July 2003

Western Forest Products Limited

Naka Tree Farm Licence 25

(Southern and North Central Vancouver Island, Loughborough Inlet, Central and North Mainland Coast and Southern Queen Charlotte Islands (Haida Gwaii))

Sustainable Forest Management Plan

PROPOSED MANAGEMENT PLAN 10

November 1, 2003 To December 31, 2008

This Plan also serves as the Management Plan and Commitment for Managed Forest 30

The Environmental Management System covering forest operations in TFL 25 is registered as conforming to ISO 14001 standards. This certification was achieved in April 2000 through the Canadian Quality Management Institute as Registration Number 009680.

WFP
Western Forest Products Limited

Tree Farm Licence 25

Proposed Management Plan 10

This Management Plan, submitted on behalf of Western Forest Products Limited, was prepared by and under the supervision of

K McGourlick

Kerry McGourlick, R.P.F.
Chief Forester

REGISTERED PROFESSIONAL
PROVINCE OF
KERRY J. McGOURLICK
BRITISH COLUMBIA
FORESTER

Table of Contents

Tables

Figures

Appendices

1.0 INTRODUCTION

1.1 Purpose

The Tree Farm Licence (TFL) agreement requires the licence holder to submit a Management Plan (MP) to the Ministry of Forests (MoF) every five years. The Management Plan provides goals and strategies to guide management activities over the next five years and provides direction for the preparation of operational plans.

The Management Plan is focused on results and outcomes so that Western Forest Products Limited (WFP) can evaluate performance and continuously improve management practices. The format of this MP has been modified significantly to align it with WFP's certification initiatives and the Management Plan approach used for other WFP TFLs. As a result, in addition to the legislative requirements, the Plan contains Principles, Criteria, Elements, Objectives and measurable parameters called Indicators that will enable WFP to achieve sustainable forest management objectives.

A separate Timber Supply Information Package (TSIP), Timber Supply Analysis (TSA) and Twenty Year Plan has been supplied to the Chief Forester to aid in his determination of an allowable annual harvest rate for this licence for the Management Plan period.

1.2 Description of the TFL

On October 1, 1998, the Minister of Forests approved several significant changes to Tree Farm Licence 25, originally granted in 1958. These included the deletion of Block 4 (Port McNeill) from TFL 25 and its consolidation into TFL 6 and the cancellation of Moresby TFL 24 and its consolidation into TFL 25 as Block 6. There is no longer a Block 4 in the TFL. Amendments made to the TFL are provided in Appendix I.

Western Forest Products Naka Tree Farm Licence 25 is now comprised of five 5 administrative units. Two are located on Vancouver Island at Jordan River (Block 1) and Naka Creek (Block 3). Two are on the Mainland coast at Loughborough Inlet (Block 2) and Swanson Bay (Block 5) and one is on Moresby Island (Block 6) in the Queen Charlotte Islands/Haida Gwaii. Figure 1 provides block locations, while individual Block maps and tenure features are found in Appendix II.

The total area of the TFL is approximately 480,150 hectares of which 268,850 hectares is productive forest. The timber harvest landbase (THLB), approximately 138,077 ha, is the formal forested area that supports the annual harvest level.

The THLB includes both publicly (129,107 ha) and privately (8,970 ha) owned lands. As part of the TFL, private lands are managed to public standards. The private lands in all five TFL 25 blocks make up Managed Forest 30 for taxation purposes.

Information on the Managed Forest is found in Appendix III.

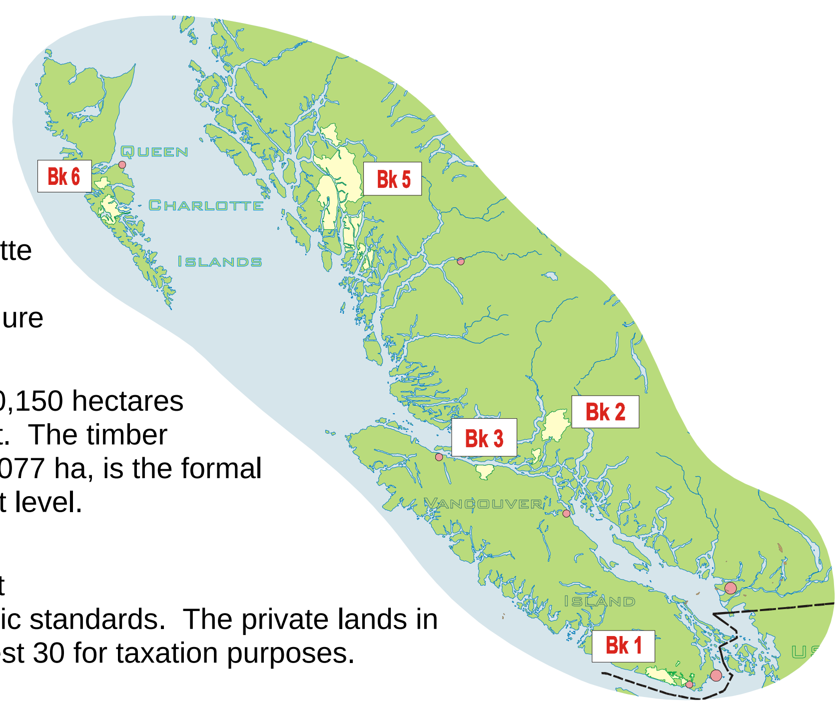


Figure 1 – TFL 25

A detailed summary of the combined TFL land status and mature timber volumes is presented in Table 1. A breakdown of individual Block summaries are found in the Timber Supply Information Package located in Appendix IV. This landbase will be modified by the outcome of active LRMPs (Central Coast, North Coast and Haida Gwaii/Queeen Charlotte Islands) which are scheduled to be completed during the term of this Management Plan. There may be additional adjustments as a result of Bill 28, The Forest Revitalization Act, passed on March 31, 2003.

Block 1 is located on the southwest coast of Vancouver Island. It has a total area of 32,200 ha of which 30,477 ha are productive forest and a THLB area of 25,562 ha. The THLB area is comprised of 16,754 ha of Crown land and 8,808 ha of privately owned land. This block extends from sea level to the height of land on Loss and San Juan Ridges. This area has been managed as a separate, sustained yield unit within the TFL since its inception in 1958. The closest communities are Port Renfrew, Jordan River and Sooke.

Block 1 contains several; private properties that may be best suited to uses other than forestry. These include parcels within the boundaries of the community of Sooke or those isolated from the main TFL land base. As well, there is also an opportunity to develop a commercial gravel operation in Block 1. It is expected that applications related to these initiatives will be made during the term of MP 10.

Block 2 is on the Mainland coast at the head of Loughborough Inlet. It has a total area of 66,891 ha of which 28,312 ha are productive and a THLB area of 15,002 ha. The THLB area is predominantly crown land with only 10 ha in private ownership. There are three sub-units to Block 2: Heydon Bay, Apple River and Fraser Bay/Stafford River. The THLB within the Heydon Bay and Apple River units are now mainly second growth originating from logging. The main community servicing this remote area is Campbell River.

Block 3 is on the east coast of Vancouver Island between Robson Bight and Eve River. It has a total area of 15,985 ha of which 12,852 ha are productive and a THLB area of 9,444 ha. The THLB is all Crown land. The nearest communities are Woss, Sayward and Campbell River.

Block 5 is located on the mainland coast between Bella Bella (Waglisla) and Gardener Canal. It has an area of 311,707 ha of which 150,249 ha are productive forest and a THLB area of 62,901 ha. The THLB is predominantly Crown land with only 151 ha of private land. Communities in or servicing Block 5 include Bella Bella, Shearwater, Klemtu, Hartley Bay, Bella Coola, Port Hardy, Port McNeill, Kitimat and Prince Rupert.

Block 6 is located on Moresby Island in the Queen Charlottes. This 53,364 ha unit was formerly Tree Farm Licence 24, which was significantly impacted by the creation of the South Moresby National Park Reserve in 1987. It has a productive area of 46,961 ha and an THLB area of 25,169 ha. The majority of the northern Moresby subunit of this Block is second growth. Current harvest is concentrated in the southern Sewell Inlet subunit. The nearest community is Sandspit.

Table 1 – TFL Landbase

Classification	Area (ha)			Mature Volume (m³)		
	Schedule A	Schedule B	Total	Schedule A	Schedule B	Total
Total Area	51,772.9	428,376.2	480,149.1	18,151,616.0	90,132,672.6	108,284,288.6
Less: Non-Forest	5,306.3	202,936.2	208,242.5	12,778.9	17,761.7	30,540.6
Less: Non-Productive Forest	234.4	2,820.9	3,055.3	26,823.2	365,435.5	392,258.7
Total Productive Forest	46,232.2	222,619.1	268,851.3	18,112,013.9	89,749,475.4	107,861,489.3
Less Reductions to Total Productive Forest:						
Non-Commercial	93.6	1,643.0	1,736.6	581.9	5,858.2	6,440.1
Low Sites	5,296.8	34,897.3	40,194.1	1,125,512.3	8,843,881.6	9,969,393.9
Riparian Reserves	868.2	3,262.1	4,130.3	376,753.6	1,304,592.7	1,681,346.3
Inoperable / Inaccessible (I, Oce, Ohe)	8,806.5	70,441.3	79,247.8	4,753,750.5	36,273,975.3	41,027,725.8
Environmentally Sensitive Areas	243.8	3,348.3	3,592.1	117,959.6	1,811,645.2	1,929,604.8
Unclassified Roads, Trails and Landings	446.9	1,426.0	1,872.9	16,710.2	62,110.8	78,821.0
Total Reductions to Productive Forest	15,755.8	115,018.0	130,773.8	6,391,268.1	48,302,063.8	54,693,331.9
Total Reduced Land Base	30,476.4	107,601.1	138,077.5	11,720,745.8	41,447,411.6	53,168,157.4
Less: Not Sufficiently Restocked Areas	657.0	1,968.0	2,625.0	0.0	0.0	0.0
Add: Not Sufficiently Restocked Areas	657.0	1,968.0	2,625.0	0.0	0.0	0.0
Timber Harvesting Land Base	30,476.4	107,601.1	138,077.5	11,720,745.8	41,447,411.6	53,168,157.4
Less: Future Roads, Trails and Landings	861.3	2,717.7	3,579.0	426,430.6	1,381,639.4	1,808,070.0
Less: Volume Reductions (WTP&RMZ – 8.5%)	2,008.1	6,845.1	8,853.2	863,472.6	2,884,862.9	3,748,335.5
Total Long Term Land Base	27,607	98,038.3	125,645.3	10,430,842.6	37,180,909.3	47,611,751.9

The forests of TFL 25 lie primarily within the Coastal Western Hemlock biogeoclimatic zone. A full range of subzones from the Very Dry Maritime through to the Very Wet Hyper Maritime are represented. Annual precipitation levels vary between 3,000 and 5,000 mm. The climate is characterized by mild, wet winters and cool moist summers. However, local climates within the TFL can be significantly different due to topographic influences

The dominant timber species is western hemlock, which occurs in conifer stands mixed with varying amounts of amabilis fir and western red cedar. Lesser amounts of Sitka spruce, yellow cedar, Douglas fir, alder, shore pine and mountain hemlock are present. Species and volumes are in the Timber Supply Information Package in Appendix IV.

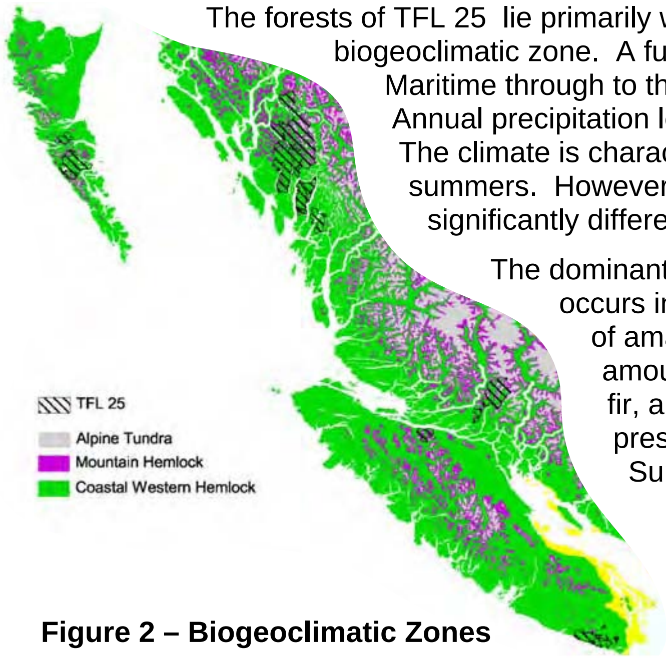


Figure 2 – Biogeoclimatic Zones

1.3 History and Progress

The original TFL 25 was granted to a WFP predecessor company, Alaska Pine and Cellulose, on May 21, 1958. The agreement was replaced in 1979 and again in 1989. TFL 24 (now block 6 of TFL 25) was granted to the same predecessor company on May 2, 1958. This licence was also replaced in 1979 and 1989.

TFL 25 is now in its fifth decade of operation. WFP and its predecessors have always met or exceeded the expectations of the licensor and society through a continuous evolution of management objectives. Management Plan 10 will be the next stage in matching management strategies to the evolving expectations of society and the licensor. WFP is proud of the efforts of employees and contractors in helping to sustain this important employment and crown revenue generating TFL while protecting its environmental assets.

The following accomplishments indicate the licensee's willingness and ability to manage the lands and forests in Tree Farm Licence 25 in a spirit of cooperation with government agencies, WFP employees and contractors, First Nations and the public.

Timber Harvesting

- Over the last 43 years (1958 through 2001) the licensee has harvested 98% of the available Allowable Annual Cut (AAC) and has been at all times in compliance with the cut control regulations.
- Compliance with contracting regulations has always been met. From 1996 through 2001 compliance was 127%.

Small Business Forest Enterprise Program

In 1988 the Forest Act was amended to enable the MoF to initiate a small business program within major forest tenures.

- Between 1988 and 1991 the program was allocated a total volume of 151,909 m^3 from TFLs 24 and 25. Between 1992 and 1997 the annual SBFEP allocation varied from 42,607 m^3 to 51,233 m^3. In 1998 the annual SBFEP volume was changed to 48,236 m^3/annually.
- By the end of 2000, just over half of the SBFEP volume allocated to this program had been harvested through timber sale licenses administered by the Ministry of Forests.

- The Kitasoo First Nation has been awarded two Timber Sale Licences (TSL A59446 and TSL A61254) in Block 5 with a total volume of about 150,000 m^3.

Basic Silviculture

- Reforestation has kept pace with harvesting since the TFL was granted in 1958. As a result there is no backlog non-satisfactorily restocked (NSR) area on the TFL.
- The licensee has logged just over 38,000 ha. More than 26 million seedlings have been planted on over 29,500 ha. The species and seed sources used in this reforestation program have been matched to the planting locations. The balance of the area was restocked by natural means using natural and advanced regeneration.
- Tree improvement programs for western hemlock, Sitka spruce and western red cedar began in 1966,1969 and 1974 respectively. Today the majority of seedlings used in TFL 25 reforestation programs are grown from improved seed.
- More than 9,700 ha of young stands have had competing vegetation controlled.
- The historic silviculture summary is provided in Appendix VI.

Enhanced Silviculture

- More than 10,500 ha of young forests have been juvenile spaced since 1966.
- More than 9,000 ha have been fertilized since 1978.
- More than 1,600 ha have been pruned since 1986.

First Nations

- The traditional territories of thirteen First Nations are found within the TFL. In many cases these traditional territories overlap.
- The company has supported First Nations involvement in forest planning, harvesting and silviculture in the TFL. Support has been tailored to the needs of specific communities.
  - Planning has been aided through infrastructure support as well as funding for technical training and/or forestry coordinator positions.
  - Harvesting capacity has been increased with logging training as well as logging contracts and arranging logging equipment for First Nations enterprises.
  - Silviculture has been supported through silviculture training and follow-up silviculture contracts for planting, brushing, spacing and pruning.
- Maps of First Nation traditional territories are in Appendix VIII.

Community Involvement

- The communities of Campbell River, Jordan River, Sooke, Port Renfrew, Sayward, Sandspit, Bella Bella, Klemtu, Hartley Bay and Kitimat benefit from forestry employment and associated business. Jobs are also created in other Vancouver Island and south mainland coast communities. A community map as well as regional district map is provided Appendix IX.
- In 2001, 72,000 person-days of direct employment were created by TFL 25 activities. In 2001 poor markets (as evidenced by the Minister of Forests declaration of 2001 as a depressed market year, high inventories and land use uncertainty (mainly in block 5) resulted in the licensee achieving only 65%% of the AAC.
- The economic viability of WFP’s coastal operations and the prosperity of associated resource based communities are closely related. WFP supports community initiatives that meet our joint goals and encourages open communication.

Recreation

- WFP has maintained five trails and recreation sites on both private and public land within the TFL. Sites on public land are managed cooperatively with the Ministry of Forests. In 2000, there was an estimated 13,000 visitor days of use at our sites with an additional 30,000 visitor days of recreational use of the forest land within the tenure. As well, dock and picnic facilities are maintained by R&N Logging Ltd., the company's contractor at the head of Loughborough Inlet in Block 2. Detailed recreation site maps for Blocks 1, 3 and 6, and sample visitor guides can be found in Appendix X and Appendix XI.

Research and Tree Improvement

- WFP maintains several tree improvement and reforestation research sites throughout TFL 25. These are maintained in cooperation with the B.C. Ministry of Forests (MoF) and the Canadian Forestry Service (CFS). Current projects include fertilization monitoring, vegetation management, yellow cedar tree improvement, hemlock tree improvement and growth and yield plots. A summary of active research projects is in Appendix XII.
- The Saanich Forestry Centre (SFC) was established in 1964, and the Lost Lake Seed Orchard in 1974, to provide a reliable and superior seed source for improving planting stock for reforestation. Seed orchards for western hemlock, western red cedar and Sitka spruce are maintained at these sites. Improved yellow cedar hedges are also established as a source of rooted cuttings for general reforestation purposes. As well, the SFC has a 4-million seedling container nursery. WFP is a member of the Northwest Hemlock Tree Improvement Co-operative Program and is active in most forums related to tree improvement.

Figure 3 illustrates the general forest management cycle for the TFL. It does not fully reflect changes to stand or landscape level forest management.

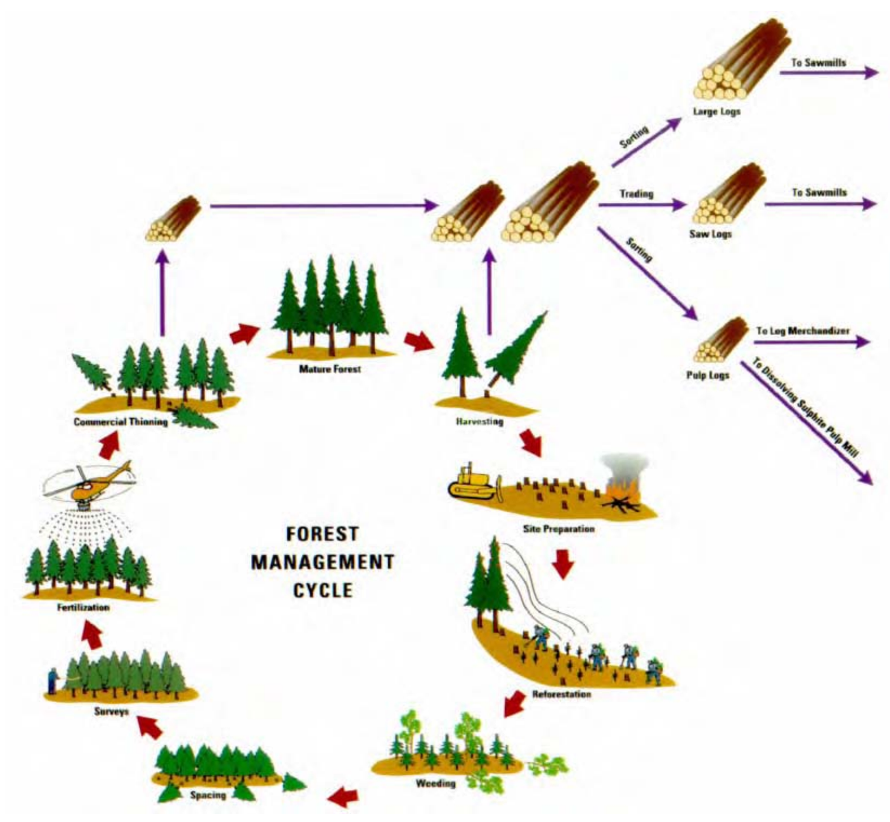


Figure 3 – Forest Management Cycle

1.4 Licence Holder and Administration

Western Forest Products Limited is a wholly owned subsidiary of Doman Industries Limited (Doman). Doman is a coastal B.C. forest products company involved in timber harvesting, sawmilling, value-added lumber remanufacturing, dissolving sulphite pulp production and kraft pulp production. Doman's nine sawmills have an annual lumber production capacity of 1.1 billion board feet. Major markets include the U.S.A., Japan and Europe.

Western Pulp, a Doman subsidiary, operates a sulphite pulp mill at Port Alice on Vancouver Island and a kraft mill at Woodfibre on Howe Sound. Port Alice has an annual production capacity of 160,000 air-dried metric tonnes (ADMT) while Woodfibre has an annual production capacity of 240,000 ADMT. Major markets for pulp include North America, Europe and the Far East.

Western Forest Products Limited is responsible for timber harvesting, reforestation and forest management on approximately 1 million hectares of Crown and private forest lands located in coastal British Columbia that include tenures held by both Doman and Western Forest Products. WFP manages an annual timber harvest of approximately 4.1 million cubic meters under a variety of tenures, which include three Tree Farm Licences, seven Forest Licences, five Managed Forests and 127 Timber Licences. The AAC together with log trading and other log supply agreements provides approximately 85% of the fibre requirements for the Doman and Western Pulp conversion plants. The remainder of the required logs are purchased on the open market.

WFP's forest operations and management are organized into three regions. North Vancouver Island Region, with a regional office in Port McNeill, administers harvesting and reforestation activities on the north end of Vancouver Island and Block 3 of TFL 25. Mainland/Islands Region, with a regional office in Campbell River, administers harvesting and reforestation activities in numerous north and central coast operations as well as operations on the Queen Charlotte Islands, southern Vancouver Island and the lower mainland coast. This office is responsible for the balance of TFL 25. Nootka Region, with a regional office in Gold River, administers harvesting and reforestation activities on the central, west coast of Vancouver Island. WFP's forest management activities are based in Campbell River while the corporate office for Doman Industries Limited is in Duncan. Appendix XIII contains a copy of the Doman Industries Limited Corporate Annual Statutory Report for 2002. A generalized view of the company's woodflow and forest products is illustrated in Figure 4.

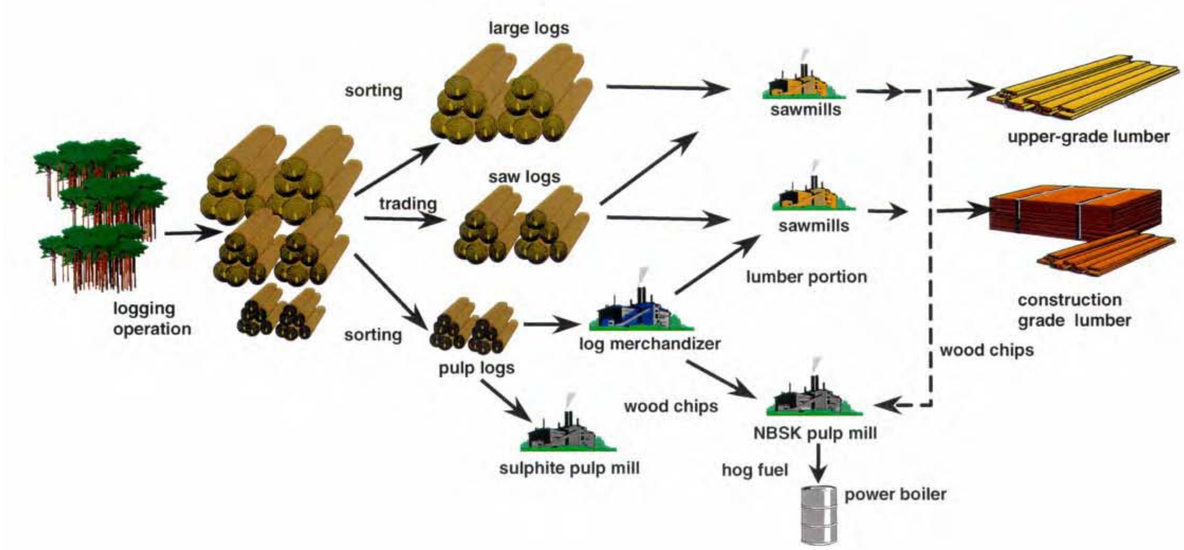


Figure 4 – Log Utilization

2.0 SUSTAINABLE FOREST MANAGEMENT PRINCIPLES

2.1 Sustainable Forest Management Policy

WFP's forest management is guided by three main principles.

- Our operations must be economically viable. Our company must operate in a financially successful manner in order to meet shareholders expectations of a fair return on investment and to maintain social and environmental commitments;
- Our actions must be socially beneficial to local, regional and First Nations communities. WFP is committed to respecting, understanding and supporting First Nations, community and employee aspirations for stability and certainty;
- Our activities must be environmentally appropriate. WFP is committed to the protection of the environment and the sustainable development of the resources under our stewardship through sound forestry and environmental management practices that meet or exceed government standards.
- Under these principles, our company is committed to:
    - Establishing harvest levels that balance the carrying capacity of forest ecosystems with social, environmental, and economic considerations.
    - Utilizing forest practices appropriate to maintaining social, environmental, and economic objectives.
    - Engaging a team of dedicated professional foresters and planners committed to implementing and practising sustainable forest management.
    - Continually enhancing our ability to plan and manage by promoting applied research and using leading edge inventory and modeling systems.
    - Planning for the long-term in an integrated manner to incorporate the full range of forest values including soil, water, fish and wildlife, cultural sites, scenic areas and biological diversity.
    - Maintaining a practical, registered management system to guide and direct the environmental aspects of company operations.
    - Performing regular, internal and external audits to ensure compliance with forest practices legislation and the commitments made in this SFM statement.
    - Committing to a level of compliance that meets or exceeds legal requirements and satisfies public expectations.
    - Continuously improving all aspects of our forest practices though adaptive management.
    - Communicating our performance to stakeholders and the public on a regular basis.
    - Maintaining biological diversity and conservation objectives at regional, landscape and stand levels.
    - Sustaining, enhancing and protecting forest ecosystem functions.
    - Maintaining soil productivity and water quality by harvesting with environmentally appropriate systems.

- Maintaining an active salmonid enhancement program to sustain or increase salmonid populations through hatchery and habitat restoration programs.
- Implementing restoration programs to address issues arising from past practices.
- Promoting a representative Protected and Protection Areas system within and adjacent to company forest tenures.
- Ensuring the economic health and sustainability of associated, resource-dependent communities.
- Involving the public and stakeholders in meaningful consultation on all aspects of our forest management.
- Encouraging public participation in identifying and assessing sustainable forest management goals, objectives and measurable indicators.
- Cooperating and consulting with community resource boards and stakeholder groups with resource management mandates.
- Managing operations to safeguard the health and safety of employees, contractors and the public.
- Developing our human resources through continuous training and recognition of employee contributions.
- Maintaining and enhancing opportunities for public enjoyment of forests through an open road policy as well as recreation site development and management.
- Respecting and recognizing First Nations traditional territories through information sharing and involvement in forest development planning.
- Providing for First Nations' participation in setting and achieving sustainable forest management goals, objectives and measurable indicators.
- Establishing employment opportunities through cooperative ventures with First Nations to increase the benefits of our operations to the economic and social well being of their communities.
- Supporting the fair and affordable settlement of aboriginal land claims through negotiated treaties with involvement of all stakeholders.
- Achieving a fair return to shareholders by operating in a financially successful manner
- Promptly regenerating all areas after harvest with ecologically appropriate species to maintain and enhance forest growth.
- Undertaking silviculture practices to enhance the value and volume of young forest stands.
- Maintaining and furthering our competitive position in the global forest product marketplace based on our long-standing commitment to innovation, research, leadership and sustainable forest management.
- Continuous improvement.

2.2 Linking WFP's Sustainable Forest Management Principles to Criteria and Indicators

2.2.1 Hierarchy of SFM Levels

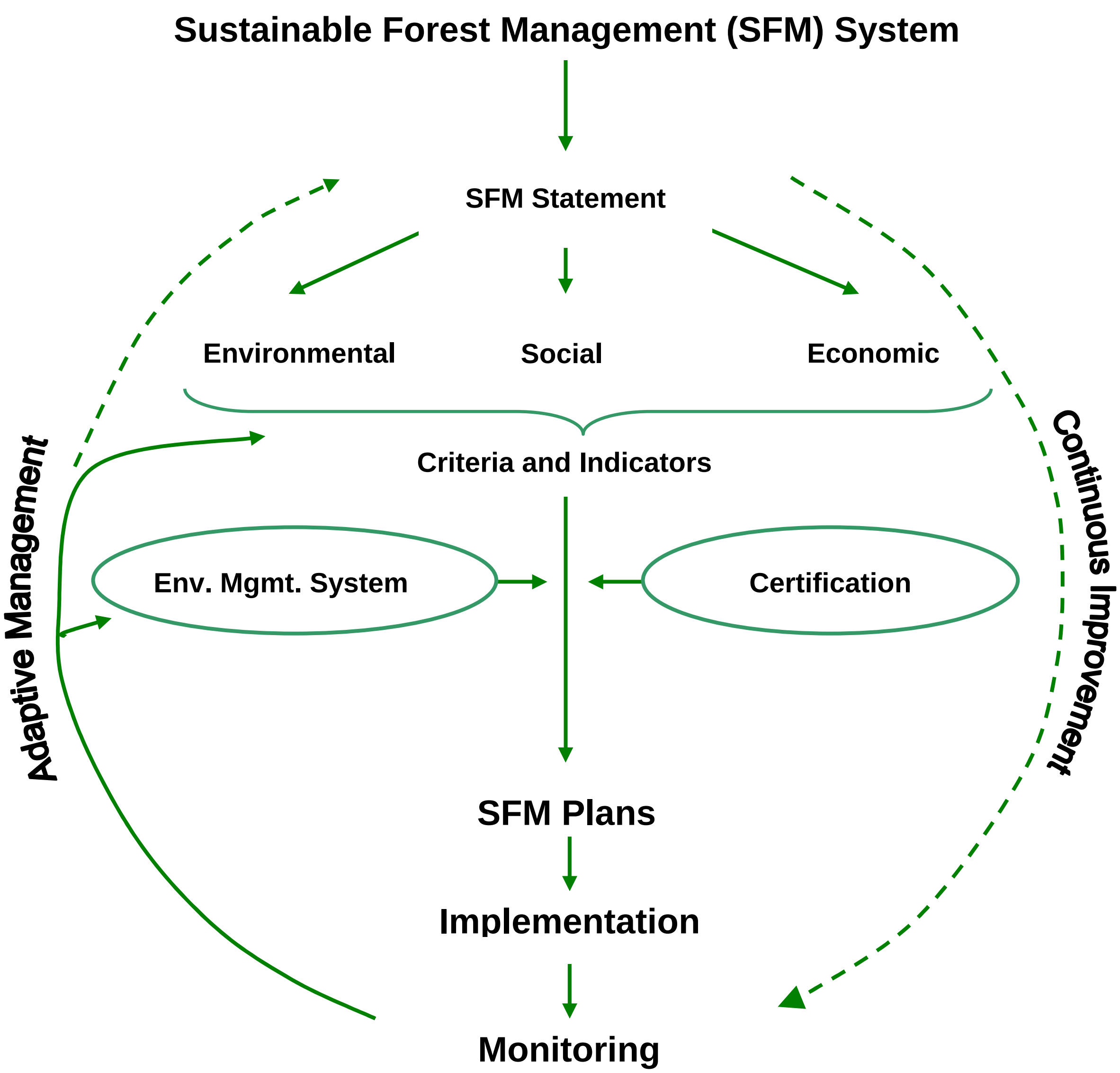
WFP's forest tenure Management Plans have been developed to meet tenure requirements, implement the company's Sustainable Forest Management (SFM) program and ensure compatibility with the various forest certification opportunities available to the licensee. The Plan focuses on the three main economic, environmental and social Principles outlined in Section 2.1. These three Principles are further defined by a series of increasingly specific Criteria, Elements, Objectives and Indicators. The Indicators will be used to monitor the effectiveness of the SFM Plan. Table 2 outlines the SFM concepts using specific examples from the Plan.

Table 2 – SFM Hierarchy

Principle	Economic	Environmental	Social
Criteria	Multiple Benefits	Conservation of Biological Diversity	Responsibility for Sustainable Development
Element	Profitability	Ecological Diversity	First Nations
Objective	Achieve a reasonable return on investment	Maintain a dynamic distribution of habitat over the landscape	Increase First Nations involvement in forest management
Indicator	EBITDA, Profit, % Return on Investment	Seral Stage Distribution	% of Silviculture contracts to First Nations

2.2.2 Sustainable Forest Management SFM System

Sustainable Forest Management is the sum total of WFP's commitments, as stated in policies, Management Plans, Environmental Management System and forest certification efforts. Criteria, Elements and Objectives are identified and Indicators monitored through audits and annual reporting. Results drive an adaptive management approach focused on continuous improvement that will adjust the Criteria, Elements, Objectives and Indicators as required over time. The following illustration below outlines the SFM process.



2.3 WFP's Forest Certification Initiatives

The stewardship principles are essential components in the Company's objective to maintain our ISO 14001 Environmental Management System Standard (see Appendix XIV) and potentially pursuing certification to Canada's National Sustainable Forest Management System Standard CAN/CSA-Z809-96 (CSA) as well as other international standards such as the Sustainable Forestry Initiative and the Forest Stewardship Council. Linkages between WFP's sustainable forest management approach and the principles, criteria and requirements of ISO, CSA, SFI and FSC are embodied in this Management Plan and articulated in its objectives, strategies and performance targets.

Measurable performance targets are set and monitored as a means of meeting the Plan objectives. Some targets will be established and reviewed annually while others will be set and reviewed periodically.

WFP will report on performance in achieving Plan objectives and targets. The TFL annual report will be one of the main reporting mechanisms used. Others include corporate reports to shareholders and external audits.

3.0 FOREST MANAGEMENT INVENTORY AND PLANNING

3.1 Resource Inventories

Resource Inventories are maintained in TFL 25 for: forest cover, ecosystems, terrain stability, recreation features, recreation opportunities, visual landscape, ownership, operability, archaeological resource potential and streams. In addition inventory projects or research studies are carried out for specific wildlife species. Environmentally Sensitive Areas (ESAs) were provided for in the previous Management Plan but have been replaced in this plan with more detailed inventories. Table 3 outlines the current inventory status.

Table 3 – Resource Inventory Status

Item	Block	Status	MOF Acceptance	Plan
Forest Cover (Timber Inventory)	1	Completed 1999 to Vegetative Resource Inventory (VRI) Standards. Updated annually, currently to January 1, 2001.	Yes, RIB accepted 1999	VRI ratio adjustments and Net Volume Adjustment Factor (NVAF) information still under review.
	2 3	Completed 1971. Updated annually, currently to January 1, 2001. Planned for completion in 2004.	Yes	New inventory started in 2001.
	5	Completed 1985. Updated annually, currently to January 1, 2001.	Yes	New inventory to begin once land use issues are resolved.
	6	Completed 2000 to Vegetative Resource Inventory (VRI) Standards. Updated annually, currently to January 1, 2001.	Yes, RIB accepted 2000	VRI ratio adjustments and NVAF information still under review.
Ecosystems	1	Completed 1988 by T. Lewis. Inventory completed to WFP standards. Minor updates and revisions completed in 1999.	Yes	
	2	Completed 1994 and 1995 by T. Lewis. Inventory completed to WFP standards. Minor updates and revisions completed in 1999.	Yes	
	3	Completed 1988 by T. Lewis. Inventory completed to WFP standards. Minor updates and revisions completed in 1999.	Yes	
	5	In progress. Inventory started in 1999 and is expected to be complete once CCLRMP land use decisions have been settled.		
	6	Completed 1981 by T. Lewis. Reinventory completed to WFP standards in 2002.	Yes	
Terrain Stability	1	Completed 1992 by T. Lewis. Reclassified to MOF standards 1996	Yes	
	2	Completed 1994 (Stafford), 1995 (Apple) and 1996 (Heydon) by T. Lewis. Reclassified to MOF standards.	Yes	
	3	Completed 1992 by T. Lewis. Reclassified to MOF standards 1996.	Yes	
	5	Partial completion 1995 by Maynard (Yeo, Rodrick, Pooley), 1995 by T. Lewis (Neekas, Coldwell Penn.).		Remaining areas (except PRI) being completed as part of the ecosystem classification.
	6	Completed 1981 by T. Lewis. Reclassified to MOF standards 1996.	Yes	

Item	Block	Status	MOF Acceptance	Plan
ESA (Wildlife) (Recreation)	1	Completed 1992 by T. Lewis		ESA mapping has been replaced with detailed inventories. Use of ESA mapping will be minimal in MP10.
	2	Not done		
	3	Completed 1992 by T. Lewis		
	5	Completed 1985 by T. Lewis		
	6	Not done		
Wildlife	1 – 6	See Wildlife Studies – Section 3.1.11 of TFL 25 Management Plan		Inventory and research are intertwined.
Recreation Features Inventory	1	Completed 2002 by Recreation Resources Limited	Submitted 01/13/03	
	2	Completed 2002 by Recreation Resources Limited	Submitted 11/16/02	
	3	Completed 2001 by Recreation Resources Limited	Submitted 11/16/02	
	5	Completed 1996 by Recreation Resources Limited	Yes	Inventory will be revised once CCLRMP land use issues are resolved.
	6	Completed 2002 by Recreation Resources Limited	Yes 03/26/03	
Recreation Opportunity Spectrum Analysis	1	Completed 2002 by Recreation Resources Limited	Submitted 01/13/03	
	2	Completed 2002 by Recreation Resources Limited	Submitted 11/16/02	
	3	Completed 2001 by Recreation Resources Limited	Submitted 11/16/02	
	5	Completed 1996 by Recreation Resources Limited	Yes	Inventory will be revised once CCLRMP land use issues are resolved.
	6	Completed 2002 by Recreation Resources Limited	Yes 03/26/03	
Visual Landscape Inventory	1	Completed 2002 by Recreation Resources Limited	Submitted 01/13/03	
	2	Completed 2002 by Recreation Resources Limited	Submitted 11/16/02	
	3	Completed 2001 by Recreation Resources Limited	Submitted 11/16/02	
	5	Partial completed 1994 by LA West (Yeo, Coldell, Neekas, Susan, Roderick, Pooley). Remaining area completed 1995 by Recreation Resources Limited	Yes	Inventory will be revised once CCLRMP land use issues are resolved.
	6	Completed 2002 by Recreation Resources Limited	Yes 03/26/03	
Stream Classification	1 – 6	Ongoing – Operational classification is being integrated into overview inventory for all blocks. Conversion from old A,B,C classification to FPC "S" class has been completed or is approximated.	MP 10 uses existing information supplemented with GIS slope analysis to derive overview stream classifications.	Continue to update inventory as new operational data becomes available.
Archaeological Overview Assessment (AOA)	1	Not done		
	2	Not done		
	3	Not done		
	5	Completed 2000 by Golders Associates. Funded by FRBC	Yes 2000	
	6	Draft report completed in 2002.		Under review by the Haida Nation
Operability	1	Completed 2000 by WFP. Inventory contains classification for operability by harvest system and economic conditions.	Yes	
	2			
	3			
	5			
	6			

3.1.1 Forest Cover

Forest cover inventories were compiled between 1968 and 1985. These inventories have subsequently been updated annually to account for the area harvested and regenerated as well as other changes.

WFP has recently begun a conversion of forest cover inventories to the Resource Inventory Committee Vegetation Resource Inventory Standards (RIC-VRI). Block 1 was completed in 1999 and Block 6 was completed in 2001. Blocks 2 and 3 will be completed in 2004. Block 5 photo preparation started in 2000, but has been postponed until land use issues have been resolved. Funding for the VRI program has come from Forest Renewal BC and the Forest Investment Account.

3.1.2 Environmentally Sensitive Areas

Most areas formerly identified as ESA are now captured in more accurate feature specific inventories. The constraints incorporated in these other inventories are modeled as part of the Timber Supply Analysis.

3.1.3 Operability

Original operability assessments were completed for the various blocks in the TFL between 1981 and 1995. In 2000, these assessments were reviewed to incorporate harvest systems and economic conditions. Final maps were supplied to the Ministry of Forests in 2001.

3.1.4 Recreation

Recreation features and recreation opportunities were inventoried between 1992 and 1996. These inventories will be used in the current Timber Supply Analysis. Revised inventories for Blocks 1, 2,3 and 6 were completed in 2002/03 and will replace the existing inventory within the term of this plan. Block 5 updating has been delayed until the CCLRMP land use issues are resolved.

3.1.5 Visual Landscape Inventory

Visual landscape inventories were updated between 1990 and 1994 in preparation for Management Plan 9 and subsequently used in the current Timber Supply Analysis. Visual inventories for Blocks 1, 2, 3 and 6 were upgraded in 2002/03 and will replace the existing inventory within the term of this plan. Block 5 updating has been delayed until the CCLRMP land use issues are resolved.

3.1.6 Terrain Stability

Terrain Stability Mapping (1:20,000 scale) has been completed for all Blocks with the exception of Block 5. Mapping for this Block is ongoing and will be completed once the CCLRMP land use issues are resolved. The completed Level C terrain mapping has been used to identify areas where Field Terrain Stability Assessments are needed in advance of development to ensure that appropriate management strategies are implemented for soil conservation. This mapping also provides guidance during the TFL operability revisions. Only under rare circumstances is road construction proposed in terrain Class V areas. On terrain Class IV and V areas roads and harvesting will occur only after further geotechnical analyses and careful planning. Government agency review and approval is an integral part of all road construction activities.

3.1.7 Ownership and other Tenures

Less than seven percent of the TFL operable area is private land. These private holdings are managed to the same standards as Crown land. Operational plans taking direction from this Management Plan indicate private land ownership in and adjacent to the TFL and private timber found on Crown land.

3.1.8 Archaeological Resources

An FRBC funded overview assessment of archaeological resources was conducted in Block 5 in 2000 by Golder and Associates. An FRBC funded AOA of the Queen Charlotte Islands (including Block 6 of TFL 25) was carried out in 2002 and is currently under review by the Haida Nation.

3.1.9 Ecosystem Mapping

Ecosystem Mapping (1:20,000 scale) or remapping was completed for most of theTFL in 2002. Only a portion of Block 5 remains to be completed pending the outcome of the CCLRMP.

Ecosystem mapping begins with the phototyping of terrain units on 1:15,000 scale photographs. Sample plots are then selected and assessed to represent ecosystem mapping units. At each plot an evaluation of site and soil characteristics is made, a detailed vegetation list compiled by strata and estimates made of percent cover and stand structure. Structural elements include abundance of snags, including species, decay class, size and use, coarse woody debris on the forest floor, including volume, species and decay class and gap analysis including % closed canopy, % open gap and % extended gap.

The relationships between terrain units and ecosystem types are empirically developed during fieldwork. Terrain units are subdivided as necessary and mapped into two or more ecosystem types based on vegetation and site factors.

Ecosystem mapping provides an ecological basis for future management programs and includes the appropriate selection of species for reforestation. The system has been used as a basis for forest management activities and site productivity estimation in areas of the TFL since 1981.

3.1.10 Streams

Area specific stream inventories are conducted to FPC standards in advance of forest development. These in-depth assessments are combined with Resource Inventory Committee inventories and GIS gradient based models to provide landscape level planning information. These landscape level inventories are utilized in projecting harvest levels.

3.1.11 Wildlife Inventories and Studies

The wildlife related studies in Table 4 have been conducted within TFL 25 during the period of the current management plan. These studies provide direction to operational planning and will be used in landscape unit planning and the delineation of draft OGMAs and WHAs.

During the term of the current Management Plan, WFP convened an expert committee on bear management that has met on an annual basis and provided information updates. We believe that any concerns with forest management with respect to the Kermode bear have been addressed through the work of this committee as well as land use decisions made by the provincial government in Central Coast.

Table 4 – Wildlife Studies

Block	Status
1	▪ Marbled Murrelet and Ungulate Winter Range habitat modeling 2000 ▪ Marbled Murrelet Nesting Habitat Evaluation – Nov 1999 Ecologic Consulting ▪ Marbled Murrelet detection surveys – 2000 Ecologic Consulting ▪ Elk habitat assessments (Weeks Lake) – 1998 to 2001
2	▪ Deer Winter Range and Goat Assessments in the Stafford River Watershed – May 1996 D. Blood & Associates Ltd. ▪ Marbled Murrelet detection surveys – July 1996 D. Blood & Associates Ltd. ▪ Stafford Wildlife Assessment – 1993/97 R. McLaughlin ▪ Grizzly Bear Habitat Mapping – 2000 A.G.MacHutcheon ▪ Goat Study
3	▪ No specific studies conducted, SPs contain some wildlife references.
5	▪ Kermode Bear Report – May 97 D. Blood & Associates Ltd. ▪ Kermode Bear Genetics Project – 1997/01 UBC/Artemis ▪ Wildlife Survey and Habitat Map (Yeo, Pooley and Roderick Islands) – 1994/95 D. Blood & Associates Ltd.
6	▪ Biodiversity Assessment of TFL 24 - 1996 D. Blood & Associates Ltd. ▪ Marbled Murrelet Inventory (Botany and Fairfax Inlet) – 1997/98 D. Blood and Associates Ltd.

3.1.12 High Conservation Value Forests

The Forest Stewardship Council defines High Conservation Value Forests as forests that possess one or more of the following attributes:

- Forest areas containing globally, regionally or nationally significant:
  - Concentrations of biodiversity values (e.g. endemism, endangered species refugia); and/or
  - Large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance
- Forest areas that are in or contain, rare, threatened or endangered ecosystems
- Forest areas that provide basic services of nature in critical situations (e.g. watershed protection, erosion control)
- Forest areas fundamental to meeting basic needs of communities (e.g. subsistence, health) and/or critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

While WFP is not currently pursuing FSC certification for TFL 25, we anticipate that the concept of HCVF will be integrated into the Ecosystem Based Forest Management efforts being undertaken on the Mid Coast in Block 5.

As part of the process to identify and conserve HCVF attributes, the company has developed an initial report on rare vascular plants in Block 1 that can be found in Appendix XV. It is expected that further reports of a similar nature will be prepared.

3.2 Planning Linkages - Strategic and Operational Planning

This Management Plan fits into the hierarchy of planning as follows:

- LRMPs (i.e. VISLUP, CCLCRMP)
  - Higher Level Plans
    - Landscape Unit (LU) Planning
      - **Management Plan 10 (and associated AAC Determination)**
        - Operational Plans (FDPs, FSP, SPs (transition)
          - Site Plans

Strategies objectives both within and between these various plans must be consistent. Generally, Higher Level Plans that result from LRMPs and Landscape Unit Plans allow for legally enforceable objectives to be established under the Forest Practices Code and subsequently the Forest and Range Practices Act. These legalised objectives give direction to subordinate plans that provide implementation details.

Some objectives have been incorporated into Higher Level Plans under the Forest Practices Code. These objectives affect operational planning in Special Management Zones (SMZ) and Enhanced Management Zones (EMZ). On Vancouver Island, SMZs Higher Level Plan objectives deal with cut block structure, size and silviculture systems, approval of Forest Development Plans and visual quality management. EMZs Higher Level Plan objectives deal with cut block size and green-up, hydrology and reforestation species selection.

Linkages to WFP's sustainable forest management (SFM) principles are made with both strategic level and operational level plans. SFM principles incorporate the Forest Practices Code and Regulations, Forest Act and other related legislation as minimum standards.

3.2.1 LRMP and Higher Level Plans

All of the five TFL 25 Blocks have been, or are currently incorporated into LRMPs.

Blocks 1 and 3 are included in the Vancouver Island Summary Land Use Plan (VISLUP). The Higher Level Plan Order establishing portions of the VISLUP was effective December 1, 2000 and required operational plan conformance as of April 1, 2001. The VISLUP Higher Level Plan also provided direction to Landscape Unit Planning in a number of key Landscape Units.

The VISLUP identifies four resource management zones (RMZs) within the TFL 25 landbase. One zone is classified Special, one General, and two Enhanced. These zones have specific integrated resource management expectations and reflect pertinent resource legislation and policy. Table 5 summarizes applicable management regimes for timber, silviculture, water, fish, recreation, tourism, visuals, wildlife, biodiversity, cultural features, access and cave or karst features.

Table 5 – VISLUP Resource Management Zones – Blocks 1 and 3

Description	Loss- Jordan	San Juan Ridge	E&N South	Naka
Number	RMZ 47	SMZ 22	RMZ 34	RMZ 27
Zone Category	Enhanced	Special	General	Enhanced
Timber	Enhanced	Special	General	Enhanced
Silviculture	Enhanced	-	Enhanced	Enhanced
Water	General	General	Community	General
Fish	General	General	General	General
Recreation	General	Special	General	General
Tourism	General	Special	General	General
Visual	General	Special	General	General
Wildlife	General	General	General	General
Biodiversity	Basic	General	General	Basic
Cultural	General	General	General	General
Access	General	General	General	General
Cave/Karst	-	General	General	-

The Central Coast LRMP covers Block 2 and a significant portion of Block 5. Interim recommendations were agreed upon by all stakeholders and publicly announced in April 2001. Government subsequently established a Completion Table for the LRMP that is expected to provide a final report that will be incorporated into government-to-government discussions in the fall of 2003.

The portion of Block 5 falling into the North Coast Forest District was included in the scope of the CCLRMP. As a result, the North Coast Forest District has already been impacted by LRMP decisions independent of the NCLRMP. The economic impacts and environmental "credits" resulting from CCLRMP decisions affecting the North Coast Forest District must be recognized in the NCLRMP. The North Coast LRMP will be completed during the term of this Management Plan.

In February 2003, the provincial government and the Haida Nation signed a framework agreement to co-manage planning on Haida Gwaii/Queen Charlotte Islands where Block 6 is located. This LRMP is planned for completion during the term of this Management Plan.

3.2.2 Landscape Unit Plans

In early 1999, the provincial government released the Landscape Unit Planning guide. At about the same time the Vancouver Forest Region developed a Regional Landscape Unit Planning Strategy that focused on the identification and establishment of old growth management areas (OGMAs) to meet biodiversity objectives. The strategy also dealt with the establishment of wildlife tree patches (WTPs) and the protection of marbled murrelet habitat.

Portions of twenty-three landscape units cover the TFL landbase. The boundaries of the LUs generally follow those of the RMZs. A high, intermediate or low Biodiversity Emphasis Option (BEO) has been assigned to each LU based on a combination of factors including the amount of protected area within the LU, percent of old forest, ecosystem complexity, sensitivity to development, connectivity, forest productivity and timber operability. WFP will continue to take a lead role in landscape unit planning for the area covered by the Plan. Table 6 summarizes the twenty-three TFL 25 LUs and BEOs. Maps by TFL block of Landscape Units can be found in Appendix XVI. RMZs established by Higher Level Plan include portions of the Loss, Tugwell, Sooke, Naka and Tsitika Landscape Units.

Table 6 – Landscape Units and BEOs for TFL 25[1]

Block	LU Name	BEO	Gross LU Area (ha)	Gross LU Area within TFL 25 (ha)
Jordan River	Loss	Low	21,457	15,150
Block 1	Sooke	Low	36,972	13,650
	Tugwell	Low	31,972	3,450
Loughborough	Stafford	High	58,450	58,450
Block 2	Fulmore	Intermediate	85,099	8200
Naka	Tsitika	High	40,165	1,340
Block 3	Naka	Low	15,782	14,960
Swanson Bay	Crab	Low	24,110	24,110
Block 5	Triumph	Low	20,698	5,400
	Kiltuish	Low	28,110	28,110
	Klekane	Low	23,601	23,601
	Aaltanhash	Low	18,482	18,482
	Khutze	Intermediate	34,586	34,586
	Green	Intermediate	34,171	32,600
	Butedale	Intermediate	21,488	21,488
	Tolmie	High	22,130	16,400
	Laredo	Intermediate	53,482	34,500
	Roderick	Low	54,822	54,822
	Yeo	Low	25,823	13,050
	Don Peninsula	Intermediate	85,099	7,700
Queen Charlottes	Selwyn Inlet	Low	47,108	27,000
Block 6	Skidegate Lake	Low	53,444	2,700
	Tasu	Low	34,382	24,000

[1]*Some units in Block 5 are expected to become formal protected areas as part of the Central Coast LRMP.*

3.2.3 Forest Development Plans and Forest Stewardship Plans

Forest Development Plans (FDPs) were required under the Forest Practices Code and the Operational Planning Regulation to direct forest management activities and practices. FDPs showed the location of proposed harvesting activities as well as road construction, maintenance and deactivation details. The FDP also included information on access management and described how other resource values would be maintained and protected in the area covered by the plan.

A FDP had to be consistent with Higher Level Plans and made available for review by resource agencies, First Nations and the public before approval was considered by the Ministry of Forests. FDPs were submitted either annually or every two years and contained enough proposed cut blocks to equal at least five years of annual harvest. Legislative changes made since the draft Management Plan was submitted will replace the FDP with a new Forest Stewardship Plan that will meet new “tests” and require a new format. In spite of this, several FDP items will continue to be used as SFM indicators and will be reported on in the TFL Annual Report.

The list of indicators includes:

- Ha maintained as stand level reserves
- Silviculture systems
- Kilometers of road maintained
- Consultation and meetings with First Nations and communities
- Cumulative ha of wildlife habitat reserves
- Harvest systems
- CWAP status
- Archaeological impact assessments (AIAs)

3.2.4 Site Level Plans

At the time of draft Management Plan submission a number of additional operational plans detailing forest management activities were required to be prepared for review and approval by the MoF. In addition to FDPs, Silviculture Prescriptions, Stand Management Prescriptions, and Logging Plans were referred to as operational plans in the FPC's Operational Planning Regulation. New legislation has removed the requirement for Stand Management Prescriptions and has replaced the Silviculture Prescription with a Site Plan requirement. The Site Plan is not approved by the Ministry of Forests but has prescribed content and professional sign-off.

Road activities including road layout and design, road construction and modification, as well as road maintenance and deactivation were not by definition operational plans, but they were regulated under the FPC through the Forest Road Regulation. Under the Forest and Range Practices Act they will continue to be regulated.

3.2.5 Permits

Cutting authority and road approvals are granted by the MoF in the form of Cutting Permits and Road Permits under the Forest Act. They take direction from other plans higher in the planning hierarchy.

The content requirements for the various operational plans and permits are defined by legislation. Policy guidelines and guidebooks also give direction to the development of plans, prescriptions and permit applications.

3.2.6 Adaptive Management

Forestry plans recognize that knowledge will always be limited and that some uncertainty will always exist. For these reasons, sustainable forest management plans must incorporate adaptive management. Management must be adjusted to maintain ecosystems and habitats across a landscape, to consider land management impacts at both the stand and landscape levels and to balance timber and other resource values.

3.2.7 Ecosystem Based Forest Management

In past Management Plans, operational planning has taken some direction from an ecosystem inventory based upon vegetation characteristics, climate and site physical properties.

Ecosystem-based forest management takes a broader view of ecological functions and ecological components. During the term of this management plan it is anticipated that a framework for ecosystem based forest management (EBFM) will be developed for Block 5. Pilot projects are underway at James Bay on Pooley Island and at Jackson Lake on Roderick Island within TFL 25. James Bay is a WFP Forest Operation while Jackson Lake is a Small Business Timber Sale Licence which WFP is assisting the Kitasoo First Nation in developing. Forest practices at both the stand and landscape level will be adjusted as required to fit this new framework. If the Central Coast approach to EBFM appears practical for other coastal areas, we can anticipate a transfer of knowledge and techniques. Appendix XVII contains the Definitions, Principles and Goals of Ecosystem Based Management as appended to the General Protocol Agreement on Land Use Planning and Interim Measures for the Central Coast.

The Central Coast LRMP agreement definition is as follows*: "Ecosystem based management is a strategic approach to managing human activities that seeks to ensure the coexistence of healthy functioning ecosystems and human communities. The intent is to maintain those spatial and* *temporal characteristics and processes of whole ecosystems such that component species and human, social, economic and cultural activities can be sustained."*

3.2.8 Non-FPC Planning and Protocols

Western Forest Products realizes that this Management Plan and subsequent operational plans will require adjustments for government-to-government agreements, non-FPC/FRPA initiatives, non-FPC/FRPA land use plans, and local resource studies. A few examples are the BC Government–Haida Nation land use planning protocol, the Turning Point process, the Heiltsuk Cultural Landscape Assessment, the Gitga'at Land Use Plan and in particular the Kitasoo/Xai'xais Land Use Plan which is expected to provide direction for future development within the traditional territory of the Kitasoo/Xai'xais Nation. The Kitasoo Land Use Plan is provided in Appendix XVIII. The Protocol Agreement on Land Use Planning between the provincial government and First Nations is provided in Appendix XIX.

4.0 SUSTAINABLE FOREST MANAGEMENT STRATEGY

The following sections describe the SFM Principles, Criteria, Elements, Objectives and Indicators that form this SFM Plan.

4.1 Economically Viable Forest Management — *Principle*

4.1.1 Multiple Benefits — *Criteria*

4.1.1.1 Timber Supply — *Element*

Objective	*Indicator*
Harvest AAC	*% Achievement of AAC, 5 year cut control, Estimated total value of timber produced*
Prevent timber loss	*Ha of non-recoverable losses (wind, fire)*
Efficient utilization	*M^3 of billable waste*

Harvest Levels

WFP is committed to economically harvest the licensee portion of the TFL 25 AAC on both an annual and a five-year cut control basis in accordance with its SFM principles and the FPC. Volume will be made available as required by legislation for the BC Timber Sale program.

Since 1959, the TFL harvest has been within 2% of the licensee AAC. Table 7 through Table 9 provides the periodic harvest history since the licence was granted as well as the Timber Harvesting Operability and the Timber Harvest Volumes by Block since 1997. Annual and cumulative harvest rates as well as the estimated value of timber produced will be provided in the TFL annual report.

Table 7 – Cut Control Performance 1959 – 2001

Period	Allowable Cut Available To Licensee	Chargeable Cut
1959-1968	6,917,794	7,106,222
1969-1978	10,206,702	9,729,213
1979-1988	10,818,208	11,371,339
1989-1993	3,890,783	4,007,750
1994-1998	4,143,813	3,816,963
1999-2001	1,931,022	1,336,090
Total	***37,908,322***	***37,367,577***

During the preparation of this Management Plan, the Ministry of Forests approached Western Forest Products Limited to explore the possibility of the licence AAC being determined and monitored on an area basis rather than a volume basis. Their rationale was that harvesting a fixed area rather than volume on an annual basis is easier for the public to understand and may be easier for government and a licensee to administer.

After some discussion, WFP agreed to put TFL 25 forward to test this concept. Both the Timber Supply Information Package and the Timber Supply Analysis appended to this Plan as Appendix IV and V were prepared on this basis. The TSA proposes an annual area to be harvested for each Block of the TFL.

Table 8 – Timber Harvesting Volumes (m^3) by TFL Block
1997 through 2001

TFL Block	1997	1998	1999	2000	2001
Block 1	177,723	92,497	138,607	215,878	112,693
Block 2	81,338	83,127	37,487	93,168	112,740
Block 3	32,267	320	35,540	49,165	25,246
Block 4*	200,769	150,893	N/A	N/A	N/A
Block 5	156,387	107,111	105,882	120,584	26,334
Block 6*	N/A	45,871	43,216	26,664	116,841
Residue	34,525	29,587	10,932	37,946	27,167
Credits	(5,062)				
Total	*677,946*	*509,405*	*371,663*	*534,405*	*421,021*

**October 1, 1998, Block 4 of TFL 25 was eliminated and amalgamated into TFL 6. On the same date TFL 24 was eliminated and consolidated into TFL 25 as Block 6.*

Table 9 – Timber Harvesting Operability Report
(Harvest Height Class (%) vs Inventory Height Class (%) in THLB

Year	Ht Class2	Ht Class 3	Ht Class 4	Ht Class 5	Ht Class 6	Ht Class 7
1997	3	16	38	26	10	0
1998	1	20	42	32	5	0
1999	0	17	56	20	5	1
2000	1	19	47	27	6	0
2001	1	16	37	42	3	0
Average	1	18	44	30	6	0
Inventory	0	18	42	34	5	1

The TFL 25 MP 10 harvest level options are provided in the Timber Supply Analysis, which is appended as Appendix IV . A copy of the TFL 20 Year Plan a well as TFL operability criteria that support the 20-year plan (provided as Appendix XX) has been supplied to District offices for review. The Timber Supply Analysis proposes that in subsequent cut control periods, the AAC be regulated by area harvested rather than volume scaled. This method of harvest regulation has been encouraged by government and Western Forest Products has agreed to allow TFL 25 to be used as a trial area for this approach. Experience gained over the next cut control period will be used to determine whether or not this form of harvest regulation should be continued going forward.

Timber Losses

Salvage from stands damaged by blowdown, fire, pest or disease infestations will continue to be given a high priority. Assessments of these stands will include the extent and degree of damage, feasibility for harvest and relevant value with respect to biological diversity. A ledger system has been developed to monitor the damage and salvage occurring within the TFL. For calendar year 2001, the system identified only a small area of unsalvaged losses over the past 5 years. For Management Plan 10, a monitoring system will be put in place to record the damage and salvage of timber within the Timber Harvesting Land Base (THLB). Each incident will be tracked to determine the location, approximate area and volume, and recovery status. The goal will be to recover all economically viable THLB volume. The annual non-recovered timber losses will be reported in the TFL annual report.

Utilization

Harvesting will emphasize maximum recovery of saw logs and pulp log grades. Log recovery will conform to the Vancouver Forest Region Close Utilization Standards (See Table 10). Operations may exceed these minimum standards by recovering low-grade pulp quality logs. Generally, these logs are marginal Y grade whose utilization is optional. Utilization will be improved by encouraging the salvage of cedar shake and shingle blocks and to a lesser extent cypress and spruce cants and blocks from residue materials.

Presently, Ministry policy permits 35 m^3/ha of avoidable waste from mature stands and 10 m^3/ha of avoidable waste from second growth stands before a penalty billing is issued. WFP operations have averaged less than half of these levels (14.6 m^3/ha) over the past five years. Utilization levels will be reported in TFL annual reports.

Residue surveys are used to monitor utilization levels. These surveys provide the AAC volume, the avoidable volume and the billable volume/ha on each cutblock. WFP aims for a lower residue level than MoF policy permits unless there are over-riding ecological concerns with the level of Coarse Woody Debris (CWD) left on site. If there are ecological reasons for higher than permitted residue levels, WFP will request billing relief. Should the Chief Forester approve the use of an area based AAC for the subsequent cut control period, residue survey plots will only be used as required to monitor utilization for compliance and enforcement purposes and will not be used for cut control.

Table 10 – Utilization Standards

Utilization Standards	Mature (>120 years)	Second Growth (<=120 years)
Diameter at Breast Height (cm)	17.5	12.5
Maximum Stump Height (cm)	30.0	30.0
Minimum Top Diameter (cm)	15.0	10.0
Minimum Log Length (m)	3.0	3.0

During the term of this management plan, should the current market interest in hardwoods be maintained, the licensee may propose management strategies to increase the utilization of red alder. The company will consider increased harvest of deciduous volumes as well as the management of suitable sites for hardwood production.

4.1.1.2 Harvest Methods **Element**

Objective	***Indicator***
Employ appropriate harvest methods	*Harvest system (by volume)*

A variety of harvest systems are utilized in TFL 25. The main conventional systems are mobile grapple yarding, high lead tower yarding and hoe forwarding. Helicopter yarding is utilized where timber values can cover the high costs and where conventional systems are either economically or environmentally inappropriate. Manual falling and log length yarding are common to all of the above-mentioned systems. Table 11 details the harvest systems used in TFL 25 from 1996 through 2001.

Table 11 – Logging System (%) Utilized in TFL 25

System/Year	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Cable and Ground	82	76	83	95	95	93
Helicopter	17	23	17	5	5	27
Thinning	1	1	0	0	0	0

Our Jordan River Forest Operation in Block 1 has experimented with mechanical falling and bunching and roadside processing of second growth stems. These trials have been effective on favourable slopes. Since 1997, economic conditions have not been suitable for commercial thinning on Crown land. Figure 5 illustrates the generalized timber harvesting methods used in TFL 25.

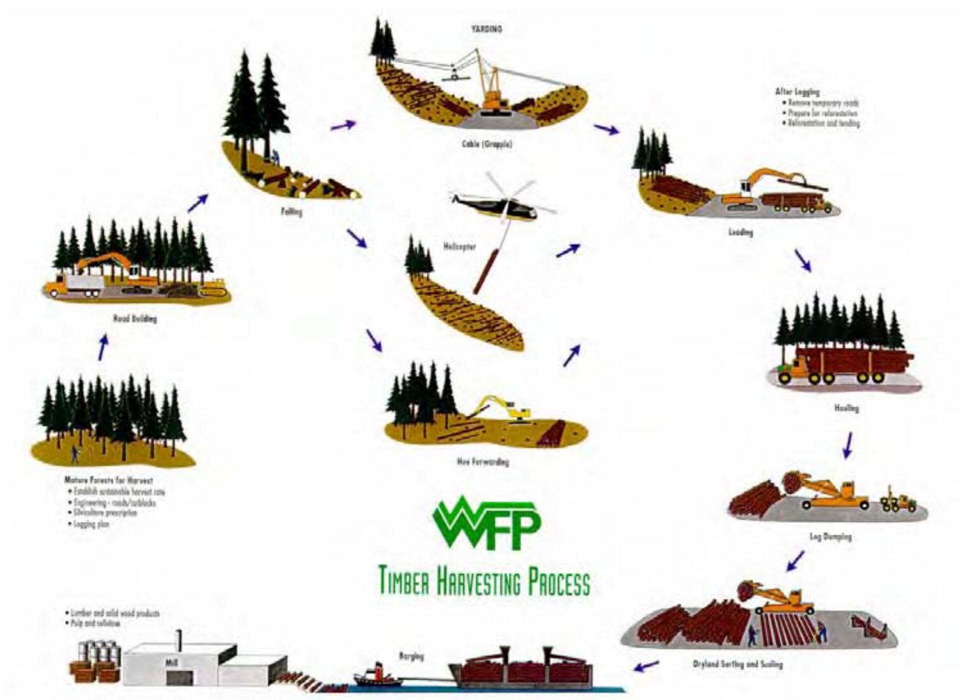


Figure 5 – Generalized Timber Harvesting Process

The volume harvested by each harvest system will be reported in the TFL annual report.

4.1.1.3 Contractor Commitment ***Element***

Objective	*Indicator*
Maintain contractor commitments	*% Required commitment achieved*

The TFL agreement requires that 50% of the volume harvested from Crown lands within the TFL, be harvested by contractors according to the Timber Harvesting Contract and Sub-Contract Regulation. Over the past six years WFP has performed in excess of requirements as indicated in Table 12:

Table 12 – Timber Harvesting Contracting Regulation Compliance

Year	Compliance
1996	150%
1997	114%
1998	100%
1999	131%
2000	139%
2001	106%
Average	*123%*

The following Bill 13 contractors operated in TFL 25 in 2001:

Full Phase Logging

Naka Logging Ltd.
R&N Logging

Falling, Yard, Loading
G.L.M. Falling Limited
Donne Contracting Limited
Hayes Forest Services

Road Building
Alliford Bay Logging
DeMedeiros Construction Ltd.
S.B.J. Contracting
Townsend Construction Co.
M.R.Adama Contracting

Hauling
R.Saunders & Sons Ltd.

An annual accounting of the contracting requirements and performance is provided in the TFL annual report.

There are more than 100 contracting firms working in TFL 25 as part of forest operations. Tasks include cruising, cut block layout, resource assessments, silviculture projects and special forest products salvage among others.

4.1.1.4 Profitability ***Element***

Objective	*Indicator*
Achieve a reasonable return on investment	*EBITDA, Profit, % return on investment*

WFP is committed to the maintenance of economically viable forestry and manufacturing operations through operational efficiencies and the optimal utilization of our log and fibre supply. Through the internal manufacture and trading of logs WFP will strive to maximize value margins and provide a competitive return on investment to our shareholders.

EDITDA, profit, and return on investment will be reported for the Doman Group of companies in Doman financial and WFP TFL annual reports respectively.

4.1.1.5 Non-Timber Forest Products ***Element***

Objective	***Indicator***
Encourage NTFP utilization	*Volume, value and type of NTFP (m^3, kg)*

NTFP

The main non-timber forest products harvested in TFL 25 are yew bark, honey, salal, mushrooms and furs.

- Between 1997 and 2000 roughly 4,000 kg of yew bark has been collected from cutblocks approved for falling. WFP collects $1.00/kg to cover some of the administration costs.
- The production of fireweed honey has fluctuated over the past several years. Commercial apiaries are commonly set up in recently harvested areas throughout the TFL. Between 1995 and 2000 almost 34,000 kg of honey was produced and collected in Block 1. WFP does not collect any administration fees for the collection of honey on lands managed by the company. However, the company does request hive location and production reports each year.
- Salal is a common shrub growing in cutovers and open grown stands. Salal is collected commercially from TFL lands for the floral industry. Between 1995 and 2000 over 44,000 kg of salal was produced. Potential site degradation associated with salal "poaching" may result in some access restrictions in Block 1 Access will be limited through the removal of old bridges and culverts, placement of rock barriers and the installation of a limited number of gates. These plans will be discussed with the South Island Forest District prior to implementation.
- Chanterelles and other edible mushrooms grow in many stands throughout the TFL. There is a thriving wild mushroom harvesting industry, which resists regulation so the weight or value of mushrooms gathered each year from the TFL is not known.
- A small trapping industry focusing on fur bearing species utilizes some of the TFL landbase. Designated trapping areas are provided in Appendix XXI. The level of activity within the licence area is relatively low. WFP will cooperate with the licensees to minimize impacts on trapping resources. WFP depends on the notification processes used to contact the general public, as trapper information is kept confidential by BC Environment.

WFP will encourage and cooperate with other groups wishing to utilize commercial non-timber forest products as long as sufficient revenue will be generated to offset administration costs, the activities will not negatively impact other forest management investments, environmental standards will not be compromised and sustainability can be assured. WFP staff will continue to participate in non-timber forest products forums and initiatives regarding policy development and employment opportunities. WFP will continue to report on non-timber forest product activities in TFL annual reports.

4.1.1.6 Special Forest Products Element

Objective	Indicator
Encourage utilization of special forest products	*Estimated value and volume of SFP recovered*

WFP has encouraged a number of long-term operators to salvage special forest products from TFL 25 logging residues. These established contractors primarily salvage western red cedar shake and shingle blocks as well as cants from these and other species. Between 1995 and 2001 over 20,000 m^3 of special products were produced from the TFL.

WFP will continue to encourage utilization of special forest products and will report the volume produced and estimated value in the TFL annual report.

4.1.1.7 Access Management Element

Objective	Indicator
Provide for public access	*Km of road maintained*

A transportation system has been developed in the TFL over the past 43 years to deliver logs by truck and by water to manufacturing facilities. About 340 km of road are maintained annually.

Since 1995 roads are designed, constructed, modified, maintained and deactivated as per the Forest Practices Code and Forest Road Regulation. Maps showing the current and planned status of forest roads are prepared and made available for public comment with Forest Development Plans. Requirements are expected to change with FRPA and new road regulations. All road users assume certain obligations for the use of roads including the risk of accident or injury. Road users are also expected to cooperate with WFP staff in reporting and suppressing fires, conforming to company and Ministry of Forests fire protection regulations, participating in Neighborhood Watch programs, and reporting wildlife violations and other criminal activities.

Road status is reported in the Annual TFL Report.

4.1.1.8 Recreation Element

Objective	Indicator
Maintain recreation sites and features	*No. and type of recreation sites maintained* *User days by category*

Recreation management in the TFL is based on a feature inventory and special studies to evaluate future developments. The main recreational uses have been camping, hiking, fishing and hunting - predominantly by local residents. There are significant water corridors that pass through the TFL in Blocks 3, 5 and 6. The major corridor is the Inside Passage, which sees over a million visitors per year passing through on cruises to and from Alaska. A much less traveled but still important marine corridor is the access route from Moresby in Block 1 to the South Moresby National Park Reserve.

There are five established recreation areas within the TFL. Two at Jordan River, one at Naka Creek and two in the Moresby block of TFL 25. A number of provincial Parks as well as existing and candidate Protected and Protection Areas and a National Park Reserve are adjacent to TFL 25. Maintained roads within TFL 25 provide access to some of these areas.

Some cave and karst features have important recreational values. Efforts are made to identify features well in advance of harvest. Experts are brought in to evaluate the significance of features found by our staff. When required, they also develop management recommendations that are incorporated into site plans. When previously unidentified features are discovered in active areas, work is redirected until the necessary evaluations and prescriptions can be completed.

Between 1995 and 2001 more than $175,000 was spent on developing and maintaining recreational opportunities in the TFL. Table 13 summarizes recreational use between 1995 and 1999. In 2000 and 2001 there were an estimated 43,000 and 46,000 recreational visitor days of use in the TFL.

WFP, the Ministry of Forests and the Forest Investment Account have provided the funding for site development and maintenance. WFP will continue to report recreational visitor days based on site occupancy records, estimates made by local staff, and discussions with government agencies by activity in the TFL annual report. New recreation site development and maintenance will be carried out in partnership with government. The amount of work performed will be dependent on continued cooperative funding arrangements.

Visual aesthetics are an important component of the recreational experience. Harvest blocks in scenic areas will be designed to meet the recommended visual quality class for management. Visually effective greenup (VEG) will be determined on a site-specific basis when new harvest blocks adjacent to previously harvested areas are proposed.

Table 13 – Recreation Activities Summary

Location/Activity	**User Days**					
	1995	1996	1997	1998	1999	Total
Beach Use	7725	7325	6875	7520	8701	38146
WFP Sites and Trails	17770	13500	8550	11696	15348	66864
Hunting	2950	3050	3010	3950	3068	16028
Fishing (Freshwater)	3380	2075	2300	1775	1875	11405
Fishing (Saltwater)	2550	3700	3918	2850	1982	15000
Firewood Cutting	1450	860	860	115	197	3482
Food Gathering	600	700	910	1375	1300	4885
Kayaking	2350	1150	1050	1120	1291	6961
Whale Watching	5400	4300	5100	1850	1394	18044
Surfing	n/a	n/a	n/a	n/a	1200	1200
Auto Touring	2200	2600	1300	4000	4166	14266
Hiking and Caving	4250	4250	300	1490	1460	11750
TOTAL	**50625**	**43510**	**34173**	**37741**	**41982**	**208031**

4.1.1.9 Research and Development ***Element***

Objective	***Indicator***
Support research and development	*$ Invested in research*

WFP's research and development program will investigate new and evolving techniques to maintain or improve the health and productivity of forest stands and ecosystems. The company will continue to cooperate with the MoF, Canadian Forest Service, FERIC, universities and other research specialists on various research initiatives. Current research projects include:

- Participation in the Salal Cedar Hemlock Integrated Research Program (SCHIRP) that is looking at the regeneration and growth dynamics and ecology of salal as well as vaccinium dominated ecosystems.
- Selection, breeding and testing of yellow cedar, Sitka spruce, western red cedar and western hemlock parent trees and siblings to provide healthy, well-adapted, genetically diverse and superior seed for reforestation.
- Cooperative research on important wildlife species including the marbled murrelet, grizzly bear, Kermode bear, black bear, and mountain goat.
- Growth and yield research according to the priorities established by the Coastal Forest Productivity Council. Particular emphasis will be placed on species with identified information gaps and the effect of partial cutting on stand productivity.
- Alternative silviculture and harvesting systems will be investigated in cooperation with research agencies such as FERIC. Research topics will include harvesting productivity, costs and impacts on non-timber resource values.
- Forest productivity and health of ecosystems will be investigated. Fertilization effects on western red cedar and western hemlock stands will continue.

Activities and expenditures in research and development will be reported in the TFL annual report. Appendix XII has additional information on active WFP research projects.

4.1.1.10 Contribution to Provincial Revenues ***Element***

Objective	***Indicator***
Contribute to provincial revenues	*Payment of fees*

Timber harvest and associated forestry activities on TFL 25 contribute to provincial revenues. Stumpage and royalty payments for the TFL 25 harvest are significant. For the period 1995-2001 over $68 million was paid in stumpage and royalty fees. All of these charges and fees go to general revenue to help pay for roads, hospitals, schools and services enjoyed by all British Columbians.

In order to fulfill social responsibilities and meet with SFM objectives, WFP will pay all applicable fees related to its operations in TFL 25. Payments will be reported in the TFL annual report.

4.2 Environmentally Appropriate Forest Management ***Principle***

4.2.1 Conservation of Biological Diversity ***Criteria***

Biological diversity (or biodiversity) is the diversity of plants, animals and other living organisms in all their forms and levels of organization, and includes the diversity of genes, species and ecosystems, as well as the evolutionary and functional processes that link them (FPC, Biodiversity Guide book, September 1995). An ecosystem management approach that maintains suitable habitat conditions for native species will be used as a surrogate to maintaining biodiversity. Both coarse and fine filter approaches will be utilized to achieve biodiversity objectives.

At the landscape level, coarse filter strategies include the maintenance of riparian habitats, areas of old growth and a variety of patch sizes. At the stand level coarse filter strategies include maintaining wildlife tree patches, snags, downed woody debris and deciduous trees.

Fine filter strategies deal with the identification and maintenance of specific habitats for known sensitive plant and animal species. These include the creation of Wildlife Habitat Areas, the establishment of Old Growth Management Areas in critical habitat zones and the use of interim measures, as prescribed in the Identified Wildlife Management Strategy to protect red and blue listed species and their habitats.

4.2.1.1 Ecological Diversity ***Element***

Objective	***Indicator***
Maintain a dynamic distribution of habitat over a landscape	*Average opening size (ha)* *Seral stage distribution (5 year basis)* *Patch size distribution - % of landbase in patches > 200 ha (5 year basis)* *$ Invested and type of environmental inventories and assessments* *Ecosystem representation (5 year basis)* *THLB status (5 year basis)*

Opening Size

Prior to the Forest Practices Code, cutblock areas were much larger than at present. Legislative limits put on cutblock size as well as increased attention being paid to riparian and biodiversity values resulted in much smaller post-Code block sizes as well as the establishment of significant stand level reserves with each block. Average block size will be tracked and reported in the TFL annual report.

Seral Stage and Patch Size Distribution

Past harvesting in TFL 25 has provided a variety of ages, patch sizes and shapes across the landscape. Currently more than 60% of the timber harvesting landbase is covered with mature or old seral stage forests. Over time a trend toward a more balanced age class distribution will occur as a result of harvesting. Spatial modeling tools will be utilized to test our ability to maintain various amounts of habitat with desired attributes. Areas of old growth, as defined by the FPC Biodiversity Guidebook, will be designated as Old Growth Management Areas (OGMAs) as Landscape Unit Planning progresses.

Harvesting during the Plan period will continue to be mainly in mature forest more than 120 years of age. Some 60 to 120 year old second growth stands of wind or logging origin will also be harvested where they fit with the development of older stands or where specific landscape level objectives dictate this course. The latter will be most common in Block 1 of TFL 25 that is in transition to a second growth based industry.

Wind, slope instability and to a much lesser extent fire are the main natural disturbance factors in the forests of TFL 25. Development will create a range of patch sizes across the landscape such that habitat of sufficient quantity and quality is present to maintain viable populations of native organisms. Seral stage and patch size distribution will be tracked annually and reported on a five-year basis.WFP will use the Ministry of Forests approach to deliniating “patches” until such time as a more refined methodology is developed.

Ecological Inventories

Western Forest Products maintains a variety of landscape level ecological inventories including ecosystems, forest cover, riparian features, and terrain. Details have been provided in Section 3.1. Many of these have been compiled over more than two decades.

As an example, the comprehensive ecological classification of Tree Farm Licence 25 started in 1978 with the final portions of Block 5 to be completed in 2002 The work completed to date has provided a solid basis for interpretation of forest ecology and the response of ecosystems to management. It is also proving to be a useful tool for predicting the general location of rare species, plant communities and habitats that may require special consideration. It also allows ecosystem representation to be analyzed and tracked at the landscape level. A new publication, Rare Vascular Plants on South Vancouver Island, based on this work is found in Appendix XV. When these inventories are combined with GIS tools, it is feasible to analyze landscape issues. A summary of inventory work and expenditures will be provided each year in the TFL annual report.

Ecological Assessments

Operational planning is also supported by a range of stand level environmental assessments ranging from site classification on site plans through to detailed stream classification and field level terrain assessments. These detailed assessments will be maintained on file and used to provide greater detail on specific areas relative to the landscape inventory database.

THLB Status

It is inevitable that a portion of the area that is currently found within the THLB will be reserved from development during the term of this Management Plan for a variety of stand level reasons. Withdrawals may be for additional riparian reserve zones, wildlife tree patches or sensitive soils. At a landscape level, additional withdrawals may also be made for ungulate winter ranges, wildlife habitat areas, Old Growth Management Areas and other environmentally significant areas. Conversely, areas currently not part of the THLB may be added based on site surveys or changes in economic operability.

Areas within TFL 25 that are removed from or added to the THLB will be tracked annually and reported on a five-year basis. These changes to the THLB will be utilized in subsequent Timber Supply Analyses.

4.2.1.2 Species Diversity **Element**

Objective	***Indicator***
Maintain viable populations of native species	*Ha maintained as stand level reserves (5 year)*
	Cumulative ha of ungulate winter ranges, protected (protection) areas, OGMAs, WHAs (5 year)
	# Known species classified as threatened, endangered or vulnerable (COSEWIC & CDC)
	% Area declared as mixed species regeneration
	# Trees planted by species
	# Fry released by species

Stand Level and Larger Reserves

The species strategy for TFL 25 will focus on maintaining terrestrial forest dependent organisms across the tenure. To do this the Company will employ three main approaches:

1. Maintaining the amount, distribution and heterogeneity of habitat and landscape elements important for biodiversity over time.
2. Ensuring representation of ecologically distinct habitat types to maintain lesser known species and ecological functions.
3. Maintaining the distribution and viability of known sensitive species.

The first two approaches form a “coarse filter”, which should provide for the majority of species whose needs are relatively unknown. While maintaining a range of suitable habitats across the landscape will provide for the majority of the species, the final approach will form a fine filter to provide for those species who’s needs are relatively known but are not provided for under the coarse filter.

The fine filter would provide for species on the provincial red and blue lists[1] or species identified in the Identified Wildlife Management Strategy as regionally important that warrant special consideration. The stand level and larger reserves that will support this three-pronged policy will be tracked annually and reported at the end of the MP period.

Particular attention will be given to old growth dependent species. While earlier work by Donald Blood (1996) has given some indication of the presence of these species in Block 5, further inventory work will need to be done for many sensitive species so that a baseline can be established to measure management efforts. WFP will cooperate with inventory efforts. The

1.1

[1] BC Conservation Data Centre (MSRM). Red-list includes species or subspecies considered to be extirpated , endangered or threatened in BC. Blue-list includes any indigenous species or subspecies considered to be vulnerable in BC.

COSEWIC and CDC species lists will serve as a red and blue listed species guide. The status of the species on this list will be monitored and reported on a five-year basis.

Stand level Wildlife Tree Patches will be maintained according to direction provided by agency staff in different Districts. We expect that the WTP attributes, the % of WTP area retained relative to developed area and the location of WTPs relative to a harvest area will vary across the TFL as a result. Wildlife features will be managed in the same manner.

Our general philosophy is that the placement of WTP's on the edge of developed areas will allow larger reserves to be established across the landscape over time, as "edge" areas become amalgamated into larger WTPs once adjacent areas are developed.

Reforestation

Reforestation programs also affect species diversity. WFP will reforest with a variety of ecologically appropriate native conifer species. Preferred and acceptable species lists by ecosystem are provided in Appendix XXII. These species lists have been developed in concert with the ecological classification of the TFL and from years of localized experience. We intend the species recommendations and silviculture standards in the Appendix to replace the provincial Chief Forester's standards for TFL 25.

A minor component of native deciduous species will also be retained within stands, riparian reserves and wildlife tree patches. The TFL annual report will provide the species composition of regenerated areas, numbers of trees planted and species planted.

Salmonid Enhancement

Salmon enhancement programs contribute to the maintenance of salmon stocks. WFP supports one salmon enhancement hatchery at Sewell Inlet in Block 6. QCI SEP facilities supported by WFP have released over 2 million fry since 1980. The TFL annual report will provide annual enhancement figures and an update on habitat projects.

4.2.1.3 Genetic Diversity ***Element***

Objective	***Indicator***
Maintain the variation of genes within species	*% Seed orchard seed used*

A range of suitable habitats across the landscape will contribute to maintenance of genetic diversity within plant and animal populations. Special measures may be needed in situations where research indicates that distinct local populations are threatened through habitat loss. Further study will need to be undertaken to quantify and describe these issues.

Reforestation and tree improvement programs contribute to the maintenance of genetic diversity for commercial conifer species. Seed orchards are designed to include a wide genetic base and a portion of the seed produced is retained through the ex situ gene conservation program. Figure 6 illustrates the company's tree improvement programs.

Wild seed collections will continue to be conducted for specific species and locations not covered by tree improvement programs. Seed orchard seed has higher genetic diversity than seed found in a local area as it has come from parents from a wider geographic distribution. Some species such as western red cedar display very little genetic variation whether the seed source is local or from seed orchards. The relative percentage of seed orchard seed used in reforestation programs will be reported in the TFL annual report.

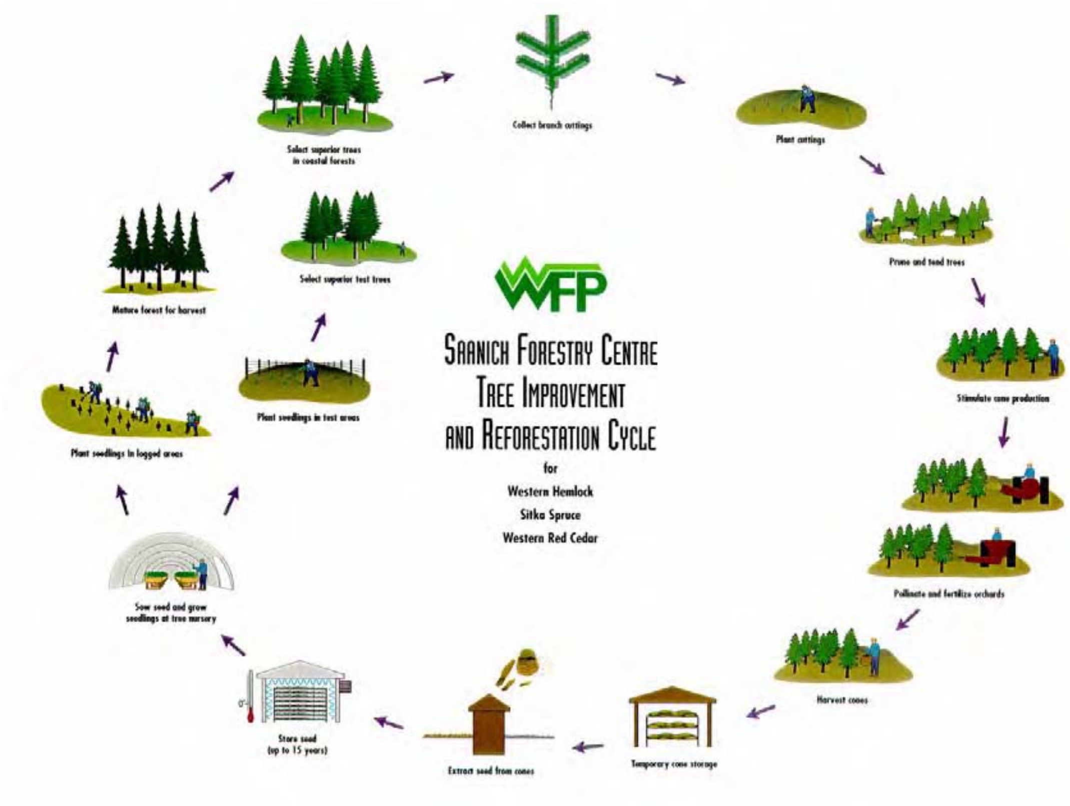


Figure 6 – Tree Improvement and Reforestation Cycle

4.2.2 Maintenance of Ecosystem Condition and Productivity ***Criteria***

4.2.2.1 Forest Health ***Element***

Objective	***Indicator***
Maintain forest health	*Pest attack status*
	Ha or # of weevil resistant spruce planted in high hazard zones
	# Browse guards installed or maintained
	# Accidental fires and ha burned

Forest health is a key element in the maintenance of ecosystem condition and productivity. WFP will maintain a forest health program that is designed to protect the licence area from damage from insects and disease, abiotic factors and fire. A proactive strategy will be pursued in detection and control. The goals of the program are to:

- Minimize the loss of timber in operable merchantable stands;
- Maintain the forest productivity and health of immature stands by monitoring insects and disease activity and implementing control action when needed;
- Salvage insect, disease, wind or fire damaged merchantable timber quickly;
- Minimize the time between felling, harvesting and processing of timber

The forests of TFL 25 have been relatively free of catastrophic insect or disease infestations and as a result there have been no significant unsalvaged mortality or volume losses. Animal damage to regenerating forests is common in Block 6 and occasionally occurs in the other areas.

Common Pests and Diseases

Hemlock dwarf mistletoe is widespread in mature stands. Sanitation treatments of advanced regeneration are sometimes required to prevent the spread of new infections in regenerating hemlock stands. Vigorously growing, well stocked stands are not impacted significantly by hemlock dwarf mistletoe. As silviculture systems move to greater retention, there will be more infected trees left as an adjacent overstory that may pose a concern. Where it is required to conduct severity assessments of mistletoe infection on individual trees, the Hawksworth rating system will be utilized.

Endemic root diseases result in small pockets of mortality throughout the TFL however they are not a significant problem. In Block 1, where Phellinus root disease is occasionally encountered, the reforestation program uses less susceptible species such as cedar to reforest root rot pockets.

Ambrosia beetle attack degrades the value of logs in inventory or storage. Keeping felled and bucked inventories low and processing logs quickly is the best method of control. Pheromone baited traps may be used to protect vulnerable log storage and handling sites. At most sites, wood is moved rapidly enough that beetle degrade is not a significant issue.

Cyclical western black-headed budworm (*Acleris gloverana*) outbreaks have occurred on a regular basis i in Block 6. The latest outbreak ended in 2001. This pest has been defoliating QCI stands on a 10 to 15 year cycle but has not caused catastrophic losses to date. Monitoring will continue.

Outside of Block 6, spruce leader weevil (*Pissodes strobi*) has severely infested Sitka spruce plantations to the point where the species is now only a minor component of reforestation programs. Work is underway to produce resistant planting stock. WFP will increase utilization of this species as resistant seedlings or vegetative material becomes available.

Table 14 lists the common insects and diseases of commercial importance or affecting timber in TFL 25.

Table 14 – Common Insects and Disease found in TFL 25

Agent		Occurrence	Incidence[2]	Susceptible Species[2]	Management Risk
Root disease					
Armillaria root rot	*Armillaria ostoyae*	Occasional	Light	Fd, Hw, Ba, (Cw,Ss)	M
Annosus root rot	*Heterobasidion annosum*	Occasional	Light	Fd, Cw, (Hw, Ba, Ss)	L
Phellinus Root rot	*Phellinus weirii*	Infrequent	Light	Fd, Ba, (Hw, Ss) Cw	L
Stem/Branch Diseases					
Hemlock Dwarf Mistletoe	*Arceuthobium tsugense*	Frequent	Medium	Hw	L
Insects					
Spruce terminal weevil	*Pissodes strobi*	Common	Heavy	Ss	H
Western black-headed budworm	*Acleris gloverana*	Cyclical	Light	Hw, Ss, Ba	M
Ambrosia beetles	*Trypodendron lineatum*	Common	Heavy	(Hw, Ss, Ba, Fd, Yc)	H
Hemlock sawfly	*Neodiprion tsugae*	Occasional	Light	Hw, Ba (Ss)	L

Detection of insect and disease activity normally occurs with the collection of site plan field data or during silviculture surveys. Completed site plans will include proposed actions for dealing with insects or diseases noted. Any increased incidence of insect or disease activity observed during the course of regular operations will be dealt with by a specific action plan. WFP will seek assistance from specialists at the Canadian Forestry Service, MoF, universities, and consultants, as required.

If specific control measures are warranted, such as spraying to control severe defoliation outbreaks, a plan will be developed in consultation with the MoF, First Nations and other stakeholders. Where effective, biological insecticides will be preferred over inorganic products. Pest conditions and pest management programs, including the planting of weevil resistant trees, will be reported in the TFL annual report.

Abiotic Factors

Abiotic factors such as windthrow are also considered in the forest health program. Windthrow assessments will be conducted where there is evidence of significant historic windthrow. Where windthrow may be an issue, cut blocks will be designed to take advantage of favourable topography or stand types. Where wind firm edges do not naturally exist, treatments such as feathering or pruning will be prescribed to protect sensitive areas. When significant amounts of blowdown occur, salvage of merchantable timber will be undertaken unless there are overriding environmental or economic reasons for the damaged timber to remain on-site.

As noted in Section 4.1.1.1 Timber Supply, annual damage and recovery programs will be reported in the TFL annual report.

1.1

[2] Species are listed in order of susceptibility. Brackets indicate species are equally susceptible.

Fire

As the licence area is situated in wetter areas of Vancouver Island, Haida Gwaii and the northern mainland coast, the risk and occurrence of wildfire is low. WFP will comply with regulations under the Forest Act and Forest Practices Code Act relating to the prevention, detection and suppression of fires.

A fire preparedness plan will be submitted by April 1 each year to the MoF. The plan will outline proposed activities, key contacts, shut down criteria, suppression equipment and company policies with respect to fire prevention and suppression. Fuel management planning will be incorporated into Forest Development Plans and will include an analysis of anticipated fuel build-up over the five-year planning period and strategies to reduce the build-up and mitigate risk. A sample Fire Preparedness Plan is found in Appendix XXIII

Animal Damage

Black tailed deer cause significant damage to young plantations in some areas. The problem is especially severe in Block 6 where the deer have no natural predators and target young cedar. Over the years, control techniques have included wire caging, fencing, deer repellents and plastic tubing. Browse guarding and maintenance is extremely expensive but necessary to protect seedlings. The installation and maintenance of browse guards will be reported in the TFL annual report.

4.2.2.2 Forest Ecosystem Resilience ***Element***

Objective	***Indicator***
Maintain forest ecosystem resilience	*NSR balance*
	% Surveyed area free growing
	Average regen delay
	Ha reforested
	$Invested in basic silviculture

Site Plan

The resilience of forest ecosystems to natural and induced disturbance is a key factor affecting harvest planning and silviculture activities. Prior to harvesting, an ecologically based site plan (SP) specific to each cutblock is prepared by a Company or consulting RPF. Incorporated into the SP are the results of various assessments completed by Company staff and external specialists. Ecologically related assessments that may be completed include: terrain stability, riparian, gully, karst, windthrow and forest health.

Key elements of the resulting SP are:

- Signature, seal and dating by the RPF who prepared the Plan.
- The harvest method and associated hazard rating for soil compaction, erosion and displacement.
- The location of roads and a plan for their post harvest use.
- A description of the silviculture system and the purpose and function of reserves stand structures.
- A description of non-timber resource features and a plan to protect them.
- The location of streams, wetlands and lakes and a plan to protect them.
- A reforestation plan that states the target number of healthy, well-spaced trees by species that will make up the free growing stand.

Basic Silviculture

Once an area is harvested, the silvicultural component of the site plan is implemented to quickly re-establish a forest stand. The main goals of WFP's basic silviculture program are to:

- Reforest all harvested or naturally disturbed productive forest within 3 years of disturbance.
- Manage regenerated areas to target stocking standards.
- Establish a free growing stand of ecologically appropriate, well-spaced trees within the prescribed period.

To achieve these goals the following basic activities are undertaken as necessary:

- Site preparation.
- Planting or use of natural regeneration.
- Fertilization at time of planting.
- Regeneration monitoring surveys (survival and stocking).
- Replanting as required.
- Vegetation management
- Basic spacing (if required) for declaration of free growing.
- Free growing surveys.

WFP's basic silviculture program conforms to the FPC and the Silviculture Practices Regulation. A description of the basic silviculture program is as follows:

Site preparation is not required for initial reforestation in most areas. The exceptions are heavy spot accumulations of yarding slash along roads and areas with heavy concentrations of cedar slash and salal competition. In these areas spot piling and/or pile burning and broadcast site preparation (mechanical or broadcast burning) is required. Piles may be burned or left as coarse woody debris for future habitat.

Most harvested areas are planted following an initial stocking and plantability survey to confirm the Silviculture Regime and Silviculture Prescription recommendations. Planting is recommended in most areas to speed the re-establishment of the new forest and to influence final species composition. Planting stock is naturally supplemented by advanced or natural regeneration originated from nearby trees. If vegetation competition is anticipated, larger trees are planted and may be fertilized at time of planting to speed development.

Seedlings are grown in nurseries located on Vancouver Island including WFP's nursery in Saanich. Whenever available, improved (A Class) seed is used. Much of the Hw, Cw and Fd seed used is "A" class and is produced at WFP's seed orchard in Saanich. Difficult to grow seedlings such as yellow cedar are often produced from rooted cuttings rather than seed. Wild seed collections or seed purchases are made to address any deficiencies in short-term seed supplies. A five to ten year supply of seed, depending on the species, is normally held in storage.

Regeneration monitoring surveys (survival walk-through on all cut blocks, staked trees on representative ecosystems/stock combinations and stocking on all cut blocks) are carried out to monitor seedling performance and progress towards free growing status. Information collected includes species; tree height and increment, total number of stems and well-spaced stems; brush species and distribution; qualitative remarks. The results are used to prescribe follow-up silviculture treatments if necessary. Once vegetation management programs have been completed and free-growing targets met, a final free-growing survey is conducted.

An integrated pest management approach will be used when determining treatments for vegetation management. Any vegetation management treatments that require pesticide use will be carried out under the authority of a Pesticide Use Permit or a Pest Management Plan that has a significant public review and comment component. These plans or permits specify when and how brush control treatments will be undertaken, consultation protocols, environmental protection measures and monitoring. The Company is striving to reduce the amount of pesticide used. Where feasible, alternatives to herbicides are used to control brush. Table 15 provides the Five-Year Basic Silviculture Forecast for TFL 25.

Silviculture Standards for TFL 25 are in Appendix XXII. These have been modified from the previous Management Plan. We intend the species recommendations and silviculture standards in the Appendix to replace the current provincial Chief Forester's standards. We allow, and expect that our professional staff will use judgement and occasionally vary from these standards in response to order to take into account specific site conditions.

Table 15 – Basic Silviculture Activity Forecast (ha) for TFL 25

Activity	2003	2004	2005	2006	2007
SP's (area logged)	800	1200	1200	1200	1200
Site Preparation	36	48	48	48	48
Planting	855	1140	1140	1140	1140
Silvicultural Surveys	2700	3600	3600	3600	3600
Brushing	135	180	180	180	180

Each year the NSR balance, free growing area, average regeneration delay, hectares reforested and expenditures on basic silviculture will be reported in the TFL annual report.

4.2.2.3 Forest Ecosystem Productivity ***Element***

Objective	***Indicator***
Maintain forest ecosystem productivity	*# Growth and yield plots monitored*
	Km of fish habitat created/enhanced
	Ha of riparian restoration
	$ Invested in enhanced silviculture
	Ha fertilized, spaced and pruned
	Ha harvested by silviculture system

Growth and Yield Program

As discussed in Research and Development, WFP maintains permanent growth and yield plots that are used to measure stand productivity. New plots will be established to monitor incremental silviculture treatments and existing plots will be monitored in accordance with the priorities of the Coastal Forest Productivity Council. Annual accomplishments will be reported in the TFL annual report.

Habitat Enhancement and Riparian Restoration

Past forest management, in some situations, has had a significant impact on fish habitat and riparian ecosystems. In recent years, FRBC funding has been available for the restoration of in-stream habitat and associated riparian areas. WFP has been a leader in this program and in the development of restoration techniques. The kilometers of in-stream habitat enhancement and hectares of riparian restoration will be reported in the TFL annual report.

Enhanced Silviculture

Once the commitments and obligations of an SP have been fulfilled, stands are available for incremental silviculture treatments.

Historically, incremental silviculture activities such as juvenile spacing, pruning, and fertilization on Crown land have been funded by various government administered investment accounts. Currently the Provincial government has established the Forest Investment Account for this purpose. WFP funds similar activities on private land within the TFL. A list of desired management actions to support the goals of this plan is maintained (Appendix VII) and forms the basis of the Land Based Investment Rationale currently required for funding under the Forest Investment Account. Table 16 outlines the potential five-year enhanced silviculture goals based on government funding continuing at historic levels. The dollars invested in enhanced silviculture as well as the outputs will be reported in TFL annual reports.

Table 16 – Five-year Enhanced Silviculture Goals (ha)

Activity	2003	2004	2005	2006	2007
Juvenile Spacing	170	110	210	130	190
Pruning	120	50	120	75	130
Fertilization	200	500	1150	330	1500

Silviculture Systems

A variety of silvicultural systems are being utilized within the TFL. All are variations of clearcutting or partial cutting as defined by the FPC Operational Planning Regulation (OPR). The primary silviculture systems used to date in the TFL have been patch clearcutting and patch clearcutting with reserves.

The retention silviculture system, which maintains structural diversity over the cutblock for a minimum of one rotation, is not yet being applied to TFL 25 blocks. However, WFP's Mainland Island Region, which administers the majority of TFL 25, is experimenting with retention in a number of non-TFL areas and is monitoring retention pilots in other WFP Regions. We expect that the first TFL 25 retention areas will be in Block 5. WFP remains committed to using silviculture systems that maintain forest ecosystem productivity and function. The silviculture systems used on the TFL will be recorded and reported in the TFL annual report.

4.2.3 Conservation of Soil and Water Resources

Criteria

4.2.3.1 Productive Area

Element

Objective	***Indicator***
Minimize permanent loss of productive area	*% Permanent access within cutblocks*

The total area of TFL 25 is approximately 480,000 ha of which 269,000 ha are considered productive. The productive area is furthered reduced to a timber harvesting landbase of 138,000 ha once a range of environmental and economic factors are considered.

One of the primary goals of harvest planning is to minimize impacts on the timber harvesting landbase. Government policy is to have less than 7% of the productive area occupied by permanent access structures such as roads and landings. Permanent and temporary access structures are planned to minimize the total amount of road required to safely and economically harvest the timber.

Terrain stability assessments are completed where harvesting is proposed in areas of moderate or high hazard for landslide initiation following timber harvesting or road construction. Harvesting only proceeds in these areas when the recommendations of terrain specialists indicate that the risk is acceptable.

The following practices are undertaken to minimize the loss of productive area.

- Stability assessments are conducted and road designs prepared to minimize the occurrence of road related slope failures and productive site loss. All road-building plans in less stable areas must be reviewed and approved by the Ministry of Forests.
- Road widths, road length and pit sizes are minimized.
- Temporary access structures are rehabilitated when not required for future management activities.
- Historically over steepened fill slopes are rehabilitated through side cast pullback and planted with trees and grass seeded.
- Surface erosion of slope failures is minimized through the establishment of new groundcover. Productive areas are replanted with commercial tree species.

The percentage of cut block area occupied by permanent access structures will be reported in the TFL annual report.

4.2.3.2 Water Quality ***Element***

Objective	***Indicator***
Maintain water quality	*Km of road deactivated*
	Ha of RMA (RRZ& RMZ)
	Ha of CWAPs conducted each year
	# reportable spills to water

Water quality is important, not only for anadromous and resident fish, but also for domestic purposes. As a result the maintenance of water quality is a key element in the SFM program. The TFL area has both community watersheds and individual water licences. Maps of designated community watersheds are found in Appendix XXIV.

Road Deactivation and Terrestrial Restoration

WFP funded operational road deactivation and road maintenance as well as FIA funded terrestrial restoration projects are key activities in the maintenance of water quality. The focus of road deactivation and maintenance is to maintain natural surface and ground water flow patterns and to minimize risks posed by road related landslides or other mass wasting events. Specific watershed restoration projects are directed at high-risk road systems that may impact fish habitat. The TFL annual report will list annual road deactivation and maintenance as well as FIA restoration projects. Appendix XXVI provides a summary of restoration programs funded by FRBC from 1997 through 2001.

Riparian Management Areas

FPC riparian reserve zone and management zone provisions are incorporated into operational plans to protect water quality and fish habitat. In addition, WFP has standard operating procedures (SOP) designed to protect water quality. These SOPs provide direction on issues such as machine operation and refueling within RMAs, the application of herbicides for brush control and cut block design and layout. The TFL annual report will provide the area found in RMAs relative to developed area.

Coastal Watershed Assessments

A key determinant of harvest rates is the Coastal Watershed Assessment. This assessment integrates the physical parameters of a watershed (terrain, soils and climate, forest cover) and predicts the impact on water quality and flow of proposed forest management. These assessments are directed by the Ministry of Forests District Manager and are repeated or updated as often as every three years. The TFL annual report will provide the CWAP hectares assessed each year.

Reportable Spills

Proper fuel and pesticide handling aid in maintaining water quality. Any quantity of spilled petroleum products or pesticides that reach water must be reported. The TFL annual report will record the number of spills to water.

4.2.4 Contribution to Global Ecological Cycles — ***Criteria***

4.2.4.1 Carbon Sequestration — ***Element***

Objective	***Indicator***
Maintain carbon balance relative to company operations	*Ha of NSR (current + backlog)* *Fuel consumption/m^3*

Carbon sequestration refers to long-term storage of carbon in the terrestrial biosphere, below ground, or aquatic systems so that the buildup of carbon dioxide in the atmosphere is reduced or slowed. In some cases, maintaining or enhancing natural processes can accomplish this.

Global carbon cycles are not fully understood. However, it is believed that the global carbon cycle is changing with potentially serious impacts. The increasing atmospheric CO_2 level is making global climatic change more likely.

Establishment and maintenance of forests is an important aspect of terrestrial carbon cycling. As forests grow they convert carbon dioxide in the air to carbon stored in trees. As a result, it is important that harvesting be followed by prompt reforestation. TFL annual reports will provide the NSR balance relative to harvest rates.

Forest operations are a consumer of fossil fuels. The combustion of these fuels is one of the main sources of greenhouse gases. TFL annual reports will provide an estimate of fossil fuel consumed by forest operations per cubic meter of harvest.

4.3 Socially Beneficial Forest Management *Principle*

4.3.1 Responsibility for Sustainable Development *Criteria*

4.3.1.1 First Nations *Element*

Objective	Indicator
Provide meaningful consultation on forest management	*Records of meetings and correspondence*
Increase First Nations involvement in forest management	*% Silviculture contracts to First Nations*
	Person-days employment to First Nations and/or joint ventures
Protect First Nations cultural features	*# AIAs, AOAs, cultural donations*

The TFL 25 landbase falls within the traditional territories of 13 First Nations. Basic information on these First Nations is provided in Table 17. Maps of the First Nation traditional territories are provided in Appendix VIII.

Table 17 – TFL 25 First Nations

First Nation	Principle Community	On Reserve Population	Off Reserve Population
T'sou-ke	Sooke	107	94
Pacheedaht	Port Renfrew	118	127
Da'naxada'xw	Albert Bay	n/a	n/a
Malahat	Mill Bay	125	114
Scia'new	Sooke	89	125
Campbell River Indian Band	Campbell River	255	333
Comox	Comox	115	155
Tanakteuk (Da'naxda'xw)	Alert Bay	22	149
Tlowitsis-Mumtagila	Campbell River, Alert Bay	1071	2201
Heiltsuk	Bella Bella	1188	869
Kitasoo/Xai'xais	Klemtu	325	141
Gitga'at	Hartley Bay	181	445
Haisla	Kitamaat	669	820
Haida	Skidegate Masset	715 769	563 1717

Information Sharing

WFP is committed to maintaining a meaningful and respectful relationship with First Nations. The TFL Management Plan and various operational plans are referred to First Nations representatives for review and comment. WFP planners meet with Band Councils or representatives to review the draft plans and address concerns brought forward by the Bands. Operational plans are adjusted to respect First Nations cultural and heritage resources. FN information sharing will be recorded in the TFL annual report. Notes and minutes will be kept on file.

Involvement in Forest Management

WFP has implemented a policy of assisting First Nations in capacity building through administrative support and involvement in harvesting and silviculture activities.

- WFP has encouraged the Heiltsuk Band's development of a logging and silviculture capability in Block 5. The Band holds a 30,000 m^3 renewable logging contract with WFP and receives direct-awarded silviculture contracts.
- WFP has assisted the Kitasoo Band in obtaining a 150,000 m^3 Timber Sale Licence for the Jackson Lake area of Block 5. A small Kitasoo silviculture crew has been trained for a variety of activities. WFP also supports a Kitasoo forestry coordinator based in Klemtu.
- In addition, WFP in the past has supported a number of First Nations candidates in obtaining forestry technical training at Nicola Valley Institute of Technology.
- WFP has targeted that between 20 and 25% of all silviculture contracting be carried out by First Nations workers provided that costs are within the traditional range of historic open-tendered projects of a similar nature.

Capacity building efforts as well as First Nations employment will be reported in the TFL annual report.

Protect First Nations Cultural Features

Operational plans recognize and, wherever possible, protect First Nations cultural features and sites. When features or sites have to be altered, the alterations are done following consultation with the affected First Nation and according to the Heritage Conservation Act. Operationally, areas with high archeological feature potential as well as areas adjacent to areas of high potential require a field survey to confirm the presence or absence of cultural features. In most cases these areas are surveyed by an archaeologist and members of the local First Nation. These surveys generate archaeological impact assessments (AIA) that identify features, when they are found, and propose protection measures. The AIA is sent to the local First Nations for review and comment.

The need for AIAs is guided by Archeological Overview Assessments, where they exist. An AOA is available for the Mid-Coast District area of Block 5 and one has been prepared for Block 6.

Western Forest Products also assists First Nations in creating new cultural features by providing large diameter timber upon request for a range of traditional use projects ranging from canoes and totem poles to Big House beams.

The number of AOAs and AIAs conducted and cultural donations will be documented in the TFL annual report.

Cultural Cedar Supply

A concern for many First Nations is their continued access to cultural cedar, especially monumental cedar, over time. In response to this concern, the Timber Supply Analysis, appended as Appendix V, contains a preliminary analysis of cedar availability by TFL Block over the next 250 years. The analysis indicates that cultural cedar will remain available over time and definitely will not be an issue during the term of this Management Plan.

However, the model is crude and makes a number of assumptions that will require refinement. During the term of this Management Plan the licensee proposes to work with interested First Nations, First Nations' artisans, and the Ministry of Forests to refine this model in order to provide greater assurance to interested parties that a supply of cultural cedar can be sustained.

4.3.1.2 Communities ***Element***

Objective	***Indicator***
Conduct effective consultation with communities	*# Contacts/meetings/consultation*
	$ Invested in public projects
Maintain and enhance community stability	*$ Spent on forest education*

The Company policy is to support local businesses and contractors and cooperate with local governments. Businesses in the coastal communities where WFP operates rely heavily on economic activity generated by local forestry operations.

Meetings with the public as well as dollars spent on community projects and forest education will be provided in the TFL annual report.

Appendix IX shows the location of TFL operations relative to communities.

4.3.1.3 Employment ***Element***

Objective	***Indicator***
Sustain employment levels	*Person-days of direct employment*
	Direct jobs/m³

Tree Farm Licence 25 logging, silviculture and forest management activities generate significant rural employment. Additional employment is created when the logs produced from TFL 25 are processed in the Western Pulp and Doman Industries mills. Table 18 presents the direct forest industry employment generated in 2001as a result of TFL 25 operations. This table does not include the processing employment associated with TFL 25 logs sold or traded to other BC forest companies.

Table 18 – Direct Employment 2001

Category	**Person Days of Employment**
Planning/Harvesting	38,343
Silviculture & Integrated Use	8,856
Administration	1,953
Subtotal	**49,152**
Manufacturing	23,174
Total	**72,326**

Over the term of MP 10 WFP intends to maintain employment levels through the following strategies:

- Support the resolution of land use disputes that currently prevent harvest of 100% of the approved AAC within TFL 25.
- Meet contractor requirements as per Timber Harvesting Contract and Subcontract Regulation (harvest minimum of 50% of Crown volume using phase and stump-to-dump contractors).

- Maintain or expand enhanced silviculture and watershed restoration programs through renewal of FRBC multi-year agreements.
- Maintain and where possible expand special forest products and NTFP harvesting opportunities.
- Work with First Nations to expand employment opportunities and partnerships.

Employment strategies will hinge on the maintenance of a timber harvesting landbase and its associated AAC, no diminishment of company tenure rights and continued or expanded funding from Forest Investment Account. The TFL annual report will provide annual direct employment and jobs/m3 harvested.

4.3.1.4 Compliance ***Element***

Objective	***Indicator***
Provide adequate training	*# Training hours (training records)*
Achieve compliance with all legislation and regulations	*% Compliance*

Forestry activities in TFL 25 are focused on sustainable development and environmental protection. Legislation, regulations, policy and guidebooks provide basic standards for forest practices. WFP's objective is to achieve full compliance with all legislation and regulations.

WFP has developed a series of Standard Operating Procedures (SOPs) for key management practices. These guide our staff, employees and contractors and associated training programs assist WFP's operations to achieve a consistent and high level of responsible forest stewardship.

The SOPs are a key element of WFP's Environmental Management Systems. They set minimum standards for specific activities. Progress and performance are assessed through internal and external audits of each operation.

Contraventions are investigated and, if required, controls and policy changes put in place to prevent reoccurrence. Compliance with rules and regulations will be reported in the TFL annual report.

4.3.1.5 Employee Relations ***Element***

Objective	***Indicator***
Provide adequate training	*# Training hours (training records)*
Provide regular communication to employees and contractors	*WFP Western Spirit and Environment Matters Newsletter circulation*

Maintaining good relations with WFP's employees, contractors and their employees is an important element of WFP's Sustainable Forest Management Program. The objective is to provide adequate training and regular communication to workers and contractors. The employees are trained in sustainable forestry practices and through regular communication are informed of new practices. Existing practices are reviewed and updated when required.

WFP's *Western Matters* newsletter (Appendix XXV) is circulated regularly to employees. Training records and training needs for all employees are maintained at WFP's Regional Offices.

Environmental Committees meet twice a year to review their environmental management programs.

As many employees work in a number of tenures it is not possible to provide tenure specific training records. Instead an annual summary of training hours for all forest management employees will be provided in the TFL annual report.

4.3.1.6 Safety ***Element***

Objective	***Indicator***
Provide a safe working environment	*# Lost Time Accidents*

Western Forest Products recognizes the necessity of establishing and maintaining a safe working environment for all employees, contractors and their employees. Safety has always been and always will be the most important aspect of operations. Each operation's safety program includes the following:

- Monthly meeting of safety committees.
- Safe work practices for each activity.
- Training in safe work procedures.
- Communication on the importance of safety to all workers on a regular basis.
- Reporting of dangerous conditions and incidents.

Lost time accidents will be reported in the TFL Annual Report.

5.0 SUSTAINABLE FOREST MANAGEMENT PLAN CONSULTATION

The MP 10 stakeholder and public review strategy is provided in Appendix XXVII. Open houses were held in five communities. WFP staff also met with municipal councils and with the First Nations whose traditional territory encompasses TFL 25. A summary report was submitted to the Ministy of Forest in late 2001.

6.0 SUMMARY IMPACT ANALYSIS

Economic, environmental and social impacts will be monitored using indicators developed to measure WFP forest management activities. These indicators will be reported on an annual or five-year basis in the TFL Annual Report. WFP will develop specific management strategies to mitigate the effects of the company's forest management activities if significant negative impacts become apparent.

6.1 Economic

One of WFP's primary principles is to be an economically viable forest products company that can compete in world markets. This will be achieved by:

- Economically harvesting the licensee portion of the proposed AAC.
- Achieving production and administration efficiencies.
- Improve product values and enhancing lumber recoveries through optimal log allocations and utilization.

Independent certification of forest operations will provide assurances that operations are being conducted in a sustainable manner.

Table 19 summarizes the Section 4.0 Criteria, Elements, Objectives and Indicators that will be used to measure WFP's performance in practising Economically Viable Forest Management.

Table 19 – Indicators of Economically Viable Forest Management

Criteria – Multiple Benefits		
Element	**Objective**	**Indicator**
Timber Supply	Harvest AAC	% Achievement of AAC, 5 year cut control Estimated total value of timber produced
	Prevent timber loss	Ha of non-recoverable losses due to wind, fire
	Efficient utilization	M^3 of billable waste
Harvest Methods	Employ appropriate harvest methods	Harvest system by volume
Contractor Commitment	Maintain contractor commitments	% Required contractor commitment achieved
Profitability	Achieve a reasonable return on investment	EBITDA, profit, % return on investment
Non-Timber Forest Products	Encourage NTFP utilization	Volume, type and value of NTFP (m^3, kg)
Special Forest Products	Encourage utilization of special forest products	Volume of special forest products Estimated SFP value
Access Management	Provide for public access	Km of road maintained
Recreation	Maintain recreation sites and Features	# and Type of recreation sites maintained
		User days by category
Research and Development	Support research and development	$ Invested in research
Contribution to Provincial Revenues	Contribute to provincial revenues	Payment of fees

6.2 Environmental

Environmentally appropriate forest management is another key principle in WFP's Sustainable Forest Management Policy. WFP is committed to the protection of the environment and the sustainable development of the resources under our stewardship. This will be achieved by implementing forestry and environmental management practices that meet or exceed government standards. Management practices will continue to be evaluated and adapted in response to new information and experience.

Implementation of new management practices designed to further environmental goals will have a negative impact on the AAC. Implementing intensive forest management in those areas where funding is available and it is ecologically appropriate could reduce but will not eliminate the impact on future generations. .

Table 20 summarizes the Section 4 Criteria, Elements, Objectives and Indicators that will be used to measure WFP's performance in practising Environmentally Appropriate Forest Management.

Table 20 – Indicators of Environmentally Appropriate Forest Management

Criteria – Conservation of Biological Diversity		
Element	**Objective**	**Indicator**
Ecological Diversity	Maintain a dynamic distribution of a habitat over a landscape	Average opening size (ha)
		Seral stage distribution (5 year basis)
		Patch size distribution - % of landbase in patches > 200 ha
		$ Invested and type of environmental inventories and assessments
		Ecosystem representation (5 year basis)
		THLB status
Species Diversity	Maintain viable populations of native species	Ha maintained as stand level reserves
		Cumulative ha WHA, UWR, PA, OGMAs established
		# Known species classified as threatened, endangered or vulnerable (COSEWIC & CDC)
		% Area declared as mixed species regeneration
		# Trees planted by species
		# Fry released by species
Genetic Diversity	Maintain the variation of genes within species	% Seed orchard seed used
Criteria – Maintenance of Ecosystem Condition and Productivity		
Element	**Objective**	**Indicator**
Forest Health	Maintain forest health	Pest attack status
		Ha or # of weevil resistant spruce planting stock in high hazard zones
		# Browse guards installed or maintained
		# of accidental fires/ha burned
Forest Ecosystem Resilience	Maintain forest ecosystem resilience	NSR balance
		% Surveyed area free growing
		Average regeneration delay
		Ha reforested
		$ Invested in basic forestry
Forest Ecosystem Productivity	Maintain forest ecosystem productivity	# Growth and yield plots monitored
		Km of fish habitat enhanced
		Ha of riparian restoration
		$ Invested in enhanced forestry
		Ha fertilized, spaced and pruned
		Ha harvested by silviculture system

Criteria – Conservation of Soil and Water Resources		
Element	**Objective**	**Indicator**
Productive Area	Minimize permanent loss of productive area	% Permanent access within cutblocks
Water Quality	Maintain water quality	Km of road deactivated
		Ha in Riparian Management Areas
		Ha of CWAPs completed by year
		# Reportable spills to water
Criteria – Contribution to Global Ecological Cycles High Conservation Value Forests		
Element	**Objective**	**Indicator**
Carbon Sequestration	Maintain carbon balance relative to company operations	NSR balance relative to harvest Fuel consumption/m3

6.3 Social

WFP is committed to respecting, understanding and supporting First Nations, community and employee aspirations for stability and certainty. An economically viable company with a stable timber supply translates into stable employment for employees and promotes community stability. Continuation of environmentally appropriate management practices in balance with timber needs will ensure long-term, sustainable, socially beneficial operations.

Table 21 summarizes the Criteria, Elements, Objectives and Indicators that will be used to measure WFP's performance in practising Socially Beneficial Forest Management.

Table 21 – Indicators of Socially Beneficial Forest Management

Criteria – Responsibility for Sustainable Development		
Element	**Objective**	**Indicator**
First Nations	Provide meaningful consultation on forest management	Records of meetings and correspondence
	Increase First Nation involvement in forest management	% Silviculture contracts to First Nations
		Person-days employment to First Nations and/or joint venture
	Protect First Nations cultural features	# AIAs, AOAs, cultural donations
Communities	Conduct effective consultation with communities	# Contacts/meetings/consultations
	Maintain and enhance community stability	\$ Invested in public projects \$ Spent on forest education
Employment	Sustain employment levels	Person days of employment Direct jobs/m^3
Compliance	Provide adequate training	# Training hours (training records)
	Achieve compliance with all legislation and regulations	% Compliance
Employee Relations	Provide adequate training	# Training hours (training records)
	Provide regular communication to employees and contractors	*WFP Western Spirit* and *Environmental Matters* Newsletter circulation
Safety	Provide a safe working environment	# Lost time accidents

6.4 Impacts of the Implementation of Management Plan 10

The following summarize the significant changes from Management Plan 9.

6.4.1 Plan Structure

Management Plan 10 is the first Sustainable Forest Management Plan prepared for TFL 25 that has been structured to allow for CSA certification should the company pursue certification for all or a portion of the licence. This restructuring replaced general objectives with SFMP Criteria, Elements, Objectives and Indicators that allow for ongoing monitoring.

6.4.2 Timber Supply Analysis

The previous Timber Supply Analysis appended to MP 9 was non-spatial. The TSA appended to MP 10 incorporates spatial constraints that result in a more realistic modelling of the interrelated management opportunities and constraints affecting timber supply.

The increased rigor of the analysis has helped in addressing the complexity that has accompanied the Forest Practices Code. The Timber Supply was also modelled on an area rather than volume basis. This is discussed below in section 6.4.5.

6.4.3 TFL 25 Area

Since Management Plan 9 was approved in 1996 there have 7 amendments to the TFL area. The result has been a net increase in the area of the licence of approximately 21,702 hectares.

The majority of the area increase is due to the transfer out of the TFL of the former Block 4 (to TFL 6) and the incorporation of TFL 24 into TFL 25 as Block 6. The following table shows the changes in area by TFL Block from MP 9 to 10.

Table 22 - Amendments to TFL Area

	MP 9 (ha)	MP 10 (ha)	Difference (ha)
Block 1	32,247.9	32,201.6	(46.3)
Block 2	66,644.9	66,891.1	246.2
Block 3	16,305.0	15,985.0	(320.0)
Block 4	31,300.3	0.0	(31,300.3)
Block 5	311,948.6	311,707.4	(241.2)
Block 6	0.0	53,364.0	53,364.0
Total Area	**458,446.7**	**480,149.1**	**21,702.4**

6.4.1 Operability

During the term of Management Plan 9, the operability of TFL 25 was updated. This revised operability was used in the preparation of the Timber Supply Analysis appended to this Management Plan. The operability criteria are included in Appendix XX. Overall, the review of the operability when combined with the gross area increase resulted in a net increase of 19% to the Timber Harvesting Landbase as provided in the following Table 23.

Table 23 - THLB Changes

Block	THLB (ha) MP 10	THLB (ha) MP 9	Change %
1	25,562	21,671	+18%
2	15,002	13,109	+14%
3	9,444	8,895	+6%
5	62,901	48,609	+29%
6	25,169	23,514	+7%
Total	138,078	115,798	19%

6.4.2 Harvest Level

MP 9 authorized a volume based AAC of 779,000 m^3. On October 1, 1998, due to the transfer of TFL Blocks as noted above, the AAC was adjusted downward to 692,000 m^3. July 2, 2002 the AAC was temporarily reduced by 135,000 m^3 to 557,000m^3 under Part 13 of the Forest Act in recognition of the Protection and Option Areas under discussion in Block 5 through the CCLRMP. MP 10 has proposed an area based AAC rather than a volume based AAC.

During the preparation of Management Plan 10, the Ministry of Forests approached WFP to explore the possibility of the licence AAC being determined and monitored on an area basis rather than a volume basis. The caveat was that an area based proposal would have to propose a flat-lined harvest area and couldn't vary over time as does a volume based AAC.

The rationale was that harvesting a fixed area on an annual basis, rather than a volume that changes over time, would be easier for the public to understand and would be easier for government and a licensee to administer.

After some discussion, WFP agreed to put TFL 25 forward to test this concept and both the Timber Supply Information Package and the Timber Supply Analysis, appended to this Plan, were prepared on this basis. The TSA proposes a flat-line harvest rate of 1242 hectares per year.

As a flat-line area harvest rate puts an additional harvesting constraint on development, it is not possible to directly compare the MP 9 volume based AAC to the MP 10 area based AAC. However, the following table was prepared to help demonstrate the potential difference that may exist from one MP to another. While the results are affected by additional factors, there is a strong indication that the harvest rate has increased less dramatically than the THLB increase noted in the previous section.

Table 24 - MP 9 and MP 10 Harvest Projections

Block	Indicated Annual Harvest (ha)	MP 10 Volume to 2022[3] (m^3/yr)	Current MP 9 Volume (m^3/yr)	Change %
1	290	164,534	175,000	-6
2	123	90,234	92,000	-2
3	87	68,342	55,000	+24
5	491	284,258	255,000	+11
6	251	140,873	115,000	+22
Total	1,242	748,241	692,000	+8

1.1

[3] Actual harvest volume will vary; this parameter is not suitable for conversion of area to volume for administrative or operational purposes.

6.4.3 Environmental Values

Management Plan 10 is the first Management Plan for TFL 25 that takes into consideration the Forest Practices Code and higher level plans such as the Vancouver Island Summary Land Use Plan. While non-timber values were referenced in previous Management Plans, Management Plan 10 has taken a more comprehensive approach and introduced “indicators” which will aid in an evaluation of whether or not SFMP Objectives are being met over the term of the Plan.

This Plan and the associated Timber Supply Analysis provide further recognition of environmental values such as fish and wildlife habitat, riparian values, biological diversity and sensitive soils. The Plan also proposes more monitoring of these values than in the past.

6.4.4 General Impacts of Implementation

It is not anticipated that the new Plan structure and goals will have negative impacts relative to MP 9. Impacts will be due to unresolved land use decisions, evolving forest practices and new legislative and regulatory requirements.

The ongoing Central Coast, North Coast and Queen Charlotte/Haida Gwaii LRMP processes and evolving EBM practices will have an impact on the THLB within the licence and may affect the scheduling of activities. Until land use issues are resolved and EBM practices are better understood, it will not be possible to project their impact on harvest rates. The same is true for regulatory change.

Employment and contractor impacts will be tied directly to harvest impacts. MP 10 could result in a slightly higher volume being harvested than under MP 9. However, this is due more to the THLB increasing than other factors in the MP. If there are no impacts from the ongoing LRMP processes, new EBM practices and regulatory change, employment could be expected to remain stable or increase modestly.

Appendix I

TFL Amendments

TFL 25 Amendments

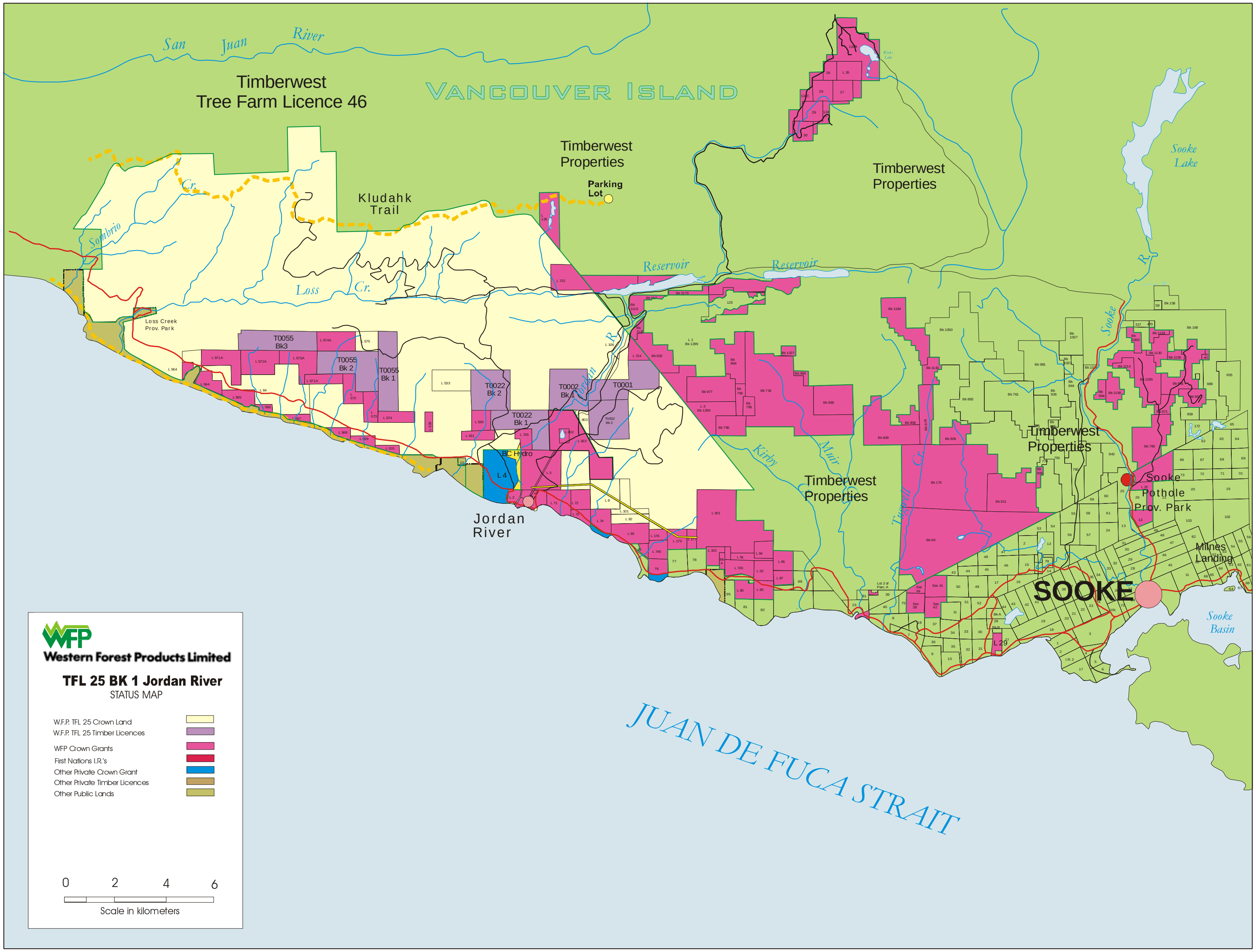
Amend. No.	Date	Schedule "A" (Ha)	Schedule "B" (Ha)	Net Change	Amendment	TFL Block
1	11/8/58	61.86		61.86	1) Sec 81, except R/W Lot 868. 2) Sec 2 Plan 13R. 3) Parcel "A" Swc. 2 (D.D.88175-j) EXCEPT: a) part in plan 4194, b) parcel 1 of parcel "A" (D.D.130151-j), c) part in red on plan 843-R. 4) Lot 189 added to Sch. "A"	1
2	4/9/58			0	Keogh Main Road "centreline" corrected to read "easterly limit" in the description of Blk. 4 of Sch. "B"	2
3	7/11/58		-21.04	-21.04	Loss Creek Park site removed from Sch. "B"	1
4				0	Issued in error and cancelled	1
5				0	Issued in error and cancelled	
*6	21/05/59			0	Road right of way removed from Sch. "B" to permit removal of forest products from TSX77513, for the duration of SUP 3333. *It is assumed that SUP3333 has expired and road R/W reverted to Sch. "B"*	1
7	11/12/59			0	Clause 2 deleted from Agreement and replaced. Now appurtenant to all company "Manufacturing plants"	
8	2/12/60			0	Description of Blk. 2, Frazer Bay area revised to include Pt. Of Frazer Bay watershed	2
9	21/12/60	-357.34	357.34	0	Tbr. lease 140 (lot 54) transferred from Sch "A" to "B"	
10	22/12/60	84.18		84.18	Blks. 1119 and 1120 Malahat LD added to Sch. "A"	1
11	19/12/61	-256.58	256.58	0	TL 3304, Renfrew LD transferred to Sch. "B"	1
12				0	Cancelled - issued in error	1
13	23/05/62	-83.77	83.77	0	Lots 55 and 56, range 4 transferred from Sch A to Sch B.	5
14	23/05/62		-0.54	-0.54	50' powerline r/w in the vicinity of Loss Creek withdrawn from Sch. "B"	1
**15	18/06/62		-20.77	-20.77	40' powerline r/w within Blk.4 withdrawn from Sch. "B" **NOTE: Portions within Sch "A" not affected**	4
16	16/10/62	-60.82		-60.82	Pt. Sec 10 Renfrew LD removed from Sch "A" for park purposes	1
17	22/11/62	-1.29		-1.29	Lot A of DL 189 Renfrew LD withdrawn from Sch "A"	1
***18	7/3/63		-44.19	-44.19	Pt. Road r/w within sec.10, Renfrew LD withdrawn from Sch. "B" **it should have read Sch. "A"**	1
19	8/5/63	-64.75		-64.75	SW 1/4 Sec 35, Tp. 12withdrawn from Sch. "A"	4
20	19/06/63	1311.78		1311.78	Lot 176, Blks 780, 871, 891, 983, 994, 1035, 1069, Pcl. "A" of sec.s 38, 41, 42 taken into Sch "A"	1

Amend. No.	Date	Schedule "A" (Ha)	Schedule "B" (Ha)	Net Change	Amendment	TFL Block
21	29/01/64	-147.43		-147.43	Pts. Lying E of plan 356 R/W of sec. 14 and sec 11, Tp. 2, withdrawn from Sch. "A"	4
22	17/04/64	893.16		893.16	Blks. 1114, 1130, 1133, 1156, 1159 Malahat LD Sec 16, Tp 3, Sec. 21, Tp 2 and N1/2 of sec 16, Tp 2 Rupert taken into Sch "A"	1
23	3/7/64	-6.88		-6.88	Amended Pcl. "A" of Lot 39 withdrawn from Sch. "A"	1
24	16/11/64	941.04		941.04	Blks. 1172, 1173, 909, 977, 980, 1027, 1143, 1184, 984, Blk. "B" Lot 102 and blk. "A" of sec 91 taken into Sch. "A"	1
25	22/07/66	-258.6	258.6	0	TL 1959 transferred to Sch "B"	2
26	14/09/66	53.82		53.82	Sec. 76 Renfrew LD taken into Sch. "A"	1
N/A	23/02/67			0	Lot 532 is considered to be within Sch "B". See letter dated Feb. 23 1967 on file 253-2	
27	31/05/67	29.78		29.78	Sec.39, Otter LD added to Sch "A"	1
28	15/01/68			0	Clause 11A added to Agreement	
29	18/11/68	417.48		417.48	1) Lot 2 of Blk. 1299, Lot 3 Blk. 1299 and Lot 2 of Blk. 1298 added to Sch. "A"	1
29	18/11/68	-330.64		-330.64	2) 36 acre of Lot 1 of Blk. 1299, Lot 4 of Blk. 1299, 42 acre of Blk. 1298 and Lot 124 withdrawn from Sch. "A"	1
30	13/01/69		1161.47	1161.47	Description of Parcel "E" of Blk. 5 of TFL amended to include all of Crab lake and Owjaeumish Creek Watershed	5
31	23/03/71			0	Clause 31 amended	
32	16/02/71	-2.02		-2.02	Lot A of Sec. 93 is withdrawn from TFL	1
33	11/3/71		-3.44	-3.44	Blk. A of Sec.21, Tp 3 Rupert LD is withdrawn from TFL	4
34	2/4/71	-0.16		-0.16	Part sec. 2, Renfrew LD, Plan 23879 withdrawn from Sch. "A"	1
35	14/01/72	-2.75		-2.75	Lot A of Sec 22 and Sec 74 (Sooke Pot Holes Park) are withdrawn from TFL	1
36	19/07/72		-25.09	-25.09	BC Hydro Powerline withdrawn form TFL	
37	28/09/72		-4.05	-4.05	Part of Sec.21, Tp.3 Rupert LD withdrawn from TFL (BCH Station)	4
38	16/10/73	12.95		12.95	Lot 160, Renfrew LD added to Sch "A"	1
39	3/8/78		-26.24	-26.24	Blk B of Lot 106, Blk 4 of lot 830, Renfrew LD withdrawn from Blk. 1	1
40	27/08/79		-36.42	-36.42	Blk. A of sec. 24 and Blk. A of sec. 25, Tp 4 Rupert LD removed from Blk. 4 (Loran "C" site)	4
41	6/3/80			0	Revised Sch. A to 61 902.267 hectares	

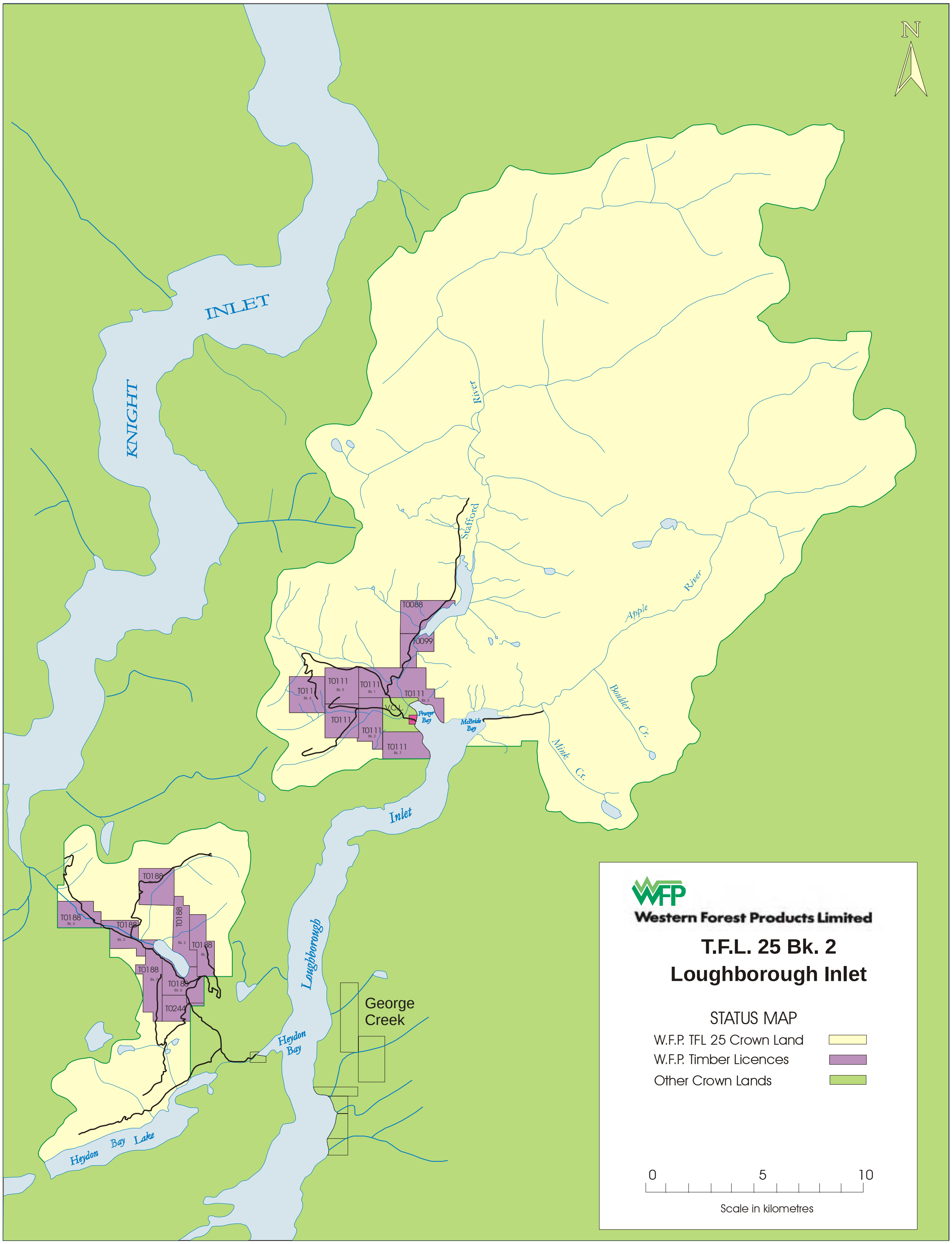
Amend. No.	Date	Schedule "A" (Ha)	"B" (Ha)	Net Change	Amendment	TFL Block
42				0	Cancelled and replaced with instrument 46	
43				0	Cancelled and replaced with instrument 45	
44	30/03/82	-62.69	-1.44	-64.13	Withdraw Lot 1, Sec 16, Tp 3 and public road, Rupert LD	4
45	29/03/82	-26.25		-26.25	Delete Portion of lot 1 of Sec 9, Rupert LD	4
46	30/08/82	18.49		18.49	Lot 1, Sec 75, Plan 24134, Renfrew LD	1
47	30/08/82	18.49		18.49	S1/2 of E1/2 of Lot 22, Renfrew LD	1
48	11/7/83	-2.03		-2.03	Withdraw portion of Sec 3, Renfrew LD	1
49	24/10/84	307.57		307.57	Add W 30 chs, lot 26 and lots 27 to 30, Malahat LD	1
50	22/02/85			0	Redefines legal description of Blk. 2, parcel A	2
51	1/11/85			0	Amends TFL document to include District Manager in part 3	
52	30/12/97		-4.29	-4.29	Withdrawal of area around road through sec. 54, Renfrew LD	1
53	26/08/97	-17.2		-17.2	Portion of Sec 76, Renfrew LD is deleted from TFL 25	1
56	10/4/96	-486.4	712.1	225.7	Exchange of land in TFL 25 needed for Juan de Fuca Marine Park Trail	1
57	1/10/98			0	To exchange Timber Harvesting rights from Strathcona TSA to mitigate impart in VILUP and to transfer 8626m^3 from TFL 25 to SBFEP	
58	15/11/01		100.44	100.44	Addition of area in T0887 (Weyco) at Naka Cr	3
59	1/10/98	-9200.14	31540	22339.86	Transfers TFL 24 to TFL 25 Blk 6 and TFL 25 Blk 4 to TFL 6 Blk 2.	
60	Pending Sept 2001		-128.4	-128.4	Increased deletion of Robson Bight Ecological Reserve	3
61	*Cancelled* July 2001			0	Proposed deletion of Lots 1-21 Sec 74. Otter L.D. Proposal was cancelled Oct 1,2002	1
63	22/01/02	-9.64		-9.64	Deletion of Sec 23 Otter L.D. (mouth of Muir Cr)	1
		-6,514.68	33,212.39	26,697.71	**Total hectares added or deleted in TFL**	

Appendix II

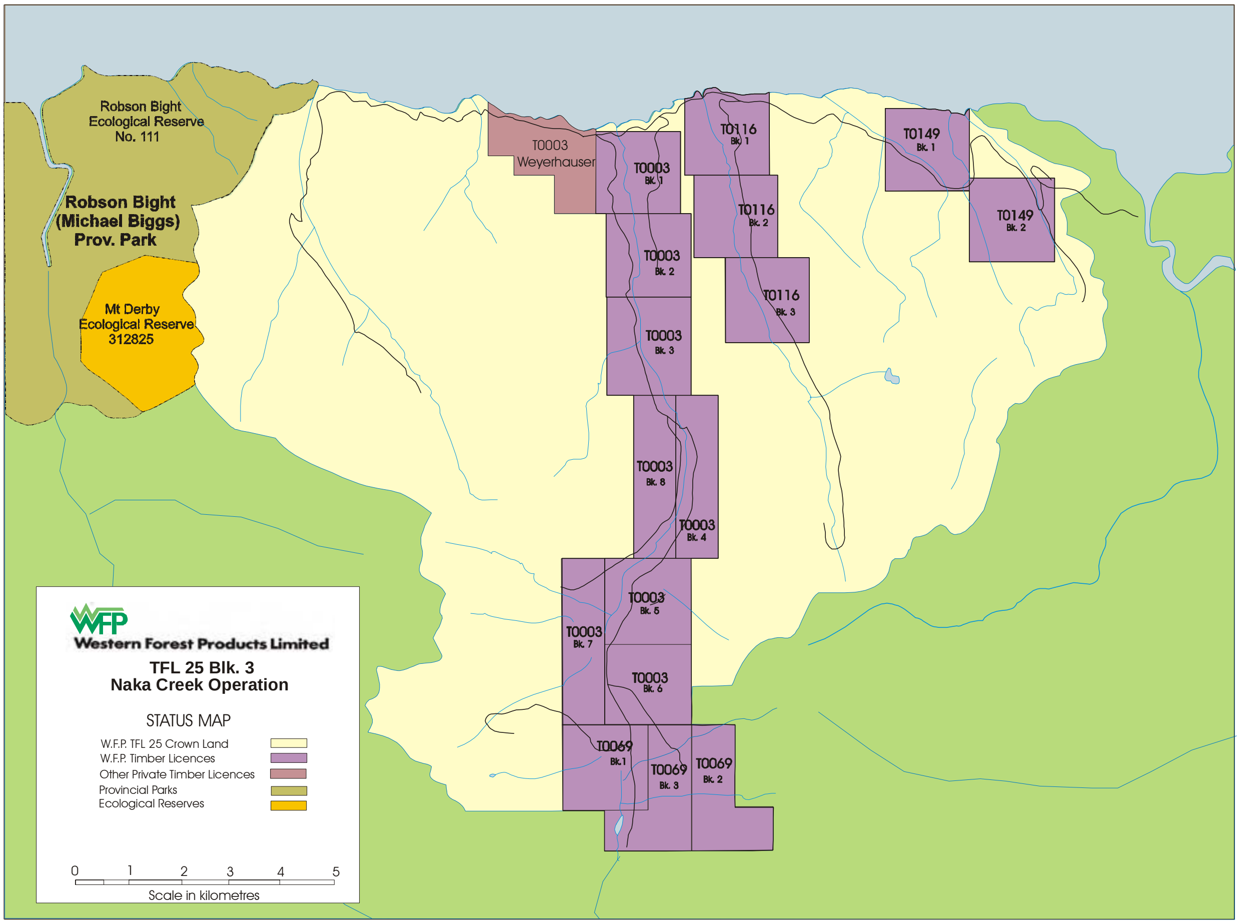
TFL 25 Block Maps and Tenures



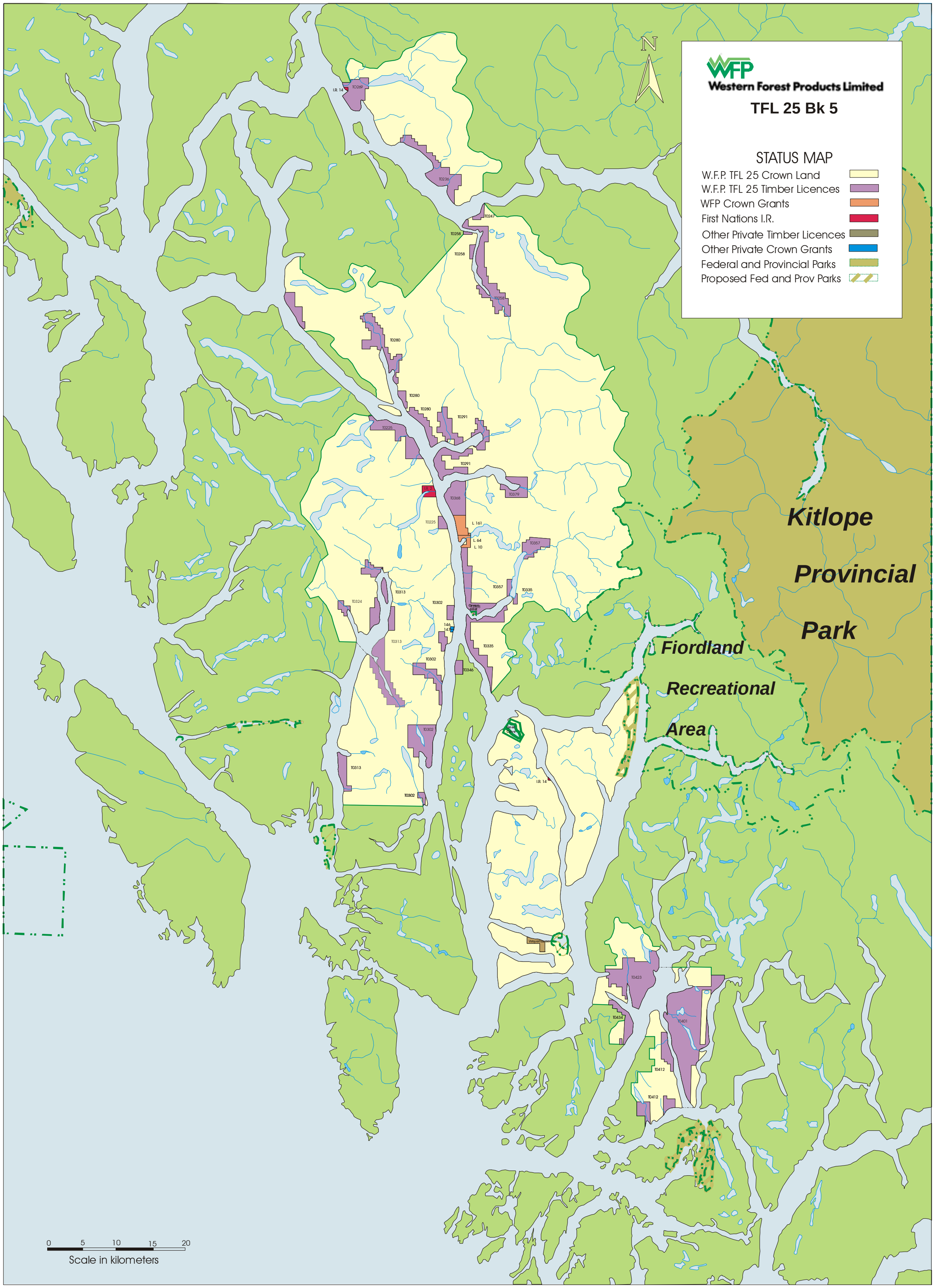
TFL 25 Block 1



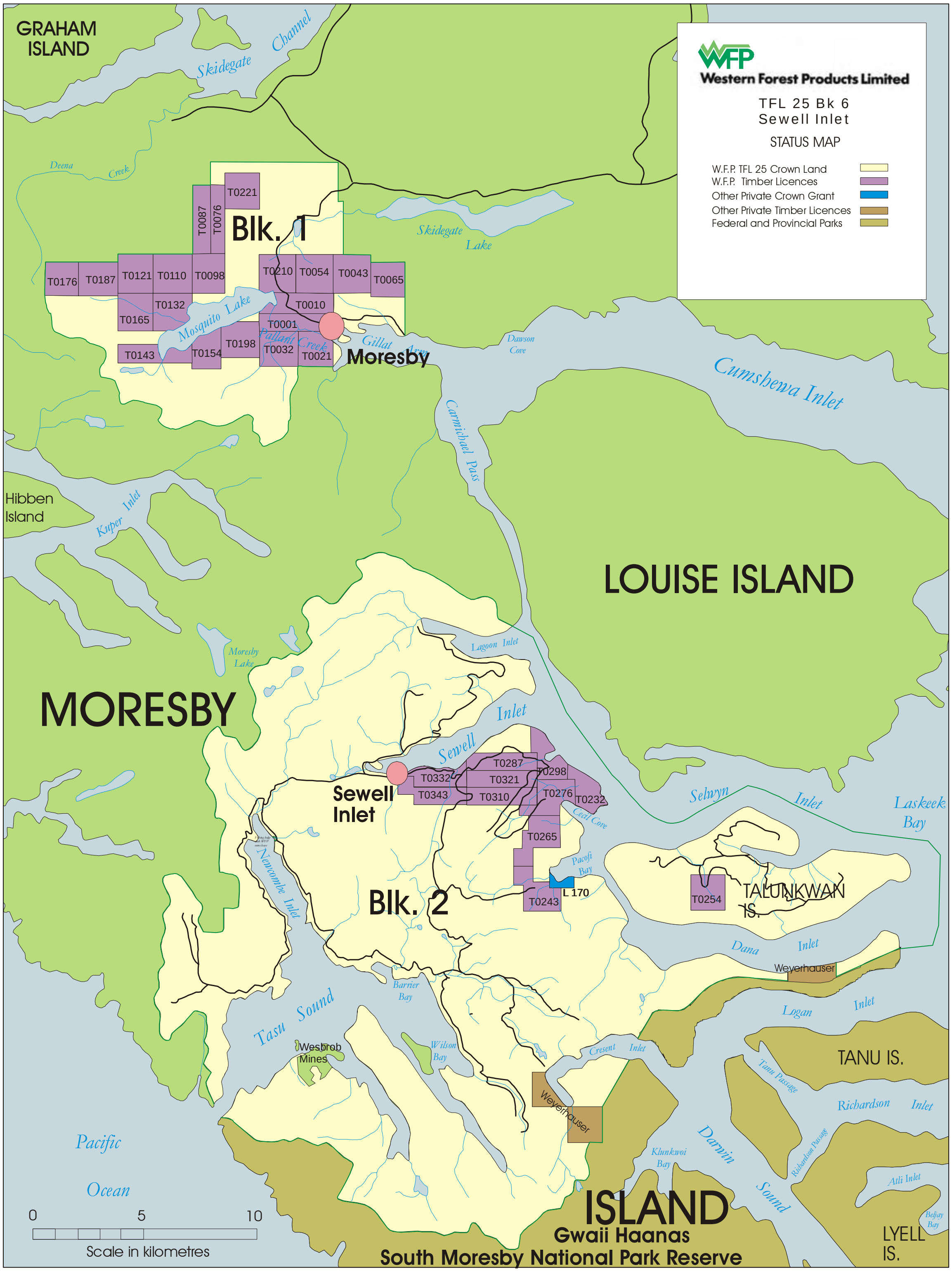
TFL 25 Block 2



TFL 25 Block 3



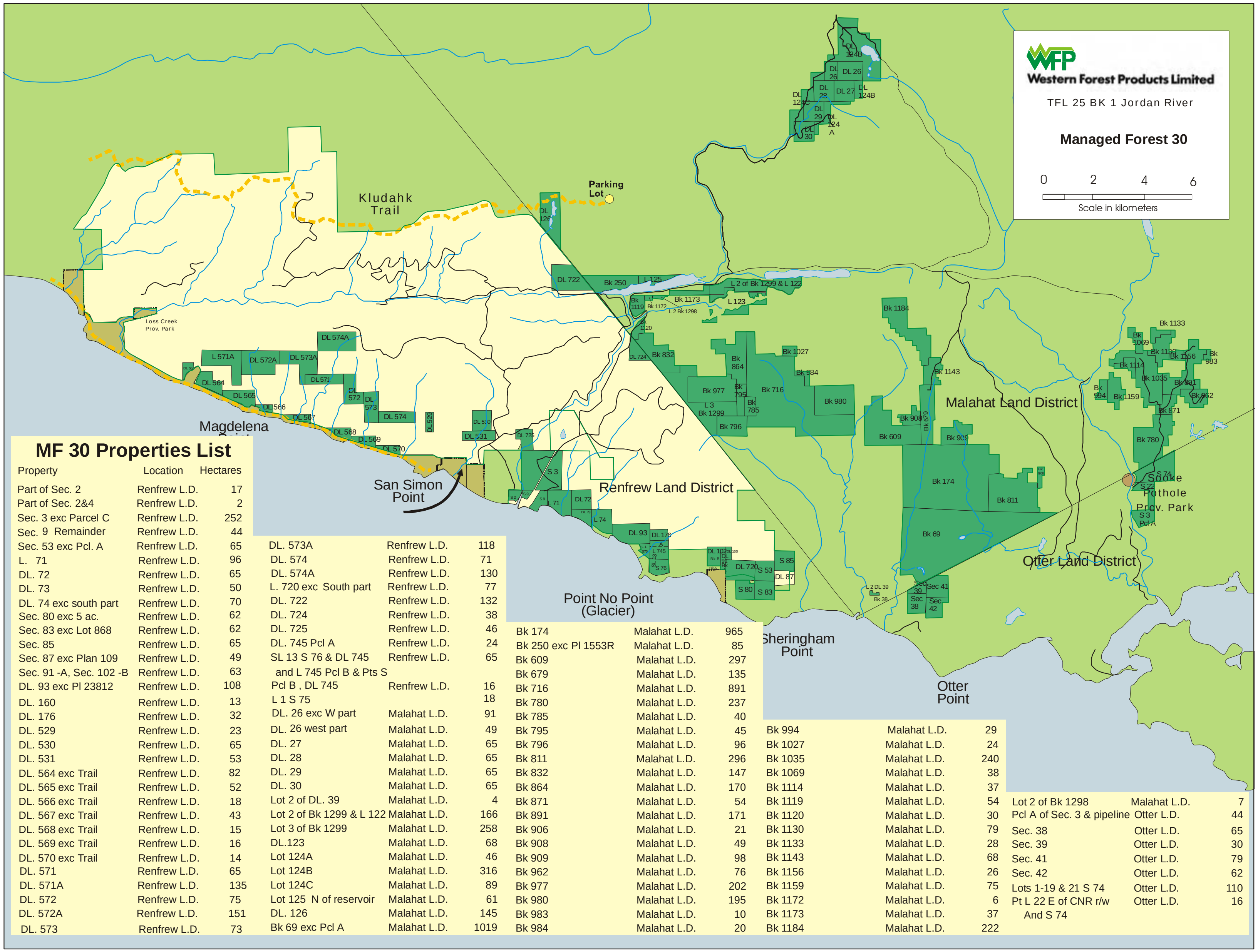
TFL 25 Block 5



TFL 25 Block 6

Appendix III

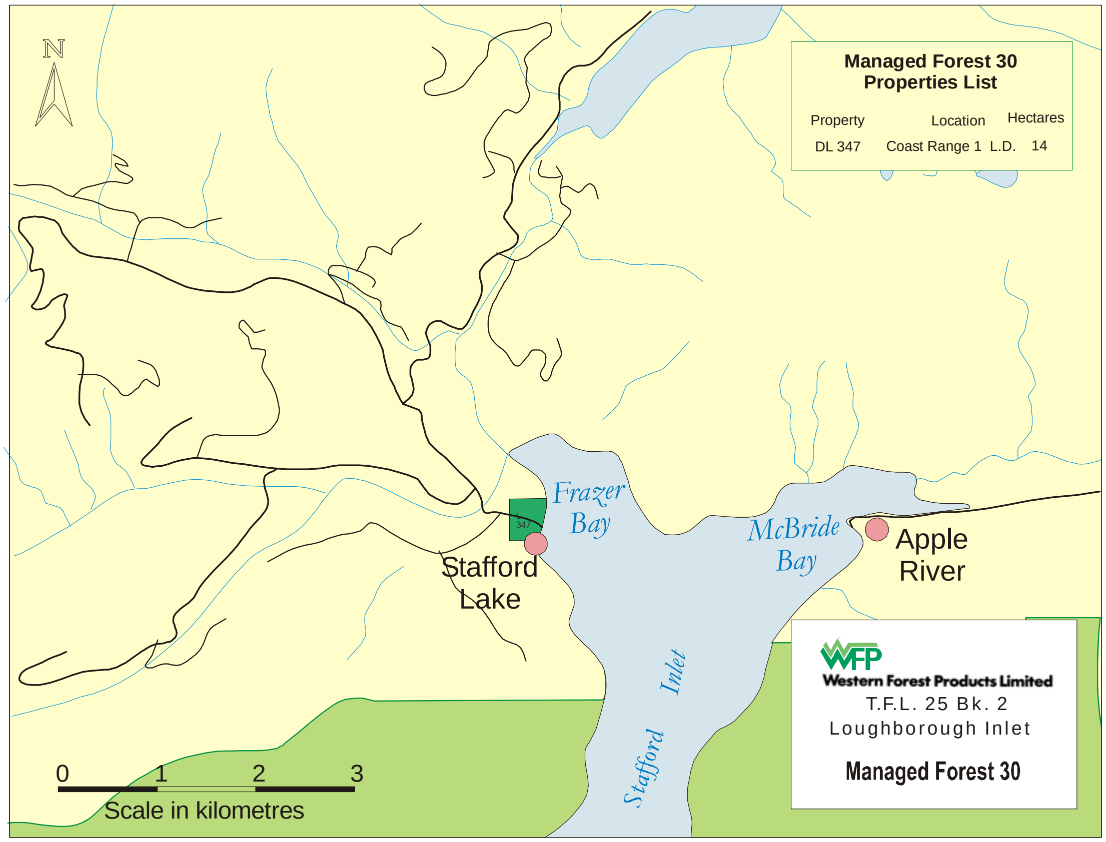
Managed Forest No. 30



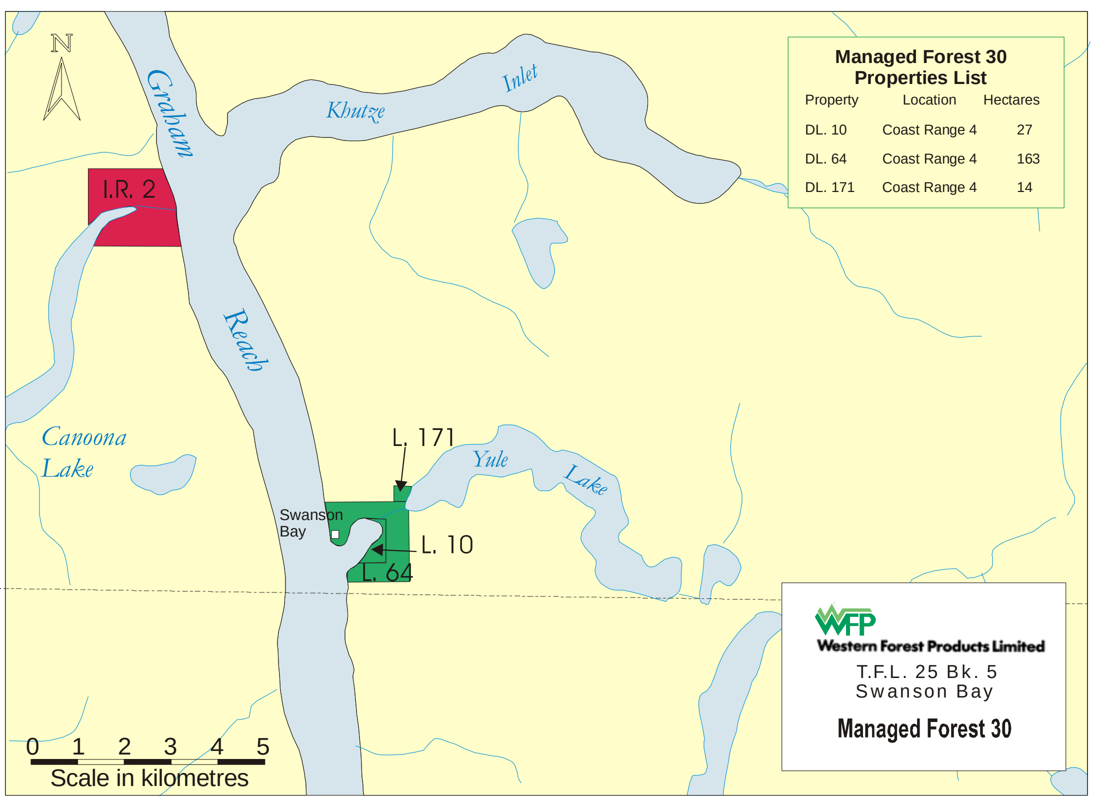
MF 30 Properties List

Property	Location	Hectares
Part of Sec. 2	Renfrew L.D.	17
Part of Sec. 2&4	Renfrew L.D.	2
Sec. 3 exc Parcel C	Renfrew L.D.	252
Sec. 9 Remainder	Renfrew L.D.	44
Sec. 53 exc Pcl. A	Renfrew L.D.	65
L. 71	Renfrew L.D.	96
DL. 72	Renfrew L.D.	65
DL. 73	Renfrew L.D.	50
DL. 74 exc south part	Renfrew L.D.	70
Sec. 80 exc 5 ac.	Renfrew L.D.	62
Sec. 83 exc Lot 868	Renfrew L.D.	62
Sec. 85	Renfrew L.D.	65
Sec. 87 exc Plan 109	Renfrew L.D.	49
Sec. 91 -A, Sec. 102 -B	Renfrew L.D.	63
DL. 93 exc Pl 23812	Renfrew L.D.	108
DL. 160	Renfrew L.D.	13
DL. 176	Renfrew L.D.	32
DL. 529	Renfrew L.D.	23
DL. 530	Renfrew L.D.	65
DL. 531	Renfrew L.D.	53
DL. 564 exc Trail	Renfrew L.D.	82
DL. 565 exc Trail	Renfrew L.D.	52
DL. 566 exc Trail	Renfrew L.D.	18
DL. 567 exc Trail	Renfrew L.D.	43
DL. 568 exc Trail	Renfrew L.D.	15
DL. 569 exc Trail	Renfrew L.D.	16
DL. 570 exc Trail	Renfrew L.D.	14
DL. 571	Renfrew L.D.	65
DL. 571A	Renfrew L.D.	135
DL. 572	Renfrew L.D.	75
DL. 572A	Renfrew L.D.	151
DL. 573	Renfrew L.D.	73
DL. 573A	Renfrew L.D.	118
DL. 574	Renfrew L.D.	71
DL. 574A	Renfrew L.D.	130
L. 720 exc South part	Renfrew L.D.	77
DL. 722	Renfrew L.D.	132
DL. 724	Renfrew L.D.	38
DL. 725	Renfrew L.D.	46
DL. 745 Pcl A	Renfrew L.D.	24
SL 13 S 76 & DL 745 and L 745 Pcl B & Pts S	Renfrew L.D.	65
Pcl B , DL 745	Renfrew L.D.	16
L 1 S 75		18
DL. 26 exc W part	Malahat L.D.	91
DL. 26 west part	Malahat L.D.	49
DL. 27	Malahat L.D.	65
DL. 28	Malahat L.D.	65
DL. 29	Malahat L.D.	65
DL. 30	Malahat L.D.	65
Lot 2 of DL. 39	Malahat L.D.	4
Lot 2 of Bk 1299 & L 122	Malahat L.D.	166
Lot 3 of Bk 1299	Malahat L.D.	258
DL.123	Malahat L.D.	68
Lot 124A	Malahat L.D.	46
Lot 124B	Malahat L.D.	316
Lot 124C	Malahat L.D.	89
Lot 125 N of reservoir	Malahat L.D.	61
DL. 126	Malahat L.D.	145
Bk 69 exc Pcl A	Malahat L.D.	1019
Bk 174	Malahat L.D.	965
Bk 250 exc Pl 1553R	Malahat L.D.	85
Bk 609	Malahat L.D.	297
Bk 679	Malahat L.D.	135
Bk 716	Malahat L.D.	891
Bk 780	Malahat L.D.	237
Bk 785	Malahat L.D.	40
Bk 795	Malahat L.D.	45
Bk 796	Malahat L.D.	96
Bk 811	Malahat L.D.	296
Bk 832	Malahat L.D.	147
Bk 864	Malahat L.D.	170
Bk 871	Malahat L.D.	54
Bk 891	Malahat L.D.	171
Bk 906	Malahat L.D.	21
Bk 908	Malahat L.D.	49
Bk 909	Malahat L.D.	98
Bk 962	Malahat L.D.	76
Bk 977	Malahat L.D.	202
Bk 980	Malahat L.D.	195
Bk 983	Malahat L.D.	10
Bk 984	Malahat L.D.	20
Bk 994	Malahat L.D.	29
Bk 1027	Malahat L.D.	24
Bk 1035	Malahat L.D.	240
Bk 1069	Malahat L.D.	38
Bk 1114	Malahat L.D.	37
Bk 1119	Malahat L.D.	54
Bk 1120	Malahat L.D.	30
Bk 1130	Malahat L.D.	79
Bk 1133	Malahat L.D.	28
Bk 1143	Malahat L.D.	68
Bk 1156	Malahat L.D.	26
Bk 1159	Malahat L.D.	75
Bk 1172	Malahat L.D.	6
Bk 1173	Malahat L.D.	37
Bk 1184	Malahat L.D.	222
Lot 2 of Bk 1298	Malahat L.D.	7
Pcl A of Sec. 3 & pipeline	Otter L.D.	44
Sec. 38	Otter L.D.	65
Sec. 39	Otter L.D.	30
Sec. 41	Otter L.D.	79
Sec. 42	Otter L.D.	62
Lots 1-19 & 21 S 74	Otter L.D.	110
Pt L 22 E of CNR r/w And S 74	Otter L.D.	16

Managed Forest 30 – Jordan River



Managed Forest 30 – Loughborough Inlet



Managed Forest 30 – Swanson Bay

Managed Forest 30 Properties List

Assessment Roll	General Location	Legal Description	Area (ha.)
762-29030.010	Jordan River	Section 2	17.07
762-29030.020	Jordan River	Pt Sec 2&4 Pl 427-R	2.06
762-29030.030	Jordan River	Sec 3 Exc Pcl C (DD 170967-I)	251.71
762-29030.040	Jordan River	Sec 9 Rem (Exc Pcl A,B,C, etc)	43.71
762-29030.060	Jordan River	Sec 53 Exc Pcl A,Renfrew Dist.	64.75
762-29030.070	Jordan River	Lot 71, Renfrew District	96.32
762-29030.080	Jordan River	District Lot 72, Renfrew Dist.	64.75
762-29030.090	Jordan River	District Lot 73,Renfrew Dist.	49.78
762-29030.100	Jordan River	Lot 74 Exc Pt S of Pl 109RW	70.42
762-29030.120	Jordan River	Sec 80 Exc 5 Ac in NE Corner	61.92
762-29030.130	Jordan River	Sec 83 Exc L 868 and RW	61.86
762-29030.140	Jordan River	Section 85, Renfrew Dist.	64.75
762-29030.150	Jordan River	DL 87, Renfrew District	48.56
762-29030.160	Jordan River	Block A, DL 91, Renfrew District	63.33
762-29030.170	Jordan River	Dist Lot,93 Exc Pl 23812	108.05
762-29030.195	Jordan River	District Lot 160, Renfrew Dist	12.95
762-29030.200	Jordan River	District Lot 176,Renfrew Dist.	32.29
762-29030.220	Jordan River	District Lot 529,Renfrew Dist.	23.47
762-29030.230	Jordan River	District Lot 530,Renfrew Dist.	64.75
762-29030.240	Jordan River	District Lot 531,Renfrew Dist	53.42
762-29030.250	Jordan River	District Lot 564, Rem, Renfrew Dist	82.70
762-29030.260	Jordan River	District Lot 565, Rem, Renfrew Dist	51.87
762-29030.270	Jordan River	District Lot 566, Rem, Renfrew Dist	17.98
762-29030.280	Jordan River	District Lot 567, Rem, Renfrew Dist	42.83
762-29030.290	Jordan River	District Lot 568, Rem, Renfrew Dist	14.52
762-29030.300	Jordan River	District Lot 569, Rem, Renfrew Dist	16.00
762-29030.310	Jordan River	District Lot 570, Rem, Renfrew Dist	14.37
762-29030.320	Jordan River	District Lot 571,Renfrew Dist	64.75
762-29030.330	Jordan River	District Lot 571A,Renfrew Dist	134.76
762-29030.340	Jordan River	District Lot 572,Renfrew Dist	74.87
762-29030.350	Jordan River	District Lot 572A,Renfrew Dist	150.95
762-29030.360	Jordan River	District Lot 573,Renfrew Dist	72.84
762-29030.370	Jordan River	District Lot 573A,Renfrew Dist	117.76
762-29030.380	Jordan River	District Lot 574,Renfrew Dist	71.23
762-29030.390	Jordan River	District Lot 574A,Renfrew Dist	129.50
762-29030.400	Jordan River	Lot 720,Exc Pt S of Pl 868RW	76.89
762-29030.410	Jordan River	District Lot 722, Renfrew Dist	131.93
762-29030.420	Jordan River	District Lot 724,Renfrew Dist	38.04
762-29030.430	Jordan River	District Lot 725,Renfrew Dist	46.13
762-29030.440	Jordan River	District Lot 745,Pcl A	24.28
762-29030.445	Jordan River	Strata Lot 13, Section 76 & DL 745, Renfrew District	64.70
762-29030.450	Jordan River	Parcel B, District Lot 745, Renfrew Dist	16.21
762-29030.455	Jordan River	Lot 1,Sec 75,Pl 24134,Renfrew	18.49
762-29030.460	Jordan River	District Lot 26,Exc W 30 Chns	80.94
762-29030.462	Jordan River	The West 30 Chns of Lot 26	48.56
762-29030.464	Jordan River	District Lot 27,Renfrew Dist	64.75
762-29030.466	Jordan River	District Lot 28,Renfrew Dist	64.75
762-29030.468	Jordan River	District Lot 29,REnfrew Dist	64.75

Assessment Roll	General Location	Legal Description	Area (ha.)
762-29030.470	Jordan River	District Lot 30,Renfrew Dist	64.75
762-29030.475	Jordan River	Lot 2, DL 39, Pl 23012, Malahat Dist	4.05
762-29030.480	Jordan River	Lot 2,Blk 1299 & L122 Pl 20837	165.52
762-29030.490	Jordan River	Lot 3,Blk 1299 Pl 20837	257.79
762-29030.500	Jordan River	District Lot 123 on Pl 1554R	67.58
762-29030.510	Jordan River	District Lot 124A,Malahat Dist	45.73
762-29030.512	Jordan River	District Lot 124B,Malahat Dist	315.66
762-29030.514	Jordan River	District Lot 124C,Malahat Dist	89.03
762-29030.520	Jordan River	Lot 125,Pt N of Pl 1555R,Malah	61.11
762-29030.530	Jordan River	District Lot 126,Malahat Dist	144.88
762-29030.540	Jordan River	Block 69 Exc Pcl A,Malahat D	1019.00
762-29030.550	Jordan River	Block 174,Malahat District	965.18
762-29030.560	Jordan River	Block 250,Exc Pl 1554R,Malahat	84.98
762-29030.570	Jordan River	Block 609,Malahat District	297.44
762-29030.580	Jordan River	Block 679,Malahat District	135.41
762-29030.590	Jordan River	Block 716,Malahat District	891.12
762-29030.600	Jordan River	Block 780,Malahat District	237.15
762-29030.610	Jordan River	Block 785,Malahat District	40.47
762-29030.620	Jordan River	Block 795,Malahat District	44.52
762-29030.630	Jordan River	Block 796,Malahat District	96.23
762-29030.640	Jordan River	Block 811,Malahat District	295.83
762-29030.650	Jordan River	Block 832,Malahat District	146.50
762-29030.660	Jordan River	Block 864,Malahat District	169.97
762-29030.670	Jordan River	Block 871,Malahat District	53.62
762-29030.680	Jordan River	Block 891,Malahat District	171.18
762-29030.690	Jordan River	Block 906,Malahat District	20.64
762-29030.700	Jordan River	Block 908,Malahat District	48.56
762-29030.710	Jordan River	Block 909,Malahat District	97.93
762-29030.720	Jordan River	Block 962,Malahat District	76.20
762-29030.730	Jordan River	Block 977,Malahat District	202.34
762-29030.740	Jordan River	Block 980, Malahat District	195.46
762-29030.750	Jordan River	Block 983,Malahat District	10.04
762-29030.760	Jordan River	Block 984,Malahat District	20.23
762-29030.770	Jordan River	Block 994,Malahat District	29.34
762-29030.780	Jordan River	Block 1027,Malahat District	24.40
762-29030.790	Jordan River	Block 1035,Malahat District	239.78
762-29030.800	Jordan River	Block 1069,Malahat District	38.45
762-29030.810	Jordan River	Block 1114,Malahat District	37.43
762-29030.820	Jordan River	Block 1119,Malahat District	54.07
762-29030.830	Jordan River	Block 1120,Malahat District	30.08
762-29030.840	Jordan River	Block 1130,Malahat District	78.51
762-29030.850	Jordan River	Block 1133,Malahat District	27.88
762-29030.860	Jordan River	Block 1143,Malahat District	67.66
762-29030.870	Jordan River	Block 1156,Malahat District	26.31
762-29030.880	Jordan River	Block 1159,Malahat District	74.87
762-29030.890	Jordan River	Block 1172,Malahat District	6.48
762-29030.900	Jordan River	Block 1173,Malahat District	36.62
762-29030.910	Jordan River	Block 1184,Malahat District	222.13
762-29030.915	Jordan River	Lot 2,Block 1298,Plan 20838	6.72
762-29030.920	Jordan River	Pcl A,Sec 3,Exc Pl 3943 & Pipe	43.62

Assessment Roll	General Location	Legal Description	Area (ha.)
762-29030.950	Jordan River	Section 38,Pl DD18138,Otter D	64.75
762-29030.960	Jordan River	Section 39,Exc Plan 121 R/W	29.81
762-29030.970	Jordan River	Section 41,Pl DD551121 Otter d	79.32
762-29030.980	Jordan River	Section 42,Exc Pl 121R/W,Otter	62.00
762-29030.990	Jordan River	Section 74, Otter District, Plan 1419	109.53
762-29030.995	Jordan River	Pt Sec 20,PL.1419,Sec.74,Otter	16.19
772-29030.005	Cooper Reach	DL 347, R1, Coast Dist	14.16
780-29030.010	Swanson Bay	DL 10, R4, Coast Dist	27.52
780-29030.020	Swanson Bay	DL 64, R4, Coast Dist	163.09
780-29030.030	Swanson Bay	DL 171, R4, Coast Dist	14.17
Total			**11214.22**

Appendix IV

Timber Supply Analysis

Information Package

Western Forest Products Limited

Tree Farm Licence 25

Timber Supply Analysis Information Package

MANAGEMENT PLAN 10

Revised

Submitted to the Ministry of Forests
Timber Supply Branch
Victoria, BC

March 2003

David Byng, *R.P.F*
Manager, Timber Supply and Planning
Western Forest Products Limited

REGISTERED PROFESSIONAL FORESTER
PROVINCE OF BRITISH COLUMBIA
DAVID A. BYNG
NO. 3161

TABLE OF CONTENTS

List of Tables

List of Figures

1.0 INTRODUCTION

1.1 Overview

This Information Package provides a summary of data, assumptions, and modelling procedures to be used in the Timber Supply Analysis for Western Forest Product's (WFP) Tree Farm Licence (TFL) 25 Management Plan (MP) 10. The timber supply analysis will be completed with spatially explicit management objectives and provide area-based and volume-based harvest alternatives; the information in this package is presented accordingly.

The forest estate model Complan® will be used to complete the timber supply analysis. Complan is a spatially-explicit harvest scheduling model for forest management planning and will allow the effects of adjacency to be modelled and incorporated in the timber supply analysis providing greater operational relevance. The result is a detailed analysis that will guide operational planning and that can be checked and verified as planning proceeds.

Complan is designed for simulating timber flow using volume regulation of harvest levels. The Licensee intends to test area regulation by requesting high volume harvests per period but using area constraints to limit harvesting to the specified area harvest per year. As per volume-regulated simulations, the area constraint will be changed incrementally until an optimum and constant annual area harvest is attained. A constraint to impose balanced cutting across eligible analysis units will be also invoked to ensure that harvesting is close to profile and disruptive oscillations in volume harvested are not induced as a result of area-regulation.

As a first step, strategies to model environmental protection through net downs of productive forest and yield curve volume reductions will be devised. The analysis of the residual timber supply will then estimate timber flow or area harvest over a 250-year planning horizon based on the residual harvestable land base, existing old forest timber volumes, and secondary forest growth rates. Spatial realism is an important consideration in environmental protection and non-timber resource management; where feasible these factors will be spatially modelled as part of the timber supply analysis. The harvest forecast will project the timber supply impacts of current environmental protection and management practices including operational requirements of the Forest Practices Code (FPC) and other regulations and guidelines. Scenario and sensitivity analyses will be performed to investigate the expected impacts of different management options, and to evaluate the relative importance of specific assumptions. These may include changing the land base, forest-cover retention, or growth & yield (G&Y) assumptions.

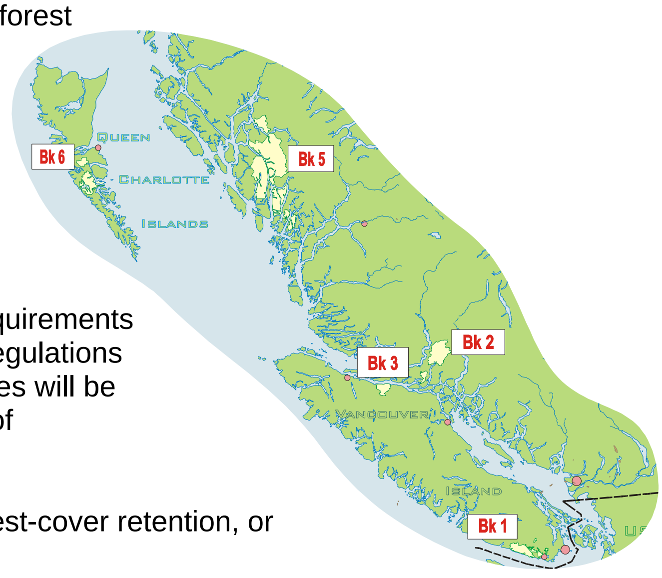


Figure 1 – TFL 25.

The timber supply forecast will attempt to achieve the long-term harvest potential, and minimize negative rates of change during the transition from the current level of harvest to the mid- and long-term sustainable levels. In meeting these objectives, model outputs may be analyzed to ensure that other indicators such as seral stage availability, hydrological characteristics, timber profile, or long term productivity are not disrupted through the planning horizon.

1.2 CCLRMP Interim Agreement

The Central Coast Land and Resource Management Plan (CCLRMP) process covers Block 2 and a significant portion of Block 5. In April 2001 an interim agreement for the CCLRMP was ratified by stakeholders, announced to the public and accepted by the provincial government. This agreement contained land use recommendations for designation of Candidate Protection Areas and “Option” Areas, and a commitment to define and implement Ecosystem Based Management in the planning area. The completion phase of the process is now underway. During this phase government intends to formally declare Candidate Protection and “Option” Areas through an Order in Council as “Designated Areas” under Part 13 of the Forest Act (Forest harvesting is suspended in these areas and a temporary, intrim AAC reduction is expected until land use objectives are resolved), and define and implement Ecosystem Based Management.

Since the outcome of the CCLRMP is still subject to uncertainity before final approval by government, current forest management assumptions do not incorportate the interim agreement decision announced in April 2001. Instead, sensitivity analysis will be undertaken to assess the influence proposed decisions will have on timber supply and provide guidance for adjusting the AAC to reflect the interim and final agreement.

2.0 PROCESS

2.1 Overview

This information package was developed under the latest management plan provisions of the Ministry of Forests (MOF) and reflects management commitments as outlined in Management Plan 10[4]. This information package is being submitted for review to the Timber Supply Forester at Timber Supply Branch. The revised and approved package will guide the timber supply analysis and with the timber supply analysis report will be appended to MP 10.

The TFL is divided into five geographically separated Blocks. Each block will be analyzed as a separate sustainable unit with a separate area- or volume-regulated harvest flow recommendation.

Block # (Name)	Operation (2001)
Block 1 (Jordan River)	Jordan River Forest Operation
Block 2 (Loughborough Inlet)	Stafford Lake Forest Operation
Block 3 (Naka Creek)	Naka Creek Forest Operation
Block 5 (Swanson Bay)	Roderick Island and Yeo Island Forest Operation
Block 6 (Queen Charlotte Islands)[5]	Sewell Inlet Forest Operation

2.2 Growth and Yield

Yield tables for existing stands will be divided into three groups based on age class. In Blocks 1 and 6, volumes of existing mature stands (>140 years) will be derived using Vegetation Resource Inventory attributes to generate VDYP estimates of stand volumes. Blocks 2, 3 and 5 will have mature volumes assigned using AVL (average volume lines) generated from the last Forest Inventory (see Table 5 for dates). For all blocks mature volumes will remain static (flat line) throughout the analysis, as the assumption for these mature stands is that growth net decay is zero.

Immature inventory (>40 and <141 years,) will have volumes projected with VDYP. In Blocks 1 and 6 VRI attributes will be used to generate VDYP output. In Blocks 2 and 3, ecosystem mapping will be used to assign SIBEC SI to immature polygons and augment inventory data lacking height assignments. In Block 5 ecological mapping is incomplete so SI will be assigned to inventory G-M-P classes based on a benchmark for “M” sites derived from local Permanent Sample Plots with adjustments to “G” and “P” sites based on inventory derived shifts from “M” sites.

Existing stands less than or equal to 40 years of age and future stands will have yields projected with TIPSY version 3.0. TIPSY yield projections will be assigned to existing NSR areas and simulated harvest areas according to their expected management regime and productivity group. With the exception of Block 5, ecosystem mapping will be the basis of analysis unit

1.1

[4] previously a Statement of Management Objectives, Options, and Procedures (SMOOP) was required.
[5] This block was added in October 1998 and was previously TFL 24. Block 4 is no longer included as it was transferred to TFL 6 at the same time.

assignment and site index estimation. In Block 5, G-M-P classification will be the basis of site index assignment.

3.0 TIMBER SUPPLY FORECASTS/OPTIONS/SENSITIVITY ANALYSES

3.1 Overview

This section describes the management scenarios to be included in the timber supply analysis. The details, assumptions, and sensitivities of each are also described.

3.2 Current Management Option

The current management option represents the present operational requirements and management practices on the TFL. The forecast of current management incorporates existing land use designations, including Resource Management Zones[6] (where applicable) and currently enforced regulations and guidelines including the FPC. This option is used as the basis for analysing various timber supply projections.

Current Management on TFL 25 includes:

- Harvest from operable land base of forested area accessible using conventional (Oc) and helicopter (Oh) methods.
- Silviculture to meet free growing requirements is carried out on all regenerated stands. Harvested areas are promptly reforested, primarily by planting, usually well before expiry of regeneration delay dates.
- Research-based estimates of tree improvement gains will be applied primarily to future regenerated stands. Theoretical gains expected within the next two decades are excluded.
- Visual quality classes (VQC) are modelled based on newly completed inventory revisions with upper range denudation assumed.
- Green-up heights are assigned based on Resource Management Zoning established in the Vancouver Island Higher Level Plan for Blocks 1 and 3. Special and General zones have a 3m green-up requirement while Enhanced zones have a 1.3m green-up requirement. Green-up heights for all other Blocks will be 3m.
- Future Wildlife Tree Patch retention within the THLB is accounted for by a blanket percent volume reduction in the timber supply model.
- Biodiversity and Landscape Units – seral stage targets for old seral will be applied to each landscape unit. For Blocks 2 and 5, the old seral target is based on target proportions of 10/45/45 for high/intermediate/low as per TSR 2 directives. For all other blocks, the old seral target is based on the Biodiversity Emphasis Options assigned to the individual Landscape Units.
- Minimum harvest age will be adjusted to ensure that second growth average harvest diameters are in the range of 30 – 45 cm or better.
- Deciduous leading stands are minor and are included in the THLB; any volume in these stands contributes to the analysis.

1.1 ————————————————

[6] Resource Management Zones and Resource Management Zone objectives approved by Government in December 2000. Planning documents submitted after April 1, 2001 must conform to the RMZ management objectives.

- Harvest rules are set to harvest oldest stands first and to minimize growth loss.

The area available for timber production under Management Plan 10 is 138,078 ha (Table 1). The THLB under Management Plan 9[7] was approximately 115,798 ha. There has been an increase of forest land capable and available for timber production since the last MP due to refinements in operability mapping and riparian reserve estimates. Mapping refinements to the TFL boundary along various heights of land has both added and subtracted land from the total landbase.

Table 1 – TFL 25 landbase comparison for MP 10 compared to MP 9.

		MP 10	MP 9	Difference
Block 1	**Total Area**	32,201.6	32,247.9	(46.3)
	THLB Area	25,561.9	21,671.4	3,890.5
Block 2	**Total Area**	66,891.1	66,644.9	246.2
	THLB Area	15,002.4	13,108.9	1,893.5
Block 3	**Total Area**	15,985.0	16,305.0	(320.0)
	THLB Area	9,443.6	8,894.9	548.7
Block 5	**Total Area**	311,707.4	311,948.6	(241.2)
	THLB Area	62,901.1	48,608.5	14,292.6
Block 6[8]	**Total Area**	53,364.0	53,660.0	(296.0)
	THLB Area	25,168.5	23,514.0	1,654.5
Total	**Total Area**	480,149.1	480,806.4	(657.3)
	THLB Area	138,077.5	115,797.7	22,279.8

3.3 Alternate Harvest Flow

Under a volume regulation scenario, alternate harvest flows will investigate variations in the rate of transition to the mid and long term harvest levels and the effect of delaying or advancing start of the transition period. Under an area regulation scenario, area harvested will be kept constant through the simulation but constant harvest levels above and below the current management base case will be investigated as alternatives.

3.4 Sensitivity Analyses

Sensitivity analyses will be conducted for the current management scenario to examine the potential impact of uncertainty in several key attributes. These may include the removal of operable areas from the timber harvesting land base (THLB), imposing forest-cover harvest constraints, or changes in growth & yield (G&Y) estimates.

Sensitivities for the base case will include:

1) Operability: Operability classes have been developed that reflect current harvesting methods, timber quality, terrain stability, and economic accessibility. The purpose of this analysis is to examine potential timber supply impacts of changing economic conditions by excluding non-conventional systems or including operability classes that are currently not economic to harvest. Sensitivity analyses will model the impacts of:

1.1

7 MP 9 statistics are adjusted to reflect the removal of TFL 25 Block 4 and addition of TFL 24 (as block 6) to the TFL.

8 Block 6 landbase and THLB statistics are from TFL 24 MP 7 prepared in 1989.

- o Removing the non-conventional area (Oh), and;
- o Including areas that are considered economically marginal (Oce and Ohe).

2) Area Request: The harvest forecasts will be evaluated by adjusting the base case flatline area harvest request by ± 10%.

3) Site Productivity: Site indices (SI50) for existing managed and future stands in the base case will be reduced by 3 metres to test the uncertainties associated with assigned SI.

4) Harvest Age: Increasing and decreasing the base case minimum harvest ages by adjusting product size criteria by ± 3cm will test the effect of varying rotation length.

5) Visual Quality: Current management incorporates constraints from VQCs assigned by the revised landscape inventory completed for the TFL in 2000. A sensitivity analyses will be used to examine the impacts of varying the percentage of area below Visually Effective Green-up (VEG) to the mid range percent denudation limit recommended for the VQC class.

6) Biodiversity Emphasis Options: The current management option for Blocks 2 and 5 conforms to earlier TSR 2 procedures and does not consider assigned Biodiversity Emphasis Options (BEO) ratings for individual Landscape Units. BEO ratings on Landscape Units in Blocks 2 and 5 will be considered in a sensitivity analysis to study the implications of managing to maintain biodiversity at the landscape unit level. Old seral targets for the assigned BEO will be modelled within each Landscape Unit according to guidebook procedures for draw down in low emphasis units.

7) CCLCRMP Interim Agreement: To evaluate the implication for timber supply of 1) removing Candidate Protection Areas from the THLB, and 2) removing both Candidate Protection Area and "Options Areas" from the THLB.

During preparation of the timber supply analysis, further sensitivity analyses may be performed and if warranted some of these sensitivity analyses will be included in the timber supply analysis for consideration.

3.5 Other Options

Unconstrained options (operability the only constraint) representing the raw timber potential for each block of the TFL will be performed to indicate the magnitude of economic activity foregone to ensure protection of non-timber opportunities.

Table 2 – Summary of Current Management and Sensitivity Analyses

Issue Tested	Proposed Options / Sensitivity Analysis	
	Title	Reason for Analysis and Range to be tested
To project the timber supply based on current management practices, performance, operational requirements and currently enforced guidelines while meeting the objective of maintaining a timber supply which is not excessively variable over time and which maintains the long-term productivity of the TFL.	**Current Management Option**	Current Management Option includes the following: • Conventional and helicopter harvesting • Visual Quality based on known scenic areas within the TFL inventory • WTP – 3.25% volume net down to meet future WTP requirements (assuming 3/4 of the 13% WTP designated will be areas otherwise constrained) • Riparian reserves based on FPC requirements • Volume net down allowance for future retention and riparian management in THLB • Silviculture practices as described in Section 3.2 • Biodiversity Landscape Unit targets for old seral based on the 10/45/45, high intermediate, low proportions
	(1) Operability	The impact on the harvest flow will be evaluated by including different operability classes in the THLB as follows (current management practices for all): • Non-conventional areas removed. • Economically marginal areas included.
	(2) Area Request	The impact on the harvest flow will be evaluated by varying the flatline harvest request by ± 10%.
	(3) Site Productivity	Site Indices (SI50) for existing managed and future stands will be reduced by 3 metres to model uncertainties associated with assigned SI.
	(4) Harvest Age	Increasing and decreasing the minimum harvest ages by adjusting product size by ± 3cm will assess the effect of varying rotation length.
	(5) Visual Quality	The effects of varying the percent-denudated limit to the mid range.
	(6) Biodiversity Emphasis Options	The impact of current management for biodiversity in Block 2 and 5 where individual landscape units are constrained as dictated by the Biodiversity Emphasis Options (guidebook procedures for old seral targets requirements).
	(7) CCLCRMP Interim Agreement	The impact on timber supply due to potential land use decisions in Block 5 will be assessed by removing: • Candidate Protections Areas from the THLB • Candidate Protection Areas and "Option Areas" from the THLB

Table 3 – Other Analyses

Option	Issue to be Tested	Constraints
Unconstrained Run	To quantify timber potential and non-timber values in terms of annual harvest volume foregone.	No constraints will be imposed upon this run with the exception of operability.

4.0 HARVEST MODEL

4.1 Complan

This section presents a brief description of the analytical model used to produce harvest level and forest inventory projections. The proprietary forest estate simulation model Complan will be employed in TFL 25 to determine the harvest flows based on spatially explicit information.

Complan is a spatially explicit forest estate model that schedules harvests at the cutblock or stand level subject to adjacency (green-up) and non-timber resource constraints (cover constraints). The model's hierarchy of spatial units make it possible to evaluate many different scenarios with improved realism.

Complan software uses a hierarchical data structure that takes advantage of a compartment management approach to spatial data organization. Advantages of this approach include easy integration with GIS systems, adaptation to a wide variety of tenure administration structures and integration of both strategic and operational planning.

Tests have been completed which compare results of Complan with those from the B.C. Ministry of Forests' model FSSIM. These tests, done in cooperation with the MOF showed that Complan could produce results that are very similar to that of FSSIM. The minor differences are well understood and documented.

<u>Key Features</u>

Complan offers a number of key features that make it suited for both strategic and operational planning:

- Annual internal time increment allows accurate representation of growth, harvest, adjacency and constraint status.
- Yield table structures allow for many additional variables other than volume to be modelled.
- Constraints are localized to site-specific conditions (e.g. green-up time will be longer for cutblocks on poor sites compared with cutblocks on good sites).
- Cover constraints that address non-timber values can overlap so that it is not necessary to divide the area into management zones according to which constraint is most restrictive.
- All forested land base is retained in the simulation and contributes to cover requirements even if it is not part of the timber harvesting land base.
- Commercial thinning can be modelled.
- Spatially explicit nature allows harvest schedules to be easily mapped and verified.
- Flexible yield table columns and the ability to shift yield tables at different ages allow for modelling of succession as well as alternative silvicultural strategies.
- Several different prioritization algorithms are available, including minimize growth loss, oldest first, geographic priority and analysis unit priority.
- Cutblock aggregation can be used.
- Several options exist for "harvesting the profile".
- There are no artificial limitations on numbers of polygons, yield tables, or other model inputs.

.

5.0 CURRENT FOREST COVER INVENTORY

5.1 Overview

The purpose of this section is to summarise:

1) History of the current forest-cover inventory.
2) Updates and changes to the inventory since the last timber supply analysis.
3) Area of the inventory.
4) Audits and reviews.
5) Plans for future updates.

5.2 History

The current forest cover inventory for TFL 25 is outlined below in Table 4. Each block has been maintained and updated to account for forest cover changes due to harvesting and reforestation activities. The data used in this analysis has been updated to January 1, 2001 and reflects area and volume changes in the land base due to logging, reforestation, growth and natural depletions occurring up until that date.

Table 4 – TFL 25 Forest Cover Status

Block	Status	Comments
1	Completed 1999 to Vegetative Resource Inventory (VRI) Standards.	VRI ratio adjustment process is still under review. Adjustments will be incorporated if resolved prior to analysis.
2	Completed 1971.	New inventory to VRI standards was started in September 2001.
3	Completed 1971	New inventory to VRI standards was started in September 2001.
5	Completed 1985	New inventory to VRI standards was initiated in 2000 but was put on hold until land use issues are resolved.
6	Completed 2000 to Vegetative Resource Inventory (VRI) Standards	VRI ratio adjustment process is still under review. Adjustments will be incorporated if resolved prior to analysis.

5.3 Updates

The inventory for the Timber Supply Analysis has been updated for depletion (harvesting and natural) and reforestation to January 1, 2001.

The inventory is maintained by WFP's Geomatics group and is currently in UTM NAD 83.

5.4 Inventory Audits

For the forest inventories conducted to VRI standards in Block 1 and 6, a comprehensive quality control audit was conducted both internally and by MOF. Checks were made on photo interpretation, ground sample selection and ground sample plots. Net volume adjustment factors (NVAF) have been determined from destructive sampling and are incorporated in the final inventory adjustments. Final ratio adjustments are still being reviewed due to the newness of procedures.

No other inventory audits have been conducted in the TFL. A MOF audit was planned for 1998 for Blocks 2 and 3 but was delayed.

5.5 Inventory Plans

Subject to availability of funds, forest inventories to VRI standards for Block 2, 3 and 5 should be completed over the next couple of years. The photo interpretation phase was started for Blocks 2 and 3 in September 2001 and will be completed by June 2002. Ground sampling is planned for 2002 but is dependent on funding. Block 5 has been delayed given land use uncertainties associated with the Central Coast Land and Resource Management Plan (CCLRMP). This LRMP process has a target completion date in early 2003 and given the outcome, scheduling of the Block 5 inventory will be revisited.

6.0 DESCRIPTION OF LAND BASE

6.1 Overview

This section describes the TFL 25 land base and the methods used to determine the portion of the land base that contributes to timber harvesting (THLB). Some portions of the productive land base, while not contributing to harvest, are crucial for sustaining non-timber resources.

6.2 Timber Harvesting Land Base Determination

The THLB and the total long-term land base in TFL 25 are presented in Table 5 thru Table 10. Areas are reported for both Schedule A and Schedule B land classes. Areas and volumes have been compiled from a stand database constructed for the preparation of this information package. Appendix I shows detailed area and volume summaries for the timber harvesting land base. Mature and immature stand volumes have been derived from growth and yield projections.

In the last timber supply analysis the total area (all blocks combined) of reductions applied against the forest land base amounted to 138,919.8 ha (approximately 55%). For MP10 the total area of reductions for all blocks combined is 130,773.8 ha, which is 49% of the forested land base. The difference is primarily due to revised operability mapping in Block 5 and a review of riparian net downs, which were overly conservative in the MP 9 analysis.

The following sections show total area classified by category as noted in Table 5 thru Table 10 and serve to summarise the area deducted from the timber harvesting land base including overlaps.

6.3 Total Area

The total area of the TFL is 480,149 ha. The total area in 1996 was 458,446.4 ha. The change in land base is due to the removal of Block 4 (31,300 ha), the addition of Block 6 (53,364 ha), the addition of crown land in exchange for the designation and withdrawal of the Juan de Fuca Marine Trail (no overall change in land base), the expansion of the Robson Bight Ecological Reserve which resulted in a 123 ha removal from Block 3, and mapping refinements to the TFL, which includes boundary revisions along TRIM defined heights of land.

Table 5 – Timber harvesting land base for TFL 25

Classification	Area (ha)			Mature Volume (m³)		
	Schedule A	Schedule B	Total	Schedule A	Schedule B	Total
Total Area	51,772.9	428,376.2	480,149.1	18,151,616.0	90,132,672.6	108,284,288.6
Less: Non-Forest	5,306.3	202,936.2	208,242.5	12,778.9	17,761.7	30,540.6
Less: Non-Productive Forest	234.4	2,820.9	3,055.3	26,823.2	365,435.5	392,258.7
Total Productive Forest	46,232.2	222,619.1	268,851.3	18,112,013.9	89,749,475.4	107,861,489.3
Less Reductions to Total Productive Forest:						
Non-Commercial	93.6	1,643.0	1,736.6	581.9	5,858.2	6,440.1
Low Sites	5,296.8	34,897.3	40,194.1	1,125,512.3	8,843,881.6	9,969,393.9
Riparian Reserves	868.2	3,262.1	4,130.3	376,753.6	1,304,592.7	1,681,346.3
Inoperable / Inaccessible (I, Oce, Ohe)	8,806.5	70,441.3	79,247.8	4,753,750.5	36,273,975.3	41,027,725.8
Environmentally Sensitive Areas	243.8	3,348.3	3,592.1	117,959.6	1,811,645.2	1,929,604.8
Unclassified Roads, Trails and Landings	446.9	1,426.0	1,872.9	16,710.2	62,110.8	78,821.0
Total Reductions to Productive Forest	15,755.8	115,018.0	130,773.8	6,391,268.1	48,302,063.8	54,693,331.9
Total Reduced Land Base	30,476.4	107,601.1	138,077.5	11,720,745.8	41,447,411.6	53,168,157.4
Less: Not Sufficiently Restocked Areas	657.0	1,968.0	2,625.0	0.0	0.0	0.0
Add: Not Sufficiently Restocked Areas	657.0	1,968.0	2,625.0	0.0	0.0	0.0
Timber Harvesting Land Base	30,476.4	107,601.1	138,077.5	11,720,745.8	41,447,411.6	53,168,157.4
Less: Future Roads, Trails and Landings	861.3	2,717.7	3,579.0	426,430.6	1,381,639.4	1,808,070.0
Less: Volume Reductions (WTP&RMZ – 8.5%)	2,008.1	6,845.1	8,853.2	863,472.6	2,884,862.9	3,748,335.5
Total Long Term Land Base	27,607	98,038.3	125,645.3	10,430,842.6	37,180,909.3	47,611,751.9

Table 6 – Timber harvesting land base for TFL 25 Block 1

Classification	Area (ha)			Mature Volume (m³)		
	Schedule A	Schedule B	Total	Schedule A	Schedule B	Total
Total Area	12,372.7	19,828.9	32,201.6	993,098.4	4,210,590.4	5,203,688.8
Less: Non-Forest	429.2	206.8	636.0	9,116.9	1,017.1	10,134.0
Less: Non-Productive Forest	180.0	908.3	1088.3	16,292.7	129,878.2	146,170.9
Total Productive Forest	11,763.5	18,713.8	30,477.3	967,688.8	4,079,695.1	5,047,383.9
Less Reductions to Total Productive Forest: Non-Commercial	19.4	7.2	26.6	101.8	268.1	369.9
Low Sites	1,587.5	519.5	2,107.0	189,387.1	160,506.3	349,893.4
Riparian Reserves	334.6	288.8	623.4	55,738.7	63,695.9	119,434.6
Inoperable / Inaccessible (I, Oce, Ohe)	371.9	1,093.2	1,465.1	100,548.7	565,916.6	666,465.3
Unclassified Roads, Trails and Landings	306.8	386.5	693.3	7,332.9	15,797.0	23,129.9
Total Reductions to Productive Forest	2,620.2	2,295.2	4,915.4	353,109.2	806,183.9	1,159,293.1
Total Reduced Land Base	9,143.3	16,418.6	25,561.9	614,579.6	3,273,511.2	3,888,090.8
Less: Not Sufficiently Restocked Areas	264.9	345.7	610.6	0	0	0
Add: Not Sufficiently Restocked Areas	264.9	345.7	610.6	0	0	0
Timber Harvesting Land Base	9,143.3	16,418.6	25,561.9	614,579.6	3,273,511.2	3,888,090.8
Less: Future Roads, Trails and Landings	190.1	377.4	567.5	20,484.2	127,194.1	147,678.3
Less: Volume Reductions (WTP&RMZ – 5%)	447.7	802.1	1,249.8	29,704.8	157,315.9	187,020.7
Total Long Term Land Base	8,505.5	15,239.1	23,744.6	564,390.6	2,989,001.2	3,553,391.8

Table 7 – Timber harvesting land base for TFL 25 Block 2

Classification	Area (ha)			Mature Volume (m³)		
	Schedule A	Schedule B	Total	Schedule A	Schedule B	Total
Total Area	1,767.3	65,123.8	66,891.1	583,391.1	10,051,151.8	10,634,542.9
Less: Non-Forest	203.6	38,375.1	38,578.7	0.0	0.0	0.0
Less: Non-Productive Forest	0.0	0.0	0.0	0.0	0.0	0.0
Total Productive Forest	1,563.7	26,748.7	28,312.4	583,391.1	10,051,151.8	10,634,542.9
Less Reductions to Total Productive Forest:						
Non-Commercial	11.2	741.8	753.0	0.0	0.0	0.0
Low Sites	150.4	3,304.8	3,455.2	39,894.1	993,245.7	1,033,139.8
Riparian Reserves	20.6	659.5	680.1	13,102.1	233,898.1	247,000.2
Inoperable / Inaccessible (I, Oce, Ohe)	368.7	7791.5	8,160.2	217,757.3	4,215,994.9	4,433,752.2
Unclassified Roads, Trails and Landings	21.7	239.8	261.5	2,699.4	10,869.9	13,569.3
Total Reductions to Productive Forest	572.6	12,737.4	13,310.0	273,452.9	5,454,008.6	5,727,461.5
Total Reduced Land Base	991.1	14,011.3	15,002.4	309,938.2	4,597,143.2	4,907,081.4
Less: Not Sufficiently Restocked Areas	7.7	564.4	572.1	0	0	0
Add: Not Sufficiently Restocked Areas	7.7	564.4	572.1	0	0	0
Timber Harvesting Land Base	991.1	14,011.3	15,002.4	309,938.2	4,597,143.2	4,907,081.4
Less: Future Roads, Trails and Landings	12.8	241.6	254.4	5,196.1	111,332.0	116,528.1
Less: Volume Reductions (WTP&RMZ – 5%)	48.9	688.5	737.4	15,237.1	224,290.6	239,527.7
Total Long Term Land Base	929.4	13,081.2	14,010.6	289,505	4,261,520.6	4,551,025.6

Table 8 – Timber harvesting land base for TFL 25 Block 3

Classification	Area (ha)			Mature Volume (m^3)		
	Schedule A	Schedule B	Total	Schedule A	Schedule B	Total
Total Area	3,371.5	12,613.5	15,985.0	1,603,049.8	4,833,701.5	6,436,751.3
Less: Non-Forest	76.1	3,057.3	3,133.4	0.0	0.0	0.0
Less: Non-Productive Forest	0.0	0.0	0.0	0.0	0.0	0.0
Total Productive Forest	3,295.4	9,556.2	12,851.6	1,603,049.8	4,833,701.5	6,436,751.3
Less Reductions to Total Productive Forest:						
Non-Commercial	1.4	13.5	14.9	0.0	0.0	0.0
Low Sites	31.0	689.7	720.7	17,097.7	271,167.5	288,265.2
Riparian Reserves	119.7	177.0	296.7	61,870.3	60,661.4	122,531.7
Inoperable / Inaccessible (I, Oce, Ohe)	432.7	1,800.2	2,232.9	261,930.1	970,168.9	1,232,099.0
Unclassified Roads, Trails and Landings	53.0	89.8	142.8	3,158.2	3,717.2	6,875.4
Total Reductions to Productive Forest	637.8	2,770.2	3,408.0	344,056.3	1,305,715.0	1,649,771.3
Total Reduced Land Base	2,657.6	6,786.0	9,443.6	1,258,993.5	3,527,986.5	4,786,980.0
Less: Not Sufficiently Restocked Areas	59.4	54.2	113.6	0.0	0.0	0.0
Add: Not Sufficiently Restocked Areas	59.4	54.2	113.6	0.0	0.0	0.0
Timber Harvesting Land Base	2,657.6	6,786.0	9,443.6	1,258,993.5	3,527,986.5	4,786,980.0
Less: Future Roads, Trails and Landings	60.9	192.1	253.0	50,095.1	134,238.2	184,333.3
Less: Volume Reductions (WTP&RMZ – 5%)	129.8	329.7	459.5	60,444.9	169,687.4	230,132.3
Total Long Term Land Base	2,466.9	6,264.2	8,731.1	1,148,453.5	3,224,060.9	4,372,514.4

.

Table 9 – Timber harvesting land base for TFL 25 Block 5

Classification	Area (ha)			Mature Volume (m³)		
	Schedule A	Schedule B	Total	Schedule A	Schedule B	Total
Total Area	31,729.7	279,977.7	311,707.4	13,961,861.0	59,671,246.7	73,633,107.7
Less: Non-Forest	4,537.9	156,920.9	161,458.8	0.0	0.0	0.0
Less: Non-Productive Forest		0.0	0.0	0.0	0.0	0.0
Total Productive Forest	27,191.8	123,056.8	150,248.6	13,961,861.0	59,671,246.7	73,633,107.7
Less Reductions to Total Productive Forest:						
Non-Commercial	57.6	617.2	674.8	0.0	0.0	0.0
Low Sites	3,473.4	26,082.3	29,555.7	865,440.0	6,506,605.0	7,372,045.0
Riparian Reserves	346.7	1,129.8	1,476.5	215,823.1	664,817.0	880,640.1
Inoperable / Inaccessible (I, Oce, Ohe)	6,917.6	44,940.6	51,858.2	3,895,720.5	24,571,288.3	28,467,008.8
Environmentally Sensitive Areas	243.8	3,348.3	3,592.1	117,959.6	1,811,645.2	1,929,604.8
Unclassified Roads, Trails and Landings	53.5	136.7	190.2	3,090.2	21,602.9	24,693.1
Total Reductions to Productive Forest	11,092.6	76,254.9	87,347.5	5,098,033.4	33,575,958.4	38,673,991.8
Total Reduced Land Base	16,099.2	46,801.9	62,901.1	8,863,827.6	26,095,288.3	34,959,115.9
Less: Not Sufficiently Restocked Areas	313.7	785.5	1,099.2	0.0	0.0	0.0
Add: Not Sufficiently Restocked Areas	313.7	785.5	1,099.2	0.0	0.0	0.0
Timber Harvesting Land Base	16,099.2	46,801.9	62,901.1	8,863,827.6	26,095,288.3	34,959,115.9
Less: Future Roads, Trails and Landings	552.0	1,540.0	2,092.0	327,918.1	907,454.4	1,235,372.5
Less: Volume Reductions (WTP&RMZ – 8.5%)	1,321.5	3,847.3	5,168.8	725,552.3	2,140,965.9	2,866,518.2
Total Long Term Land Base	14,225.7	41,414.6	55,640.3	7,810,357.2	23,046,868	30,857,225.2

Table 10 – Timber harvesting land base for TFL 25 Block 6

Classification	Area (ha)			Mature Volume (m³)		
	Schedule A	Schedule B	Total	Schedule A	Schedule B	Total
Total Area	2,531.7	50,832.3	53,364.0	1,010,215.7	11,365,982.2	12,376,197.9
Less: Non-Forest	59.5	4,376.1	4,435.6	3,662.0	16,744.6	20,406.6
Less: Non-Productive Forest	54.4	1,912.6	1,967.0	10,530.5	235,557.3	246,087.8
Total Productive Forest	2,417.8	44,543.6	46,961.4	996,023.2	11,113,680.3	12,109,703.5
Less Reductions to Total Productive Forest:						
Non-Commercial	4.0	263.3	267.3	480.1	5,590.1	6,070.2
Low Sites	54.5	4,301.0	4,355.5	13,693.4	912,357.1	926,050.5
Riparian Reserves	46.6	1,007.0	1,053.6	30,219.4	281,520.3	311,739.7
Inoperable / Inaccessible (I, Oce, Ohe)	715.6	14,815.8	15,531.4	277,793.9	5,950,606.6	6,228,400.5
Unclassified Roads, Trails and Landings	11.9	573.2	585.1	429.5	10,123.8	10,553.3
Total Reductions to Productive Forest	832.6	20,960.3	21,792.9	322,616.3	7,160,197.9	7,482,814.2
Total Reduced Land Base	1,585.2	23,583.3	25,168.5	673,406.9	3,953,482.4	4,626,889.3
Less: Not Sufficiently Restocked Areas	11.3	218.2	229.5	0.0	0.0	0.0
Add: Not Sufficiently Restocked Areas	11.3	218.2	229.5	0.0	0.0	0.0
Timber Harvesting Land Base	1,585.2	23,583.3	25,168.5	673,406.9	3,953,482.4	4,626,889.3
Less: Future Roads, Trails and Landings	45.5	366.6	412.1	22,737.1	101,420.7	124,157.8
Less: Volume Reductions (WTP&RMZ – 5%)	77.0	1,160.8	1,237.8	32,533.5	192,603.1	225,136.6
Total Long Term Land Base	1,462.7	22,055.9	23,518.6	618,136.3	3,659,458.6	4,277,594.9

6.4 Non-Forest

The non-forest portion of TFL 25 includes area where merchantable tree species are largely absent. Most of this area is in alpine, rocks and slides, and wet areas (Table 11).

Table 11 – Non-forest area in TFL 25

Type	Block 1	Block 2	Block 3	Block 5	Block 6
Alpine	0.0	35,566.3	2,721.8	134,736.6	2,628.2
Rock and Slides	202.6	1,276.4	238.8	3,562.7	636.1
Swamp, Marsh, Creek, River, Lake	335.9	1,687.5	107.6	23,135.0	1,072.6
Town	17.0	0.0	0.0	0.0	0.0
Dump, Camps and Sort	15.4	6.1	13.4	6.3	8.6
Islands	0.1	31.3	0.0	12.1	4.4
Classified Roads and Pits	42.2	11.1	51.8	6.2	37.3
Hydro and Telephone R-of-Way	22.8	0.0	0.0	0.0	48.4
TOTAL	**636.0**	**38,578.7**	**3,133.4**	**161,458.9**	**4,435.6**

6.5 Non-Productive Forests

TFL 25 includes 3,055.3 ha of non-productive land (Table 12). Existing forest inventory mapping currently available for Blocks 2, 3 and 5 does delineate these non-productive types.

Table 12 – Non-productive area in TFL 25

Criteria	Block 1	Block 2	Block 3	Block 5	Block 6
Non-productive Forests	463.1	0.0	0.0	0.0	1,967.0
Forested Swamps	625.2	0.0	0.0	0.0	0.0
Total	**1,088.3**	**0.0**	**0.0**	**0.0**	**1,967.0**

6.6 Non-commercial Cover

Approximately 1,736.6 ha of TFL 25 are classified as non-commercial cover (Table 13). Most of this area is occupied by brush.

Table 13 – Non-commercial area

Non-Commercial	Block 1	Block 2	Block 3	Block 5	Block 6
NCD	0.0	261.9	3.9	187.9	0.0
Brush	26.6	491.1	11.0	486.9	267.3
Total	**26.6**	**753.0**	**14.9**	**674.8**	**267.3**

6.7 Low Sites

Low sites for all blocks except Block 5 are defined based on expert interpretation of ecosystem mapping. Table 14 defines the ecosystem type and area identified as low sites. For block 5, where ecosystem mapping is incomplete, low sites are identified based on the site class defined as part of the forest cover interpretation.

Table 14 – Low Sites Types– TFL 25

Block	Low Ecosystems	Total Area (ha)[9]	Reduction Area (ha)
1	A4, MH2, P, W, NV	3,149.4	2,107.0
2	A, AT, MH2, MH4, S11, ST11, P, W, NV	33,585.9	3,455.2
3	A, AT, MH2, MH4, S2P, S9, P, W, NV	3,308.9	720.7
5	Site Class – L	29,555.7	29,555.7
6	A, H3FO, H2, H11, H32, Q10, P, W	8,339.9	4,355.5

6.8 Riparian Reserves

Riparian mapping is ongoing for TFL 25. Primarily, operational stream inventories associated with development planning have been used to update riparian classification in all blocks.

This classification in conjunction with GIS modelling helped to obtain an overall estimate of the riparian classes for watercourses and reserve areas for the TFL. The approach employed in the timber supply analysis was to utilise the available stream classification in the GIS to apply reserves to all known and predicted fish bearing streams, in accordance to specifications in the Forest Practices Code.

Currently within the GIS, streams are classed as S1 to S6 (as per FPC definitions), and Unclassified (which are streams of unknown fish presence and width).

Double line streams – Within the GIS all double-lined streams are assigned a riparian reserve based on their classification. The perimeter of double line stream/river and lakes are provided for information only; as streams meander the perimeter distance multiplied by the reserve width does not accurately represent actual reserve area. Total area is the actual GIS-buffer riparian reserve area.

1.1

[9] Total area refers to the entire area covered by this classification including other, overlapping classifications that may already have been removed. Reduction area is the incremental reduction of the land base.

Table 15 – Riparian Reserve Zones – Double Line Water Features

Block	Riparian class	Stream Perimeter (km)	Reserve Width	Total Area (ha)	Total Reduction area (ha)
1	S1	47.4	50	337.9	312.3
	S2	32.4	30	138.6	128.1
	S5	63.4	0	0.0	0.0
	L1	1.9	10	2.7	2.5
	L3	7.2	0	0.0	0.0
2	S1	204.4	50	840.7	496.0
	S2	39.0	30	96.2	56.8
	S5	115.9	0	0.0	0.0
	L1	52.8	10	43.4	25.6
	L3	19.6	0	0.0	0.0
3	S1	0.2	50	1.0	1.0
	S2	49.3	30	152.9	141.7
	S5	25.6	0	0.0	0.0
	L3	3.4	0	0.0	0.0
5	S1	176.0	50	768.2	477.4
	S2	96.0	30	251.4	156.2
	S5	65.0	0	0.0	0.0
	L1	753.0	10	657.4	408.5
	L3	145.8	0	0.0	0.0
6	S1	13.5	50	61.2	58.0
	S2	171.2	30	465.1	440.6
	S3	1.3	20	2.3	2.2
	S5	44.6	0	0.0	0.0
	L1	48.0	10	43.5	41.2
	L3	11.2	0	0.0	0.0

Unclassified single-line streams – where unclassified streams exist in the TFL a GIS analysis (terrain model) was used to separate and class streams of less than 30% gradient as being potentially fish bearing. The 30% gradient parameter is more conservative than the normal assumption of <20% but considers the coarse nature of the digital elevation model (TRIM) and that fish have been identified, in some cases, in streams of >20% gradient. A weighted average riparian reserve zone width was calculated based on the proportion of fish bearing single line streams. This average reserve width was then applied to an identical proportion of the potentially fish bearing but unclassified streams within the TFL block. Table 16 outlines the calculation used to assign riparian reserves to unclassified streams.

Single line stream classification has been completed for Blocks 2 and 3, hence there are no unclassified streams identified in the GIS for these blocks.

Table 16 – Unclassified Stream Riparian Reserve Zones

Block	Riparian Feature Class	Stream Length (km)		Proportion (%) of Class relative to total Classified Fish-Bearing Streams	Total Riparian Reserve width (metres)	Weighted Average Riparian Reserve Zone Unclassified Streams
		Topography <30% gradient	Topograph y >30% gradient			
1	S2	9.8	0.0	46%	30	13.7
	S3	3.3	0.0	15%	20	3.1
	S4	8.4	0.0	39%	0	0
	S5	42.5	9.7			
	S6	137.4	194.4			
	Unclassified	468.4	63.9			**16.8**
5	S2	21.1	0.0	13%	30	3.9
	S3	11.3	0.0	7%	20	1.4
	S4	133.8	0.0	80%	5*	4.0
	S5	6.4	18.6			
	S6	515.5	5,354.2			
	Unclassified	908.0	639.4			**9.3**
6	S2	13.7	0.0	4%	30	1.2
	S3	172.0	0.0	46%	20	9.2
	S4	186.8	0.0	50%	0	0.0
	S5	2.7	9.2			
	S6	345.8	1,366.5			
	Unclassified	59.7	6.5			**10.4**

* Based on current management practices a 5-metre riparian reserve zone was used to estimate the range of management zone practices.

Block 1

Based on the 201.4 km of known S2 to S6 classified single line streams identified as less than 30% gradient, it was estimated that 11% (21.5 km S2-S4 / 201.4 km S2-S6) of the unclassified single line streams are likely fish bearing. A weighted average riparian reserve width was then calculated (16.8 metres) for the known single line streams and applied to the 11% of unclassified single line streams. The 16.8 m implied riparian zone width was applied sequentially starting with the lower gradient unclassified streams until 11% (51.5 km) of the unclassified stream length was tagged with a reserve zone. This amounted to all of the unclassified streams on topography of less than or equal to 9.3%.

Block 5

Based on the 688.0 km of known S1 to S6 classified single line streams identified as less than 30% gradient, it was estimated that 24% (166.1 km S1-S4 / 688.0 km S1-S6) of the unclassified single line streams are likely fish bearing. A weighted average riparian reserve width was then calculated (9.3 metres) for the known single line streams and applied to the 24% of unclassified single line streams. The 9.3 m implied riparian zone width was applied sequentially starting with the lower gradient unclassified streams until 24% (217.9 km) of the unclassified stream length was tagged with a reserve zone. This amounted to all of the unclassified streams on topography of less than or equal to 10%.

Block 6

Based on the 721.0 km of known S1 to S6 classified single line streams identified as less than 30% gradient, it was estimated that 52% (372.5 km S1-S4 / 721.0 km S1-S6) of the unclassified single line streams are likely fish bearing. A weighted average riparian reserve width was then calculated (10.4 metres) for the known single line streams and applied to the 52% of unclassified single line streams. The 10.4 m implied riparian zone width was applied sequentially starting with the lower gradient unclassified streams until 52% (31.0 km) of the unclassified stream length was tagged with a reserve zone. This amounted to all of the unclassified streams on topography of less than or equal to 15.9%.

Table 17 – Riparian Reserve Zones – Single Line Water Features

Block	Riparian class	Stream Length (km)	Reserve Width	Total Area (ha)	Total Reduction area (ha)
1	S2	9.8	30	58.8	37.5
	S3	3.3	20	13.0	12.3
	S4	8.4	0	0.0	0.0
	S5	42.5	0	0.0	0.0
	S6	137.4	0	0.0	0.0
	Un Classed	468.4	16.8	159.3	130.7
2	S2	1.9	30	11.1	7.5
	S3	40.5	20	161.9	94.2
	S4	26.6	0	0.0	0.0
	S5	5.3	0	0.0	0.0
	S6	1472.8	0	0.0	0.0
3	S2	11.1	30	66.4	50.8
	S3	33.1	20	132.6	103.2
	S4	0.0	0	0.0	0.0
	S5	34.2	0	0.0	0.0
	S6	446.1	0	0.0	0.0
5	S2	21.1	30	126.4	96.0
	S3	11.3	20	45.4	31.2
	S4	133.9	5	133.8	111.1
	S5	25.0	0	0.0	0.0
	S6	5869.7	0	0.0	0.0
	Un Classed	908.0.	9.3	404.0	196.1
6	S2	13.7	30	82.2	56.8
	S3	172.0	20	687.9	428.7
	S4	186.8	0	0.0	0.0
	S5	2.7	0	0.0	0.0
	S6	345.8	0	0.0	0.0
	Un Classed	31.0	10.4	65.0	26.1

The reduction area (Table 17) applies only to those areas of the productive forested land that fall within the reserve buffer and were otherwise unconstrained. The total area refers to actual RRZ area.

Table 18 – Riparian reserves in TFL 25

Riparian Reserves	Total Area (ha)	Reduction Area (ha)
Block 1	710.3	623.4
Block 2	1153.3	680.1
Block 3	352.9	296.7
Block 5	2,389.6	1,476.5
Block 6	1,407.2	1,053.6

This methodology represents the best available estimate of reserve area associated with streams but there is limited uncertainty due to:

- In operational practice FPC minimum reserve widths are usually exceeded to some degree to ensure a margin of safety.
- Extrapolation of known stream classifications (from field work) to unclassified streams (from photo mapping) may be inappropriate if field classifications are adding significant kilometres of smaller RRZ streams that were not photo mapped.
- Management zone practices have been evolving and changing since the implementation of the FPC and prescriptions tend to be very site specific; hence it is difficult to appropriately characterize retention levels.

Subject to availability of resources, over the next five years the Licensee is considering development of a sampling protocol to confirm these estimates and capture typical management zone retention levels. For the purposes of this analysis, a volume reduction (Table 49) has been added to ensure that reserves and retention associated with riparian management are not underestimated. In Block 5 extrapolation is less certain due to the relatively short development/stream classification history, and in response to the “Great Bear Rainforest” campaign and Joint Solutions Project initiatives, higher stand retention levels are being incorporated in current operational plans. In this case the THLB volume reduction and buffer is arbitrarily tripled to allow for resolution of these uncertainties.

6.9 Inoperable/Inaccessible

Operability classes have been developed for TFL 25 that reflect the harvesting system, timber quality and volume, terrain stability, and economic accessibility. Methodology and assumptions used in completing the operability classification for TFL 25 can be found in Management Plan 10.

The first category relates to area not available for timber harvesting or inoperable (I) due to being physically inaccessible and/or unmerchantable. Physical inoperability relates to the presence of a physical barrier or terrain constraint leaving access virtually impossible. Unmerchantable relates to stands that do not produce wood volumes or quality that are profitable to harvest regardless of the historical range of market conditions. The second category uses economic criteria to identify stands potentially operable during the highest market cycles (Oce/Ohe). In this case, timber harvesting under normal market conditions is not justified given costs of harvesting and the expected value of the timber. Classifying areas as operable with an economic constraint relates to the inability to harvest stands in a cost-effective manner given the value of the timber. For the purpose of sensitivity analyses two classes are recognised: (1) Oce for areas that could be logged profitably by conventional harvesting systems should markets improve sufficiently and (2) Ohe for areas that could be heli-logged profitably should markets improve sufficiently.

Table 19 – Inoperable area (ha) by class

Block	Criteria	Total Area (ha)	Reduction Area (ha)
1	I	2,104.8	1,220.6
	Oce	349.9	243.0
	Ohe	1.5	1.5
Sub Total		*2,456.2*	*1,465.1*
2	I	49,938.6	7,600.8
	Oce	9.2	9.1
	Ohe	630.1	550.4
Sub Total		*50,577.9*	*8,160.3*
3	I	5753.8	2,015.7
	Oce	78.1	61.6
	Ohe	190.0	155.6
Sub Total		*6,021.9*	*2,232.9*
5	I	49,169.0	48,914.0
	Oce	205.1	204.6
	Ohe	2,741.0	2,739.6
Sub Total		*52,115.1*	*51,858.2*
6	I	25,419.5	14,802.2
	Oce	204.1	195.7
	Ohe	579.5	533.5
Sub Total		*26,203.1*	*15,531.4*
Total		**137,374.2**	**79,247.9**

6.10 Environmentally Sensitive Areas (ESAs)

Areas assessed as sensitive or valuable for other resource values have been defined by inventories completed before and after MP 9. With the exception of Block 5, land base reductions reflecting the presence of these areas are captured in other sections of the Information Package. These include terrain stability and soil sensitivity, which have been considered in the definition of operability classes (Section 6.9), and wildlife habitat (Section 6.11). Productive area net downs for riparian reserves (Section 6.8) and volume reductions (Section 1.1) are applied to capture the reservation of future Wildlife Tree Patches (WTP) and riparian management practices in the THLB.

For Block 5, terrain stability and ecosystem mapping are still unavailable for the majority of the area. To address areas of unstable terrain and areas where regeneration delays are expected after harvesting, ESA mapping completed in March 1984 is used. Three classes of environmental sensitivity have been identified in Block 5 – Es1, Ep and Es1p.

Table 20 – Environmentally Sensitive Areas (ESAs)

Block 5	Total Area (ha)	Reduction Area (ha)
Es1	1,264.5	103.4
Es1p	18,726.8	1,490.1
Ep	8,649.6	1,998.6
Total	28,640.9	3,592.1

Es1 – Soils

The Es1 designation was applied mainly to forest types occurring on shallow colluvial veneers overlying bedrock at lower elevations within the CWH zone. Such units typically are scarred by continual mass movement processes, predominantly debris slides and avalanches. Many of these units are characterized by a high density gully network.

Ep - Forest Regeneration

The Ep designation is used where forest types are anticipated to experience at least a 20-year regeneration delay after harvesting. Ep was applied in Block 5 most often to types immediately adjacent to or repeatedly cut by snow avalanche tracks and runout zones, where harvesting may result in the spreading and expansion of the avalanching snow. This is a particular concern in dealing with the open-slope type rather than the confined, gully type of avalanche. Ep was also applied to the open mountain hemlock parkland types that experience a particularly high snowpack. Such stands occur on moderately to gently sloping terrain near treeline.

Es1p – Soils and Forest Regeneration

The combined designation, Es1p, was mapped extensively on the very steep mid to upper slopes of the Coast Mountains portion of the Block. Such slopes are characterized by very shallow, discontinuous organic soils interspersed with pockets of rubbly colluvium and bare rock, and are marked throughout by many debris slide and snow avalanche scars. Within the Coast Mountains, Es1p types commonly form a band between treeline and productive stands of timber growing on deep, stable, lower slope and valley bottom colluvial and fluvial soils.

6.11 Wildlife Habitat

Since MP 9 a number of wildlife inventories have been undertaken or broadened in an effort to identify and classify potential wildlife habitat areas suitable for identified species. To date however, there has been no formal establishment of any designated wildlife habitat areas that require removal from THLB. The following section briefly identifies some wildlife studies that have occurred in the individual blocks of TFL 25 and provides a timber supply modelling rational for accounting for wildlife habitat.

Table 21 – Wildlife Habitat Management Strategy for Timber Supply

Block	Status	Management Strategy for Timber Supply Model
1	▪ Marbled Murrelet and Ungulate Winter Range habitat modeling 2000 ▪ Marbled Murrelet Nesting Habitat Evaluation – Nov 1999 Ecologic Consulting ▪ Marbled Murrelet detection surveys – 2000 Ecologic Consulting ▪ Elk habitat assessments (Weeks Lake) – 1998 to 2001	▪ Assume majority of critical wildlife habitat associated with mature forest will be meet by achieving old growth targets as defined in Section 10.3.1.4. ▪ Assume wildlife tree patch retention will supplement critical habitat needs.
2	▪ Deer Winter Range and Goat Assessments in the Stafford River Watershed – May 1996 D. Blood & Associates Ltd. ▪ Marbled Murrelet detection surveys – July 1996 D. Blood & Associates Ltd. ▪ Stafford Wildlife Assessment – 1993/97 R. McLaughlin ▪ Grizzly Bear Habitat Mapping – 2000 A.G.MacHutcheon ▪ Goat Study	
3	▪ Eagle nest survey – 1989 ▪ Peel Creek sedimentation study – effects on whale rub – ongoing. ▪ SPs contain some wildlife references.	
5	▪ Kermode Bear Report – May 97 D. Blood & Associates Ltd. ▪ Kermode Bear Genetics Project – 1997/01 UBC/Artemis ▪ Wildlife Survey and Habitat Map (Yeo, Pooley and Roderick Islands) – 1994/95 D. Blood & Associates Ltd.	
6	▪ Biodiversity Assessment of TFL 24 - 1996 D. Blood & Associates Ltd. ▪ Marbled Murrelet Inventory (Botany and Fairfax Inlet) – 1997/98 D. Blood and Associates Ltd.	

Future WTPs will be handled through a volume reduction in the timber supply analysis as described in Section 10.3.1.5. As per policy direction at least 75% of the WTPs are assumed incorporated in riparian reserves or other constrained areas.

6.12 Recreation Feature Inventory

Updating of recreation inventory mapping, including recreation feature significance and sensitivity to alteration, is currently being carried out for Blocks 1, 2, 3, and 6. To date no net downs of THLB have been assumed to deal with recreation in the TFL. Established campsites in Blocks 1, 3 and 6 are identified and removed as part of Section 6.4 and 6.9. A list of established campsites are outlined in Table 22. Other areas of significant recreation use in Block 1 include trails that provide access to marine shoreline (Juan de Fuca Marine Trail) and ridgeline meadows and forest (Kludahk Trail). The Juan de Fuca Marine trail has been designated to park status and removed from the TFL. The Kludahk trail is now within a Special Management Zone. Recreation opportunities will be reinforced through the integration of forest harvest planning and landscape inventories designed to maintain visual landscape quality and preserve known scenic values.

Table 22 – Established Campsites

Block	Campsite	Area (ha)
1	Jordan River Rec Site	6.3
2	Naka Creek	1.5
6	Moresby Dock	0.5
	Moresby Rec Area	1.8
	Mosquito Lake Rec Area	1.9
	Moresby Adventure Camp	1.0

6.13 Cultural Heritage Resource Reductions

An archaeological overview assessment for the CCLRMP area, which includes blocks 2 and 5 was completed in 1999. This overview deals with archaeological sites and resources and indicates where evidence of past human activities is most likely to be found. This assessment is used in operational planning. Areas with high potential of past activities are subject to field reconnaissance and inventory. No explicit reductions for cultural heritage resources have been made to the inventory file although the most common features such as culturally modified trees are commonly included in already-accounted-for reserves for riparian protection or wildlife tree patches.

6.14 Deciduous Stands

Table 23 shows the area of stands defined as deciduous leading in the THLB component of the inventory. This represents about 3.1% of the long-term harvestable land base. These are included in the THLB and for simplicity deciduous volume is harvested and will be included in modelled timber flows. In Block 1, deciduous sawlogs are routinely utilized. For Block 6 an analysis of deciduous volume harvested will be presented to indicate the magnitude of the harvest component under a volume-regulated harvest flow.

Table 23 – Area of Deciduous forest types

Block	Inventory Type Group	Total Area (ha) By Age					Total	% Of LT THLB
		0-20	21-40	41-60	61-80	80-120		
1	Pure Deciduous	3.5	0.8	0.0	0.0	0.0	**4.3**	
	Deciduous-Leading	47.4	176.8	321.5	235.5	8.4	**789.6**	
	Sub Total	***50.9***	***177.6***	***321.5***	***235.5***	***8.4***	***793.9***	***3.3%***
2	Pure Deciduous	0.0	73.1	50.1	0.0	37.0	**160.2**	
	Deciduous-Leading	0.0	82.2	29.5	0.0	35.3	**147.0**	
	Sub Total	***0.0***	***155.3***	***79.6***	***0.0***	***72.3***	***307.2***	***2.2%***
3	Pure Deciduous	0.0	0.0	0.0	0.0	9.4	**9.4**	
	Deciduous-Leading	0.0	0.0	4.5	0.0	0.0	**4.5**	
	Sub Total	***0.0***	***0.0***	***4.5***	***0.0***	***9.4***	***13.9***	***0.2%***
5	Pure Deciduous	0.0	2.5	6.7	84.1	32.6	**125.9**	
	Deciduous-Leading	0.0	125.6	493.0	186.5	43.7	**848.8**	
	Sub Total	***0.0***	***128.1***	***499.7***	***270.6***	***76.3***	***974.7***	***1.6%***
6	Pure Deciduous	102.9	269.5	183.6	56.0	6.5	**618.5**	
	Deciduous-Leading	184.1	459.6	562.7	63.4	0.0	**1269.8**	
	Sub Total	***287.0***	***729.1***	***746.3***	***119.4***	***6.5***	***1888.3***	***7.9%***
Total		***337.9***	***1,190.1***	***1,651.6***	***625.5***	***172.9***	***3,978.0***	***3.1%***

6.15 Trails and Landings

6.15.1 Classified Roads

Classified roads are those that are mapped as forest cover polygons distinctly separate from adjacent polygons. Only highways and/or mainline roads have been identified as separate polygons on the forest cover maps. Table 24 summarizes the areas of classified roads in the TFL.

Table 24 – Classified roads

Block	Total Area of Road (ha)	Total Area Reduction (ha)
1	42.2	42.2
2	11.1	11.1
3	51.8	51.8
5	6.2	6.2
6	37.3	37.3

6.15.2 Unclassified Roads, Trails and Landings

Unclassified roads on the TFL have been mapped as lineal features. For the purposes of determining the total area of unclassified roads, all are assumed to occupy a 10 metre unproductive width. As with classified trails and landings, all trails and the majority of the landings are rehabilitated and restocked immediately following logging and consequently the associated area reduction is thought insignificant. Table 25 indicates the area of unclassified roads in the TFL that is excluded from the timber harvesting land base.

Table 25 – Unclassified roads, trails and landings

Block	Total Road Length (km)	Total Area Reduction (ha)
1	765.1	693.3
2	292.2	261.5
3	158.7	142.8
5	218.1	190.6
6	647.3	585.1

6.15.3 Future Roads, Trails and Landings

A projected road system was developed as part of the operability classification for TFL 6. This road system was digitized into the GIS in conjunction with the operability classification, which allowed for the same approach used with unclassified roads to predict area summaries. Table 26 indicates the area of future roads in the TFL that have yet to be developed.

Table 26 – Future roads, trails and landings

Block	Total Road Length (km)	Total Area Reduction (ha)
1	628.1	567.5
2	285.5	254.4
3	266.1	253.0
5	2,435.2	2,092.0
6	447.1	412.1

7.0 INVENTORY AGGREGATION

7.1 Overview

This section describes the delineation of the TFL land base and definition of stand types needed to complete the timber supply analysis. The TFL area is categorized in a hierarchy of different management zones to allow for a variety of forest cover constraints (e.g., for wildlife habitat, VQOs, biodiversity, etc.). Stand types are grouped in analysis units based on similar leading species, history and productivity.

7.2 Management Zones

Unique forest cover objectives will be modelled through the different management zones. Landscape Units, Special Management Zones (SMZ) and Resource Management Zones (RMZ) are delineated in the data and may be used to report seral stage distributions or for selected sensitivity analyses (Table 27 and Table 28). Currently, only Blocks 1 and 3 are subject to higher-level plan objectives defined in the Vancouver Island Land Use Plan. Blocks 2 and 5 are within the Central Coast Land and Resource Management Plan, which is currently underway. Block 6 will be part of the Queen Charlottes - Haida Gwaii Land and Resource Management Plan, which is scheduled to start in the spring of 2002.

Table 27 – Management zones and landscape units

Block	Mgmt Zone	Mgmt Unit	Landscape Unit	Productive Forest (ha)	THLB (ha)	Management Considerations
1	EFZ 47	Loss-Jordan	Loss *Low BEO* Tugwell *Low BEO*	24,490	21,042	***Enhanced Forestry Zone,*** with enhanced timber harvesting, as well as enhanced silviculture and increased growth and yield opportunity; general integration of recreation, and tourism values, as well as visuals along road corridor and in Sombrio Creek area; other non-timber (including biodiversity) values are to be addressed at the basic level of stewardship in accordance with legislation and regulations.
	RMZ 34	E&N South	Koksilah *Low BEO* Sooke *Low BEO* Tugwell *Low BEO*	4,475	2,749	***General Management Zone***, with significant timber values and particular suitability for enhanced silviculture and growth and yield management on larger blocks of Crown provincial forest land; due to its proximity to population centres, the area offers significant recreation/scenery and tourism opportunities associated with intensively managed, roaded resource lands; fish and wildlife values are significant, and biodiversity conservation/restoration is recommended with an emphasis on retention, and where required, active restoration of mature and old seral forest attributes and age classes.
	RMZ 46	Gordon – Caycuse – San Juan	San Juan *Intermediate BEO*	107	83	***General Management Zone***, significant timber values combined with high fish, wildlife and biodiversity values, as well as recreation values.

Block	Mgmt Zone	Mgmt Unit	Landscape Unit	Productive Forest (ha)	THLB (ha)	Management Considerations
	SMZ 22	San Juan Ridge	Loss *Low BEO* *Tugwell Low BEO* San Juan *Intermediate BEO*	1,319	779	***Special Management Zone***, primary focus is on maintenance of recreational and scenic values and opportunities associated with the Kludahk Trail.
3	EFZ 27	Naka	Naka *Low BEO*	12,852	9,444	***Enhanced Forestry Zone*** suited for enhanced silviculture and limited opportunity for enhanced timber harvesting in remaining old forests; maintenance of coastal viewsheds and associated recreational values; objectives for biodiversity and other resources are to be integrated at the basic stewardship level.
	Total			**43,243**	**34,097**	

Table 28 – Area by landscape unit and BEC variant

Block 1 Landscape Unit	BEC	Seral Stage	Productive Forest (ha)	Non Contributing Area		THLB Area	
				ha	%	ha	%
Koksilah *Low BEO*	CWH mm 1	Early	8.2	0.4	5%	7.8	95%
	CWH mm 1 Total		8.2	0.4	5%	7.8	95%
Koksilah Total			8.2	0.4	5%	7.8	95%
Loss *Low BEO*	CWH vm 1	Early	5156.3	381.2	4%	4775.1	51%
		Mid	1821.2	69.4	1%	1751.8	19%
		Mature	96.7	15.4	0%	81.3	1%
		Old	2332.6	485.7	5%	1847.0	20%
	CWH vm 1 Total		9406.9	951.7	10%	8455.2	90%
	CWH vm 2	Early	1251.5	81.3	2%	1170.2	23%
		Mature	58.0	2.9	0%	55.1	1%
		Old	3689.0	1310.9	26%	2378.1	48%
	CWH vm 2 Total		4998.5	1395.1	28%	3603.5	72%
	CWH xm 2	Early	1.9	1.9	100%	0.0	0%
	CWH xm 2 Total		1.9	1.9	100%	0.0	0%
	MH mm 1	Early	73.3	4.8	1%	68.5	12%
		Old	498.9	198.0	35%	300.9	53%
	MH mm 1 Total		572.1	202.8	35%	369.3	65%
Loss Total			14979.5	2551.5	17%	12428.0	83%
San Juan *Intermediate BEO*	CWH vm 1	Old	5.6	1.8	32%	3.8	68%
	CWH vm 1 Total		5.6	1.8	32%	3.8	68%
	CWH vm 2	Early	0.1	0.1	0%	0.0	0%
		Mature	0.1	0.1	0%	0.0	0%
		Old	101.8	22.7	22%	79.0	78%
	CWH vm 2 Total		101.9	22.9	22%	79.0	78%
	MH mm 1	Old	25.8	7.2	28%	18.5	72%
	MH mm 1 Total		25.8	7.2	28%	18.5	72%
San Juan Total			133.3	31.9	24%	101.3	76%

Block 1 Landscape Unit	BEC	Seral Stage	Productive Forest (ha)	Non Contributing Area		THLB Area	
				ha	%	ha	%
Sooke *Low BEO*	CWH mm 1	Early	213.1	27.6	8%	185.5	51%
		Mid	46.1	11.9	3%	34.2	9%
		Mature	87.7	36.9	10%	50.8	14%
		Old	16.4	1.9	1%	14.6	4%
	CWH mm 1 Total		363.3	78.3	22%	285.1	78%
	CWH mm 2	Early	14.7	12.0	72%	2.7	16%
		Mature	2.0	1.7	10%	0.4	2%
	CWH mm 2 Total		16.7	13.6	82%	3.1	18%
	CWH xm 2	Early	934.5	428.6	15%	506.0	18%
		Mid	1308.9	410.5	15%	898.4	32%
		Mature	508.9	213.1	8%	295.9	11%
		Old	40.8	20.4	1%	20.5	1%
	CWH xm 2 Total		2793.2	1072.5	38%	1720.6	62%
Sooke Total			3173.2	1164.4	37%	2008.8	63%
Tugwell *Low BEO*	CWH mm 1	Early	1691.3	165.5	7%	1525.8	69%
		Mid	119.8	5.3	0%	114.5	5%
		Mature	161.4	64.2	3%	97.2	4%
		Old	251.7	119.2	5%	132.5	6%
	CWH mm 1 Total		2224.1	354.2	16%	1870.0	84%
	CWH mm 2	Early	490.4	60.4	9%	430.0	61%
		Mid	7.2	0.1	0%	7.1	1%
		Mature	78.2	69.9	10%	8.3	1%
		Old	123.8	50.3	7%	73.5	11%
	CWH mm 2 Total		699.6	180.7	26%	518.9	74%
	CWH vm 1	Early	1431.6	102.8	4%	1328.8	49%
		Mid	514.8	40.5	1%	474.3	17%
		Mature	19.8	5.9	0%	13.9	1%
		Old	752.1	193.0	7%	559.1	21%
	CWH vm 1 Total		2718.3	342.2	13%	2376.1	87%
	CWH vm 2	Early	993.3	63.6	3%	929.6	49%
		Mid	9.6	1.9	0%	7.7	0%
		Mature	56.6	4.1	0%	52.5	3%
		Old	842.4	282.2	15%	560.2	29%
	CWH vm 2 Total		1901.9	351.8	18%	1550.1	82%
	CWH xm 2	Early	2176.8	533.5	10%	1643.3	30%
		Mid	2936.9	279.2	5%	2657.7	48%
		Mature	303.5	100.0	2%	203.5	4%
		Old	111.2	14.4	0%	96.7	2%
	CWH xm 2 Total		5528.4	927.1	17%	4601.2	83%
	MH mm 1	Early	17.5	2.2	1%	15.4	8%
		Old	181.5	97.1	49%	84.4	42%
	MH mm 1 Total		199.0	99.3	50%	99.8	50%
Tugwell Total			13271.3	2255.3	17%	11016.1	83%
Block 1 Total			31565.5	6003.5	19%	25562.0	81%

Block 2 Landscape Unit	BEC	Seral Stage	Productive Forest (ha)	Non Contributing Area		THLB Area	
				ha	%	ha	%
Fulmore *Intermediate BEO*	CWH vm 1	Early	2127.3	116.8	3%	2010.4	45%
		Mid	1473.6	165.1	4%	1308.5	29%
		Mature	301.5	16.6	0%	284.9	6%
		Old	595.5	378.2	8%	217.4	5%
	CWH vm 1 Total		4497.9	676.7	15%	3821.2	85%
	CWH vm 2	Early	574.1	35.9	2%	538.2	33%
		Mid	0.1	0.0	0%	0.1	0%
		Mature	1.8	1.8	0%	0.0	0%
		Old	1048.2	867.0	53%	181.1	11%
	CWH vm 2 Total		1624.2	904.7	56%	719.5	44%
	MH mm 1	Early	0.8	0.0	0%	0.8	0%
		Old	233.0	229.6	98%	3.4	1%
	MH mm 1 Total		233.7	229.6	98%	4.2	2%
Fulmore Total			6355.8	1811.0	28%	4544.8	72%
Stafford *High BEO*	AT p	Mid	0.7	0.7	1%	0.0	0%
		Old	111.4	111.4	99%	0.0	0%
	AT p Total		112.1	112.1	100%	0.0	0%
	CWH vm 1	Early	3136.3	789.8	7%	2346.6	21%
		Mid	1452.7	162.2	1%	1290.5	12%
		Mature	424.2	101.0	1%	323.2	3%
		Old	5997.9	2585.9	23%	3412.0	31%
	CWH vm 1 Total		11011.0	3638.8	33%	7372.2	67%
	CWH vm 2	Early	708.2	323.9	4%	384.3	5%
		Mid	89.1	55.6	1%	33.5	0%
		Mature	104.2	62.6	1%	41.6	0%
		Old	7449.8	5031.4	60%	2418.4	29%
	CWH vm 2 Total		8351.2	5473.5	66%	2877.7	34%
	MH mm 1	Early	10.9	8.7	0%	2.2	0%
		Mid	9.3	8.4	0%	0.9	0%
		Mature	16.8	9.7	1%	7.1	0%
		Old	2445.3	2247.9	99%	197.4	8%
	MH mm 1 Total		2482.3	2274.6	92%	207.7	8%
Stafford Total			21956.6	11499.0	52%	10457.6	48%
Block 2 Total			28312.4	13310.0	47%	15002.4	53%

Block 3 Landscape Unit	BEC	Seral Stage	Productive Forest (ha)	Non Contributing Area		THLB Area	
				ha	%	ha	%
Naka	AT p	Old	50.6	49.2	97%	1.4	3%
Low BEO	AT p Total		50.6	49.2	97%	1.4	3%
	CWH vm 1	Early	1842.6	203.4	4%	1639.3	35%
		Mid	75.4	36.0	1%	39.4	1%
		Mature	273.6	49.1	1%	224.6	5%
		Old	2479.2	692.3	15%	1786.9	38%
	CWH vm 1 Total		4670.9	980.7	21%	3690.2	79%
	CWH vm 2	Early	1479.6	103.9	2%	1375.7	26%
		Mid	18.5	8.5	0%	10.1	0%
		Mature	134.2	11.6	0%	122.5	2%
		Old	3757.4	987.1	18%	2770.2	51%
	CWH vm 2 Total		5389.7	1111.1	21%	4278.5	79%
	MH mm 1	Early	170.4	10.5	0%	159.9	6%
		Mid	2.2	1.1	0%	1.1	0%
		Mature	21.1	3.6	0%	17.5	1%
		Old	2546.7	1251.8	46%	1294.8	47%
	MH mm 1 Total		2740.4	1267.0	46%	1473.4	54%
Naka Total			12851.6	3408.1	27%	9443.6	73%
Block 3 Total			12851.6	3408.1	27%	9443.6	73%

Block 5 Landscape Unit	BEC	Seral Stage	Productive Forest (ha)	Non Contributing Area		THLB Area	
				ha	%	ha	%
Aaltanhash	CWH vm 1	Early	208.5	37.7	1%	170.9	4%
Low BEO		Mid	103.0	56.6	1%	46.4	1%
		Mature	113.0	46.2	1%	66.8	1%
		Old	4194.6	2520.6	55%	1674.0	36%
	CWH vm 1 Total		4619.1	2661.1	58%	1958.1	42%
	CWH vm 2	Early	12.6	12.6	1%	0.0	0%
		Mid	43.0	43.0	2%	0.0	0%
		Mature	11.1	11.1	1%	0.0	0%
		Old	1923.9	1683.3	85%	240.6	12%
	CWH vm 2 Total		1990.7	1750.0	88%	240.6	12%
	MH mm 1	Mature	1.1	1.1	1%	0.0	0%
		Old	108.0	108.0	99%	0.0	0%
	MH mm 1 Total		109.1	109.1	100%	0.0	0%
Aaltanhash Total			6718.9	4520.2	67%	2198.7	33%
Bishop	CWH vm 1	Early	13.9	13.9	3%	0.0	0%
Low BEO		Mid	69.3	0.0	0%	69.3	15%
		Mature	2.1	2.1	0%	0.0	0%
		Old	379.3	281.4	61%	97.8	21%
	CWH vm 1 Total		464.6	297.4	64%	167.2	36%
	CWH vm 2	Early	21.9	21.9	6%	0.0	0%
		Mid	2.4	0.0	0%	2.4	1%
		Old	359.1	352.7	92%	6.4	2%
	CWH vm 2 Total		383.4	374.6	98%	8.8	2%
	MH mm 1	Early	13.3	13.3	2%	0.0	0%
		Mid	69.3	7.2	1%	62.2	8%
		Mature	25.1	16.3	2%	8.8	1%
		Old	627.3	411.9	56%	215.4	29%
	MH mm 1 Total		735.0	448.6	61%	286.3	39%
Bishop Total			1583.0	1120.7	71%	462.3	29%
Butedale	CWH vh 2	Old	1.2	1.2	100%	0.0	0%
Intermediate BEO	CWH vh 2 Total		1.2	1.2	100%	0.0	0%
	CWH vm 1	Early	157.7	143.2	2%	14.5	0%
		Mid	303.2	47.1	1%	256.1	3%
		Mature	63.3	33.3	0%	29.9	0%
		Old	7548.5	3665.2	45%	3883.3	48%
	CWH vm 1 Total		8072.7	3888.8	48%	4183.9	52%
	CWH vm 2	Early	6.5	6.5	0%	0.0	0%
		Mid	0.7	0.7	0%	0.0	0%
		Mature	16.3	16.3	1%	0.0	0%
		Old	1611.4	1457.7	89%	153.7	9%
	CWH vm 2 Total		1634.9	1481.1	91%	153.7	9%
	MH mm 1	Early	4.2	4.2	1%	0.0	0%
		Mature	1.8	1.8	1%	0.0	0%
		Old	331.3	294.2	87%	37.1	11%
	MH mm 1 Total		337.3	300.2	89%	37.1	11%
Butedale Total			10046.1	5671.3	56%	4374.8	44%

Block 5 Landscape Unit	BEC	Seral Stage	Productive Forest (ha)	Non Contributing Area		THLB Area	
				ha	%	ha	%
Crab	AT p	Old	6.0	6.0	100%	0.0	0%
Low BEO	AT p Total		6.0	6.0	100%	0.0	0%
	CWH vm 1	Early	1952.4	231.0	4%	1721.4	31%
		Mid	658.8	67.4	1%	591.4	11%
		Mature	74.4	47.9	1%	26.5	0%
		Old	2879.5	1995.2	36%	884.2	16%
	CWH vm 1 Total		5565.0	2341.6	42%	3223.5	58%
	CWH vm 2	Early	226.0	107.5	2%	118.5	2%
		Mid	70.9	36.3	1%	34.6	1%
		Mature	43.5	38.4	1%	5.1	0%
		Old	4586.5	4399.6	89%	186.9	4%
	CWH vm 2 Total		4926.9	4581.8	93%	345.1	7%
	MH mm 1	Mature	1.2	1.2	0%	0.0	0%
		Old	501.9	501.9	100%	0.0	0%
	MH mm 1 Total		503.1	503.1	100%	0.0	0%
Crab Total			11001.0	7432.5	68%	3568.5	32%
Green	CWH vm 1	Early	58.4	41.5	0%	16.9	0%
Intermediate BEO		Mid	246.2	156.1	1%	90.1	1%
		Mature	217.0	168.8	1%	48.2	0%
		Old	10887.3	5088.4	45%	5798.8	51%
	CWH vm 1 Total		11408.9	5454.9	48%	5954.0	52%
	CWH vm 2	Early	2.5	2.5	0%	0.0	0%
		Mid	82.1	82.1	3%	0.0	0%
		Mature	109.0	95.0	3%	14.0	0%
		Old	2709.4	2454.5	85%	254.9	9%
	CWH vm 2 Total		2902.9	2634.0	91%	268.9	9%
	MH mm 1	Mid	7.3	7.3	5%	0.0	0%
		Mature	4.5	4.5	3%	0.0	0%
		Old	139.4	139.4	92%	0.0	0%
	MH mm 1 Total		151.2	151.2	100%	0.0	0%
Green Total			14427.4	8240.1	57%	6222.9	43%
Khutze	CWH vm 1	Early	252.3	101.5	2%	150.8	3%
Intermediate BEO		Mid	270.3	185.0	3%	85.3	2%
		Mature	136.3	106.4	2%	30.0	1%
		Old	4732.0	3096.7	57%	1635.3	30%
	CWH vm 1 Total		5390.8	3489.5	65%	1901.3	35%
	CWH vm 2	Early	6.8	6.8	0%	0.0	0%
		Mid	16.8	16.8	1%	0.0	0%
		Mature	28.2	28.2	1%	0.0	0%
		Old	1880.7	1822.0	94%	58.6	3%
	CWH vm 2 Total		1932.4	1873.7	97%	58.6	3%
	MH mm 1	Old	131.6	131.6	100%	0.0	0%
	MH mm 1 Total		131.6	131.6	100%	0.0	0%
Khutze Total			7454.8	5494.8	74%	1960.0	26%

Block 5 Landscape Unit	BEC	Seral Stage	Productive Forest (ha)	Non Contributing Area		THLB Area	
				ha	%	ha	%
Don Peninsula *Intermediate BEO*	CWH vh 2	Early	8.2	4.2	0%	4.0	0%
		Mid	9.5	0.1	0%	9.4	0%
		Old	6619.0	2898.7	44%	3720.3	56%
	CWH vh 2 Total		6636.7	2903.0	44%	3733.8	56%
Don Peninsula Total			6636.7	2903.0	44%	3733.8	56%
Kiltuish *Low BEO*	CWH vm 1	Early	532.0	60.8	1%	471.2	12%
		Mid	463.3	124.2	3%	339.1	8%
		Mature	115.8	81.8	2%	34.0	1%
		Old	2944.8	1894.0	47%	1050.7	26%
	CWH vm 1 Total		4055.8	2160.7	53%	1895.1	47%
	CWH vm 2	Early	9.3	4.0	0%	5.3	0%
		Mid	19.8	19.8	1%	0.0	0%
		Mature	5.6	5.6	0%	0.0	0%
		Old	1345.3	1286.0	93%	59.3	4%
	CWH vm 2 Total		1380.0	1315.5	95%	64.6	5%
	MH mm 1	Mid	4.5	4.5	3%	0.0	0%
		Old	142.5	142.5	97%	0.0	0%
	MH mm 1 Total		147.0	147.0	100%	0.0	0%
Kiltuish Total			5582.8	3623.2	65%	1959.6	35%
Klekane *Low BEO*	CWH vm 1	Early	195.2	15.7	0%	179.5	4%
		Mid	245.8	55.1	1%	190.6	4%
		Mature	48.0	30.4	1%	17.6	0%
		Old	3990.4	2166.5	48%	1823.9	41%
	CWH vm 1 Total		4479.3	2267.7	51%	2211.6	49%
	CWH vm 2	Early	20.4	20.4	1%	0.0	0%
		Mid	6.3	6.3	0%	0.0	0%
		Mature	16.8	13.3	1%	3.5	0%
		Old	2224.5	2144.8	95%	79.7	4%
	CWH vm 2 Total		2268.0	2184.8	96%	83.2	4%
	MH mm 1	Old	248.1	233.2	94%	15.0	6%
	MH mm 1 Total		248.1	233.2	94%	15.0	6%
Klekane Total			6995.4	4685.7	67%	2309.7	33%
Surf *Intermediate BEO*	CWH vh 2	Mid	9.8	1.2	1%	8.6	7%
		Old	110.5	65.1	54%	45.5	38%
	CWH vh 2 Total		120.3	66.2	55%	54.1	45%
	CWH vm 1	Old	211.7	110.7	52%	101.0	48%
	CWH vm 1 Total		211.7	110.7	52%	101.0	48%
	CWH vm 2	Old	21.6	21.6	100%	0.0	0%
	CWH vm 2 Total		21.6	21.6	100%	0.0	0%
Surf Total			353.6	198.5	56%	155.1	44%
Swindle *Low BEO*	CWH vm 1	Old	119.1	40.6	34%	78.5	66%
	CWH vm 1 Total		119.1	40.6	34%	78.5	66%
Swindle Total			119.1	40.6	34%	78.5	66%

Block 5 Landscape Unit	BEC	Seral Stage	Productive Forest (ha)	Non Contributing Area		THLB Area	
				ha	%	ha	%
Laredo *Intermediate BEO*	CWH vh 2	Early	2.5	2.5	0%	0.0	0%
		Mid	62.5	41.9	1%	20.5	0%
		Mature	33.3	17.6	0%	15.7	0%
		Old	7462.3	5429.9	72%	2032.4	27%
	CWH vh 2 Total		7560.5	5491.8	73%	2068.7	27%
	CWH vm 1	Mid	49.6	36.1	0%	13.5	0%
		Mature	7.7	1.7	0%	6.0	0%
		Old	11438.8	4726.1	41%	6712.7	58%
	CWH vm 1 Total		11496.1	4763.9	41%	6732.2	59%
	CWH vm 2	Mid	13.5	12.1	1%	1.4	0%
		Mature	6.2	6.2	0%	0.0	0%
		Old	1700.5	1368.5	80%	332.0	19%
	CWH vm 2 Total		1720.1	1386.8	81%	333.4	19%
	MH mm 1	Old	28.1	28.1	100%	0.0	0%
	MH mm 1 Total		28.1	28.1	100%	0.0	0%
	MH wh 1	Mature	4.9	4.9	3%	0.0	0%
		Old	190.2	184.2	94%	6.0	3%
	MH wh 1 Total		195.1	189.1	97%	6.0	3%
Laredo Total			21000.0	11859.7	56%	9140.3	44%
Roderick *Low BEO*	AT p	Old	94.6	88.4	93%	6.3	7%
	AT p Total		94.6	88.4	93%	6.3	7%
	CWH vh 2	Early	1199.1	130.9	0%	1068.2	4%
		Mid	694.6	148.9	1%	545.8	2%
		Mature	58.0	17.7	0%	40.3	0%
		Old	27336.4	16204.9	55%	11131.5	38%
	CWH vh 2 Total		29288.2	16502.3	56%	12785.8	44%
	CWH vm 1	Early	158.1	11.8	0%	146.3	3%
		Mid	95.3	63.4	1%	31.9	1%
		Mature	9.6	9.6	0%	0.0	0%
		Old	4855.3	3525.3	69%	1330.0	26%
	CWH vm 1 Total		5118.1	3610.0	71%	1508.1	29%
	CWH vm 2	Mid	4.8	4.8	1%	0.0	0%
		Old	562.0	518.5	91%	43.5	8%
	CWH vm 2 Total		566.8	523.2	92%	43.5	8%
	MH wh 1	Old	2.8	2.8	100%	0.0	0%
	MH wh 1 Total		2.8	2.8	100%	0.0	0%
Roderick Total			35070.5	20726.8	59%	14343.7	41%

Block 5 Landscape Unit	BEC	Seral Stage	Productive Forest (ha)	Non Contributing Area		THLB Area	
				ha	%	ha	%
Tolmie	CWH vh 2	Old	3160.9	1561.3	49%	1599.7	51%
High BEO	CWH vh 2 Total		3160.9	1561.3	49%	1599.7	51%
	CWH vm 1	Mid	4.1	1.8	0%	2.3	0%
		Mature	51.6	50.0	1%	1.6	0%
		Old	6629.3	2331.1	35%	4298.2	64%
	CWH vm 1 Total		6685.0	2382.9	36%	4302.1	64%
	CWH vm 2	Mid	2.1	2.1	0%	0.0	0%
		Mature	3.8	3.8	0%	0.0	0%
		Old	834.0	679.7	81%	154.3	18%
	CWH vm 2 Total		839.9	685.6	82%	154.3	18%
	MH mm 1	Old	17.6	17.6	100%	0.0	0%
	MH mm 1 Total		17.6	17.6	100%	0.0	0%
	MH wh 1	Old	15.4	15.4	100%	0.0	0%
	MH wh 1 Total		15.4	15.4	100%	0.0	0%
Tolmie Total			10718.9	4662.9	44%	6056.1	56%
Triumph	CWH vm 1	Early	7.7	7.7	1%	0.0	0%
Low BEO		Mid	7.8	7.8	1%	0.0	0%
		Mature	16.8	7.0	1%	9.9	1%
		Old	835.7	530.8	61%	304.9	35%
	CWH vm 1 Total		868.1	553.4	64%	314.8	36%
	CWH vm 2	Mid	3.3	3.3	1%	0.0	0%
		Mature	0.9	0.9	0%	0.0	0%
		Old	372.1	350.2	93%	22.0	6%
	CWH vm 2 Total		376.3	354.3	94%	22.0	6%
	MH mm 1	Old	29.5	29.5	100%	0.0	0%
	MH mm 1 Total		29.5	29.5	100%	0.0	0%
Triumph Total			1274.0	937.2	74%	336.8	26%
Yeo	AT p	Old	25.4	23.7	93%	1.8	7%
Low BEO	AT p Total		25.4	23.7	93%	1.8	7%
	CWH vh 2	Early	286.5	36.8	0%	249.7	2%
		Mid	139.5	39.3	0%	100.2	1%
		Old	10779.3	5130.8	46%	5648.6	50%
	CWH vh 2 Total		11205.3	5206.8	46%	5998.5	54%
Yeo Total			11230.7	5230.5	47%	6000.3	53%
Block 5 Total			150248.5	87347.4	58%	62901.1	42%

Block 6 Landscape Unit	BEC	Seral Stage	Productive Forest (ha)	Non Contributing Area		THLB Area	
				ha	%	ha	%
Sewell *Intermediate BEO*	AT p	Early	3.8	3.8	6%	0.0	0%
		Mid	4.2	4.2	7%	0.0	0%
		Mature	42.9	42.9	71%	0.0	0%
		Old	9.9	9.9	16%	0.0	0%
	AT p Total		60.8	60.8	100%	0.0	0%
	CWH vh 2	Early	487.7	63.5	4%	424.2	28%
		Mid	9.4	9.4	1%	0.0	0%
		Mature	164.1	160.4	11%	3.6	0%
		Old	856.8	685.7	45%	171.2	11%
	CWH vh 2 Total		1518.1	919.0	61%	599.0	39%
	CWH wh 1	Early	7022.4	908.2	5%	6114.3	33%
		Mid	4357.3	543.6	3%	3813.8	20%
		Mature	1427.5	827.2	4%	600.3	3%
		Old	5882.6	2795.3	15%	3087.3	17%
	CWH wh 1 Total		18689.9	5074.3	27%	13615.6	73%
	CWH wh 2	Early	1135.4	263.7	5%	871.7	15%
		Mid	157.4	42.9	1%	114.5	2%
		Mature	1318.7	1228.6	22%	90.1	2%
		Old	3061.0	2336.4	41%	724.6	13%
	CWH wh 2 Total		5672.5	3871.5	68%	1800.9	32%
	MH wh 1	Mid	0.9	0.9	1%	0.0	0%
		Mature	42.2	42.2	53%	0.0	0%
		Old	36.5	36.5	46%	0.0	0%
	MH wh 1 Total		79.6	79.6	100%	0.0	0%
	MH wh 2	Early	64.3	59.0	4%	5.3	0%
		Mid	45.6	45.5	3%	0.1	0%
		Mature	535.8	532.3	41%	3.5	0%
		Old	665.8	650.0	50%	15.8	1%
	MH wh 2 Total		1311.5	1286.7	98%	24.7	2%
Sewell Total			27332.3	11292.0	41%	16040.3	59%
Skidegate Lake *Low BEO*	CWH wh 1	Early	640.9	39.3	2%	601.6	32%
		Mid	859.0	36.7	2%	822.4	43%
		Mature	69.4	18.3	1%	51.1	3%
		Old	327.7	117.4	6%	210.3	11%
	CWH wh 1 Total		1897.0	211.7	11%	1685.4	89%
	CWH wh 2	Early	594.3	27.7	3%	566.5	66%
		Mid	112.6	6.2	1%	106.4	12%
		Mature	58.3	46.3	5%	11.9	1%
		Old	92.1	15.7	2%	76.4	9%
	CWH wh 2 Total		857.2	96.0	11%	761.2	89%
	MH wh 2	Mature	0.1	0.1	5%	0.0	0%
		Old	2.1	2.1	95%	0.0	0%
	MH wh 2 Total		2.2	2.2	100%	0.0	0%
Skidegate Lake Total			2756.4	309.8	11%	2446.6	89%

Block 6 Landscape Unit	BEC	Seral Stage	Productive Forest (ha)	Non Contributing Area		THLB Area	
				ha	%	ha	%
Tasu *Low BEO*	AT p	Early	2.8	2.8	2%	0.0	0%
		Mature	110.5	110.5	79%	0.0	0%
		Old	25.9	25.5	18%	0.4	0%
	AT p Total		139.2	138.8	100%	0.4	0%
	CWH vh 2	Early	5551.8	872.5	5%	4679.3	28%
		Mid	158.1	149.7	1%	8.4	0%
		Mature	2595.4	2425.2	15%	170.3	1%
		Old	8405.7	6650.7	40%	1755.0	11%
	CWH vh 2 Total		16711.0	10098.0	60%	6613.0	40%
	CWH wh 1	Early	2.6	0.2	3%	2.3	28%
		Mature	4.7	1.5	18%	3.2	38%
		Old	1.2	0.3	3%	1.0	11%
	CWH wh 1 Total		8.5	2.0	24%	6.5	76%
	CWH wh 2	Early	15.0	2.4	2%	12.6	8%
		Mature	27.1	26.2	17%	0.9	1%
		Old	110.7	100.9	66%	9.8	6%
	CWH wh 2 Total		152.7	129.5	85%	23.3	15%
	MH wh 1	Early	44.5	44.4	3%	0.1	0%
		Mid	32.2	32.2	2%	0.0	0%
		Mature	642.0	637.8	47%	4.2	0%
		Old	642.3	616.3	45%	26.1	2%
	MH wh 1 Total		1361.0	1330.7	98%	30.3	2%
	MH wh 2	Early	23.8	23.1	5%	0.7	0%
		Mid	5.5	5.5	1%	0.0	0%
		Mature	170.6	170.6	37%	0.0	0%
		Old	267.5	260.0	56%	7.5	2%
	MH wh 2 Total		467.3	459.1	98%	8.2	2%
Tasu Total			18839.7	12158.1	65%	6681.6	35%
Block 6 Total			48928.4	23760.0	49%	25168.5	51%

7.3 Analysis Units

The forest area in the THLB is aggregated into groups of similar stands to produce growth and yield information needed to model timber supply. For existing stands, analysis units are based on leading species group and site productivity (as determined from the dominant ecosystem site series within each polygon for Blocks 1 – 3 and 6, and by site class for Block 5).

Table 29 – Analysis units for existing stands – Block 1

Analysis Unit*	Area (ha)	% THLB
B-A	233.4	0.9%
B-B	13.3	0.1%
B-C	320.3	1.3%
C-A	792.6	3.1%
C-B	152.9	0.6%
C-C	1780.3	7.0%
D-A	383.5	1.5%
D-B	367.7	1.4%
D-C	42.7	0.2%
F-A	2913.8	11.4%
F-B	3313.5	13.0%
F-C	3087.0	12.1%
H-A	3301.5	12.9%
H-B	1054.1	4.1%
H-C	4117.4	16.1%
P-B	77.0	0.3%
P-C	153.5	0.6%
S-A	55.2	0.2%
S-B	3.9	0.0%
S-C	4.4	0.0%
Y-A	28.8	0.1%
Y-B	8.9	0.0%
Y-C	2789.3	10.9%

Table 30 – Analysis units for existing stands – Block 2

Analysis Unit*	Area (ha)	% THLB
B-A	166.1	1.1%
B-B	1660.8	11.1%
B-C	238.2	1.6%
C-A	449.6	3.0%
C-B	2404.1	16.0%
C-C	964.0	6.4%
D-A	116.3	0.8%
D-B	186.4	1.2%
D-C	4.4	0.0%
F-A	187.7	1.3%
F-B	466.3	3.1%
F-C	77.6	0.5%
H-A	748.0	5.0%
H-B	5366.2	35.8%
H-C	735.5	4.9%
S-A	11.5	0.1%
S-B	62.8	0.4%
Y-A	14.6	0.1%
Y-B	303.4	2.0%
Y-C	266.7	1.8%

1.1

* See Table 35

Table 31 – Analysis units for existing stands – Block 3

Analysis Unit*	Area (ha)	% THLB
B-A	26.1	0.3%
B-B	587.0	6.2%
B-C	45.8	0.5%
C-A	30.1	0.3%
C-B	1308.2	13.9%
C-C	687.1	7.3%
D-A	2.9	0.0%
D-B	11.0	0.1%
F-A	7.5	0.1%
F-B	104.8	1.1%
F-C	36.0	0.4%
H-A	204.7	2.2%
H-B	4431.9	46.9%
H-C	811.9	8.6%
Y-A	5.7	0.1%
Y-B	586.4	6.2%
Y-C	442.7	4.7%

Table 32 – Analysis units for existing stands – Block 6

Analysis Unit*	Area (ha)	% THLB
C-A	250.0	1.0%
C-B	1524.8	6.1%
C-C	1342.0	5.3%
D-A	706.2	2.8%
D-B	1113.6	4.4%
D-C	72.2	0.3%
H-A	844.6	3.4%
H-B	8149.9	32.4%
H-C	2136.2	8.5%
P-C	9.0	0.0%
S-A	1039.6	4.1%
S-B	6354.3	25.2%
S-C	964.6	3.8%
Y-A	1.7	0.0%
Y-B	68.4	0.3%
Y-C	264.8	1.1%

Table 33 – Analysis units for existing stands – Block 5

Analysis Unit*	Area (ha)	% THLB
B-A	3709.7	5.9%
B-B	7201.6	11.4%
B-C	38.9	0.1%
C-A	192.8	0.3%
C-B	14405.8	22.9%
C-C	11052.8	17.6%
D-A	64.7	0.1%
D-B	902.7	1.4%
D-C	7.1	0.0%
H-A	1555.0	2.5%
H-B	19469.8	31.0%
H-C	1067.3	1.7%
S-A	1279.0	2.0%
S-B	244.3	0.4%
S-C	22.6	0.0%
Y-B	163.7	0.3%
Y-C	424.2	0.7%

1.1

* See Table 35

Analysis units for previously harvested and future stands are based on silvicultural strategies defined in *TFL 25 Management Plan #10*. Some amalgamation of future planting regimes has been done to simplify timber supply modelling.

Table 34 – Analysis units for future stands

Block	Analysis Unit*	Current NSR (ha)	% THLB
1	F-A-P	15.4	0.1%
1	S-A-P	0.3	0.0%
1	H-A-P	49.0	0.2%
1	F-B-P	225.1	0.9%
1	F-C-P	34.9	0.1%
1	C-C-P	31.9	0.1%
1	H-C-P	210.5	0.8%
2	S-A-P	14.3	0.1%
2	C-A-P	62.2	0.4%
2	H-B-P	309.6	2.1%
2	H-B-N	97.3	0.6%
2	H-C-P	25.6	0.2%
2	H-C-N	63.2	0.4%

Block	Analysis Unit*	Current NSR (ha)	% THLB
3	S-A-P	3.4	0.0%
3	H-B-P	82.3	0.9%
3	C-C-P	10.8	0.1%
3	Y-C-N	3.0	0.0%
3	H-C-P	14.1	0.1%
5	S-A-P	94.8	0.2%
5	H-A-P	0.0	0.0%
5	C-B-P	441.8	0.7%
5	H-B-X	0.0	0.0%
5	Y-B-P	31.0	0.0%
5	H-B-P	396.6	0.6%
5	H-C-P	96.6	0.2%
5	C-C-P	20.4	0.0%
5	Y-C-P	18.2	0.0%
5	H-C-N	0.0	0.0%
6	S-A-P	4.6	0.0%
6	S-B-P	153.4	0.6%
6	S-C-P	10.0	0.0%
6	H-C-P	158.5	0.6%

Table 35 – Analysis Units Legend

i.e. B-A-OG					
First Character *Leading Species*		Second Character *Productivity Group*		Third Character *Age Group*	
i.e. B	Ba / Bg	A	See Section 8.2	2M	Age Class 1 to 2 (managed)
H	Hw / Hm	B		2U	Age Class 3 to 6 (unmanaged)
C	Cw / Yc	C		OG P or N	Age Class 7 to 9 Future Stands (Planted / Natural)

1.1 ______________________________

* See Table 35

8.0 GROWTH AND YIELD

8.1 Overview

This section describes the approach used to develop yield tables for managed and natural stands. The general approach is to develop yield tables for existing and future stands, thus specific yield tables are developed for:

1) Existing natural mature stands or old growth (OG).
2) Existing natural immature 2nd growth stands (2U).
3) Existing managed 2nd growth stands (2M).
4) Future managed stands.

Table 36 describes the different input parameters for the four different yield tables. It also summarizes the main output results.

Table 36 – Modeling overview

	Existing Mature Natural Stands	Existing Immature Natural Stands	Existing Immature Managed Stands	Future Stands
Model	Flat Line	Batch VDYP (6.6d4)	Batch TIPSY (3.0)	Batch TIPSY (3.0)
Age Class	7-9	>40 and <141	> 0 and < 41	All
		Block 1		
Average Culm MAI	Past Culm	8.3 m^3/ha/yr	8.6 m^3/ha/yr	7.8 m^3/ha/yr
Average Culm Age		76 years	89 years	101 years
Average Volume at Culm Age		578 m^3/ha	732 m^3/ha	772 m^3/ha
		Block 2		
Average Culm MAI	Past Culm	7.8 m^3/ha/yr	8.9 m^3/ha/yr	8.6 m^3/ha/yr
Average Culm Age		79 years	92 years	99 years
Average Volume at Culm Age		587 m^3/ha	808 m^3/ha	823 m^3/ha
		Block 3		
Average Culm MAI	Past Culm	8.0 m^3/ha/yr	9.3 m^3/ha/yr	8.8m^3/ha/yr
Average Culm Age		75 years	96 years	105 years
Average Volume at Culm Age		560 m^3/ha	874 m^3/ha	908 m^3/ha
		Block 5		
Average Culm MAI	Past Culm	7.2 m^3/ha/yr	9.9 m^3/ha/yr	8.5m^3/ha/yr
Average Culm Age		58 years	83 years	103 years
Average Volume at Culm Age		401 m^3/ha	807 m^3/ha	782 m^3/ha
		Block 6		
Average Culm MAI	Past Culm	8.9 m^3/ha/yr	12.2 m^3/ha/yr	12.9m^3/ha/yr
Average Culm Age		55 years	81 years	83 years
Average Volume at Culm Age		480 m^3/ha	977 m^3/ha	1050 m^3/ha

8.2 Site Index

Block 1

Site index estimates for existing immature natural stands were calculated from the inventory database based on the primary tree layer leading species.

Site index estimates for existing managed stands and future stands were estimated by calculating a site index value for all major species for each existing immature natural stand in the inventory. Where the site index couldn't be calculated directly from forest attributes a site index conversion equation was used. Area summaries and weighted average site indices by ecosystem were calculated and sorted based on the ecologically appropriate species site index. Based on this summary and the estimated SI for most preferred species (highlighted), ecosystems were divided into productivity groups. Table 37 outlines the ecosystem and estimated site index by species, where Table 38 shows the weighted average site index by productivity group.

Table 37 – Ecosystem and Estimated Site Index – Block 1

	F		H		B		C/Yc		S		D	
Ecosystem	**SI**	**Area**	**SI**	**Area**	**SI**	**Area**	**SI**	**Area**	**SI**	**Area**	**SI**	**Area**
S3	20.9	6.9	18.4	6.9	30.8	0.7	15.7	5.3	38.4	0.7	30.4	1.6
A5	35.2	423.8	31.4	425.6	28.8	265.6	25.9	303.1	34.7	268.2	27.4	225.9
S1HA	35.0	2088.4	31.4	2107.4	28.8	1939.5	26.1	2043.7	34.5	1979.9	27.3	39.6
S13	33.9	104.1	30.4	102.7	28.1	93.3	25.2	103.7	32.2	92.1	28.4	10.1
A1	32.5	2373.1	29.0	2393.8	27.3	1728.7	25.1	1805.2	32.1	1731.2	26.7	443.0
A2	32.5	414.6	28.7	416.8	26.7	221.8	25.0	308.3	31.0	222.5	27.2	95.7
L3	30.6	9.4	28.4	9.4	26.4	9.3	24.1	7.7	30.5	9.3	27.4	5.6
A6	30.8	29.1	27.4	29.5	27.1	12.1	23.7	17.0	29.2	15.4	23.8	17.6
L1	28.7	86.1	24.5	82.5	23.7	79.4	21.1	79.1	25.8	77.2	28.5	2.1
N1	26.8	244.1	23.6	245.4	23.4	232.2	21.9	230.4	24.8	232.2	26.5	3.8
L2	24.4	18.2	19.5	18.2	20.3	17.7	18.8	15.5	19.6	15.2	30.4	0.2
S2	25.5	39.2	22.7	36.1	22.4	34.8	19.5	39.4	23.2	34.8		
N2	20.9	10.9	22.2	7.8	19.6	10.9	18.3	10.9	22.8	7.8		
S1CH	26.8	134.0	25.2	103.1	24.3	101.5	19.6	133.4	26.5	101.8	20.9	6.0
S6	26.8	21.1	23.6	22.0	22.9	21.4	18.9	21.4	24.3	21.6	27.1	1.6
A3	22.6	608.0	20.1	604.7	24.1	161.9	22.4	190.2	26.7	158.6	23.7	40.9
M1	23.2	48.9	19.9	48.9	21.0	48.9	17.3	44.8	19.9	48.9		
MH1	21.7	1.8	16.7	1.8	18.4	1.8	16.7	1.3	16.0	1.8		
M4	20.2	24.9	17.8	24.9	19.1	24.7	12.9	24.4	17.2	24.4		
M2	20.8	17.1	15.6	16.5	17.6	16.5	16.5	17.1	14.6	16.5		

Table 38 – Site Index Estimates– Block 1

Productivity Group	Ecosystems	F	H	B	C/Yc	S	D
A	S3, A5, S13, S1HA	34.9	31.3	28.8	26.0	34.4	27.4
B	A1, A2, A6, L3, L1	32.3	28.8	27.1	25.0	31.7	26.7
C	N1, L2, S2, N2, S1CH, S6, A3, M1, MH1, M4, M2	24.1	21.4	23.0	20.6	24.4	23.7

Block 2

Site index estimates for existing managed, existing unmanaged and future stands were derived based on values provided in *Site Index Estimates by Site Series for Coniferous Tree Species in British Columbia* – 1997. Using the ecosystem classification available for the block, site index estimates from the SIBEC project were assigned for major commercial tree species. A crosswalk table between WFP's ecosystem classification and MOF site series was developed to facilitate this assignment. Where site index values were not available for certain species a derived value was assigned based on a conversion factor. Area summaries and assigned site indices by ecosystem are outlined in Table 39 and were sorted based on the ecologically appropriate species site index (highlighted). Based on this summary ecosystems were then divided into productivity groups to allow for analysis unit grouping. Table 40 shows the weighted average site index by productivity group.

Table 39 – Ecosystem and Estimated Site Index – Block 2

Ecosystem	THLB (ha)	SI F	SI H	SI B	SI C/Yc	SI S
S5	12.0	30.9	23.8	23.2	19.6	34.0
ST5	40.0	30.9	23.8	23.2	19.6	34.0
S3	148.1	35.0	31.3	26.2	21.2	32.8
S3B	2.6	35.0	31.3	26.2	21.2	32.8
S13F	73.3	35.0	31.3	26.2	21.2	32.8
S13	331.5	37.0	30.4	29.8	24.3	29.2
ST13	1159.3	37.0	30.4	29.8	24.3	29.2
S1HA	1499.2	34.8	29.0	26.7	22.4	28.9
ST1	2916.9	34.8	29.0	26.7	22.4	28.9
M1	1455.0	35.0	28.9	26.8	17.7	28.2
M1C	298.8	35.0	28.9	26.8	17.7	28.2
MT1	3187.3	35.0	28.9	26.8	17.7	28.2
MT1C	377.3	35.0	28.9	26.8	17.7	28.2
MT1S	3.2	35.0	28.9	26.8	17.7	28.2
M5	13.5	34.1	28.0	29.4	22.9	29.6
MT5	236.0	34.1	28.0	29.4	22.9	29.6
ST3	569.1	24.4	17.3	16.0	22.7	25.2
ST4	189.0	24.4	17.3	16.0	22.7	25.2
S15	17.3	33.5	26.4	21.4	22.0	23.7
ST15	97.0	33.5	26.4	21.4	22.0	23.7
MT15	0.7	32.4	26.3	26.3	15.1	25.6
S6	75.7	30.9	23.8	23.2	19.6	34.0
ST6	8.4	30.9	23.8	23.2	19.6	34.0
S1CH	43.7	20.0	20.0	19.4	22.4	18.3
M2	195.2	31.0	18.4	23.8	16.8	17.7
MT2	458.0	31.0	18.4	23.8	16.8	17.7
S2	150.0	31.1	17.2	23.8	16.8	17.1
S2F	48.4	31.1	17.2	23.8	16.8	17.1
ST2	481.6	31.1	17.2	23.8	16.8	17.1
MH1	661.9		16.0	12.0		
MH1C	206.6		16.0	12.0		
M4	34.2		29.8		18.6	
MT4	11.9		29.8		18.6	

Table 40 – Site Index Estimates– Block 2

Productivity Group	Ecosystems	F	H	B	C/Yc	S
A	S5, ST5, S3, S3B, S13F, S13, ST13	36.6	30.3	29.1	23.8	29.8
B	S1HA, ST1, M1, M1C, MT1, MT1C, MT1S, M5, MT5, ST3, ST4, S15, ST15, MT15	34.2	28.1	26.0	20.1	28.3
C	S6, ST6, S1CH, M2, MT2, S2, S2F, ST2, MH1, MH1C, M4, MT4	30.7	17.6	19.3	17.2	18.4

Block 3

Site index estimates for existing managed, existing unmanaged and future stands were derived based on valves provided in *Site Index Estimates by Site Series for Coniferous Tree Species in British Columbia* – 1997. Using the ecosystem classification available for the block, site index estimates from the SIBEC project were assigned for major commercial tree species. A crosswalk table between WFP's ecosystem classification and MOF site series was developed to facilitate this assignment. Where site index values were not available for certain species a derived value was assigned based on a conversion factor. Area summaries and assigned site indices by ecosystem are outlined in Table 41 and were sorted based on the ecologically appropriate species site index (highlighted). Based on this summary ecosystems were then divided into productivity groups to allow for analysis unit grouping. Table 42 shows the weighted average site index by productivity group.

Table 41 – Ecosystem and Estimated Site Index – Block 3

Ecosystem	THLB (ha)	SI F	SI H	SI B	SI C/Yc	SI S
S3B	4.0	35.0	31.3	26.2	21.2	32.8
S3	103.0	35.0	31.3	26.2	21.2	32.8
S13	52.8	35.0	30.4	26.2	21.2	29.2
M3C	10.8	37.0	30.0	28.8	18.8	29.3
M3	109.9	37.0	30.0	28.8	18.8	29.3
S1HA	2493.6	34.8	29.0	26.7	22.4	28.9
M1C	27.4	35.0	28.9	26.8	17.7	28.2
M1	4590.0	35.0	28.9	26.8	17.7	28.2
S15	39.5	33.5	26.4	21.4	22.0	23.7
S6	8.5	30.9	23.8	23.2	19.6	34.0
S1CH	182.1	20.0	20.0	19.4	22.4	18.3
M2	669.2	31.0	18.4	23.8	16.8	17.7
S2F	341.3	31.1	17.2	23.8	16.8	17.1
S2	147.1	31.1	17.2	23.8	16.8	17.1
M4	310.5		29.8		18.6	
MH1	353.8		16.0	12.0		

Table 42 –Site Index Estimates– Block 3

Productivity Group	Ecosystems	F	H	B	C/Yc	S
A	S3B, S3, S13, M3C, M3	35.9	30.6	27.3	20.2	30.6
B	S1HA, M1C, M1	35.0	28.9	26.8	19.3	28.4
C	S15, S6, S1CH, M2, S2F, S2, MH1, M4	29.7	19.7	20.9	17.9	17.8

Block 5

In the original inventory, site classes (GMPL) were assigned to all forested polygons. Site Class L is considered unproductive and inoperable. To determine the site index for stands in Block 5 second growth permanent sample information is used and supplemented with information from a coastal site class table (source: Site Index – A Primer, MOF 1999).

In the mid 1990s, about 50 growth and yield permanent sample plots (PSP) were established in second growth of Block 5. Most of the second growth had been classified site class "M" in the original inventory so the top heights were computed for each of the "M" site PSPs and used to derive an average SI_{50} for common species occurring in second growth site class "M". This data is summarized below.

Table 43 – Average SI_{50} for PSP – Block 5

Leading Species	Site Class M
Ba	27.7
Cw	20.2
Hw	27.2
Ss	32.4
Yc	20.2
Dr	25.4

These plots also were BEC classified in the field. As an additional check the CWHvm1-01 or mesic site series, which might be considered representative of the "M" site class was summarized (N=8) for Hw and Ba for comparative purposes. Resultant SI_{50} for Hw and Ba were 26.1m (24.7 to 28.0) and 26.2m (21.8 to 33.4) respectively.

Using height shifts (Table 44) suggested by the site class table the mean site index values calculated for the "M" site are adjusted to create site index estimates for Good and Poor site types. The resulting site index estimates used for modelling are outline in Table 45.

Table 44 – SI_{50} Coastal Site Class and shifts from Medium

Leading Species	Site Class			Adjustment		
	G	M	P	G	M	P
Ba	29	23	14	6	0	-9
Cw	29	23	15	6	0	-8
Hw	28	22	14	6	0	-8
Ss	28	21	11	7	0	-10
Yc	29	23	15	6	0	-8

Table 45 – Site Index Estimates – Block 5

Productivity Group	Site Class	H	B	C	Yc	S	D
A	Good	33.2	33.7	26.2	26.2	39.4	
B	Medium[10]	27.2	27.7	20.2	20.2	32.4	25.4
C	Poor	19.2	18.7	12.2	12.2	22.4	

1.1

[10] Table 43

Block 6

Site index estimates for existing immature natural stands were calculated from the inventory database based on the primary tree layer leading species.

Site index estimates for existing managed stands and future stands were estimated by calculating a site index value for all major species for each existing immature natural stand in the inventory. Where the site index couldn't be calculated directly from forest attributes a site index conversion equation was used. Area summaries and weighted average site indices by ecosystem were calculated and sorted based on the ecologically appropriate species site index. Based on this summary ecosystems were divided into productivity groups. Table 46 outlines the ecosystem and estimated site index by species, where Table 47 shows the weighted average site index by productivity group.

Table 46 – Ecosystem and Estimated Site Index – Block 6

	F		H		B		C/Yc		S		D	
Ecosystem	**SI**	**Area**	**SI**	**Area**	**SI**	**Area**	**SI**	**Area**	**SI**	**Area**	**SI**	**Area**
Q5	34.8	1048.6	30.6	1151.9	28.2	783.7	25.5	771.5	33.4	1045.2	29.8	564.5
Q6	32.8	35.1	28.8	40.2	26.8	25.8	24.2	25.8	30.8	35.1	27.5	26.5
Q1	32.3	3160.2	28.8	3119.6	26.8	2915.8	24.2	2763.8	30.1	3123.3	28.7	369.4
Q1C	31.5	615.4	28.1	632.5	26.3	558.0	23.8	537.8	29.6	611.3	29.3	156.2
Q12	31.2	73.4	27.6	74.0	25.9	70.8	23.7	57.8	29.3	71.2	24.9	9.5
Q2	29.4	107.0	26.1	108.5	24.9	106.0	22.6	87.4	27.8	107.0	27.1	10.3
M1C	30.0	1.3	26.6	1.3	25.2	1.3	22.9	1.3	33.1	1.3		
M7	27.6	3.6	24.5	3.6	23.7	3.6	21.7	3.6	25.5	3.6	24.9	3.1
M3	25.1	0.0	22.1	0.0	22.1	0.0	20.4	0.0	22.7	0.0		
M1	23.2	155.5	20.5	155.5	20.9	155.2	19.5	149.8	21.6	153.0	26.9	0.3
H5	21.4	4.3	22.2	9.9	19.4	2.4	18.4	3.1	20.1	4.1	28.2	8.0
H1	21.4	7.2	18.9	7.2	20.2	6.8	18.0	6.0	19.8	6.9	38.1	0.2
MH1	9.1	4.0	18.4	0.6	19.5	0.6	18.2	0.6	4.8	4.0		

Table 47 –Site Index Estimates– Block 6

Productivity Group	Ecosystems	F	H	B	C/Yc	S	D
A	Q5	34.8	30.6	28.2	25.5	33.4	29.8
B	Q1, Q1C, Q12, Q6	32.1	28.7	26.7	24.2	30.0	28.7
C	Q2, M1, M1C, M3, M7, H1, H5, MH1	25.4	22.7	22.5	20.6	23.8	27.3

8.3 Utilization Levels

The utilization level is 12.5 cm for all existing stands less than 41 years old and for future stands. Stump height for these stands is 30 cm and top diameter inside bark (DIB) is 10 cm. Utilization level for immature and mature conifer stands is 17.5 cm, with stump height of 30 cm and top DIB of 15 cm (Table 48).

Table 48 – Utilization levels

Species Group	Utilization			Firmwood Standard
	Minimum DBH (cm)	Stump Height (cm)	Top DIB (cm)	
Managed Conifers (0 - 40 yrs, future)	12.5	30.0	10.0	50%
Immature (41 – 140 yrs)	17.5	30.0	15.0	50%
Mature (141+ yrs)	17.5	30.0	15.0	50%

8.4 Decay, Waste, and Breakage

The default decay, waste, and breakage factors for TFL 25 within VDYP 6.6d were used for existing natural stands.

8.5 Operational Adjustment Factors

Where no better information was available an OAF1 of 15% and OAF2 of 5% were used for yield tables generated with TIPSY.

In Blocks 1 and 6 VRI data for land cover classification (%) was analyzed. This analysis suggested that in existing stands net downs for unmapped non-treed areas such as ponds, swamps, rock outcrops, brush patches, and slides that were visible in aerial photographs - but for practical purposes too small to delineate - accounted for less than 1% in both Blocks 1 and 6. Based on the assumption that gaps in tree cover of this nature account for 5-10 points out of the 15% default value, the analysis suggests that the default % could be reduced by 4-9% for these blocks. Hence OAF1 was set conservatively at 11%.

Based on instructions from the Ministry of Forests an OAF2 of 12.7% was applied to CWHxm2 ecosystems with a leading Fd component, to account for *Phellinus* root rot. As this variant was part of larger productivity groups, an area-weighted OAF2 adjustment of 5.6%, 9.8% and 5.7% was calculated and applied to analysis units F-A-2M, F-B-2M and F-C-2M in Block 1.

8.6 Volume Deductions

Volume deductions will be used to model the retention of Wildlife Tree Patches in the THLB, to allow for evolving riparian management and retention practices, incorporate CMT that are not included in WTP, and to include a precautionary buffer. These reductions are summarized in Table 49 and will occur during modelling when individual stands are harvested. Yield curves are unmodified.

Table 49 – Volume Deductions

Block	WTP	Riparian Management/ Dispersed retention	Buffer	Total
1	3.25	1.0	0.75	5.0
2	3.25	1.0	0.75	5.0
3	3.25	1.0	0.75	5.0
5	3.25	3.0[11]	2.25[1]	8.5
6	3.25	1.0	0.75	5.0

In the event of area-based determinations, a post-simulation adjustment for these volume net downs will be necessary. Assuming the volume net downs remain <10% in total, the area harvest can be reduced by the same percentage as the total volume net down percentage without significant distortion of the annual area harvest calculation.

Deciduous volumes existing in pure or mixed stands have not been removed from the volume calculations. Standing volumes are generally a small proportion of total volume. In any case, alder saw logs are commonly utilized in Block 1, and interest in alder harvest elsewhere is on the rise suggesting increased utilization elsewhere in the TFL is likely.

1.1

[11] Tripled to reflect uncertainty as discussed in Section 6.8

8.7 Yield Tables For Unmanaged Stands

8.7.1 Natural Immature Stand Volumes

For existing natural immature stands, an analysis unit was assigned to every forest cover polygon based on criteria defined in Section 7.3. For Blocks 1 and 6 the inventory site index was used to generate the yield tables. For Blocks 2, 3 and 5 the ecosystem based site index determined in Section 8.2 was used. Yield tables were first calculated for each individual polygon using VDYP 6.6d4. An area weighted average yield table was then calculated for the analysis unit. The average yield curves for each Block are shown below.

Table 50 – Unmanaged Stands Analysis Units by Area

Block 1

AUnit	THLB Area
B-A-2U	11.2
B-C-2U	12.3
C-A-2U	87.9
C-B-2U	90.2
C-C-2U	243.4
D-A-2U	285.0
D-B-2U	335.0
D-C-2U	26.6
F-A-2U	1157.7
F-B-2U	2099.9
F-C-2U	808.3
H-A-2U	1923.9
H-B-2U	794.5
H-C-2U	747.2
P-B-2U	75.6
P-C-2U	151.0
S-A-2U	33.7
S-B-2U	3.9

Block 2

AUnit	THLB Area
B-A-2U	37.0
B-B-2U	785.2
B-C-2U	7.8
C-A-2U	48.9
C-B-2U	176.0
C-C-2U	320.9
D-A-2U	434.8
D-B-2U	609.0
D-C-2U	19.4
F-A-2U	640.5
F-B-2U	769.2
F-C-2U	159.1
H-A-2U	1645.8
H-B-2U	13650.4
H-C-2U	1875.5
S-B-2U	37.4

Block 3

AUnit	THLB Area
B-A-2U	13.1
B-B-2U	452.8
B-C-2U	58.9
C-B-2U	8.8
C-C-2U	28.2
D-A-2U	23.1
D-B-2U	88.2
F-B-2U	16.5
F-C-2U	1.5
H-A-2U	14.9
H-B-2U	1769.8
H-C-2U	801.2

Block 5

AUnit	THLB Area
B-B-2U	71.1
C-B-2U	16.2
C-C-2U	2.7
D-A-2U	64.7
D-B-2U	774.6
D-C-2U	7.1
H-A-2U	29.0
H-B-2U	1521.6
H-C-2U	95.3
S-A-2U	4.5
S-B-2U	8.7
S-C-2U	12.8

Block 6

AUnit	THLB Area
C-A-2U	6.6
C-B-2U	11.1
C-C-2U	3.3
D-A-2U	519.9
D-B-2U	481.8
D-C-2U	12.5
H-A-2U	244.3
H-B-2U	2035.3
H-C-2U	206.7
S-A-2U	374.3
S-B-2U	1661.9
S-C-2U	66.6
Y-B-2U	0.3
Y-C-2U	0.5

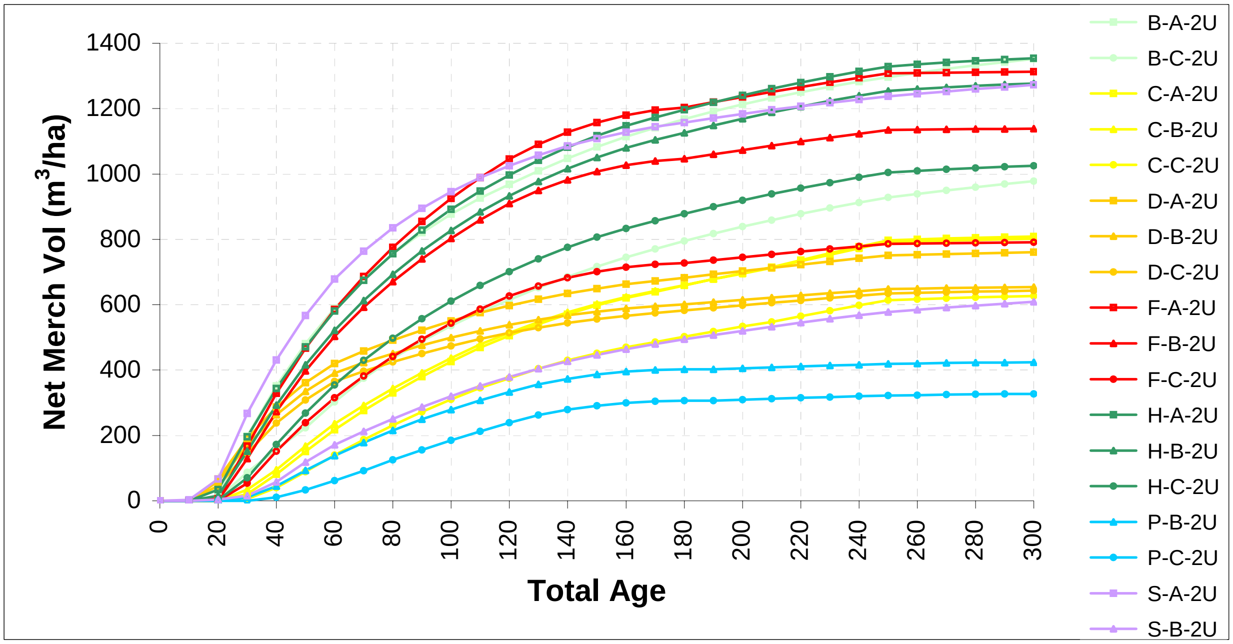


Figure 2 – Yield curves for existing analysis units, >40 and <141 years – Block 1

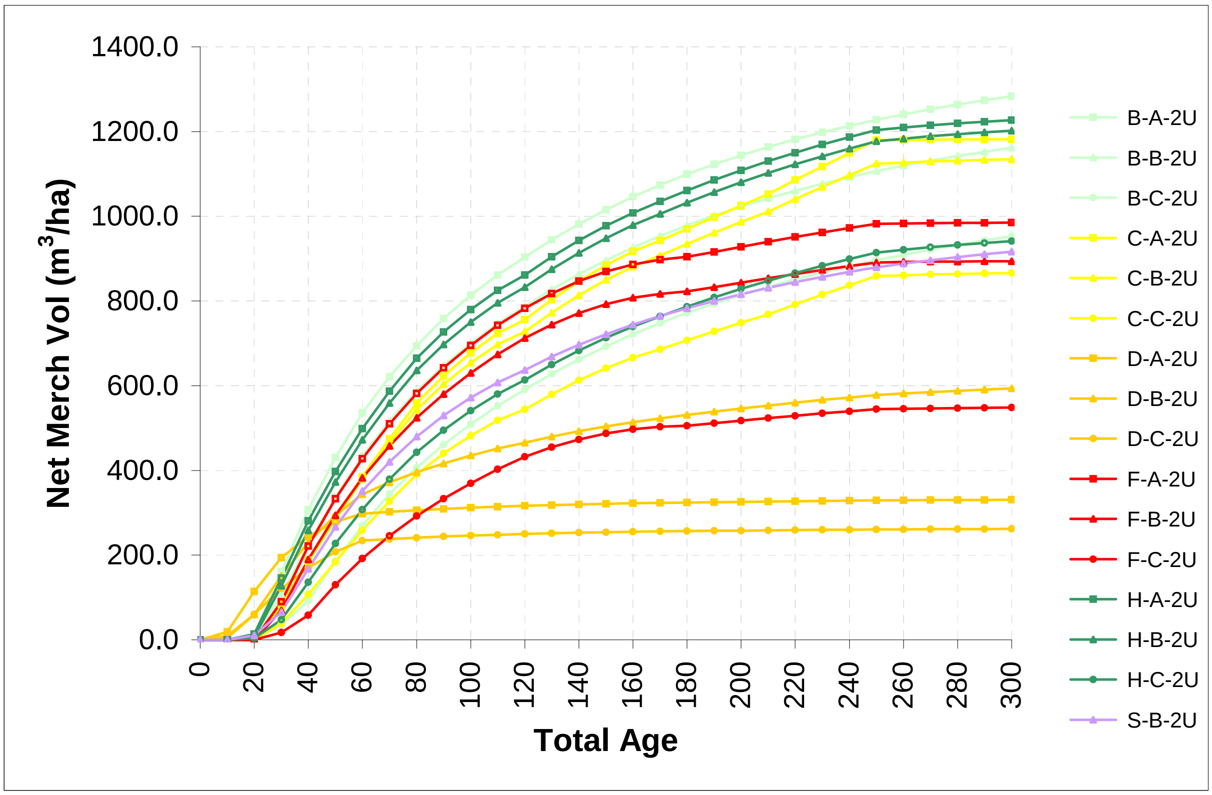


Figure 3 – Yield curves for existing analysis units, >40 and <141years – Block 2

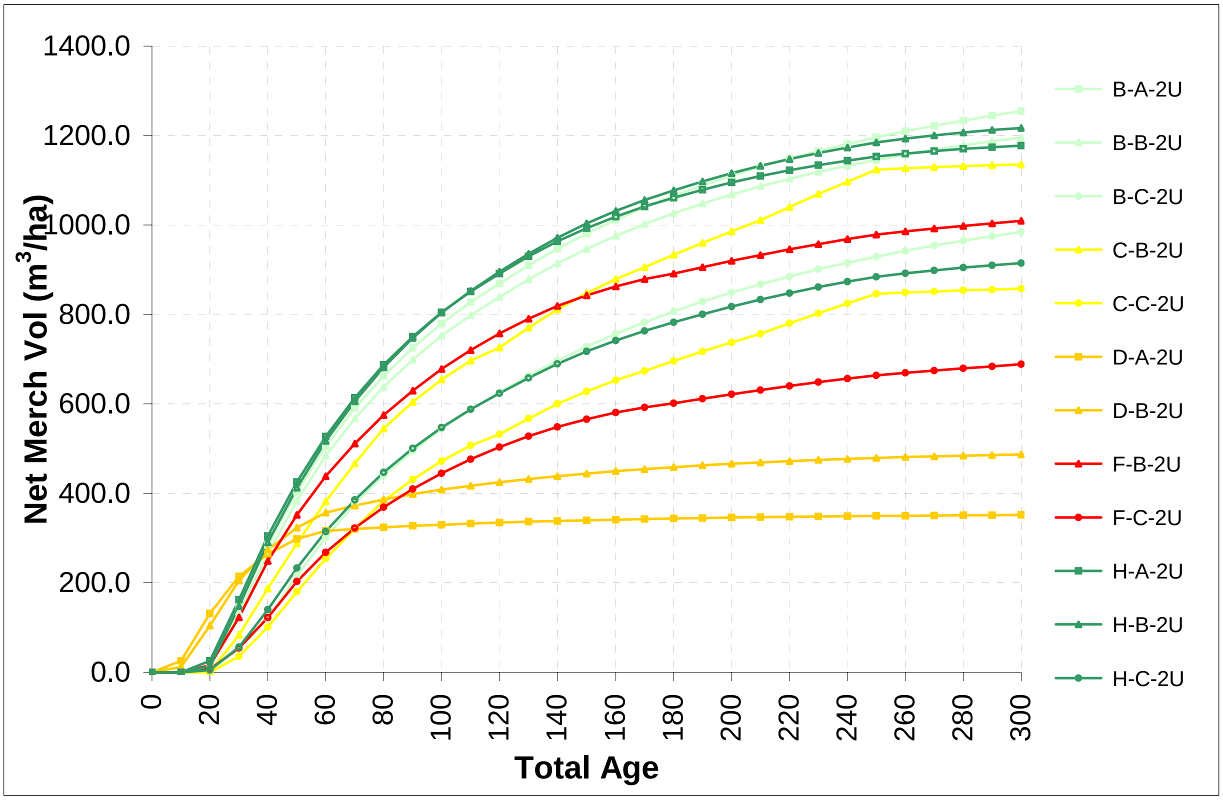


Figure 4 – Yield curves for existing analysis units, >40 and <141years – Block 3

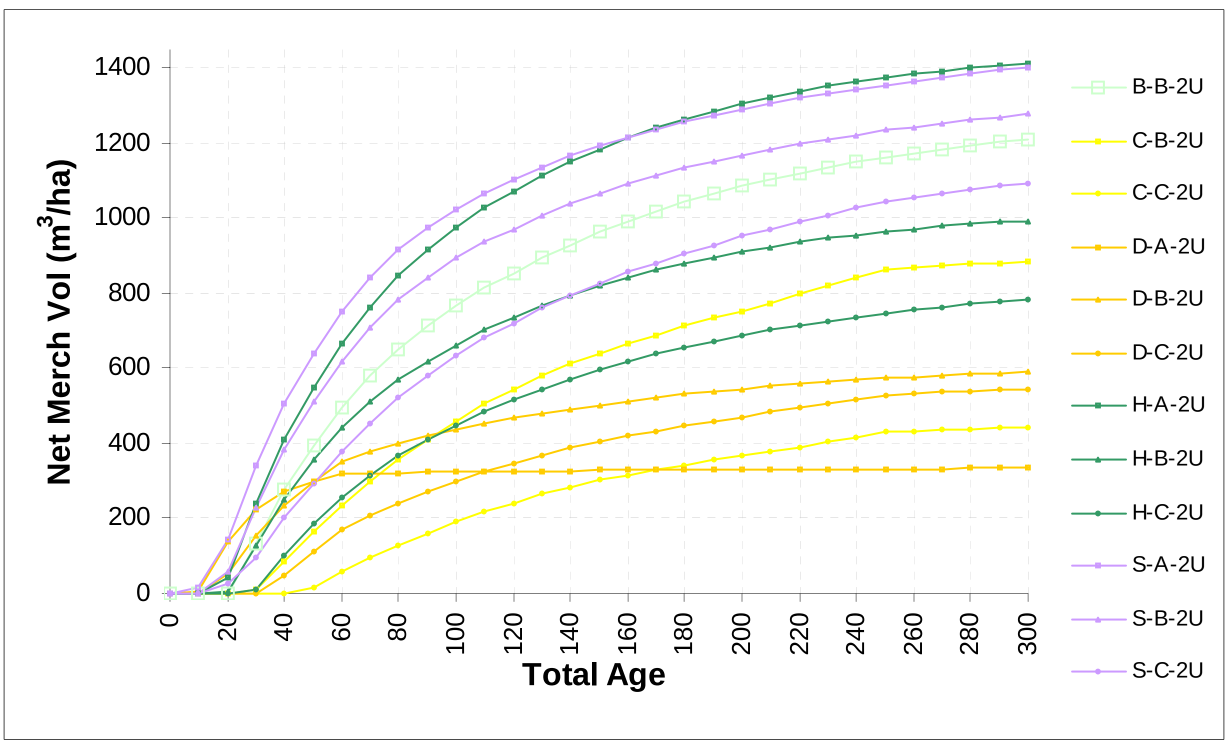


Figure 5 – Yield curves for existing analysis units, >40 and <141 years – Block 5

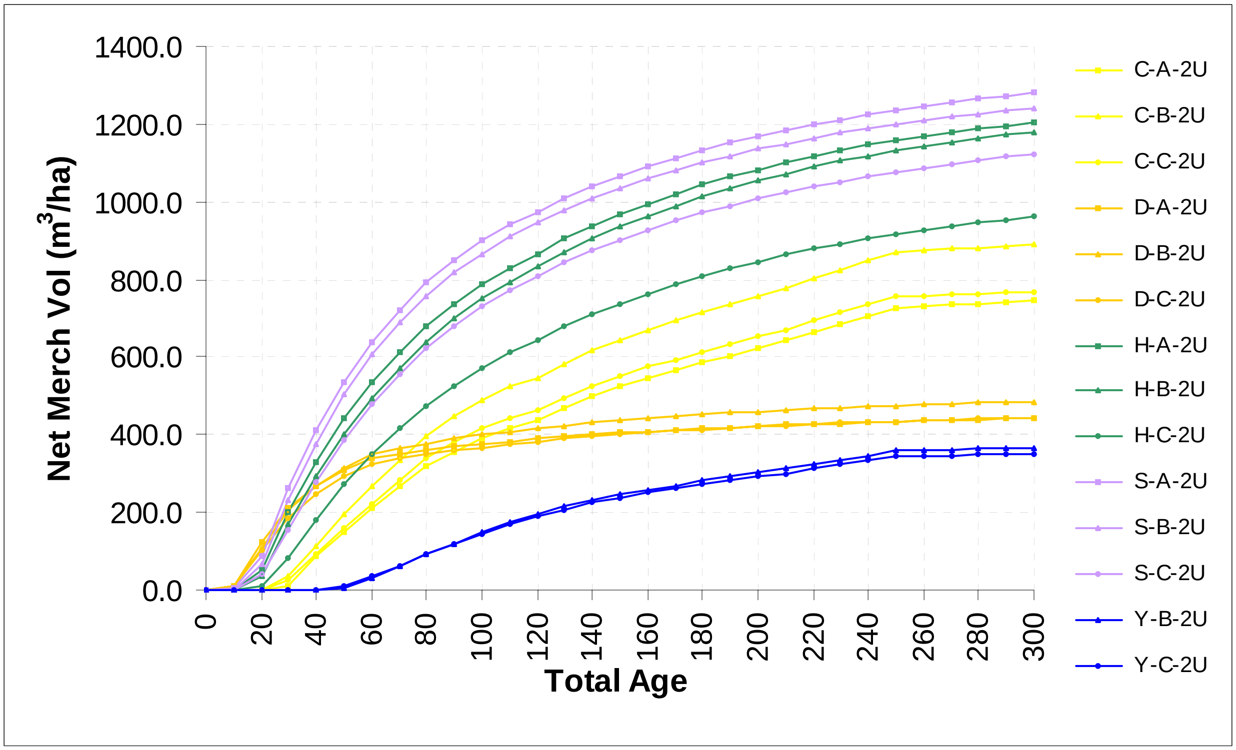


Figure 6 – Yield curves for existing analysis units, >40 and <141 years – Block 6

8.7.2 Existing Mature Stand Volumes

For Blocks 1 and 6 the timber volume in existing mature stands (those ≥ 140 years) was determined for each analysis unit by using area weighted average volumes as calculated from VDYP for these stands. For Blocks 2, 3 and 5 volumes were assigned based on area weighted average volume line (AVL) derived from inventory plots located in these stands.

Table 51 – Existing mature volume. – Block 1

Analysis Unit	THLB Area	Weighted Avg Volume/ha	Analysis Unit Volume
B-A-OG	71.0	838.0	59,456.8
B-B-OG	3.4	637.2	2,134.6
B-C-OG	57.8	696.8	40,270.2
C-A-OG	455.1	803.1	365,511.4
C-B-OG	57.1	651.4	37,197.6
C-C-OG	844.3	562.6	474,968.6
F-A-OG	8.4	370.8	3,107.5
F-B-OG	45.3	478.9	21,670.4
F-C-OG	47.0	407.0	19,130.6
H-A-OG	724.8	829.0	600,873.3
H-B-OG	112.2	645.8	72,461.4
H-C-OG	1949.7	552.7	1,077,552.9
S-A-OG	2.8	1062.0	2,973.6
Y-A-OG	2.0	413.8	815.1
Y-B-OG	6.0	516.4	3,083.2
Y-C-OG	2010.1	372.5	748,705.8

Table 52 – Existing mature volume. – Block 2

Analysis Unit	THLB Area	Weighted Avg Volume/ha	Analysis Unit Volume
B-A-OG	145.2	741.2	107,652.0
B-B-OG	1187.7	730.6	867,647.9
B-C-OG	216.0	662.2	143,042.9
C-A-OG	396.0	873.1	345,737.5
C-B-OG	1956.5	800.2	1,565,612.0
C-C-OG	816.8	695.3	567,941.8
F-A-OG	11.0	1055.1	11,627.1
F-B-OG	30.6	1209.7	37,004.9
F-C-OG	10.9	1147.5	12,450.0
H-A-OG	130.9	783.1	102,474.2
H-B-OG	976.9	784.9	766,780.9
H-C-OG	221.1	740.3	163,694.8
S-A-OG	5.4	1062.2	5,704.0
S-B-OG	51.0	947.9	48,348.5
Y-A-OG	4.2	513.6	2,131.5
Y-B-OG	104.1	609.4	63,422.7
Y-C-OG	175.4	519.3	91,101.9

Table 53 – Existing mature volume. – Block 3

Analysis Unit	THLB Area	Weighted Avg Volume/ha	Analysis Unit Volume
B-A-OG	12.2	917.5	11,166.2
B-B-OG	120.4	908.2	109,330.8
B-C-OG	21.9	904.7	19,795.8
C-A-OG	25.8	874.9	22,592.9
C-B-OG	984.8	887.2	873,762.1
C-C-OG	575.7	772.7	444,821.0
F-B-OG	4.1	1117.5	4,525.8
F-C-OG	5.5	710.5	3,886.3
H-A-OG	79.4	908.7	72,184.1
H-B-OG	2577.8	873.9	2,252,678.5
H-C-OG	558.1	784.4	437,732.6
Y-A-OG	5.7	568.5	3,263.0
Y-B-OG	478.3	632.7	302,597.9
Y-C-OG	403.9	565.2	228,292.5

Table 54 – Existing mature volume. – Block 5

Analysis Unit	THLB Area	Weighted Avg Volume/ha	Analysis Unit Volume
B-A-OG	3685.7	796.3	2,935,056.2
B-B-OG	6971.9	630.8	4,397,924.9
B-C-OG	25.3	399.3	10,102.3
C-A-OG	144.7	777.7	112,543.3
C-B-OG	14058.5	702.4	9,874,246.9
C-C-OG	11038.1	458.1	5,056,971.3
H-A-OG	1484.1	729.1	1,082,016.4
H-B-OG	15714.3	615.8	9,676,888.0
H-C-OG	887.9	438.2	389,068.7
S-A-OG	1228.8	909.0	1,116,997.5
S-B-OG	53.2	678.1	36,088.5
S-C-OG	1.7	399.3	682.8
Y-B-OG	140.1	678.3	95,023.0
Y-C-OG	414.8	423.1	175,506.1

Table 55 – Existing mature volume. – Block 6

Analysis Unit	THLB Area	Weighted Avg Volume/ha	Analysis Unit Volume
C-A-OG	242.9	629.7	152,946.6
C-B-OG	1501.3	566.8	850,991.2
C-C-OG	1272.3	473.6	602,623.8
D-B-OG	1.0	134.2	135.5
H-A-OG	292.6	730.4	213,697.3
H-B-OG	1779.0	652.4	1,160,602.7
H-C-OG	884.4	589.8	521,608.0
P-C-OG	9.0	220.3	1,991.3
S-A-OG	157.1	920.2	144,558.8
S-B-OG	167.2	923.4	154,395.0
S-C-OG	147.4	779.9	114,950.3
Y-A-OG	1.7	390.0	647.4
Y-B-OG	68.1	394.7	26,863.7
Y-C-OG	252.0	407.6	102,728.9

Table 56 – Existing mature volume. – All Blocks

Block	THLB Area	Weighted Avg Volume/ha	Analysis Unit Volume
1	6,396.8	551.8	3,529,754.2
2	6,439.6	761.3	4,902,467.5
3	5,853.5	817.7	4,786,407.0
5	55,849.2	626.0	34,961,599.2
6	6,776.0	597.5	4,048,660.0
Total	81,315.1	642.3	52,228,887.9

8.8 Yield Tables for Managed Stands

8.8.1 Existing Managed Stand Volumes

For existing managed stands, all stands were assumed to be plantations, species composition was taken from the inventory database, establishment density was assumed to be 1000 stems per hectare, which is typical planting density and 10% higher than free growing standards. The site index derived in Section 8.2 was used. Yield tables were first calculated for each individual polygon using Batch Tipsy 3.0. An area weighted average yield table was then calculated for each analysis unit. No other treatment was used in existing managed stands. Although juvenile spacing has been carried out in most Blocks, it is assumed that such treatments have been primarily a cleaning of natural infill and modelling based on planting density is appropriate. Fertilization has been sporadic in some blocks but the volume gain has not been explicitly modelled for past treatments. Some pruning has been done but growth impacts are assumed insignificant.

Table 57 – Managed Stand Analysis Units by Area[12]

Block 1

AUnit	THLB Area
B-A-2M	151.2
B-B-2M	9.9
B-C-2M	250.2
C-A-2M	249.5
C-B-2M	5.5
C-C-2M	692.8
D-A-2M	98.5
D-B-2M	32.7
D-C-2M	16.0
F-A-2M	1748.0
F-B-2M	1173.7
F-C-2M	2237.4
H-A-2M	652.8
H-B-2M	147.4
H-C-2M	1420.2
P-B-2M	1.3
P-C-2M	2.5
S-A-2M	18.8
S-C-2M	4.3
Y-A-2M	26.8
Y-B-2M	2.9
Y-C-2M	779.1

Block 2

AUnit	THLB Area
B-A-2M	15.5
B-B-2M	360.9
B-C-2M	21.0
C-A-2M	46.7
C-B-2M	422.5
C-C-2M	94.5
D-A-2M	54.1
D-B-2M	99.3
D-C-2M	1.6
F-A-2M	85.1
F-B-2M	325.8
F-C-2M	44.1
H-A-2M	382.3
H-B-2M	2438.7
H-C-2M	239.6
S-A-2M	6.2
S-B-2M	6.4
Y-A-2M	10.4
Y-B-2M	199.4
Y-C-2M	91.1

Block 3

AUnit	THLB Area
B-A-2M	12.3
B-B-2M	410.2
B-C-2M	15.7
C-A-2M	4.3
C-B-2M	322.2
C-C-2M	108.2
F-A-2M	7.5
F-B-2M	98.6
F-C-2M	30.2
H-A-2M	123.3
H-B-2M	1633.0
H-C-2M	150.4
Y-B-2M	108.1
Y-C-2M	38.8

Block 5

AUnit	THLB Area
B-A-2M	61.5
B-B-2M	276.6
B-C-2M	22.6
C-A-2M	146.1
C-B-2M	742.2
C-C-2M	12.0
D-B-2M	128.1
H-A-2M	41.8
H-B-2M	3272.7
H-C-2M	110.5
S-A-2M	127.0
S-B-2M	351.0
S-C-2M	8.0
Y-B-2M	23.6
Y-C-2M	9.4

Block 6

AUnit	THLB Area
C-A-2M	0.6
C-B-2M	12.4
C-C-2M	66.4
D-A-2M	208.2
D-B-2M	631.4
D-C-2M	59.9
H-A-2M	307.4
H-B-2M	4357.6
H-C-2M	1045.3
S-A-2M	508.5
S-B-2M	4535.6
S-C-2M	750.6
Y-C-2M	24.5

1.1

[12] Yield curves that exceed TASS/Tipsy data ranges at older ages have had older data extrapolated from the last acceptable value according to the following formula: $Vol_{Age+10} = Vol_{Age}+(Vol_{Age}-Vol_{Age-10})/2$

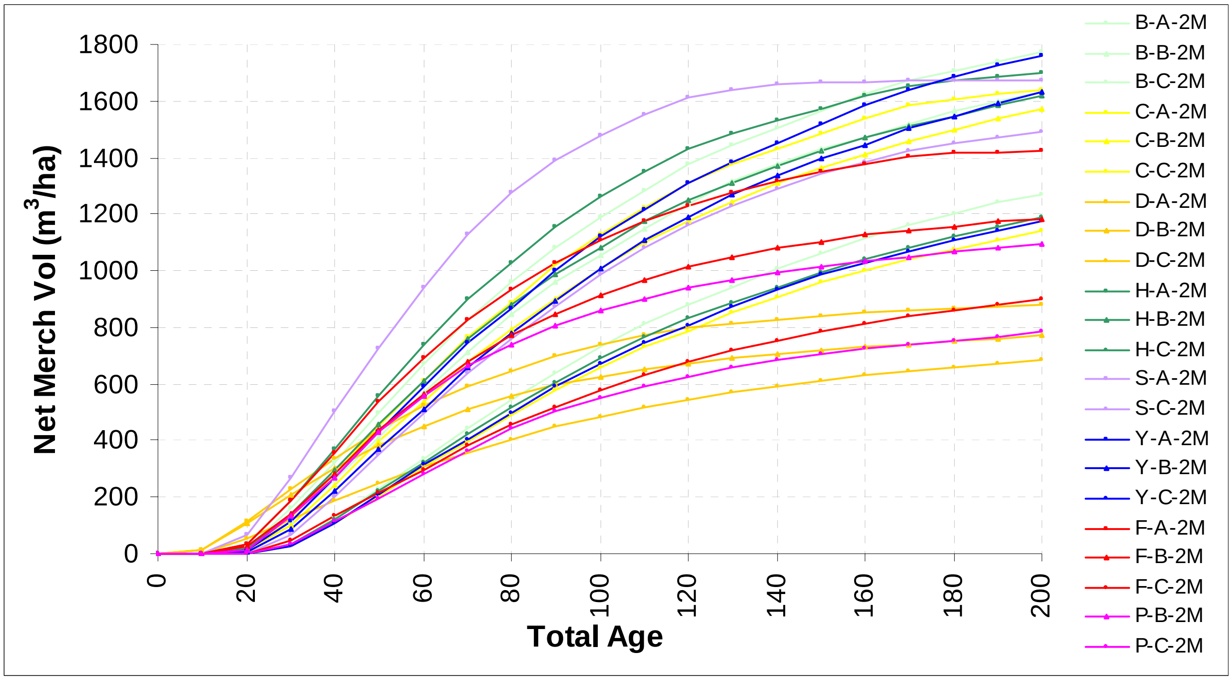


Figure 7 – Yield curves for existing analysis units, <41 years – Block 1

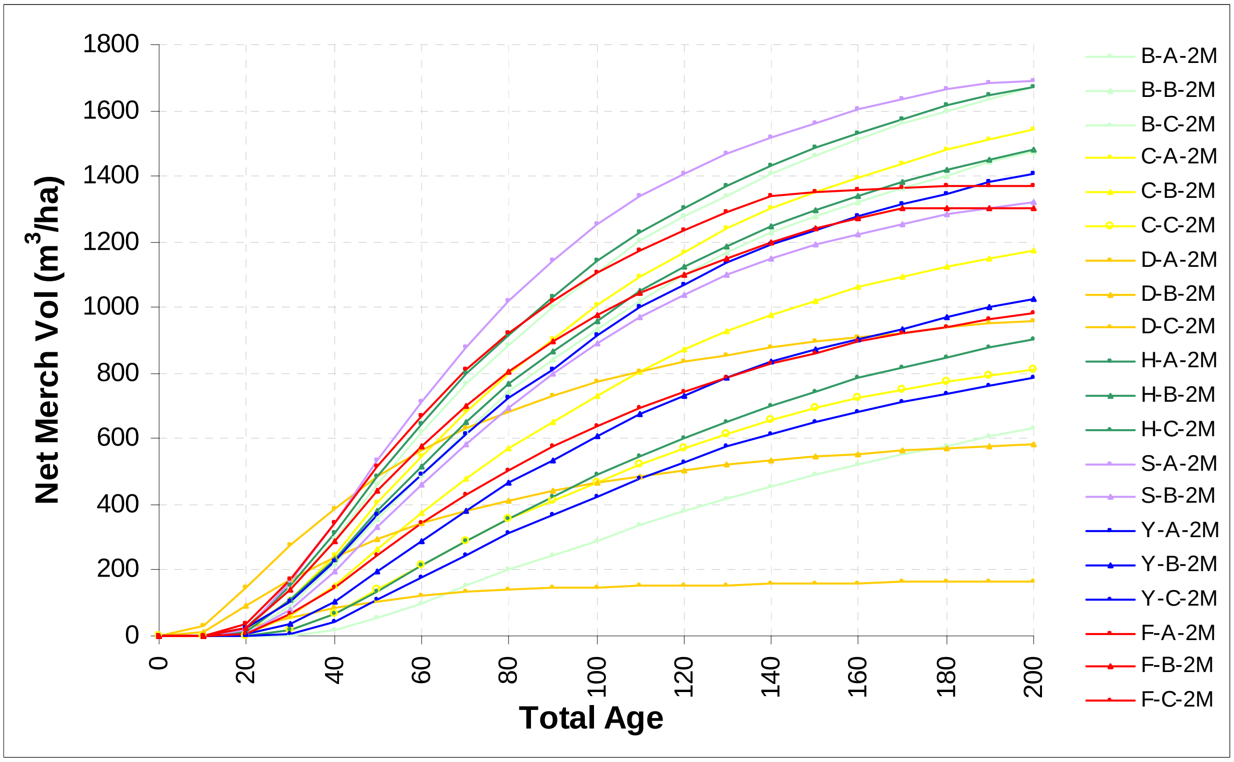


Figure 8 – Yield curves for existing analysis units, <41 years – Block 2

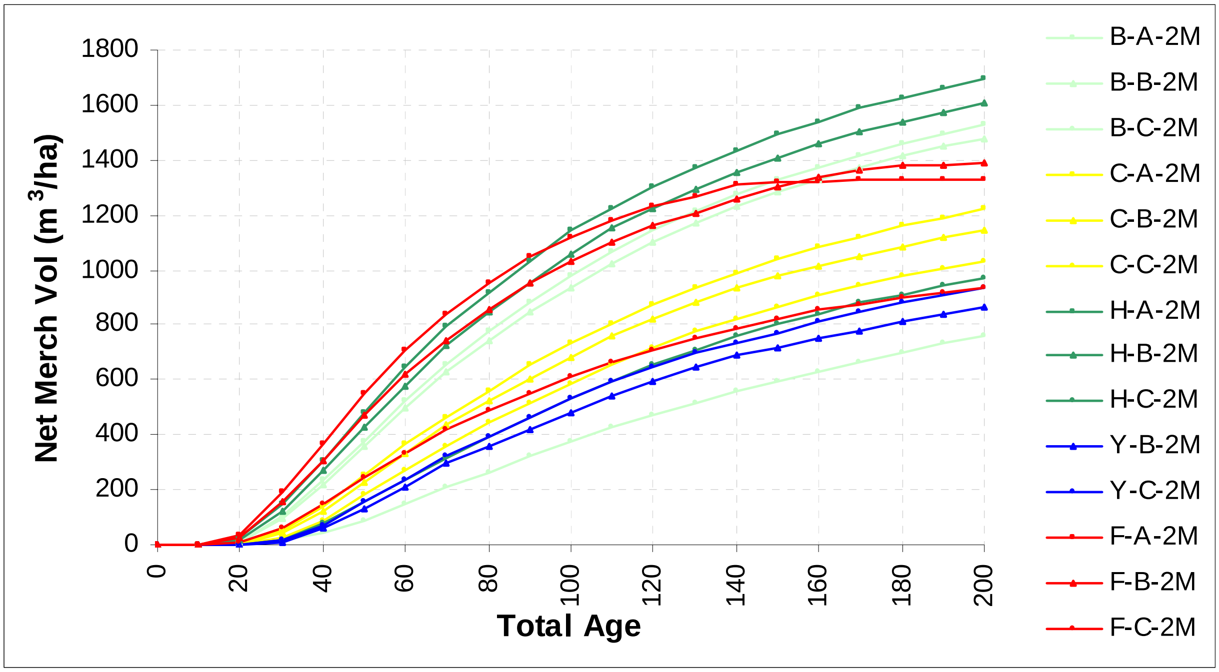


Figure 9 – Yield curves for existing analysis units, <41 years – Block 3

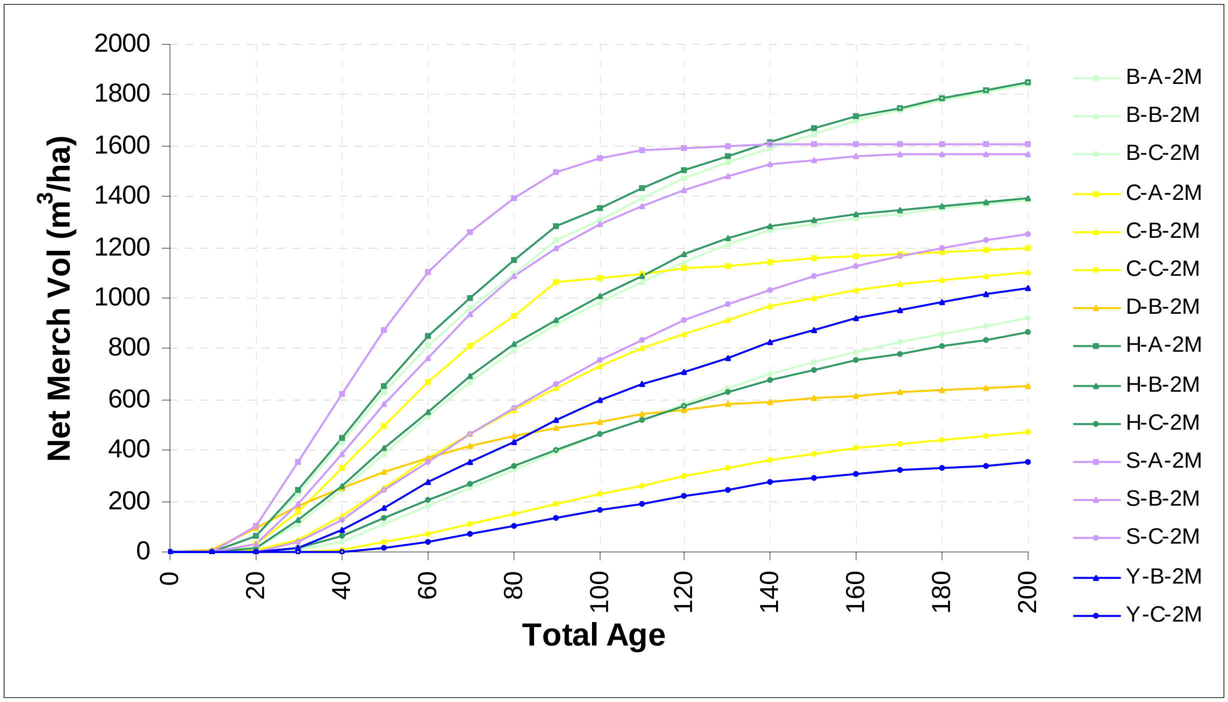


Figure 10 – Yield curves for existing analysis units, <41 years – Block 5

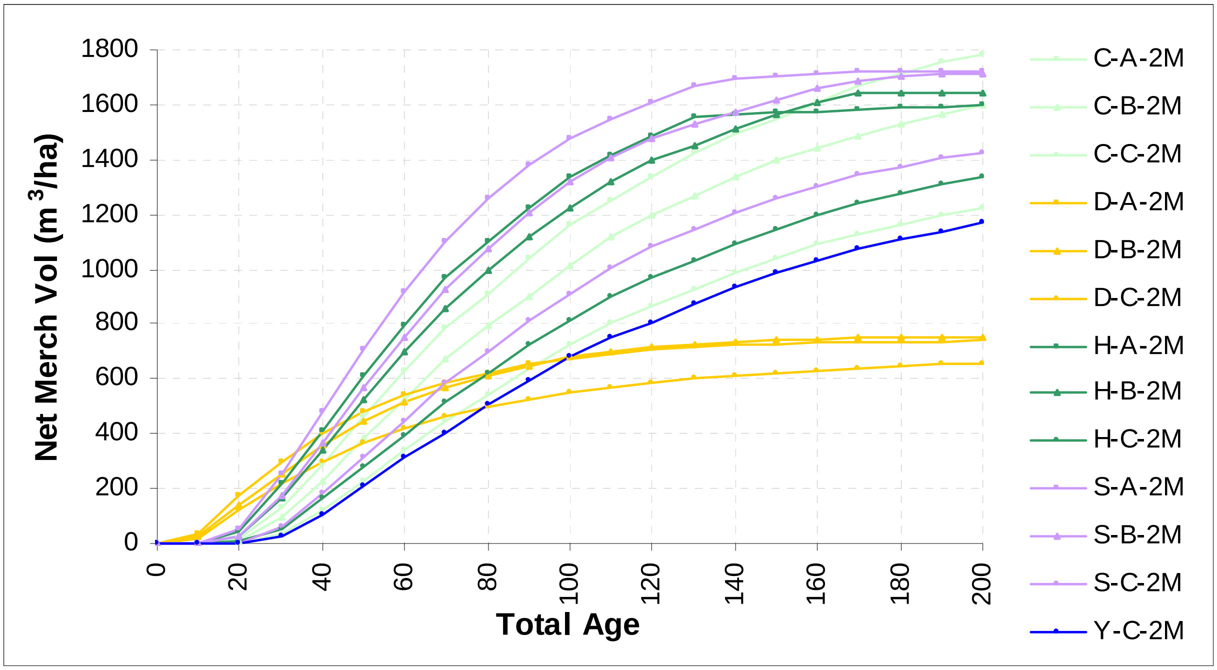


Figure 11 – Yield curves for existing analysis units, <41 years – Block 6

8.8.2 Future Stand Volumes

For future stands, a series of silviculture strategies were derived based on what is currently being done on the TFL and what Western Forest Products intends to do in the future. These silviculture strategies were based on ecological units. Input information is given in Table 58Table 58. Utilization limit was 12.5 cm and regeneration delay is to be applied within the timber supply model. OAF 2 in Block 1 Fir leading analysis units have been adjusted to reflect estimates of Phellinus root rot (see Section 8.5)

Fertilization is modelled for Block 1 only. A late rotation (55 year old) fertilization curve for Douglas fir mixed stands on productivity group B sites was developed by first running a pure Douglas Fir stand in Tipsy using the default fertilization gain of 30m^3/ha, calculating the net gain by comparing it to a unfertilized pure fir stand and using this net gain to adjust the untreated fir mixed stand defined for analysis unit F-B-P. Fertilization of Cedar leading stands on productivity group C sites is modelled by assuming a shift in the productivity to the next highest group.

Table 58 – Silviculture strategies for future stands[13]

Block	Aunit	Ecosystem	Sp 1	%	SI	Sp 2	%	SI	Sp 3	%	SI	Sp 4	%	SI	Initial Density	Regn	OAF 1	OAF 2	Fert
1	F-A-P	A5	Fd	75	34.9	Cw	20	26.0	Ba	5	28.8				1000	P	11	5.6	
1	S-A-P	S3, S13	Ss	40	34.4	Ba	30	28.8	Cw	20	26.0	Hw	10	31.3	1000	P	11	5	
1	H-A-P	S1HA, M3, S15	Hw	60	31.3	Ba	30	28.8	Cw	5	26.0	Fd	5	34.9	1000	P	11	5	
1	F-B-P_F	A1, A2, L3, L1	Fd	80	32.3	Cw	10	25.0	Hw	10	28.8				1000	P	11	9.8	Yes
1	F-B-P	A1, A2, L3, L1	Fd	80	32.3	Cw	10	25.0	Hw	10	28.8				1000	P	11	9.8	
1	F-C-P	N1, L2, N2, A3	Fd	90	24.1	Cw	10	20.6							1000	P	11	5.7	
1	C-C-P_F	A6, S1CH, S6, M4	Cw	90	25.0	Hw	10	28.8							1300	P	11	5	Yes
1	C-C-P	A6, S1CH, S6, M4	Cw	90	20.6	Hw	10	21.4							1300	P	11	5	
1	H-C-P	S2, M1, M2, MH1	Hw	50	21.4	Cw	25	20.6	Ba	25	23.0				1000	P	11	5	
2	S-A-P	S3, S13	Ss	40	29.8	Ba	30	29.1	Cw	20	23.8	Hw	10	30.3	1000	P	15	5	
2	C-A-P	S5, ST5, ST13	Cw	30	23.8	Ba	30	29.1	HW	30	30.3	Fd	10	36.6	1000	P	15	5	
2	H-B-P	S1HA, ST1, M1, MT5	Hw	50	28.1	Ba	40	26.0	Cw	10	20.1				1000	P	15	5	
2	H-B-N	MT1, MT15, M5	Hw	40	28.1	Ba	40	26.0	Yc	20	20.1				4000	N	15	5	
2	H-C-P	M2, S2, ST2	Hw	50	17.6	Cw	20	17.2	Yc	20	17.2	Fd	10	30.7	1000	P	15	5	
2	H-C-N	MH1, MT2	Hw	40	17.6	Ba	30	19.3	Cw	30	17.2				4000	N	15	5	
3	S-A-P	S3, S13, M3	Ss	40	30.6	Ba	30	27.3	Cw	20	20.2	Hw	10	30.6	1000	P	15	5	
3	H-B-P	S1HA, M1	Hw	50	28.9	Ba	30	26.8	Yc	20	19.3				1000	P	15	5	
3	C-C-P	S15, S6, S1CH	Cw	80	17.9	Hw	20	19.7							1000	P	15	5	
3	Y-C-N	M4, MH1	Yc	60	17.9	Hw	20	19.7	Ba	20	20.9				4000	N	15	5	
3	H-C-P	M2, S2	Hw	60	19.7	Yc	40	17.9							1000	P	15	5	
5	S-A-P	CWH vm1, vh2	Ss	70	39.4	Cw	20	26.2	Ba	10	33.7				1000	P	15	5	
5	H-A-P	CWH vm2	Hw	50	33.2	Yc	40	26.2	Ba	10	33.7				1000	P	15	5	
5	H-B-P	CWH vm1	Hw	70	27.2	Ba	20	27.7	Cw	10	20.2				1000	P	15	5	
5	Y-B-P	CWH vm2	Yc	40	20.2	Hw	40	27.2	Ba	20	27.7				1000	P	15	5	
5	C-B-P	CWH vh2	Cw	50	20.2	Yc	30	20.2	Hw	20	27.2				1000	P	15	5	
5	H-B-X	MH mm1, wh1	Hw	60	27.2	Yc	20	20.2	Ba	20	27.7				1000	P	15	5	
5	H-C-P	CWH vm1	Hw	50	19.2	Cw	40	12.2	Ba	10	18.7				1000	P	15	5	
5	Y-C-P	CWH vm2	Yc	50	12.2	Cw	30	12.2	Hw	20	19.2				1000	P	15	5	
5	C-C-P	CWH vh2	Cw	50	12.2	Yc	50	12.2							1000	P	15	5	
5	H-C-N	MH mm1, wh1	Hw	60	19.2	Yc	40	12.2							4000	N	15	5	
6	S-A-P	Q5	Ss	80	33.4	Hw	10	30.6	Cw	10	25.5				1000	P	11	5	
6	S-B-P	Q1, Q1C, Q6, Q12	Ss	80	30.0	Cw	10	24.2	Hw	10	28.7				1000	P	11	5	
6	S-C-P	Q2, Q3, Q15, H5, M3	Ss	80	23.8	Hw	10	22.7	Cw	10	20.6				1000	P	11	5	
6	H-C-P	M1, M1C, M7, H13, H1	Hw	80	23.8	Yc	20	20.6							1000	P	11	5	

1.1

[13] Yield curves that exceed TASS/Tipsy data ranges at older ages have had older data extrapolated from the last acceptable value according to the following formula: $Vol_{Age+10} = Vol_{Age}+(Vol_{Age}-Vol_{Age-10})/2$

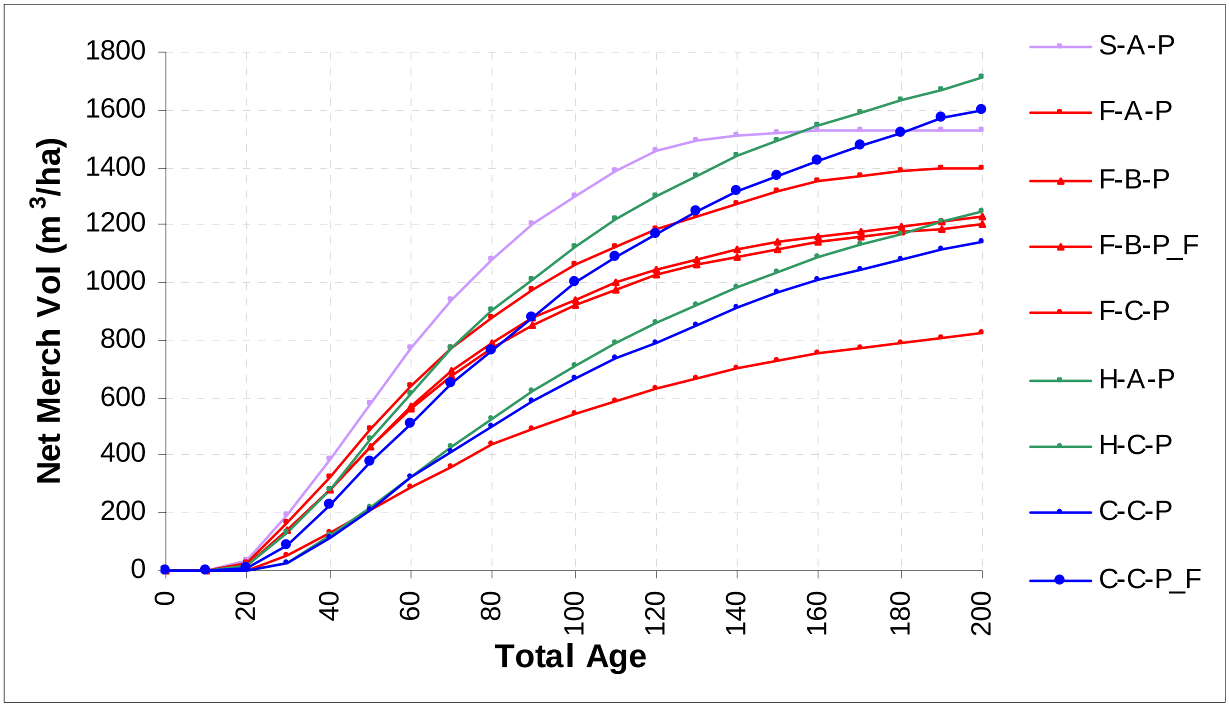


Figure 12 – Yield curves for future stands – Block 1

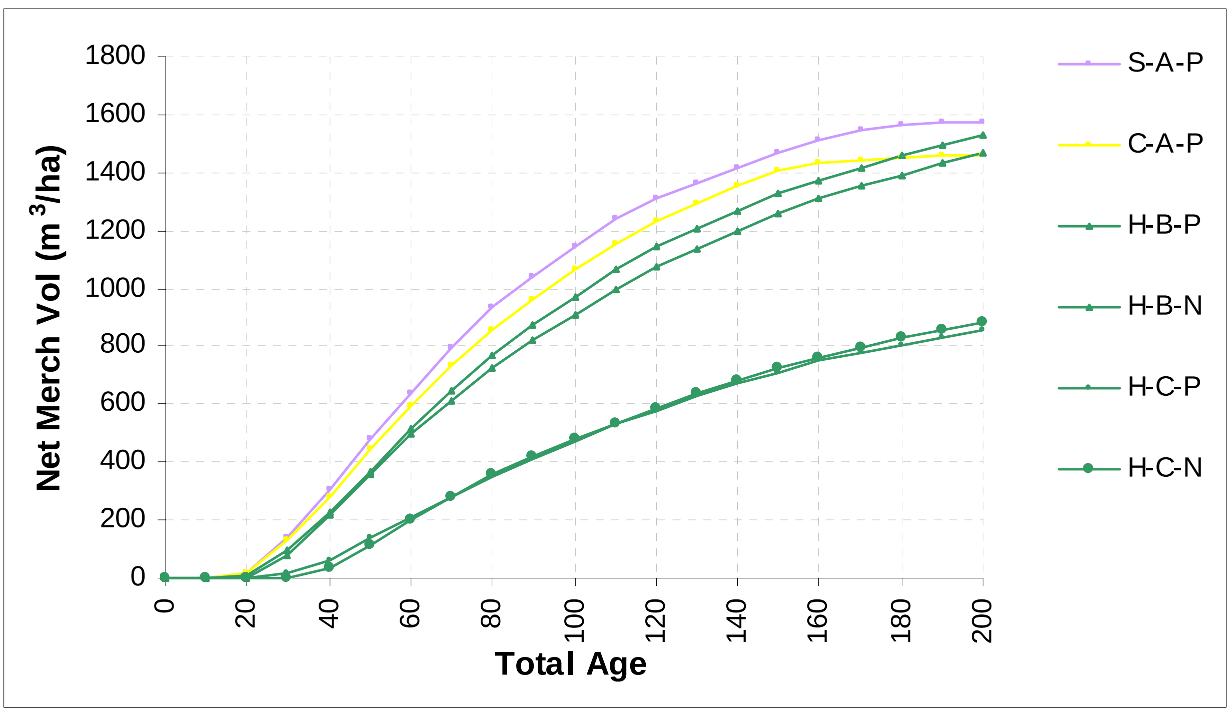


Figure 13 – Yield curves for future stands – Block 2

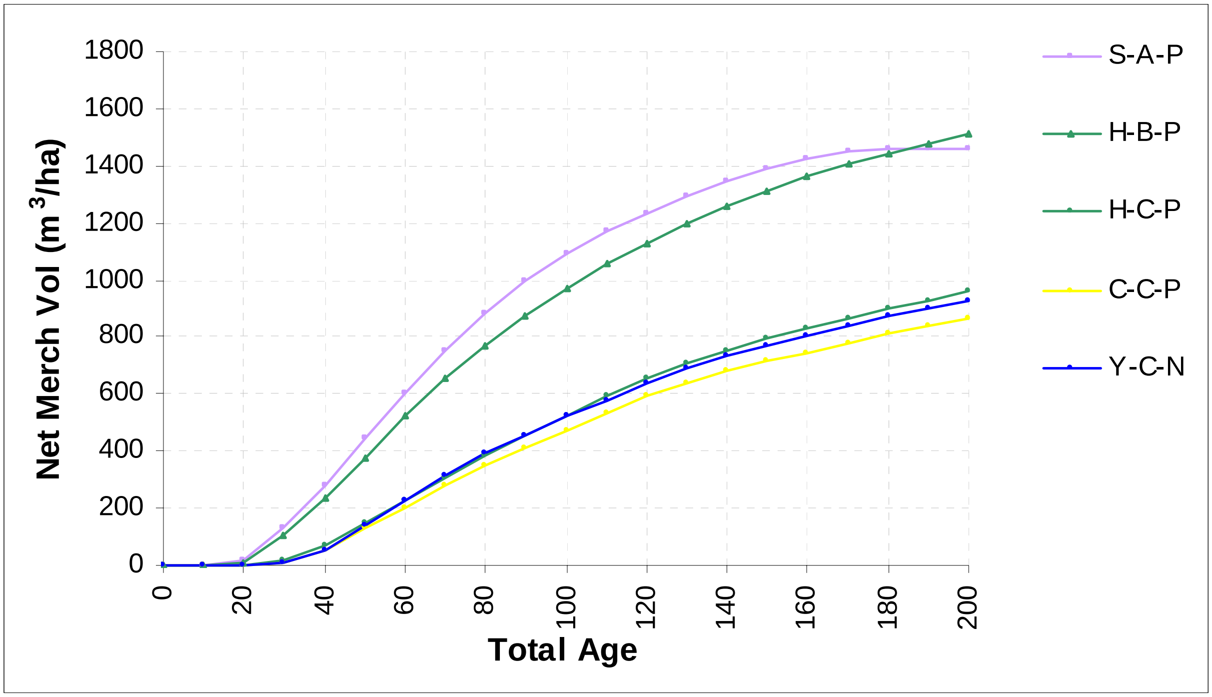


Figure 14 – Yield curves for future stands – Block 3

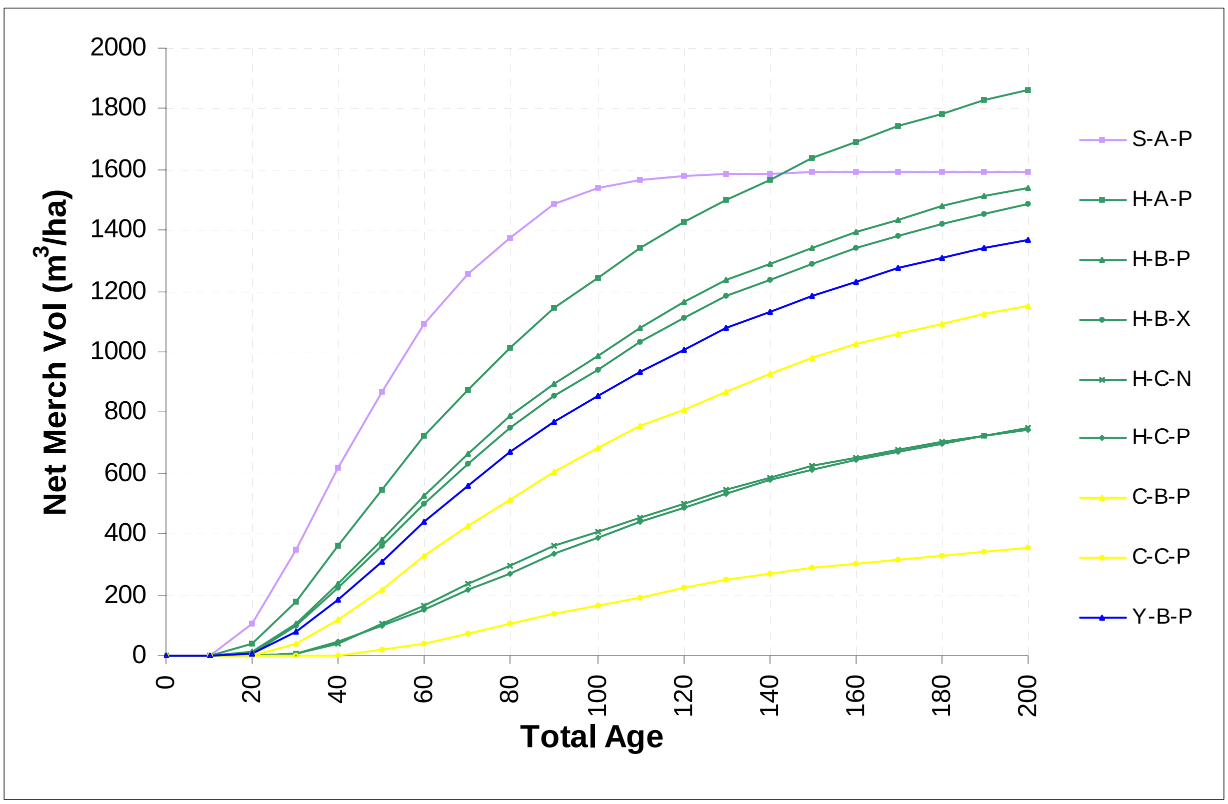


Figure 15 – Yield curves for future stands – Block 5

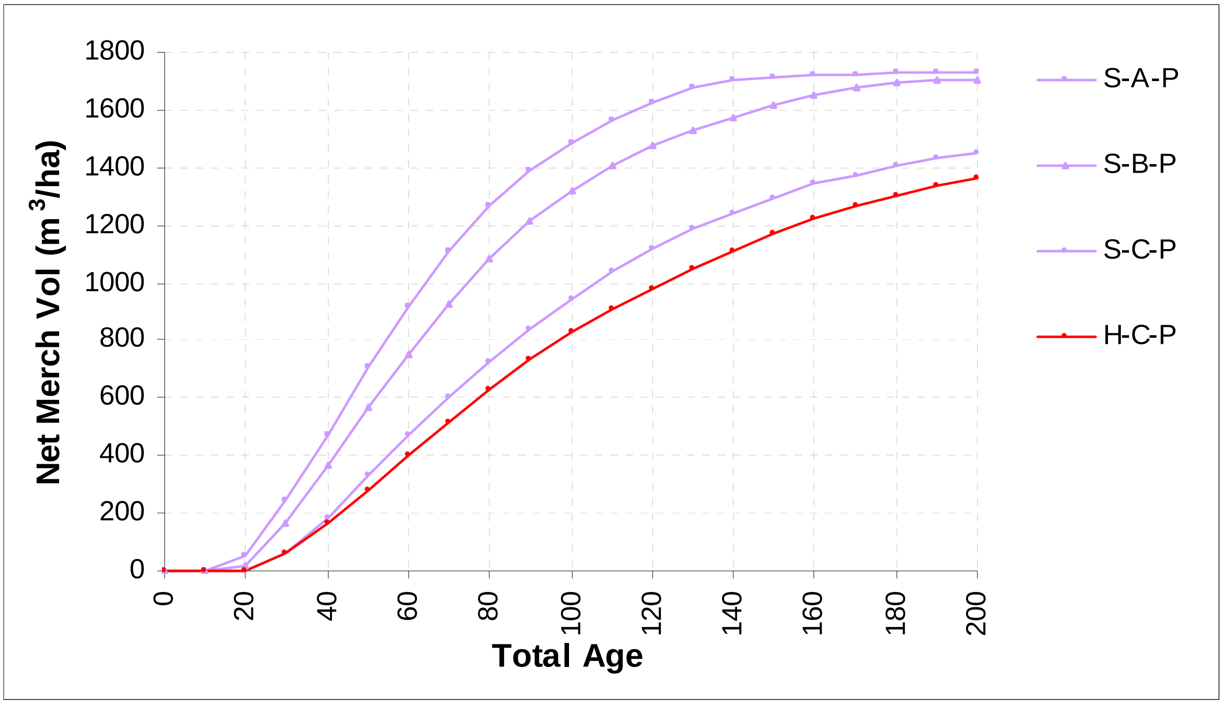


Figure 16 – Yield curves for future stands – Block 6

8.8.3 Genetic gains for future stands

Genetic gains for future stands will be modelled by applying the gains specified in Table 59.

Table 59 – Genetic gain by regeneration era

Species	Elevation (m)	Block 1		Block 2		Block 3		Block 5		Block 6	
		2001-06	2007+	2001-06	2007+	2001-06	2007+	2001-06	2007+	2001-06	2007+
Cw	0 – 600	2%	8%	2%	8%	2%	8%	2%	8%	2%	5%
Fd	0 – 600	10%	12%	10%	12%	10%	12%				
Fd	600 – 1200	6%	6%	6%	6%						
Hw	0 – 600	12%	14%	12%	14%	12%	14%			2%	5%
Hw	600 – 1200	2%	7%	2%	7%	2%	7%				
Ss	0 – 600	2%	5%	2%	5%	2%	5%	2%	5%	2%	7%
Yc	All	8%	18%	8%	18%	8%	18%	8%	18%	8%	18%

8.8.4 Regeneration Delay

The regeneration delay refers to the average time elapsed between harvesting and establishment of new plantations on the TFL. For most sites in the TFL actual regeneration delay is around 2.0 years or better. However, with time-of-planting fertilization, which is current management practice on most sites, an “effective” one-year reduction of regeneration delay is appropriate and conservative. For modelling proposes a 1 year regeneration delay will be used for all planted stands and a 3 year regeneration delay will be assigned to naturally established stands. Regeneration delay will be applied in the timber supply model, not in the TIPSY yield model.

8.8.5 Regeneration Assumptions

The assignment of future regeneration analysis units is based on the ecosystem classification grouping for Blocks 1, 2, 3 and 6. As ecosystem mapping is still unavailable for Block 5, future stand analysis units are assigned based on productivity class and biogeoclimatic mapping. The timber supply analysis for the TFL will use the regeneration assumptions outlined in Table 60.

Table 60 – Regeneration assumptions

Block	Future Analysis Unit	Ecosystem
1	F-A-P	A5
1	S-A-P	S3, S13
1	H-A-P	S1HA, M3, S15
1	F-B-P_F	A1, A2, L3, L1
1	F-B-P	A1, A2, L3, L1
1	F-C-P	N1, L2, N2, A3
1	C-C-P_F	A6, S1CH, S6, M4
1	C-C-P	A6, S1CH, S6, M4
1	H-C-P	S2, M1, M2, MH1
2	S-A-P	S3, S13
2	C-A-P	S5, ST5, ST13
2	H-B-P	S1HA, ST1, M1, MT5
2	H-B-N	MT1, MT15, M5
2	H-C-P	M2, S2, ST2
2	H-C-N	MH1, MT2
3	S-A-P	S3, S13, M3
3	H-B-P	S1HA, M1
3	C-C-P	S15, S6, S1CH
3	Y-C-N	M4, MH1
3	H-C-P	M2, S2
5	S-A-P	CWH vm1, vh2
5	H-A-P	CWH vm2
5	H-B-P	CWH vm1
5	Y-B-P	CWH vm2
5	C-B-P	CWH vh2
5	H-B-X	MH mm1, wh1
5	H-C-P	CWH vm1
5	Y-C-P	CWH vm2
5	C-C-P	CWH vh2
5	H-C-N	MH mm1, wh1
6	S-A-P	Q5
6	S-B-P	Q1, Q1C, Q6, Q12
6	S-C-P	Q2, Q3, Q15, H5, M3
6	H-C-P	M1, M1C, M7, H13, H1

8.8.6 Species Conversion

A small amount of non-productive brush type (NP BR) is converted on a yearly basis within the TFL. This type occurs in small patches and is usually contiguous to or surrounded by productive forest land. These areas are site prepared in conjunction with the harvested area and planted. As the area converted on a yearly basis is difficult to quantify but thought insignificant, it will not be explicitly modelled but a slight positive impact on future timber supply may be realized operationally.

8.9 Silviculture History

8.9.1 Existing Managed Immature

The silviculture program in TFL 25 has been fairly aggressive since the 1960s with 78% of all stands harvested being planted. Brush control is regularly used to ensure time to free growing is minimized. A fair sized fertilization program has been ongoing in Blocks 1 and 6 throughout the 1990s with a small pruning program in Blocks 1, 2 and 6.

8.9.2 Backlog and Current Not Sufficiently Restocked (NSR) Areas

As of January 1, 2001 the total area of NSR in TFL 25 amounted to 2,979.8 ha. Of the NSR area within the TFL, 2,625.0 ha are in the timber harvesting land base with the remainder in constrained areas. Currently, 51.4 ha of backlog areas are reported in the GIS; however, operational staff estimates indicate that most of these area are incorrectly classified and are in fact SR or NP. Natural NSR areas, blow-down and old slash fire escapes, are also reported in the GIS (194.1 ha). In Blocks other than 1 and 6, these areas are also believed to be incorrectly classified and are most likely fully stocked stands. Western Forest Products' target is to re-stock denudated areas within two years of harvest.

Table 61 – NSR area

Block	THLB	Non-THLB	Total Area (ha)
1	610.6	24.0	634.6
2	572.1	22.5	594.6
3	113.6	12.4	126.0
5	1099.2	147.3	1,246.5
6	229.5	148.6	378.1
Total	***2,625.0***	***354.8***	***2,979.8***

Timber supply analysis assumption for dealing with reported NSR is as follows:

- Backlog NSR and Natural NSR areas are assumed fully stocked and will be assigned to an existing managed stand and given an age of 10 years.
- Current NSR will be regenerated to the appropriate future Analysis Unit within the specified regeneration delay period.

9.0 NON-RECOVERABLE LOSSES

9.1 Overview

The intent of this section is to describe the non-recoverable losses that will be deducted from the calculated annual harvest. These losses include epidemic losses from insects, disease, wind-throw, fire, or other factors not otherwise accounted for in the analysis.

9.2 Insects and Disease

The forests of TFL 25 have been relatively free of major insect or disease infestations and therefore no losses are defined. There have been no recent catastrophic outbreaks causing significant unsalvaged mortality or volume losses.

Hemlock dwarf mistletoe is widespread throughout merchantable sized stands. Sanitation treatments of advanced regeneration are sometimes required to prevent the spread in newly regenerated western hemlock stands. Usually regenerated stands are not impacted significantly by hemlock dwarf mistletoe. Root diseases sometimes result in small pockets of mortality. These endemic losses are assumed accounted for in yield curves via the calibration plots or adjustment factors.

Blackheaded budworm and hemlock sawfly outbreaks have been documented in second growth, most recently in Block 6. However there is no evidence that growth losses have been significant, that they are unaccounted for in PSP re-measurements, or that they warrant additional adjustment factors. Studies currently underway in Block 6 may improve knowledge of long-term budworm impacts.

9.3 Wind-Throw

Recently, wind-throw has been isolated in relatively small areas within TFL 25. WFP has maintained an aggressive program of salvaging wind-thrown stands that are relatively accessible. Any large windthrown areas that have occurred historically are accounted for in updates to the forest inventory. A ledger system has been developed to monitor ongoing damage and salvage occurring within the TFL.

9.4 Fire

The risk of loss of timber due to fire is moderate to low within the TFL. The bulk of the TFL has a wet climate characterized by cool, wet summers and fire suppression has been efficient; hence the likelihood of losses to forest fire is small. Any large fires that have occurred historically are accounted for in updates to the forest inventory.

9.5 Other

Other potential risks of loss of timber could include landslides, snow avalanches, theft, or wilful damage. Landslides are added to the forest cover as NSR or NP as they occur and are therefore reflected in the inventory. Timber losses in any Management Plan period are typically small and are included in the timber loss ledger system. We are unaware of any significant losses to theft.

9.6 Summary

Table 62 – Annualized Timber Loss Summary

Block	Total (m3/yr)	Inoperable (m3/yr)	Operable (m3/yr)	Ledger length (yrs)	NRL adjustment (m3/yr)
1	800	40	760	6	800
2	633	0	633	3	700
3	1,063	475	588	8	600
5	63	63	0	3	400[14]
6	1,500	357	1,143	7	1,200

For the purposes of converting non-recoverable loss volumes for reducing area harvest calculations, the volume suggested will be divided by average mature volume/ha to estimate associated non-recoverable loss area.

1.1

[14] The ledger record for Block 5 only samples current operating areas. All losses away from current operations would be non-recoverable. Assuming that the current operating areas represent roughly 20% of total area, the total loss figure was multiplied by a factor of 5 and rounded upward as was the case for the other blocks

10.0 INTEGRATED RESOURCE MANAGEMENT

10.1 Overview

The intent of this section is to give an overview of the resource inventories available and being used for the timber supply review. The section also describes other resource management information that is being utilized for planning within TFL 25.

10.2 Forest Resource Inventory

Table 63 summarizes the forest resource inventories currently being maintained for the TFL.

Table 63 – Forest resource inventory status

Item	Block	Status	MOF Acceptance	Plan
Forest Cover (Timber Inventory)	1	Completed 1999 to Vegetative Resource Inventory (VRI) Standards. Updated annually, currently to January 1, 2001.	Yes, RIB accepted 1999	VRI ratio adjustments and NVAF information still under review.
	2	Completed 1971. Updated annually, currently to January 1, 2001.	Yes	New inventory started in 2001.
	3			
	5	Completed 1985. Updated annually, currently to January 1, 2001.	Yes	New inventory to begin once land use issues are resolved.
	6	Completed 2000 to Vegetative Resource Inventory (VRI) Standards. Updated annually, currently to January 1, 2001.	Yes, RIB accepted 2000	VRI ratio adjustments and NVAF information still under review.
Ecosystems	1	Completed 1988 by T. Lewis. Inventory completed to WFP standards. Minor updates and revisions completed in 1999.	Yes	
	2	Completed 1994 and 1995 by T. Lewis. Inventory completed to WFP standards. Minor updates and revisions completed in 1999.	Yes	
	3	Completed 1988 by T. Lewis. Inventory completed to WFP standards. Minor updates and revisions completed in 1999.	Yes	
	5	In progress. Inventory started in 1999 and is expected to be complete early 2002.		
	6	Completed 1981 by T. Lewis. Inventory completed to WFP standards.	Yes	Revision mapping scheduled for 2001/02
Terrain Stability	1	Completed 1992 by T. Lewis. Reclassified to MOF standards 1996	Yes	
	2	Completed 1994 (Stafford), 1995 (Apple) and 1996 (Heydon) by T. Lewis. Reclassified to MOF standards.	Yes	
	3	Completed 1992 by T. Lewis. Reclassified to MOF standards 1996.	Yes	
	5	Partial completion 1995 by Maynard (Yeo, Rodrick, Pooley), 1995 by T. Lewis (Neekas, Coldwell Penn.).		Remaining areas (except PRI) being completed as part of the ecosystem classification.
	6	Completed 1981 by T. Lewis. Reclassified to MOF standards 1996.	Yes	

Item	Block	Status	MOF Acceptance	Plan
ESA (Wildlife) (Recreation)	1	Completed 1992 by T. Lewis		ESA mapping has been replaced with detailed inventories. Use of ESA mapping will be minimal in MP10.
	2	Not done		
	3	Completed 1992 by T. Lewis		
	5	Completed 1985 by T. Lewis		
	6	Not done		
Wildlife	1 – 6	See Wildlife Studies – Section 3.1.11 of TFL 25 Management Plan		Inventory and research are intertwined.
Recreation Features Inventory	1	Completed 1992 by Recreation Resources Limited	Yes 09/14/95	Revision of all blocks is being carried out over the next two years to reflect changes to standards.
	2	Completed 1992 by Recreation Resources Limited	Yes 07/04/95	
	3	Completed Dec 01 by Recreation Resources Limited	Submitted Jan 2002	
	5	Completed 1996 by Recreation Resources Limited	Yes	
	6	Completed 1995 by Recreation Resources Limited	Yes	
Recreation Opportunity Spectrum Analysis	1	Completed 1995 by Recreation Resources Limited	Yes 09/14/95	Revision of all blocks is being carried out over the next two years to reflect changes to standards.
	2	Completed 1994 by Recreation Resources Limited	Yes 07/04/95	
	3	Completed Dec 01 by Recreation Resources Limited	Submitted Jan 2002	
	5	Completed 1996 by Recreation Resources Limited	Yes	
	6	Completed 1995 by Recreation Resources Limited	Yes	
Visual Landscape Inventory	1	Completed 1994 by Recreation Resources Limited	Yes 03/01/95	Designation of recommended VQOs (rVQO) were established under a Visual Mitigation Strategy conducted in 1998. Revision of all blocks is being carried out over the next two years to reflect changes to standards.
	2	Completed 1994 by LA West Landscape Architects	Yes 07/04/95	
	3	Completed Dec 2001 by Recreation Resources Limited	Submitted Jan 2002	
	5	Partial completed 1994 by LA West (Yeo, Coldell, Neekas, Susan, Roderick, Pooley). Remaining area completed 1995 by Recreation Resources Limited	Yes	
	6	Completed 1995 by Recreation Resources Limited	Yes	
Stream Classification	1 – 6	Ongoing – Operational classification is being integrated into overview inventory for all blocks. Conversion from old A,B,C classification to FPC "S" class has been completed or is approximated.	MP 10 uses existing information supplemented with GIS slope analysis to derive overview stream classifications.	Continue to update inventory as new operational data becomes available. RIC 1:20 overview mapping will be incorporated as it becomes available.
Archaeological Overview Assessment (AOA)	1	Not done		
	2	Not done		
	3	Not done		
	5	Completed 2000 by Golders Associates. Funded by FRBC	Yes 2000	
	6	Ongoing FRBC project in place for QCI.		Expected completion date 2002.
Operability	1	Completed 2000 by WFP. Inventory contains classification for operability by harvest system and economic conditions.	Submitted to Districts in May 2001	
	2			
	3			
	5			
	6			

10.3 Forest Cover Requirements

10.3.1 Forest Cover Objectives - Rationale

The rationale for each forest cover objective reported in the timber analysis is described below. The rationales are based on the unique attributes of each TFL Block.

10.3.1.1 Visual Quality

For all Blocks other than Block 3, visual quality is currently being managed to the recommended visual quality class (rVQC) as established during the Visual Mitigation Strategy conducted in 1998. A revised inventory for Block 3 was completed in December 2001, which identifies revised rVQC based on existing landscape conditions and management goals. Recommended Visual Quality Classes to be modelled in the timber supply analysis are Preservation (P), Retention (R), Partial Retention (PR) and Modification (M). The amount of area that can be disturbed (i.e. has not achieved visually effective green-up) is 1%, 5%, 15% and 25% for each rVQC respectively. These levels are set at the upper end of the % denudation range for use in timber supply analyses to reflect the successful implementation of visual landscape design during cutblock layout in sensitive viewscapes.

A 6 m visually effective green-up (VEG) height is proposed for Blocks 5 and 6, 5 m is proposed for other blocks.

Table 64 to Table 68 outlines the management assumptions for dealing with visual quality within each block of the TFL. The areas reported are based on the results of the visual mitigation strategy completed in 1998.

Block 1

As part of the visual mitigation strategy conducted in 1998, Block 1 was divided into three Scenic Classes that defined the level of management for individual rVQCs. Scenic Class 1 rVQCs are to be managed to traditional timber supply assumptions, Scenic Class 2 rVQCs are to be managed to the upper limit of VQC % denudation range, and Scenic Class 3 rVQCs are considered non-visible and are not managed for scenic values. For simplicity, the small amount of area falling in Scenic Class 1 will be assumed Scenic Class 2 for timber supply modelling.

Table 64 – Visual Quality Management Assumptions – Block 1

Scenic Class	rVQC	Productive Forest	THLB Area	Denudation %
1	R	2.6	2.2	5%
	PR	0.0	0.0	15%
	M	0.0	0.0	25%
2	R	67.1	63.5	5%
	PR	17.7	17.2	15%
	M	5,677.8	5,509.9	25%
3	R	23.8	22.7	N/A
	PR	0.0	0.0	N/A
	M	0.0	0.0	N/A

Block 2

As part of the visual mitigation strategy conducted in 1998, rVQC polygons were defined in the lower reaches of the Stafford and Apple valleys and around Stafford Lake. The Heydon Bay unit as well as the upper ends of the Stafford and Apple valleys were identified as not requiring objectives for the maintenance of scenic values.

Table 65 – Visual Quality Management Assumptions – Block 2

rVQC	Productive Forest	THLB Area	Denudation %
R	0.0	2.2	5%
PR	861.8	728.3	15%
M	4,103.2	2,343.0	25%

Block 3

A revised inventory was completed in December of 2001, which re-examined the existing visual condition of Block 3 and re-classified the landscape to ensure the maintenance of scenic values. This inventory was completed using the methodology outlined in the Ministry of Forests – Visual Landscape Inventory, Procedures and Standards dated May 1997.

Table 66 – Visual Quality Management Assumptions – Block 3

rVQC	Productive Forest	THLB Area	Denudation %
PR	4,519.9	3,338.8	15%
M	1,121.8	747.9	25%

Block 5

As part of the visual mitigation strategy conducted in 1998, the requirement for visual management around inland lakes in the Mid Coast Forest District was eliminated. In the North Coast Forest District revisions to scenic management included the relaxation of visual constraints in areas away from the main marine travel corridor between Princess Royal Island and the Mainland.

Table 67 – Visual Quality Management Assumptions – Block 5

rVQC	Productive Forest	THLB Area	Denudation %
P	133.4	74.2	1%
R	6,499.4	3,227.6	5%
PR	33,161.8	14,299.7	15%
M	21,290.4	8,999.5	25%

Block 6

As part of the Visual mitigation strategy conducted in 1998, minor revisions to the visual landscape inventory for Block 6 were completed whereby areas away from major marine travel corridors were assigned a less restrictive rVQC.

Table 68 – Visual Quality Management Assumptions – Block 6

rVQC	Productive Forest	THLB Area	Denudation %
R	665.4	350.9	5%
PR	15,110.8	7,778.7	15%
M	10,284.7	4,660.3	25%

10.3.1.2 Wildlife

10.3.1.2.1 Ungulate winter range

To date there has been no formal designation of ungulate winter ranges within TFL 25. There has been some modelling work carried out in Blocks 1, 2 and 3, which predicts suitable winter range, as well as a number of field deer winter range assessments in Block 2. These modelled results and field assessments are being used at the Landscape Unit planning level in guiding suitable locations for Old Growth Management Areas.

10.3.1.2.2 Identified wildlife

To date there have been no Wildlife Habitat Areas delineated in TFL 25.

10.3.1.3 Adjacent Cutblock Green-up

For Blocks 1 and 3, the Vancouver Island Land Use Plan and associated Higher Level Plan provide for a 3 metre green-up height in General and Special Resource Management Zones and a 1.3 metre green-up height in Enhanced Resource Management Zones. These green-up heights are proposed for areas without visual quality objectives.

For Blocks 2, 5 and 6, a green-up height of 3 metres is proposed for areas without visual quality objectives.

As described in Section 10.3.1.1, an age surrogate for each analysis unit will be used within the model to represent height.

10.3.1.4 Landscape Level Biodiversity

Due to ongoing land use planning in the Central Coast the current management option for Block 2 and 5 will have forest cover constraints imposed based on guidance provided in the *Provincial Guide for the Submission of Timber Supply Analysis Information Packages for Tree Farm Licences Version 4 – March 2001*. According to the policy, approximately 45 percent of the TFL will be in the lower BEO, 45 percent in the intermediate BEO and 10 percent in the high BEO. As a result, in the current management option the area-weighted average (i.e. 45/45/10) biodiversity constraints (old seral only) for the three BEOs will be applied for each variant in each Landscape Unit.
Sensitivity analyses will evaluate the impacts of managing for biodiversity as specified by the interim BEO ratings assigned to each Landscape Unit. Modelling of the management of

Landscape Units assigned Low, Intermediate and High BEO ratings will be guided by the Landscape Unit Planning Guidebook and, as indicated to date by government policy, only old seral targets will be modelled during the sensitivity.

For all other Blocks within TFL 25, landscape level biodiversity will be modelled by applying the old seral target specified by the interim BEO rating assigned to each Landscape Unit.

Table 69 – Landscape biodiversity assumptions

Current Management Option									
NDT 1		Early seral stage	Off		*Draw down acceptable in Low BEO Lunits*				
		Mature + old	Off		*Only if timber supply impact is noted*				
		Old seral stage	On		*All other Lunits are to be assigned the full constraint*				
					Implement old seral cover %				
					0 years		guidebook *0.33		
					70 years		guidebook *0.67		
					140 years		guidebook*1.0		
Block 2 and 5									
CWH					***MH***				
Time 0	H	19%*0.10	1.9	**9.7**	Time 0	H	28%*0.10	2.8	**14.2**
(OLD)	I	13%*0.45	5.9		*(OLD)*	I	19%*0.45	8.6	
	L	(13%*0.33)*0.45	1.9			L	(19%*0.33)*0.45	2.8	
Time 70	H	19%*0.10	1.9	**11.6**	Time 70	H	28%*0.10	2.8	**17.0**
(OLD)	I	13%*0.45	5.9		*(OLD)*	I	19%*0.45	8.6	
	L	(13%*0.66)*0.45	3.9			L	(19%*0.66)*0.45	5.6	
Time 140	H	19%*0.10	1.9	**13.6**	Time 140	H	28%*0.10	2.8	**19.9**
(OLD)	I	13%*0.45	5.9		*(OLD)*	I	19%*0.45	8.6	
	L	(13%*1.00)*0.45	5.9			L	(19%*1.00)*0.45	8.6	
Blocks 1, 3, and 6									
Old seral biodiversity targets									
		Low	Intermediate		High				
CWH		>13%	>13%		>19%				
MH		>19%	>19%		>28%				

10.3.1.5 Reductions to Reflect Volume Retention in Cutblocks

Where feasible and wildlife objectives can be met, wildlife tree patches (WTPs) are located in constrained areas such as riparian reserves, unmerchantable stands or unstable slopes. Existing WTPs are captured in the inventory. In order to capture future WTPs to be located in harvestable areas a volume reduction will be implemented in the timber supply model for all future harvesting. Management direction for WTP targets are available in the Biodiversity Guidebook and range from 0 to 18% depending on how much of the landscape is available for harvest. A preliminary analysis indicates that a WTP retention target of 13% represents a conservative estimate of what is being realized in the TFL. Assuming 75% of the WTP retention is in constrained areas (based on the *Forest Practices Code Timber Supply Impact Analysis*) a volume reduction of 3.25% (0.25x13%) is recommended for use to account for operable area in WTPs.

10.3.1.6 Community Watersheds

There are four community watersheds that overlap areas of TFL 25 Block 1. The largest of these watersheds are comprised primarily of private land outside of the TFL. Application of timber supply constraints in the model to emulate on the ground management is not a meaningful analysis, as activities outside the TFL are the primary hydrological driver. The smaller watersheds will also be managed sensitively on the ground, but modelling specific cover constraints for timber supply is expected to be inconsequential and therefore not worthwhile in this context.

Table 70 – Community Watersheds

CWS Code	CWS Name	CWS Gross Area (ha)	Productive Forest	THLB Area
930.008	Goudie Community Watershed	66.8	39.3	31.9
930.037	Charters Community Watershed	1,926.5	97.1	82.2
930.040	Leech Community Watershed	9,357.0	325.5	250.4
930.041	Mary Vine Community Watershed	307.8	182.5	151.6

10.3.1.7 Higher Level Plans

For Blocks 1 and 3, the order establishing Resource Management Zones and Resource Management Zone objectives within the area covered by the Summary Vancouver Island Land Use Plan came into effect as of December 1, 2000. All plans filed after April 1, 2001 are to conform to this order. WFP is conducting operations within the Resource Management Zones within these two blocks to meet the intent of the stated management objectives as outlined in Table 27. For modelling purposes, current management constraints such as visual quality, green-up (as per Section 10.3.1.3) and old seral stage targets for Landscape Units will adequately address RMZ objectives for General and Enhanced zones, hence no additional forest cover constraints are being modelled specifically for these RMZ objectives. In Block 1, the primary objective for Special Management Zone 22 is the maintenance of recreational and scenic values along the Kludahk Trail. As a detailed inventory has yet to be completed along the trail, modelling of the SMZ objectives will be met by applying a cover constraint that retains at least 50% of the forested landbase within the SMZ in ages >140 years throughout the planning horizon.

For Block 2 and 5, which are part of the Central Coast Land and Coastal Resource Management Plan (CCLCRMP), an interim agreement was reached in April of 2001 where government announced its acceptance of the recommendations of the CCLCRMP. These recommendations related to candidate protection areas, special management zones and "Options areas" on which land-use decisions remain to be taken. As the CCLCRMP has not been established as a Higher Level Plan, and is therefore not yet conclusive, its tentative management recommendations are not reflected in current management assumption. Instead, sensitivity analyses will be used to evaluate the implication for timber supply of 1) removing the candidate protection areas from the THLB, and 2) removing both the candidate protection areas and "option areas" from the THLB. The following table outlines the CCLCRMP recommendations as they pertain to TFL 25.

Table 71 – CCLCRMP Recommendations – Block 2 and 5

Block	Candidate Protection Areas		Option Areas		Total THLB
	Productive Forest	THLB Area	Productive Forest	THLB Area	
2	383.5	203.2	0.0	0.0	203.2
5	39,030.4	15,235.2	44,846.5	19,685.1	34,920.3

10.4 Timber Harvesting

10.4.1 Minimum Harvestable Age

Minimum harvestable ages are simply minimum criteria. While harvesting may occur in stands at the minimum requirements in order to meet forest level objectives (i.e. maintaining overall timber flows) many stands will not be harvested until well past the minimum timber production ages because consideration of other resource values takes precedence, or timber may be in ample supply elsewhere.

In the previous timber supply analysis, target quadratic mean diameters (DBHq) were used for good, medium, and poor sites (45, 40, 35 cm respectively) to set conservative minimum harvest ages. For model set-up purposes we propose to relax this constraint for each yield curve to the younger of (1) the age 95% of maximum MAI is attained or (2) the age 30cm DBHq is attained. However, rather than maximize harvest levels by forcing harvest at yield curve minimums and to facilitate development of area-based harvest regulation (where feasible), we intend to analyze overall average harvest DBHq through time for various area or volume-based harvest scenarios and choose a base case where average DBHq through the mid and long terms remains in the range of 30-40cm.

10.4.2 Operability

The criteria used to determine operability for use in the timber supply analysis are defined in the terms of reference submitted and approved by the Regional Manager, MOF – Vancouver Region May 2000. The Terms of Reference document can be found in the TFL 25 Management Plan and contains detailed information regarding the assumptions and criteria used.

Table 72 – Operability Summary

Block	Operability	THLB Area (ha)
1	Oc – Operable Conventional	25,142.3 (98%)
	Oh – Operable Helicopter	419.7 (2%)
	Total	***25,562.0***
2	Oc – Operable Conventional	11,995.1 (80%)
	Oh – Operable Helicopter	3,007.3 (20%)
	Total	***15,002.4***
3	Oc – Operable Conventional	8,600.0 (91%)
	Oh – Operable Helicopter	843.6 (9%)
	Total	***9,443.6***
5	Oc – Operable Conventional	51,577.6 (82%)
	Oh – Operable Helicopter	11,323.5 (18%)
	Total	***62,901.1***
6	Oc – Operable Conventional	22,446.6 (89%)
	Oh – Operable Helicopter	2,721.9 (11%)
	Total	***25,168.5***
Total	***Oc – Operable Conventional***	***119,761.6 (87%)***
	Oh – Operable Helicopter	***18,316.0 (13%)***
	Total	***138,077.6***

10.4.3 Initial Harvest Rate

Initially, the timber supply analysis will be set at a harvest level similar to that of the last approved AAC determination. Harvest rates will be set by individual blocks and will incorporate partitions associated with operable helicopter areas where appropriate. Partitions defined for commercial thinning volume, specifically in Block 1, will not be modelled in the current management analysis. Rates will be varied to meet the objectives stated in Section 10.4.7. Once a suitable flow is established sensitivity analyses will be performed. Should these analyses suggest an alternative flow pattern is warranted, additional runs may be initiated.

For area regulation, initial volume requests will be set 50% higher than indicated and a maximum annual area constraint imposed to restrict area harvest to typical existing annual area harvests as indicated in annual reports.

Table 73 – Initial Harvest Rates - Volume

Block	Conventional	Helicopter	Total
1	159,000	6,000	165,000
2	70,000	22,000	92,000
3	53,000	2,000	55,000
5	185,000	70,000	255,000
6	115,000	0	115,000
Total	*582,000*	*100,000*	*682,000*

10.4.4 Harvest Rules

Harvest rules priorize forest stands for harvest based on specified criteria. Since the timber supply model is spatially based, a couple of options are available to implement harvest rules. Like aspatial timber supply models, harvesting stands on an oldest first basis or by minimizing growth loss is available as harvest rules. However, an additional rule of closest to the log dump can be used. This rule allows the model to harvest in a pattern typical of actual operations. Additional rules can be placed on the model to control the harvest levels by operating area. A number of options may be run to test sensitivity to changes of harvest rules.

10.4.5 Harvest Profile

Harvesting to the inventory profile in TFL 25 has been achieved and will continue. For volume regulation, no constraints will be imposed in the model to target certain species or product grades.

In the case of area regulation, balancing of harvest from analysis unit groups of varying productivity, or other methods, may be used to try to smooth volume flows associated with flat-line area regulation.

10.4.6 Silviculture Systems

The majority of the TFL is currently harvested using clearcut with reserve or group retention harvest methods. There is no significant selection or partial cutting with dispersed retention, with the exception of certain riparian management situations, occurring at this time.

In Block 5, the Licensee has committed to implementing ecosystem based management (EBM) strategies (to be determined by the CCLRMP with assistance of the Joint Solutions Project) to test the appropriateness of such strategies to ensure economic, social, and environmental sustainability. However implementation is in an early stage and it is largely impossible to forecast the nature of the landscape- and stand-level changes that will be forthcoming and evolving as negotiations progress.

For the purposes of modelling clumped retention, volume reductions as discussed in Section 10.3.1.5 in combination with even-aged growth and yield projections for the remaining harvested area are assumed adequate, albeit imperfect.

To date the Licensee has focussed management strategies for conservation of biodiversity at the landscape level. Riparian reserves, larger wildlife tree patches and other exclusions from the timber harvesting land base are examples of areas being managed for conservation. Strategies for stand level retention within the TFL are now being investigated to augment higher-level conservation plans with the most significant changes now expected in Block 5

As pressures to adopt non-traditional cutting methods and uneven-aged silviculture systems mount, growth and yield models need to be developed and calibrated for predicting the long term outcome of partial cutting in coastal old-growth and second-growth stands. As there is little experience on the coast and few, if any, stands to sample for partial cutting response, models will have to deviate significantly from the usual strategy of permanent sample plot analyses. Due to the lack of growth and yield data and predictive tools, the licensee will not attempt to model partial cutting for this timber supply analysis. However the Licensee is, and will be, supportive of any initiatives of the Ministry of Forests or others to meet the challenge of developing uneven-aged or partial cutting models for the Coastal Western Hemlock Zone.

10.4.7 Harvest Flow Objectives

Under a volume regulation scenario, the current AAC will be used as the starting volume request and be maintained only as long as the smooth transition to a lower mid or long term harvest level is not compromised. Should declines exceeding 10% per decade be required to complete the transition, starting volume request will be decreased until declines less than or equal to 10% are achieved, if possible. Where potential increases above the current AAC seem feasible, increases in initial harvest level will not be such that future percentage declines are in excess of those expected if the current AAC were the initial harvest level.

Under an area regulation scenario, the harvest area will remain constant through the planning horizon. The average area harvested under the current AAC will be the harvest area benchmark. Where a large immediate drop is required to maintain a stable plot of harvest area through time, area-regulation will be deemed socially and economically inappropriate and abandoned in favour of volume regulation with appropriate transitions. Where increases in area harvest per year seem feasible, output analyses will ensure that increases are constrained to prevent disruption of other indicators such as habitat availability, harvest DBHq, volume flow, seral stage distribution, etc.

APPENDIX I - DETAILED AREA AND VOLUME SUMMARIES

Table 74 – Area (ha) by leading species, and age class – Block 1

Leading	Age Class										Immature	Mature	Total	Immature	Mature	Total
Species	0	1	2	3	4	5	6	7	8	9	Area	Area	Area	Volume	Volume	Volume
NSR	567										567		567			
Ba		388	23	17			6	1	44	88	434	133	567	9,267	107,857	117,124
Cw		509	439	313	74	14	20		17	1,340	1,369	1,357	2,726	56,164	895,779	951,943
Dr		15	133	205	406	33		2			791	2	794	228,531	41,528	270,059
Fd		1,009	4,151	2,519	1,098	240	142	55	19	81	9,158	156	9,314	1,776,915	163,981	1,940,896
Hm		17								22	17	22	39		1,880	1,880
Hw		1,092	1,112	2,346	897	152	64	6	43	2,722	5,663	2,771	8,434	1,586,384	1,894,894	3,481,277
Pl			1	30	85	35	65				214		215	9,631	26,594	36,225
Pw		3		13							16		16	3,305		3,305
Ss		13	10	36	1					3	61	3	63	21,287	2,974	24,261
Yc		809								2,018	809	2,018	2,827		752,604	752,604
Total	567	3,856	5,866	5,478	2,562	473	297	65	123	6,274	19,100	6,462	25,562	3,691,483	3,888,091	7,579,574

Table 75 – Area (ha) by leading species, and age class – Block 2

Leading	Age Class										Immature	Mature	Total	Immature	Mature	Total
Species	0	1	2	3	4	5	6	7	8	9	Area	Area	Area	Volume	Volume	Volume
NSR	572										572		572			
Ba		247	150	14	35	16	10	44	0	1,549	472	1,593	2,065	86,906	1,118,343	1,205,248
Cw		453	111	49	1	15	0	18	4	3,165	630	3,187	3,818	32,061	2,479,526	2,511,587
Dr			155	80		69	4				307		307	43,586		43,586
Fd		292	163	2		129		93		52	586	146	732	155,256	61,082	216,338
Hw		1,088	1,972	1,992	225	170	2	72	6	1,323	5,449	1,400	6,850	809,725	1,033,390	1,843,114
Ss			13			1		4		56	14	60	74	2,860	54,053	56,912
Yc		299	2							284	301	284	585		160,689	160,689
Total	572	2,379	2,567	2,137	261	400	16	231	10	6,430	8,332	6,671	15,002	1,130,394	4,907,081	6,037,475

Table 76 – Area (ha) by leading species, and age class – Block 3

Leading Species	Age Class 0	1	2	3	4	5	6	7	8	9	Immature Area	Mature Area	Total Area	Immature Volume	Mature Volume	Total Volume
NSR	114										114		114			
Ba		438			7	49	9	1		154	503	156	659	49,368	140,293	189,661
Cw		426	9	4		1				1,586	439	1,586	2,025	1,877	1,341,176	1,343,053
Dr				4		9					14		14	7,493		7,493
Fd		137					2			10	139	10	148	1,329	8,412	9,741
Hw		1,489	417	7	27	144	109	40		3,215	2,193	3,255	5,448	245,869	2,762,946	3,008,815
Yc		147								888	147	888	1,035		534,153	534,153
Total	114	2,637	426	15	34	203	120	41		5,853	3,549	5,895	9,444	305,936	4,786,980	5,092,916

Table 77 – Area (ha) by leading species, and age class – Block 5

Leading Species	Age Class 0	1	2	3	4	5	6	7	8	9	Immature Area	Mature Area	Total Area	Immature Volume	Mature Volume	Total Volume
NSR	1,099										1,099		1,099			
Ba		166	30		9	21	26	15	20	10,663	253	10,697	10,950	55,344	7,343,083	7,398,427
Cw		391			5			14	18	25,223	396	25,255	25,651	8,973	15,043,762	15,052,734
Dr			128	500	271	76					975		975	302,640		302,640
Hw		1,165	1,195	944	620	57	7	18	64	18,022	3,988	18,104	22,092	644,165	11,147,973	11,792,138
Ss		236			20	1		4	16	1,267	258	1,288	1,546	15,815	1,153,769	1,169,583
Yc		33								555	33	555	588		270,529	270,529
Total	1,099	1,991	1,353	1,444	925	156	33	51	118	55,731	7,001	55,900	62,901	1,026,936	34,959,116	35,986,051

Table 78 – Area (ha) by leading species, and age class – Block 6

Leading Species	Age Class 0	1	2	3	4	5	6	7	8	9	Immature Area	Mature Area	Total Area	Immature Volume	Mature Volume	Total Volume
NSR	327										327		327			
Cw		79		1		3		16	45	2,971	84	3,033	3,117	5,578	1,611,475	1,617,053
Dr		214	686	784	196	11				1	1,891	1	1,892	262,696	148,179	410,876
Hm										12		12	12		3,923	3,923
Hw		1,357	4,353	1,827	431	20	74	112	59	2,886	8,063	3,056	11,119	895,634	2,242,793	3,138,427
Pl									9			9	9		1,991	1,991
Ss		3,110	2,677	1,954	86	20	7	21	39	433	7,854	492	8,347	991,311	492,886	1,484,197
Sw			7		5						12		12	2,111		2,111
Yc		12						1	13	309	12	322	335	170	130,240	130,410
Total	327	4,773	7,724	4,566	718	55	81	149	165	6,611	18,243	6,925	25,169	2,157,501	4,631,488	6,788,989

Appendix V

Timber Supply Analysis

Western Forest Products Limited

Tree Farm Licence 25

Timber Supply Analysis

MANAGEMENT PLAN 10

March 2003

R. Paul Bavis, *R.P.F*
Regional Forester
Western Forest Products Limited

Executive Summary

This analysis examines timber supply projections for Tree Farm Licence 25, which is comprised of five administrative units. Two are located on Vancouver Island at Jordan River (Block 1) and Naka Creek (Block 3). Two are on the Mainland coast at Loughborough Inlet (Block 2) and Swanson Bay (Block 5) and the fifth is on Moresby Island (Block 6) in Haida Gwaii.

Complan 3.0, a spatially-explicit harvest model, was used to simulate current management practices for protection and maintenance of ecological values and to estimate the residual timber potential through the year 2252.

After allowances for non-recoverable losses, the simulation of current management practice as agreed and set out in the associated information package suggests the following area-based AAC by block for the term of the proposed management plan:

Block	Location	AAC (hectares)
1	Jordan River	290
2	Loughborough Inlet	123
3	Naka Creek	87
5	Central Coast	491
6	Haida Gwaii	251
	Total	1,242

The proposed harvest levels should accommodate ecological concerns in the short and longer terms. The simulation suggests that a minimum of 124,600 ha (46% of productive forest) will be maintained in older forests (>140 yrs) and a minimum 64,000,000 m^3 of merchantable growing stock will be retained throughout the 250-year simulation horizon. These forests are expected to contribute significantly to biodiversity conservation and complement protected areas (~240,800 ha) adjacent to the Tree Farm Licence. The timber flowing from the proposed harvests would be sufficient to maintain existing people and communities dependent on harvesting and forest management in the short term, and may allow for an expansion in the future.

The analysis suggests that with time, timber volumes realized from this fixed harvest area will begin to increase as will stand ages, standing volume, and associated environmental values. Projections of cedar harvest and availability suggest that these species remain available for cultural and commercial uses throughout the simulation.

Sensitivity analyses suggest that the current management simulation is sensitive to land base and minimum harvest age changes. Policies that change either or both of these parameters may have significant impacts on area and volume harvest levels.

TABLE OF CONTENTS

List of Tables

List of Figures

List of Appendices

Acknowledgements

David Byng, R.P.F. prepared yield tables, performed GIS analysis and inventory preparation, and set up model parameters. Mike Landers, R.P.F. assisted and established base case runs, performed many sensitivity analyses, and prepared dozens of output graphs. David and Mike also provided many valuable editorial comments and interpretations of model outputs. Jim Wilson of Timberline Forest Inventory Consultants analysed historic cruise data to estimate cedar diameter distributions.

1.0 Introduction

1.1 Purpose

Tree Farm Licence 25 is located in coastal British Columbia and consists of five independent blocks encompassing 480,149 hectares, of which 138,078 hectares are considered available for long term timber production. The TFL was established in 1958 with the intent of maintaining a sustainable harvest level indefinitely. Since that time the AAC has been re-determined periodically and more recently at five-year intervals. This report provides the technical basis for re-determination of the AAC.

1.2 Objectives

The primary objective of this report is to estimate achievable and sustainable annual area harvests and associated timber flows for the consideration of the Provincial Chief Forester in making his determination of Allowable Annual Cut for the term of Management Plan 10. More specifically the timber supply model is to be programmed to ensure the following primary objectives:

1. Non-timber values such as fish and wildlife habitat, biodiversity, recreation, visual quality, and terrain stability are to be given priority over timber. Protection of non-timber values will be satisfied by land base removals, yield net downs and/or by maintaining a percentage of polygons in older stands.
2. Annual harvest area is to be derived as a residual after non-timber values are accommodated. The proposed harvest level will consider harvestable inventory, growth potential of present and future stands, silvicultural treatments, potential timber losses, operational and legislative constraints.
3. Annual area harvested is held constant throughout the 250-year time horizon of the simulation.

Secondary objectives include:

4. Estimation of growing stock and age class changes through time as a coarse gauge of future habitat supply.
5. Evaluation of the impacts of and effectiveness of existing and alternative forest policies and land uses.
6. Identification of potential silvicultural or other interventions that may have social and/or ecological benefit.
7. Identification of data, inventory, or modelling uncertainties or shortcomings that may, if reduced or eliminated in future, significantly improve model predictions.

1.3 Timber Supply Model

Timber supply simulations were completed with Complan 3.2006 software developed by Olympic Resource Management and predecessors and currently owned by Timberline Forest Inventory consultants. Complan is a spatially-explicit supply model and is described in more detail in the associated information package (MP 10, Appendix IV, section 4.1)

The inventory database was current to January 1, 2001 and the simulation was set up to include a one-year initial harvest period to force actual 2001 harvesting to bring the effective inventory date ahead to 2002. This initialization year was included in all runs but is not presented in the tables or graphs herein. For each of the five blocks, a 20-year plan was prepared based on the first two decades of model output to depict the current management simulation. Total simulation horizon was set at 250 years.

Analysis units and associated yield curve parameters are described in more detail in the associated information package (MP 10, Appendix IV, sections 7 & 8).

To ensure optimization of harvest scenarios, harvest request levels were incrementally changed until a one-hectare change induced a small deficit, typically occurring in the vicinity of the transition to second growth. The reported harvest level is the last requested level where no deficit is evident.

2.0 Current Management or Base Case

The current management (CM) simulation includes the following assumptions and modelling parameters that are described in more detail in the associated information package (MP 10, Appendix IV, section 3.2):

- Future Wildlife Tree Patches are projected to occupy 13% of the land base, 3.25% of which is assumed to come from the otherwise harvestable land base[15,16]. Universal volume reductions ranging from 5.0% (Blocks 1, 2, 3, 6) to 8.5% (Block 5) were used to simulate the overall volume impacts of WTPs, partial cutting, and EBM. Old seral stage targets are maintained based on specific Biodiversity Emphasis Options where available, or the TSR II recommendations of 10% high, 45% intermediate, and 45% low biodiversity emphasis where landscape units have not been drafted or finalized. Green-up heights are assigned based on Resource Management Zoning established in the Vancouver Island Land Use Plan. Vancouver Island "Special" and "General" zones as well as Mainland blocks have a 3m green-up requirement, whereas "Enhanced" zones on Vancouver Island have a 1.3m limit.

1.1 ———————————

[15] As the locations of future WTPs and partial cutting are not known, the percentage is not area based. Therefore growing stock and age class distributions and summaries do not reflect this reserved area or volume.

As these volume deductions are not reflected in area calculations some options for determination of AAC and cut control are:

Option A – net down the area-based AAC Determination for WTPs (assumed 3.25%) in THLB and partial cutting (% as below). Then when determining area harvested for cut control, do not include partial cutting. This approach would require establishment of a threshold basal area removal, may invite partial cutting manipulations or abuses to avoid cut control, and assumes the WTP/THLB overlap is as estimated. (Cut control area = net block clearcut area + harvestable productive forest in PAS right-of-way outside cutblocks[2]).

Option B – net down the area-based Determination for partial cutting only (1.75% for Blocks 1,2,3,6 and 5.25% for Block 5). Then for cut control purposes include as area harvested any WTP area overlapping the THLB, but as per Option A ignore partial cutting areas. Including WTP on THLB as part of area harvested is a more direct approach to determining the percentage of THLB occupied by WTP and brings the concept of THLB closer to the operational level. The timber resource would be better utilized if field personnel observed an immediate cut control effect from unnecessary or excessive reservation of THLB. As well this approach would facilitate better tracking of WTP overlap with THLB to determine the validity of the currently assumed 3.25% and encourage updating of THLB mapping to reflect block level assessments of terrain, etc. (Cut control area = net block clearcut area + THLB in WTP + harvestable productive forest in PAS right-of-way outside cutblocks[2]).

Option C – do not adjust the area-based AAC Determination for WTPs or partial cutting but include as area harvested for cut control any WTP area overlapping the THLB and include partial cutting using a percentage-of-basal-area-removed adjustment to calculate a clearcut equivalency area. This direct-measurement-of-results approach reduces potential partial cutting abuses and makes percentage estimates of the WTP/THLB overlap and/or partial cutting irrelevant to the AAC Determination. (Cut control area = net block clearcut area + THLB in WTP + partial cut area stated as clearcut equivalent + harvestable productive forest in PAS right-of-way outside cutblocks[2]).

Note that if partially cut area were to be included as 100% clearcut, operational personnel would find this approach unfair and partial cutting could be unduly discouraged.

[16] If the "disturbed area" approach to determining area harvested for cut control is used, in theory it is also necessary to make an upward adjustment of the AAC Determination to make allowance for NP (e.g. non-forested area on access road) or unmerchantable stands (young, unharvestable second growth or lower site stands outside the THLB) that may be disturbed in developing cutblocks. A direct measurement of this at the cut control stage would be more transparent.

- The operable land base includes stands accessible to helicopter and conventional cable or ground-based harvesting systems.
- All harvested stands are planted promptly. Future plantations are assumed to use seed orchard stock. Yield reductions for stocking gaps and decay are 20% at one hundred years.
- Visual quality restrictions are based on the latest inventory revisions with upper range denudation assumed. Recreation constraints as described in the information package are generally of little impact.
- Minimum harvestable ages are based on attainment of profitable minimum mean stand diameters. Minimum acceptable stand diameters increased 10cm from poor to good growing sites and 7cm from low cost, south coast operations to higher cost operations to the north.
- Alder volumes contribute to the timber supply.
- Harvest priorities are generally to minimize growth loss and harvest oldest stands. In Block 1 the oldest first rule was not invoked to better reflect current operations that include significant second growth harvesting. Existing forest development plan blocks were harvested in the initial years as model constraints permitted.

The Current Management summary statistics for each block are presented in Table 1 below and harvest levels are presented in Figure 1 below. More detailed graphs of output parameters and sensitivity analyses are presented by TFL block in the sections following and in Appendix A (page 66).

In terms of annual area harvest, the order of importance of the blocks is: Block 5 (40%), Block 1 (23%), Block 6 (20%), Block 2 (10%), Block 3 (7%). This order remains even after Central Coast Candidate Protected Areas announced April 1, 2001 are removed, although the Block 5 area harvest is reduced by about a quarter (128 ha or 26%). In terms of projected annual volume flow, the short term block order is the same, but in the longer term Block 6 surpasses Block 1 as the age class imbalance induced by the 1988 withdrawal of the Gwaii Haanas reserve from the management unit is eventually overcome.

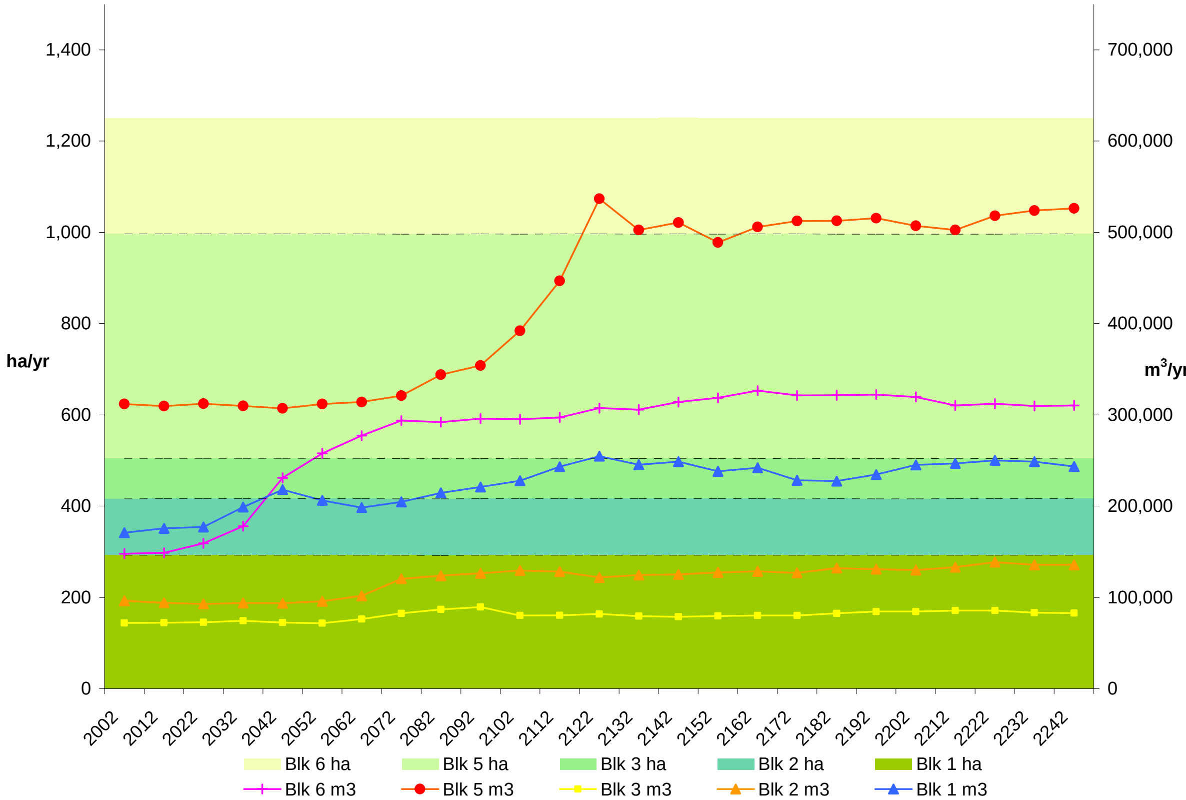


Figure 1. Area harvest (background bands) and predicted volume flow (lines) to 2252 for each block under current management

The indicated annual harvest area for the TFL of 1,250 ha is less than both the Long-Run Sustainable Area harvest calculation (LRSA) and the Long-Run Sustainable Area harvest calculation if all stands were harvested when marginally profitable (mLRSA). Future stands would on average be harvested beyond culmination of mean annual increment and be of sufficient size to ensure a reasonable economic return for future generations.

Table 1. Current management harvest summary

Block	mDBHq[17] (cm)	Indicated Annual Harvest (ha)	THLB[18] (ha)	Implied average rotation age[19] (yrs)	Predicted average annual volume to 2022[20] (m^3/yr)	Average culmination age[18] (yrs)	LRSA[21] (ha)	Average age mDBHq attained	mLRSA[22] (ha)	NRL[18] (ha)
1	40/35/30	292	25,562	88	164,534	95	269	85	301	2
2	43/38/34	124	15,002	121	90,234	96	156	115	130	1
3	43/38/34	88	9,444	107	68,342	105	90	108	87	1
5	47/42/37	492	62,901	128	284,258	103	611	126	499	1
5^{-PA}	47/42/37	364	47,966[23]	132	210,134	104	461	128	375	1
6	47/42/37	254	25,169	99	140,873	83	303	85	296	3
All		1,250	138,078	110	748,241	100	1,429	109	1,313	8
All^{-PA}		1,122	123,143	110	674,117	97	1,279	107	1,189	8

1.1

17 Minimum harvestable quadratic mean stand diameter for Good, Medium, and Poor sites respectively.
18 from the information package (MP 10, Appendix IV) for future stands.
19 THLB divided by expected annual area harvest.
20 Actual harvest volume will vary; this parameter is not suitable for conversion of area to volume for administrative or operational purposes.
21 Theoretical Long Run Sustainable Area harvest calculated as THLB divided by area-weighted culmination age of future managed stands.
22 Theoretical Long Run Sustainable Area if harvest occurs at mDBHq, calculated as THLB divided by area-weighted age that future managed stands attain mDBHq.
23 Original THLB hectares less THLB in Order-in-Council designated Protected Areas.

3.0 Block 1 Analysis (Jordan River)

3.1 Current Management – 292 ha/year

Figure 2 below summarizes for the current management or "base case" simulation, the trends for harvest variables including timber volume, harvest age, mean stand diameter (DBHq), and proportion of helicopter harvesting.

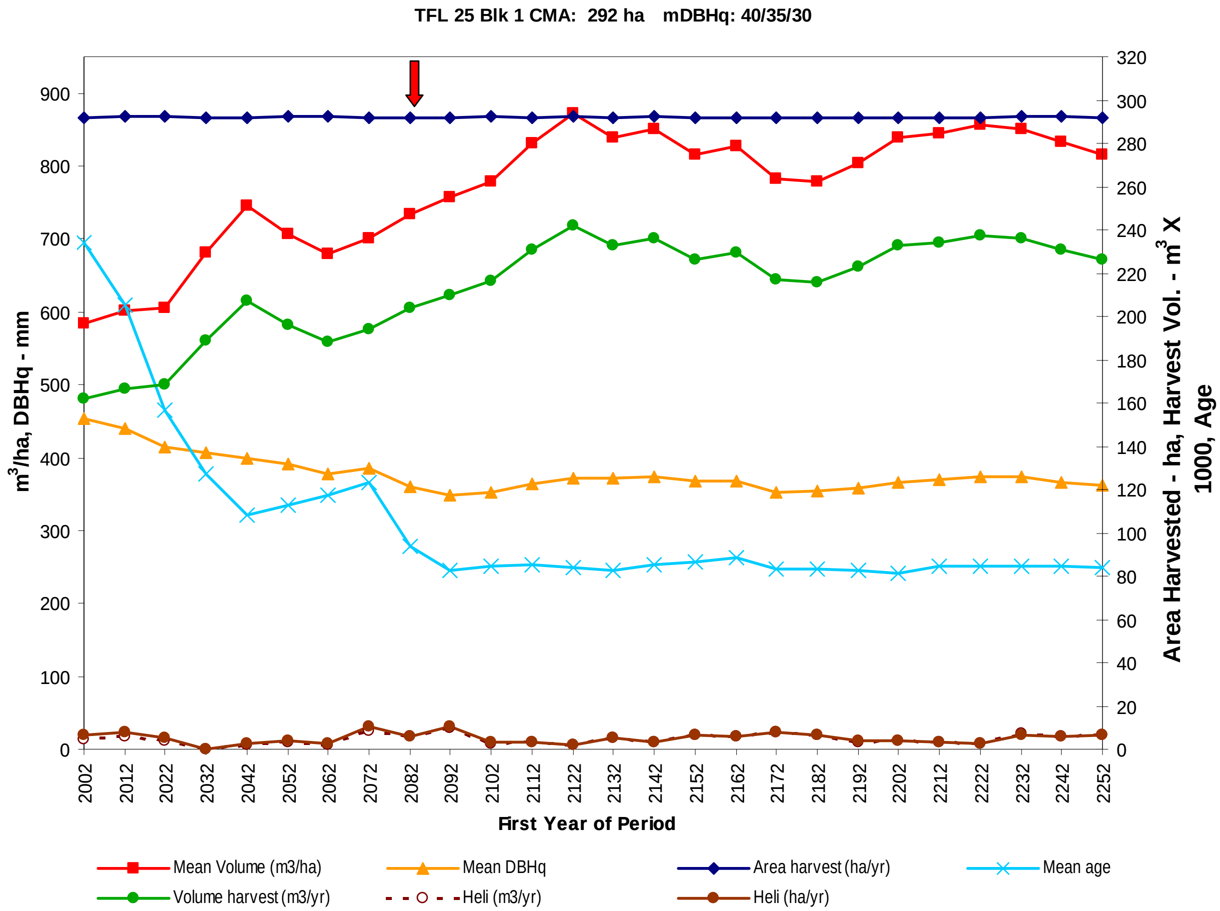


Figure 2. Block 1 Current Management harvest statistics through 250 years[24]

As the transition to second growth occurs, average age and diameter of harvested stands declines until the transition is complete. The transition will be largely complete within the next 40 years but nevertheless old forests would be a significant portion of the harvest profile until about 90 years into the future. As the transition progresses average merchantable stand volumes at harvest increase from under 600 m^3/ha initially to the 800-850 m^3/ha range in the long term. This effect is primarily related to expected gains from current silviculture practices. As the area harvest is constant, annual harvest

1.1

[24] Red arrow indicates point where an area harvest deficit occurs if harvest request is increased by 1 ha.

volumes increase[25] in tandem with the increasing stand volumes. In the long term, ages at harvest average 82-88 years and average harvest diameters are around 35-37 cm (individual stands ranging 30-65+ cm).

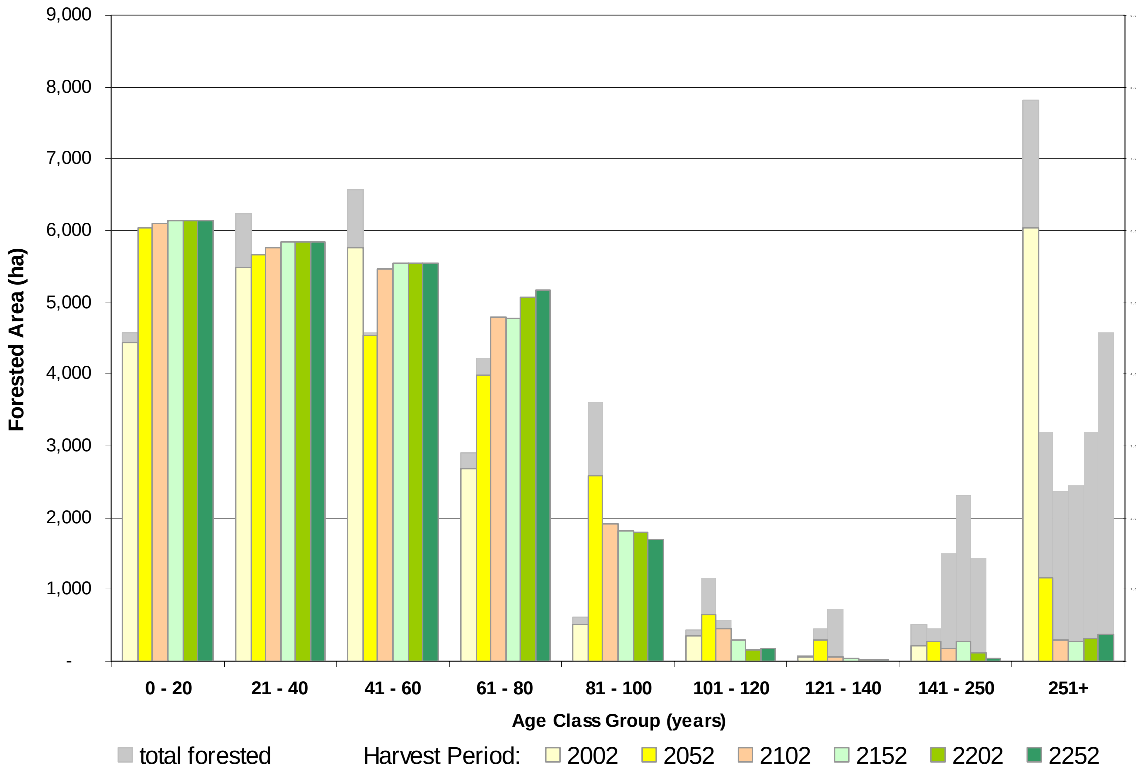


Figure 3. Age class progression on Block 1 THLB (+ total forested) for current management through 250 years

In this Block the indicated harvest level is midway between the LRSA and mLRSA calculations (Table 1), suggesting that near the pinch point (circa 2082) and beyond stands are on average harvested before culmination of mean annual increment but above the threshold minimum harvest age needed to ensure a profitable harvest.

Age class distributions are examined in Figure 3 above. On the THLB, with the exception of the 41-60 class, the age classes less than 101 years increase modestly from current levels initially and then stabilize through the remainder of the simulation. 101- to 250-year-old stands remain present in low abundance throughout the simulation. On the THLB the oldest stands decline dramatically through the first part of the simulation as the transition to second growth harvesting is completed.

1.1

[25] This "fall-up" effect is the reverse of the oft-cited "falldown" effect observed in some stands (Douglas-fir for example). At the stand level the effect is commonly observed on coastal hemlock, balsam, or cedar sites where old forests are severely decayed and of low merchantable volume when compared to second growth growing on similar sites.

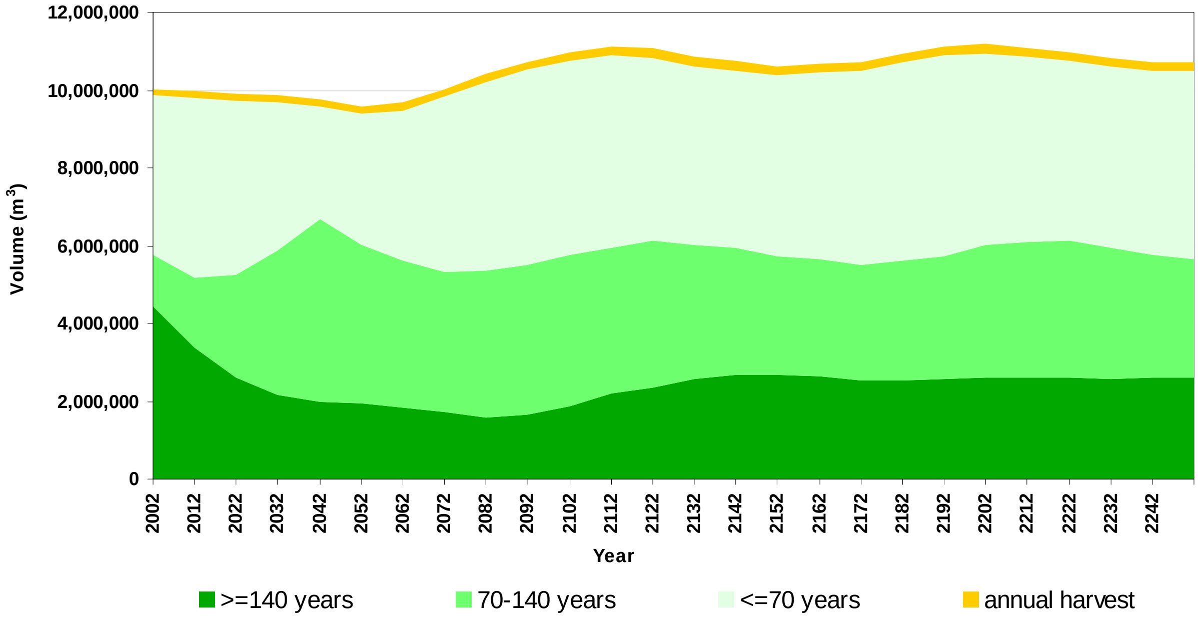


Figure 4. Merchantable growing stock on total Block 1 land base through 250 years

On the total forest land base, forest greater than 250 years old declines from the current level of about 7,800 ha to about 2,400 ha and then rebuilds to the 4,600 ha level. However during the deficit period stands in the 141- to 250-year-old class are increasing so that at least 3,900 ha of forest older than 140 years is forecasted to be present and contributing to the perpetuation of old-growth dependent processes or organisms.

Figure 4 above illustrates gross growing stock levels for the total land base. Initially levels are somewhat below 10 million m^3 but rise modestly to near 11 million m^3 in the longer term. The proportion of older forest drops initially from the current level of about 4.4 million m^3 to about 1.6 million m^3 and then stabilizes near 2.6 million m^3 in the long term. This 10-11 million m^3 standing inventory of wood permanently provides the basis for sustainable timber flow in the long term and provides substantial habitat and other environmental benefits to supplement values in adjacent park land (935 ha). The proportion of younger growing stock is initially 42% and in the long term stabilizes in the range of 43-47% of total growing stock. The 71- to 140-year-old growing stock provides the primary source of sustainable timber production through the simulation.

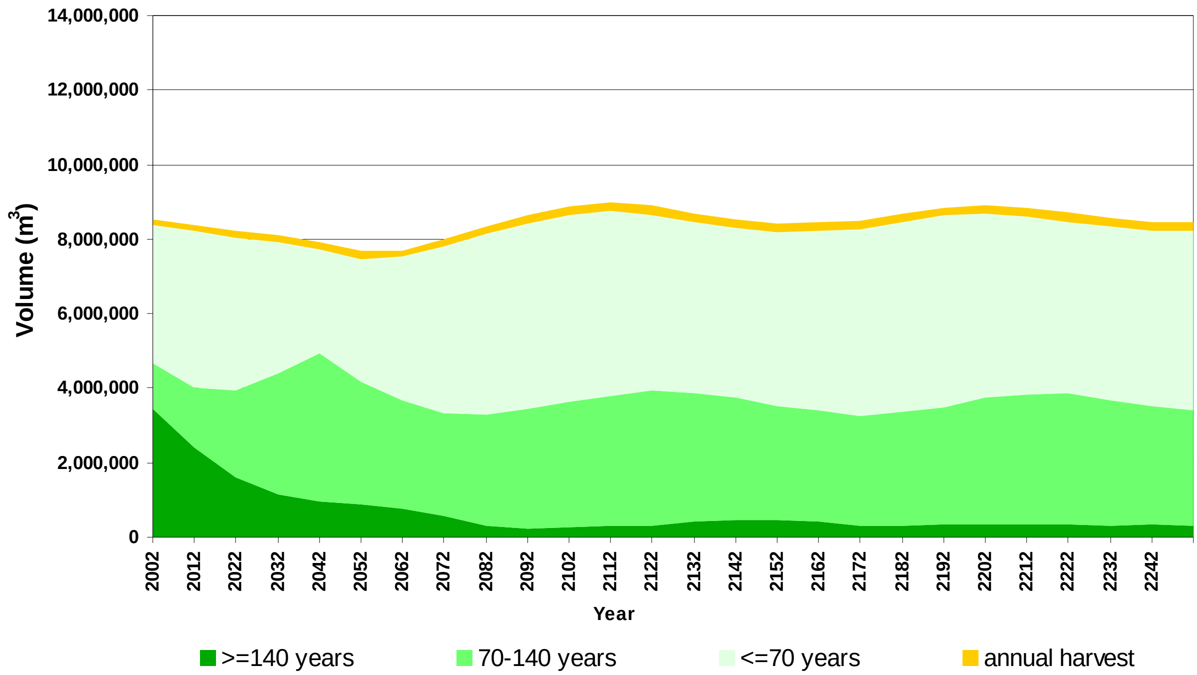


Figure 5. Merchantable growing stock on Block 1 THLB through 250 years

In the future the older growing stock is for the most part, but not entirely, in reserves or area projected to be unavailable for timber harvest. Figure 5 above displays growing stock through time for the THLB only. For non-timber reasons, some timber is held significantly beyond normal rotation ages and reaches ages in excess of 140 years before other stands become equally or more suitable for satisfying the non-timber objective(s). When this timber is released, its harvest could provide a small but ongoing supply of older stems possibly suitable for specialty manufacturing or cultural purposes.

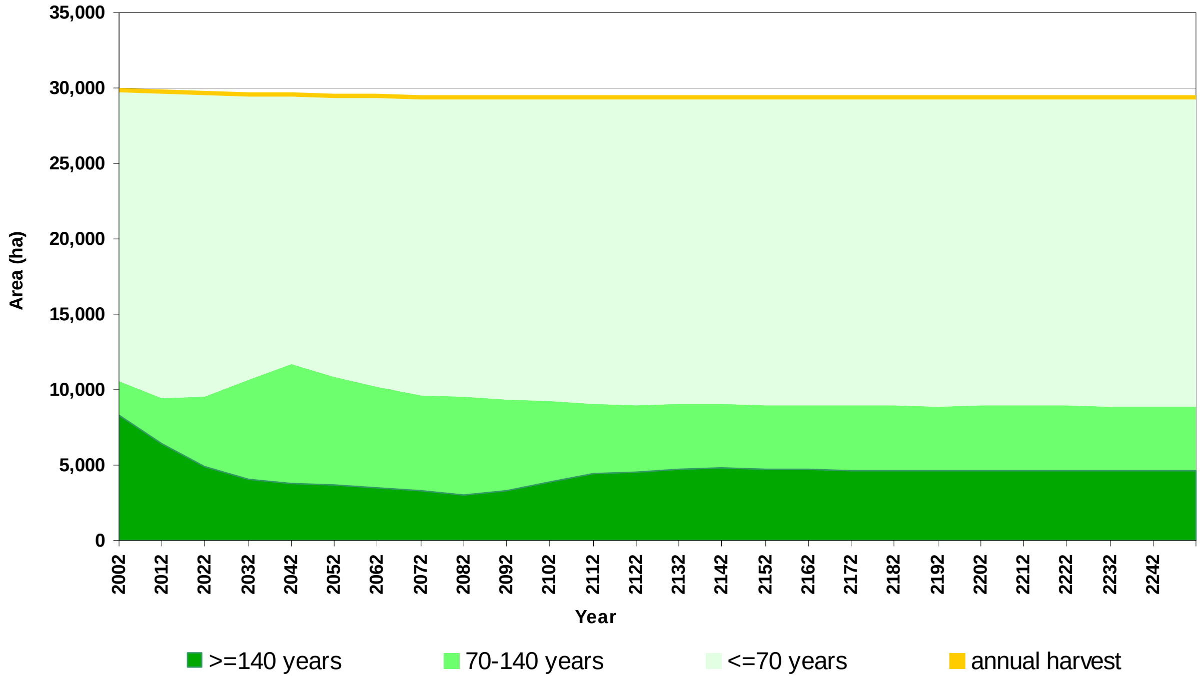


Figure 6. Age-group areas for Block 1 total land base through 250 years

Figure 6 above is as per Figure 4 except data is presented on an area basis rather than a volume basis and simplifies the age class data presented in Figure 3. There is a slight drop in the productive forest area from the initial level as new roads are built and withdrawn from the productive area.

Initially the area of old growth declines, the area of maturing stands increases, and the area of younger stands remains relatively stable. Contrary to popular opinion, as the transition from old growth progresses, at the landscape level old growth area is not replaced by clearcut area (young stands decrease from 64% to 63% through 2252), but rather by 71- to 140-year-old stands (increases from 8% to 25%). Under the current management regime, young stands will occur no more frequently after the completion of the transition to second growth than they do today.

Figure 6 also clearly demonstrates that the age class distribution is already much different than the natural disturbance type (NDT1) or recent historical range of natural variability for the area would dictate. Clearly any attempt to impose or return to an age class distribution representative of infrequent disturbances would be extremely difficult, as well as economically devastating and socially irresponsible.

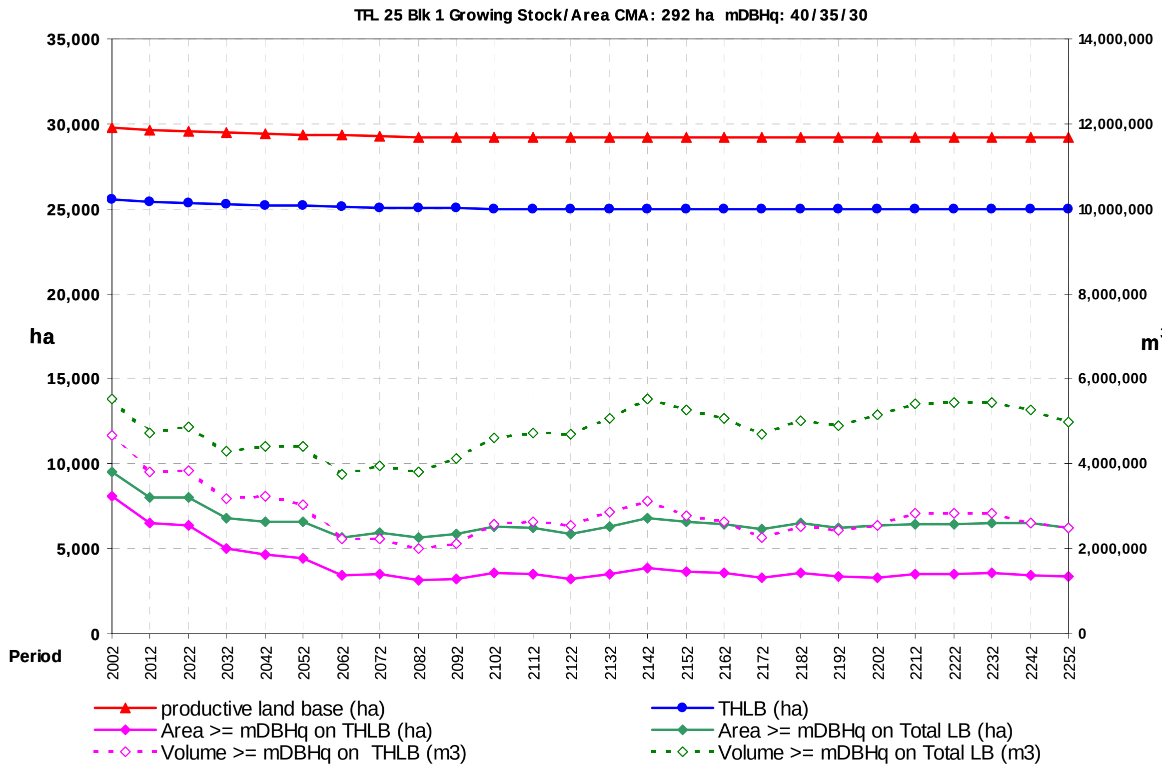


Figure 7. Merchantable growing stock in harvestable (>mDBHq) stands through 250 years for Block 1.

Figure 7 above presents growing stock in terms of merchantable volume and area that is larger than the minimum harvestable[26] DBHq.

Roughly 4,200 ha or 14% of the productive land base is unavailable for harvesting for the long term. Because the locations of future Wildlife Tree Patches and partial retention along streams or elsewhere could not be easily predicted, they were modelled as a yield curve volume net down. Consequently these net downs are not represented in any of the aforementioned Figures and the actual volume and/or hectares illustrated understate the old forest reserved from harvest by about 5% of THLB area or volume.

On the THLB, harvestable stands become less available until the transition to second growth is complete and are maintained thereafter between 3,100 and 3,500 ha, or roughly 11-14 years worth of harvesting at the indicated harvest level. The ratio of harvestable area to annual harvest is somewhat higher than for other blocks and reflects a higher influence of policy factors (adjacency, cover %) rather than a shortage of physically available stands (mDBHq, age class structure). This confirms that the annual harvest area recommendation after making provision for non-timber values, makes more or less optimal use of the land base's residual timber capacity. Operational flexibility in

1.1

[26] The term "merchantable" is used to refer to the net volume as indicated by growth and yield models: typically less a 30 cm high stump, a 10 cm top diameter, trees less than 12.5 cm dbh, and decay, waste and breakage estimates. The term "harvestable" is used here to refer to stands that have grown to mDBHq. Although a particular stand may have some, or considerable, merchantable volume it is not considered harvestable until it has attained sufficient volume and stem sizes to be deemed profitable.

the selection of harvest locations can be expected to be most limited around pinch points at 2062, 2082 and 2122.

A strategic focus for silviculture treatments could be to increase the harvestability of stands through the 2052-2132 period where area available for harvesting is projected to be lowest. A second objective would be to increase volume/ha during the anticipated dip from 2052-2082 (Figure 2, p. 7). Generally though, the differences are subtle and silviculture treatments which increase the future volume, merchantability or quality of stands may be more or less equal in terms of strategic importance and could therefore be ranked using stand-level financial analysis.

3.2 Alternate Harvest Levels

3.2.1 10% Increase

Figure 8 below shows that a higher area harvest request induces area and volume shortfalls at the transition to second growth and the rotations beyond. Average harvest age and DBHq decline sooner and remain somewhat lower in the long term. Average volume per hectare is lower in the longer term as stands are harvested earlier than was the case in the current management run. Note that relative to the current management simulation, this run produces modestly more volume (625,348 m^3 or 2,500 m^3 annually on average) through 250 years (see Appendix B, Table 12, p.103).

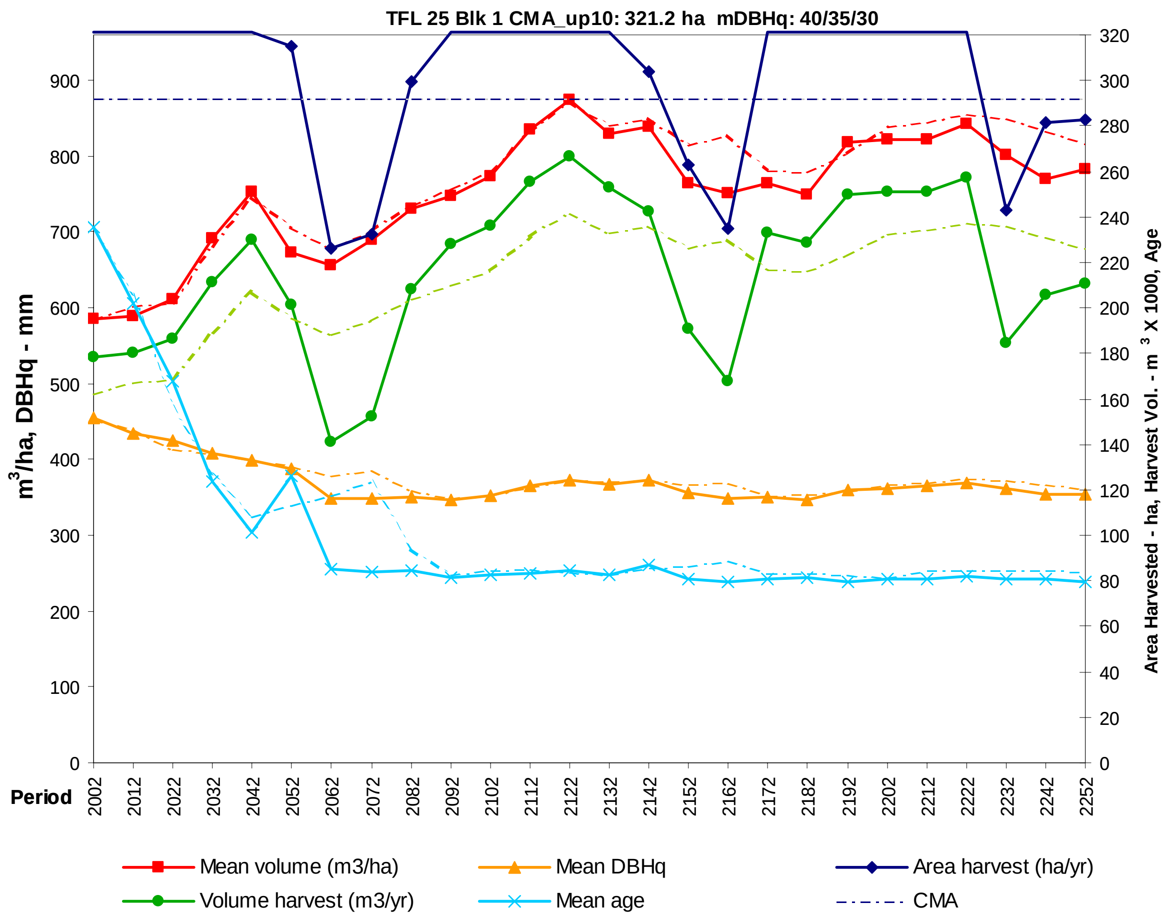


Figure 8. Block 1 harvest statistics[27] through 250 years for current management area harvest plus 10%

3.2.2 10% Decrease

Lowering the harvest request level by 10% (Figure 9 below) has the effect in the short term of lowering the harvest volume in proportion (-10.1%) to the area change. This is because existing old growth stands are assumed to be neither adding nor losing volume through time. Once second growth becomes an appreciable component of the harvest profile, harvest age and DBHq are significantly higher (longer rotation) with the result that stand volumes per hectare at harvest are higher as well. This tends to compensate for the loss of area harvested such that the overall volume harvest is less affected in the longer term (-5.6%) versus the short term (-10.1%) (Appendix B, Table 12, p.103).

1.1

[27] Dashed lines in background represent current management statistics.

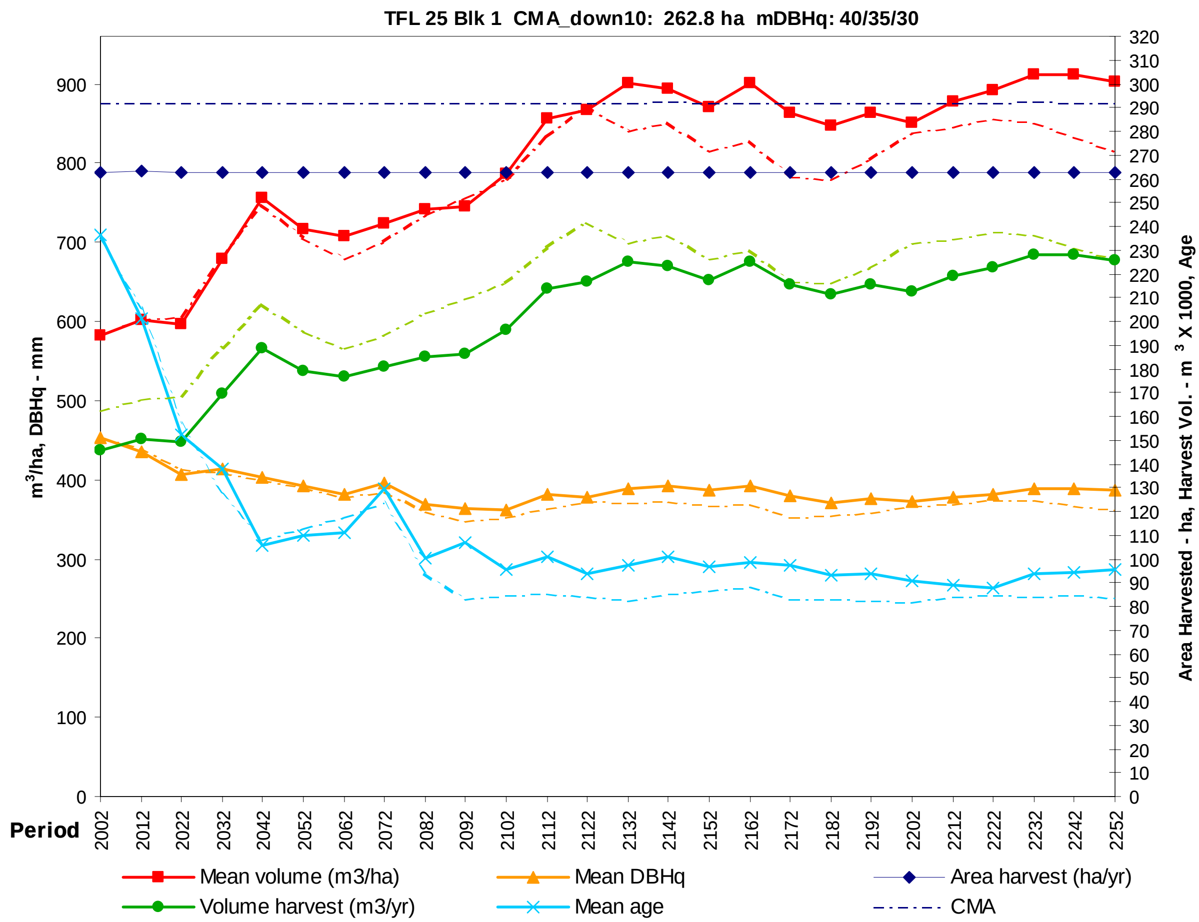


Figure 9. Block 1 harvest statistics through 250 years for current management area harvest less 10%

3.3 Sensitivity Analyses

Harvest output statistics for all sensitivity runs are presented in Appendix A (p. 66). In the harvest output graphs, decreases in area harvest relative to the base case are presented both unadjusted and as a new flat line. For increases in area harvest, a new, higher, flat-line harvest level was established. Flat-line flows were established by increasing area harvest requested until a deficit occurred, and then dropping back to the nearest whole number where the deficit disappears. Appendix B (p.100) summarizes changes in area (Table 10, Table 11) and near, mid, and long term volume (Table 12).

Table 2 presents the area results of sensitivity analyses for Block 1.

Block 1 is most sensitive to changes that alter the minimum harvest age (-SI3m, +age, +ageX2). The “+/-age” results are unbalanced and suggest that an increase in rotation age has a much stronger impact than a decrease in rotation age. This effect is most pronounced in Block 1 and is related to a pinch-point shift from harvestability limitations at the pinch point to increased adjacency or cover restrictions as rotation ages shorten (see +ageX2, +age, -age, and –ageX2 sensitivities).

Table 2. Block 1 Sensitivity results

Run ID	Harvest (ha)	Change (ha)	Change %	Description
CMA	292	-	-	Area-based current management option
+Oe	294	2.0	0.7	Include Oce and Ohe polygons in THLB (1.0% of THLB)
-Oh	286	-6.0	-2.1	Remove helicopter operable polygons (1.6% of THLB)
-SI3m	236	-56.0	-19.2	Reduce SI estimates for age class 1-2 and future stands by 3m
-age	309	17.0	5.8	Lower minimum harvest age by decreasing mDBHq by 3 cm
+age	239	-53.0	-18.2	Increase minimum harvest age by increasing mDBHq by 3 cm
-RndAge	283	-9.0	-3.1	Uses the mDBHq ages rounded up to the nearest 10th year (effectively adds 5 years to mDBHq)
-midVQ	289	-3.0	-1.0	Use mid range disturbance target
+ageX2	196	-96.0	-32.9	Increase minimum harvest age by increasing mDBHq by 3X2=6cm
-ageX2	318	26.0	8.9	Decrease minimum harvest age by decreasing mDBHq by 3X2=6cm

4.0 Block 2 Analysis (Stafford-Apple-Heydon)

4.1 Current Management - 124 ha/year

Figure 10 summarizes for the current management or “base case” simulation, the trends for harvest variables including timber volume, harvest age, mean stand diameter (DBHq), and proportion of helicopter harvesting.

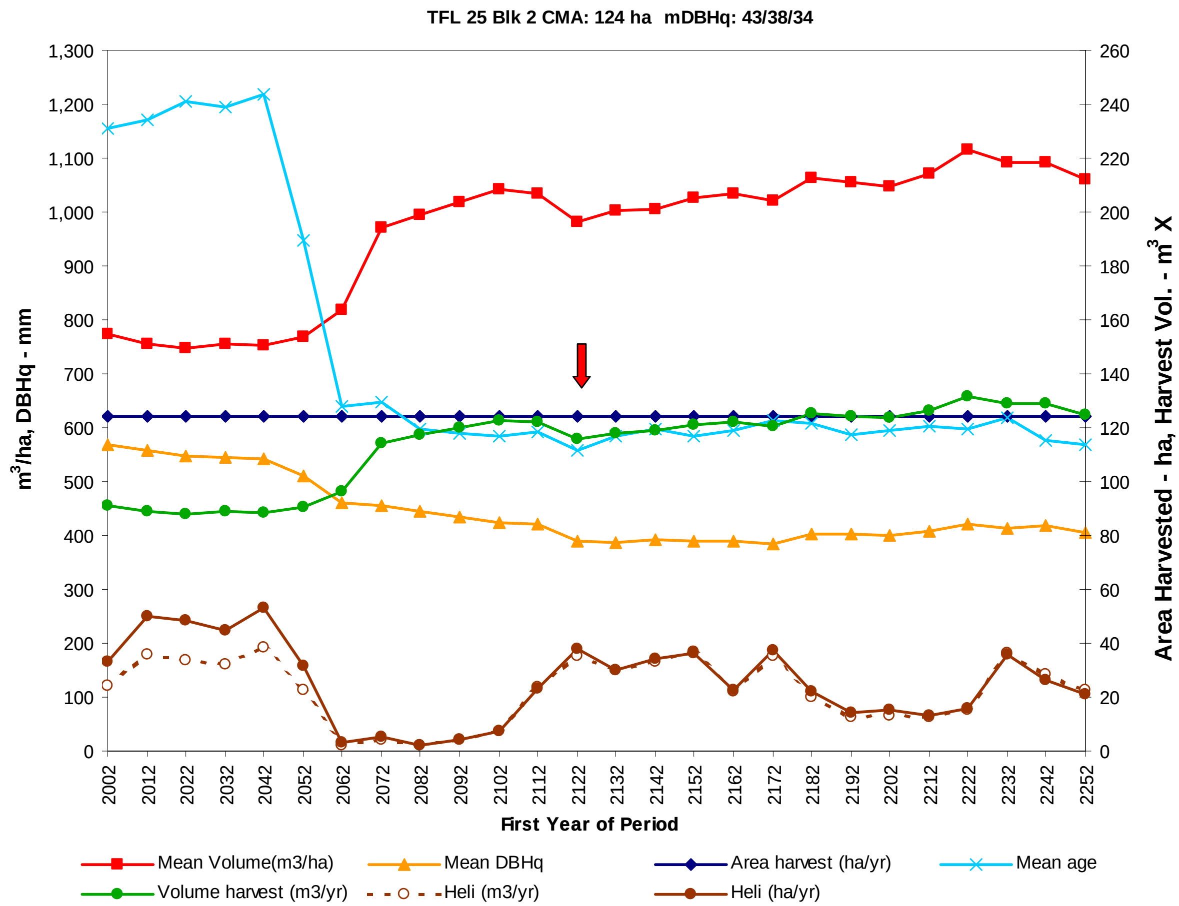


Figure 10. Block 2 Current Management harvest statistics through 250 years[28]

In this simulation the transition to second growth occurs quickly as average harvest age drops abruptly through the 2052 to 2062 periods and stabilizes around 113-124 years. Average stand diameter at harvest also drops abruptly at the transition and a gradual decline continues through the mid term before settling into the 39-42 cm range in the long term. As the second growth comes on stream average merchantable stand volumes at harvest “fall up”[25] from the old growth norm of about 750 m^3/ha to about 1000 m^3/ha and continue to trend upward to near 1100 m^3/ha in the long term. The volume harvest directly reflects the volume/ha trend as it holds steady at about 89,000 m^3/year,

1.1

[28] Red arrow indicates point where area harvest deficit occurs if harvest request is increased by 1 ha.

jumps to 115,000 after the transition, and slowly climbs to near 127,000 m^3/year in the long term.

In this block, timber only accessible to heli-logging makes up a significant portion of the land base and the harvest profile. In the current model configuration there is no satisfactory method to regulate the helicopter portion within the overall area regulation. However, a simulation of the flat line harvest flow from the helicopter-accessible land base only (CMA-Oc, Table 3) and the difference between the base case (CMA) and conventional only (CMA-Oh) harvest levels suggest that the helicopter portion makes up about 23-24 ha of the 124 ha annual flow forecast.

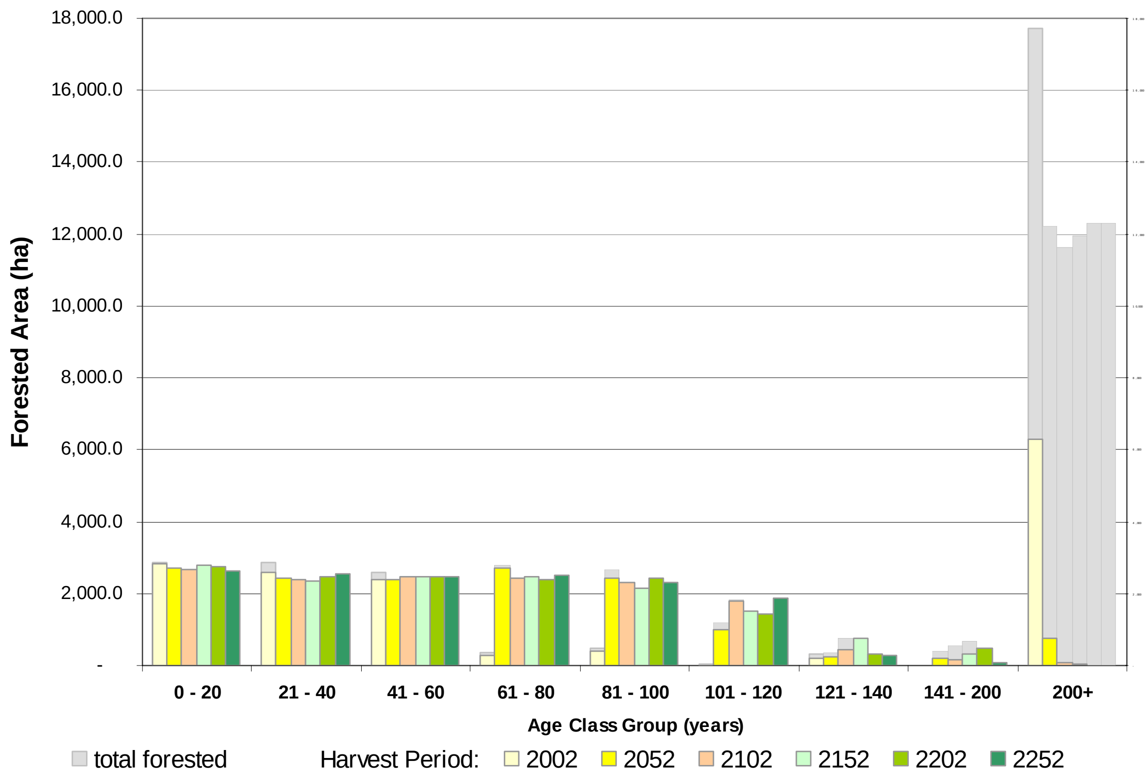


Figure 11. Age class progression on Block 2 THLB (+ total forested) for current management through 250 years

In this Block the indicated harvest level is less than both the LRSA and mLRSA calculations (Table 1). This illustrates that the pinch point or bottleneck at 2122 is preventing an optimal area harvest and in effect for most of the simulation stand harvests are delayed well beyond culmination age and beyond the mDBHq age. This pinch point is also noteworthy in that it is not associated with the old growth to second growth transition.

Age class distributions are examined in Figure 11. The younger age (≤ 60 years) classes remain relatively stable from the current state and occupy between 2,350 and 2,900 ha each indefinitely. Second growth age classes approaching harvestable ages increase significantly in the first 50-year period and then stabilize. 121- to 200-year-old stands are present in low abundance throughout the simulation and are actually increasing in abundance through the first century. On the THLB the oldest stands decline dramatically through the first part of the simulation as the transition to second growth harvesting is completed.

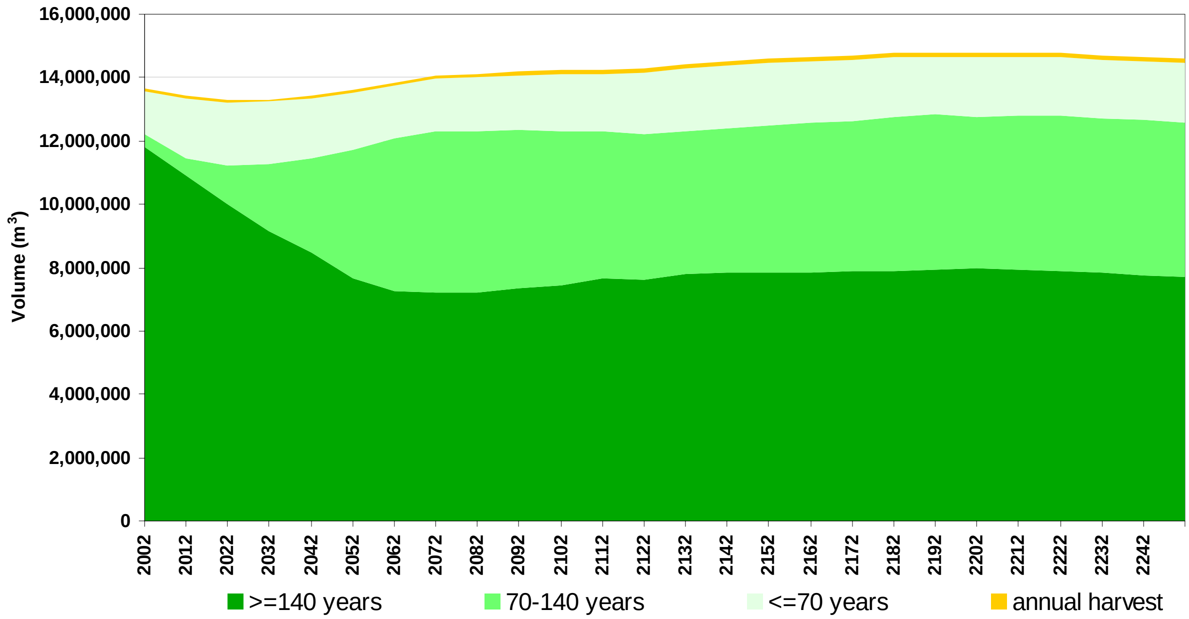


Figure 12. Merchantable growing stock on total Block 2 land base through 250 years

On the total forest land base, forest greater than 200 years old declines from the current level of just under eighteen thousand hectares to a stable long term level of about twelve thousand hectares. Old forest will continue to dominate this landscape under current management assumptions.

Figure 12 above illustrates gross growing stock levels for the total land base. Initially levels drop slightly and then slowly build to in excess of fourteen million cubic metres (m^3). The proportion of older forest drops initially from the current level of about twelve million m^3 and stabilizes at 7-8 million m^3. The older forest volume is replaced by middle-aged volumes (rising to 32-37%), whereas the younger stands remain more or less constant at around 11-15% of total merchantable growing stock. This fourteen million m^3 standing inventory of wood permanently provides substantial habitat and other environmental value while the smaller five million m^3 of 71- to 140-year-old stock therein provides the primary source of sustainable timber production (represented by the thickness of the orange "line" in Figure 12.

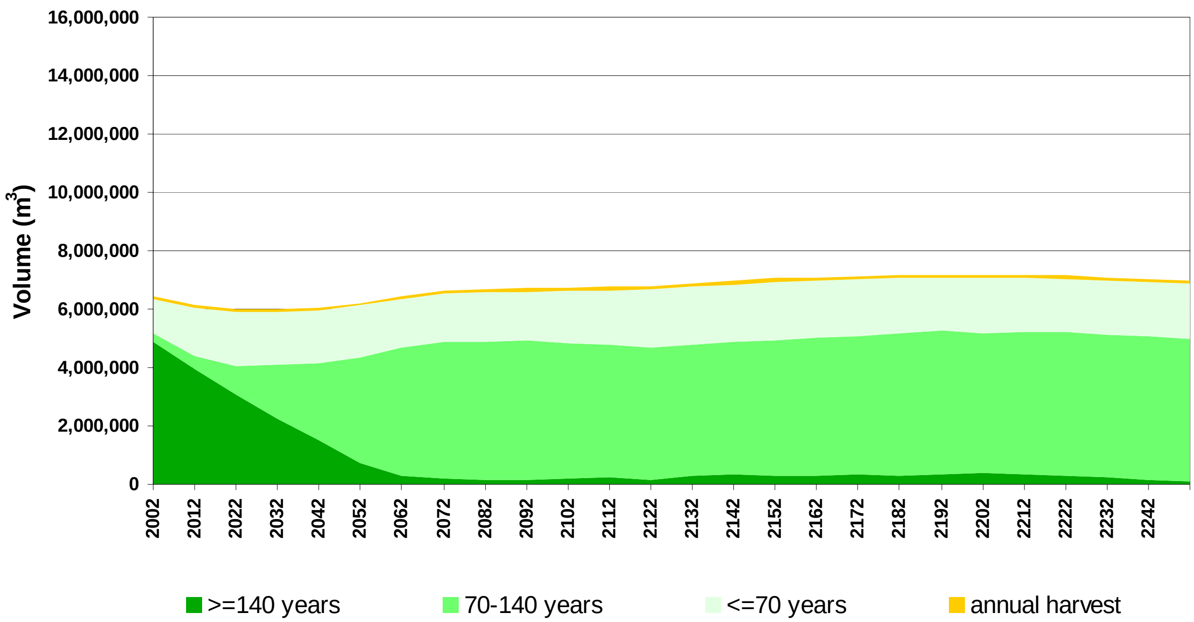


Figure 13. Merchantable growing stock on Block 2 THLB through 250 years

In future, the older growing stock volume is for the most part, but not entirely, in reserves or area projected to be unavailable for timber harvest. Figure 13 displays growing stock through time for the THLB only. For non-timber reasons, some harvestable timber is held significantly beyond normal rotation ages and reaches ages in excess of 140 years before other stands become equally or more suitable for satisfying the non-timber objective(s). When this timber is released, its harvest could provide a small but ongoing supply of older stems possibly suitable for specialty manufacturing or cultural purposes.

WFP

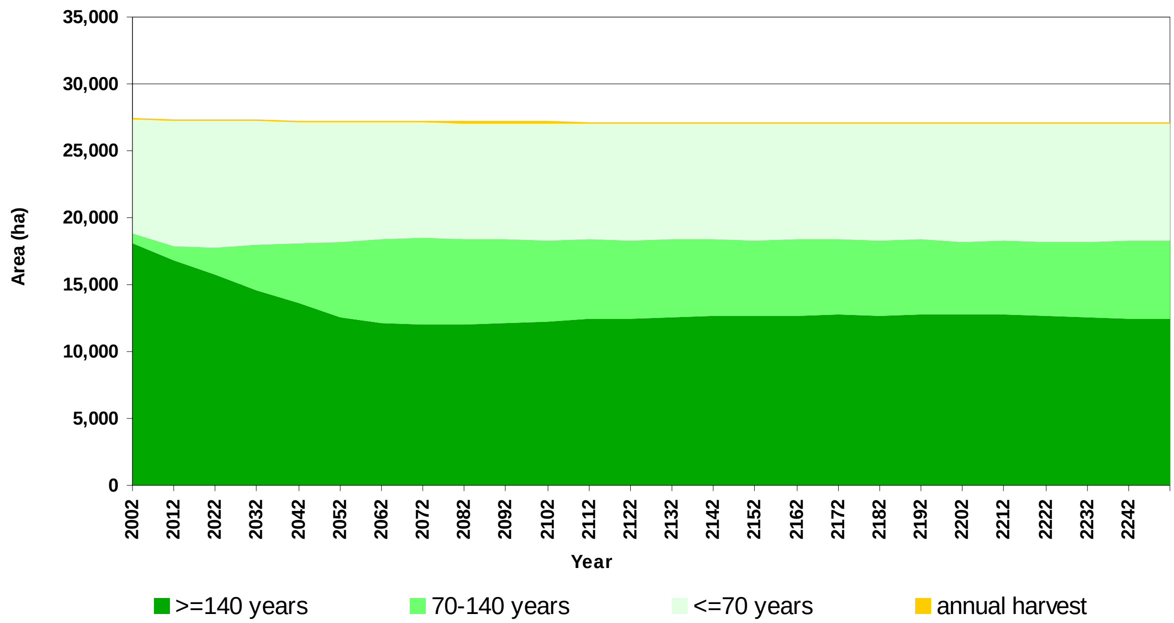


Figure 14. Age-group areas for Block 2 total land base through 250 years

Figure 14 is as per Figure 12 except data is presented on an area basis rather than a volume basis and simplifies the age class data presented in Figure 11.

Initially the area of old forest declines, the area of maturing stands increases, and the area of younger stands remains relatively stable. Contrary to popular opinion, as the transition from old forest progresses, at the landscape level old forest area is not replaced by clearcut area, but rather by 71- to 140-year-old stands. A century into the future under the current management regime, young stands will occur no more frequently than they do today and continue to occupy less than a third of the forested landscape throughout the simulation.

Figure 14 also demonstrates that the age class distribution is already different than the natural disturbance type (NDT1) or recent historical range of natural variability for the area would dictate. To impose or return to an age class distribution representative of infrequent disturbances would be very difficult as well as economically disruptive.

Figure 15 presents growing stock in terms of merchantable volume and area that is larger than the minimum harvestable DBHq.

Roughly 12,300 ha or 45% of the productive land base is unavailable for harvesting for the long term. Because the locations of future Wildlife Tree Patches and partial retention along streams could not be easily predicted, they were modelled as a yield curve volume net down. Consequently these net downs are not represented in any of the aforementioned Figures and the actual volume and/or hectares illustrated understate the old forest reserved from harvest by about 5% of THLB area or volume.

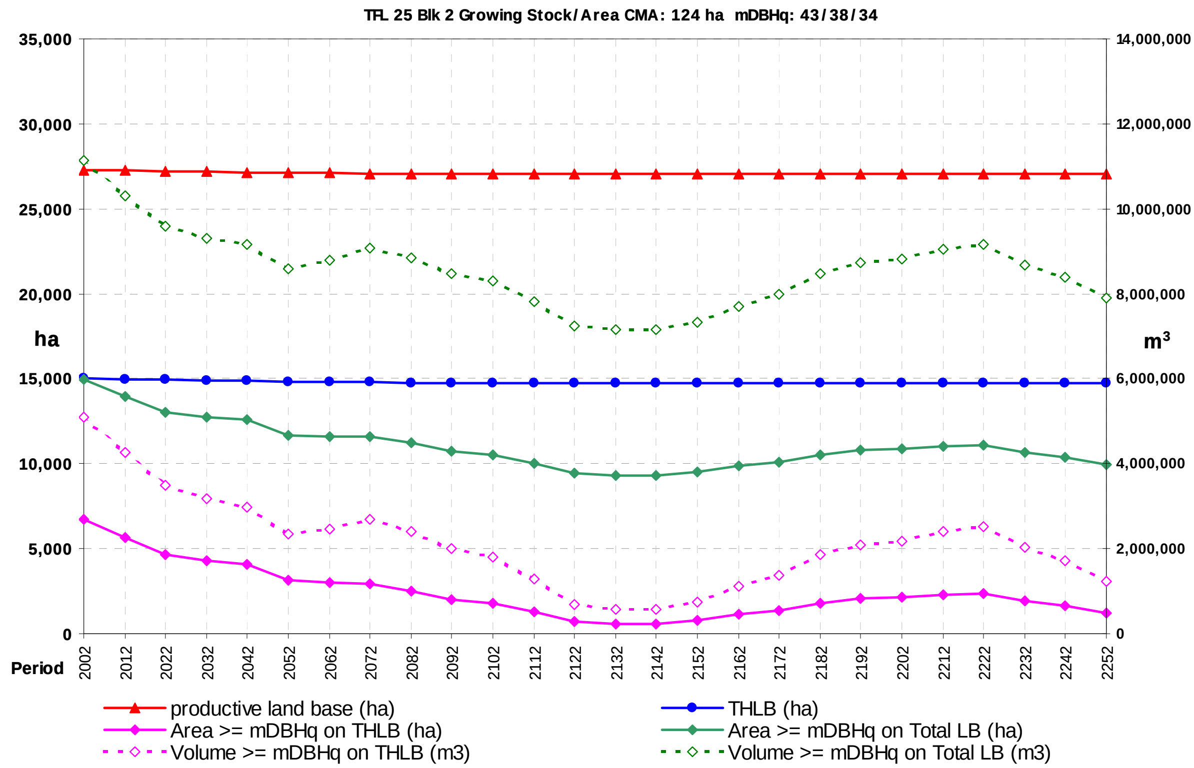


Figure 15. Merchantable growing stock in harvestable (>mDBHq) stands through 250 years for Block 2.

On the THLB, harvestable (>mDBHq) stands become less available until the pinch point is passed and then rebuid thereafter. At the low point harvestable stands amount to about 588 ha, or roughly 5 years worth of harvesting at the indicated harvest level. As the ratio of harvestable area to annual harvest is lower than in other blocks, policy factors such as adjacency are less important than the physical availablity of harvestable stands. The annual harvest area recommendation makes optimal use of the land base's residual timber capacity but operational flexibility could prove difficult through the 2122 to 2161 period. This pinch point rematerializes in the rotation beyond at the end of the simulation.

A strategic focus for silviculture treatments and density regimes could be to increase the number of harvestable stands through the 2122-2161 period where area available for harvesting is projected to be lowest. If the harvestability can be improved an Allowable Cut Effect could be realized. In terms of volume/ha and volume flow there is a slight decline associated with the pinch point so treatments that increase volume per hectare through this period would be of operational benefit.

Silviculture treatments which increase the future volume, merchantability or quality of stands outside the critical harvestability period would be more or less equal in terms of strategic importance and should therefore be ranked using stand-level financial analysis.

4.2 Alternate Harvest Levels

4.2.1 10% Increase

Figure 16 shows that a higher area harvest request induces large area and volume shortfalls starting seventy years into the future. Average harvest age and DBHq decline sooner, recover to base case levels and then decline again at the end of the simulation where a 130-year echo of the 2112 deficit occurs. Average volume per hectare becomes lower in association with area deficits as stands are harvested earlier than was the case in the current management run. Note however volume/ha is relatively unchanged elsewhere in the simulation so that relative to the current management simulation, this run produces 1.7% more volume (487,356 m^3 or 2,000 m^3 annually on average) through 250 years (see Appendix B, Table 12, page 103).

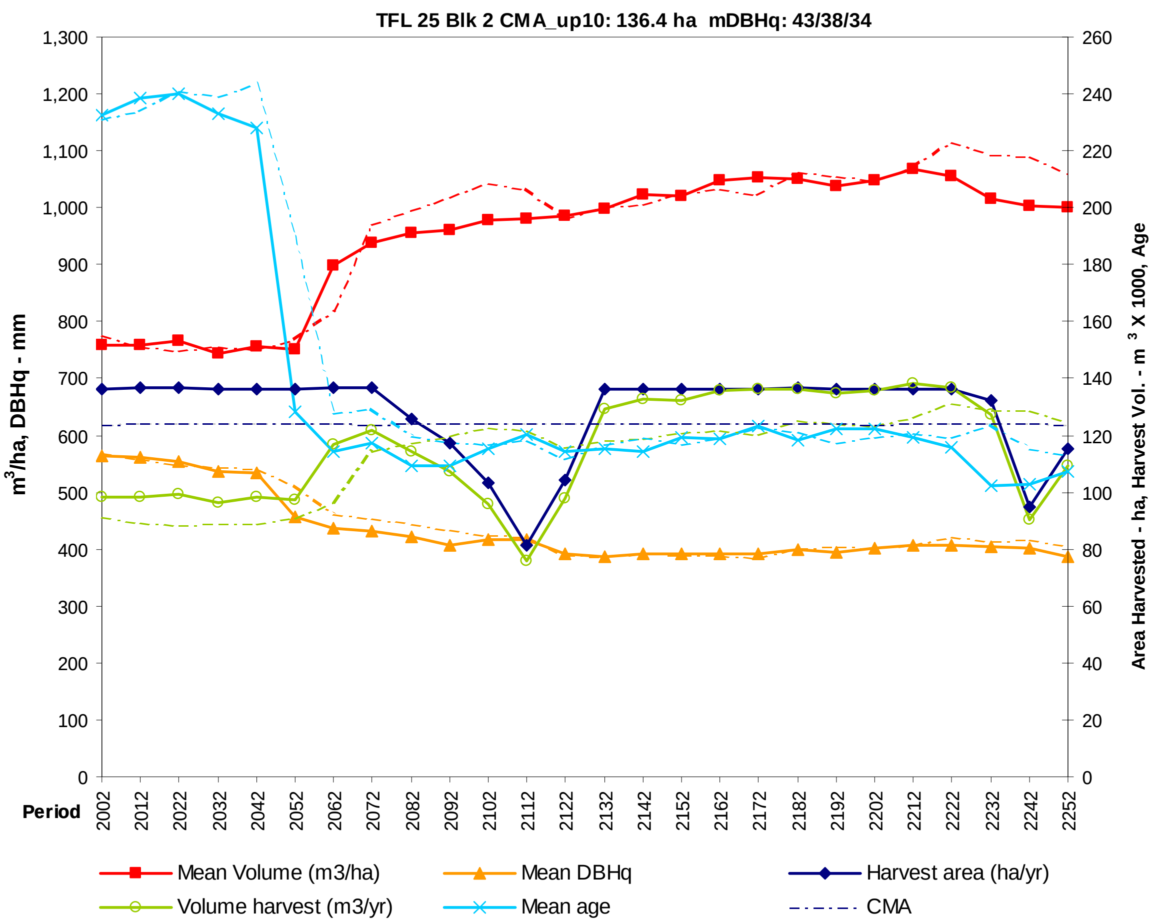


Figure 16. Block 2 harvest statistics[29] through 250 years for current management area harvest plus 10%

1.1

[29] Dashed lines in background represent current management statistics.

4.2.2 10% Decrease

Lowering the harvest request level by 10% has the effect in the short term of lowering the harvest volume about in proportion (-10.3%) to the area change. This is because existing old growth stands harvested in the short term are assumed to be neither adding nor losing volume through time. The lower request delays the transition to second growth by a decade but once second growth becomes an appreciable component of the harvest profile, harvest age and DBHq are significantly higher (longer rotation) with the result that stand volumes per hectare at harvest are higher as well. This tends to compensate for the loss of area harvested such that the overall volume harvest is less affected in the longer term (-5.0%) versus the short term (-10.3%) (Appendix B, Table 12).

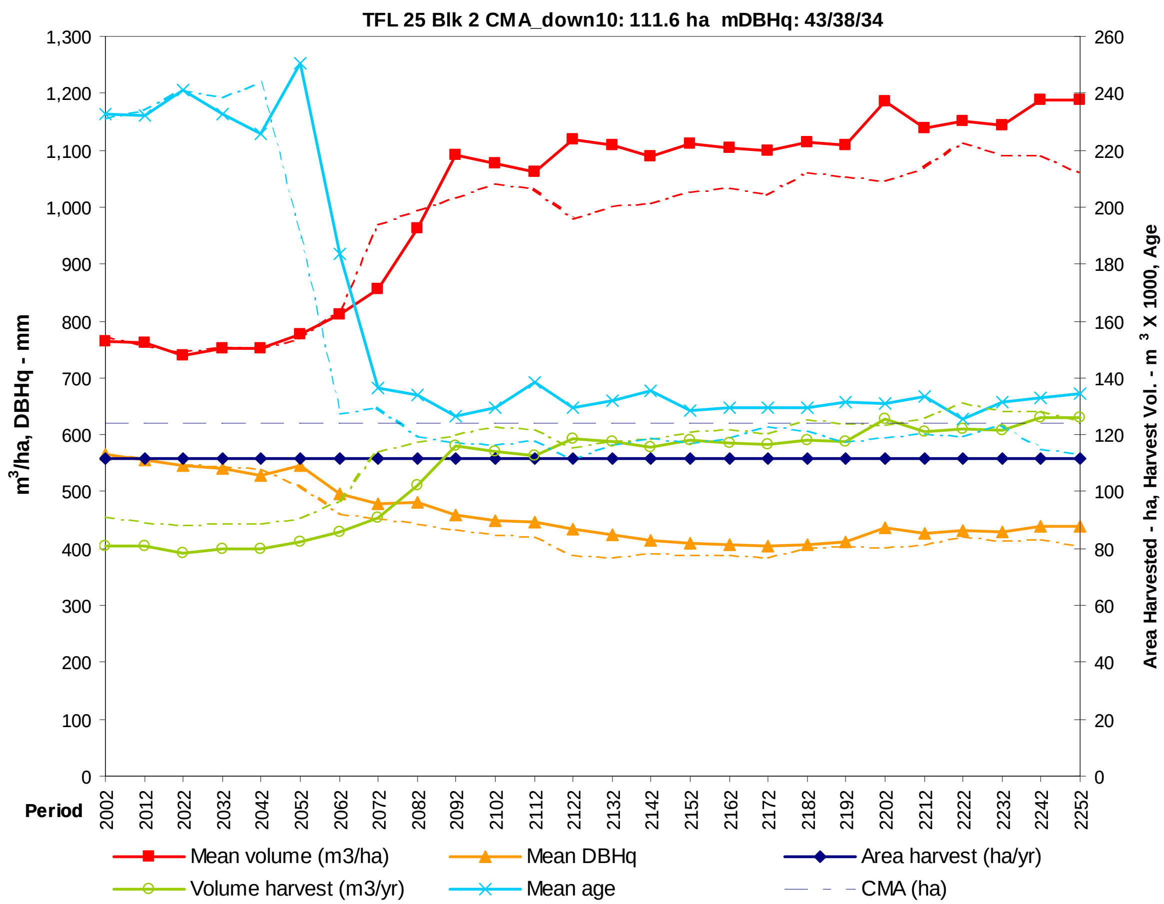


Figure 17. Block 2 harvest statistics[30] through 250 years for current management area harvest less 10%

4.3 Sensitivity Analyses

Harvest output statistics for all sensitivity runs are presented in Appendix A. In the harvest output graphs, decreases in area harvest relative to the base case are

1.1 ———————————

[30] Dashed lines in background represent current management statistics.

presented both unadjusted and as a new flat line. For increases in area harvest, a new, higher, flat-line harvest level was established. Flat-line flows were established by increasing area harvest requested until a deficit occurred, and then dropping back to the nearest whole number where the deficit disappears. Appendix B (p.100) summarizes changes in area (Table 10, Table 11) and near, mid, and long term volume (Table 12).

Table 3. Block 2 Sensitivity results

Run ID	Harvest (ha)	Change (ha)	Change %	Description
CMA	124	-	-	Area-based current management option
+Oe	126	2.0	1.6	Include Oce and Ohe polygons in THLB (3.7% of THLB)
-Oh	101	-23.0	-18.5	Remove helicopter operable polygons (20.0% of THLB)
-SI3m	106	-18.0	-14.5	Reduce SI estimates for age class 1-2 and future stands by 3m
-age	142	18.0	14.5	Lower minimum harvest age by decreasing mDBHq by 3 cm
+age	105	-19.0	-15.3	Increase minimum harvest age by increasing mDBHq by 3 cm
-RndAge	120	-4.0	-3.2	Uses the mDBHq ages rounded up to the nearest 10th year (effectively adds 5 years to mDBHq)
-midVQ	122	-2.0	-1.6	Use mid range disturbance target
+BEO	120	-4.0	-3.2	Apply specific BEOs to draft or legislated landscape units where not included in CM0
-Oc	24	-100.0	-80.6	Simulation on THLB accessible by helicopter only to estimate flat line portion of harvest attributable to helicopter harvesting.
-HRules	125	1.0	0.8	turn off oldest first and minimize growth loss harvest rules.

Table 3 presents the area results of sensitivity analyses for Block 2.

Block 2 is most sensitive to changes that alter the minimum harvest age (-SI3m, +/-age). Removing the area operable to helicopters only also has a large impact (-18.5%), but this area represents 20% of the THLB.

The –Oc run was done to test if the large fluctuation in the helicopter harvest component of the base case (Figure 10) was of management concern or merely a modelling artefact. As the flatline harvest indicated by –Oc is about the same as the deficit created by the –Oh run, the fluctuation is more likely a modelling artefact. Harvesting of helicopter operable polygons should target 100 to 120 ha for the next five years of cut control. If harvest average exceeds 17 ha/year (75% of –Oh area change) through the short term, disruptions of future harvest flows should be unlikely and later adjustments, if needed, would not have to be drastic.

5.0 Block 3 Analysis (Naka)

5.1 Current Management - 88 ha/year

Figure 18 summarizes for the Block 3 current management simulation, the trends for harvest variables including timber volume, harvest age, mean stand diameter (DBHq), and proportion of helicopter harvesting.

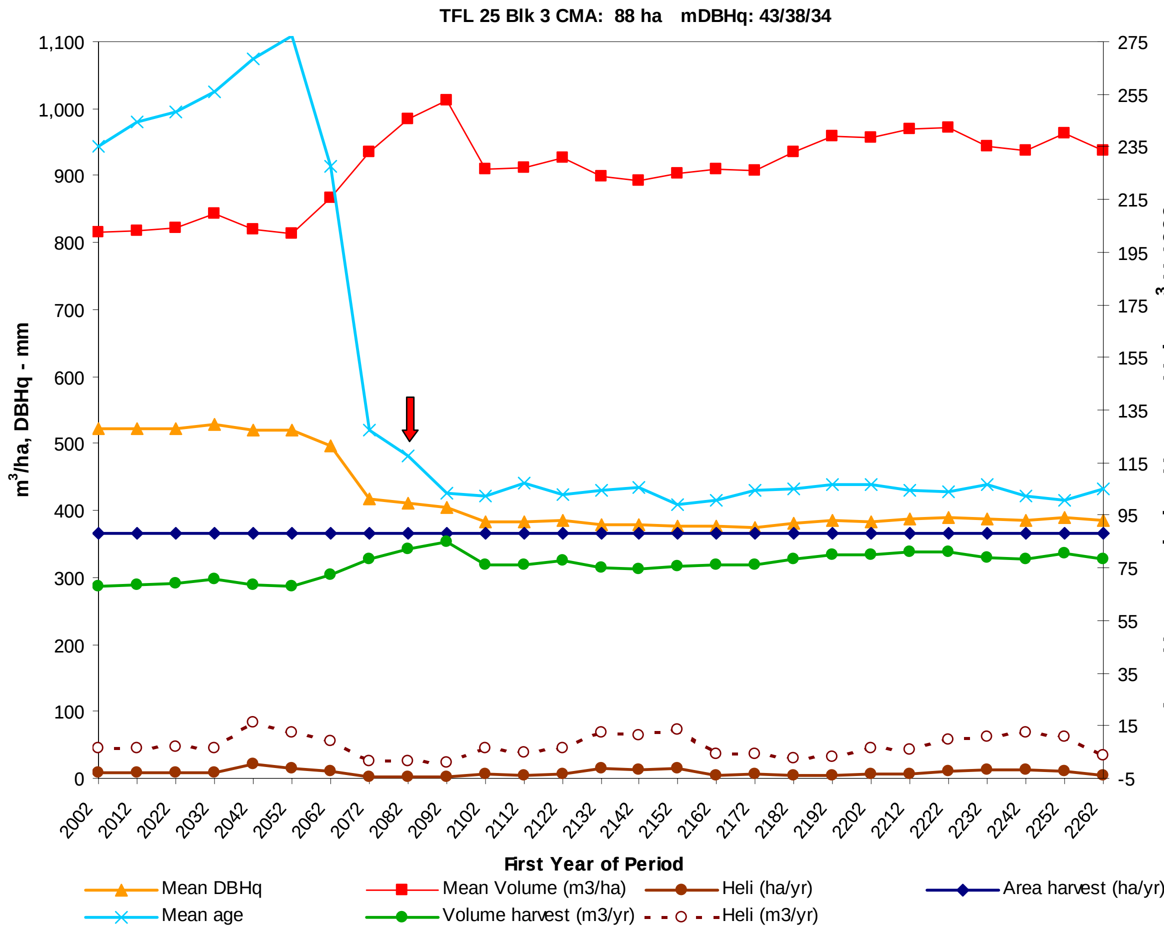


Figure 18. Block 3 Current Management harvest statistics through 250 years[31]

In this block the transition to second growth is abrupt. Average age and diameter of harvested stands declines rapidly within only two decades. Some older stands linger for another few decades and the pinch point occurs as the last of these are being harvested. The pinch point may be associated with an age class imbalance created by the sudden curtailment of harvesting in this block when Blocks 2, 3, and 5 were uncoupled for the purposes of AAC determination and cut control. Old forests make up the entire harvest profile until about 50 years into the future. As the transition progresses

1.1

[31] Red arrow indicates point where an area harvest deficit occurs if harvest request is increased by 1 ha.

average merchantable stand volumes at harvest increase from just over 800 m^3/ha initially and with some fluctuation settle into the 940-970 m^3/ha range in the long term. This effect is primarily related to expected gains from current silviculture practices. As the area harvest is constant, annual harvest volumes increase[25] in tandem with the increasing stand volumes. In the long term, ages at harvest average 101-106 years and average harvest diameters are around 39 cm (individual stands ranging 30-47 cm).

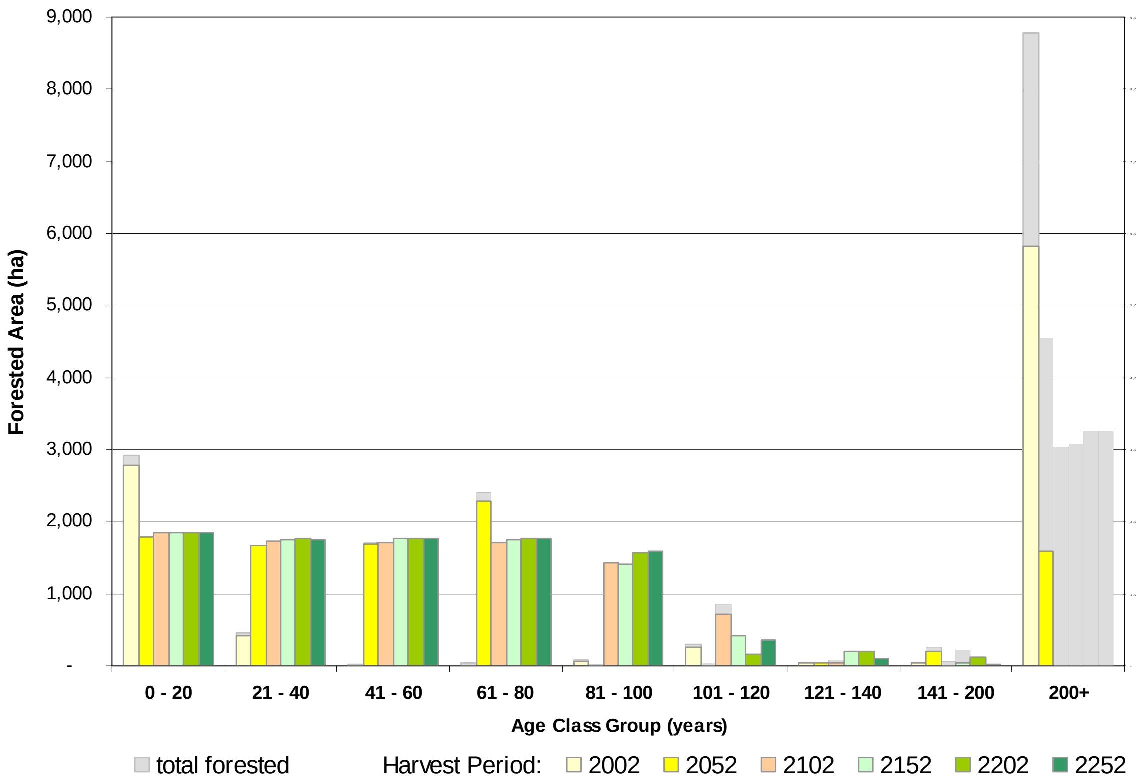


Figure 19. Age class progression on Block 3 THLB (+ total forested) for current management through 250 years

In this Block the LRSA and mLRSA calculations are very similar (Table 1) and the suggested harvest level falls between the two. On average in the long term, stands are harvested near culmination of mean annual increment and close to the threshold minimum harvest age needed to ensure profitability.

Age class distributions are examined in Figure 19. On the THLB, there is initially a disproportionate area in the youngest age class. Previously this block was the focus of harvesting for the combined Block 2, 3, 5 AAC and this regeneration pulse carries through from the 0-20 to the 61-80 age class by 2052. The 21-40 age class is low initially because harvesting began in this block only about 25 years ago. By the next century a more or less balanced age class distribution is attained. Harvestable second growth age classes increase dramatically by the next century and become the basis of the sustainable harvest. 101- to 200-year-old stands remain present in low abundance throughout the simulation. On the THLB the oldest stands decline dramatically through the first one hundred years of the simulation as the transition to second growth harvesting is completed.

On the total forest land base, forest greater than 200-years-old declines from the current level of about 8,800 ha to about 3,200 ha in the long term. This unharvested old forest should facilitate the perpetuation of most old-growth dependent processes or organisms and complement the 6,640 ha of adjacent ecological reserve and park in the Tsitika Valley.

Figure 20 illustrates gross growing stock levels for the total land base. Initially levels are about 7 million m^3 but decline to 5.6 million m^3 before recovering in the longer term to near 6 million m^3. The proportion of older forest drops from the current level of 6.7 million m^3 to about 2.3 million m^3 in the long term. The 6 million m^3 standing inventory of wood permanently provides the basis for sustainable timber flow in the long term and provides substantial habitat and other environmental benefits to supplement values in adjacent park land (6,640 ha). The proportion of younger growing stock increases initially and then stabilizes at about 22% of total growing stock. The 71- to 140-year-old growing stock provides the primary source of sustainable timber production (orange band) through the simulation.

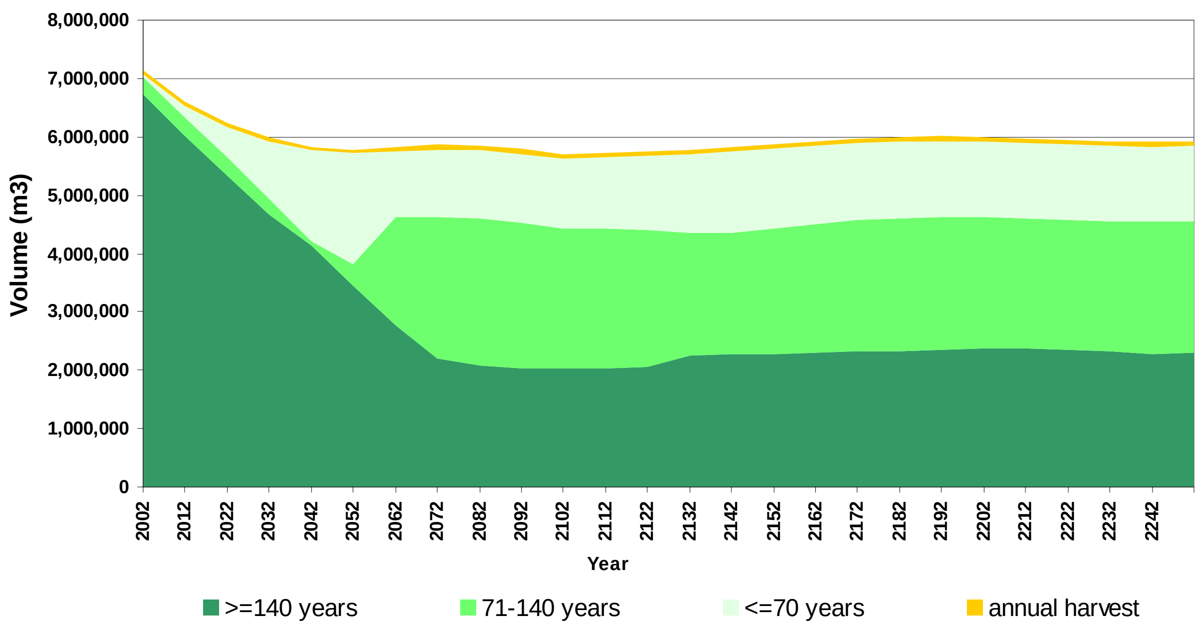


Figure 20. Merchantable growing stock on total Block 3 land base through 250 years

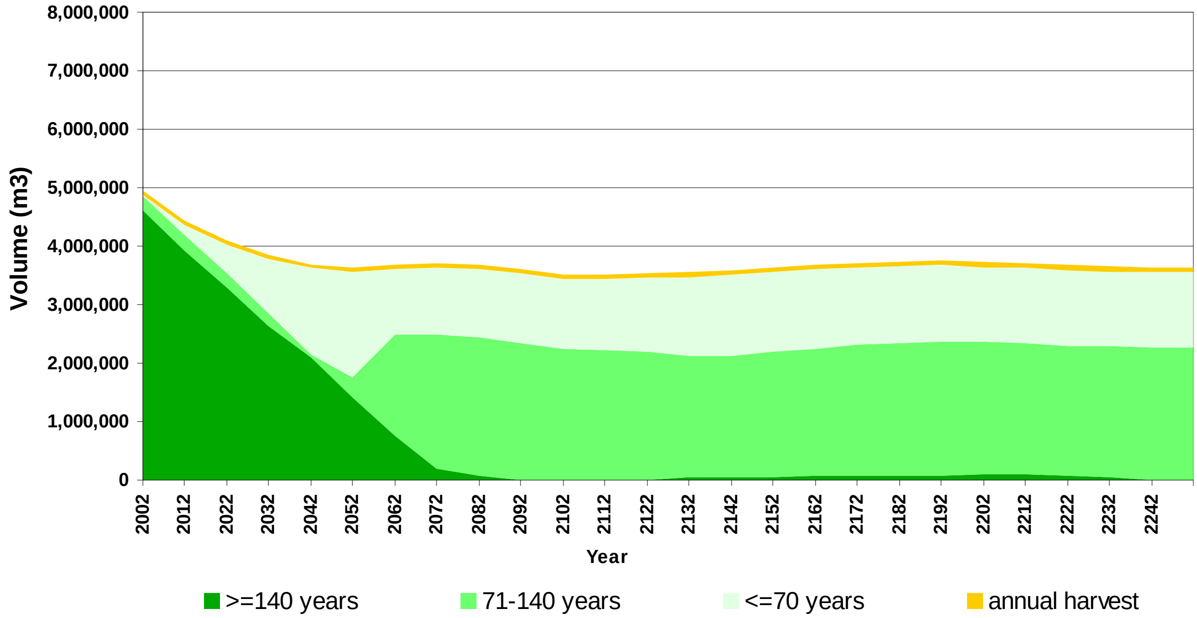


Figure 21. Merchantable growing stock on Block 3 THLB through 250 years

By the next century the older growing stock is for the most part, but not entirely, in reserves or area projected to be unavailable for timber harvest. Figure 21 displays growing stock through time for the THLB only. For non-timber or scheduling reasons, some timber is held significantly beyond normal rotation ages and reaches ages in excess of 140 years before being harvested. This harvest could provide a small but ongoing supply of older stems possibly suitable for specialty manufacturing or cultural purposes.

Figure 22 below is as per Figure 20 except data is presented on an area basis rather than a volume basis and simplifies the age class data presented in Figure 19.

Initially the area of old growth declines, the area of young stands increases and the area of maturing stands remains small. As the transition from old growth nears completion, at the landscape level old growth area is not replaced by clearcut area, but rather by maturing 71- to 140-year-old stands.

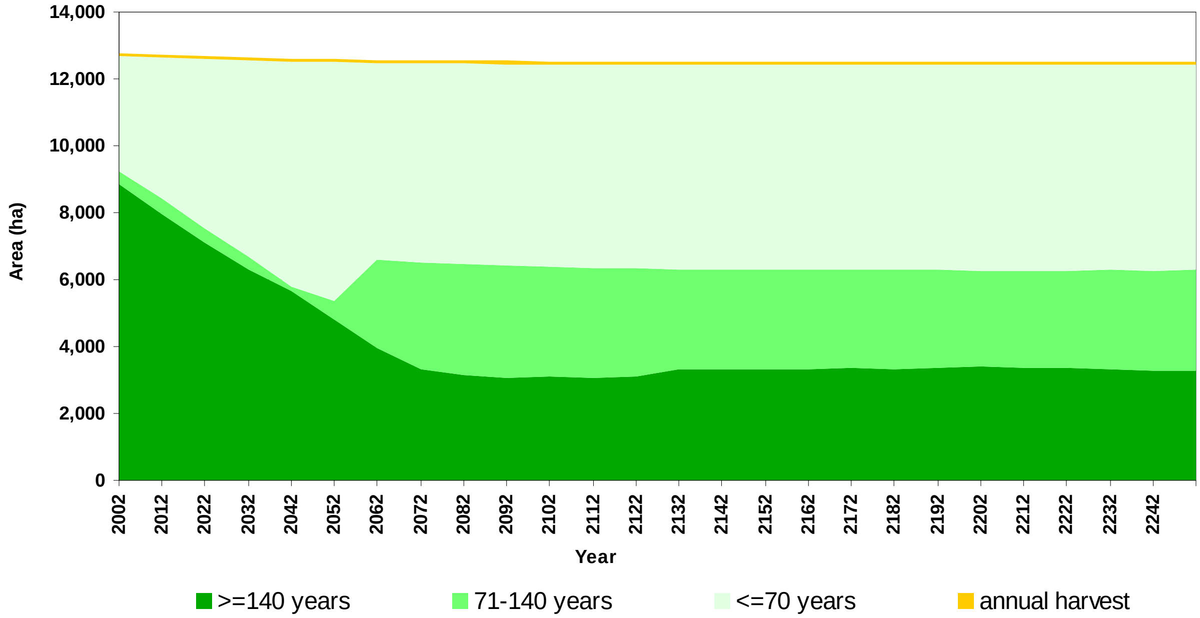


Figure 22. Age-group areas for Block 3 total land base through 250 years

Figure 22 also clearly demonstrates that the age class distribution is already different than the natural disturbance type (NDT1) or recent historical range of natural variability for the area would dictate. Clearly any attempt to impose or return to an age class distribution representative of infrequent disturbances would be very difficult and create timber shortages.

Figure 23 presents growing stock in terms of merchantable volume and area that is larger than the minimum harvestable[12] DBHq.

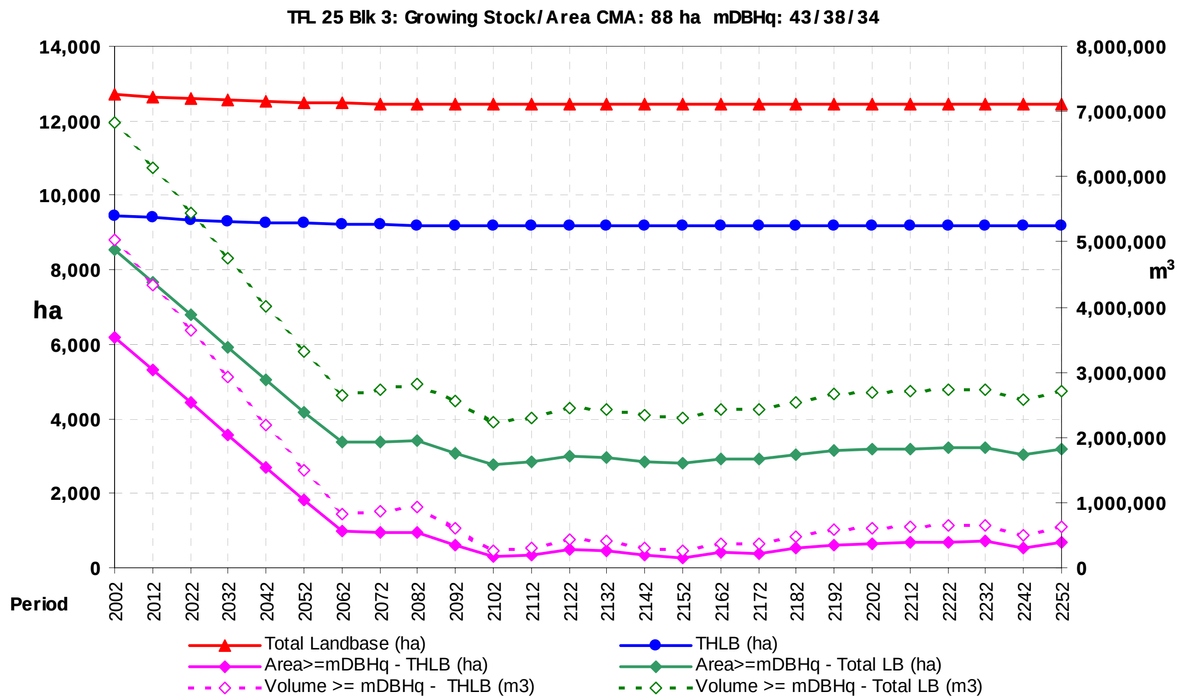


Figure 23. Merchantable growing stock in harvestable (>mDBHq) stands through 250 years for Block 3.

Roughly 3,250 ha or 26% of the productive land base is unavailable for harvesting for the long term. Because the locations of future Wildlife Tree Patches and partial retention along streams or elsewhere could not be easily predicted, they were modelled as a yield curve volume net down. Consequently these net downs are not represented in any of the aforementioned Figures and the actual volume and/or hectares illustrated understate the old forest reserved from harvest by about 5% of THLB area or volume.

On the THLB, harvestable stands become less available and at the pinch point 955 ha, or roughly 11 years worth of harvesting at the indicated harvest level, is of harvestable size. Two decades past the pinch point, this drops to 285 ha or only 3 years worth of harvesting suggesting that adjacency or cover factors are important at the pinch point but thereafter become less important as newly recruited stands are harvested soon after mDBHq is attained. By this point the annual harvest area recommendation makes near optimal use of the land base's residual timber capacity. Operational flexibility in the selection of harvest locations can be expected to be most limited around pinch points at 2102 and 2152.

A strategic focus for silviculture treatments could be to increase the harvestability of stands around the 2082 pinch point and through the 2092-2181 period where area available for harvesting is projected to be lowest. A second objective would be to increase volume/ha during the anticipated dips from 2042 to 2061 and 2102 through 2192 (Figure 18). Otherwise silviculture treatments which increase the future volume, merchantability or quality of stands maturing within the next century may be more or less equal in terms of strategic importance and should therefore be ranked using stand-level financial analysis.

5.2 Alternate Harvest Levels

5.2.1 10% Increase

Figure 24 shows that a higher area harvest request induces area and volume shortfalls at the transition to second growth and several points in the simulation thereafter. Average harvest age and DBHq dips sooner and remains somewhat lower in the long term. Average volume per hectare is lower and declining in the longer term as stands are harvested earlier than was the case in the current management run. Note that relative to the current management simulation, this run produces slightly more volume (267,522 m^3 or 1.4%) through 250 years (Appendix B, Table 12), most of which is realized in the nearer terms.

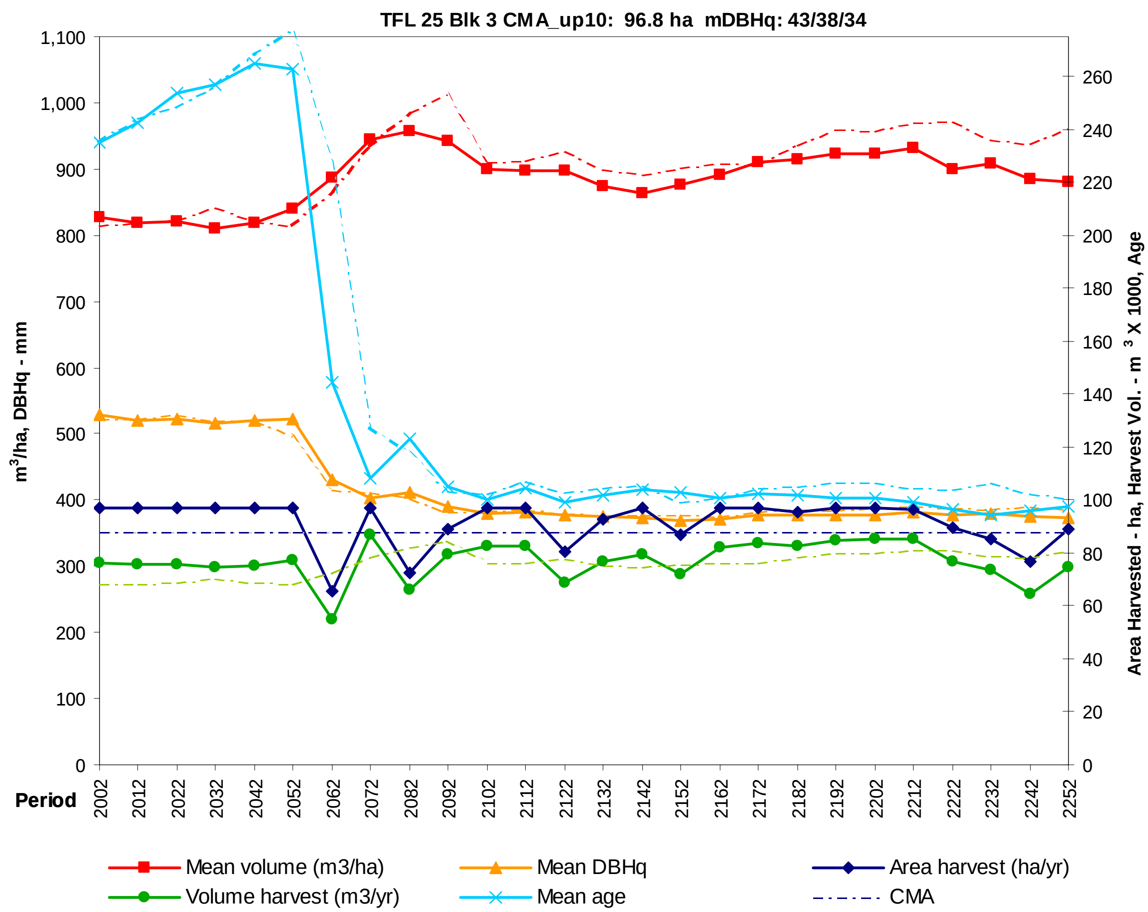


Figure 24. Block 3 harvest statistics[32] through 250 years for current management area harvest plus 10%

5.2.2 10% Decrease

1.1 ______________________

[32] Dashed lines in background represent current management statistics.

Lowering the harvest request level by 10% (Figure 25) has the effect in the short plus mid term of lowering the harvest volume in proportion (-10.4%) to the area change. This is because existing old growth stands are assumed to be neither adding nor losing volume through time. Once second growth becomes an appreciable component of the harvest profile, harvest age and DBHq are significantly higher (longer rotation) with the result that stand volumes per hectare at harvest are higher as well. This tends to compensate for the loss of area harvested such that the overall volume harvest is less affected in the longer term (-4.6%) (Appendix B, Table 12).

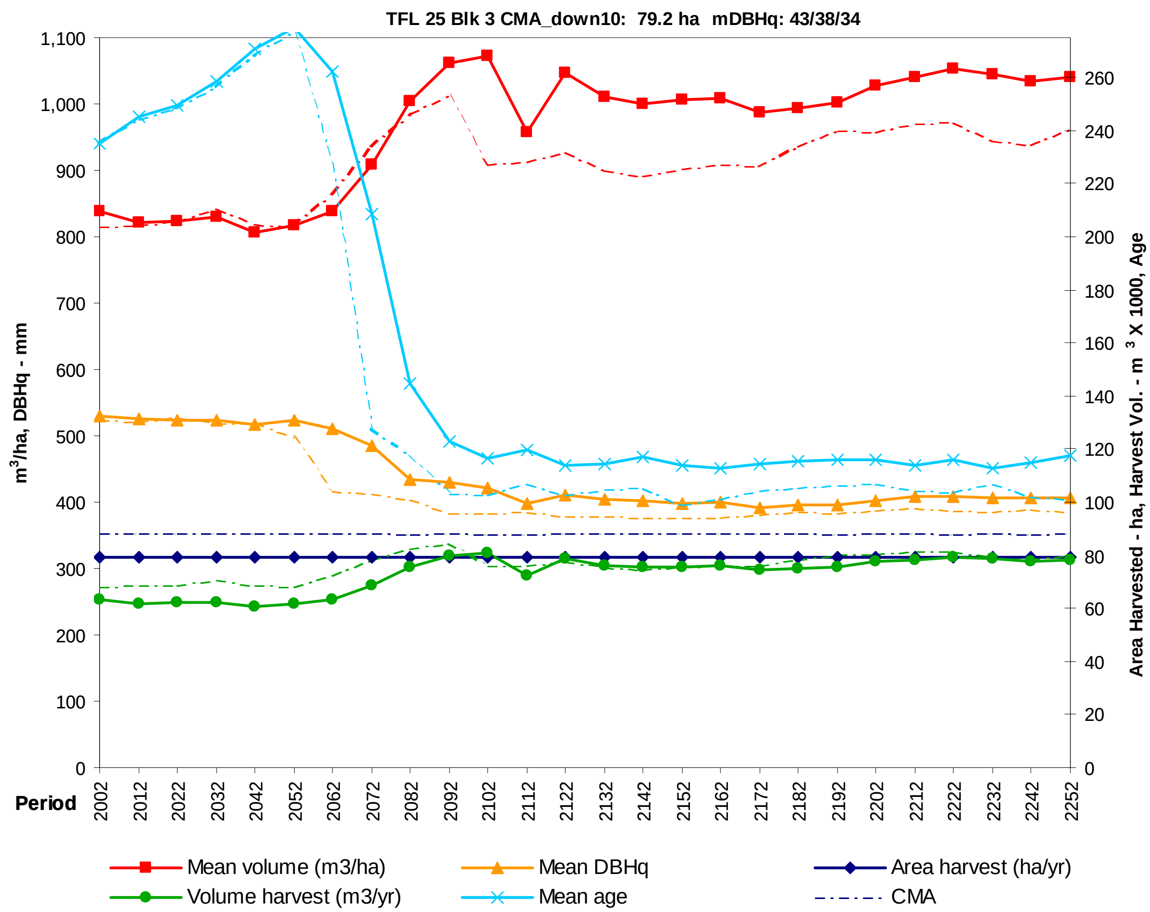


Figure 25. Block 3 harvest statistics through 250 years for current management area harvest less 10%

5.3 Sensitivity Analyses

Harvest output statistics for all sensitivity runs are presented in Appendix A. In the harvest output graphs, decreases in area harvest relative to the base case are presented both unadjusted and as a new flat line. For increases in harvest opportunity, a new, higher, flat-line harvest level was established. Flat-line flows were established by increasing area harvest requested until a deficit occurred, and then dropping back to the nearest whole number where the deficit disappears. Appendix B (p.100) summarizes changes in area (Table 10, Table 11) and near, mid, and long term volume (Table 12).

Table 4 presents the area results of sensitivity analyses for Block 3.

Block 3 is most sensitive to changes that alter the minimum harvest age (-SI3m, +/-age). Removing the area operable only by helicopter has an impact (-9.1%), about proportional to the 8.9% of the THLB excluded from the simulation.

Visual quality is an important issue along the shores of Johnstone Strait and further reducing the allowable disturbance in this area had an impact of –8.0%.

Table 4. Block 3 Sensitivity Results

Run ID	Harvest (ha)	Change (ha)	Change %	Description
CMA	88	-	-	Area-based current management option
+Oe	90	2.0	2.3	Include Oce and Ohe polygons in THLB (2.3% of THLB)
-Oh	80	-8.0	-9.1	Remove helicopter operable polygons (8.9% of THLB)
-SI3m	71	-17.0	-19.3	Reduce SI estimates for age class 1-2 and future stands by 3m
-age	101	13.0	14.8	Lower minimum harvest age by decreasing mDBHq by 3 cm
+age	74	-14.0	-15.9	Increase minimum harvest age by increasing mDBHq by 3 cm
-RndAge	84	-4.0	-4.5	Uses the mDBHq ages rounded up to the nearest 10th year (effectively adds 5 years to mDBHq)
-midVQ	81	-7.0	-8.0	Use mid range disturbance target

6.0 Block 5 Analysis (Central Coast)

6.1 Current Management

6.1.1 Protected Area Candidates Included – 492 ha/year

Figure 26 summarizes for the current management or “base case” simulation, the trends for harvest variables including timber volume, harvest age, mean stand diameter (DBHq), and proportion of helicopter harvesting.

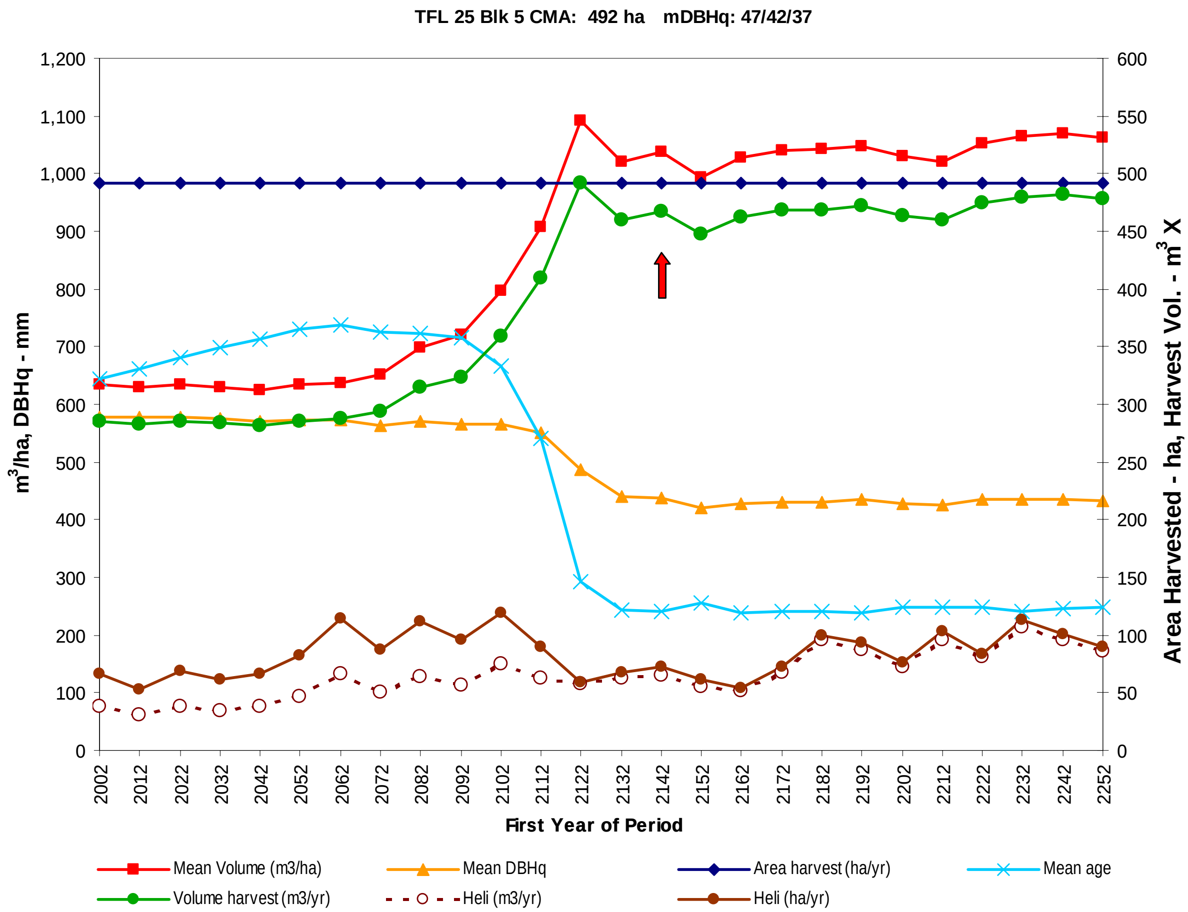


Figure 26. Block 5 Current Management harvest statistics through 250 years[33]

In this Block the primary transition to second growth is not forecast to occur until the start of the next century hence average stand age at harvest climbs until second growth harvesting becomes common. Mean diameters of harvested stands remain relatively constant as existing old stands are assumed to neither grow or decline. However a slight downward trend in DBHq, a flattening harvest age trend, and a slow increase in

1.1 ———————————

[33] Red arrow indicates point where an area harvest deficit occurs if harvest request is increased by 1 ha.

volume per hectare are evident after sixty years, indicating that a small proportion of second growth begins contributing to the harvest before the primary transition occurs. The bulk of the harvest will be from old forest for at least the next one hundred years.

The primary transition to second growth occurs rapidly within a 30-year period as harvest age and DBHq drop sharply. As the transition progresses average merchantable stand volumes at harvest increase from under 650 m^3/ha to the 1000-1070 m^3/ha range in the long term. This effect is primarily related to expected gains from current silviculture practices. As neither site series ecological mapping nor a Vegetation Resource Inventory have been completed for this Block, the second growth yield forecasts used are less certain than in other Blocks. It is conceivable that second growth yield is overstated, yet the volumes/ha indicated are comparable to Block 5 where both ecological mapping and VRI have been recently completed or updated. In any event, the harvest for the foreseeable future is not second growth dependent.

As the area harvest is constant, annual harvest volumes increase[25] in tandem with the increasing stand volumes. In the long term, ages at harvest average 120-124 years and average harvest diameters are around 42-44 cm (individual stands ranging up to 65+ cm).

In this Block the indicated harvest level is well below the LRSA and slightly below mLRSA calculations (Table 1, p.6), suggesting that near the pinch point (circa 2142) and beyond stands are on average harvested near the threshold minimum harvest age needed to ensure profitability and well beyond the culmination of mean annual increment.

Harvest from helicopter-operable polygons averages 83 ha per year through the simulation.

Age class distributions are examined in Figure 27. On the THLB, the younger age classes initially increase from current levels and then stabilize through the remainder of the simulation. Second growth stands in the 61-100 age classes do not increase significantly until the second century and then stabilize. 101- to 200-year-old stands build modestly through the simulation and 250 years into the simulation occupy more area than at present. On the THLB the oldest stands decline dramatically through the first half of the simulation as old forest is harvested but small amounts do remain indefinitely.

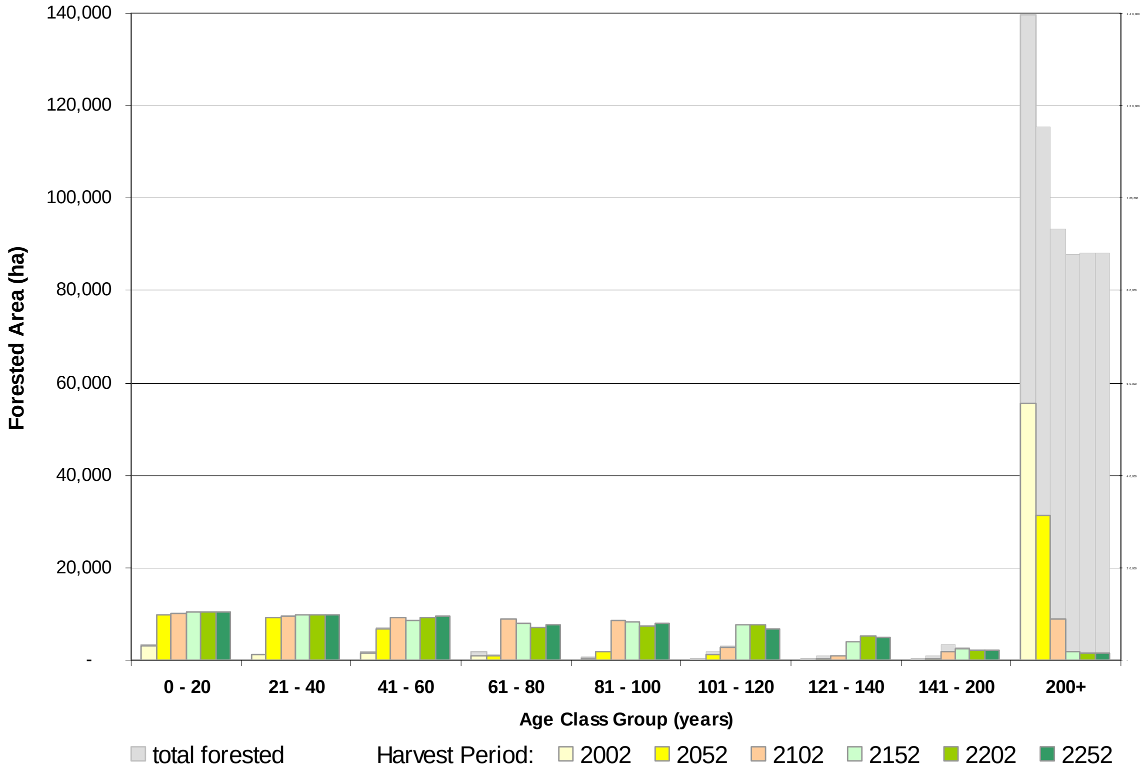


Figure 27. Age class progression on Block 5 THLB (+ total forested) for current management through 250 years

On the total forest land base, forest greater than 200 years old declines from the current level of just under 140,000 ha to about 63% of that level in the long term. At least 88,000 hectares of old forest is forecasted to be present and contributing to the perpetuation of old-growth dependent processes and organisms in the long term.

Figure 28 illustrates gross growing stock levels for the total land base. Initially levels are about 76 million m^3 and fall to about 66 million m^3 through the old forest harvesting phase before recovering to 70 million m^3 in the longer term. The proportion of older forest drops initially from the current level of 74 million m^3 to about 43 million m^3 and then stabilizes near 44 million m^3 in the long term. The 66-76 million m^3 standing inventory of wood permanently provides the basis for sustainable timber flow in the long term and provides substantial habitat and other environmental benefits supplementing values present in the adjacent Fiordland Recreation Area (84,750 ha).

![WFP]

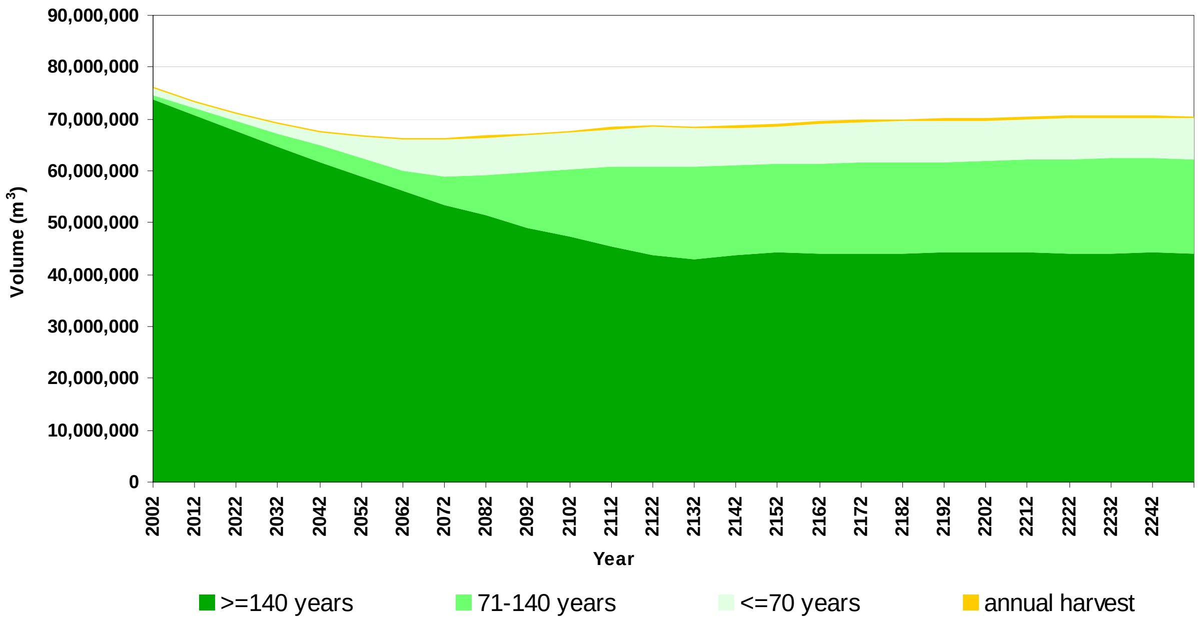


Figure 28. Merchantable growing stock on total Block 5 land base through 250 years

The proportion of younger growing stock increases gradually and then stabilizes at about 11% of total growing stock. The 71- to 140-year-old growing stock, amounting to 26% of total growing stock in the long term, provides the primary source of sustainable timber production through the simulation (represented by the thickness of the orange "line").

The older growing stock is for the most part, but not entirely, in reserves or area projected to be unavailable for timber harvest. Figure 29 displays growing stock through time for the THLB only. For non-timber reasons, 9-12% of growing stock is held significantly beyond normal rotation ages and reaches ages in excess of 140 years before other stands become equally or more suitable for satisfying the model's non-timber objective(s). When this timber is released, its harvest could provide a small but ongoing supply of older stems possibly suitable for specialty manufacturing or cultural purposes.

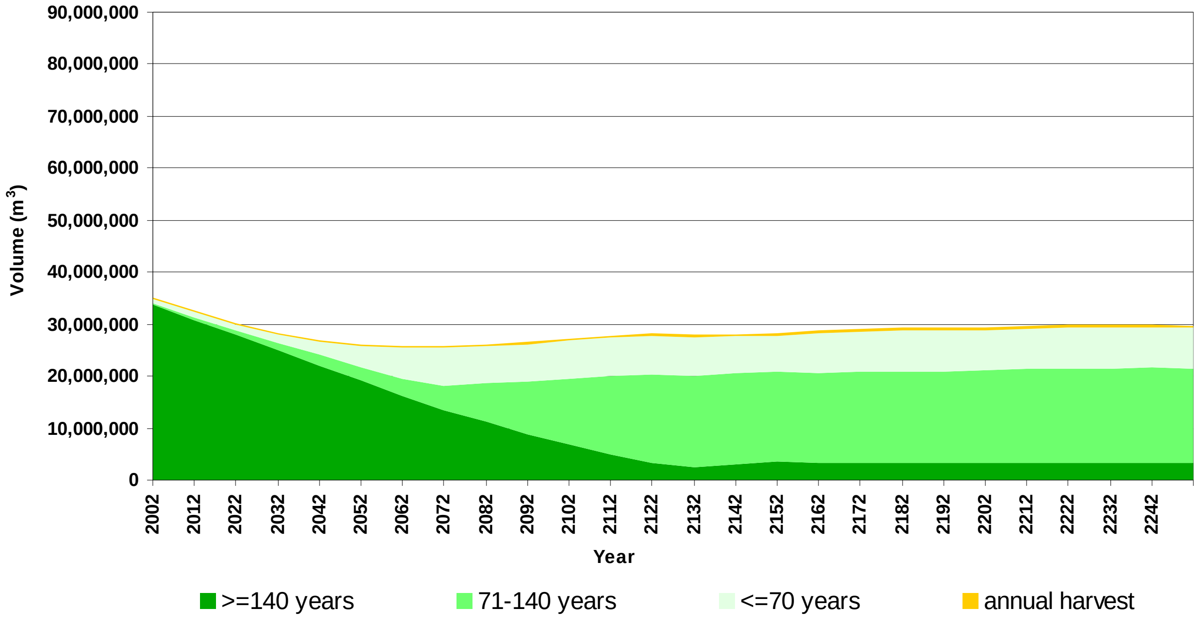


Figure 29. Merchantable growing stock on Block 5 THLB through 250 years

Figure 30 below is as per Figure 28 except data is presented on an area basis rather than a volume basis and simplifies the age class data presented in Figure 27.

The area of old forest declines gradually and the area of young forest increases in proportion through the first 70 years. As the transition to second growth harvesting approaches, the area of younger forest stabilizes and the area of maturing forest builds to provide the basis of a sustainable second growth harvest after the transition. Even in the long term, old forests would dominate this landscape.
Figure 31 presents growing stock in terms of merchantable volume and area that is larger than the minimum harvestable[26] DBHq.

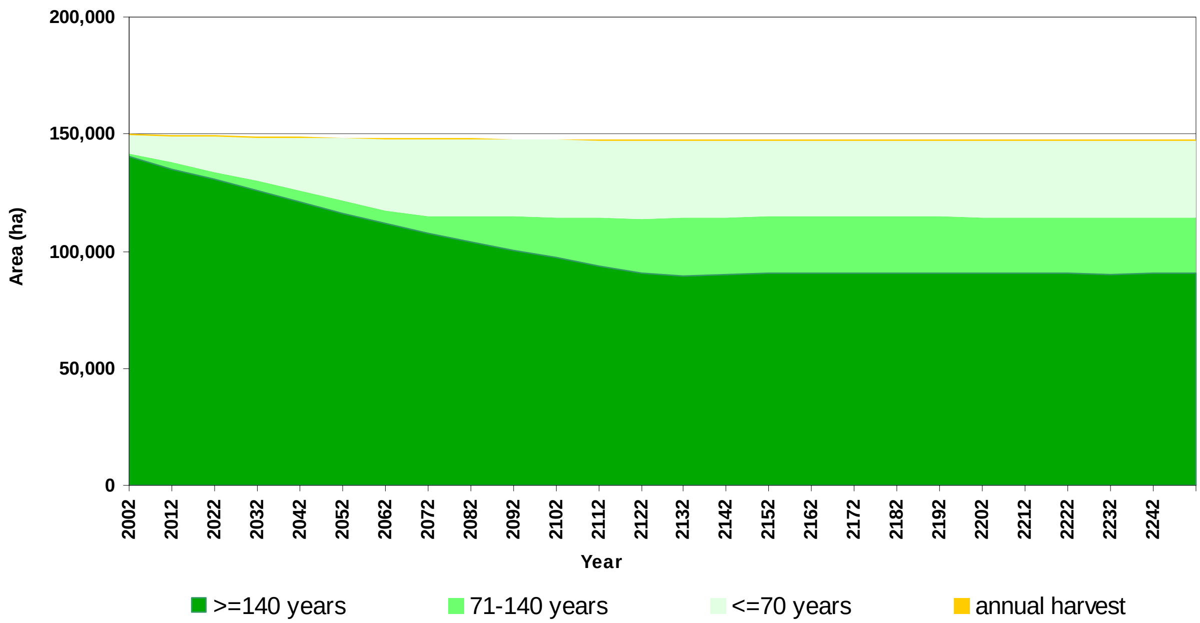


Figure 30. Age-group areas for Block 5 total land base through 250 years

Roughly 86,000 ha or 59% of the productive land base is unavailable for harvesting for the long term. Because the locations of future Wildlife Tree Patches, partial harvests along streams, or retention associated with ecosystem-based management could not be easily predicted, they were modelled as a yield curve volume net down. Consequently these net downs are not represented in any of the aforementioned Figures and the actual volume and/or hectares illustrated understate the old forest reserved from harvest by about 8.5% of THLB area or volume.

On the THLB, harvestable stands become less available until the pinch point and at 2152 amount to about 2,900 ha, or roughly 6 years worth of harvesting at the indicated harvest level. This confirms that the annual harvest area recommendation, after considering non-timber values, makes more or less optimal use of the land base’s residual timber capacity while maintaining flexibility to locate harvest blocks. Operational flexibility in the selection of harvest locations can be expected to be most limited through the 2142 through 2181 period where that ration or harvestable area to annual harvest is lowest.

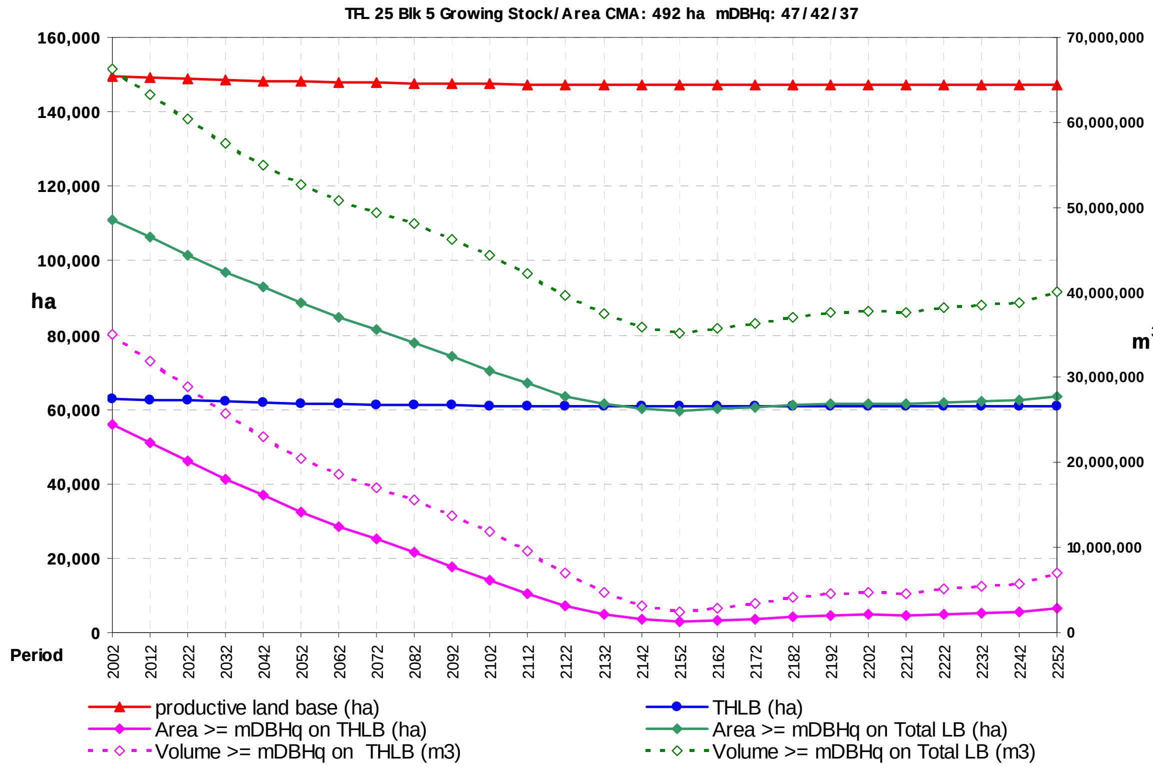


Figure 31. Merchantable growing stock in harvestable (>mDBHq) stands through 250 years for Block 5

Silviculture treatments to increase the harvestability or volumes of stands through the 2142-2181 period may prove worthwhile, but given the modelling and land use uncertainties involved, require more study before recommendation. Silviculture treatments which increase the future volume, merchantability or quality of stands may be more or less equal in terms of strategic importance and should therefore be ranked using stand-level financial analysis.

6.1.2 Protected Area Candidates Excluded – 364 ha/year

Figure 32 summarizes the current management simulation with Candidate Protected areas excluded. Trends for harvest variables including timber volume, harvest age, mean stand diameter (DBHq), and proportion of helicopter harvesting are presented.

In this simulation the output statistics and characteristics relative to the base case - with the large exceptions of area and volume harvested - are relatively unchanged. Annual area and short term volume harvest are reduced by 26% or 128 ha and 74,000 m^3/year. In the long term the impact is greater as annual volume harvest is reduced 128,000 m^3/year (27%) by the end of the simulation.

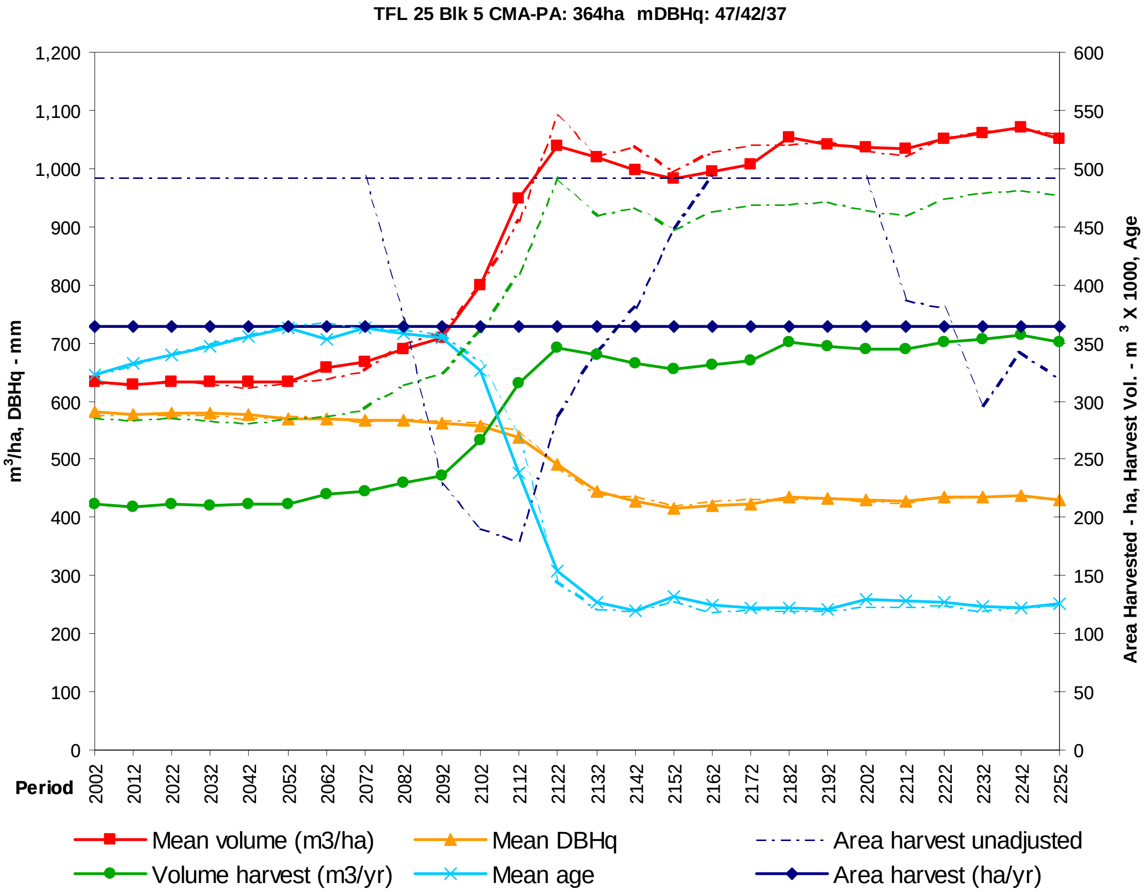


Figure 32. Block 5 Current Management with Candidate Protection Areas excluded - harvest statistics through 250 years[34]

6.2 Alternate Harvest Levels

6.2.1 10% Increase

Figure 33 shows that a higher area harvest request induces area and volume shortfalls at the transition to second growth and advances the transition by a decade. Note that the volume trough created at 2112 remains above volume estimates for the next 80 years. Average harvest age and DBHq dips sooner but is only slightly lower in the long term. Average volume per hectare trends somewhat lower in the long term. Note that relative to the current management simulation, this run produces more volume (5,789,110 m^3 or 23,200 m^3 annually on average) through 250 years (see Appendix B, Table 12).

1.1 ———————————

[34] Dashed lines in background represent current management statistics.

TFL 25 Blk 5 CMA_up10: 541.2 ha mDBHq: 47/42/37

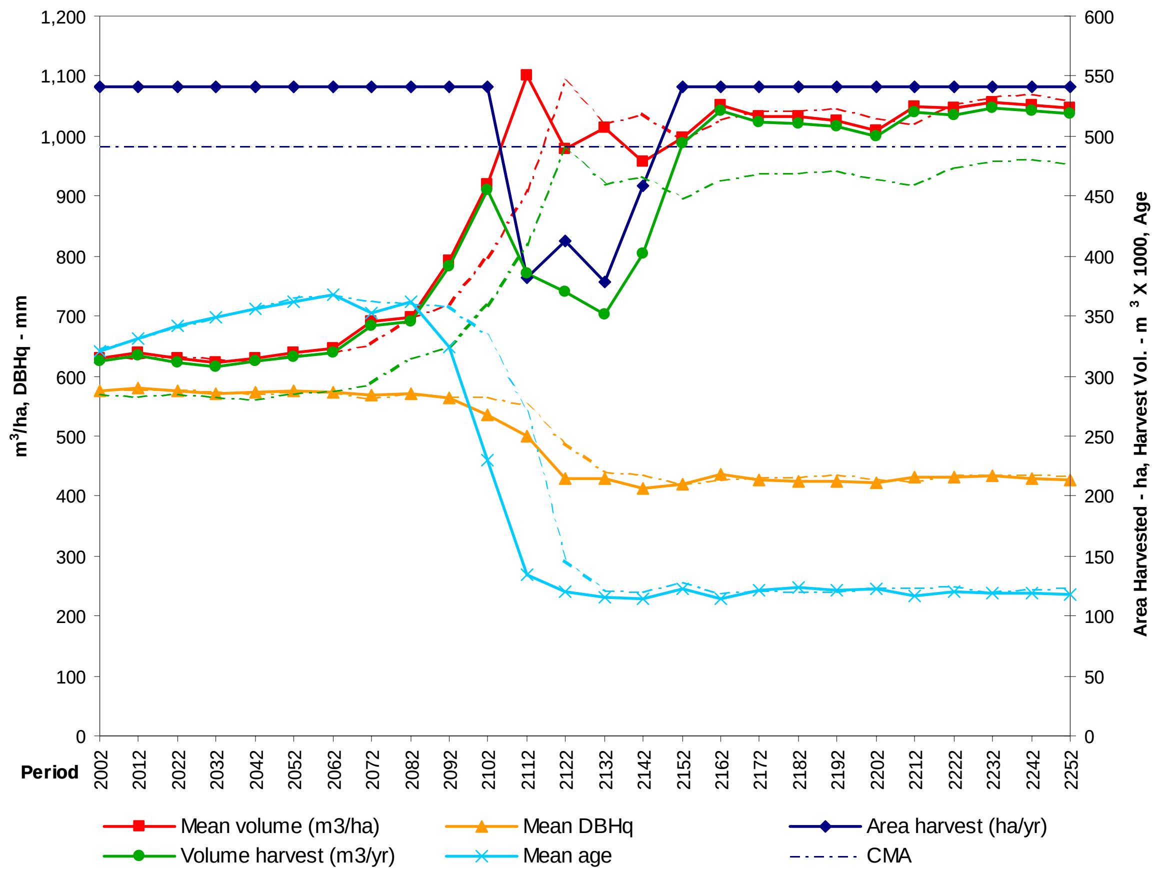


Figure 33. Block 5 harvest statistics through 250 years for current management area harvest plus 10%

6.2.2 10% Decrease

Lowering the harvest request level by 10% (Figure 34) has the effect in the short plus mid term of lowering the harvest volume in proportion (-10.0%) to the harvest area change. This is because existing old growth stands are assumed to be neither adding nor losing volume through time. Once second growth becomes an appreciable component of the harvest profile, harvest age and DBHq are higher (longer rotation) with the result that stand volumes per hectare at harvest are higher as well. This tends to compensate for the loss of area harvested such that the overall volume harvest is somewhat less affected in the longer term (-9.2%) (Appendix B, Table 12) and near the end of the simulation (-4 to -7%).

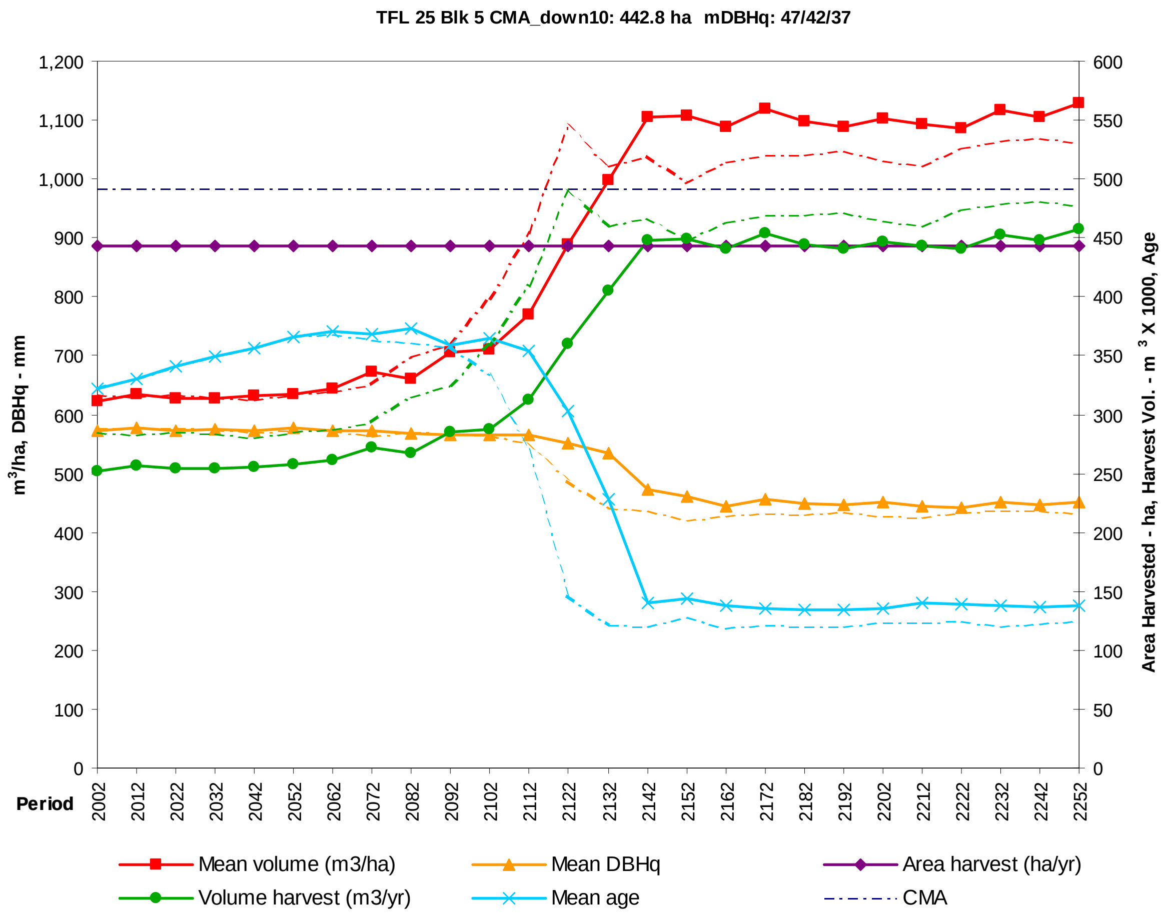


Figure 34. Block 5 harvest statistics[34] through 250 years for current management area harvest less 10%

6.3 Sensitivity Analyses

Harvest output statistics for all sensitivity runs are presented in Appendix A. In the harvest output graphs, decreases in area harvest relative to the base case are presented both unadjusted and as a new flat line. For increases in area harvest, a new, higher, flat-line harvest level was established. Flat-line flows were established by increasing area harvest requested until a deficit occurred, and then dropping back to the nearest whole number where the deficit disappears. Appendix B (p.100) summarizes changes in area (Table 10, Table 11) and near, mid, and long term volume (Table 12).

Table 5 presents the area results of sensitivity analyses for Block 5.

Table 5. Block 5 Sensitivity results

Run ID	Harvest (ha)	Change (ha)	Change %	CMA-PA Harvest (ha)	CMA-PA Change (ha)	CMA-PA Change %	Description
CMA	492	-	-	364	-128	-26.0	Area-based current management option
+Oe	511	19	3.9	-			Include Oce and Ohe polygons in THLB (4.7 % of THLB)
-Oh	404	-88	-17.9	-			Remove helicopter operable polygons (18.0% of THLB)
-SI3m	434	-58	-11.8	323	-41	-11.3	Reduce SI estimates for age class 1-2 and future stands by 3m
-age	559	67	13.6	409	45	12.4	Lower minimum harvest age by decreasing mDBHq by 3 cm
+age	448	-44	-8.9	336	-28	-7.7	Increase minimum harvest age by increasing mDBHq by 3 cm
-RndAge	483	-9	-1.8	358	-6	-1.6	Uses the mDBHq ages rounded up to the nearest 10th year (effectively adds 5 years to mDBHq)
-PA	364	-128	-26.0	-			Remove protected area candidates as identified in April, 2001 announcement
-PA-OA	206	-286	-58.1	-			As above and also remove Option Areas identified in April, 2001 announcement
-midVQ	477	-15	-3.0	349	-15	-4.1	Use mid range disturbance target
+BEO	492	0	0.0	364	0	0.0	Apply specific BEOs to draft or legislated landscape units where not included in CM0
-SsSIest	469	-23	-4.7	347	-17	-4.7	Adjust SI so that Good site Spruce SI=34m instead of 39m - Piece size remains 47-42-37

Removal of the Candidate Protected Areas identified in the April, 2001 agreement will result in a 26% reduction of area harvest. Additional removal of the Option Areas identified at that time would result in a total area harvest reduction of 58% or 286 ha.

Land base reductions aside, Block 5 is most sensitive to changes that alter the minimum harvest age (-SI3m, +/- age). Removing the area operable only by helicopter has an impact proportional to the THLB excluded from the simulation.

Visual quality is an important issue along the Inside Passage and further reducing the allowable disturbance in this area had an impact of –3.0%.

7.0 Block 6 Analysis (Haida Gwaii)

7.1 Current Management - 254 ha/year

Figure 35 summarizes for the current management or "base case" simulation, the trends for harvest variables including timber volume, harvest age, mean stand diameter (DBHq), and proportion of helicopter harvesting.

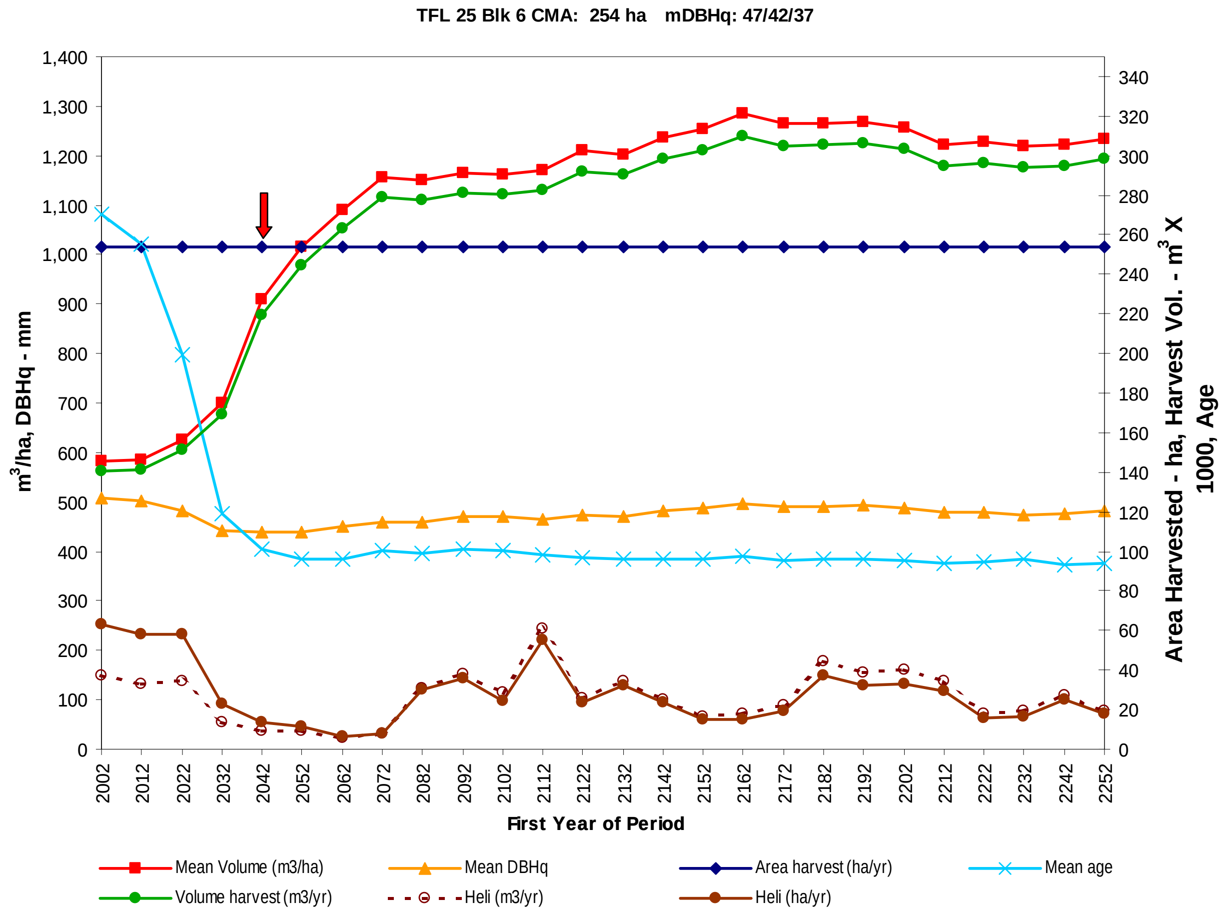


Figure 35. Block 6 Current Management harvest statistics through 250 years[35]

In this Block the transition to second growth is expected within the next few decades. As this occurs, average age of harvested stands declines abruptly until the transition is complete. Average DBHq at harvest declines from around 51 cm at present to 44 cm after 30 years and rebuilds to 47-50 cm in the long term. Within twenty years average merchantable stand volumes at harvest start to increase from current levels of under 600 m^3/ha and rapidly rise to in excess of 1,100 m^3/ha within 70 years. This effect is related to maturing second growth becoming available for harvest. Current AAC has been

1.1

[35] Red arrow indicates point where an area harvest deficit occurs if harvest request is increased by 1 ha.

significantly depressed due to the age class imbalance created by the 1988 withdrawal of Gwaii Haanas reserve from forest management. Expected gains from current silviculture practices add to the second growth fall up[25] later in the simulation. As the area harvest is constant, annual harvest volumes increase in tandem with the increasing stand volumes. In the long term, ages at harvest average 93-98 years and average harvest diameters are around 47-50 cm (individual stands ranging 37-70+ cm).

In this Block the indicated harvest level is less than the LRSA and mLRSA calculations (Table 1, p.6), suggesting that throughout the simulation and even at the pinch point circa 2042 stands are on average harvested well beyond culmination of mean annual increment and the threshold minimum harvest age needed to ensure profitability.

Harvesting in helicopter-operable polygons makes up about 60 ha annually in the short term, but on average 11% or 28 ha per year of the annual harvest is from helicopter polygons. In the current model set-up there is no satisfactory method to regulate the helicopter portion within the overall area regulation so the short term heli-portion may be overstated. The appropriate level of harvesting from helicopter-operable polygons is discussed further in section 7.3.

Age class distributions are examined in Figure 38. On the THLB, the 21-60 age classes initially decline from current levels (which reflect a larger pre-1988 AAC and the concentration of early harvesting on the northern portion of Moresby Island) and then stabilize through the remainder of the simulation. Older (61- to 120-year-old) second growth age classes increase significantly in the first 50-year period and then stabilize. 121- to 250-year-old stands remain present in low abundance throughout the simulation. On the THLB the oldest stands decline in the first 50 years from 6,000 ha to 200 ha as the transition to second growth harvesting is completed.

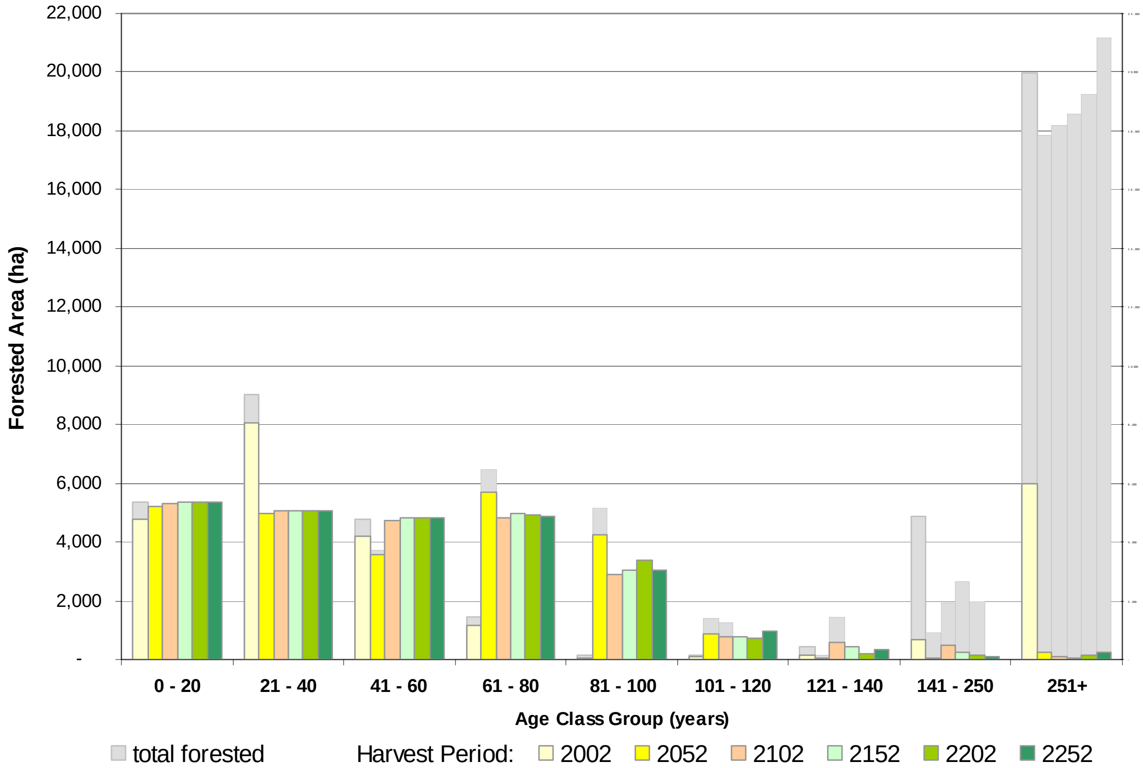


Figure 36. Age class progression on Block 6 THLB (+ total forested) for current management through 250 years

On the total forest land base, forest greater than 250 years old declines from the current level of just under 20,000 ha to about 18,000 ha and then rebuilds to above the 21,000 ha level as 141- to 250-year-old stands are recruited into the oldest age class. In this landscape, the future proportion of old forest remains essentially unaltered from current conditions.

Figure 37 illustrates gross growing stock levels for the total land base. Initially levels are about 17.5 million m^3 and rise above 25 million m^3 in the longer term. The proportion of older forest drops initially from the current level of about 12.5 million m^3 to about 9 million m^3 and then stabilizes near 12 million m^3 in the long term. This building standing inventory of wood permanently provides the basis for sustainable timber flow in the long term and provides substantial habitat and other environmental benefits to supplement values in the adjacent Gwaii Haanas reserve (148,500 ha). The proportion of younger growing stock increases initially and then stabilizes at about 24% of total growing stock. The 71- to 140-year-old growing stock provides the primary source of sustainable timber production through the simulation and increases from near nil initially to 28% in the long term.

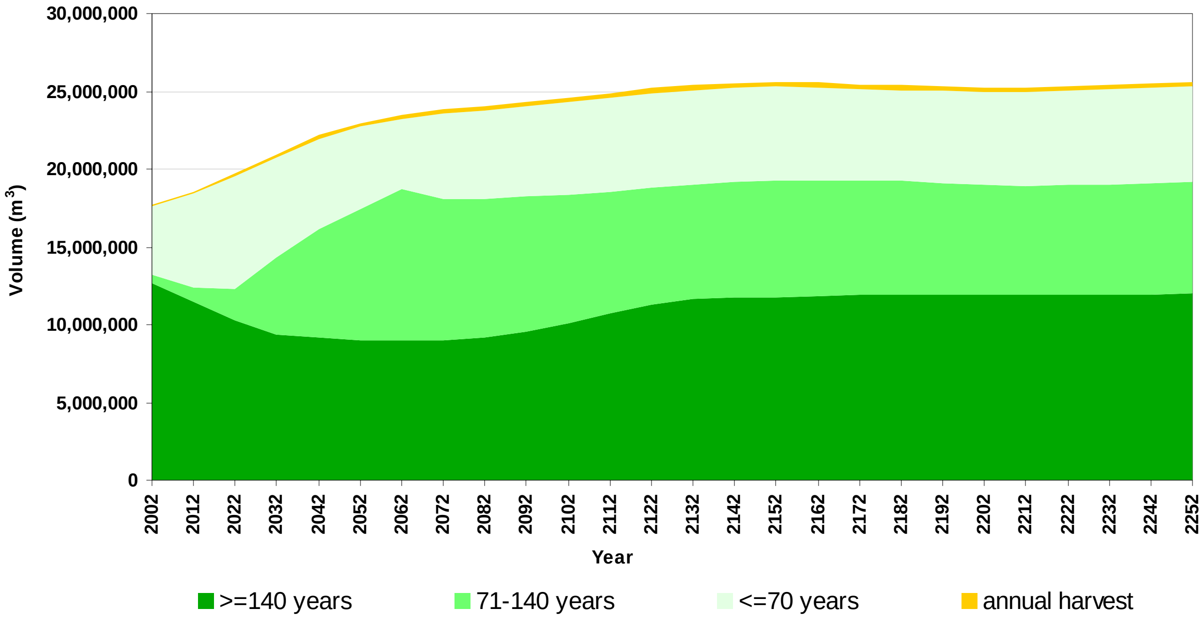


Figure 37. Merchantable growing stock on total Block 6 land base through 250 years

The older growing stock is for the most part, but not entirely, in reserves or area projected to be unavailable for timber harvest. Figure 38 displays growing stock through time for the THLB only. For non-timber or scheduling reasons, some timber is held significantly beyond normal rotation ages and reaches ages in excess of 140 years before other stands become equally or more suitable for satisfying non-timber objective(s). When this timber is released, its harvest could provide a small but ongoing supply of older stems possibly suitable for specialty manufacturing or cultural purposes.

Figure 39 is as per Figure 37 except data is presented on an area basis rather than a volume basis and simplifies the age class data presented in Figure 36.

Initially the area of old growth declines, the area of maturing stands increases, and the area of younger stands expands and then contracts. Contrary to popular opinion, as the transition from old growth progresses, at the landscape level old growth area is replaced less by clearcut area and more by 71- to 140-year-old stands. A century into the future under the current management regime, young stands will occur less frequently than they do today.

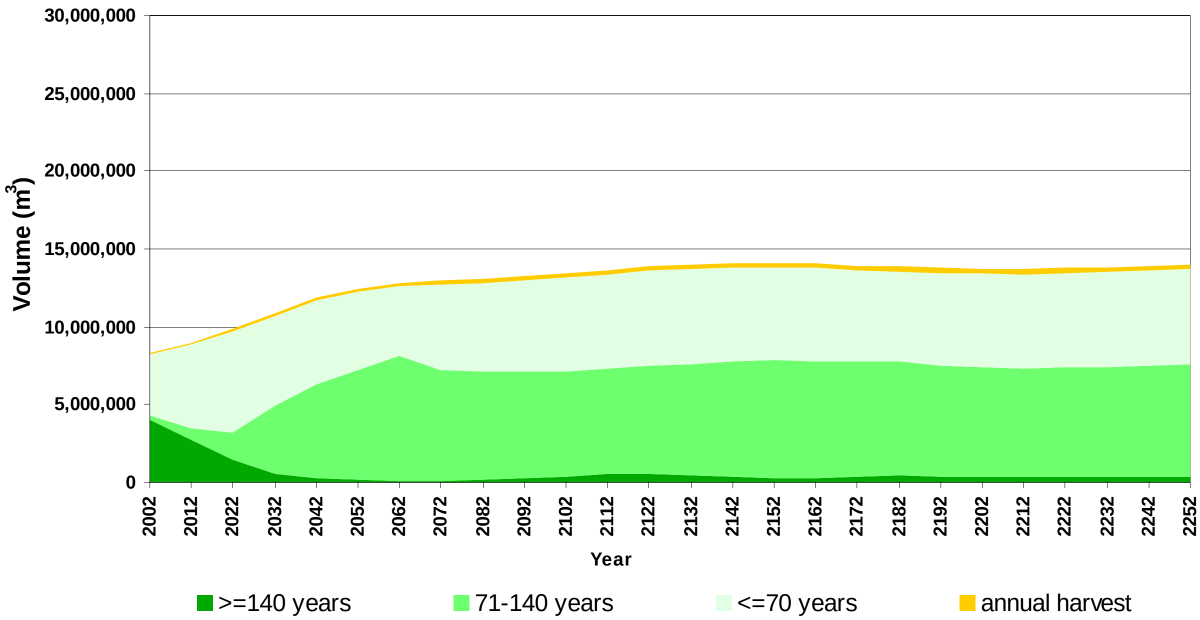


Figure 38. Merchantable growing stock on Block 6 THLB through 250 years

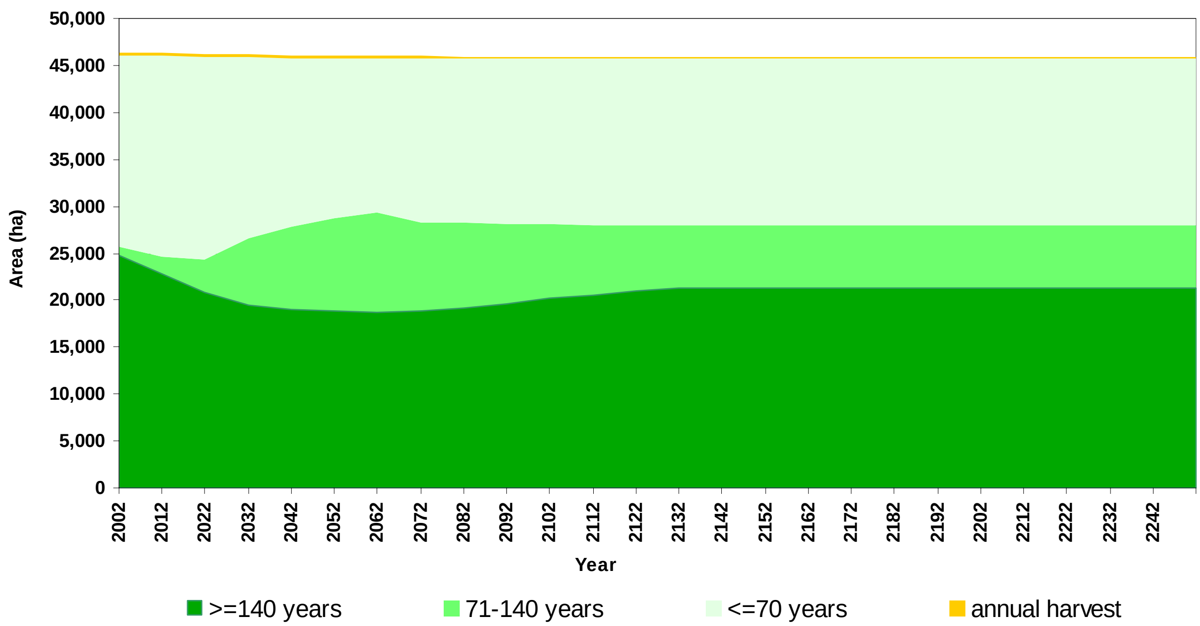


Figure 39. Age-group areas for Block 6 total land base through 250 years

Figure 39 also clearly demonstrates that the age class distribution is already much different than the natural disturbance type (NDT1) or recent historical range of natural variability for the area would dictate. Clearly any attempt to impose or return to an age class distribution representative of infrequent disturbances would be difficult, as well as economically devastating.

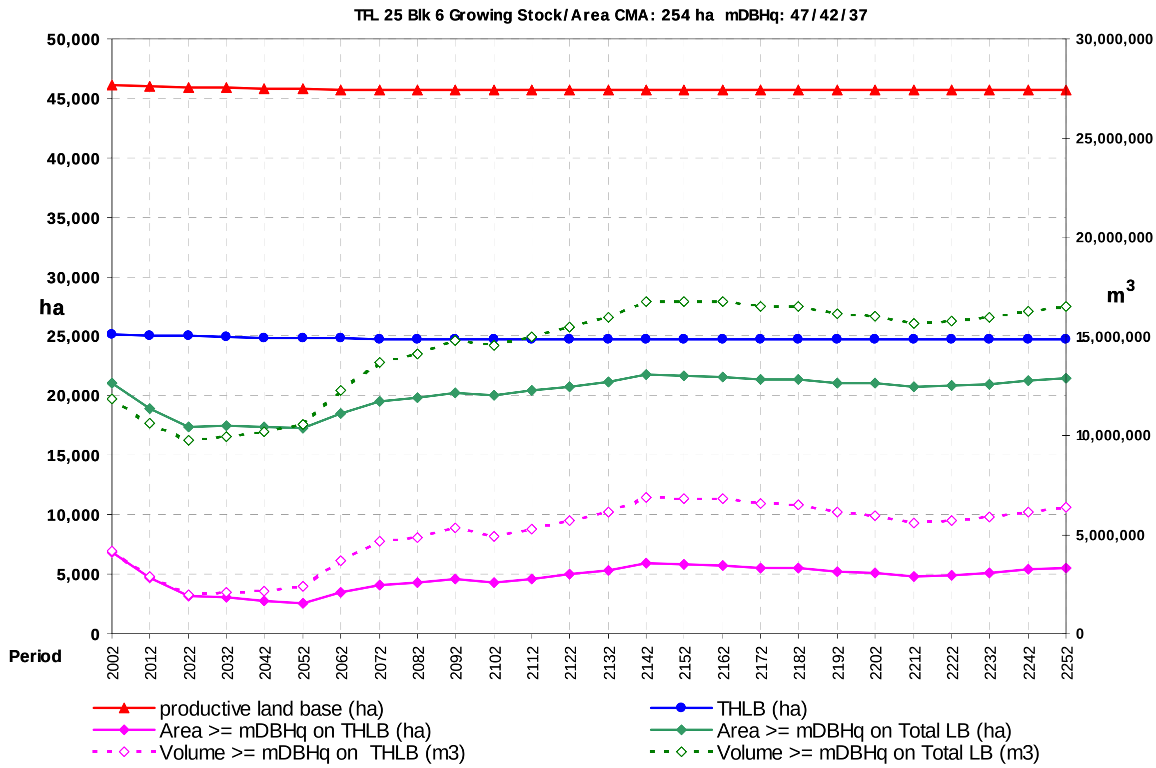


Figure 40. Merchantable growing stock in harvestable (>mDBHq) stands through 250 years for Block 6.

Figure 40 presents growing stock in terms of merchantable volume and area that is larger than the minimum harvestable[26] DBHq.

Roughly 20,900 ha or 46% of the productive land base is unavailable for harvesting for the long term. Because the locations of future Wildlife Tree Patches and partial retention along streams could not be easily predicted, they were modelled as a yield curve volume net down. Consequently these net downs are not represented in any of the aforementioned Figures and the actual volume and/or hectares illustrated understate the old forest reserved from harvest by about 5% of THLB area or volume.

On the THLB, harvestable stands become less available until the transition to second growth is complete and at the lowest point 2,557 ha are of harvestable size. This represents ten years worth of harvesting at the indicated harvest level. Operational flexibility in the selection of harvest locations can be expected to be most limited during the coming decades from 2012 through 2071.

A strategic focus for silviculture treatments could be to increase the harvestability of stands through the 2012-2071 period where area available for harvesting is projected to be lowest. However, there is expected to be ample volume available through the latter half of this period. Silviculture treatments which increase the future volume, merchantability or quality of stands beyond 2072 may be more or less equal in terms of strategic importance and should therefore be ranked using stand-level financial analysis.

7.2 Alternate Harvest Levels

7.2.1 10% Increase

Figure 41 shows that a higher area harvest request induces area and volume shortfalls at the transition to second growth. Note that the volume trough created at 2032 is about equal to the volume harvest levels from 2002-2031. Average harvest age and DBHq decline somewhat sooner but are notably lower in the long term. Average volume per hectare is lower in the long term as stands are harvested earlier than in the CMA simulation. Relative to the current management simulation, this run produces more volume (2,104,640 m^3 or 8,400 m^3 annually on average) through 250 years (see Appendix B). In the short term volume harvest is 9.9% higher but in the long term the volume harvest increases only 3.0%.

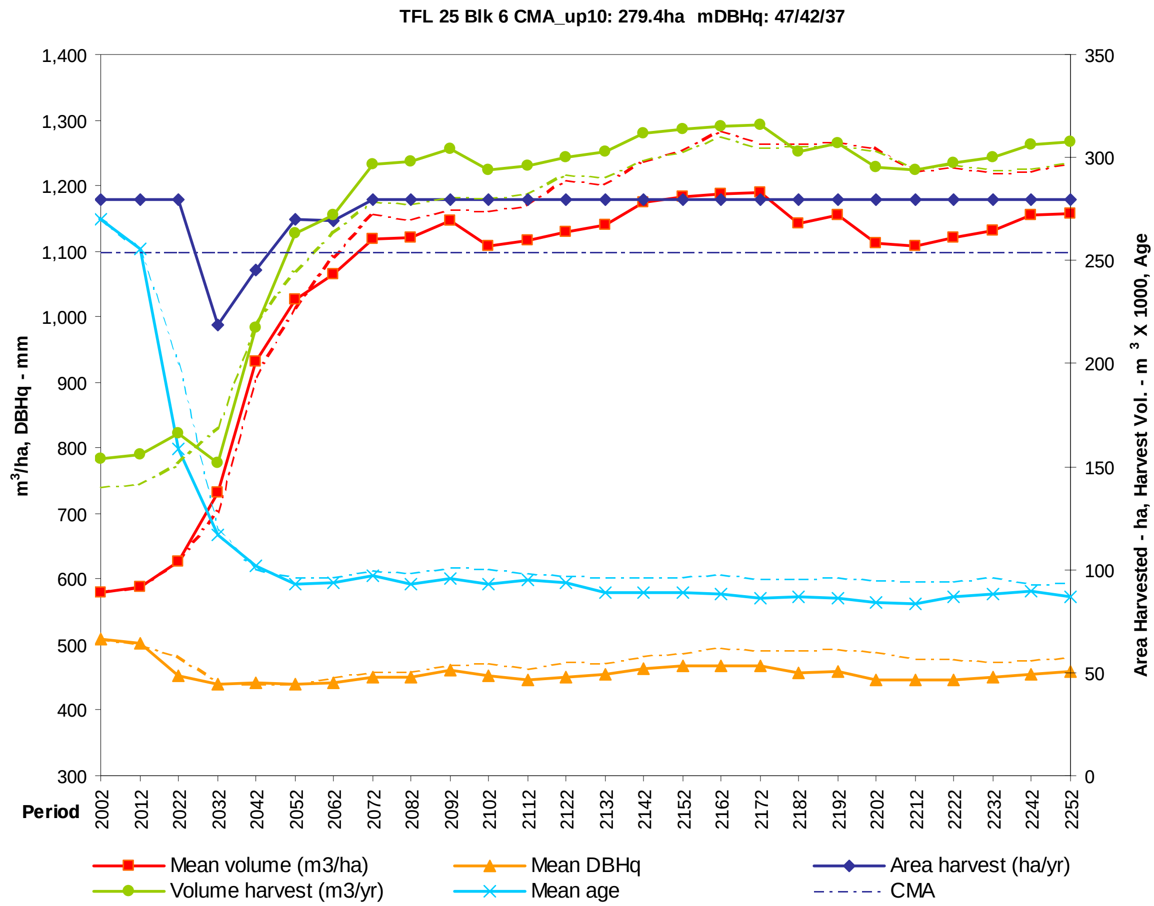


Figure 41. Block 6 harvest statistics[36] through 250 years for current management area harvest plus 10%

7.2.2 10% Decrease

Lowering the harvest request level by 10% (Figure 42) has the effect in the short term of lowering the harvest volume in proportion (-10.3%) to the harvest area change. This is because existing old growth stands are assumed to be neither adding nor losing volume through time. Once second growth becomes an appreciable component of the harvest profile, harvest age and DBHq are higher (longer rotation) with the result that stand volumes per hectare at harvest become higher as well. The higher volume per hectare tends to compensate for the loss of area harvested such that the overall volume harvest is less affected in the longer term (-4.6%) (Appendix B).

1.1

[36] Dashed lines in background represent current management statistics.

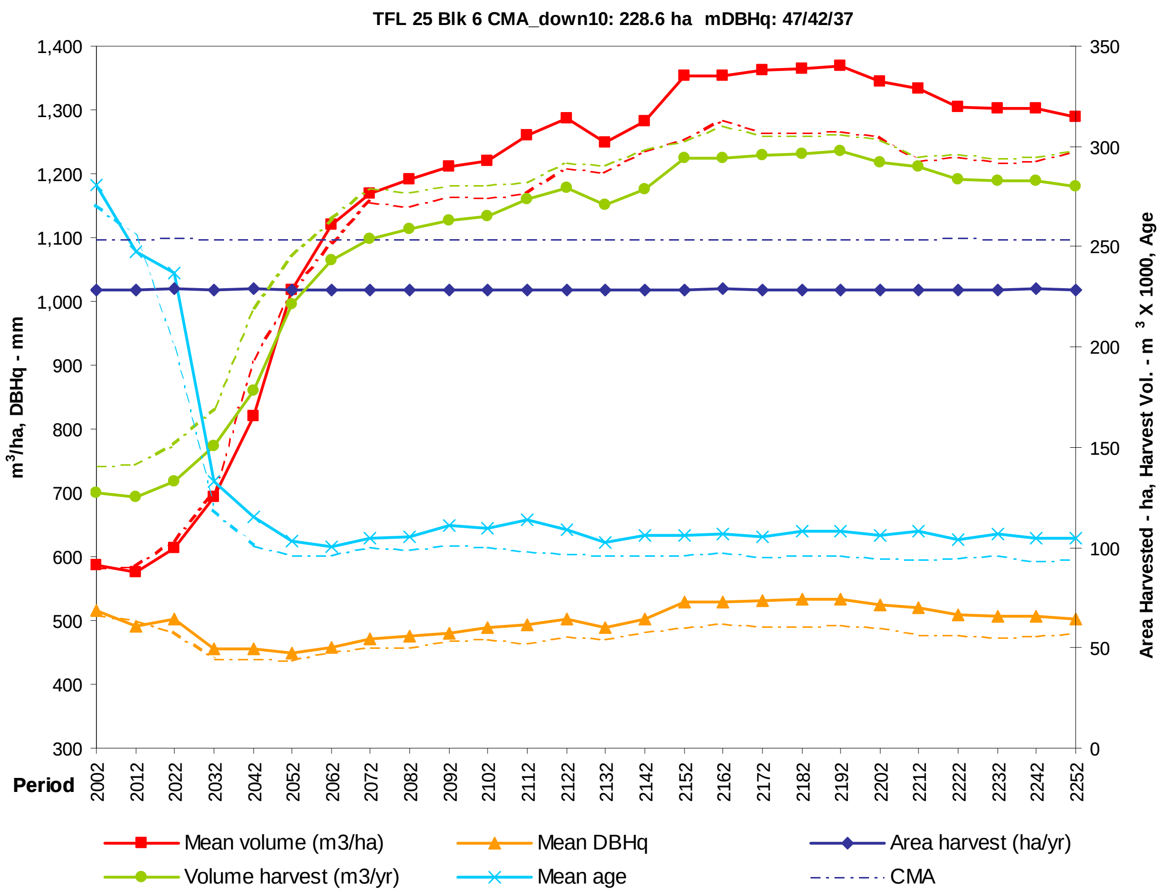


Figure 42. Block 6 harvest statistics[37] through 250 years for current management area harvest less 10%

7.3 Sensitivity Analyses

Harvest output statistics for all sensitivity runs are presented in Appendix A. In the harvest output graphs, decreases in area harvest relative to the base case are presented both unadjusted and as a new flat line. For increases in area harvest, a new, higher, flat-line harvest level was established. Flat-line flows were established by increasing area harvest requested until a deficit occurred, and then dropping back to the nearest whole number where the deficit disappears. Appendix B (p.100) summarizes changes in area (Table 10, Table 11) and near, mid, and long term volume (Table 12).

Table 6 presents the area results of sensitivity analyses for Block 6.

1.1 ———————————

[37] Dashed lines in background represent current management statistics.

Table 6. Block 6 Sensitivity results

Run ID	Harvest (ha)	Change (ha)	Change %	Description
CMA	254	-	-	Area-based current management option
+Oe	262	8.0	3.1	Include Oce and Ohe polygons in THLB (2.9% of THLB)
-Oh	215	-39.0	-15.4	Remove helicopter operable polygons (10.8% of THLB)
-SI3m	176	-78.0	-30.7	Reduce SI estimates for age class 1-2 and future stands by 3m
-age	283	29.0	11.4	Lower minimum harvest age by decreasing mDBHq by 3 cm
+age	200	-54.0	-21.3	Increase minimum harvest age by increasing mDBHq by 3 cm
-RndAge	229	-25.0	-9.8	Uses the mDBHq ages rounded up to the nearest 10th year (effectively adds 5 years to mDBHq)
-midVQ	239	-15.0	-5.9	Use mid range disturbance target
-Oc	30	-224.0	-88.2	Simulation on THLB accessible by helicopter only to estimate flat line portion of harvest attributable to helicopter harvesting.
UnCon	297	43.0	16.9	Remove all non-timber land base and volume constraints to simulate timber potential.
-Dr	234	-20.0	-7.9	Remove alder leading stands from the harvest flow permanently (no long term succession to conifers).

Block 6 is most sensitive to changes that increase the minimum harvest age (-SI3m, +age) or reduce THLB (-Oh).

As was the case in Block 1, the +/-age sensitivities are not proportional to one and other.

Reducing the THLB by 11% by removing helicopter-operable area has a disproportionate negative impact that may be an artefact caused by the unregulated peak of helicopter activity inherent in the CMA simulation (Figure 35) immediately prior to the pinch point. However the volume/year vs area/year for the first three decades indicates that the short term helicopter harvest is old growth dependent and a higher short term helicopter harvest is important. Simulations of the harvesting on the conventional land base only (-Oh) indicate a harvest level of 215 ha, suggesting that no more than 39 ha of helicopter harvesting is needed annually in the short term to sustain the current management harvest level. Adding the –Oc and –Oh runs suggests a harvest level of 245 ha, or 9 ha less than the base case. Therefore the combination of conventional and helicopter harvesting is synergistic. Cumulative harvesting from helicopter-operable polygons should exceed 150 ha within the forthcoming five years (at least 75% of –Oh change and equal to –Oc result) to ensure future harvest flow is not disrupted and adjustments, if needed as suggested by the next TSR, will not be severe.

The flow of red alder volume from the base case simulation and the –Dr simulation indicate that alder needs to be a significant proportion of the harvest profile in the short term. The annual volume harvest from stands with an alder component should be at least 15,000 m^3/year[38] in the short term and build to higher levels thereafter as the transition to second growth proceeds.

1.1

[38] For operational implementation the minimum is stated in terms of volume, rather than area, because alder generally comes from mixed stands that cannot be easily stated on an area basis.

8.0 Analysis of Combined Blocks

All blocks were combined into one management unit to test the effect of age class or other synergies among blocks. Combining the blocks resulted in a 24 ha or 2% increase[39] in annual harvest area, suggesting that some synergies between blocks may be present.

From an operational perspective, a logical block combination could be Blocks 2 and 3 which are in the same geographic vicinity, have relatively small AACs, and are at remote locations both serviced from east Vancouver Island. However, a run combining these blocks actually resulted in a harvest level somewhat below the combined harvest levels suggested earlier. The model seems to harvest exclusively in each block for extended periods thus creating adjacency and other bottlenecks. Further investigation is needed to reconfigure the model to prevent this artefact and properly investigate any potential synergy among Blocks 2 and 3.

9.0 Marginally Economic Opportunity

As part of operability mapping, a significant area of timber was identified as being “marginally economic”. In other words, it is not economically viable to harvest these stands during average market conditions as cost estimates exceed expected revenues. This area is assumed inoperable for the purposes of this timber supply analysis.

However, during market cycle peaks, stand values would exceed costs so that such stands could be harvested at a profit. The AAC Determination generally does not consider this opportunity wood. Even when markets peak and such stands become profitable, they are seldom the focus of harvesting as other stands within the regular AAC indicate a higher profit margin.

To realize this opportunity, a regulation mechanism needs to allow a periodic harvest of marginally economic stands over and above regular AAC. While a partitioned harvest could accomplish this, harvesting would not be expected for perhaps many years in succession. If a partition were stated in terms of an annual allowable harvest there could be a perceived underharvest of the partition for many years, and then an apparent over harvest once every five to ten years. A periodic allowable harvest more in sync with market cycles would be the preferred approach.

For example, the +Oe sensitivity run suggests that the following (Table 7) periodic harvests could be acceptable.

1.1 ——————————

[39] These results were based on preliminary modelling. Subsequently input files were corrected for a minor input error but were not recompiled for this combined run as creation of the combined file was onerous. Results would not be expected to change significantly.

Table 7. Potential Periodic Harvests of Marginally-Inoperable Polygons

TFL Block	+Oe result (ha/yr)	Periodic Harvest (m^3/period)	
		within 5 year period	within 10 year period
1	2	10	20
2	2	10	20
3	2	10	20
5	19	95	190
6	8	40	80

10.0 Cultural Cedar Supply

The normal harvest profiles will contain significant amounts of cedar suitable for cultural purposes such as bark stripping, small dugouts, poles, carving, or root collection. Figure 43 presents the projected cedar volume harvest for each block of the TFL through the next 250 years.

Figure 44 shows the cedar growing stock present through the simulation. Although there is a modest decline, at no point does the growing stock fall below 82% of current levels.

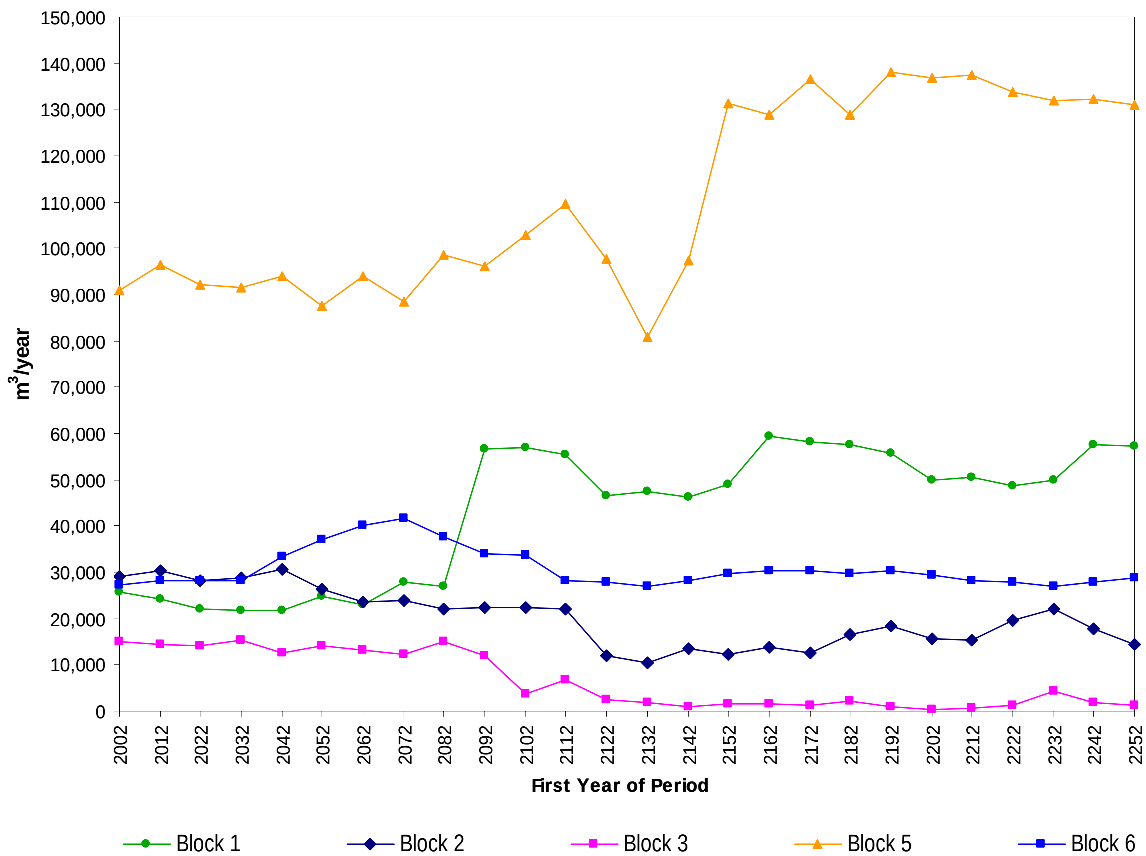


Figure 43. Projected cedar harvest by block through 250 years.

A small but continuous supply of monumental cedar (suitable for large dugouts, very large poles, split beams and planks) can be expected to be available from reserved areas including riparian reserves, old-growth management areas, and other inoperable forests. Wildlife tree patches and other trees retained within blocks were not included in this analysis and hence cedar retention estimates herein are underestimated by up to 5-8%.

A crude model was developed to estimate the availability through time of larger or "monumental" cedar trees suitable for special cultural purposes such as pole carving and dugout canoe construction. The model is described and discussed in more detail in Appendix D. Table 8 indicates the minimum and average number of larger diameter (≥70cm) trees predicted through the simulation for each Block. Although there is variation throughout the simulation, considerable numbers of larger cedar trees are forecast and contrary to some speculations such trees do not disappear.

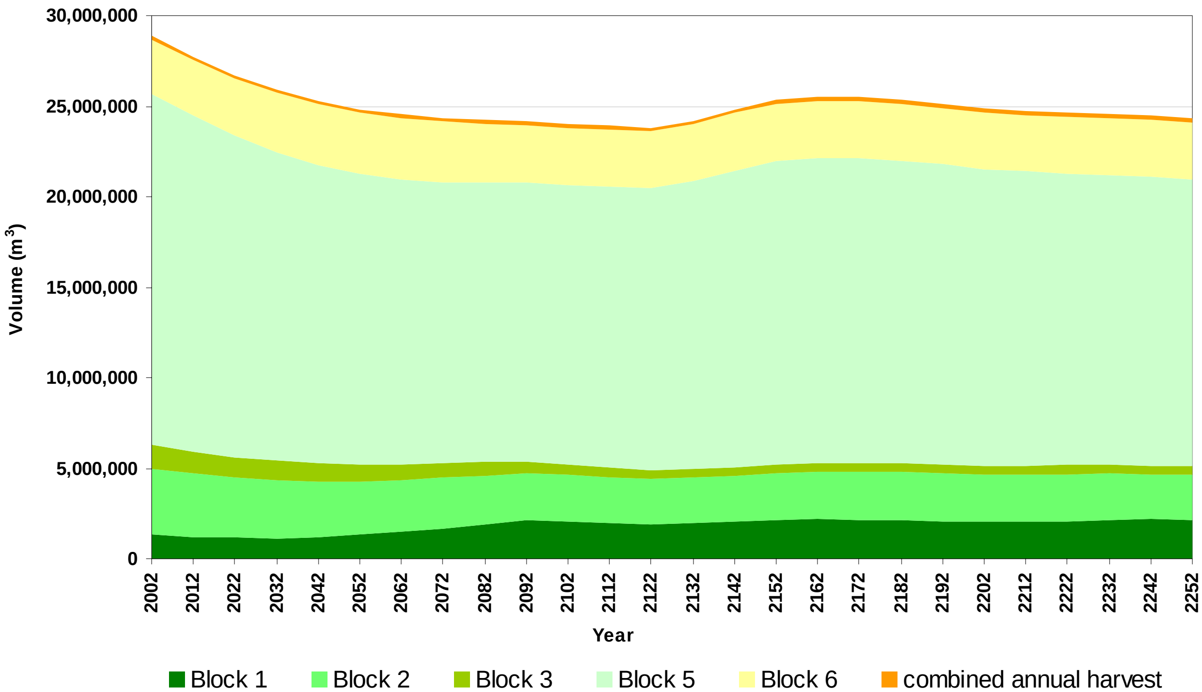


Figure 44. Cedar growing stock and annual harvest volumes through 250 years.

Table 8. Estimated larger diameter (≥ 70 cm) cedar trees available through 2252

Block	Minimum	Average
1	64,819	86,878
2	210,281	231,430
3	46,817	63,946
5	1,296,297	1,567,810
6	339,366	375,696
Total	1,957,580	2,325,760

11.0 Uncertainties

In the course of preparing for, and developing this analysis, a number of uncertainties in the underlying data and assumptions have become evident. These are listed below in order of perceived potential impact on timber supply and the direction (area harvest increase/decrease) of the potential change.

+/-	The 3.25% volume allowance for future Wildlife Tree Patches needs to be verified against actual area withdrawals from the timber harvesting land base for WTP designations. Under area-based regulation, including WTP/THLB overlap area as part of the cut[15] should allow accurate tracking of the proportion of WTPs that would otherwise be THLB. This should facilitate simulation of WTPs as THLB area withdrawals (rather than as volume net downs) for future analyses.
-/--	Ecosystem Based Management is an evolving concept that WFP has agreed to test and where feasible implement in parts of the TFL. It is expected to include increased reserve areas and use of partial retention silviculture systems[42] and at the same time it is to maintain or enhance the economic feasibility of forestry. Modelling forest re-growth in response to dispersed, stand-level partial retention/harvesting remains problematic and has not been attempted for this analysis. Intuitively, shading, scarring, and mistletoe effects on regeneration and productivity seem likely, yet some proponents of selection and other partial harvest systems suggest productivity is actually improved by advanced regeneration and efficient capture of photosynthetic energy. Field studies, calibration of uneven-aged growth models for coastal use, and development of ecological process models are needed to forecast the outcomes of heretofore-unknown silvicultural practices. However, to determine an area-based harvesting level in an increasingly uneven-aged modelling environment, mDBHq lessens in modelling importance. Perhaps then, such modelling is only important for those interested in

volume flows and is of little consequence to determining an area-based harvest level[40].

-/(+)	For Blocks 2, 3, and 5 site indices for managed and unmanaged second growth stands were based on Provincial SIBEC averages. These estimates have been recently updated but the updates were not used in this analysis. Site indices for these blocks need to be field checked and re-determined based on local field sampling. Sensitivity analysis results suggest that changes in site indices may profoundly influence area harvest levels through their influence on mDBHq at critical second growth pinch points.
+/-	For Blocks 2 and 3, and less so for Block 5, estimates of remaining old growth inventory volumes need to be confirmed in light of recent harvesting and withdrawals from the timber harvesting land base. A Vegetation Resource Inventory is in progress for Block 2 and 3. Re-inventory is not planned for Block 5 given current land use uncertainties. The existing Block 5 inventory is less than 20 years old. In Blocks 1 and 6 VRI has been completed and adjustments to timber volumes have been positive in both cases.
+/(-)	In Block 5, the procedure used to estimate site index tended to underestimate site indices for poor sites and overestimate site index for better sites. As poorer sites are more common, this may have lead to underestimation of overall yields. Completion of ecosystem mapping and VRI sampling would improve site index estimates substantially. However the harvest profile in this block is dominated by old forests for the next century or more, so second growth yields are relatively less important for setting current harvest level.

1.1

[40] In a pure, selection system landscape, harvest regulation becomes neither area- or volume-based; instead a stand level BA regulation of growing stock is the preferred approach.

+/-	Operational adjustment factors for managed stands were TIPSY defaults. Field estimates for the more common stand types would improve estimates of mid to long term yield. Anecdotally OAF1 net downs may be underestimated for Block 5 where brush problems abound and herbicide use is restricted and may be overestimated in Blocks 1, 3, and 6 where stocking tends to be very good.
+	Historic spacing and fertilization treatments need to be digitized, entered into the GIS, and appropriately modeled. As the mDBHq criterion is critical to this analysis, these treatments may have an important positive impact at the area-based pinch point by effectively reducing rotation age.
-	As retention and partial harvesting systems become more common both in riparian management and more widely, yield adjustments to reflect increased shading of crop trees and harvest damage of residual crop trees will be needed. Long term estimates of retention and its nature are as yet unreliable due to the short period of application and variability of implementation strategies to date.
+	Commercial thinning[41,42] is proven in Douglas-fir stands in the drier variants of the Coastal Western Hemlock Zone and may be used in future to alleviate timber supply shortfalls. Further analyses are warranted for Block 1, although recently CT has

1.1

[41] For cut control of commercial thinning we suggest that an equivalent clearcut area (ECCA) be calculated to go against area AAC. ECCA would be calculated based on the expected volume opportunity lost at final harvest as follows:

$ECCA_{CT}$ (ha) = CT (ha) X (BAiptc – BA_{Ct}aiptc) / BAi where,

BAi = initial BA
BAiptc = initial BA projected to culmination (or for 20 years if culmination is less than 20 years away.)
BA_{CT}aiptc = post-CT BA projected to age of BAiptc

[42] For cut control of partial cutting in older, less responsive stands we suggest that ECCA be simply harvest area X (BA removed / BAi)

proven uneconomic where hemlock is a significant stand component.

+	The capability to model future cultural cedar tree availability would be improved by improving growth and yield data and modelling of 2nd growth cedar. Samples of older second growth cedar are uncommon and diameter distributions projected from current models may be unreliable at older ages. Timber supply modelling assumptions for regeneration strategies need to be refined to better reflect current species-specific reforestation practices for western red cedar and yellow cypress.
-/+	Land base reductions and/or volume net downs for future riparian management need to be confirmed in light of evolving practices, shifting expectations, and the relatively short implementation experience so far. Although no-harvest zones had dominated earlier management thinking, more recently there has been a move to more active intervention and flexibility around streams. If a "disturbed area" model is to be used for cut control, there will be a need to model partial cut area and basal area removal.
+	Future tree improvement gains are expected to be larger than modelled herein. Where the gains are not realized until beyond pinch points they are expected to have little influence under a flat line area-regulation scenario.
+/-	Higher elevation site index estimates are less certain than for lower elevation ecosystems where older second growth is common and site index estimates are more reliable.
+/-	These simulations are not optimized for harvest sequencing (model follows inherent stand database or model priority order) although variations in harvest sequence may yield higher harvest levels. This would however be a time consuming

exercise in the current modelling environment. In any case operational forest development is not inherently optimized either.

12.0 Recommendations

- Area-regulated harvest level for TFL 25 should be set at 1,250 ha less 8 ha of non-recoverable losses. This level will ensure that both the timber harvested for human use and the growing stock performing environmental services increases for future generations.
- Should economic conditions become favourable, efforts to prove the feasibility of harvesting in forest types deemed marginally uneconomic (not included in base case analyses) are to be encouraged. Such harvests should not be charged against AAC and should be permitted to occur periodically when conditions allow. We recommend that a marginally economic area allocation[43] be allowed to accumulate for a rolling or "evergreen" 10-year period and be harvestable at the Licensee's discretion when economic conditions permit. Based on "+Oe" runs, recommended annual accumulations for Blocks 1, 2, 3, 5, and 6 respectively are: 2, 2, 2, 19, and 8 ha. Therefore within the upcoming 5-year cut control period, harvests by Block could not exceed 10, 10, 10, 95, and 40 ha respectively.
- A strategic silviculture analysis, if funded, would identify future timber and habitat shortfalls and devise strategies to alleviate these. As well the analysis should investigate opportunities for fertilization, thinning, or other interventions that may lower minimum profitable harvest ages at critical pinch points, and analyse the outcome of such strategies in terms of habitat availability, timber volume and quality, and return-on-investment.
- The Licensee should ensure that for the next 5-year cut control period the area harvested from polygons accessible only by helicopter exceeds the following (~75% of "-Oh" area change times 5 years) for each Block:
    - Block 1: 23 ha
    - Block 2: 86 ha
    - Block 3: 30 ha
    - Block 5: 330 ha
    - Block 6: 150 ha
- Government to Licensee discussions should be continued to explore administrative and policy changes associated with area-regulation that may reduce costs to government and increase Licensee profitability. Reforms may be possible with respect to, but not limited to, the following:
    - elimination of waste and residue sampling and billing programs.

1.1

[43] Small incidental harvests of marginally uneconomic area would go against AAC, and the exemption would be activated for area sums greater than 2 ha by TFL Block.

- area-based cut control and SBFEP allocations.
- area-based stumpage ($/ha harvested) or an “all found” annual tenure rental.

Appendix A
Harvest Statistics for Simulation Runs

In the graphs following, The solid coloured trend lines presented are the output variables for the sensitivity's flat line flow. Dashed lines of the same colour represent the current management (CMA) or base case statistics for comparison purposes. A flat dashed line represents the CMA flat line flow and the unadjusted deficit flow, where it occurs, is presented as a dashed line below CMA.

Run naming conventions and descriptions of each run are presented in Appendix C.

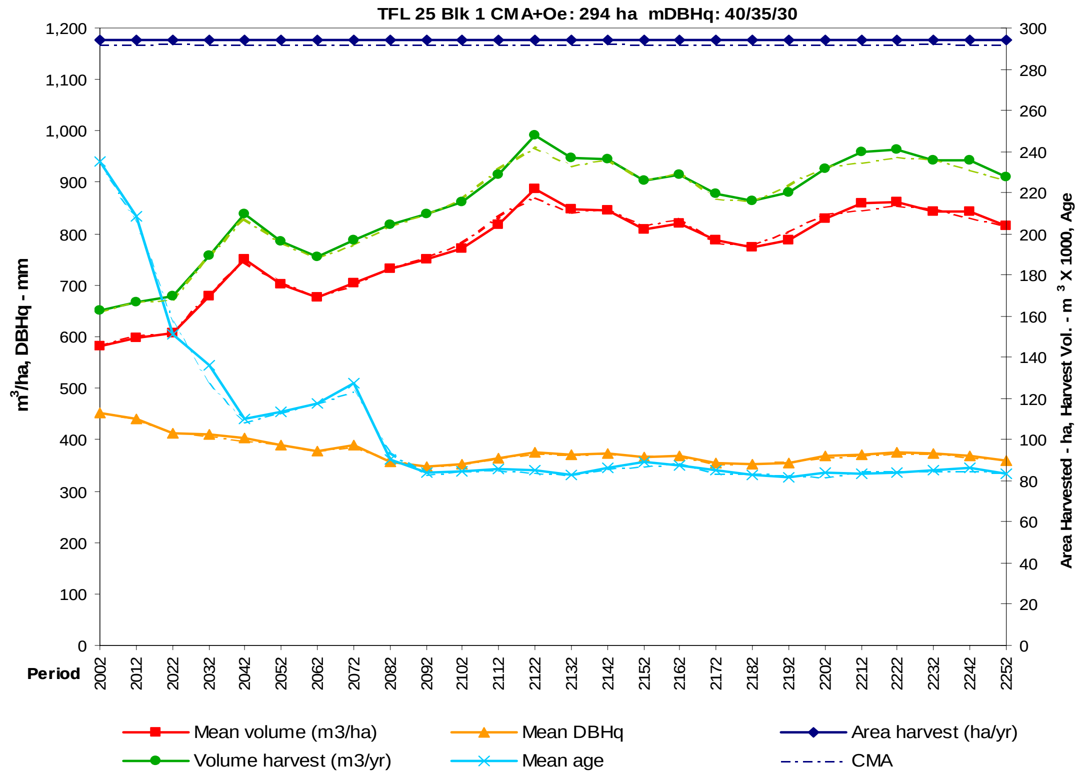


Figure 45. Block 1 CMA +Oe

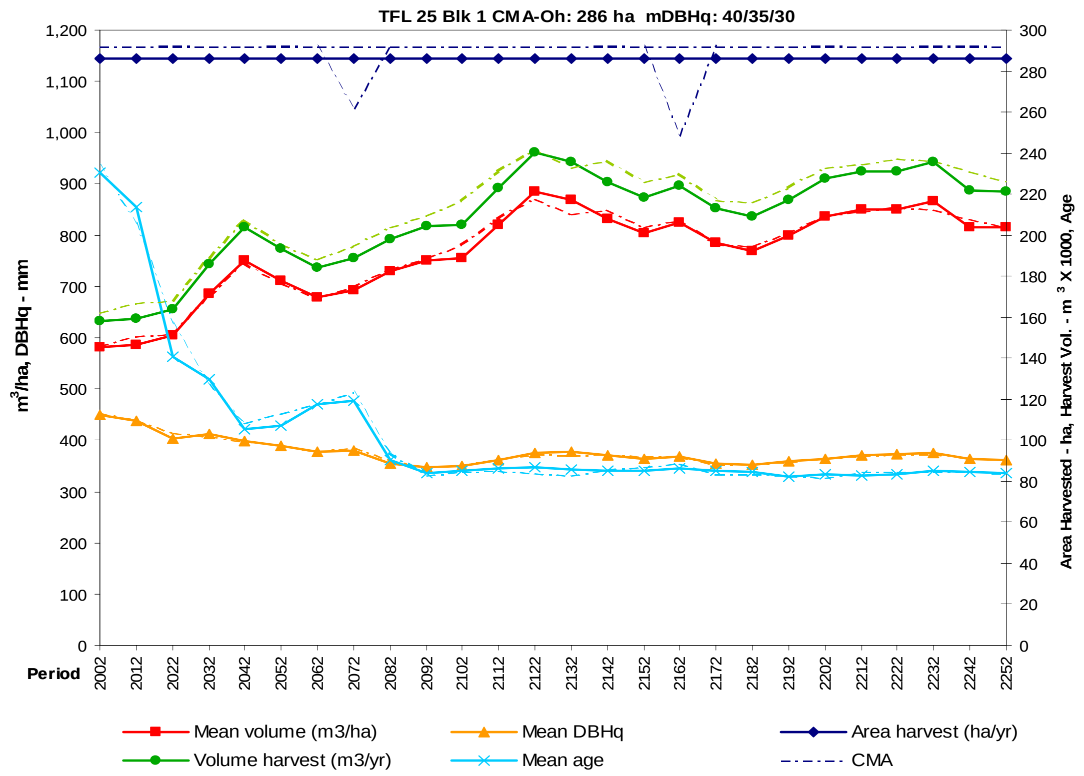


Figure 46. Block 1 CMA –Oh

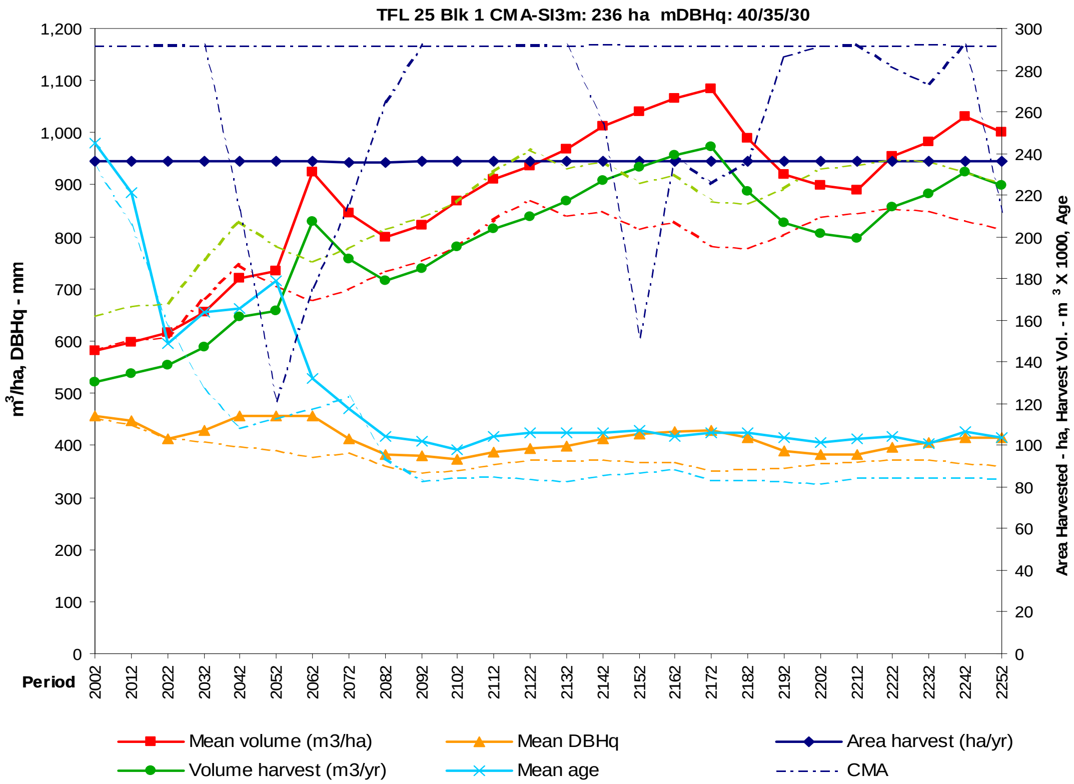


Figure 47. Block 1 CMA –SI3m

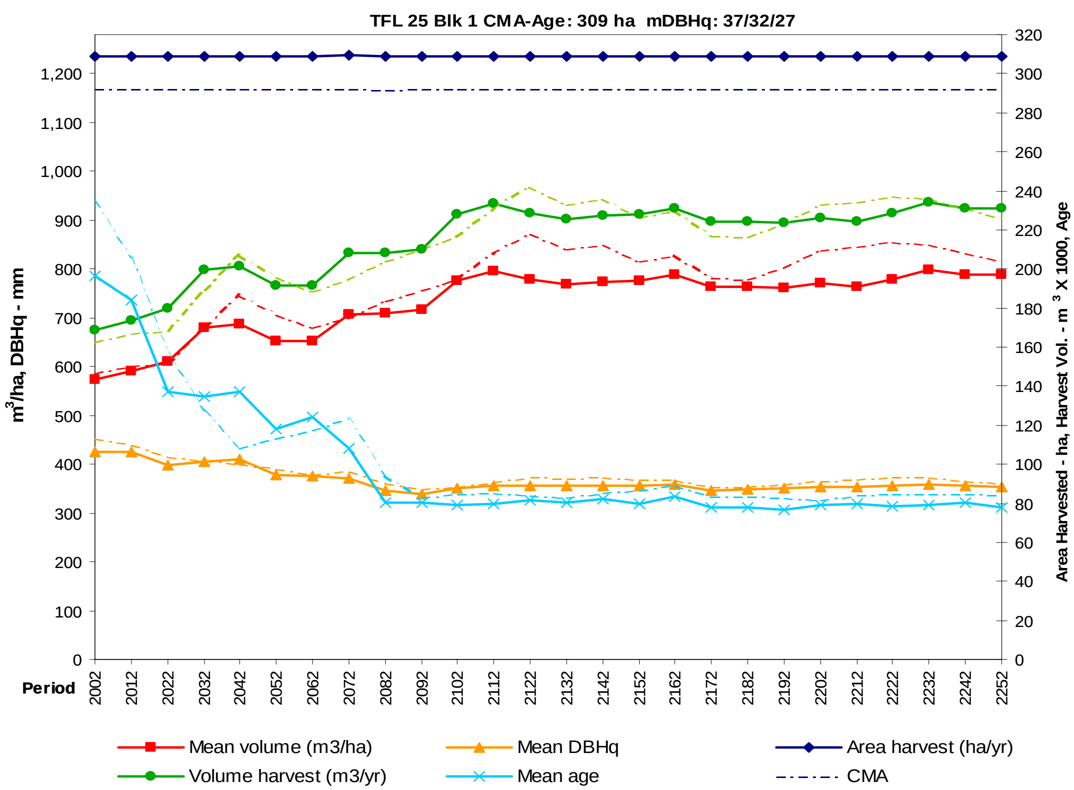


Figure 48. Block 1 CMA -age

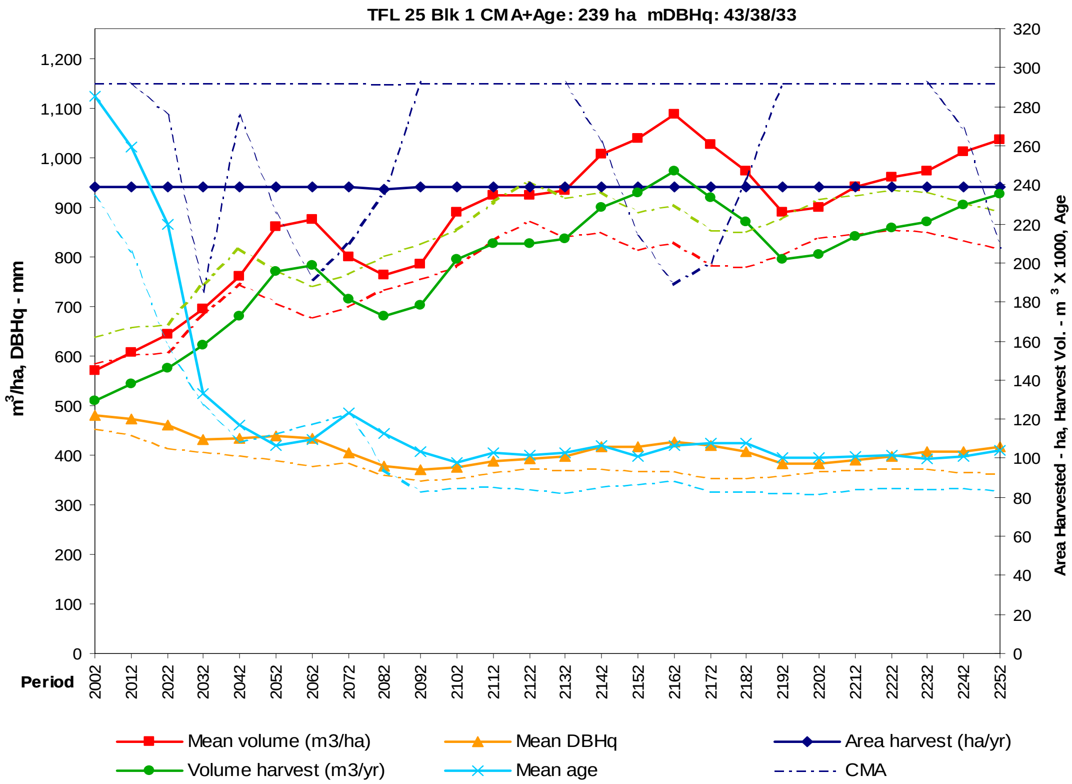


Figure 49. Block 1 CMA +age

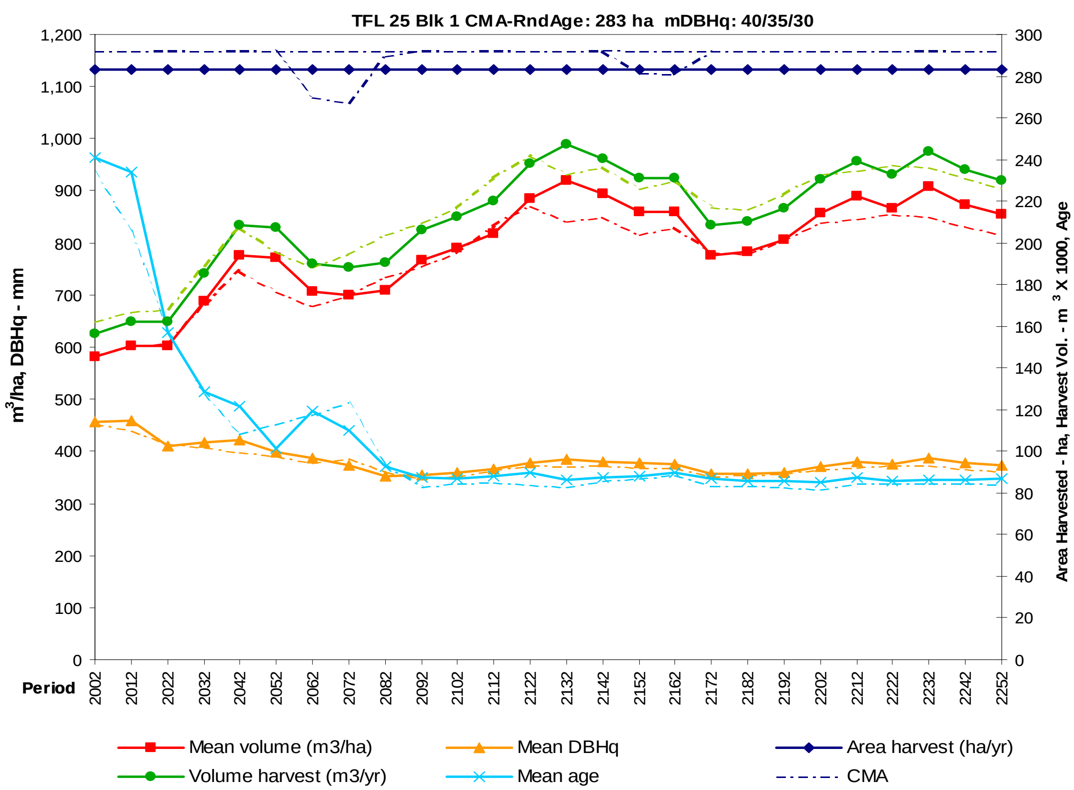


Figure 50. Block 1 CMA –RndAge

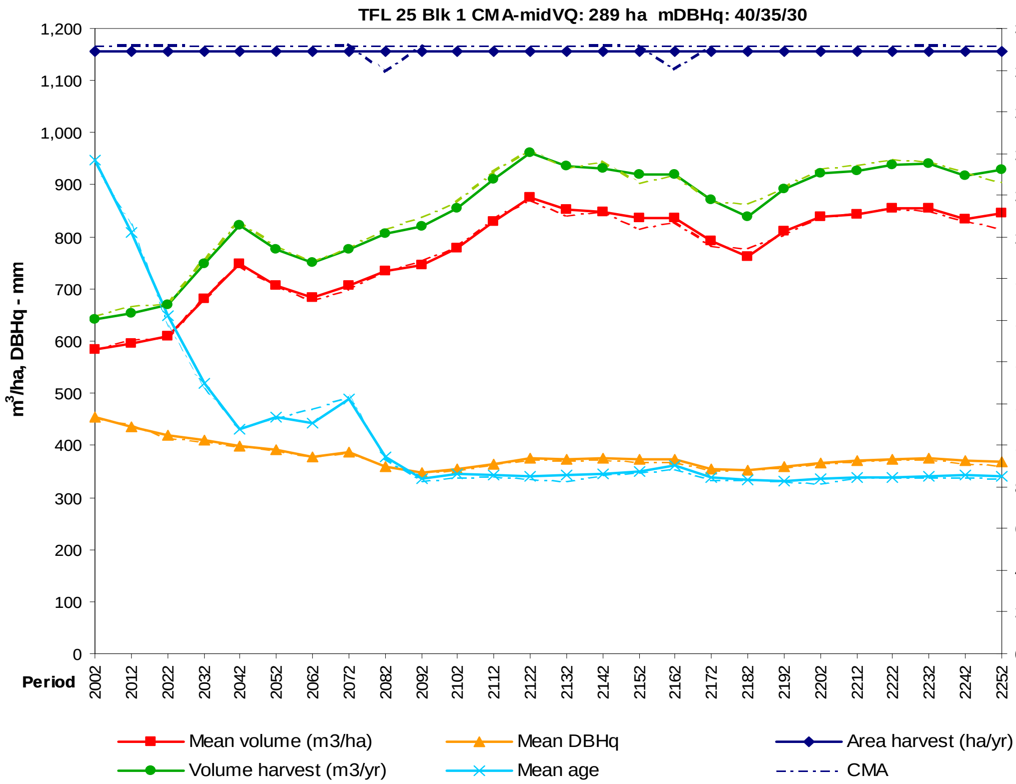


Figure 51. Block 1 CMA-midVQ

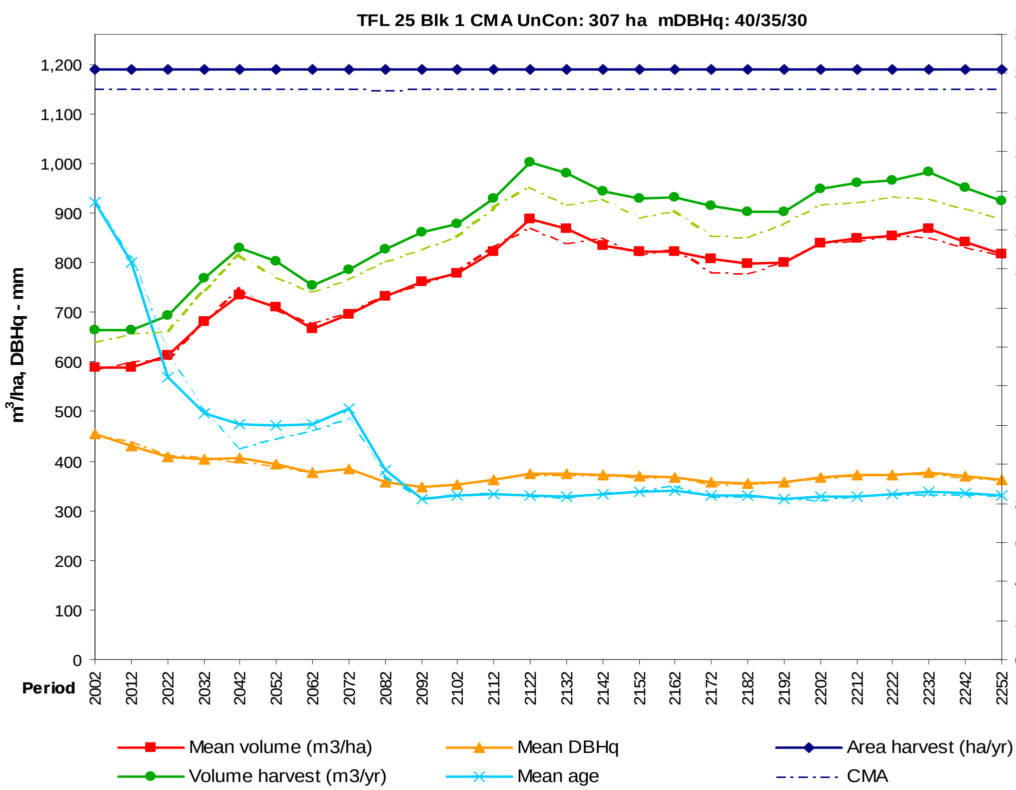


Figure 52. Block 1 CMA UnCon

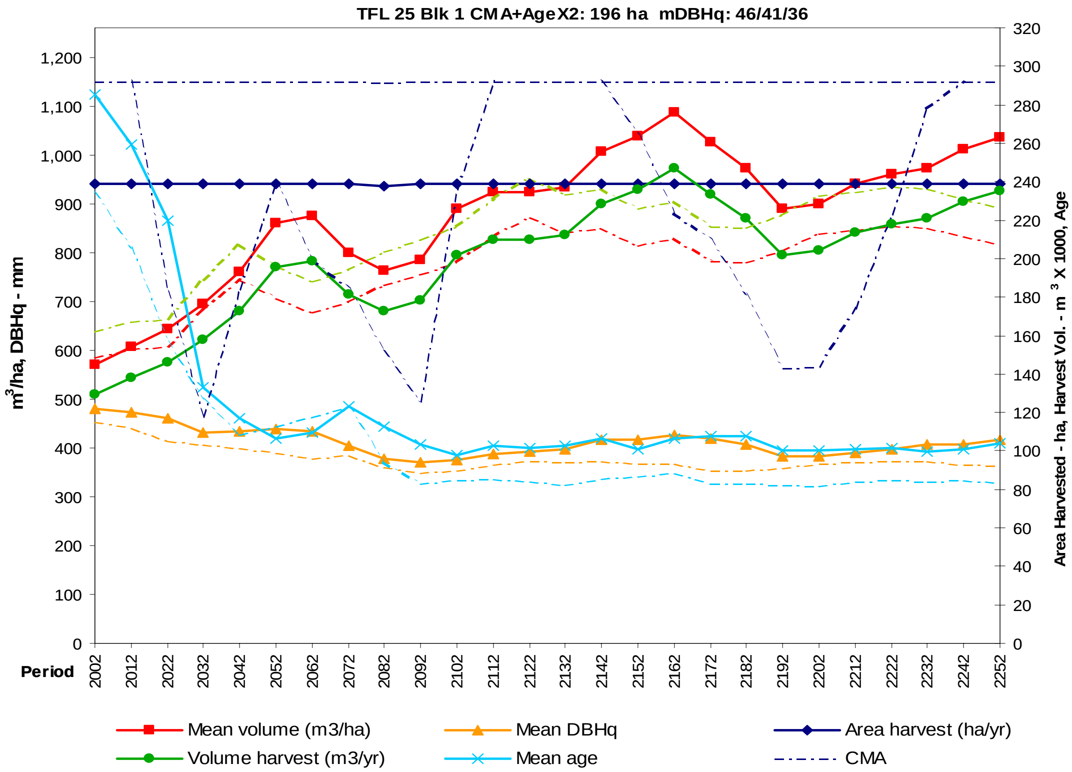


Figure 53. Block 1 CMA +ageX2

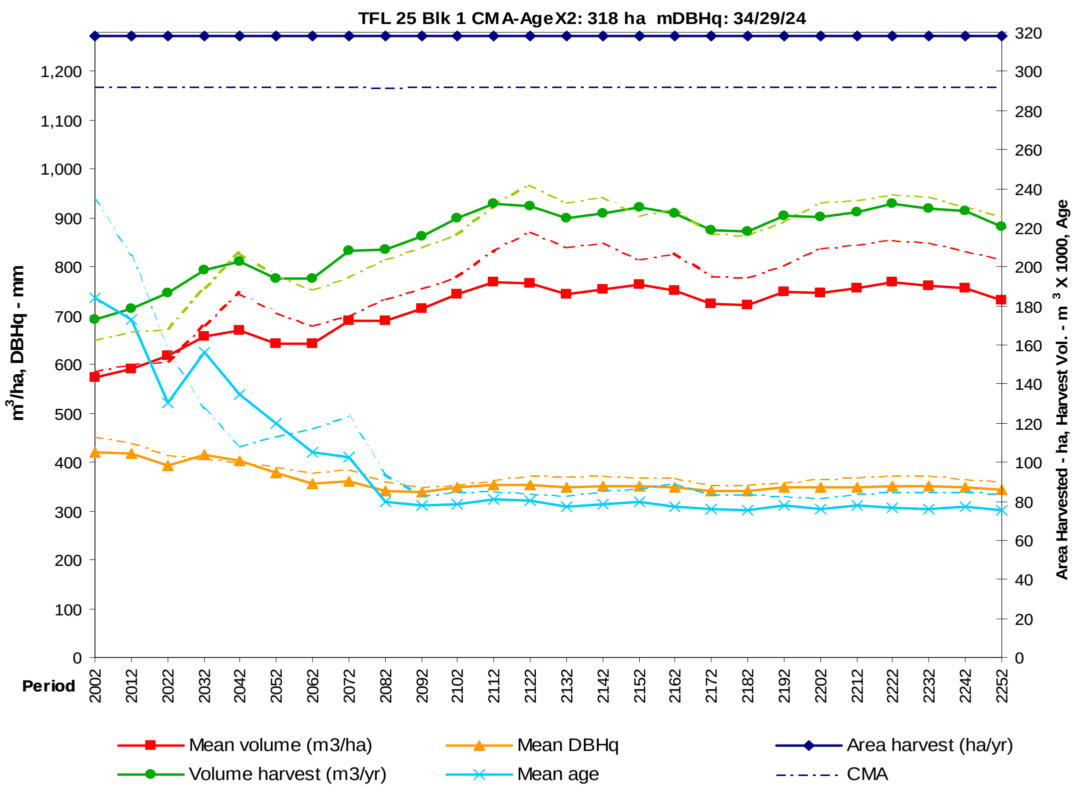


Figure 54. Block 1 CMA –ageX2

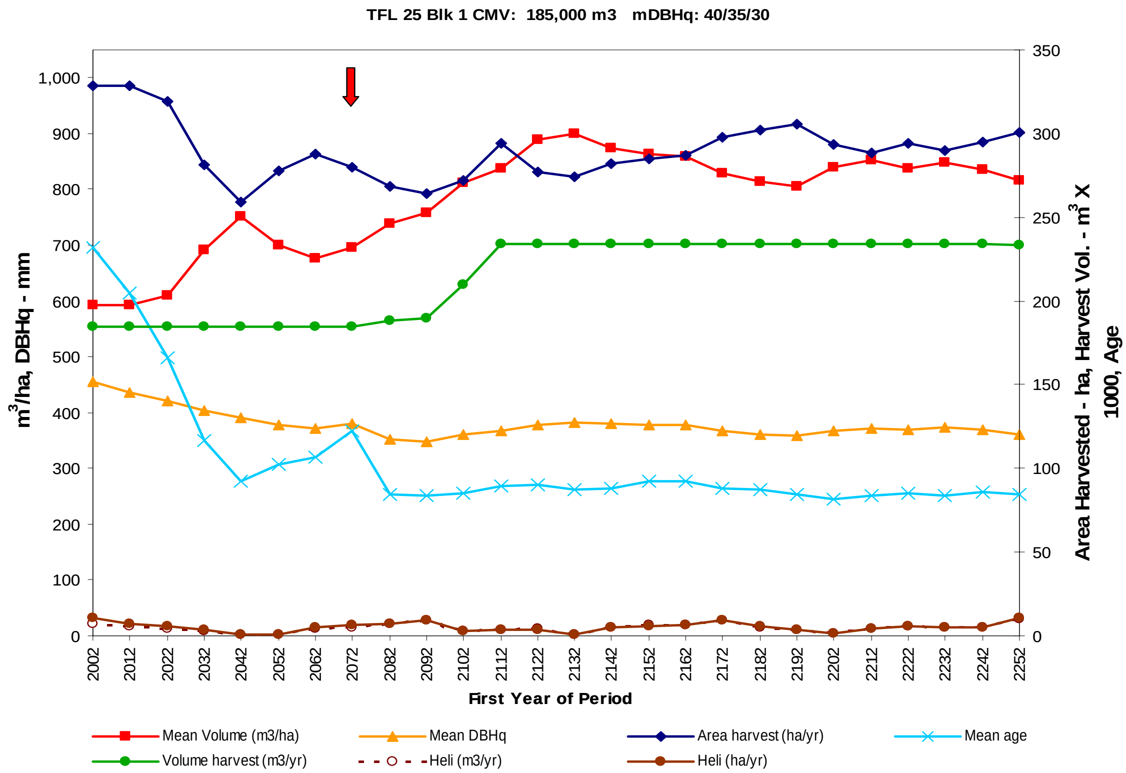


Figure 55. Block 1 CMV (Volume Regulated)

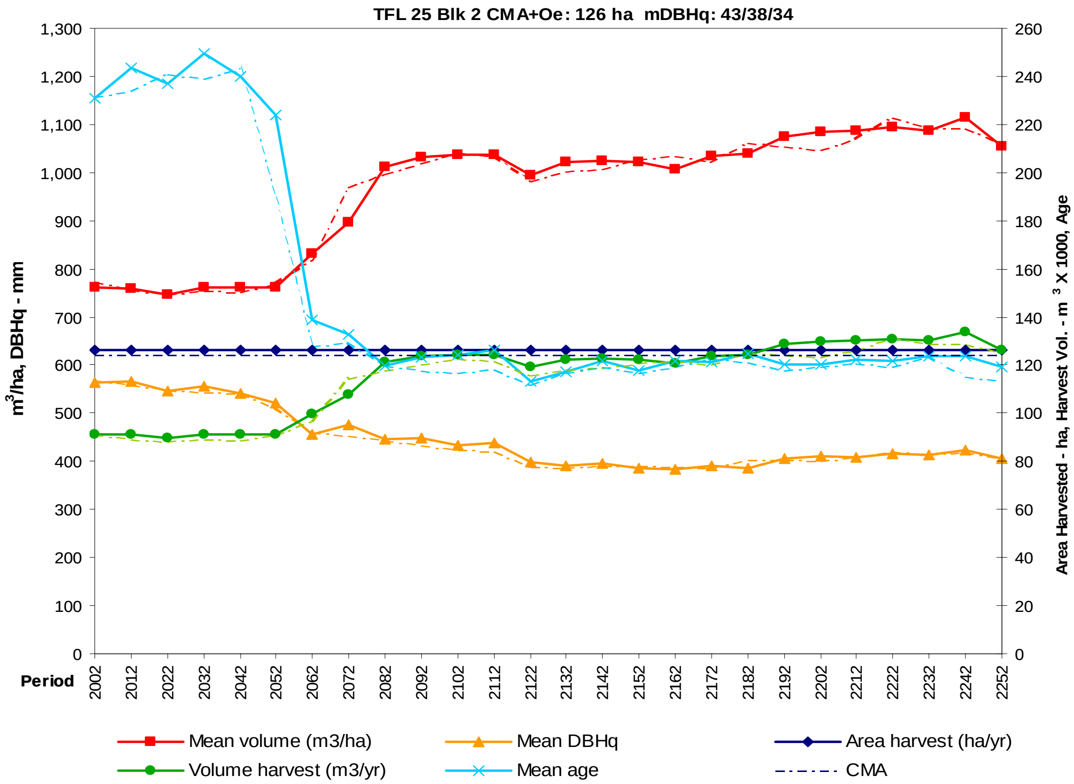


Figure 56. Block 2 CMA +Oe

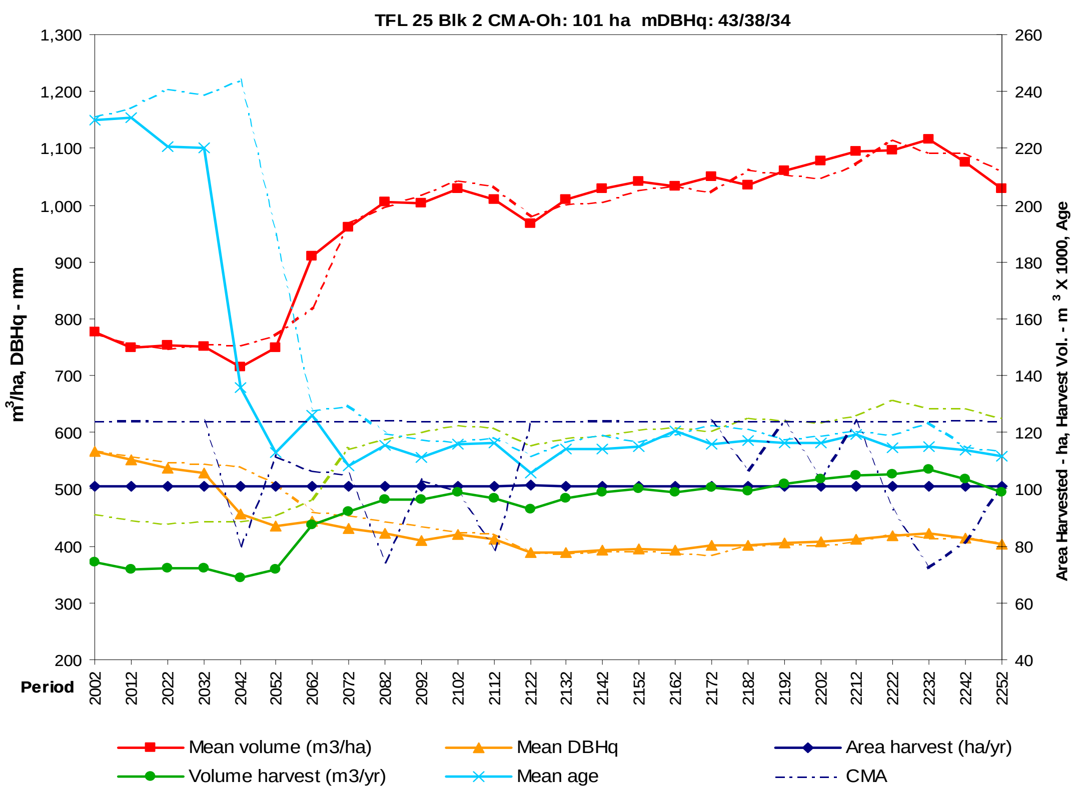


Figure 57. Block 2 CMA -Oh

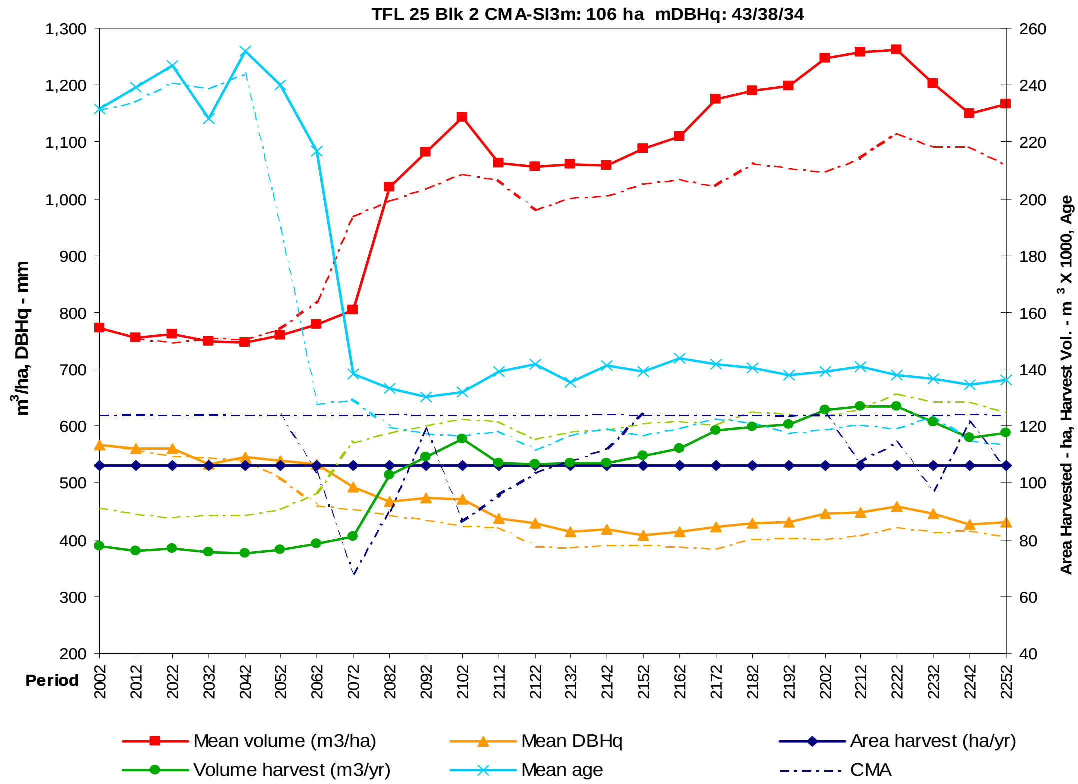


Figure 58. Block 2 CMA –SI3m

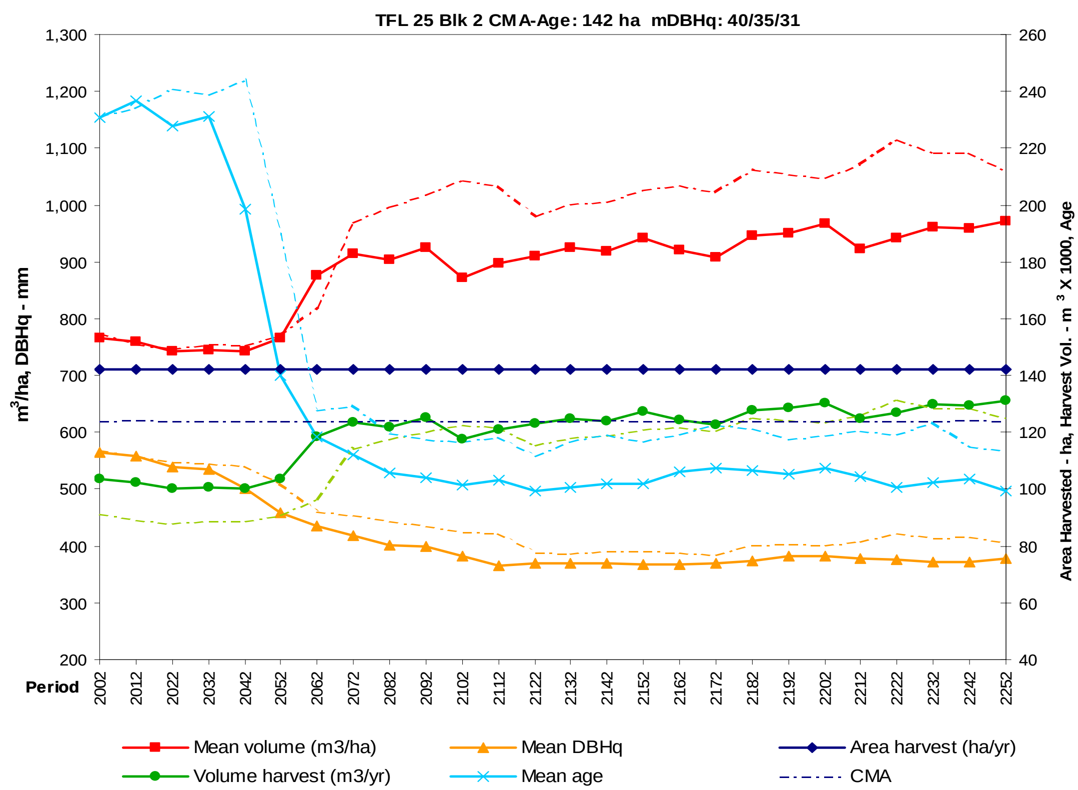


Figure 59. Block 2 CMA -age

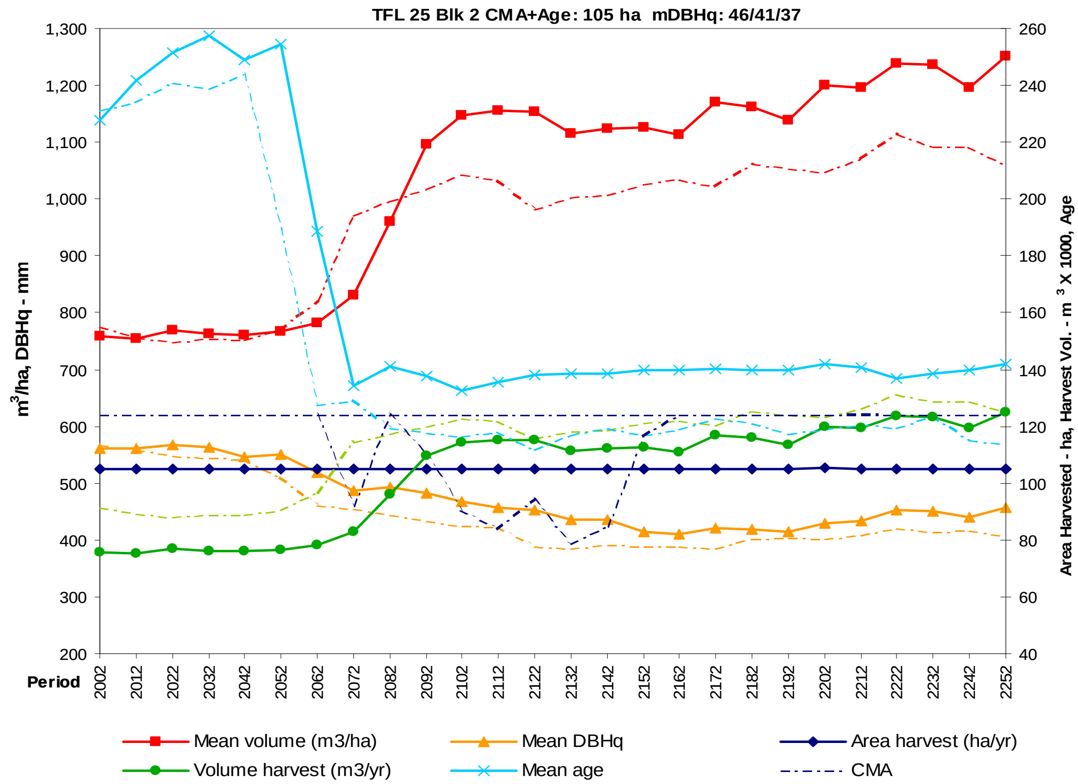


Figure 60. Block 2 CMA +age

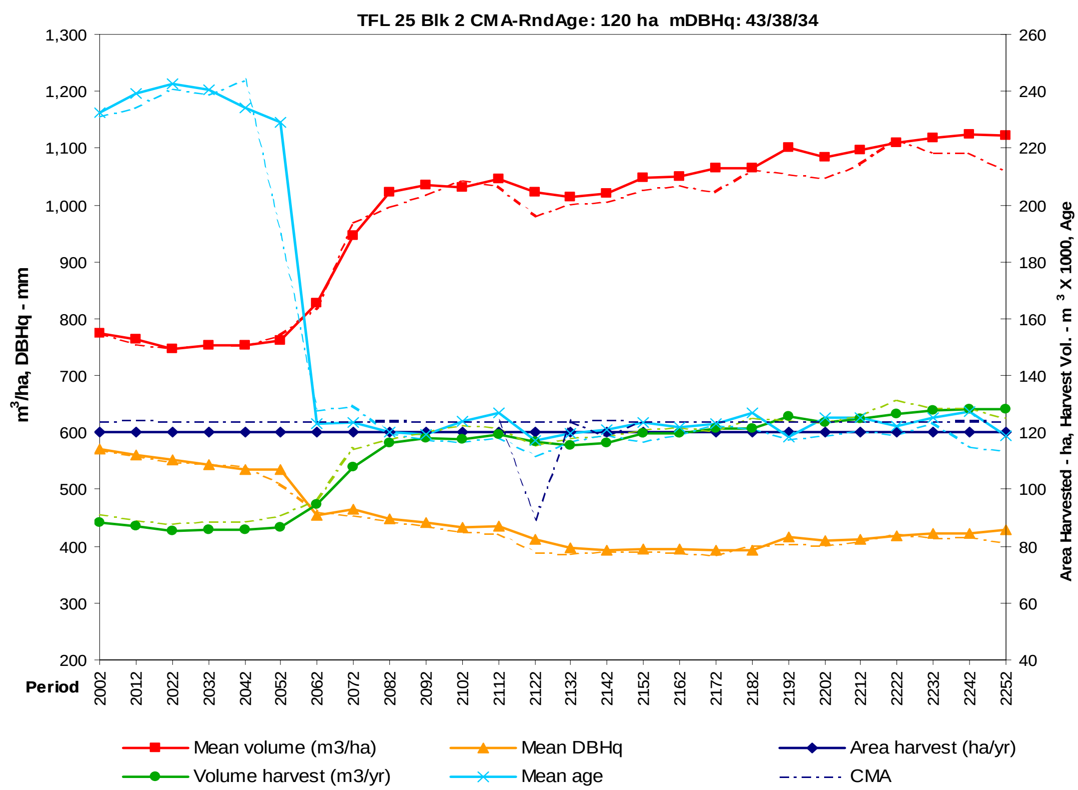


Figure 61. Block 2 CMA -RndAge

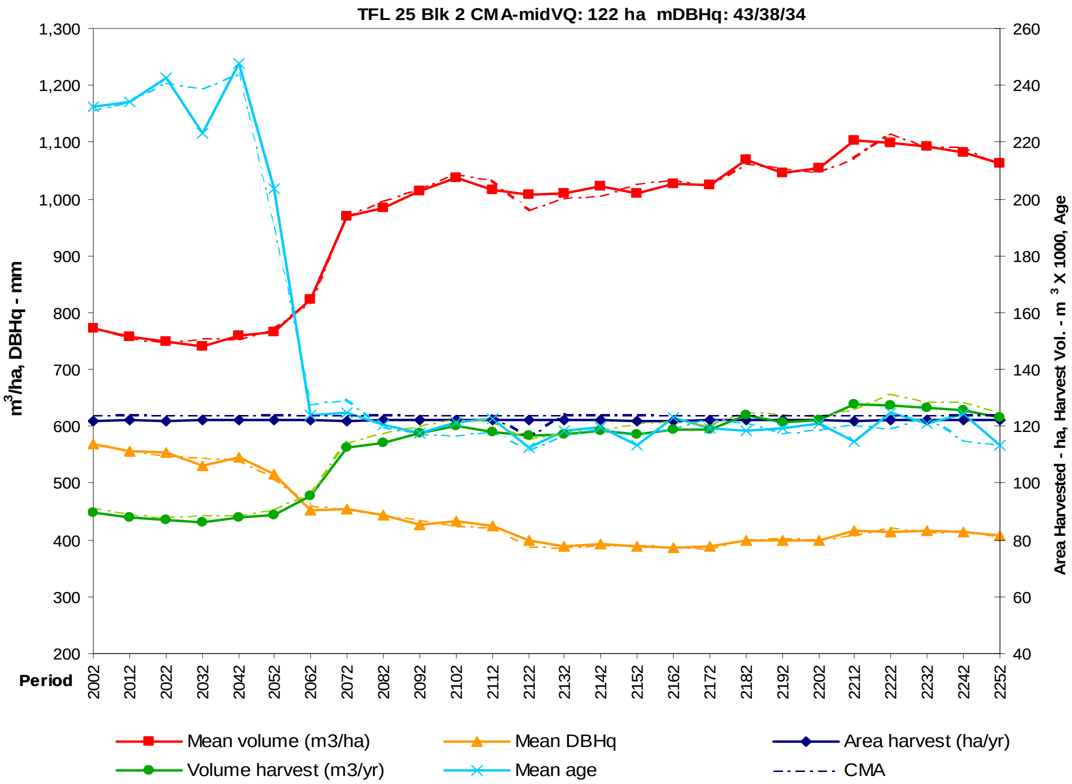


Figure 62. Block 2 CMA -midVQ

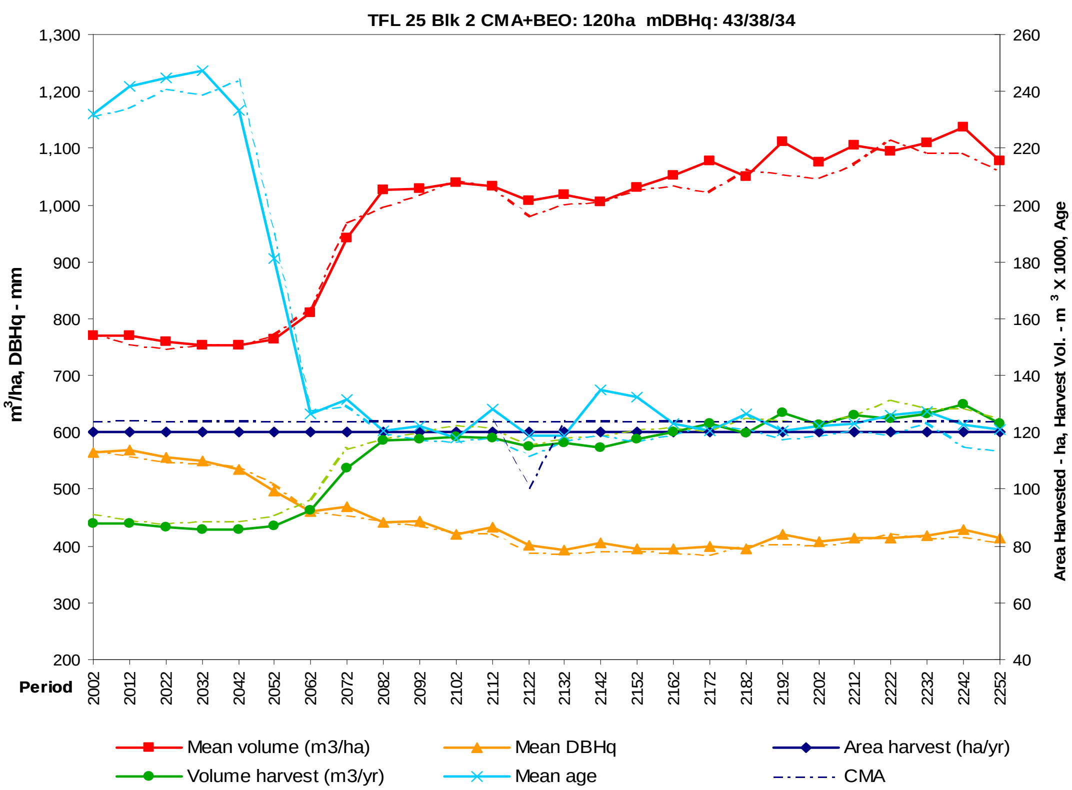


Figure 63. Block 2 CMA +BEO

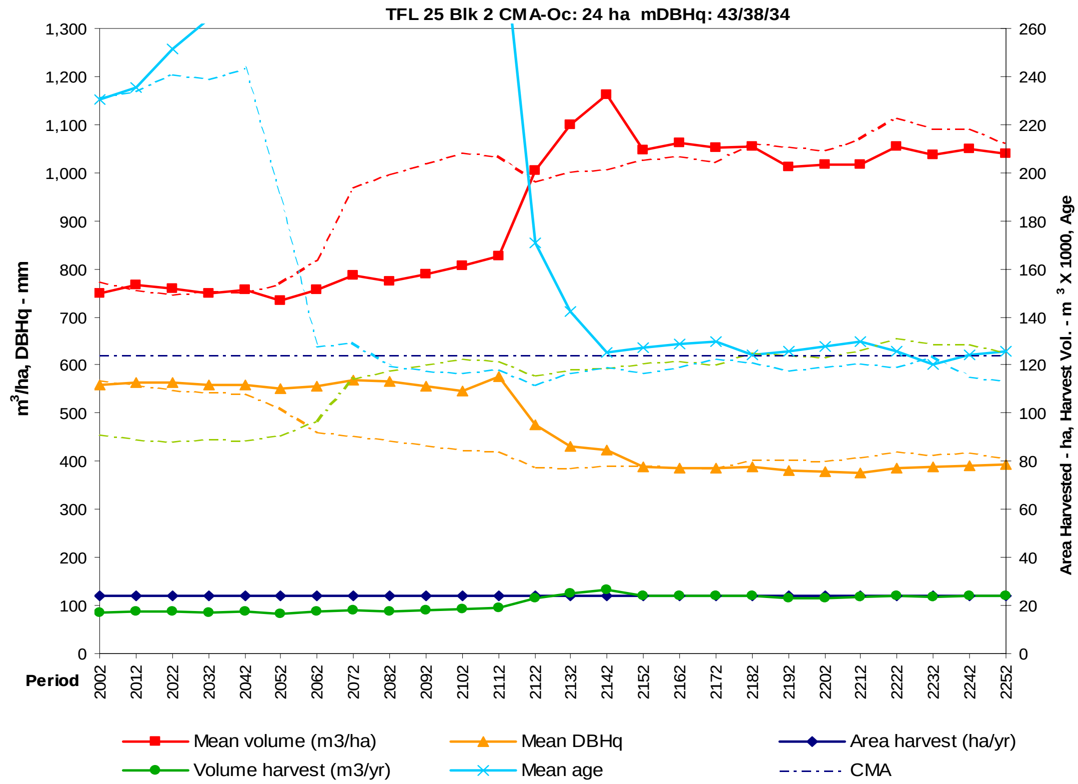


Figure 64. Block 2 CMA -Oc

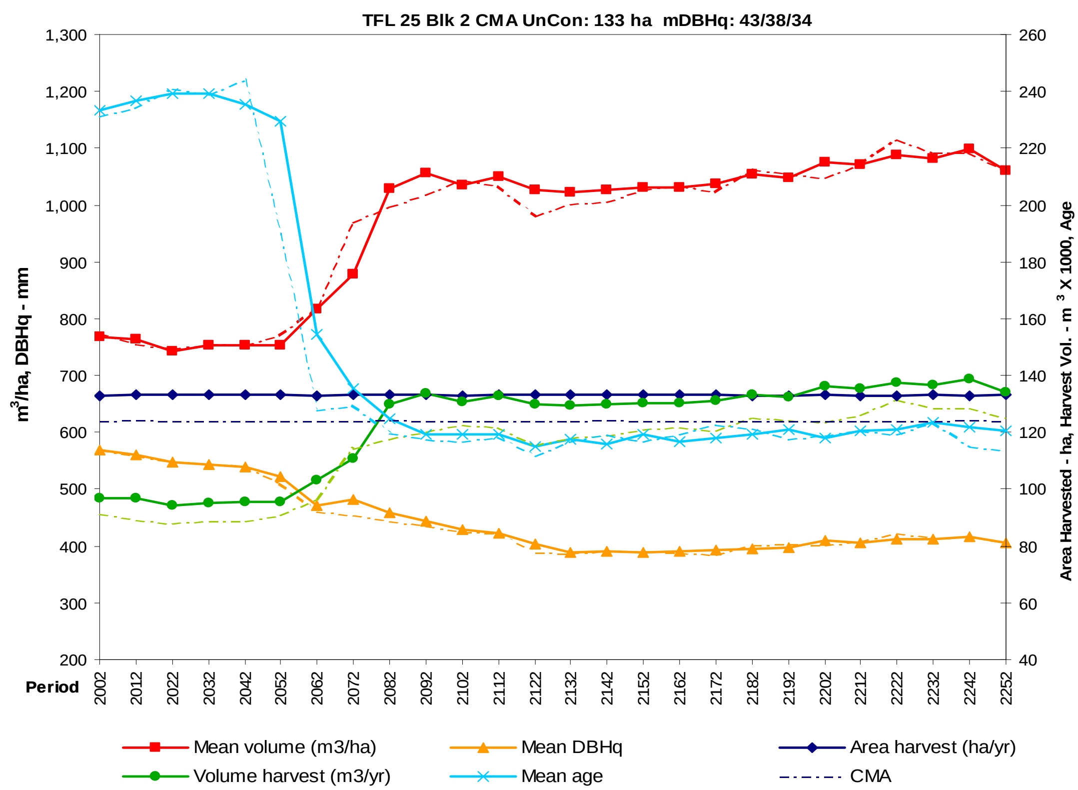


Figure 65. Block 2 CMA UnCon

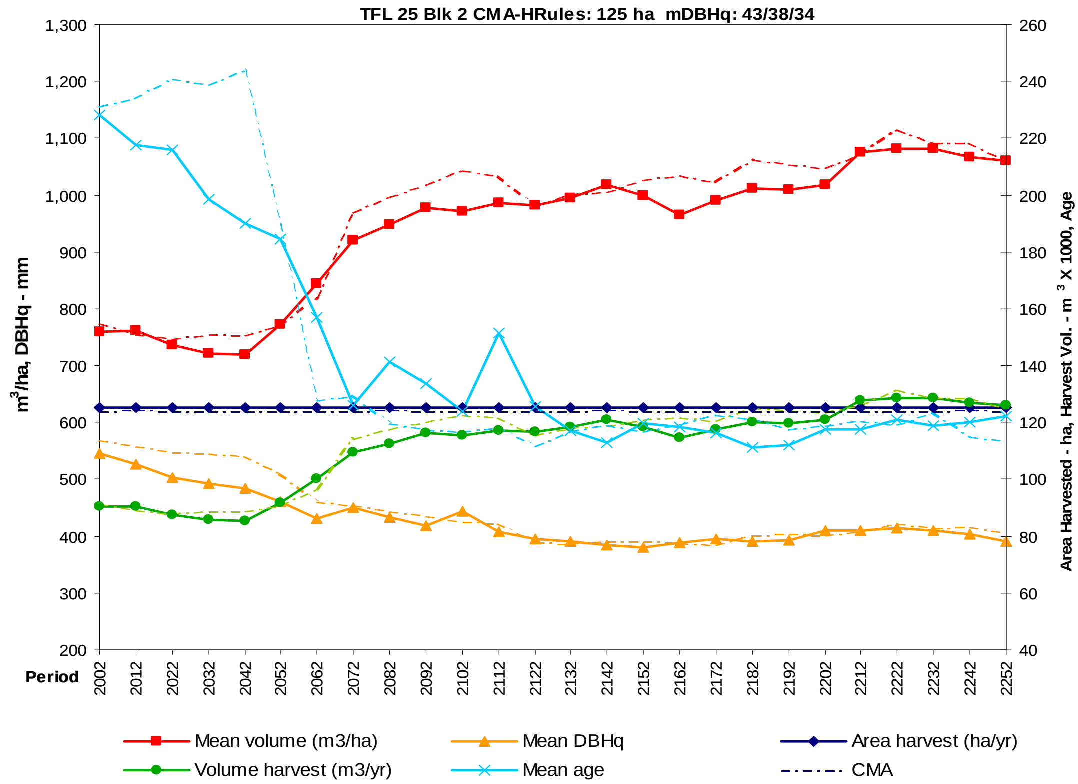


Figure 66. Block 2 CMA -HRules

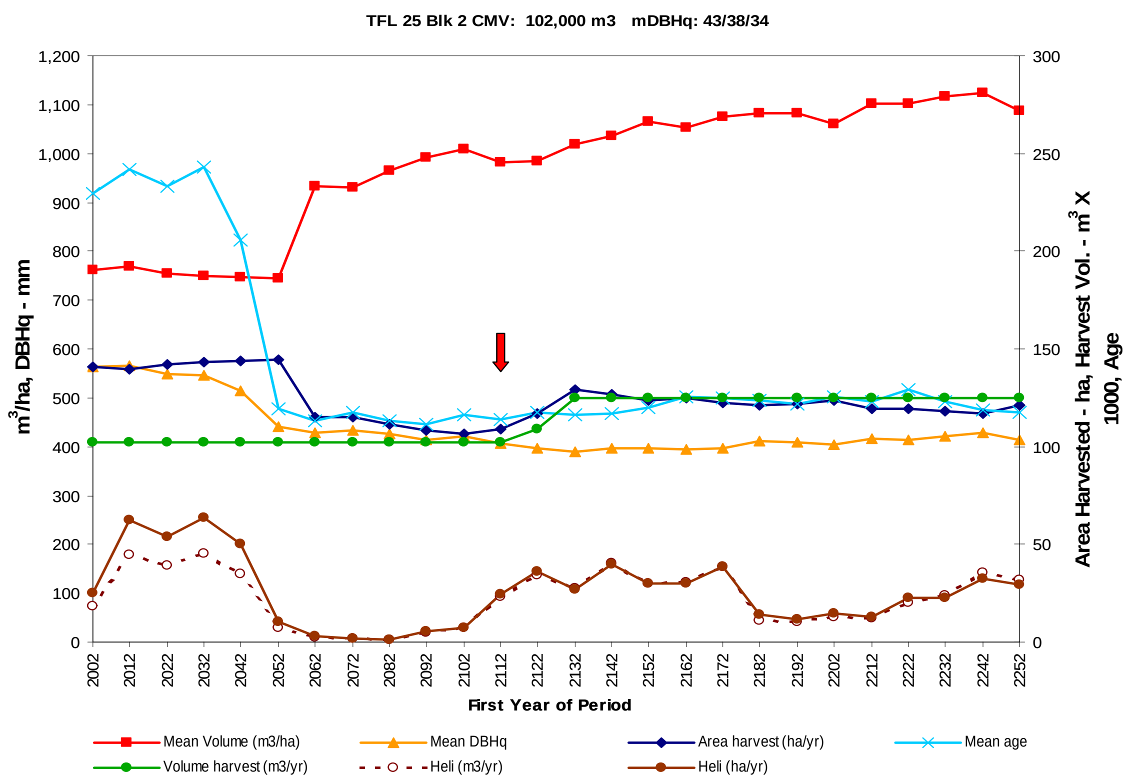


Figure 67. Block 2 CMV (Volume Regulated)

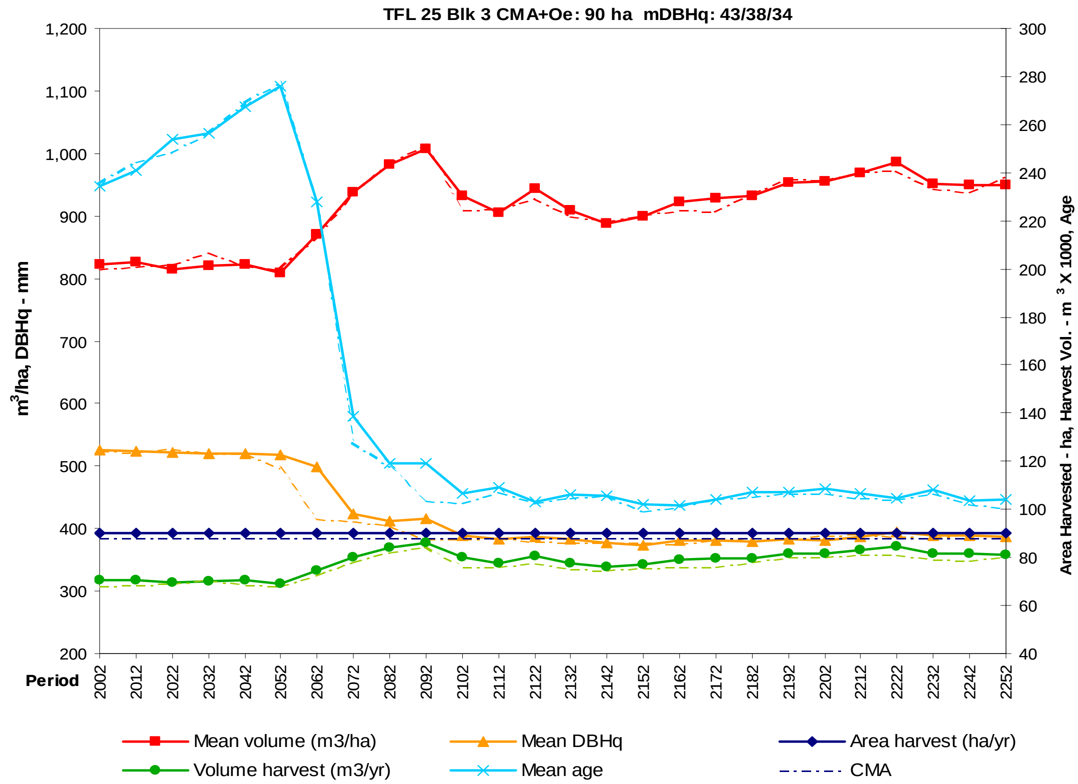


Figure 68. Block 3 CMA +Oe

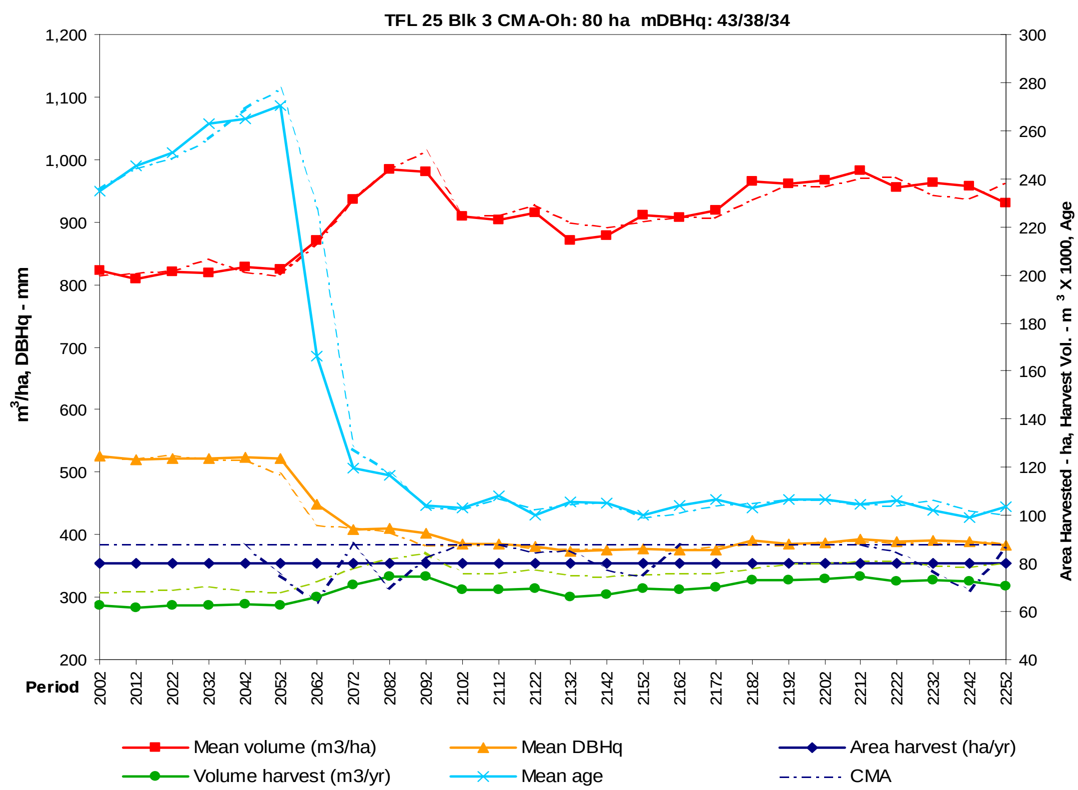


Figure 69. Block 3 CMA -Oh

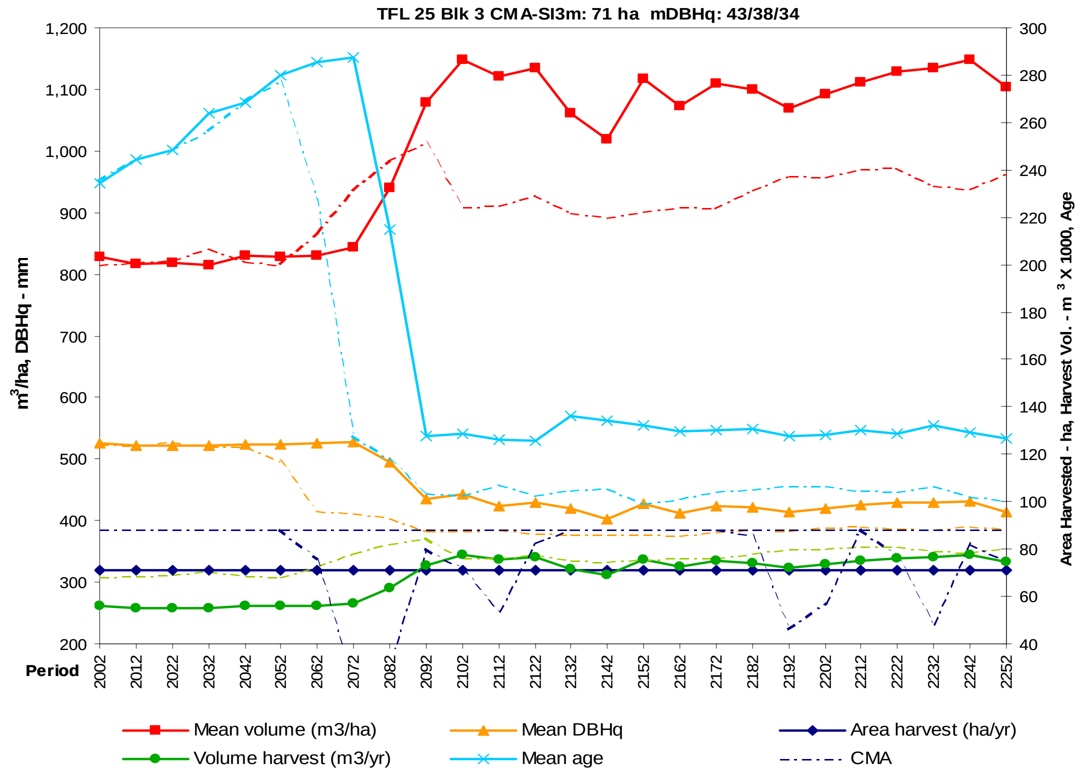


Figure 70. Block 3 CMA –SI3m

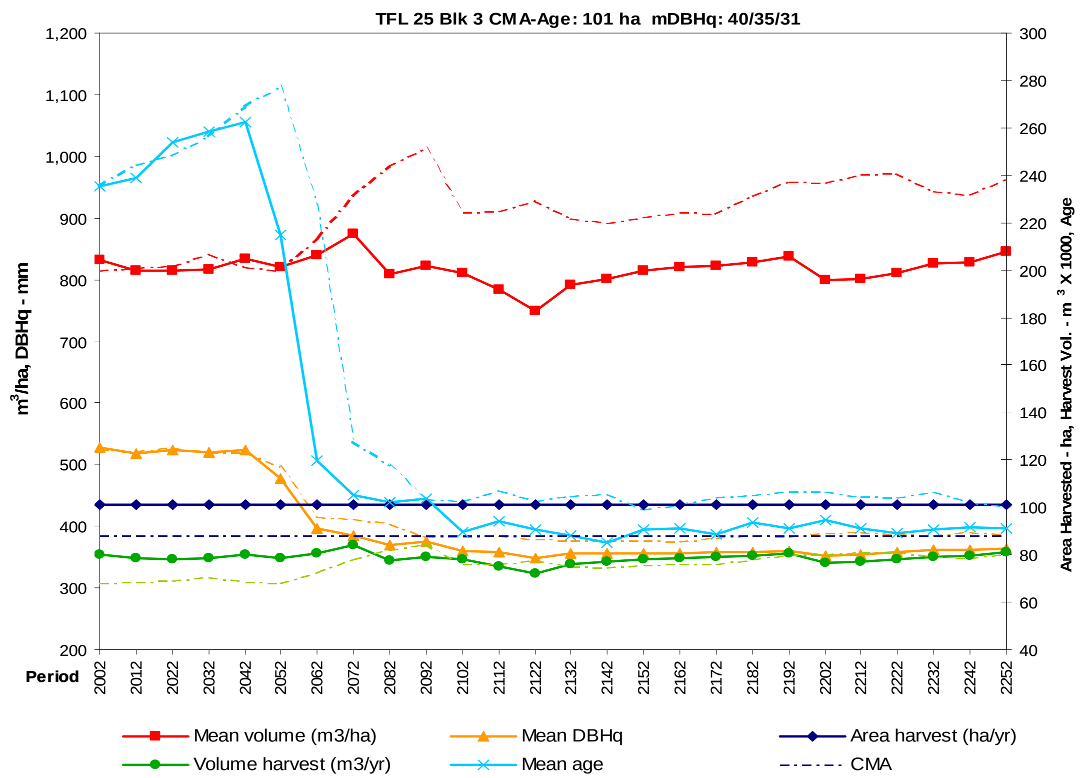


Figure 71. Block 3 CMA -age

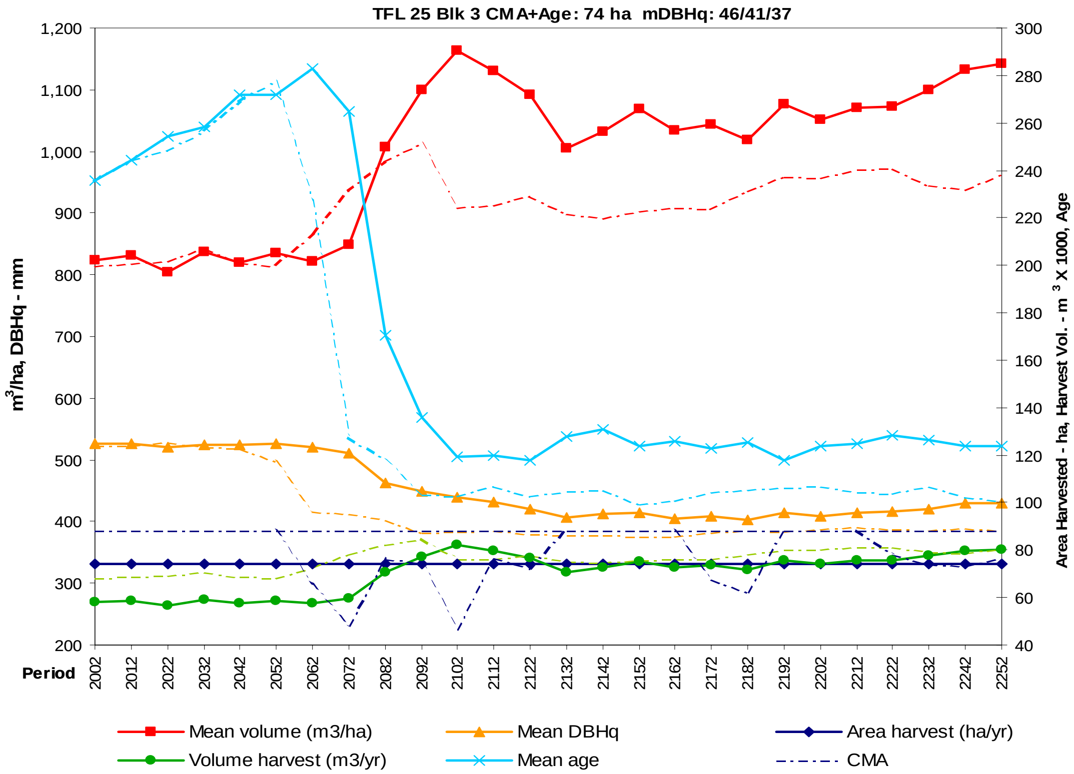


Figure 72. Block 3 CMA +age

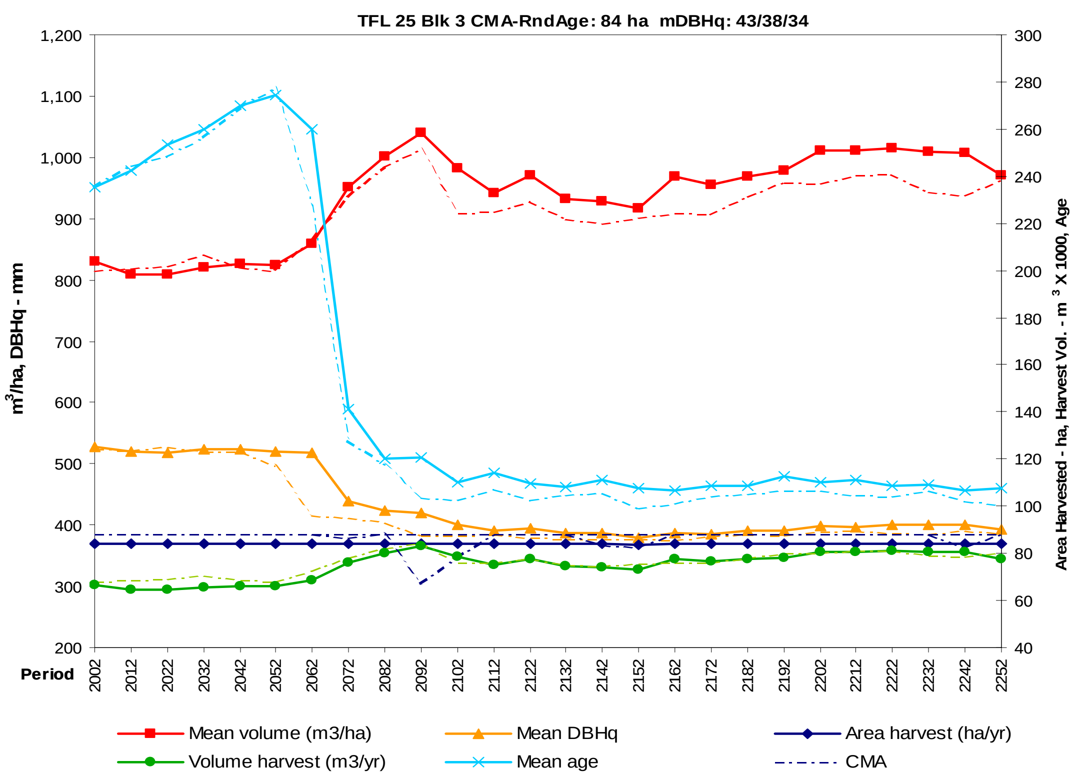


Figure 73. Block 3 CMA -RndAge

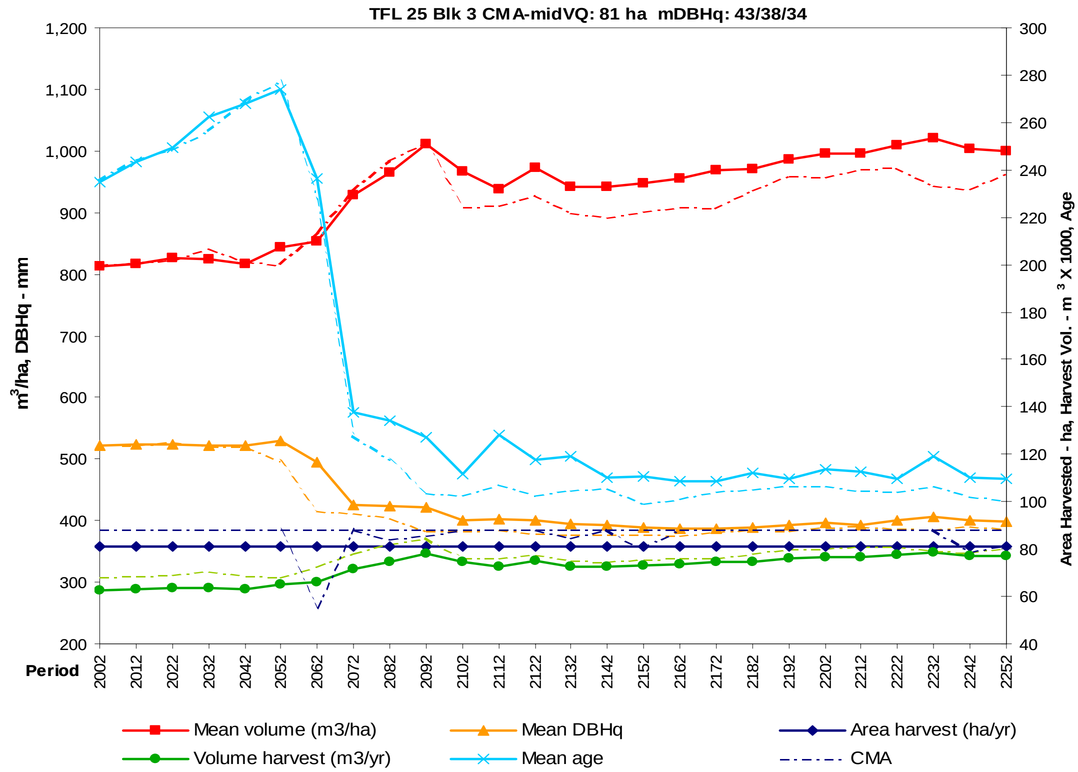


Figure 74. Block 3 CMA -midVQ

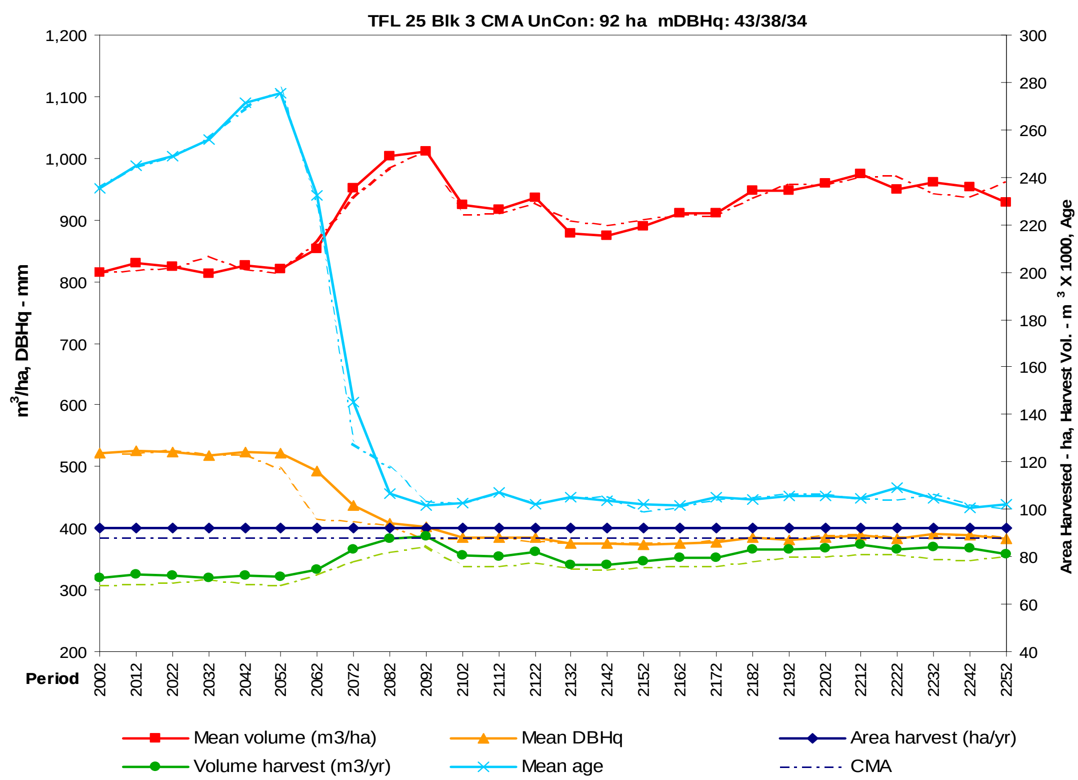


Figure 75. Block 3 CMA UnCon

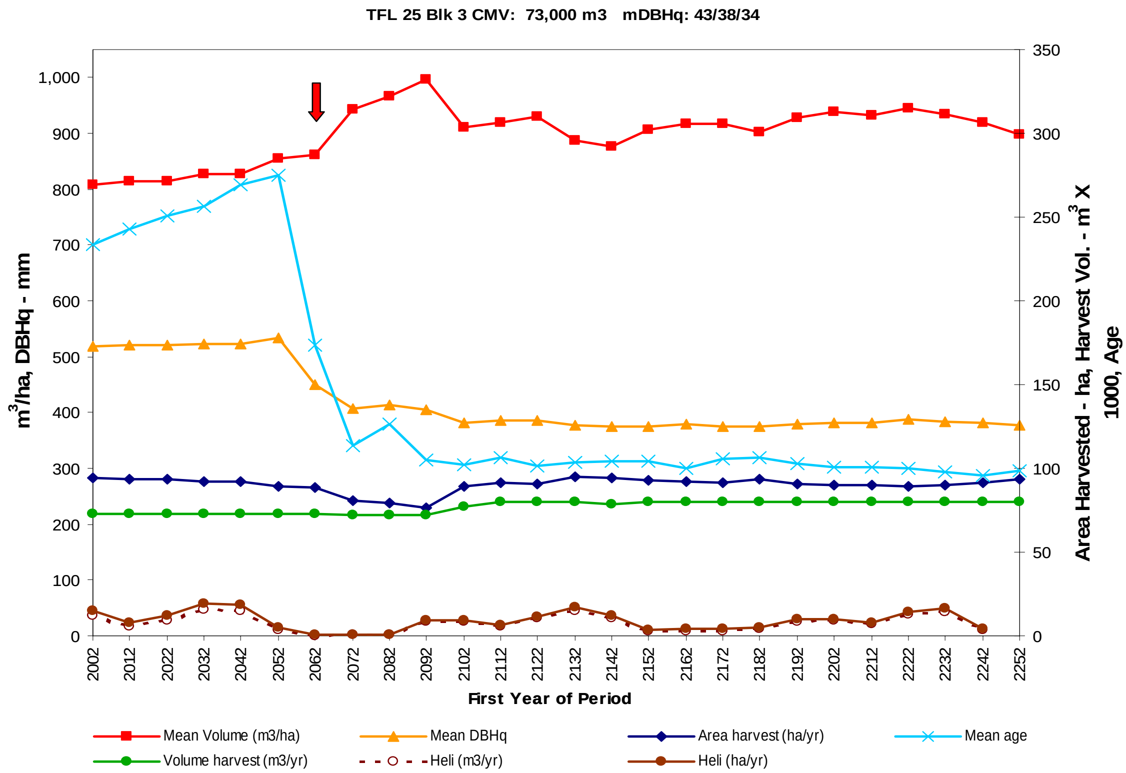


Figure 76. Block 3 CMV (Volume Regulated)

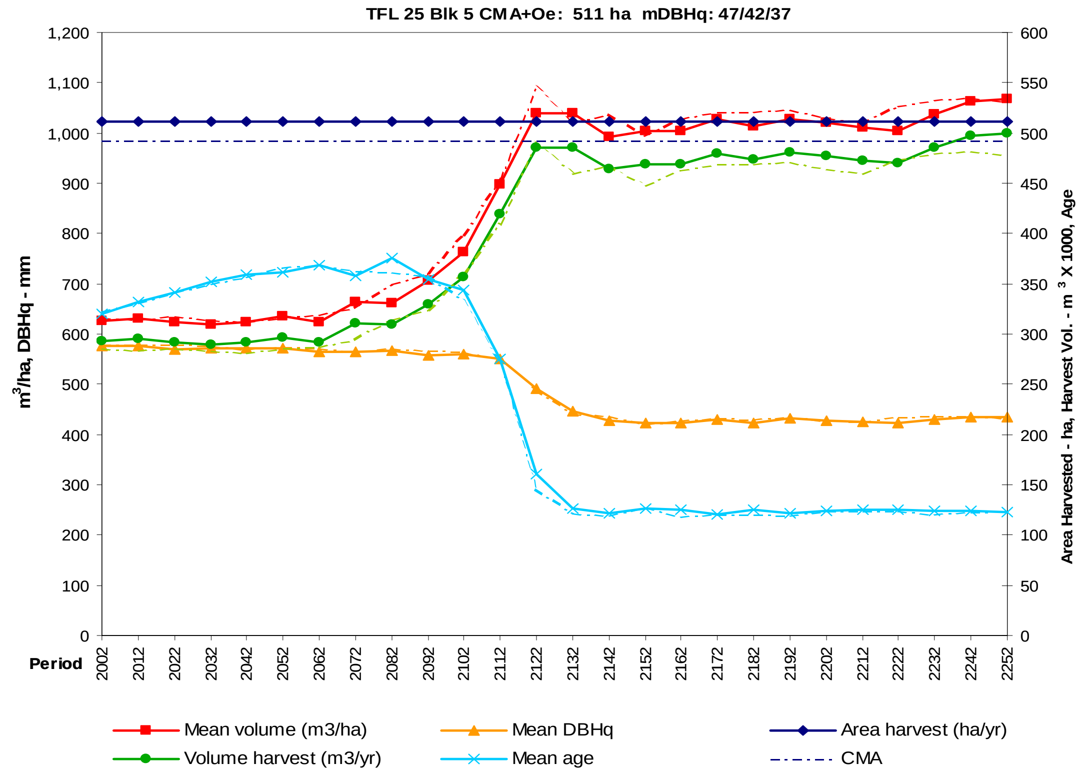


Figure 77. Block 5 CMA +Oe

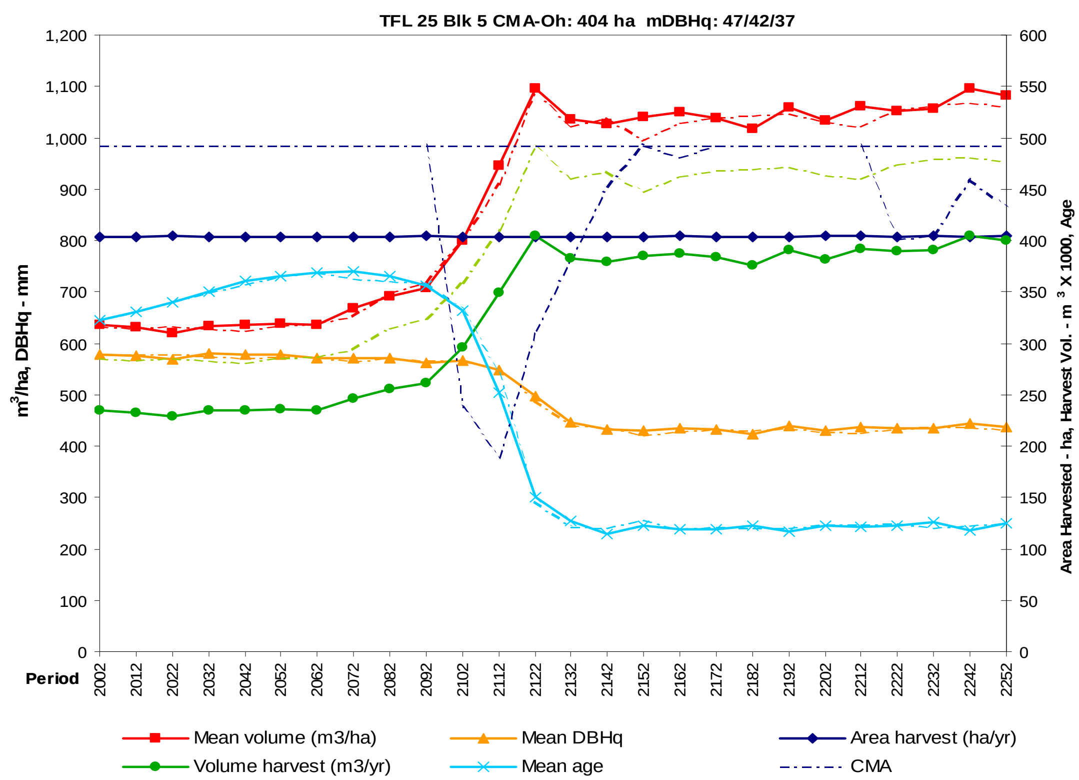


Figure 78. Block 5 CMA -Oh

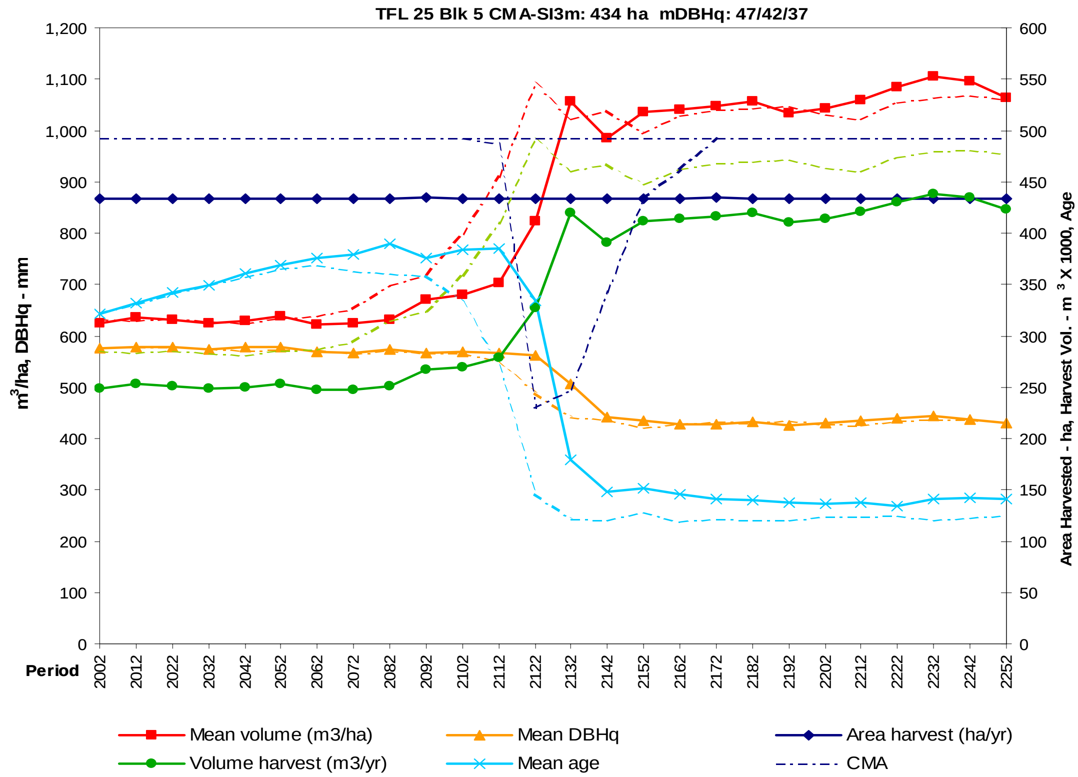


Figure 79. Block 5 CMA –SI3m

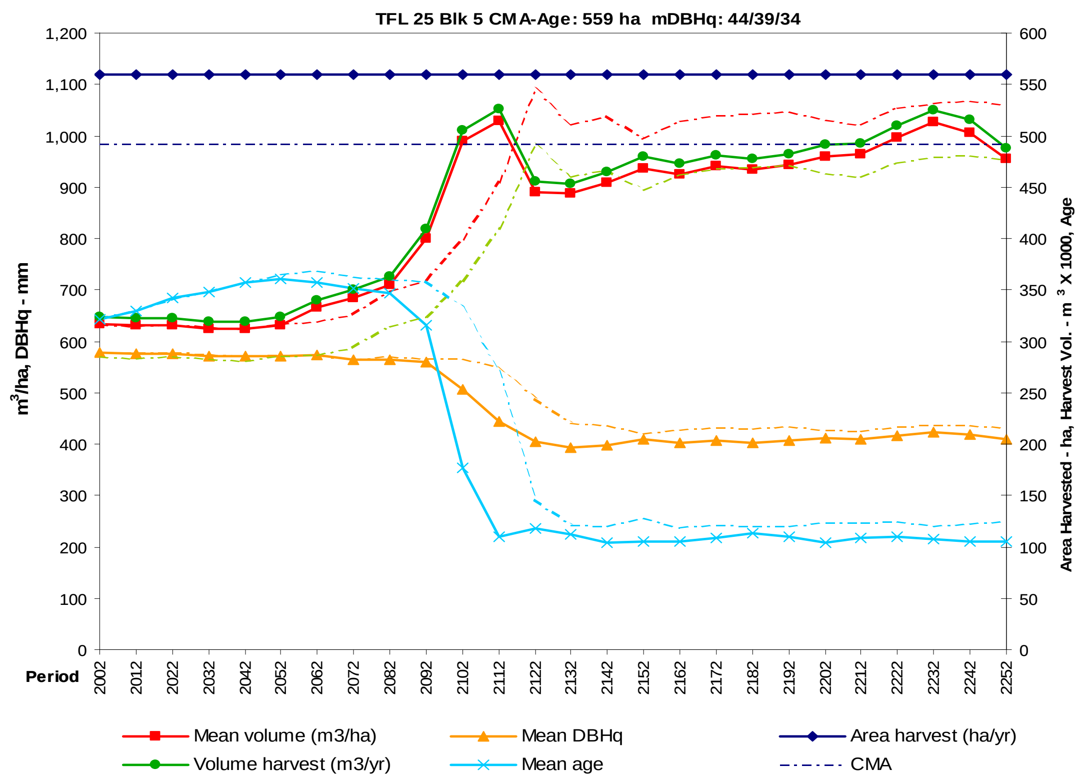


Figure 80. Block 5 CMA -age

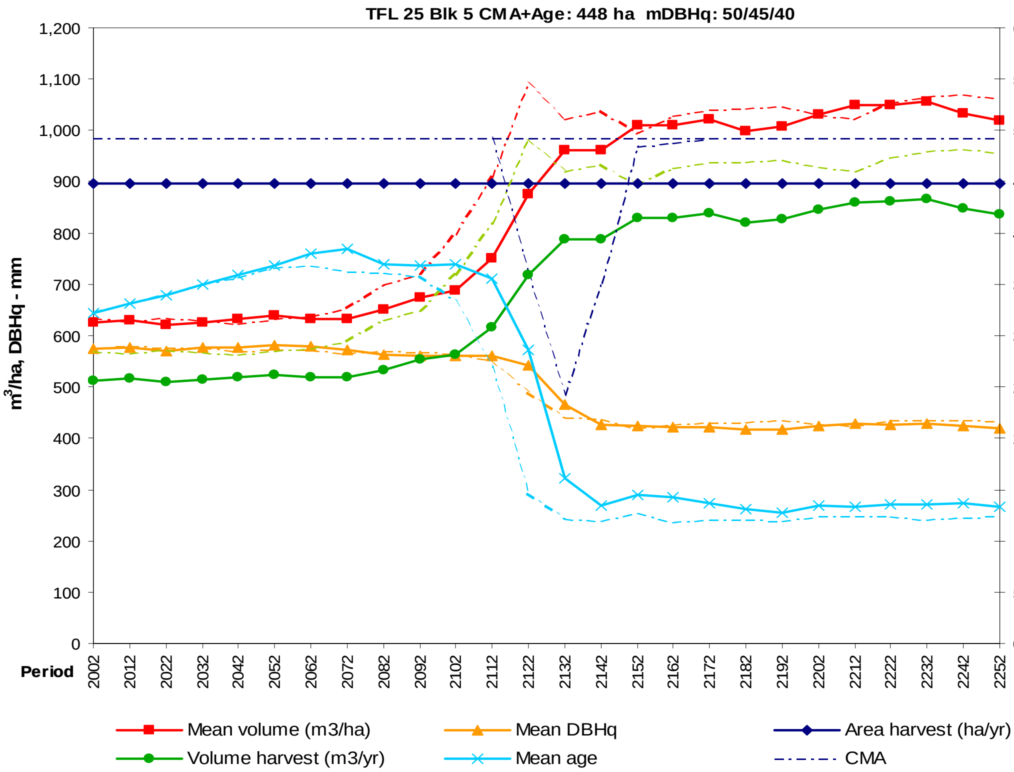


Figure 81. Block 5 CMA +age

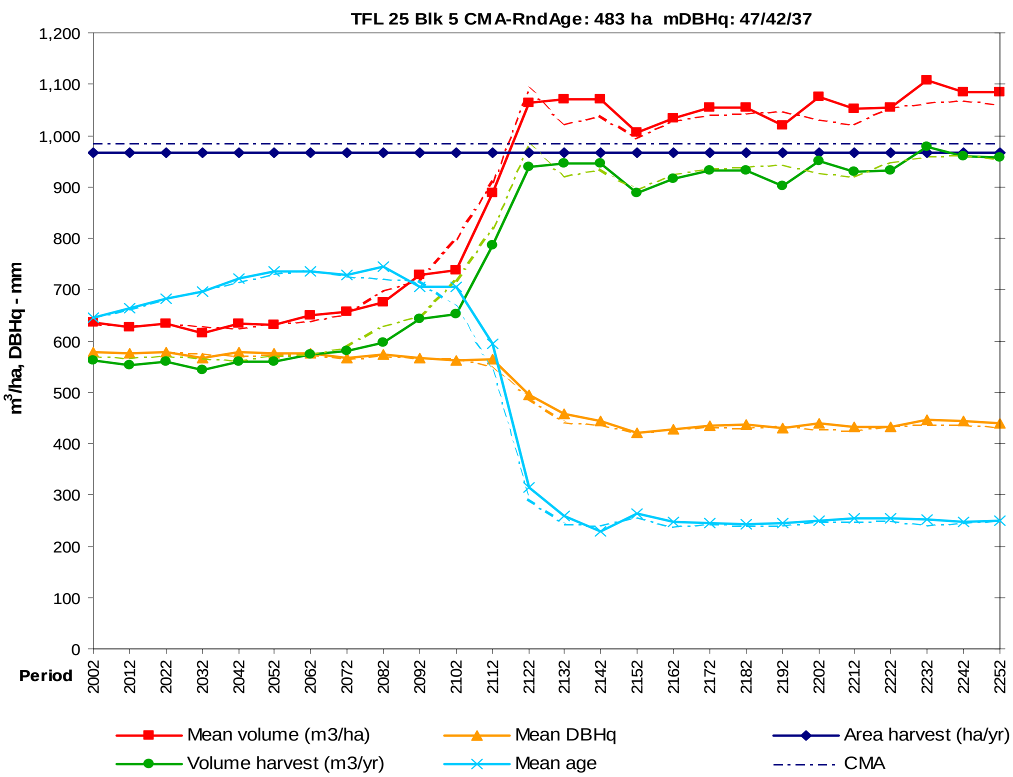


Figure 82. Block 5 CMA -RndAge

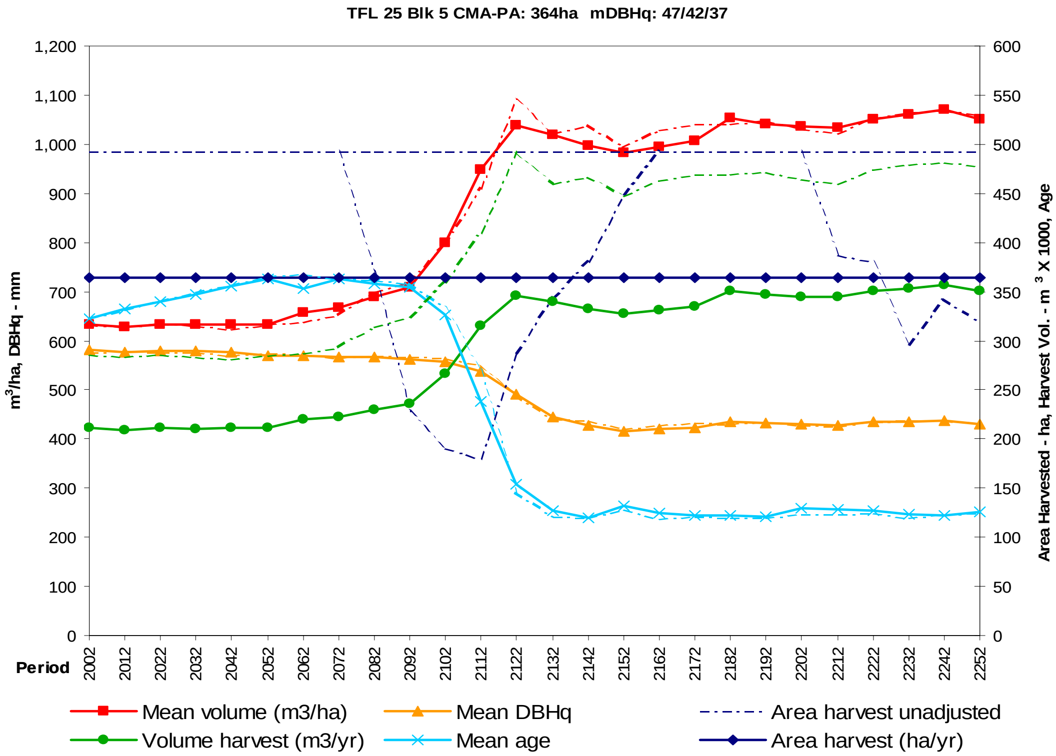


Figure 83. Block 5 CMA -PA

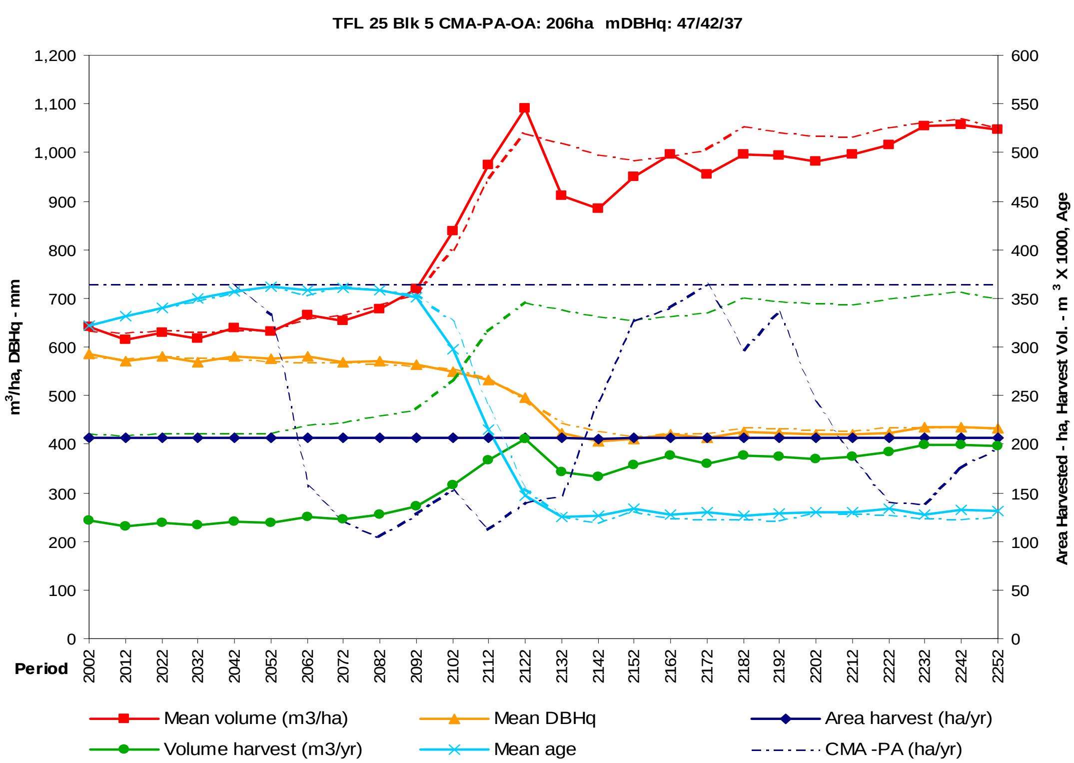


Figure 84. Block 5 CMA -PA -OA

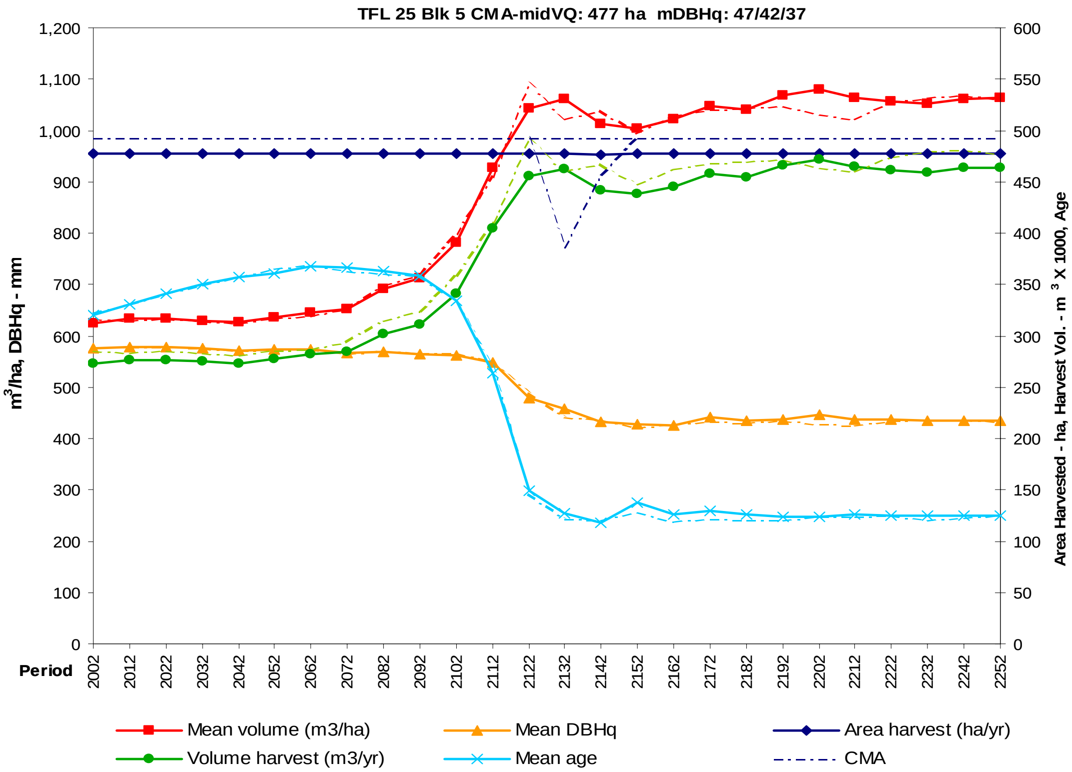


Figure 85. Block 5 CMA -midVQ

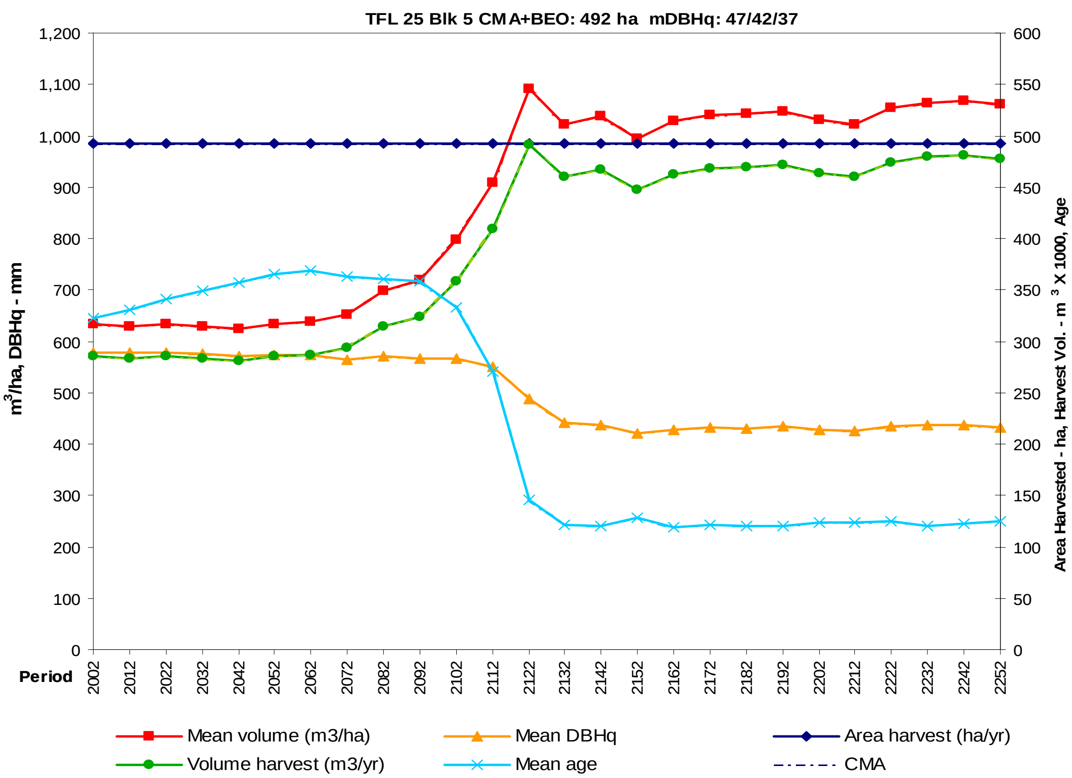


Figure 86. Block 5 CMA +BEO

WFP

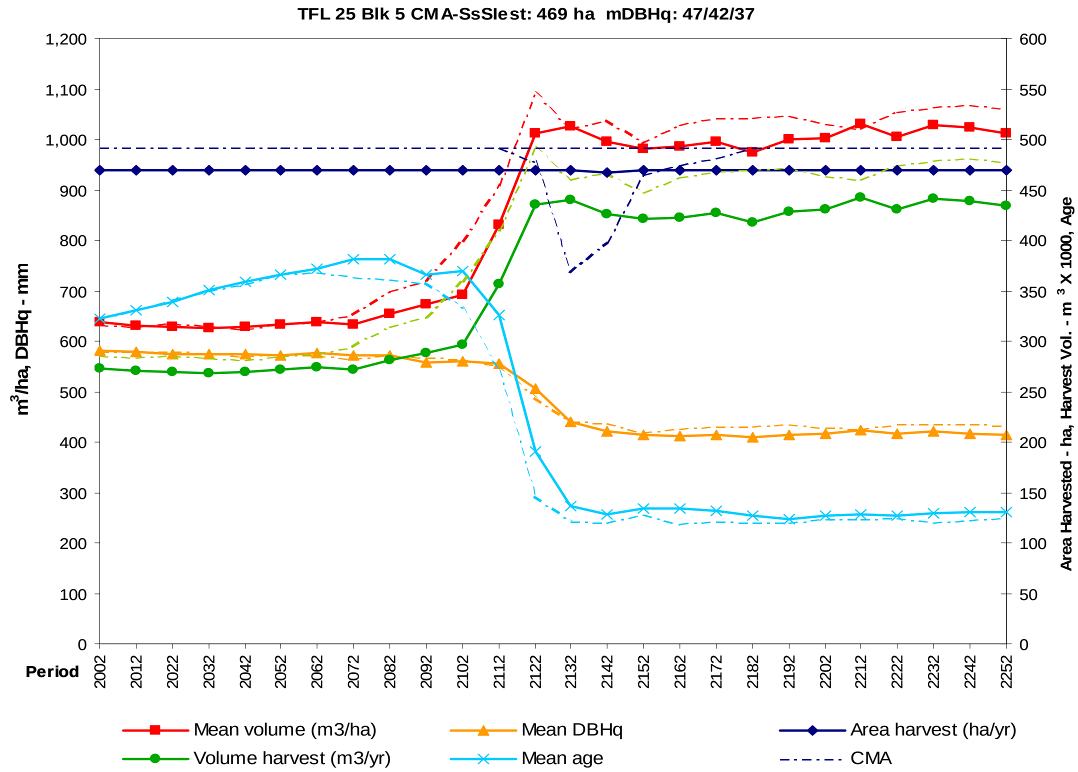


Figure 87. Block 5 CMA –SsSlest

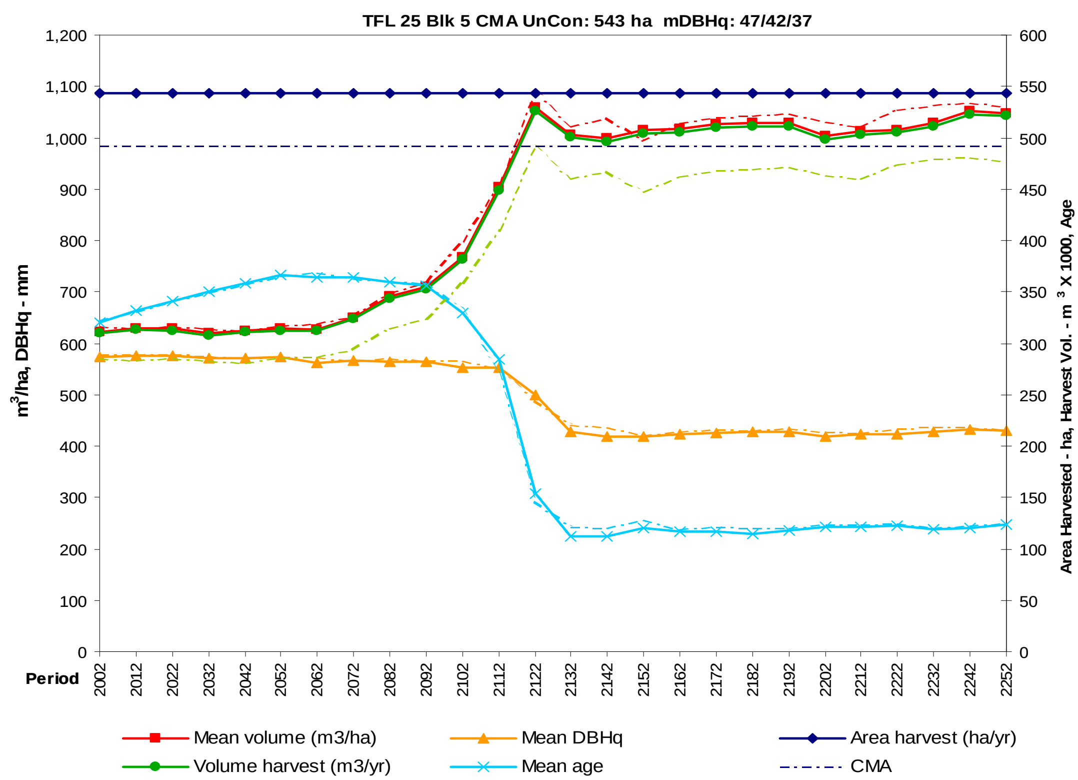


Figure 88. Block 5 CMA UnCon

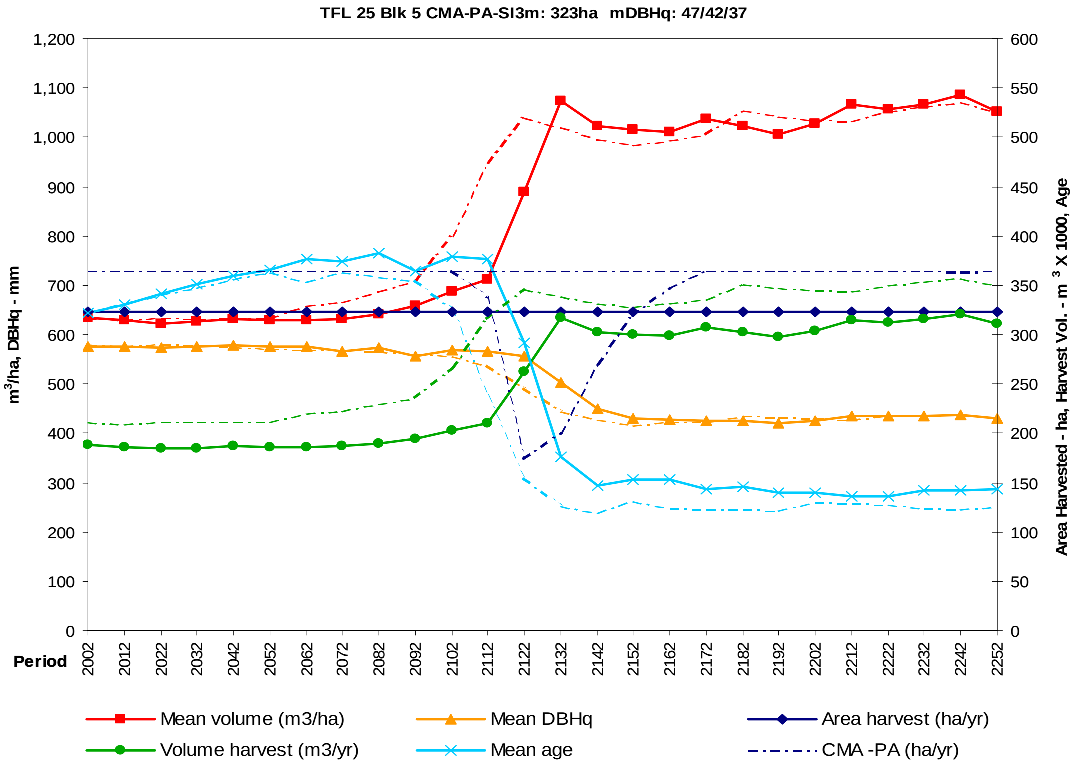


Figure 89. Block 5 CMA –PA –SI3m

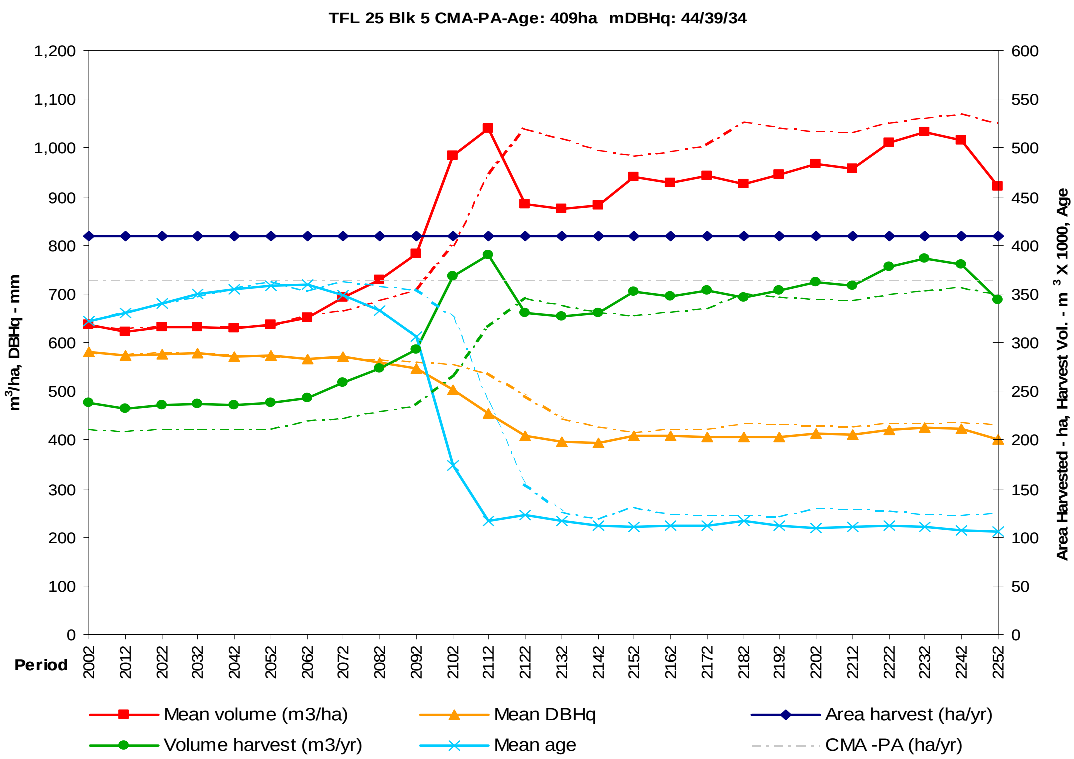


Figure 90. Block 5 CMA –PA –age

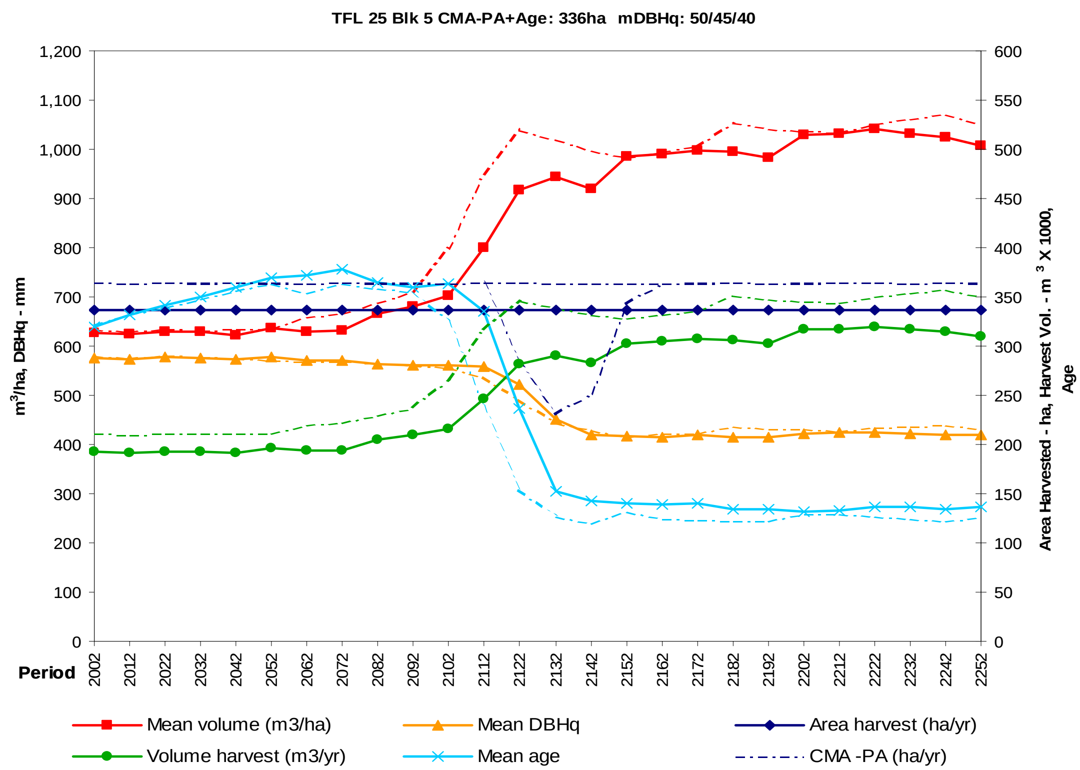


Figure 91. Block 5 CMA –PA +age

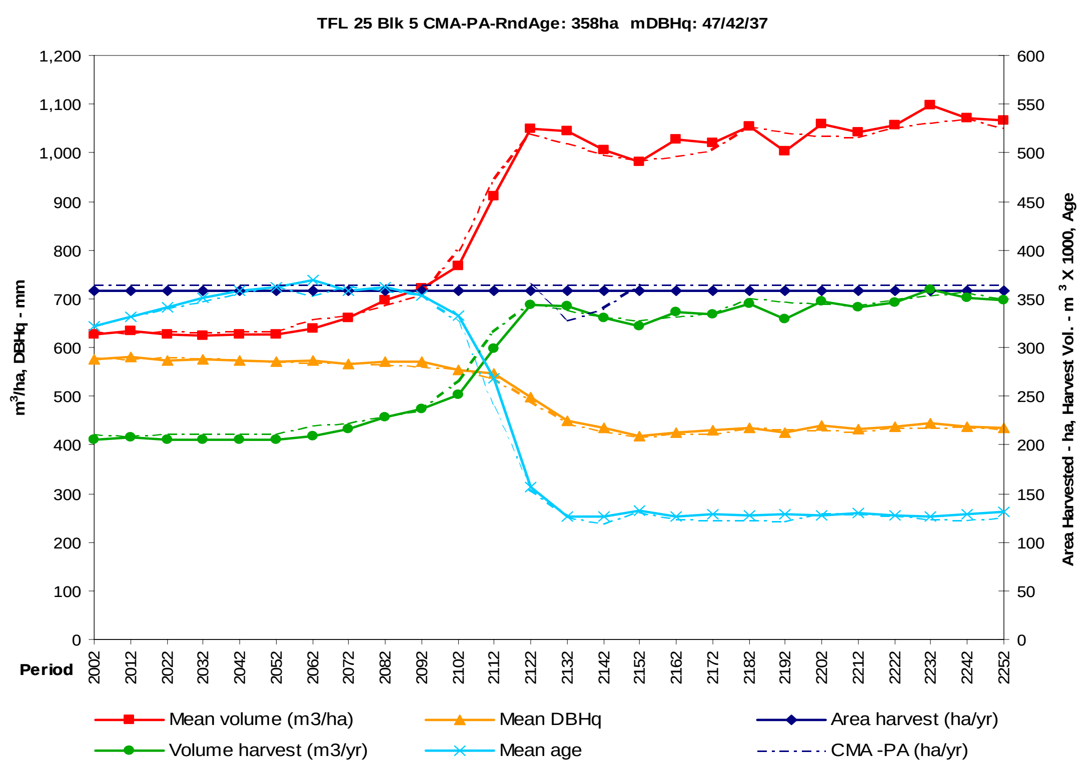


Figure 92. Block 5 CMA –PA –RndAge

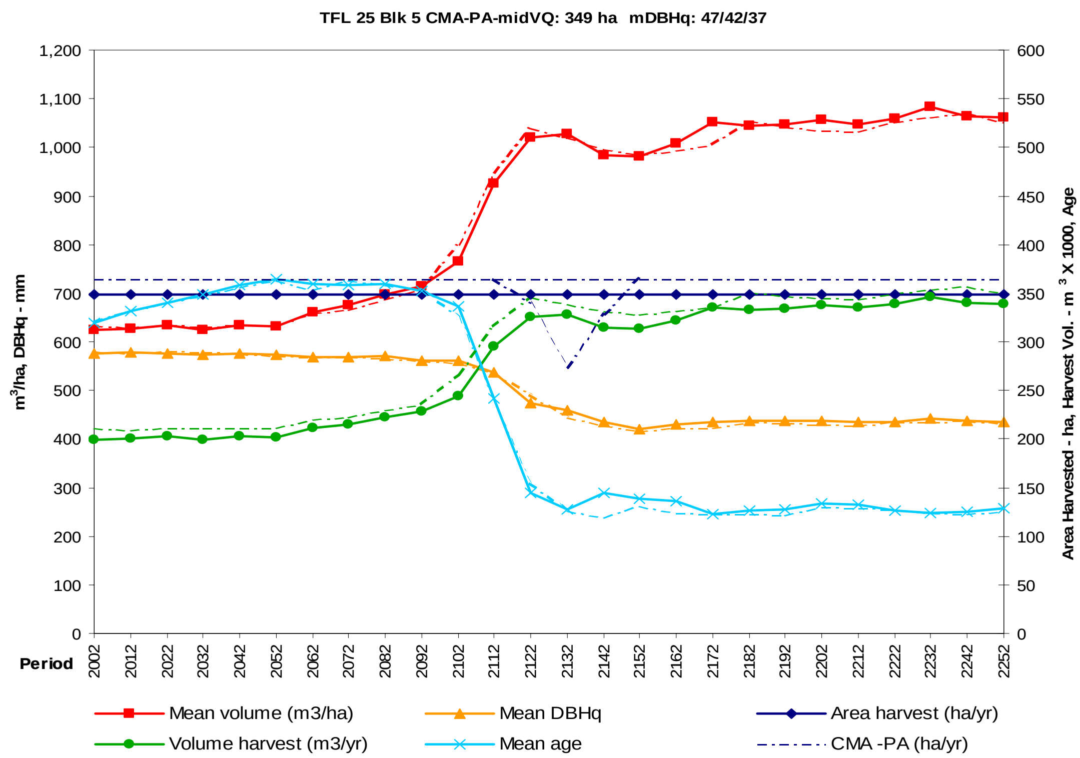


Figure 93. Block 5 CMA –PA –midVQ

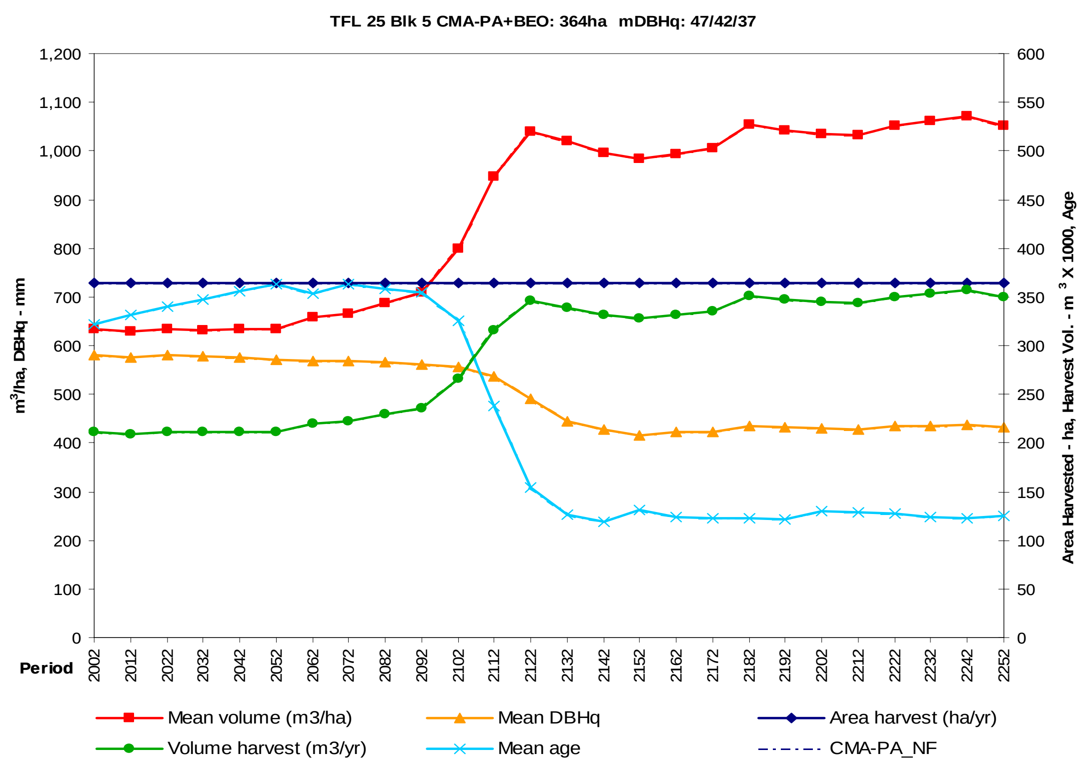


Figure 94. Block 5 CMA –PA +BEO

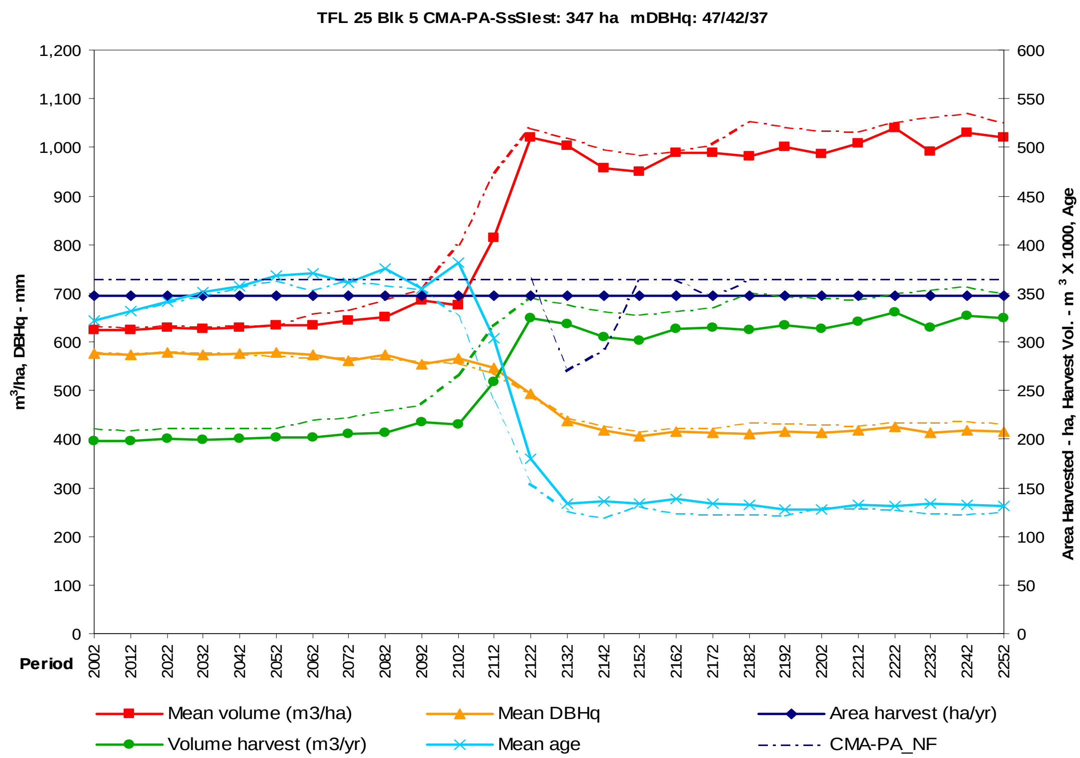


Figure 95. Block 5 CMA –PA –SsSIest

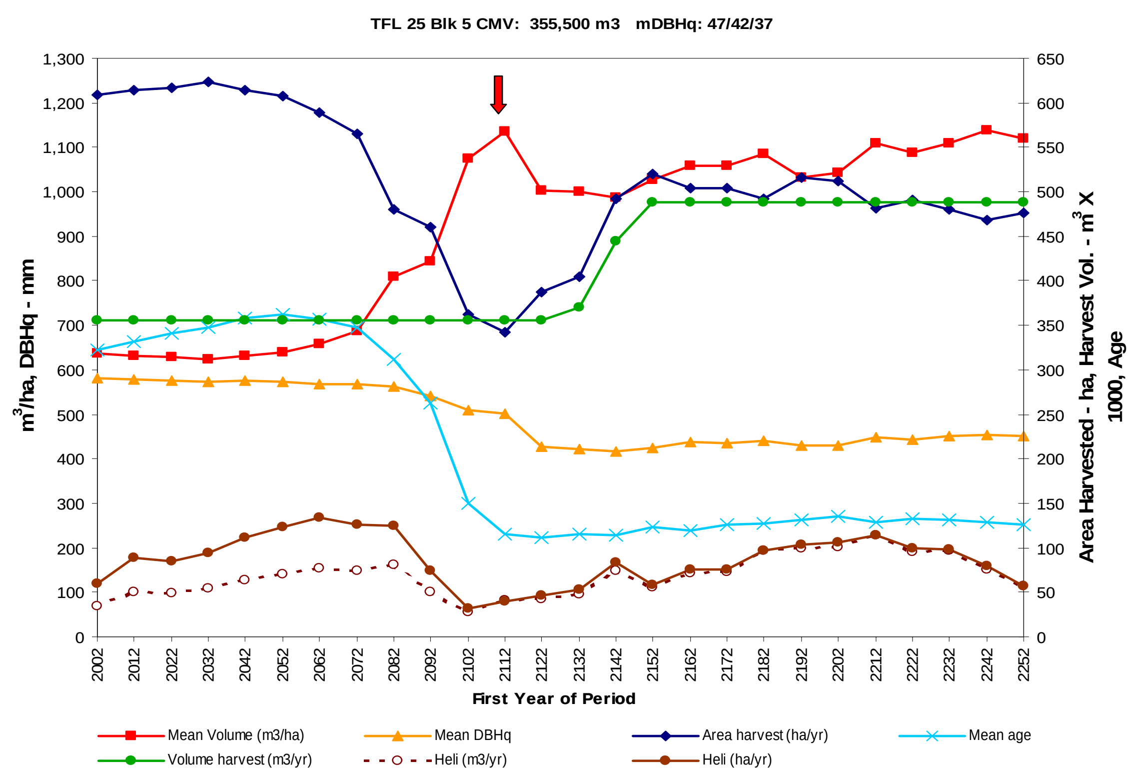


Figure 96. Block 5 CMV (Volume Regulated)

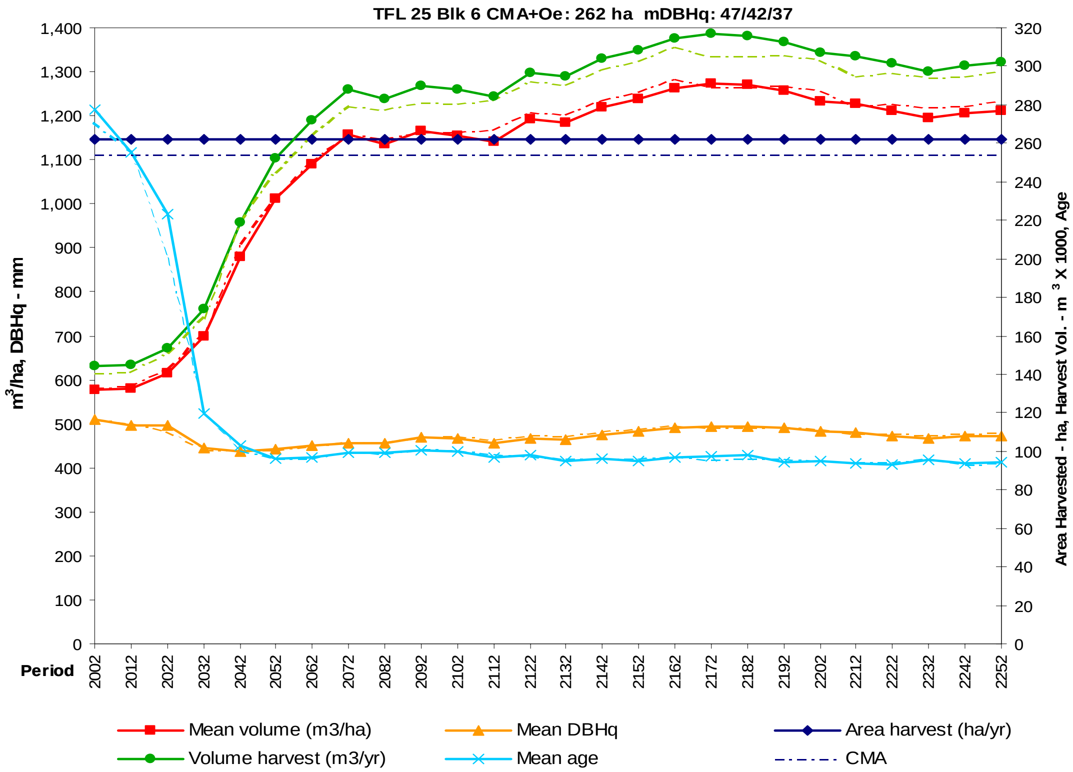


Figure 97. Block 6 CMA +Oe

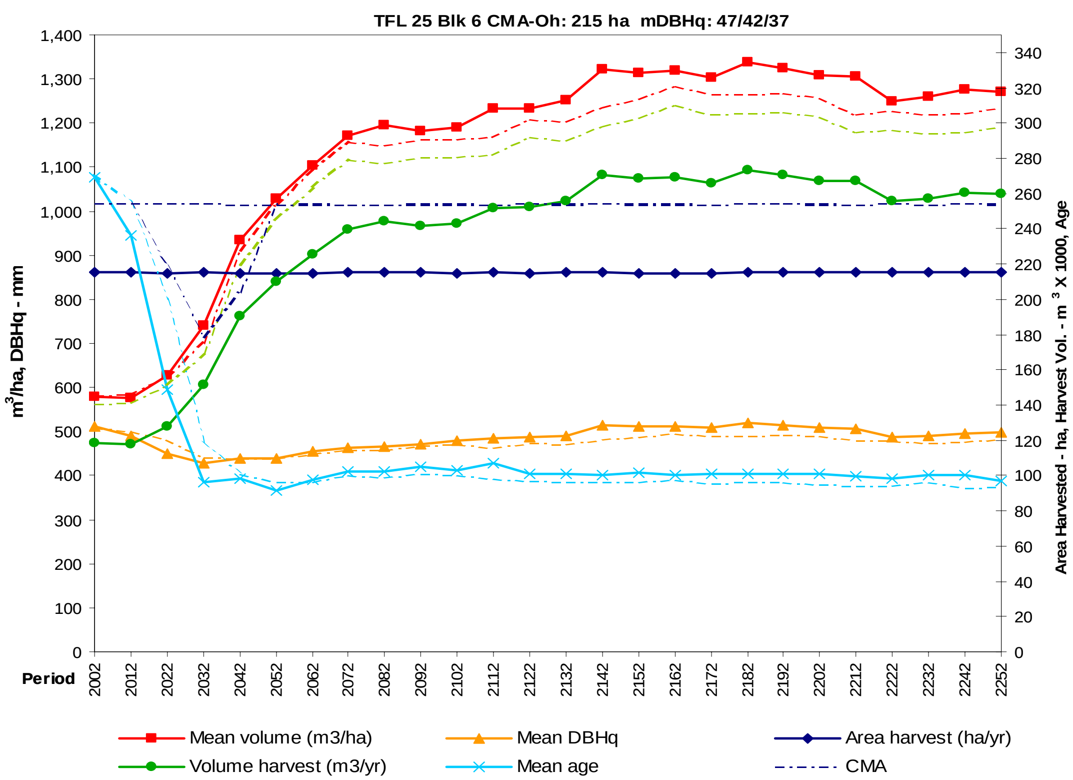


Figure 98. Block 6 CMA -Oh

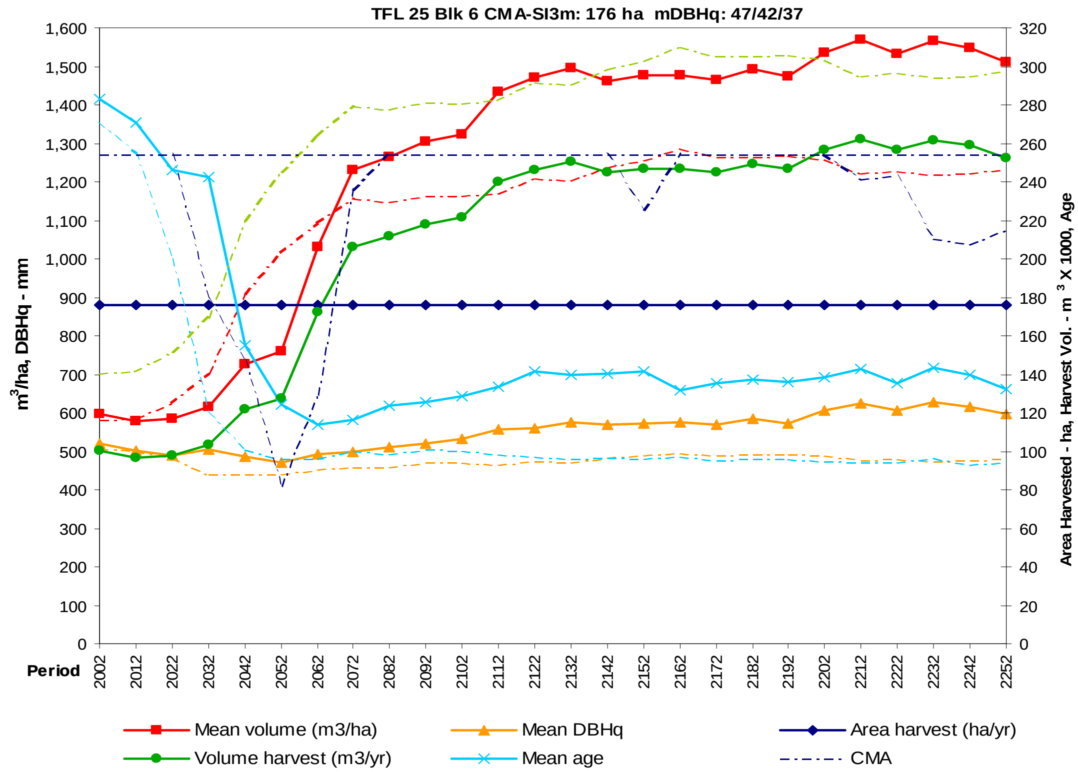


Figure 99. Block 6 CMA –SI3m

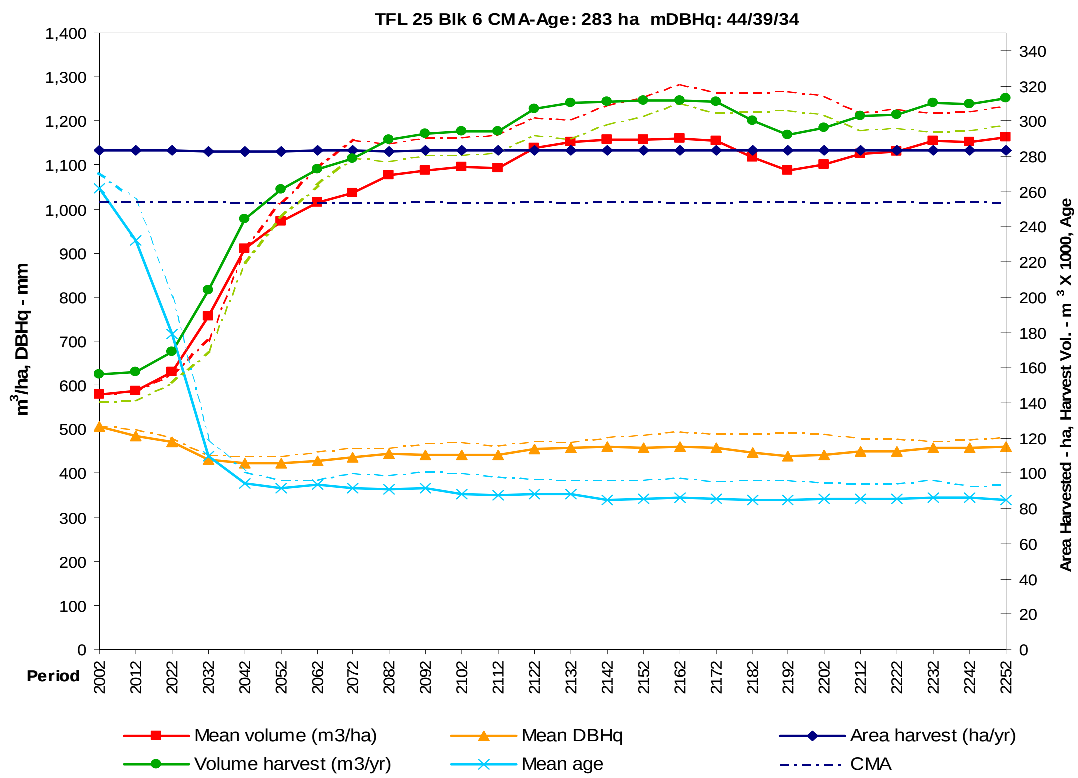


Figure 100. Block 6 CMA -age

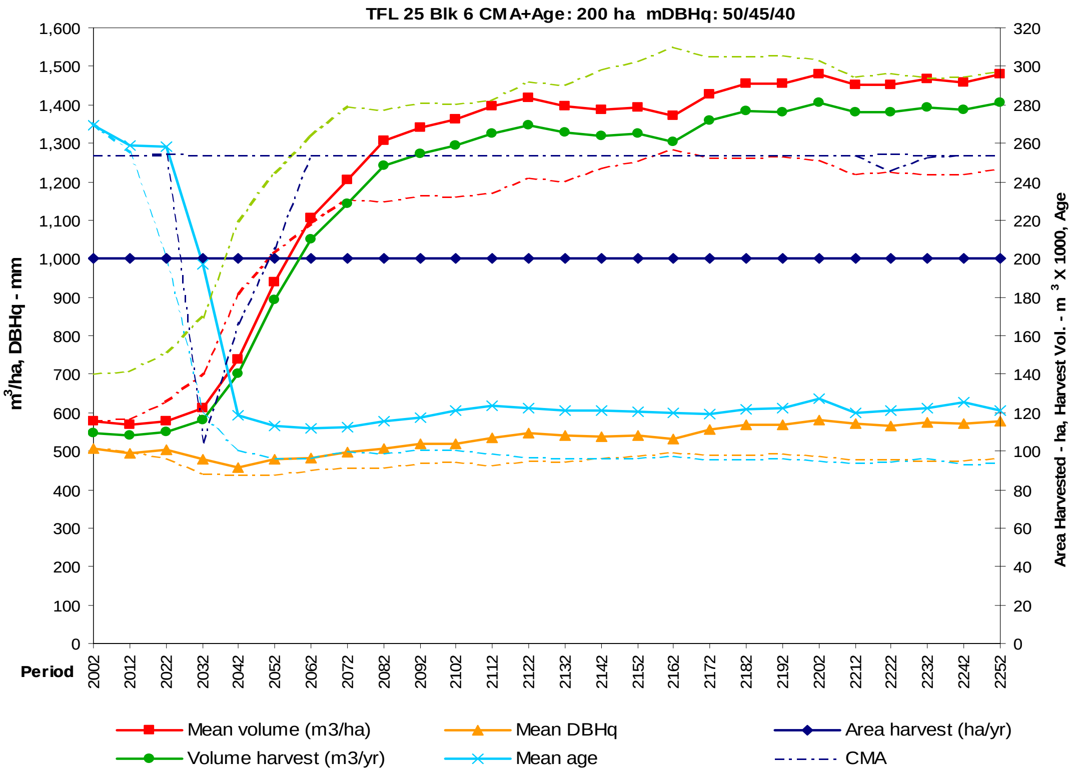


Figure 101. Block 6 CMA +age

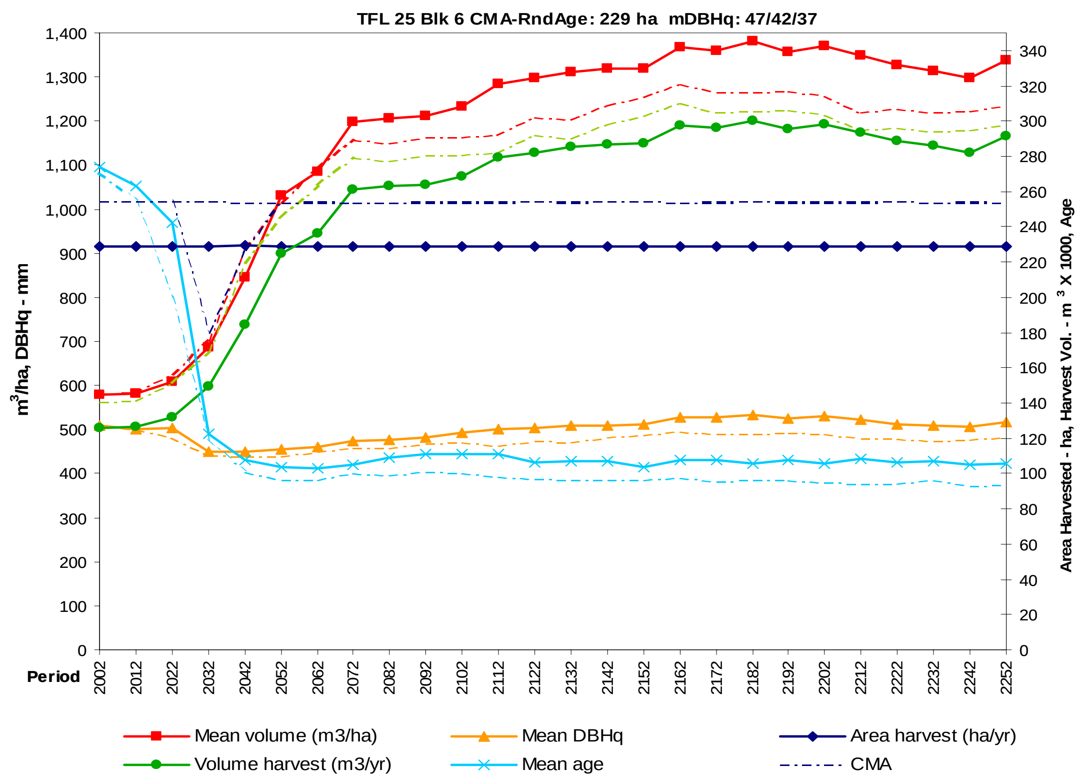


Figure 102. Block 6 CMA -RndAge

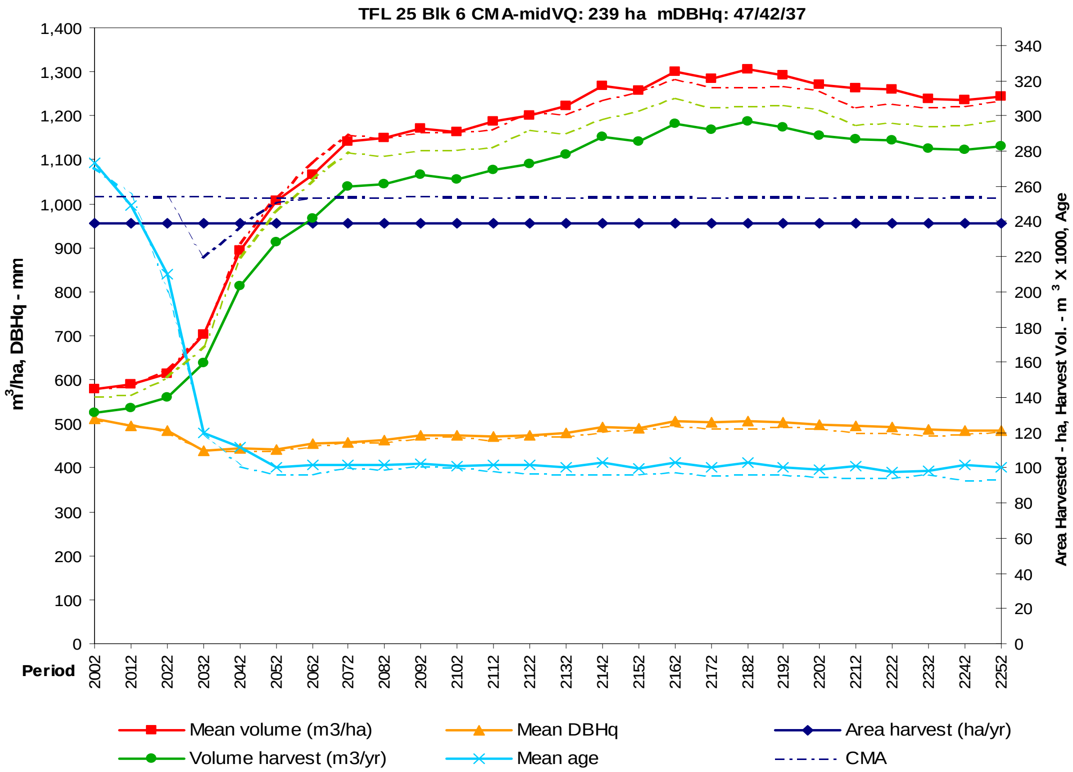


Figure 103. Block 6 CMA -midVQ

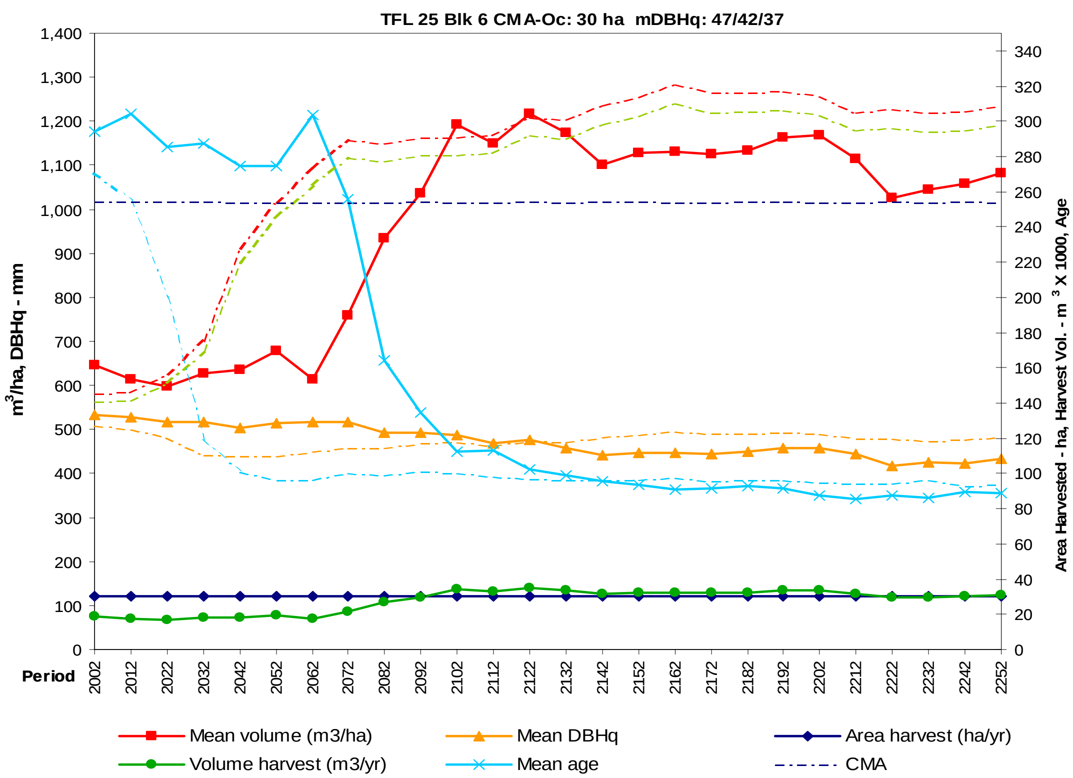


Figure 104. Block 6 CMA -Oc

![WFP logo]

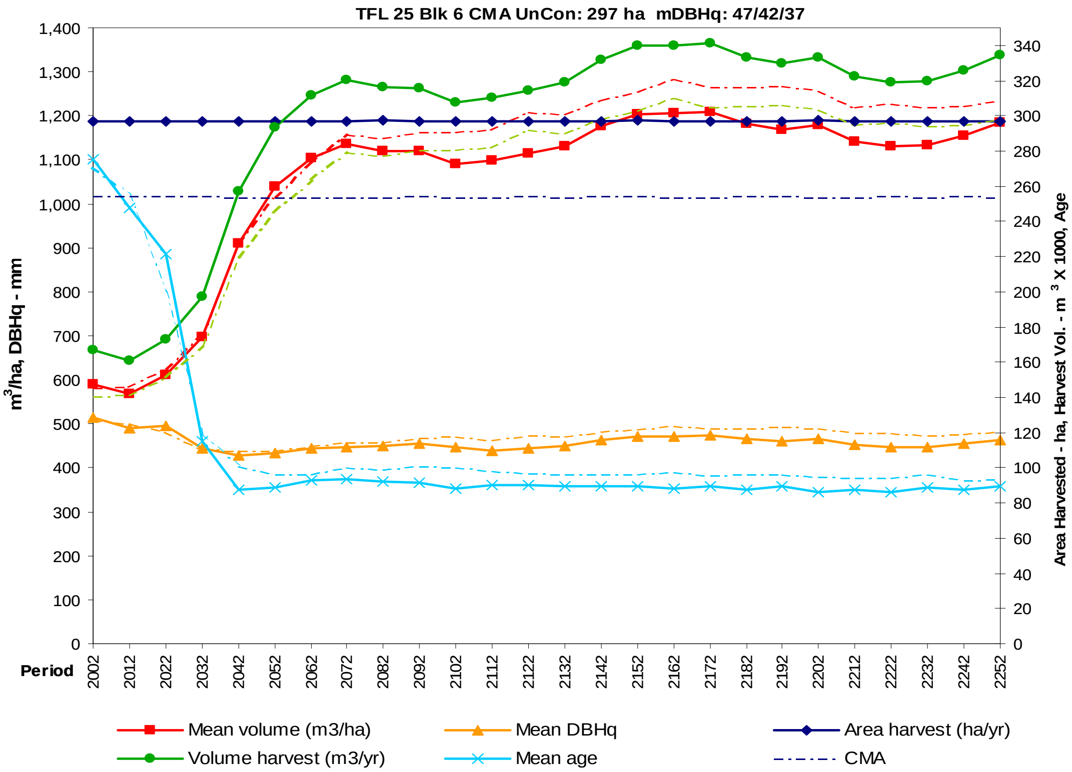


Figure 105. Block 6 CMA UnCon

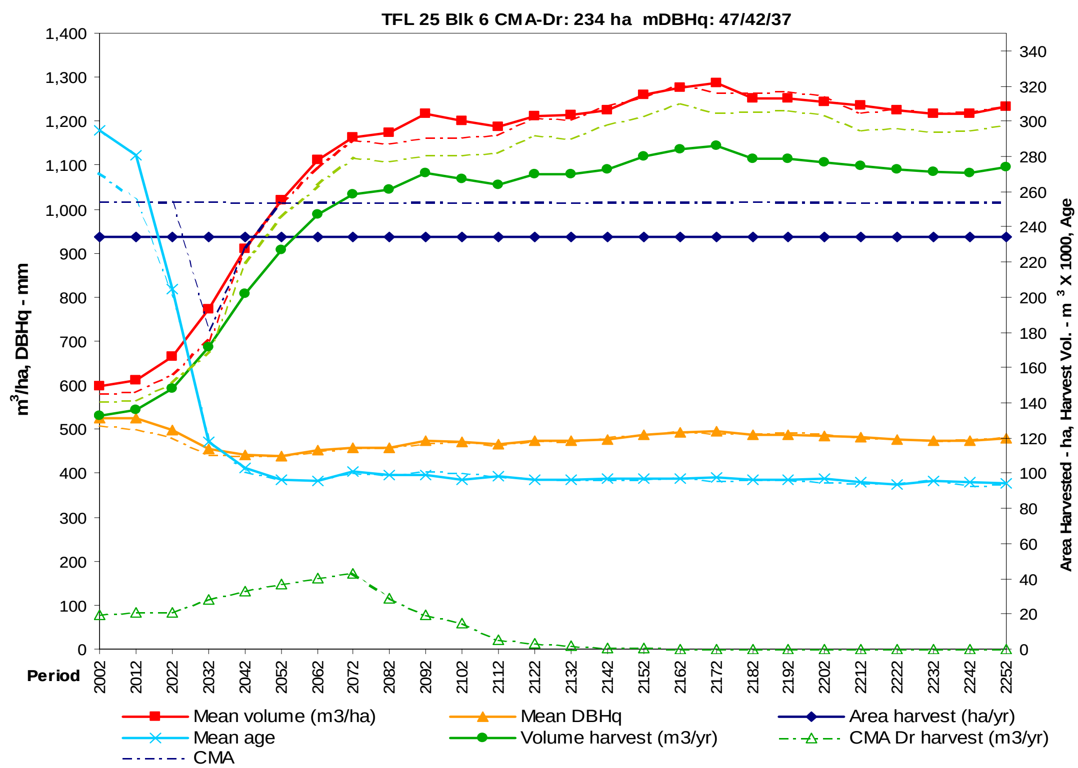


Figure 106. Block 6 CMA -Dr

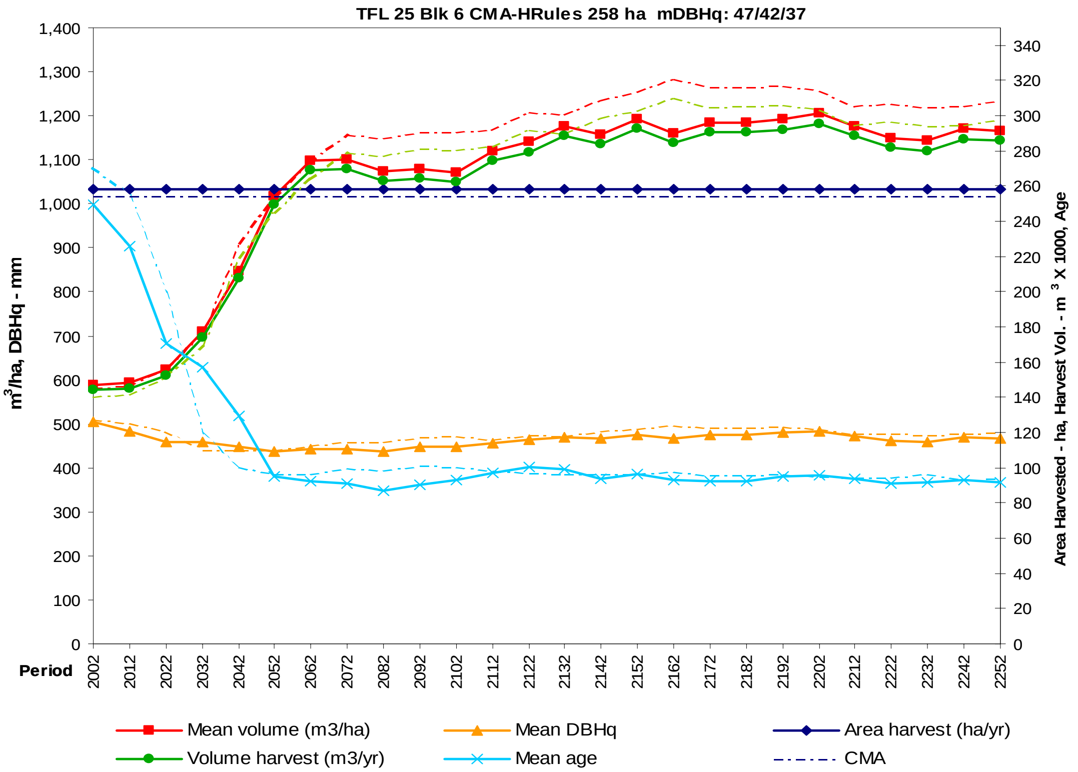


Figure 107. Block 6 -HRules

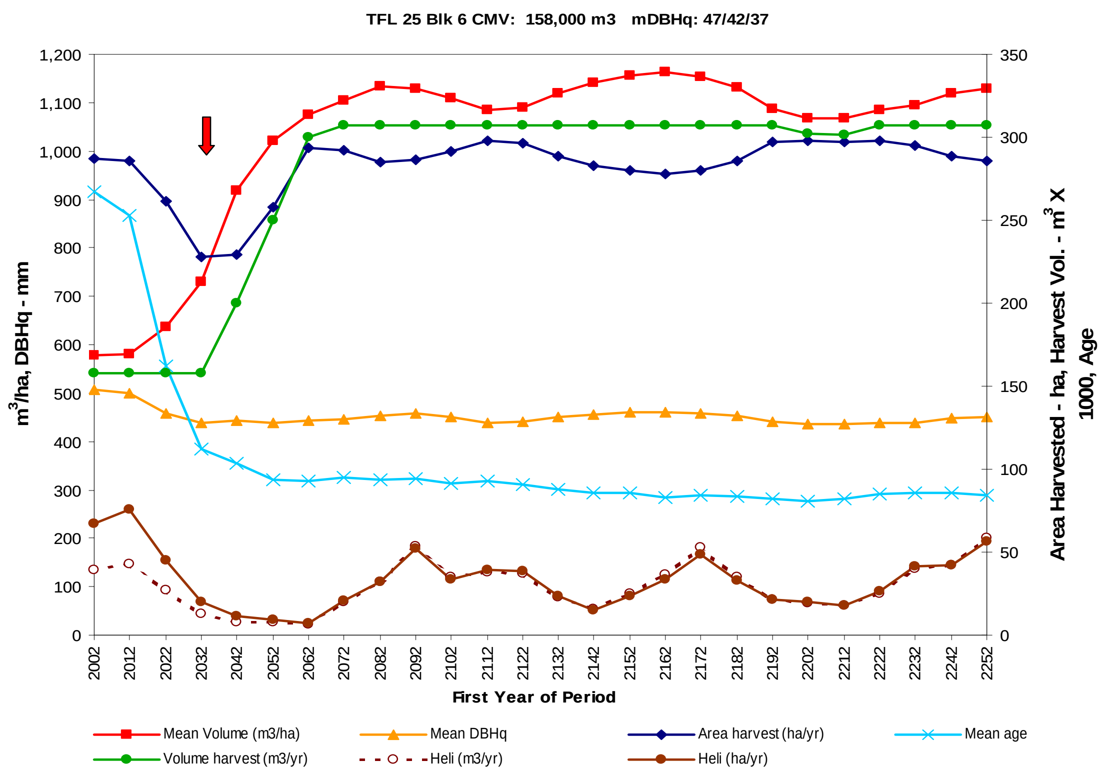


Figure 108. Block 6 CMV (Volume Regulated)

Appendix B
Change Summaries for Simulation Runs Relative to CM

Table 9. Annual Area Harvest Summary

Harvest (ha)	Block					
Run ID	**1**	**2**	**3**	**5**	**5-PA**	**6**
CMA	292	124	88	492	364	254
_up10	321.2	136.4	96.8	541.2		279.4
_down10	262.8	111.6	79.2	442.8		228.6
+Oe	294	126	90	511		262
-Oh	286	101	80	404		215
-SI3m	236	106	71	434	323	176
-age	309	142	101	559	409	283
+age	239	105	74	448	336	200
-RndAge	283	120	84	483	358	229
-PA				364		
-PA-OA				206		
-midVQ	289	122	81	477	349	239
+BEO		120		492	364	
-SsSIest				469	347	
-Oc		24				30
UnCon	307	133	92	543		297
-Dr						234
-HRules		125				258
+ageX2	196					
-ageX2	318					

Table 10. Change in Annual Area Harvest Summary

Change (ha)	Block					
Run ID	1	2	3	5	5-PA	6
CMA	292	124	88	492	364	254
_up10	29	12	9	49		25
_down10	-29	-12	-9	-49		-25
+Oe	2	2	2	19		8
-Oh	-6	-23	-8	-88		-39
-SI3m	-56	-18	-17	-58	-41	-78
-age	17	18	13	67	45	29
+age	-53	-19	-14	-44	-28	-54
-RndAge	-9	-4	-4	-9	-6	-25
-PA				-128		
-PA-OA				-286		
-midVQ	-3	-2	-7	-15	-15	-15
+BEO		-4		0	0	
-SsSlest				-23	-17	
-Oc		-100				-224
UnCon	15	9	4	51		43
-Dr						-20
-HRules		1				4
+ageX2	-96					
-ageX2	26					

Table 11. Percentage Change in Annual Area Harvest Summary

Change (%)	Block					
Run ID	**1**	**2**	**3**	**5**	**5-PA**	**6**
CMA	292	124	88	492	364	254
_up10	10.0	10.0	10.0	10.0		10.0
_down10	-10.0	-10.0	-10.0	-10.0		-10.0
+Oe	0.7	1.6	2.3	3.9		3.1
-Oh	-2.1	-18.5	-9.1	-17.9		-15.4
-SI3m	-19.2	-14.5	-19.3	-11.8	-11.3	-30.7
-age	5.8	14.5	14.8	13.6	12.4	11.4
+age	-18.2	-15.3	-15.9	-8.9	-7.7	-21.3
-RndAge	-3.1	-3.2	-4.5	-1.8	-1.6	-9.8
-PA				-26.0		
-PA-OA				-58.1		
-midVQ	-1.0	-1.6	-8.0	-3.0	-4.1	-5.9
+BEO		-3.2		0.0	0.0	
-SsSIest				-4.7	-4.7	
-Oc		-80.6				-88.2
UnCon	5.1	7.3	4.5	10.4		16.9
-Dr						-7.9
-HRules		0.8				1.6
+ageX2	-32.9					
-ageX2	8.9					

Table 12. Volume Harvest Summary[44]

Volume Changes		Block						Totals	
Run ID		1	2	3	5	5-PA	6		-PA
CMA	Near	*3,290,689*	*1,804,675*	*1,366,849*	*5,685,158*	*4,202,677*	*2,817,458*	*14,964,829*	*13,482,348*
	Mid	*9,485,043*	*4,529,882*	*3,486,836*	*14,224,787*	*10,631,840*	*10,477,782*	*42,204,329*	*38,611,383*
	Long	*40,497,623*	*22,003,138*	*14,110,692*	*77,965,375*	*57,282,168*	*52,937,604*	*207,514,432*	*186,831,225*
	total	***53,273,355***	***28,337,695***	***18,964,377***	***97,875,320***	***72,116,686***	***66,232,844***	***264,683,590***	***238,924,956***
_up10	Near	295,286	161,777	149,366	606,013		280,090	1,492,532	
	Mid	210,996	546,603	91,613	1,455,009		231,007	2,535,228	
	Long	119,066	-221,025	26,543	3,728,089		1,593,543	5,246,217	
	total	**625,348**	**487,356**	**267,522**	**5,789,110**	**0**	**2,104,640**	**9,273,977**	**0**
_down10	Near	-331,979	-186,512	-118,184	-592,618		-290,416	-1,519,709	
	Mid	-850,346	-464,403	-387,890	-1,394,214		-1,211,057	-4,307,909	
	Long	-2,276,797	-1,094,557	-358,527	-6,994,001		-2,413,468	-13,137,351	
	total	**-3,459,122**	**-1,745,471**	**-864,601**	**-8,980,833**	**0**	**-3,914,942**	**-18,964,969**	**0**
+Oe	Near	5,881	18,121	44,461	195,718		70,613	334,794	
	Mid	50,784	98,774	54,386	383,054		223,140	810,138	
	Long	204,829	397,782	403,834	1,395,432		1,139,030	3,540,907	
	total	**261,494**	**514,677**	**502,681**	**1,974,204**	**0**	**1,432,784**	**4,685,840**	**0**
-Oh	Near	-113,792	-341,175	-125,560	-1,007,168		-456,765	-2,044,460	
	Mid	-168,064	-805,616	-320,814	-2,531,151		-1,424,607	-5,250,252	
	Long	-995,535	-4,052,905	-1,284,923	-13,381,738		-6,402,669	-26,117,769	
	total	**-1,277,392**	**-5,199,695**	**-1,731,297**	**-16,920,057**	**0**	**-8,284,041**	**-33,412,481**	**0**
-SI3m	Near	-646,329	-264,691	-256,024	-674,991	-466,242	-848,975	-2,691,010	-2,482,261
	Mid	-1,290,332	-703,709	-704,861	-1,736,730	-1,354,326	-4,251,409	-8,687,042	-8,304,638
	Long	-2,332,405	-1,675,352	-993,693	-11,353,601	-7,890,131	-9,248,464	-25,603,514	-22,140,045
	total	**-4,269,066**	**-2,643,752**	**-1,954,578**	**-13,765,322**	**-9,710,700**	**-14,348,848**	**-36,981,566**	**-32,926,944**
-age	Near	131,295	252,886	215,696	779,472	501,442	318,744	1,698,093	1,420,063
	Mid	150,460	698,426	474,796	2,026,703	1,266,600	1,038,259	4,388,645	3,628,542
	Long	-44,262	519,351	-59,956	6,594,617	4,591,111	1,324,443	8,334,193	6,330,686
	total	**237,493**	**1,470,663**	**630,536**	**9,400,793**	**6,359,153**	**2,681,446**	**14,420,930**	**11,379,291**
+age	Near	-614,724	-295,108	-201,921	-535,572	-358,268	-640,327	-2,287,652	-2,110,349
	Mid	-776,149	-693,513	-588,626	-1,305,648	-963,409	-2,932,219	-6,296,154	-5,953,915
	Long	-2,302,275	-1,675,794	-705,531	-10,459,084	-6,960,139	-5,004,809	-20,147,492	-16,648,548
	total	**-3,693,148**	**-2,664,415**	**-1,496,077**	**-12,300,303**	**-8,281,817**	**-8,577,356**	**-28,731,298**	**-24,712,812**
-RndAge	Near	-101,964	-49,920	-56,918	-112,573	-70,187	-291,307	-612,681	-570,296
	Mid	44,484	-147,413	-181,702	-249,000	-332,354	-1,209,512	-1,743,143	-1,826,497
	Long	-275,867	-334,777	-62,507	-942,316	-684,677	-1,792,302	-3,407,768	-3,150,130
	total	**-333,346**	**-532,110**	**-301,127**	**-1,303,889**	**-1,087,219**	**-3,293,121**	**-5,763,593**	**-5,546,923**
-PA	Near				-1,482,481				
	Mid				-3,592,946				
	Long				-20,683,207				
	total	**0**	**0**	**0**	**-25,758,634**	**0**	**0**	**0**	**0**
-PA-OA	Near				-3,318,322	-1,835,841			
	Mid				-8,223,637	-4,630,691			
	Long				-46,412,503	-25,729,296			
	total	**0**	**0**	**0**	**-57,954,462**	**-32,195,827**	**0**	**0**	**0**

1.1

[44] "Near" refers to first two decades; "Mid" to next five decades; "Long" to decade 8 and beyond.

Volume Changes		Block						Totals	
Run ID		**1**	**2**	**3**	**5**	**5-PA**	**6**		**-PA**
-midVQ	Near	-51,139	-30,844	-113,352	-191,526	-201,782	-164,816	-551,677	-561,933
	Mid	-64,649	-78,783	-277,738	-377,468	-461,055	-749,954	-1,548,592	-1,632,179
	Long	-297,555	-352,932	-612,421	-2,121,303	-2,203,528	-2,482,001	-5,866,213	-5,948,437
	total	**-413,343**	**-462,560**	**-1,003,511**	**-2,690,298**	**-2,866,365**	**-3,396,771**	**-7,966,482**	**-8,142,550**
+BEO	Near		-46,983		0	0			
	Mid		-149,357		0	0			
	Long		-387,443		0	0			
	total	**0**	**-583,784**	**0**	**0**	**0**	**0**	**0**	**0**
-SsSlest	Near				-240,880	-240,221			
	Mid				-688,840	-616,604			
	Long				-7,001,528	-5,138,009			
	total	**0**	**0**	**0**	**-7,931,248**	**-5,994,834**	**0**	**0**	**0**
-Oc	Near		-1,458,314				-2,456,582		
	Mid		-3,670,563				-9,574,542		
	Long		-17,961,127				-47,309,926		
	total	**0**	**-23,090,004**	**0**	**0**	**0**	**-59,341,050**	**0**	**0**
UnCon	Near	85,147	130,858	71,172	538,208		456,414	1,281,798	
	Mid	290,445	302,657	130,936	1,321,438		1,845,719	3,891,194	
	Long	1,653,518	1,688,789	670,334	6,569,146		5,471,160	16,052,948	
	total	**2,029,110**	**2,122,304**	**872,442**	**8,428,792**	**0**	**7,773,294**	**21,225,941**	**0**
-Dr	Near						-128,155		
	Mid						-521,853		
	Long						-3,875,219		
	total	**0**	**0**	**0**	**0**	**0**	**-4,525,228**	**0**	**0**
-HRules	Near		5,082				77,988		
	Mid		-21,029				44,865		
	Long		-499,888				-2,246,364		
	total	**0**	**-515,835**	**0**	**0**	**0**	**-2,123,511**	**0**	**0**
+ageX2	Near	-614,724							
	Mid	-776,149							
	Long	-2,302,275							
	total	**-3,693,148**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
-ageX2	Near	224,191							
	Mid	272,761							
	Long	-113,328							
	total	**383,624**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Appendix C
Description of Simulation Runs

Run naming conventions

CMA	means current management area-based (base case)
CMV	means current management volume-based
CMA_	means change in harvest flow
_NF	means “no flow”. I.e. original flow is requested but not maintained
40/35/30	means minimum harvestable quadratic mean stand diameter (mDBHq) in centimeters (cm) for Good/Medium/Poor sites respectively.
+	means factor added for sensitivity analysis
–	means factor removed for sensitivity analysis

Table 13. Simulation Run Labels and Descriptions

Run ID	Description
CMA	Area-based current management option
_up10	Alternate flatline request up 10% of CMA
_down10	Alternate flatline 90% of CMA
+Oe	Include Oce and Ohe polygons in THLB
-Oh	Remove helicopter operable polygons
-SI3m	Reduce SI estimates for age class 1-2 and future stands by 3m
-age	Lower minimum harvest age by decreasing mDBHq by 3 cm
+age	Increase minimum harvest age by increasing mDBHq by 3 cm
-RndAge	Uses the mDBHq ages rounded up to the nearest 10th year (effectively adds 5 years to
-PA	Remove protected area candidates as identified in April, 2001 announcement
-PA-OA	As above and also remove Option Areas identified in April, 2001 announcement
-midVQ	Use mid range disturbance target
+BEO	Apply specific BEOs to draft or legislated landscape units where not included in CM0
-SsSIest	Adjust SI so that Good site Spruce SI=34m instead of 39m - Piece size remains 47-42-37
CM12356	Combine all blocks as one to test for age class and constraint complement potentials
CM23	Combine Blocks 2 and 3 to test for complementary age class structures
-Oc	Simulation on THLB accessible by helicopter only to estimate flat line portion of harvest attributable to helicopter harvesting.
UnCon	Remove all non-timber land base and volume constraints to simulate timber potential.
-Dr	Remove alder leading stands from the harvest flow permanently (no long term succession to conifers).
-HRules	turn off oldest first and minimize growth loss harvest rules.
+ageX2	Increase minimum harvest age by increasing mDBHq by 3X2=6cm
-ageX2	Decrease minimum harvest age by decreasing mDBHq by 3X2=6cm

Appendix D
Modeling for Cultural Cedar

As there is interest in the sustainability of cedar harvesting, a preliminary model was developed to predict cedar availability into the future. WFP cruise information from TFL 25 and the adjacent Timber Supply Areas was analysed to develop a cedar diameter class distribution for old growth stands and TIPSY was used to generate distributions for second growth at various stand ages. These distributions were used, based on inventory or estimated future stand species composition and simulation age, to forecast the cedar component of harvests and growing stock through the 250-year simulation.

There are a number of difficulties with such a model:

- Although TIPSY does produce a diameter distribution, it does not report diameters beyond 90 cm DBH.
- TIPSY is calibrated for predicting second growth volumes and may not reliably predict diameter distributions at older stand ages that are approaching and beyond the ages within the calibration data set.
- The western redcedar data set on which TIPSY is calibrated is much smaller than for other coastal species and therefore predictions are less certain. There is no data for yellow cedar hence it is assumed to mimic western redcedar in its growth and yield habits.
- “Monumental” and cultural cedar is not easily defined. Tree sizes and quality needed for cultural purposes likely vary considerably depending on the use. For example, large totem poles, canoes, and buildings would need large, sound trees. Large decayed trees could provide split planks and carving blocks. Sound but smaller trees may provide for smaller canoes, poles, roundwood posts and beams, and sawn planks/blocks. Trees of almost any size could provide bark for stripping if a section of clear bole is present. Perhaps smaller or more vigorous cedars provide good roots. Clearly guidance is needed from First Nations to better define the characteristics of various types of cultural cedars.
- Cruise data was used to estimate cedar diameter distributions in old growth forests, but associated decay-indicator data was not felt suitable for predicting the percentage of old growth trees that are sound and suitable for monumental purposes. Again guidance is needed from First Nations to estimate the proportion of larger trees actually suitable.

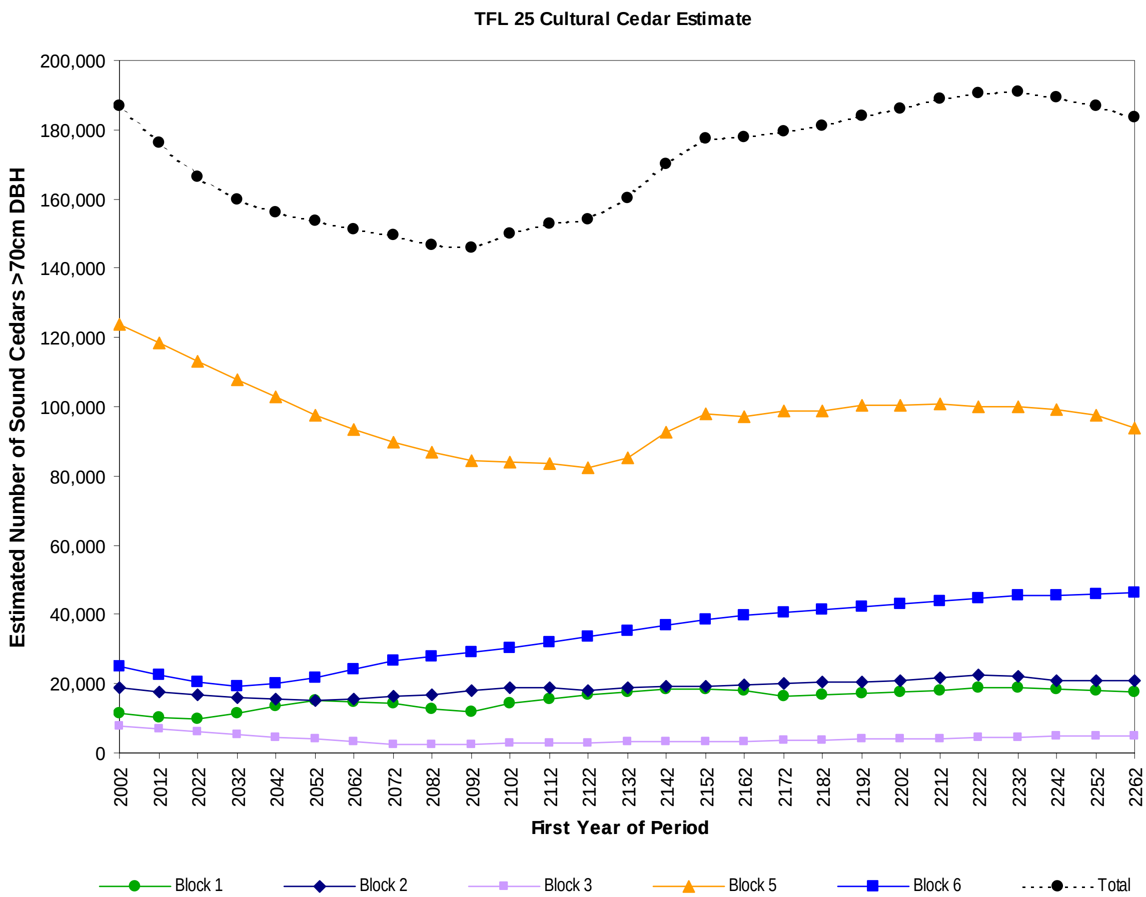


Figure 109. Test Estimate of Cultural Cedar Availability for TFL 25 through 250 years.

Figure 109 presents the results of a model test for each TFL Block using the assumptions that one in twenty large diameter old growth cedars (likely many centuries old) is sound and that most second growth cedars (<200-years-old) are sound. The data indicates the estimated number of larger, sound cedar trees occurring on the land base through time. In all blocks there is an initial decline until harvesting shifts to second growth forests and most blocks recover in the long term. In Block 5 the decline is 34% but much extended as old forest is the primary source of timber for the next century. Block 5 dwarfs the other management units due to its large land area and high percentage of timber reserved from harvest for operability or environmental reasons.

For the TFL as a whole, estimated availability of larger cedars declines 22% through the middle of the simulation but recovers in the long term to current levels.

Appendix VI

Silviculture Project History

TFL 25 Silviculture Project History

Year	Denuded (ha)	Broadcast Burning (ha)	Mechanical Site Preparation (ha)	Planted (ha)	Trees Planted (000s)	Brushing (ha)	Fertilization (ha)	Spacing (ha)	Pruning (ha)	Commercial Thinning (ha)
Pre 1965	6,062.8	711.1	36.5	2,628.2	2,531.1	153.1				
1965	884.4	564.9		346.4	298.5	4.1				
1966	999.9	341.2		458.5	432.8	1.2		40.1		
1967	798.3	477.3		577.4	547.6	623.0				
1968	727.4	308.4		630.2	645.2	143.2				
1969	766.3	321.1		607.7	446.1	62.8		15.8		
1970	741.6	305.6		418.8	341.4	279.5				
1971	834.7	187.6		671.3	586.7	37.0				
1972	918.5	284.3		290.6	295.3	11.3				
1973	1,084.5	199.0		942.3	772.4	320.8		239.8		16.2
1974	911.4	761.3		444.1	363.8			224.6		
1975	729.8	32.0		214.4	199.4	2.8				
1976	1,143.7	674.5	2.4	902.5	807.2	4.5		53.5		
1977	824.1			876.8	757.6	15.3		535.1		
1978	978.4	390.0	14.0	626.0	555.6	8.0	522.5	569.5		29.2
1979	838.3	663.0		922.6	749.0	35.0	40.0	620.5		40.0
1980	829.5	256.0	12.0	586.7	493.6	79.9	737.5	667.3		60.0
1981	650.4	342.5		924.1	803.9	31.6		615.2		34.7
1982	787.2			851.8	827.7		223.8			
1983	1,236.1	290.5		757.7	669.0	186.7		161.2		
1984	1,180.3	118.4		846.6	809.0	376.9		99.0		
1985	1,010.1	109.0		576.0	522.0	716.0		322.4		
1986	985.7	489.9	6.9	748.5	631.0	614.5		335.7	4.5	
1987	1,213.6	100.7		1,605.4	1,297.8	712.8		485.5	17.2	
1988	1,239.6	70.0	26.3	1,249.5	982.8	928.7	22.6	57.4	11.6	
1989	773.0	165.8	31.2	1,026.1	735.6	1,314.5		325.7	6.6	
1990	1,078.5	107.4		847.0	712.4	974.1		433.4	38.9	
1991	796.2	38.4		1,157.8	842.8	33.1		705.6	3.2	
1992	834.8	19.0		820.2	673.9	2.1	1,304.0	869.0	38.0	
1993	907.6	16.4		733.1	639.8	111.5		231.5	47.3	
1994	1,020.0	9.5	38.1	652.0	546.0	338.7		511.5	157.8	
1995	776.5	48.5		897.2	853.0	515.1	581.4	721.4	308.6	
1996	924.2		8.5	1,103.8	1,090.0	168.9	1,947.2	319.8	165.0	16.2
1997	850.5	21.5	3.6	904.9	951.9	269.0	1,061.9	483.2	313.9	25.0
1998	448.4		10.0	635.2	652.2	440.7		404.5	236.1	26.4
1999	619.4		14.8	358.1	413.0	143.7	2,641.3	234.3	136.0	
2000	734.6	11.6	7.1	744.2	752.5	52.9		211.9	144.1	
2001	591.0			751.2	744.5	257.1	285.5	143.4	162.2	
Total	**38,731.3**	**8,436.4**	**211.4**	**30,334.9**	**26,974.1**	**9,970.1**	**9367.7**	**10,637.8**	**1791.0**	**247.7**

Appendix VII

Proposed Management Actions to Support SFM Strategies

2003 - 2007

Proposed Management Action to Support SFM Strategies
2003 – 2007

Management Action	SFMP		Expected benefit	Funding Sources*
	Objective	Element		
All Blocks				
develop predictive tools for wind vulnerability and to assist with block design	prevent timber loss	4.1.1.1	reduce losses by 50% of historic levels, protect non-timber values	FII; RG; FIA; WFP
develop habitat modeling tools to use in conjunction with timber supply and growth and yield models	Maintain a dynamic distribution of habitat over a landscape; Maintain viable populations of native species	4.2.1.1; 4.2.1.2	ability to modify harvest patterns, silviculture systems, and silviculture treatments to avoid future habitat bottlenecks	FIA; FII; RG; CF; WFP
utilize ecological process models (e.g FORECYTE) for predicting outcomes of heretofore unseen management practices	Maintain a dynamic distribution of habitat over a landscape; Maintain viable populations of native species; Maintain forest ecosystem resilience; Maintain forest ecosystem productivity; Carbon sequestration	4.2.1.1; 4.2.1.2; 4.2.2.2; 4.2.2.3; 4.2.4.1	ability to modify harvest patterns, silviculture systems, and silviculture treatments to avoid future habitat bottlenecks	FIA; FII; RG; CF; WFP
identify rare ecological elements	Maintain a dynamic distribution of habitat over a landscape; Maintain viable populations of native species; Maintain forest ecosystem resilience	4.2.1.1; 4.2.1.2; 4.2.2.2	perpetuation of rare ecological elements enhanced	CF; RG; WFP; FIA
model seral stage distribution through time	Maintain a dynamic distribution of habitat over a landscape; Maintain viable populations of native species; Maintain forest ecosystem resilience	4.2.1.1; 4.2.1.2; 4.2.2.2	ability to modify harvest patterns, silviculture systems, and silviculture treatments to avoid future habitat bottlenecks	FIA; FII; RG; CF; WFP
forecast pest infestation trends	Maintain forest health; Maintain forest ecosystem resilience; Prevent timber loss	4.2.2.1; 4.2.2.2; 4.1.1.1	ability to preempt future pest infestations through silviculture practices of other management activity	FIA; WFP; RG
model cultural and monumental cedar through time	Protect First Nations cultural features	4.3.1.1; 4.2.1.2	ensure long term availability of cedar for cultural use and biodiversity. Social licence to operate enhanced.	CF; WFP; FIA
riparian restoration and enhancement	Maintain forest ecosystem productivity; Maintain a dynamic distribution of habitat over a landscape; Maintain viable populations of native species; Maintain forest ecosystem resilience	4.2.2.3; 4.2.1.1; 4.2.1.2; 4.2.2.2	increase functionality (CWD, snags) and output (fish) in recovering systems	FIA; CF; WFP; FN

Management Action	SFMP		Expected benefit	Funding Sources*
	Objective	Element		
hand fertilize rehabilitated roads and landslides	Minimize permanent loss of productive area	4.2.3.1	increase timber volume to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	Increase First Nations involvement; Maintain and enhance community stability; Sustain employment levels	4.3.1.1; 4.3.1.2; 4.3.1.3	improved relations and accommodation of FN; social licence to operate enhanced; increased employment	
deactivate and restore drainage of failing road systems	Maintain water quality; Maintain forest ecosystem productivity; Maintain forest ecosystem resilience	4.2.3.2; 4.2.2.3; 4.2.2.2	prevent stream damage (scouring, erosion, siltation) and loss of productive forest landbase	FIA; CF; WFP
analyze/update ECA for major watersheds	Maintain water quality; Maintain forest ecosystem productivity; Maintain forest ecosystem resilience	4.2.3.2	prevent stream damage (scouring, erosion siltation)	WFP; CF
pre-stand tending surveys	Maintain forest ecosystem productivity	4.2.2.3	identify and prepare stands for silviculture treatments to allow seamless transition and activity flow from one fiscal year to the next.	FIA, WFP
free growing surveys	Maintain forest ecosystem productivity	4.2.2.3	identify stands for further assessments and silviculture treatments .	WFP, FIA
aerial photography	Environmentally Appropriate Forest Management	4.2		FIA; WFP; CF
create localized carbon budget model to integrate with timber supply, growth and yield, and/or ecological process models to test the effects of alternate management regimes on future carbon pools for each management unit.	Carbon sequestration	4.2.4.1	ability to modify harvest patterns, silviculture systems, and silviculture treatments to ensure favourable carbon balance	FIA; FII; RG; CF; WFP

Management Action	SFMP Objective	SFMP Element	Expected benefit	Funding Sources*
Block 1 – Jordan River				
soil impact evaluation	employ appropriate harvest methods; Maintain forest ecosystem productivity	4.1.1.2; 4.2.2.3	reduce harvesting cost while ensuring potentially deleterious soil impacts avoided.	FII; RG; WFP
juvenile spacing	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.10	increase piece size and selling price $2/m3 to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.11	increase piece size to reduce harvesting costs $2/m3 to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	
	Increase First Nations involvement	4.3.1.1	improved relations and accommodation of FN; social licence to operate enhanced	
pruning	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.12	increase clears to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	Increase First Nations involvement	4.3.1.1	improved relations and accommodation of FN; social licence to operate enhanced	
aerial fertilization	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.13	improve piece size, clears, and volume to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.14	increase piece size to reduce harvesting costs by $0.50/m3 to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	
	achieve a reasonable return on investment; contribute to provincial revenues; Maintain forest ecosystem productivity	4.1.1.4; 4.1.1.15; 4.2.2.3	increase timber volume to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	
	Sustain employment levels	4.3.1.3	future employment levels improved by larger volume available for processing	

Management Action	SFMP Objective	SFMP Element	Expected benefit	Funding Sources*
hand fertilization	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.16	optimize survival and stocking (improved volume and quality), accelerate early growth to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	Increase First Nations involvement; Maintain and enhance community stability; Sustain employment levels	4.3.1.1; 4.3.1.2; 4.3.1.3	improved relations and accommodation of FN; social licence to operate enhanced; increased employment	
brushing and weeding	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.17	optimize survival and stocking (improved volume and quality) and accelerate early growth to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	Increase First Nations involvement; Maintain and enhance community stability; Sustain employment levels	4.3.1.1; 4.3.1.2; 4.3.1.3	improved relations and accommodation of FN; social licence to operate enhanced; increased employment	
inventory NTFP potential	Encourage NTFP production; Maintain forest ecosystem productivity	4.1.1.5; 4.2.2.3	additional revenues and employment; encourage sustainability and avoid conflicts with other resource users.	FII, FIA?; WFP
	Protect First Nations cultural features; Increase First Nations involvement; Maintain and enhance community stability; Sustain employment levels	4.3.1.1; 4.3.1.2; 4.3.1.3	improved relations and accommodation of FN; social licence to operate enhanced; increased employment	
maintain access to popular recreation features	Provide for public access	4.1.1.6	social licence to operate enhanced	WFP; FIA
maintain popular recreation sites within tenure	Maintain recreation sites and features	4.1.1.8	social licence to operate enhanced	FIA; WFP
fertilizer monitoring	Support research and development	4.1.19	confirm aerial fertilization expectations above	FIA; FII; WFP
monitor tree improvement field test	Support research and development	4.1.19	as per aerial fertilization	FII; FIA; WFP
establish Permanent Sample Plots	Maintain forest ecosystem productivity	4.2.2.3	identify growth falldowns	FIA; FII; WFP; RG

Management Action	SFMP Objective	SFMP Element	Expected benefit	Funding Sources*
archaeological inventories	Protect First Nations cultural features	4.3.1.1	identify in advance and avoid operational conflicts with cultural features; accommodate First Nation's interests	FN; FIA; WFP
build First Nations capacity	Provide adequate training; Sustain employment levels; Maintain and enhance community stability; Increase First Nations involvement	4.3.1.5; 4.3.1.3; 4.3.1.2; 4.3.1.1	improved relations and accommodation of FN; social licence to operate enhanced; increased employment	FIA; WFP
Block 2 – Stafford, Apple, Heydon Bay				
complete Vegetation Resource Inventory ground sampling	Maintain a dynamic distribution of habitat over a landscape; Maintain forest ecosystem productivity; Minimize permanent loss of productive area; Maintain carbon balance relative to company operations	4.2.1.1; 4.2.2.3; 4.2.3.1; 4.2.4.1	update forest cover mapping to generate seral stage distribution, monitor actual forest growth versus predictions, confirm productive forest area and total growing stock (carbon storage). Correlate site index with existing ecosystem (site series) mapping. Timber supply projections can be refined with better site index and old growth volume estimates and net down factors	FIA; WFP; RG
optimize establishment of Ungulate Winter Ranges	Maintain viable populations of native species	4.2.1.2	Maintain AAC and viable mountain goat population by rationalizing suitable winter ranges to areas with least impact on AAC.	WFP; FIA

Management Action	SFMP Objective	SFMP Element	Expected benefit	Funding Sources*
juvenile spacing	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.10	increase piece size and selling price $2/m3 to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.11	increase piece size to reduce harvesting costs $2/m3 to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	
	Increase First Nations involvement	4.3.1.1	improved relations and accommodation of FN; social licence to operate enhanced	
pruning	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.12	increase clears to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	Increase First Nations involvement	4.3.1.1	improved relations and accommodation of FN; social licence to operate enhanced	
aerial fertilization	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.13	improve piece size, clears, and volume to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.14	increase piece size to reduce harvesting costs by $0.50/m3 to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	
	achieve a reasonable return on investment; contribute to provincial revenues; Maintain forest ecosystem productivity	4.1.1.4; 4.1.1.15; 4.2.2.3	increase timber volume to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	
	Sustain employment levels	4.3.1.3	future employment levels improved by larger volume available for processing	

Management Action	SFMP		Expected benefit	Funding Sources*
	Objective	**Element**		
hand fertilization	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.16	optimize survival and stocking (improved volume and quality), accelerate early growth to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	Increase First Nations involvement; Maintain and enhance community stability; Sustain employment levels	4.3.1.1; 4.3.1.2; 4.3.1.3	improved relations and accommodation of FN; social licence to operate enhanced; increased employment	
brushing and weeding	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.17	optimize survival and stocking (improved volume and quality) and accelerate early growth to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	Increase First Nations involvement; Maintain and enhance community stability; Sustain employment levels	4.3.1.1; 4.3.1.2; 4.3.1.3	improved relations and accommodation of FN; social licence to operate enhanced; increased employment	
inventory NTFP potential	Encourage NTFP production; Maintain forest ecosystem productivity	4.1.1.5; 4.2.2.3	additional revenues and employment	FII, FIA; WFP
	Protect First Nations cultural features; Increase First Nations involvement; Maintain and enhance community stability; Sustain employment levels	4.3.1.1; 4.3.1.2; 4.3.1.3	improved relations and accommodation of FN; social licence to operate enhanced; increased employment	
maintain popular recreation sites within tenure	Maintain recreation sites and features	4.1.1.8	social licence to operate enhanced	FIA; WFP
establish Permanent Sample Plots	Maintain forest ecosystem productivity	4.2.2.3	calibrate growth and models to local conditions, monitor forest growth and yield, support timber supply and seral stage modeling	FIA; FII; WFP; RG
archaeological inventories	Protect First Nations cultural features	4.3.1.1	identify in advance and avoid operational conflicts with cultural features; accommodate First Nation's interests	FN; FIA; WFP

Management Action	SFMP		Expected benefit	Funding Sources*
	Objective	Element		
build First Nations capacity	Provide adequate training; Sustain employment levels; Maintain and enhance community stability; Increase First Nations involvement	4.3.1.5; 4.3.1.3; 4.3.1.2; 4.3.1.1	improved relations and accommodation of FN; social licence to operate enhanced; increased employment	FIA; WFP
Block 3 – Naka Creek				
complete Vegetation Resource Inventory ground sampling	Maintain a dynamic distribution of habitat over a landscape; Maintain forest ecosystem productivity; Minimize permanent loss of productive area; Maintain carbon balance relative to company operations	4.2.1.1; 4.2.2.3; 4.2.3.1; 4.2.4.1	update forest cover mapping to generate seral stage distribution, monitor actual forest growth versus predictions, confirm productive forest area and total growing stock (carbon storage). Correlate site index with existing ecosystem (site series) mapping.	FIA; WFP; RG
juvenile spacing	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.10	increase piece size and selling price $2/m3 to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.11	increase piece size to reduce harvesting costs $2/m3 to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	
	Increase First Nations involvement	4.3.1.1	improved relations and accommodation of FN; social licence to operate enhanced	
pruning	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.12	increase clears to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	Increase First Nations involvement	4.3.1.1	improved relations and accommodation of FN; social licence to operate enhanced	

Management Action	SFMP		Expected benefit	Funding Sources*
	Objective	Element		
aerial fertilization	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.13	improve piece size, clears, and volume to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.14	increase piece size to reduce harvesting costs by $0.50/m3 to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	
	achieve a reasonable return on investment; contribute to provincial revenues; Maintain forest ecosystem productivity	4.1.1.4; 4.1.1.15; 4.2.2.3	increase timber volume to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	
	Sustain employment levels	4.3.1.3	future employment levels improved by larger volume available for processing	
hand fertilization	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.16	optimize survival and stocking (improved volume and quality), accelerate early growth to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	Increase First Nations involvement; Maintain and enhance communitystability; Sustain employment levels	4.3.1.1; 4.3.1.2; 4.3.1.3	improved relations and accommodation of FN; social licence to operate enhanced; increased employment	
brushing and weeding	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.17	optimize survival and stocking (improved volume and quality) and accelerate early growth to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	Increase First Nations involvement; Maintain and enhance communitystability; Sustain employment levels	4.3.1.1; 4.3.1.2; 4.3.1.3	improved relations and accommodation of FN; social licence to operate enhanced; increased employment	

Management Action	SFMP		Expected benefit	Funding Sources*
	Objective	Element		
inventory NTFP potential	Encourage NTFP production; Maintain forest ecosystem productivity	4.1.1.5; 4.2.2.3	additional revenues and employment	FII, FIA; WFP
	Protect First Nations cultural features; Increase First Nations involvement; Maintain and enhance communitystability; Sustain employment levels	4.3.1.1; 4.3.1.2; 4.3.1.3	improved relations and accommodation of FN; social licence to operate enhanced; increased employment	
maintain popular recreation sites within tenure	Maintain recreation sites and features	4.1.1.8	social licence to operate enhanced	FIA; WFP
establish tree improvement field test	Support research and development	4.1.19	as per aerial fertilization	FII; FIA; WFP
maintain or establish Permanent Sample Plots	Maintain forest ecosystem productivity	4.2.2.3	calibrate growth and models to local conditions, monitor forest growth and yield, support timber supply and seral stage modeling	FIA; FII; WFP; RG
build First Nations capacity	Provide adequate training; Sustain employment levels; Maintain and enhance community stability; Increase First Nations involvement	4.3.1.5; 4.3.1.3; 4.3.1.2; 4.3.1.1	improved relations and accommodation of FN; social licence to operate enhanced; increased employment	FIA; WFP
Block 5 – Central Coast				
complete Vegetation Resource Inventory ground sampling	Maintain a dynamic distribution of habitat over a landscape; Maintain forest ecosystem productivity; Minimize permanent loss of productive area; Maintain carbon balance relative to company operations	4.2.1.1; 4.2.2.3; 4.2.3.1; 4.2.4.1	update forest cover mapping to generate seral stage distribution, monitor actual forest growth versus predictions, confirm productive forest area and total growing stock (carbon storage). Correlate site index with existing ecosystem (site series) mapping.	FIA; WFP; RG
finalize ecosystem (site series) mapping	Conservation of biological diversity; Maintenance of ecosystem condition and productivity; Contribution to global ecological cycles; Encourage NTFP utilization; Support research and development	4.2.1; 4.2.2; 4.2.4; 4.1.1.5; 4.1.1.9	facilitate planning, monitoring, modeling, site index estimation, rare element analysis, seral stage analysis, adaptive management	FIA; WFP; CF

Management Action	SFMP Objective	SFMP Element	Expected benefit	Funding Sources*
plan for, implement, monitor and adapt ecosytem-based management trials to ensure economic and environmental success	Develop new planning and harvesting guidelines to ensure forest management is environmentally appropriate, socially beneficial, and economically viable.	4.2; 4.3; 4.1	Expected to allow ecological processes to continue unimpeded and maintain viable populations of wildlife species and humans as well as the existing and future businesses humans depend on for their social well being.	CF; FIA; RG; WFP
juvenile spacing	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.10	increase piece size and selling price $2/m3 to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.11	increase piece size to reduce harvesting costs $2/m3 to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	
	Increase First Nations involvement	4.3.1.1	improved relations and accommodation of FN; social licence to operate enhanced	
pruning	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.12	increase clears to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	Increase First Nations involvement	4.3.1.1	improved relations and accommodation of FN; social licence to operate enhanced	
aerial fertilization	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.13	improve piece size, clears, and volume to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.14	increase piece size to reduce harvesting costs by $0.50/m3 to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	
	achieve a reasonable return on investment; contribute to provincial revenues; Maintain forest ecosystem productivity	4.1.1.4; 4.1.1.15; 4.2.2.3	increase timber volume to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	

Management Action	SFMP Objective	SFMP Element	Expected benefit	Funding Sources*
	Sustain employment levels	4.3.1.3	future employment levels improved by larger volume available for processing	
hand fertilization	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.16	optimize survival and stocking (improved volume and quality), accelerate early growth to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	Increase First Nations involvement; Maintain and enhance community stability; Sustain employment levels	4.3.1.1; 4.3.1.2; 4.3.1.3	improved relations and accommodation of FN; social licence to operate enhanced; increased employment	
brushing and weeding	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.17	optimize survival and stocking (improved volume and quality) and accelerate early growth to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	Increase First Nations involvement; Maintain and enhance community stability; Sustain employment levels	4.3.1.1; 4.3.1.2; 4.3.1.3	improved relations and accommodation of FN; social licence to operate enhanced; increased employment	
inventory NTFP potential	Encourage NTFP production; Maintain forest ecosystem productivity	4.1.1.5; 4.2.2.3	additional revenues and employment	FII, FIA?; WFP
	Protect First Nations cultural features; Increase First Nations involvement; Maintain and enhance community stability; Sustain employment levels	4.3.1.1; 4.3.1.2; 4.3.1.3	improved relations and accommodation of FN; social licence to operate enhanced; increased employment	
establish recreation sites within tenure	Maintain recreation sites and features	4.1.1.8	social licence to operate enhanced	FIA; WFP
fertilizer monitoring	Support research and development	4.1.19	confirm aerial fertilization expectations above	FIA; FII; WFP

Management Action	SFMP		Expected benefit	Funding Sources*
	Objective	Element		
maintain or establish Permanent Sample Plots	Maintain forest ecosystem productivity	4.2.2.3	calibrate growth and models to local conditions, monitor forest growth and yield, support timber supply and seral stage modeling	FIA; FII; WFP; RG
archaeological inventories	Protect First Nations cultural features	4.3.1.1	identify in advance and avoid operational conflicts with cultural features; accommodate First Nation's interests	FN; FIA; WFP
build First Nations capacity	Provide adequate training; Sustain employment levels; Maintain and enhance community stability; Increase First Nations involvement	4.3.1.5; 4.3.1.3; 4.3.1.2; 4.3.1.1	improved relations and accommodation of FN; social licence to operate enhanced; increased employment	FIA?; WFP
Block 6 – Haida Gwaii				
soil impact research	employ appropriate harvest methods; Maintain forest ecosystem productivity	4.1.1.2; 4.2.2.3	reduce harvesting cost while ensuring potentially deleterious soil impacts avoided.	FII; RG; WFP
juvenile spacing	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.10	increase piece size and selling price $2/m3 to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.11	increase piece size to reduce harvesting costs $2/m3 to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	
	Increase First Nations involvement	4.3.1.1	improved relations and accommodation of FN; social licence to operate enhanced	
pruning	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.12	increase clears to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	Increase First Nations involvement	4.3.1.1	improved relations and accommodation of FN; social licence to operate enhanced	

Management Action	SFMP		Expected benefit	Funding Sources*
	Objective	Element		
aerial fertilization research and implementation	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.13	improve piece size, clears, and volume to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.14	increase piece size to reduce harvesting costs by $0.50/m3 to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	
	achieve a reasonable return on investment; contribute to provincial revenues; Maintain forest ecosystem productivity	4.1.1.4; 4.1.1.15; 4.2.2.3	increase timber volume to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	
	Sustain employment levels	4.3.1.3	future employment levels improved by larger volume available for processing	
hand fertilization	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.16	optimize survival and stocking (improved volume and quality), accelerate early growth to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	Increase First Nations involvement; Maintain and enhance community stability; Sustain employment levels	4.3.1.1; 4.3.1.2; 4.3.1.3	improved relations and accommodation of FN; social licence to operate enhanced; increased employment	
brushing and weeding	achieve a reasonable return on investment; contribute to provincial revenues	4.1.1.4; 4.1.1.17	optimize survival and stocking (improved volume and quality) and accelerate early growth to maintain profitability and therefore harvest level for social benefit (jobs, stumpage, taxes)	FIA; WFP
	Increase First Nations involvement; Maintain and enhance community stability; Sustain employment levels	4.3.1.1; 4.3.1.2; 4.3.1.3	improved relations and accommodation of FN; social licence to operate enhanced; increased employment	

Management Action	SFMP		Expected benefit	Funding Sources*
	Objective	**Element**		
inventory NTFP potential	Encourage NTFP production; Maintain forest ecosystem productivity	4.1.1.5; 4.2.2.3	additional revenues and employment	FII, FIA?; WFP
	Protect First Nations cultural features; Increase First Nations involvement; Maintain and enhance community stability; Sustain employment levels	4.3.1.1; 4.3.1.2; 4.3.1.3	improved relations and accommodation of FN; social licence to operate enhanced; increased employment	
investigate long term impacts of blackheaded budworm on growth and yield and silviculture strategies to reduce or ameliorate impacts	Maintain forest health; Maintain forest ecosystem resilience; Prevent timber loss	4.2.2.1; 4.2.2.2; 4.1.1.1	ability to preempt future pest infestations through silviculture practices of other management activity	FIA; WFP; RG
maintain access to popular recreation features	Provide for public access	4.1.1.6	social licence to operate enhanced	WFP; FIA
maintain popular recreation sites within tenure	Maintain recreation sites and features	4.1.1.8	social licence to operate enhanced	FIA; WFP
fertilizer monitoring	Support research and development	4.1.19	confirm aerial fertilization expectations above	FIA; FII; WFP
monitor tree improvement field test	Support research and development	4.1.19	as per aerial fertilization	FII; FIA; WFP
maintain or establish Permanent Sample Plots	Maintain forest ecosystem productivity	4.2.2.3	calibrate growth and models to local conditions, monitor forest growth and yield, support timber supply and seral stage modeling	FIA; FII; WFP; RG
archaeological inventories	Protect First Nations cultural features	4.3.1.1	identify in advance and avoid operational conflicts with cultural features; accommodate First Nation's interests	FN; FIA; WFP
build First Nations capacity	Provide adequate training; Sustain employment levels; Maintain and enhance community stability; Increase First Nations involvement	4.3.1.5; 4.3.1.3; 4.3.1.2; 4.3.1.1	improved relations and accommodation of FN; social licence to operate enhanced; increased employment	FIA; WFP

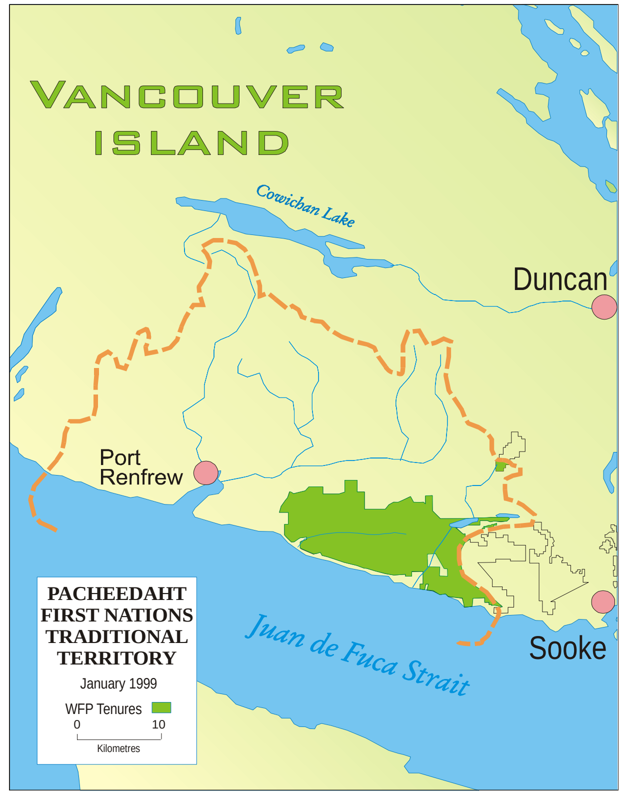
***LBIP eligibility**

Y = yes	FII = Forestry Innovation Investment
P = perhaps, see comment	RG = research grants obtained by academics
N = unlikely	FN = First Nations

Appendix VIII

First Nation Traditional Territories


T'SOU-KE FIRST NATIONS TRADITIONAL TERRITORY
January 1999
WFP Tenures
0 25 50
Kilometres
N
Vancouver
Nanaimo
VANCOUVER
ISLAND
Duncan
T'souke First Nations Traditional Territory
Victoria
Sooke
Juan de Fuca Strait

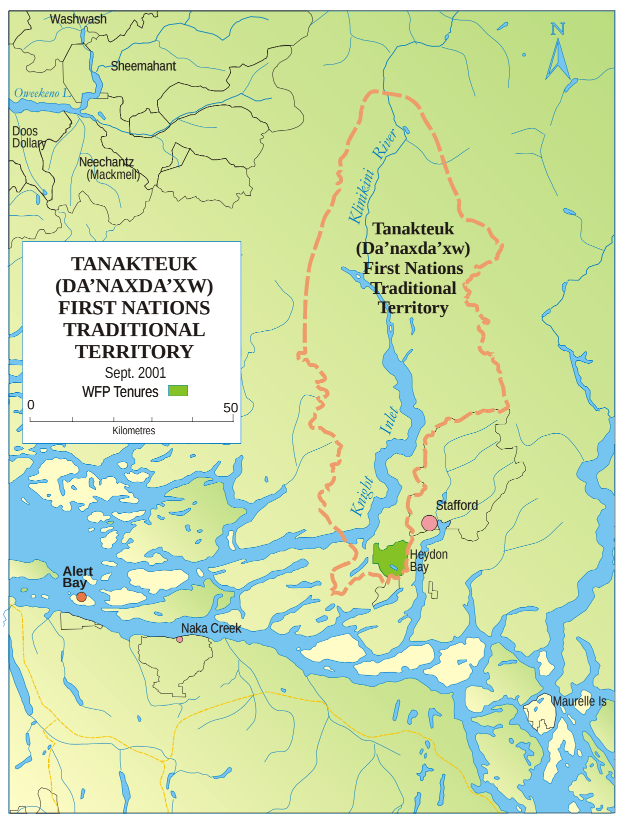

VANCOUVER ISLAND
Cowichan Lake
Duncan
Port Renfrew
PACHEEDAHT FIRST NATIONS TRADITIONAL TERRITORY
January 1999
WFP Tenures
0 10
Kilometres
Juan de Fuca Strait
Sooke


SCIA'NEW FIRST NATION TRADITIONAL TERRITORY
MAY 2003
WFP Tenures
0 25 50
Kilometres
Vancouver
Nanaimo
VANCOUVER
ISLAND
Duncan
Victoria
Sooke
Scia'new First Nation Traditional Terrritory
Juan de Fuca Strait


MALAHAT FIRST NATIONS TRADITIONAL TERRITORY
MAY 2003
WFP Tenures
0 25 50
Kilometres
N
Vancouver
Nanaimo
VANCOUVER
ISLAND
Duncan
Malahat First Nations Traditional Terrritory
Victoria
Sooke
Juan de Fuca Strait


CAMPBELL RIVER FIRST NATIONS TRADITIONAL TERRITORY
January 1999
WFP Tenures
0
50
Kilometres
Campbell River First Nations Traditional Territory
Port McNeill
Campbell River
Gold River
VANCOUVER
ISLAND
N


COMOX BAND FIRST NATIONS TRADITIONAL TERRITORY
January 1999
WFP Tenures
0
50
Kilometres
Comox First Nations Traditional Territory
Port McNeill
Campbell River
Comox
VANCOUVER
ISLAND
N


TANAKTEUK (DA'NAXDA'XW) FIRST NATIONS TRADITIONAL TERRITORY
Sept. 2001
WFP Tenures
0
50
Kilometres
Tanakteuk (Da'naxda'xw) First Nations Traditional Territory
Washwash
Sheemahant
Oweekeno L.
Doos Dollar
Neechantz (Mackmell)
Klinaklini River
Knight Inlet
Stafford
Heydon Bay
Alert Bay
Naka Creek
Maurelle Is
N

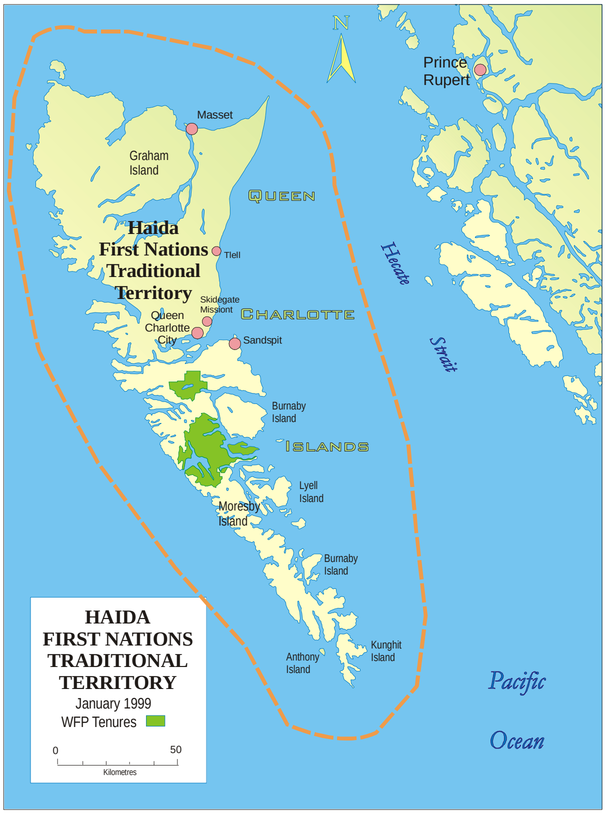

TLOWITSIS-MUMTAGILA FIRST NATIONS TRADITIONAL TERRITORY
January 1999
WFP Tenures
0
20
40
Kilometres
Tlowitsis-Mumtagila First Nations Traditional Territory
Alert Bay
Port McNeill
Sayward
N


Prince Rupert
BRITISH
COLUMBIA
N
Hartley Bay
Pacific
Ocean
Gitga'at
First Nations
Traditional
Territory
QUEEN
CHARLOTTE
ISLANDS
Bella Bella
GITGA'AT
FIRST NATIONS
TRADITIONAL
TERRITORY
January 1999
WFP Tenures
0 25 50
Kilometres


Prince
Rupert
Highway
BRITISH
COLUMBIA
N
Kitimat
Haisla
First Nations
Traditional
Territory
Pacific
Ocean
Bella
Coola
Bella
Bella
HAISLA
FIRST NATIONS
TRADITIONAL
TERRITORY
January 1999
WFP Tenures
0 50
Kilometres

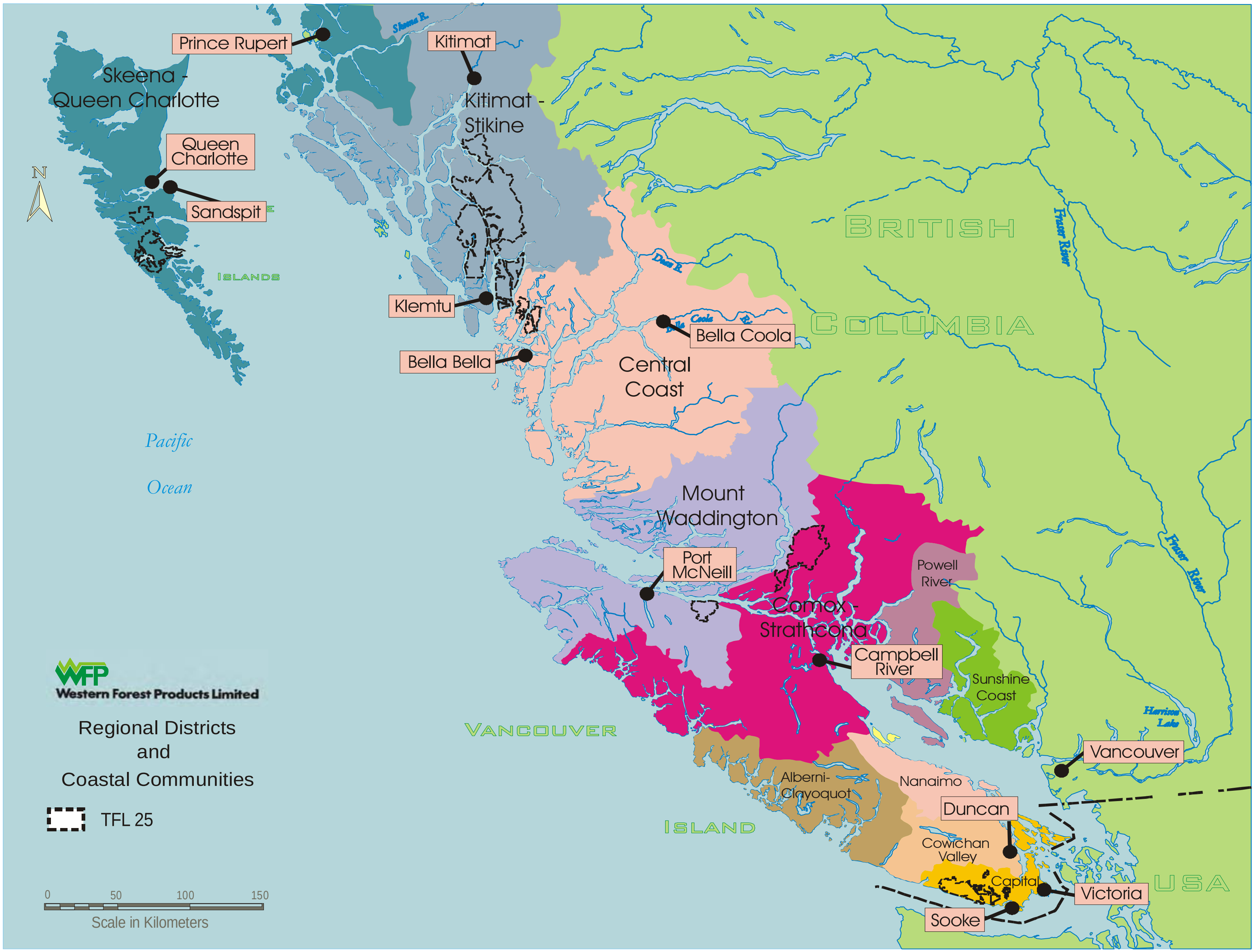

Kitimat
BRITISH
COLUMBIA
N
Klemtu
Heiltsuk
First Nations
Traditional
Territory
Bella
Coola
Pacific
Ocean
Bella
Bella
Rivers
Inlet
Dawson's
Landing
HEILTSUK
FIRST NATIONS
TRADITIONAL
TERRITORY
January 1999
WFP Tenures
0 25 50
Kilometres
Port
Hardy


N
Kitimat
BRITISH
COLUMBIA
KITASOO
FIRST NATIONS
TRADITIONAL
TERRITORY
January 1999
WFP Tenures
0 25 50
Kilometres
Kitasoo
First Nations
Traditional
Terrritory
Klemtu
Bella Coola
Bella Bella
Pacific
Ocean
Rivers Inlet


N
Prince
Rupert
Masset
Graham
Island
QUEEN
Haida
First Nations
Traditional
Territory
Tlell
Skidegate
Mission
Queen
Charlotte
City
CHARLOTTE
Sandspit
Hecate
Strait
Burnaby
Island
ISLANDS
Lyell
Island
Moresby
Island
Burnaby
Island
Kunghit
Island
Anthony
Island
Pacific
Ocean
HAIDA
FIRST NATIONS
TRADITIONAL
TERRITORY
January 1999
WFP Tenures
0
50
Kilometres

Appendix IX

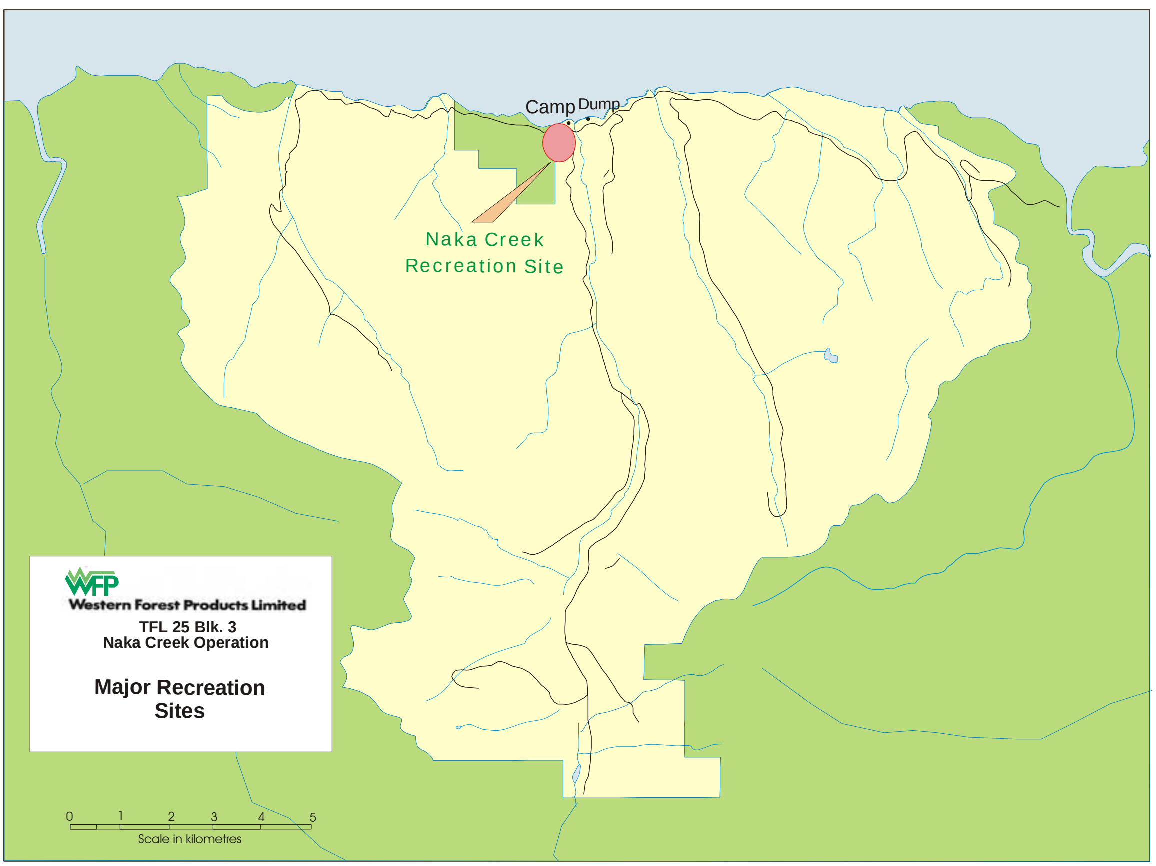
Community and Regional District Map

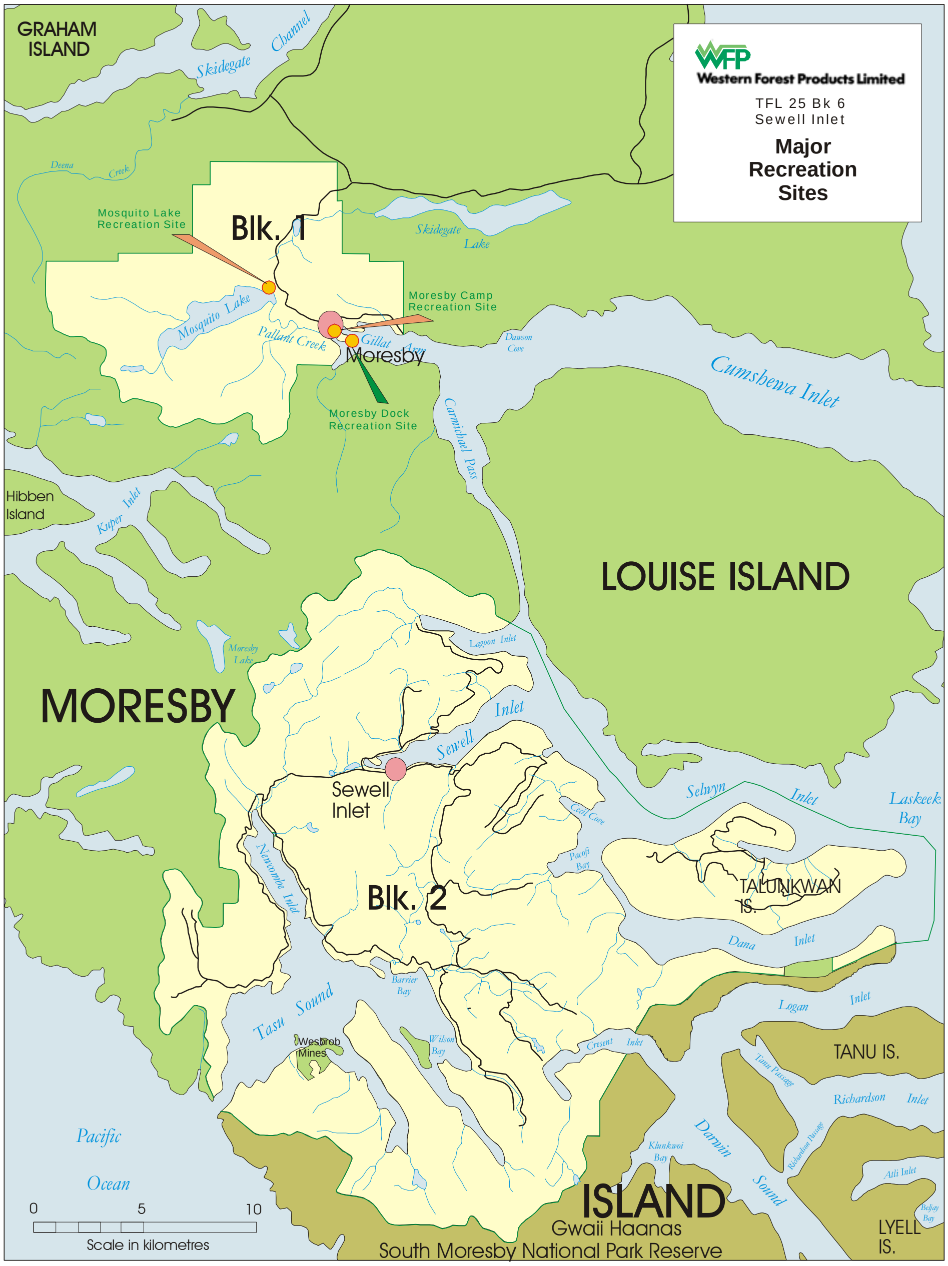

Prince Rupert
Kitimat
Skeena - Queen Charlotte
Kitimat - Stikine
Queen Charlotte
Sandspit
Islands
British Columbia
Klemtu
Bella Coola
Bella Bella
Central Coast
Pacific Ocean
Mount Waddington
Port McNeill
Powell River
Comox - Strathcona
Campbell River
Sunshine Coast
Vancouver
Harrison Lake
Fraser River
Alberni-Clayoquot
Nanaimo
Duncan
Cowichan Valley
Capital
Victoria
Sooke
USA
Vancouver Island
Western Forest Products Limited
Regional Districts and Coastal Communities
TFL 25
0 50 100 150
Scale in Kilometers

Appendix X

Trails and Recreation Sites


San Juan River
VANCOUVER ISLAND
Kludahk Trail
Kludahk
Trail
Parking
Lot
Reservoir
Reservoir
Loss Cr.
Sooke Lake
Sooke R.
Sooke
Pothole
Prov. Park
Milnes
Landing
SOOKE
Sooke
Basin
Jordan River
Recreation Site
Jordan
River
Sandcut
Beach Trail
Sheringham
Point
JUAN DE FUCA STRAIT
Western Forest Products Limited
TFL 25 BK 1 Jordan River
Major Recreation
Sites
0 2 4 6
Scale in kilometers


Camp
Dump
Naka Creek
Recreation Site
Western Forest Products Limited
TFL 25 Blk. 3
Naka Creek Operation
Major Recreation
Sites
0 1 2 3 4 5
Scale in kilometres



Western Forest Products Limited
TFL 25 Bk 6
Sewell Inlet
Major
Recreation
Sites
GRAHAM
ISLAND
Skidegate
Channel
Mosquito Lake
Recreation Site
Blk. 1
Skidegate
Lake
Moresby Camp
Recreation Site
Mosquito Lake
Pallant Creek
Gillat
Moresby
Moresby Dock
Recreation Site
Dawson
Cove
Cumshewa Inlet
Carmichael Pass
Hibben
Island
Kuper
Inlet
LOUISE ISLAND
Moresby
Lake
MORESBY
Lagoon Inlet
Inlet
Sewell
Sewell
Inlet
Selwyn
Inlet
Laskeek
Bay
Newcombe Inlet
Blk. 2
TALUNKWAN
IS.
Dana
Inlet
Barrier
Bay
Tasu Sound
Westfrob
Mines
Logan
Inlet
TANU IS.
Wilson
Bay
Crescent
Inlet
Richardson
Inlet
Darwin
Sound
Klunkwoi
Bay
Pacific
Ocean
0
5
10
Scale in kilometres
ISLAND
Gwaii Haanas
South Moresby National Park Reserve
LYELL
IS.

Western Forest Products Limited

Tree Farm Licence 25

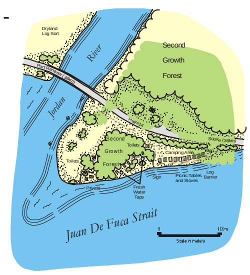
Recreation Sites and Trails

In conjunction with:

BC Ministry of Forests

Jordan River

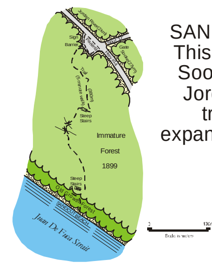
JORDAN RIVER REC SITE - WFP has developed a recreation site at the mouth of the Jordan River. Camping and picnic areas are available.



JORDAN RIVER RECREATION SITE

Jordan River

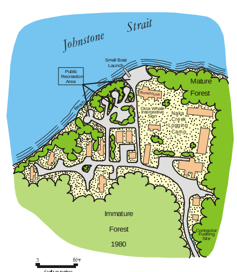
SANDCUT BEACH TRAIL This trail is 27 km west of Sooke and 2 km east of Jordan River.This short trail leads to a long expanse of attractive beach.



SANDCUT BEACH TRAIL

Naka Creek

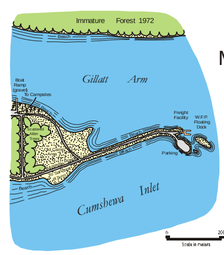
NAKA CREEK - boat launch, whale watching, public recreation areas.



NAKA CREEK RECREATION SITE

Queen Charlottes

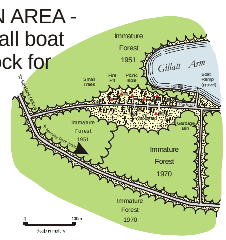
MORESBY DOCK - Parking area and floating dock for short term use.



MORESBY DOCK

Queen Charlottes

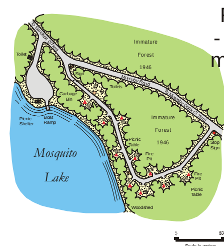
MORESBY RECREATION AREA - 6 campsite units and small boat ramp to ocean, boat dock for short term use.



MORESBY RECREATION AREA

Queen Charlottes

MOSQUITO LAKE RECREATION AREA - 10 camping units and small boat ramp situated at Mosquito Lake.



MOSQUITO LAKE RECREATION AREA

KLUDAHK TRAIL - WFP has cooperated with the Kludahk Outdoor Club which has developed trails and constructed cabins to link Sooke to Port Renfrew via a wilderness recreation corridor, Ideal for adventure backpacking

JUAN DE FUCA MARINE TRAIL - Roughly 47 km coastal trail begins at China Beach and runs to BotanicalBeach, Port Renfrew. Additional access at Sombrio Beach, which is 24 km west of Jordan River.

Appendix XI

Visitors Guide

TFL 25 Block 1 Tourist Map

TFL 25 Block 6 Tourist Map

Appendix XII

Forest Research Projects

TFL 25 FOREST RESEARCH PROJECTS

WFP continues as a leader in silvicultural research in coastal BC. The Company has initiated numerous projects aimed at improving and supporting sustainable forestry practices.

The following lists include projects that WFP is following at present.

Trial (Year Established)	Location	Measurements	Reports	Other
		Forest Nutrition		
Operational Fertilization Monitoring (2000)	Jordan River	2000	Est. Rep. 2001	
Operational Fertilization Monitoring (1995)	Sewell Inlet	1999, 1996, 1994		
Vaccinium SCHIRP (1999)	Jordan River	2000, 1999		With Pacific Forestry Centre
		Genetics Trials		
Yellow Cypress – Phase 1 (1991)	Jordan River	1997, 1994	1996	
Yellow Cypress – Phase 2 (1992)	Jordan River	1998, 1995		
Yellow Cypress – Phase 3 (1993)	Jordan River	1999, 1996		
Western Hemlock Clonal Trial (1991)	Jordan River		1992 Est. Rep.	
		Growth and Yield Monitoring		
Type III Growth and Yield Installations (1988)	Jordan River	1995	1995 MOF Report	Vegetation Measures – 1997
Growth and Yield Plots (1993)	North Coast	1993		
Growth and Yield Plots (1992)	North Coast	1992		
Growth and Yield plots (1965)	Naka Creek	1965-2001		

Appendix XIII

Doman Industries Annual Statutory Report

DOMAN INDUSTRIES LIMITED

ANNUAL STATUTORY REPORT
FOR 2002

President's Report
Notice of Meeting
Information Circular
2002 Annual Information Form – May 12, 2003
Management's Discussion and Analysis
Consolidated Financial Statements

Full Report Available at www.domans.com

Appendix XIV

ISO 14001

Registered Environmental Management System

WFP Environmental Management System (EMS) registered to ISO 14001 Standard

Western Forest Products Limited (WFP) is registered effective April 12, 2000 to the international environmental standard ISO 14001 by independent auditor Quality Management Institute (QMI) following an audit of WFP's forest operations, regional offices and corporate office. The overall aim of the ISO 14001 standard is to support environmental protection and prevention of pollution in balance with social and economic needs.

ISO 14001 is an international standard that specifies the requirements of an environmental management system (EMS). An EMS is established to achieve and demonstrate sound environmental performance by controlling the impact of our activities on the environment and taking into account our environmental policy and objectives. The EMS is a structured process for meeting all legislative requirements and measuring environmental protection.

Using the EMS framework, we set specific environmental objectives and targets that reflect our legislative requirements and information about the significant environmental impacts in our day-to-day forestry activities. We evaluated all environmental aspects of our forest operations such as road construction, yarding and loading, harvesting and silviculture for the potential risk they pose to the environment as the basis for establishing environmental programs.

The environmental programs are a key element of our EMS because they outline how WFP's objectives and targets will be achieved, including timelines and personnel responsible for implementation. We have set measurable objectives and targets within our 8 environmental programs. These programs (attached) detail WFP's targets for environmental performance that maintain air, soil and water quality. WFP has set parameters for maintaining these values that we will monitor over time. For instance, we will track the number of reportable spills in our operations to ensure we are meeting our target of reducing spills by 10% per year. WFP's EMS brings environmental issues into the day to day activities of our forest operations so that we have a positive impact on the ground.

WFP conducts regular internal audits to measure our compliance with the environmental management system standard. The WFP Internal Audit Team visits all operations to monitor progress on our environmental programs and our overall environmental performance. The Internal Audit Team reports to WFP's Management Environment Review Committee that meets annually to review the results of our environmental programs and assesses the effectiveness of our environmental objectives so that we can achieve continual improvement.

QMI awarded the registration on the company's entire operations based on WFP's commitment to the environmental management system (EMS) that applies to all of WFP's forest activities including road construction, silviculture and fisheries protection.

The registration applies to WFP's 41 forest operations and supporting facilities such as log sorts and the Saanich Forestry Centre and covers an annual harvest of 4.2 million cubic metres, making it one of the largest ISO 14001 registrations in North America.

The independent registration provides objective evidence to the public and customers that WFP's EMS is clearly a tool for continual improvement and addresses "on the ground" forest practices by setting objectives and targets. The ISO 14001 registration process is part of WFP's sustainable forest management strategy that includes ongoing certification projects such as Forest Stewardship Council (FSC), Canadian Standards Association (CSA) and other related initiatives.

Revised: April 2001

Program 1 (pg 1 of 2) - 2001
File: F-11-8-1 (Original Only)

ENVIRONMENTAL PROGRAM RECORD

Western Forest Products Limited
Register Area: Forest Operations

OPERATION [DEPARTMENT(s)]: All WFP Forest Operations [Logging, Engineering, Forestry & Lands]

PROGRAM NAME/TITLE.: Enhanced Standard Operating Procedures, Spill Plans and Haz/Mat Training

OBJECTIVE(S): 1.) Protection of water quality 2.) Protection and conservation of soil resources
3.) Maintenance of ecosystem condition and productivity

PERFORMANCE GOAL(S): 1.) Eliminate Petroleum and Hazardous Spills 2.) Zero Non-compliance's per year
3.) Eliminate all harvesting and road related landslides which impact on streams 4.) Zero accidental industry caused forest fires

TARGET(S): 1.) Reduce the number of reportable Petroleum and Hazardous spills by 10% per year
2.) Maintain 7% or less of the total area under prescription as permanent access structures (Regional average)
3.) Reduce annual accidental fires to 10 or less per year (company wide)

DATE: April 2001
Authorized by: (General Manager, Logging & Engineering, Chief Forester, Regional Manager, Environment Manager, etc.)

Resources Required:
1.) Training
2.) $16,000 (Video Production)

Program Supervisor:
Environment Manager (Corporate Environmental Department)

Method of monitoring & measurement:
1.) Operations Environment Committee Meeting Checklists 2.) Training records
3.) # of reportable spills per year
4.) # of landslides reported per year. 6.) # of accidental fires

Note:
Resources may include Training, Maintenance, Financial, Outside Agencies, etc.

Original: Corporate Office Copy(s): EMS Manual Holders WFP-8 (2001).xls

Revised: April 2001

Program 2 (pg 1 of 2)
File: F-11-8-1 (Original Only)

ENVIRONMENTAL PROGRAM RECORD

Western Forest Products Limited
Register Area: Forest Operations

OPERATION [DEPARTMENT(s)]: All WFP Forest Operations [Forestry & Lands, Logging]

PROGRAM NAME/TITLE: Waste Disposal Program

OBJECTIVE: Protection and conservation of soil resources

PERFORMANCE GOAL: Reduce solid waste

TARGET: Create procedures for transport and disposal of "Special Waste" by December 2002

DATE: April 2001
Authorized by: (General Manager, Logging & Engineering, Chief Forester, Regional Manager, Environment Manager, etc.)

Resources Required:
1.) Legal counsel
2.) Financial

Program Supervisor:
Environment Manager (Corporate Environmental Department), Purchasing Manager (Corporate Office)

Method of monitoring & measurement:
1.) Monthly reports by Environment Manager

Note:
Resources may include Training, Maintenance, Financial, Outside Agencies, etc.

Original: Corporate Office Copy(s): EMS Manual Holders WFP-8 (2001).xls

Revised: April 2001

Program 3 (pg 1 of 2) - 2001
File: F-11-8-1 (Original Only)

ENVIRONMENTAL PROGRAM RECORD

Western Forest Products Limited
Register Area: Forest Operations

OPERATION [DEPARTMENT(s)]: All WFP Forest Operations [Logging (Falling & Bucking, Dryland Sort)]

PROGRAM NAME/TITLE: Log Quality and Waste Reduction Program

OBJECTIVE: 1.) Maintanence of ecosystem condition and productivity 2.) Maintenance of air quality

PERFORMANCE GOAL: Reduce solid waste

TARGET: 1.) Maintain "trim waste" of 1% or less of total scaled production
2.) Maintain utilization standards of 15 cubic meters per hectare of avoidable waste (company wide)

DATE: April 2001
Authorized by: (General Manager, Logging & Engineering, Chief Forester, Regional Manager, Environment Manager, etc.)

Resources Required:
1.) Training - Fallers, Landing Buckers, Dryland Sort Buckers
2.) Outside Agency - Bob Mortin Consulting, Mark Fiddick, Steve Jacksons

Program Supervisor:
Regional Managers (NVIR, Nootka, M/I)

Method of monitoring & measurement:
1.) Waste and Residue Surveys
2.) Dryland Sort - Scaled volume of Trim Waste
3.) Outside Agency Reports

Note:
Resources may include Training, Maintenance, Financial, Outside Agencies, etc.

Original: Corporate Office Copy(s): EMS Manual Holders WFP-8 (2001).xls

Revised: April 2001

Program 4 (pg 1 of 2) - 2001
File: F-11-8-1 (Original Only)

ENVIRONMENTAL PROGRAM RECORD

Western Forest Products Limited
Register Area: Forest Operations

OPERATION [DEPARTMENT(s)]: All WFP Forest Operations [Forestry]

PROGRAM NAME/TITLE: NSR Reduction Program

OBJECTIVE: Maintenance of ecosystem condition and productivity

PERFORMANCE GOAL: Maintain forest cover

TARGET: 1.) Maintain forest cover by reducing NSR to 2.0 yrs of annual logging

DATE: April 2001
Authorized by: (General Manager, Logging & Engineering, Chief Forester, Regional Manager, Environment Manager, etc.)

Resources Required:
1.) Outside Agency - Tree planting contractors
2.) Financial - Approx. $4,000,000 (treeplanting cost only)

Program Supervisor:
Chief Forester (Forestry & Lands - Corporate Office)

Method of monitoring & measurement:
1.) # of hectares planted

Note:
Resources may include Training, Maintenance, Financial, Outside Agencies, etc.

Original: Corporate Office Copy(s): EMS Manual Holders WFP-8 (2001).xls

Revised: April 2001 — Program 5 (pg 1 of 2) - 2001 — File: F-11-8-1 (Original Only)

ENVIRONMENTAL PROGRAM RECORD

Western Forest Products Limited
Register Area: Forest Operations

OPERATION/DEPARTMENT: All WFP Forest Operations [Forestry & Lands, forestry]

PROGRAM NAME/TITLE: Fertilization Program

OBJECTIVE: Maintenance of ecosystem condition and productivity

PERFORMANCE GOAL: Fertilize all suitable areas within WFP TFL lands

TARGET: Identify and prioritize suitable areas for fertilization by 2002

DATE: April 2001
Authorized by: (General Manager, Logging & Engineering, Chief Forester, Regional Manager, Environment Manager, etc.)

Resources Required:
1.) Outside Agency - B.A. Blackwell & Associates, University of British Columbia
2.) Financial (FRBC Funding dependent)

Program Supervisor:
Chief Forester (Forestry & Lands - Corporate Office)

Method of monitoring & measurement:
1.) Screening trials - foliar response

Note:
Resources may include Training, Maintenance, Financial, Outside Agencies, etc.

Original: Corporate Office Copy(s): EMS Manual Holders — WFP-8 (2001).xls

Revised: April 2001 — Program 6 (pg 1 of 2) - 2001 — File: F-11-8-1 (Original Only)

ENVIRONMENTAL PROGRAM RECORD

Western Forest Products Limited
Register Area: Forest Operations

OPERATION [DEPARTMENT(s)]: All WFP Forest Operations [Forestry & Lands, Forestry]

PROGRAM NAME/TITLE: Salmon Enhancement Program

OBJECTIVE: Maintenance of ecosystem condition and productivity

PERFORMANCE GOAL: 1.) Operate hatcheries at 95% capacity

TARGET: 1.) Annually release 750,000 salmon fry (10 year average)

DATE: April 2001
Authorized by: (General Manager, Logging & Engineering, Chief Forester, Regional Manager, Environment Manager, etc.)

Resources Required:
1.) Financial - Approx. $45,000 (between Marble River, Cordy Creek, Colonial and Sewell Inlet)

Program Supervisor:
Chief Forester (Forestry & Lands - Corporate Office)

Method of monitoring & measurement:
1.) # of Salmonids released

Note:
Resources may include Training, Maintenance, Financial, Outside Agencies, etc.

Original: Corporate Office Copy(s): EMS Manual Holder — WFP-8 (2001).xls

Revised: April 2001 — Program 7 (pg 1 of 2) - 2001 — File: F-11-8-1 (Original Only)

ENVIRONMENTAL PROGRAM RECORD

Western Forest Products Limited
Register Area: Forest Operations

OPERATION/DEPARTMENT: Kimsquit Forest Operation [Logging]

PROGRAM NAME/TITLE: Camp Decommissioning Program

OBJECTIVE: 1.) Protection and conservation of soil resources
2.) Maintenance of ecosystem condition and productivity

PERFORMANCE GOAL: 1.) Acquire a "Letter of Abandonment" or "Certificate of Compliance"

TARGET: 1.) Remediate site within 5 years

DATE: April 2001
Authorized by: (General Manager, Logging & Engineering, Chief Forester, Regional Manager, Environment Manager, etc.)

Resources Required:
1.) Outside Agency - Reid Crowler Consulting (Professional Engineering Consultant/Contractor)
2.) Financial - $30,000 (consultant), $220,000 (Remediation)

Program Supervisor:
Area Manager (Logging - Mainland/Islands)

Method of monitoring & measurement:
1.) Acquired "Letter of Abandonment" or "Certificate of Compliance"

Note:
Resources may include Training, Maintenance, Financial, Outside Agencies, etc.

Original: Corporate Office Copy(s): EMS Manual Holders — WFP-8 (2001).xls

Revised: April 2001 — Program 8 (pg 1 of 2) - 2001 — File: F-11-8-1 (Original Only)

ENVIRONMENTAL PROGRAM RECORD

Western Forest Products Limited
Register Area: Forest Operations

OPERATION [DEPARTMENT(s)]: All WFP Forest Operations [Logging (Dryland Sort), Forestry & Lands]

PROGRAM NAME/TITLE: Dryland Sort and Camp Improvement Program

OBJECTIVE: 1.) Protection of water quality

PERFORMANCE GOAL: 1.) Achieve a rating of Zero or less on MoELP Dryland Sort Inspections

TARGET: 1.) Internally audit all Dryland Sorts within 2 years

DATE: April 2001
Authorized by: (General Manager, Logging & Engineering, Chief Forester, Regional Manager, Environment Manager, etc.)

Resources Required:

Program Supervisor(s):
Environment Manager (Forestry & Lands - Corporate Office)
General Manager, Logging & Engineering / Regional Managers

Method of monitoring & measurement:
1.) Monitor results of audit
2.) Implement action plan with specific timeframe

Note:
Resources may include Training, Maintenance, Financial, Outside Agencies, etc.

Original: Corporate Office Copy(s): EMS Manual Holders — WFP-8 (2001).xls

Appendix XV

WFP Management Bulletin:

Rare Vascular Plants

Western Forest Products Limited

Rare Vascular Plants

on southern Vancouver Island

June 2001

Introduction: This bulletin, which has been produced in a field guide format, provides information on site characteristics, identification, and management interpretations for four plants considered rare in British Columbia. A background report to WFP, *"Survey of rare plants, Block 1, Tree-farm Licence 25 – Jordan River"*, has more detailed notes on field observations, but has no plant descriptions, drawings, or images to assist in identification.

Three of the four species are on the B.C. Conservation Data Centre's (delete web address is in references) blue list of vascular plants: *Disporum smithii, Erythronium montanum*, and *Hydrophyllum tenuipes*. The fourth, *Corydalis scouleri*, is on the red list.

After preliminary research, a field survey was undertaken in June 2000 to determine:

- the distribution of these plants on southern Vancouver Island, and their presence or absence within Block 1 of TFL 25
- the plant communities within which these plants occur, and the associated site and edaphic conditions
- other species associated with the rare plants
- the range of successional stages occupied by the rare plants
- management considerations for maintenance of these species within Block 1

***Corydalis scouleri Hook*. (Scouler's corydalis)**

Range: Rare on southern Vancouver Island in CWHvm1; but common southward to northern Oregon from the coast to the western slopes of the Cascade Mts. Locally reported from just west of Cowichan Lake, along Nitinat Main near Vernon, Granite and Jasper Creek bridges; various sites along Nitinat River toward Nitinat L.; lower Caycuse R. toward Nitinat L.; and Klanawa R. below mouth of East Klanawa R.

Sites observed: Observed in the CWHmm1 in the Nitinat River valley. One location involved only the immediate riparian (stream edge) environment of the Nitinat River (i.e. very little penetration into the adjacent forest). Two other locations involved fluvial terrace and fluvial fan surfaces with mm1/05 and mm1/08 site series (analogous to the L3 ecosystem).

Associated species: In the immediate riparian (stream edge) with *Alnus rubra*, *Ribes bracteosum*, *Rubus spectabilis*, *Adiantum pedatum, Aruncus dioicus, Athyrium filix-femina, Claytonia sibirica, Equisetum telmatiea, Fritillaria lanceolata, Galium triflorum, Heracleum lanatum, Polystichum munitum, Stachys cooleyae, Thalictrum occidentale, Tolmeia menziesii, and Trautvetteria caroliniensis*. On higher fluvial terraces and fans with *Ribes bracteosum, Achlys triphylla, Athyrium filix-femina, Galium triflorum, Maianthemum dilatatum , Polystichum munitum, Tiarella trifoliata, Trautvetteria caroliniensis* and *Trillium ovatum*.

Management: Based on the field survey, *Corydalis scouleri* is not expected within WFP tenures on Vancouver Island. If suspected, note the location and have the plant(s) verified by a botanist or ecologist.

Corydalis scouleri

General comments: Perennial herb with thick rhizomes and erect hollow single or somewhat branched stems, 60-120 cm tall. Hairless, but has a grayish or bluish appearance (glaucus).

Leaves: Attached near or above half way on the stem, much divided (tri- to quadripinnate) in parsley fashion, and large (lower leaf often 20 cm long) – superficially like *Dicentra formosa* (Pacific bleeding heart) leaves, but larger and much less divided.

Flowers: Arranged in typically compound (2 or more) spike-like racemes (order of blooming is from base to apex) with 15-35 showy spurred pink flowers, which are individually 20-30 mm long (spur 12-20 mm).

Fruit: Egg- to pear-shaped pod-like capsules (10-15 mm long and 3-4 mm thick) which elastically eject shiny black 4 mm long seeds when ripe.

Disporum smithii (Hook.) Piper (Smith's fairybells)

Range: Rare on southern Vancouver Island in CWHxm2, CWHvm1, CWHmm1 and CWHvh1; extends south to California. Locally reported from west end of Cowichan Lake; along Nitinat Main near Jasper Cr. bridge; Port Renfrew near mouth of San Juan River and 4-5 km to the NE; various locations along the Port Renfrew -- Shawnigan Lake road; and at Loss Cr. along West Coast Hwy between Port Renfrew and Sooke.

Sites observed: *Disporum smithii* occurs within the CWHvm1 and CWHmm1 biogeoclimatic variants. It is most abundant and most vigorous on fluvial terraces (e.g. along Loss Creek, San Juan River, Nitinat River) within S3, S4 and L3 ecosystems (vm1/05, vm1/07, vm1/09, mm1/05, mm1/08). Soils on these sites are relatively young Dystric Brunisols and Regosols, which are moderately to imperfectly drained, usually with moder humus and a silt loam capping overlying gravels.

It also occurs on circum-mesic upland sites on steep colluvial S13 (vm1/05) ecosystems and on the zonal S1 (vm1/01) site with more acidic, weathered Humo-ferric Podzol soils. On these sites, the *Disporum smithii* is less vigorous (smaller plants) and tends to occur only sporadically.

Associated species: Within *D. smithii's* much more limited range it is sometimes found along with the similar looking *Disporum hookeri* – especially along the edges of D. smithii's local range, since their site requirements are alike. Most commonly associated with *Ribes bracteosum, Rubus spectabilis, Athyrium filix-femina, Maianthemum dilatatum, Polystichum munitum, Tiarella trifoliata, Trautvetteria caroliniensis and Trillium ovatum.* Other associates include *Picea sitchensis, Oplopanax horridus, Sambucus racemosa, Fritillaria lanceolata, Galium triflorum, Mitella sp., Osmorhiza purpurea, Stachys cooleyae, Streptopus amplexifolius, Tolmeia menziesii, Leucolepis menziesii, Plagiomnium insigne,* and *Stokesiella praelonga.* In the immediate riparian (stream edge) zone, also with *Rubus parviflorus, Aquilegia formosa, Aruncus dioicus, Boykinia elata, Dicentra formosa, Prenanthes alata* and *Viola glabella.*

Management: *Disporum smithii* is common on appropriate sites within Block 1 of TFL 25, and found on the full spectrum of successional stages resulting from past management. It is most disadvantaged by the low light conditions of dense regeneration to closed-canopy immature forests, but even here persists as scattered, low vigour individuals. In dense stands, the plants would benefit from juvenile spacing or commercial thinning. Partial cutting would very likely promote the cover and vigour of *Disporum smithii.*

Disporum smithii

General comments: Perennial herb 20-90 cm tall. Much easier to recognize in the field after comparing with the physically similar *Disporum hookeri.* Fine hairy stems and leaves differentiate *D. hookeri* from the essentially smooth stems and leaves of *D. smithii*.

Leaves: Prominently veined, ovate (egg-shaped) to oblong-ovate with abruptly pointed tips, usually 6-12 cm long, non-hairy above and slightly hairy beneath on the nerves closer to leaf base. Studying the leaf margins of both *Disporum* species with a 10x hand lens shows the following: *D. smithii* has at most sparse leaf margin hairs arranged in a disorderly fashion. In contrast, *D. hookeri* has abundant leaf margin hairs which all point towards the leaf apex. To the touch, as with texturing soil between thumb and forefinger, *D. smithii* is smooth and resistant to slipping, whereas *D. hookeri's* pubescence causes it to feel slightly coarse and to slide easily.

Flowers: Solitary or in groups of 2-3 at branch tips, creamy white, cylindric, 15-28 mm long; flaring only slightly near the tips; stamens and style about equal in length and 3-5 mm shorter than flower (tepal) tips; anthers 4-5 mm long; style hairy; ovary ellipsoid and smooth. *D. hookeri* has a more bell-shaped flower with stamens and style extending well beyond the creamy white tepals (bell).

Fruit: Smooth berry, yellow or orange, oblong to oblong-oval and 12–15 mm long.

Erythronium montanum S. Wats. (white glacier lily)

Range: Found in the mountain hemlock forest (MHmm1) and parkland (MHmmp1), and in the upper montane forest of the CWHvm2 of southern Vancouver Island only on San Juan Ridge. It is also reported on the east side of the Klinaklini R., upstream from the head of Knight Inlet in the MHmm2 (Mt. Waddington area). This species is widespread and abundant in the Olympic and Cascade Mountains of Washington State, and extends into Northern Oregon.

Sites observed: Prevalent on zonal sites, on richer sites and on raised, freely drained microsites within otherwise poorly drained ecosystems — i.e. M1, M3, M4, MH1. This includes MHmm1 /01, 02, 03, 05, 06 and 07; and, CWHvm2 /01, 03, 05, 07 and 09. In its lower elevation occurrences, it seems to prefer sites where snowmelt is later and there is more cold air drainage (it quickly drops out on warmer, better-drained aspects). Its occurrence only on raised, freely drained microsites of the wet M4, and clear separation from *Caltha biflora* microsites, is likely because its bulbs cannot tolerate saturation over the winter (a feature common to most bulbs).

Soils are moderately to imperfectly drained, Humo-ferric Podzols with mor humus, developed on medium textured, morainal (till) materials.

Associated species: Most commonly associated with *Tsuga mertensiana, Chamaecyparis nootkatensis, Vaccinium alaskaense, Blechnum spicant, Cornus canadensis, Gaultheria ovatifolia. Listera spp.,* and *Rubus pedatus.* Other associates include *Clintonia uniflora, Gymnocarpium dryopteris, Orthilia secunda, Streptopus roseus, Rhytidiopsis robusta, and Dicranum spp.*

Erythronium montanum is the first herb to flush in spring, flowering within 2-5 weeks of snowmelt; *Cornus canadensis* emerges when the white glacier lilies flower; *Erythronium* is in seed by the time of *Cornus* flowering.

Management: *Erythronium montanum* is common on appropriate sites within Block 1 of TFL 25, in both old-growth forest and in regeneration. *Erythronium* responds very well to the open, post-logging condition. It would be least abundant and least vigorous under dense, closed canopies of older regeneration to early immature. However, at montane-subalpine elevations, dense canopy is unlikely to occur extensively since regeneration 'problems' (frost pockets, snowpress, and microsite diversity [wet and/or rocky inclusions]) all promote variable density and structural gaps. Diversity in both age classes and stand structure will maintain a component of sites well suited to *Erythronium montanum* throughout the rotation in a managed forest.

Erythronium montanum

General comments: Perennial herb 5-25 cm tall. Somewhat similar to yellow glacier lily (*E. grandiflorum*). Responds very favourably to the open, high-light conditions created by logging. This results in far more plants flowering; larger, more vigorous plants and more flowers per plant (up to 5 per plant observed). Total cover increases considerably soon after logging; it is unclear whether this involves seed banking or seeding in, as well as the increase in size and vigour of the pre-existing bulbs. Bulbs were observed to survive under slash accumulations for some years (piles recently removed), and even survived under burned slash piles providing the H horizon was intact. The impressive vigor seen in the recent cut block openings was presumably also a function of more favorable temperature regimes. Although comparative observations were not made in the nearby parkland (Mhmmp1) the numbers of *Erythronium montanum* in old growth forest were high, and amounted to 5-12% coverage. However, the plants were generally small and only a small percentage produce flowers, predominantly with only one flower per plant (two at most).

Leaves: Has pale-green (non-mottled) leaves, like yellow glacier lily (*E. grandiflorum*). Basal, paired, broadly ovate or oblong-lanceolate, 10-20 cm long and 2-6 cm wide. Whereas *E. grandiflorum* has leaves that clasp the flowering stem base, those of *E. montanum* are non-clasping.

Flowers: Solitary or 2-5, and nodding; white tepals, fading to pink, and yellow-banded near inside base. In contrast, as the common name suggests, yellow glacier lily (*E. grandiflorum*) has golden-yellow tepals. Both species tend to bloom at the edge of melting snow banks.

Fruit: *Erect, club-shaped capsules, 1.5-3 cm long.*

Hydrophyllum tenuipes Heller (Pacific waterleaf)

Range: Extends from northern California along the coast from the west flank of the Cascade Ranges into parts of the Fraser Valley and southern Vancouver Island. Reported locally from near Sooke, in Goldstream Provincial Park, as well as in the Fraser Valley at various locations in Abbotsford—Matsqui, and the NW side of Vedder Mt.

Sites observed: Spreading clumps along Phillips Road near Sooke, within the CWHxm. Associated with communities that would be mapped as A5 in WFP's tenures, which includes CWHxm /05 (mostly) and /07 in the MOF site classification. These sites are on high fluvial terraces and medium to fine-textured remnants of glaciomarine deposits. Soils are Dystric Brunisols and Regosols, with moder or mull humus forms. Aso growing opportunistically along road edges, including fillslopes, cutslopes and even on periodically graded, gravel road shoulders.

Associated species: Most commonly associated with *Rubus ursinus, Achlys triphylla, Adenocaulon bicolor, Galium aparine, G. triflorum, Maianthemum dilatatum, Mycelis muralis, Polystichum munitum, Tiarella trifoliata , and Trientalis latifolia. On the moister sites, in addition to the above, with Osmaronia cerasiformis, Rubus spectabilis, Sambucus racemosa, and Urtica dioica.*

Management: Based on the field survey, *Hydrophyllum tenuipes* is not expected within WFP tenures on Vancouver Island. If suspected, note the location and have the plant(s) verified by a botanist or ecologist.

Hydrophyllum tenuipes

General comments: A perennial herb 20-80 cm tall from a short or elongate rhizome; solitary stem, leafy and usually hairy; whole plant has a soft velvety appearance.

Leaves: Hairy, few and large (up to 15 cm long and wide), divided into 5 (up to 9) pointed and sharply toothed leaflets.

Flowers: Colour variable in different geographic areas, from greenish-white, to creamy, to blue or purple; bell-shaped 5-7 mm long, with stamens and pistil extending well beyond calyx lobes (sepals and petals), sepals bristly on margins; flower stalks extending from upper leaf axils into loosely compact terminal clusters.

Fruit: Capsules, 1-chambered, splitting open at maturity into two halves; seeds 1-3.

Literature Referenced

Douglas, G.W., G.B. Straley and D. Meidinger. 1989, 1990, 1991, 1994. *The Vascular Plants of British Columbia.* 4 vols. BC Min. For., Victoria.

Hitchcock, C.L., A. Cronquist, M. Ownbey and J.W. Thompson. 1955, 1959, 1961, 1964, 1969. *Vascular Plants of the Pacific Northwest*. 5 vols. University of Washington Press, Seattle.

Pojar, J., and A. MacKinnon, eds. 1994. *Plants of Coastal British Columbia, including Washington, Oregon and Alaska.* Lone Pine Publishing, Edmonton, Alta.

Acknowledgements

The British Columbia Conservation Data Centre (http://srmwww.gov.bc.ca/cdc/) has provided valuable information on species distribution and site conditions (habitat) through their “Rare Element Occurrence” reporting service.

Line drawings have been used with permission from the University of Washington Press. The drawings were scanned from *Vascular Plants of the Pacific Northwest,* which is cited above.

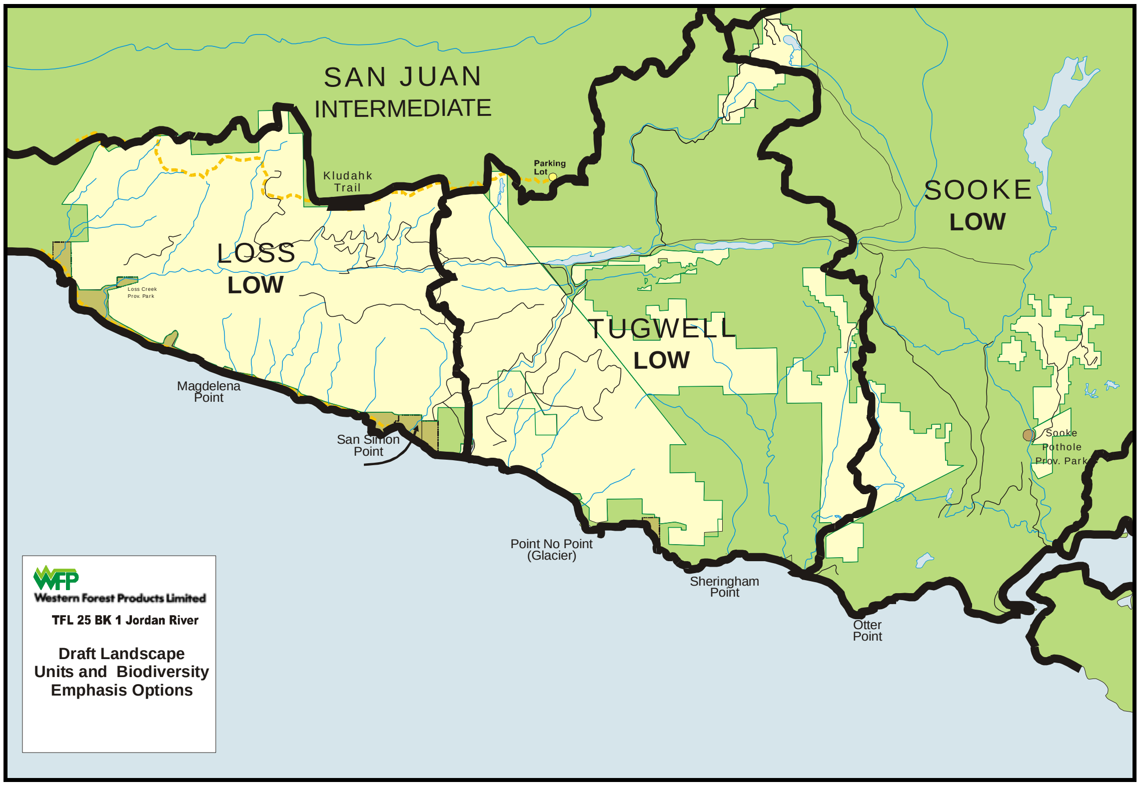
Photography

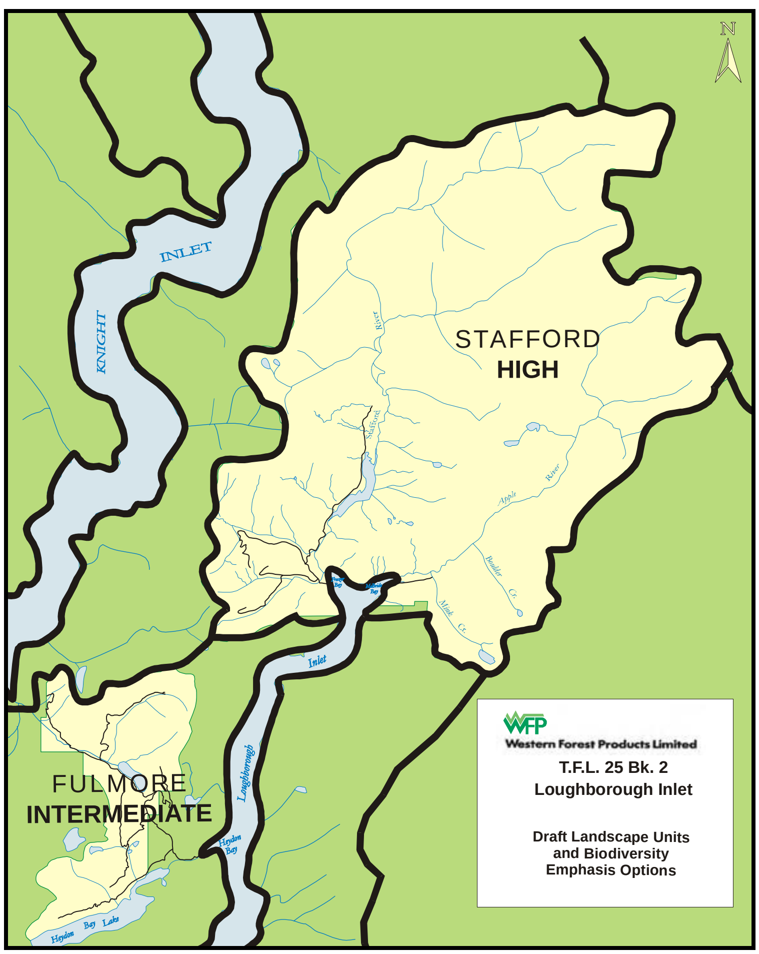
- W.M. (Bill) Merilees: *Corydalis scouleri* inset photo p. 3; *Disporum smithii* inset photo p. 5; *Hydrophyllum tenuipes* inset photo p. 9.
- Dr. Hans Roemer: *Erythronium monatum* larger photo with habitat p. 7.
- A. Inselberg: remaining photos.

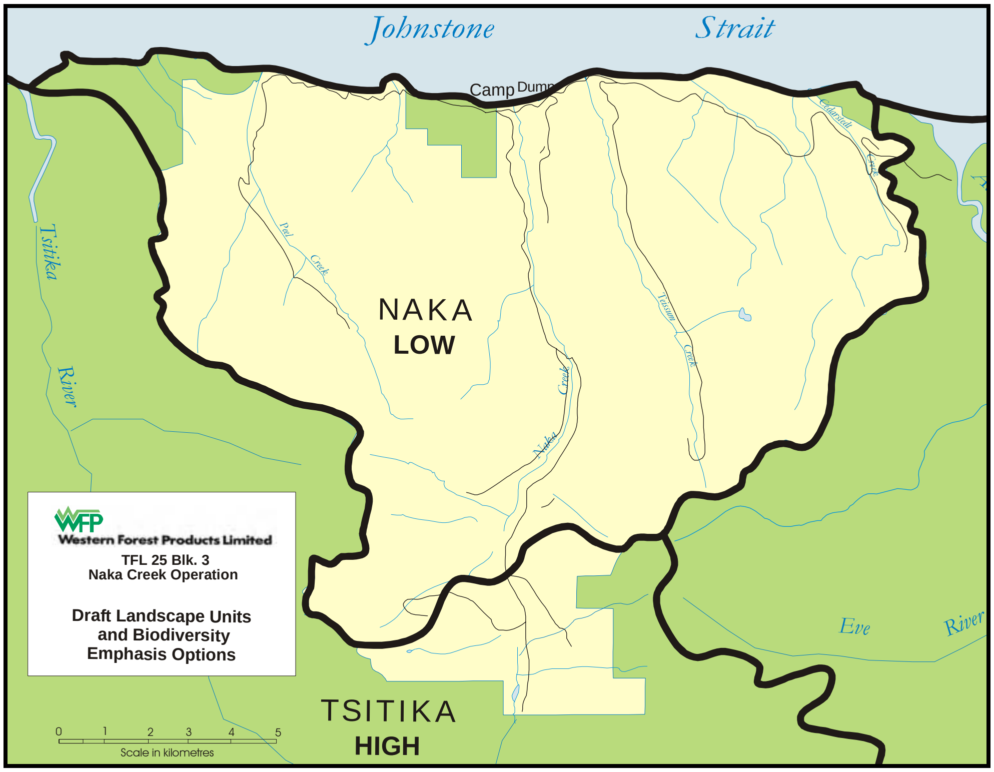
Compiled by Alex Inselberg M.Sc. and Terence Lewis Ph.D., PAg, PGeo.

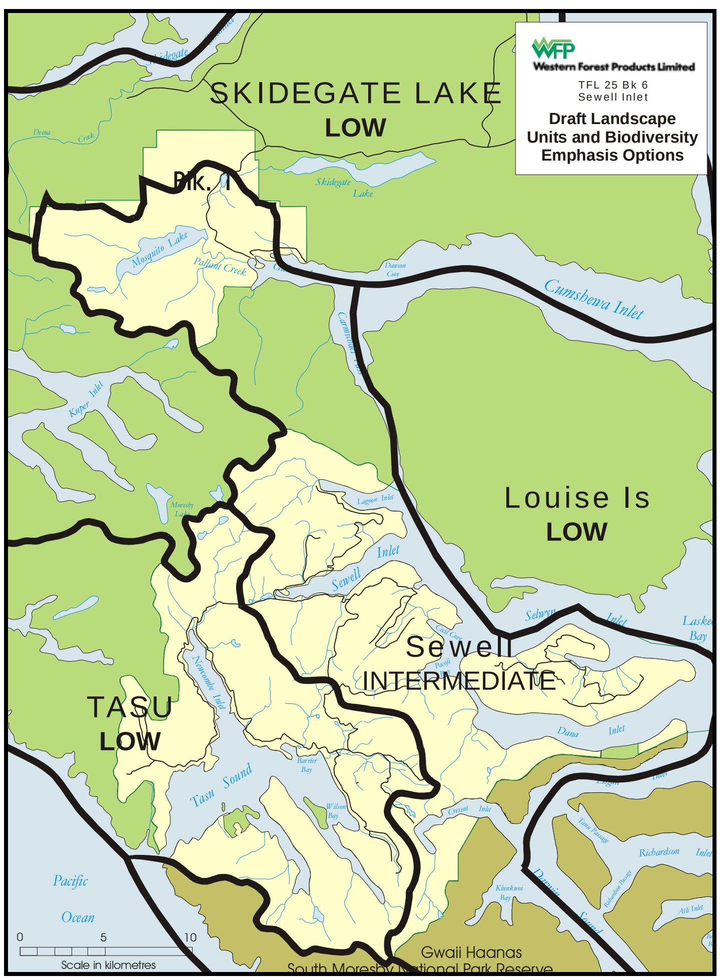
Appendix XVI

Landscape Unit Maps


SAN JUAN
INTERMEDIATE
Kludahk
Trail
Parking
Lot
SOOKE
LOW
LOSS
LOW
TUGWELL
LOW
Magdelena
Point
San Simon
Point
Sooke
Pothole
Prov. Park
Point No Point
(Glacier)
Sheringham
Point
Otter
Point
Western Forest Products Limited
TFL 25 BK 1 Jordan River
Draft Landscape
Units and Biodiversity
Emphasis Options


N
INLET
KNIGHT
STAFFORD
HIGH
Inlet
FULMORE
INTERMEDIATE
Loughborough
Western Forest Products Limited
T.F.L. 25 Bk. 2
Loughborough Inlet
Draft Landscape Units
and Biodiversity
Emphasis Options


Johnstone Strait
Camp Dump
NAKA
LOW
Tsitika River
Eve River
Western Forest Products Limited
TFL 25 Blk. 3
Naka Creek Operation
Draft Landscape Units and Biodiversity Emphasis Options
TSITIKA
HIGH
0 1 2 3 4 5
Scale in kilometres


SKIDEGATE LAKE
LOW
Western Forest Products Limited
TFL 25 Bk 6
Sewell Inlet
Draft Landscape Units and Biodiversity Emphasis Options
Blk. 1
Cumshewa Inlet
Louise Is
LOW
Sewell
INTERMEDIATE
TASU
LOW
Tasu Sound
Pacific Ocean
0 5 10
Scale in kilometres
Gwaii Haanas
South Moresby National Park Reserve

WFP


Western Forest Products Limited
TFL 25 Bk 5
Draft Landscape Units and Biodiversity Emphasis Options
KITIMAT
N
Hawkesbury Island
Gribbell Island
Gill Island
CRAB
LOW
BISHOP
LOW
TRIUMPH
LOW
KILTUISH
LOW
KLEKANE
LOW
RANGE 3
COAST L.D.
AALTANHASH
LOW
BUTEDALE
BUTEDALE
INTERMEDIATE
KHUTZE
INTERMEDIATE
GREEN
INTERMEDIATE
LAREDO
INTERMEDIATE
TOLMIE
HIGH
Princess Royal Island
Sarah Island
RANGE 3
COAST L.D.
Kitlope Provincial Park
Kitlope Lake
Kitlope River
Fiordland Recreational Area
Pooley Island
RODERICK
LOW
Roderick Island
Arlstazoba Island
KLEMTU
Swindle Island
DON
PENINSULA
INTERMEDIATE
Ellerslie Lake
Susan Island
Dowager Island
Coldwell Peninsula
YEO
LOW
Florence Peninsula
Yeo Island
Price Island
Don
Chatfield Island

Appendix XVII

Ecosystem Based Management

Definition, Principles and Goals of Ecosystem Based Management

Ecosystem based management is a strategic approach to managing human activities that seeks to ensure the coexistence of healthy, fully functioning ecosystems and human communities. The intent is to maintain those spatial and temporal characteristics and processes of whole ecosystems such that component species and human social, economic and cultural activities can be sustained.

Overarching principles

- Healthy, fully functioning ecosystems provide the basis for sustaining communities, economies, cultures and the quality of human life therefore ecological sustainability[45] is fundamental to land and marine management.
- Empowered and healthy communities play a leadership role in sustaining healthy eco-systems, cultures and economies.
- Focus planning on the needs of the ecosystems and the values that you want to maintain.
- Planning should be done over ecologically and economically relevant time frames and involve regional, landscape and site scale planning.
- Incorporate the best of existing knowledge (e.g. traditional, local and western science) into planning and decision-making.
- Knowledge of natural processes and human interactions is incomplete and inherently limited, and decisions made in the present can pose unacceptable risks for the future. Apply the Precautionary Principle and practice adaptive management in decision-making. Monitor the consequences of decisions and adopt a learning approach to planning.
- Maintain natural, social and economic capital in the region and preserve the full range of options for future generations.
- Respect individuals, communities of interest (including businesses) and cultures.
- Recognition of the history of First Nations in the region and their rights as articulated by the Constitution of Canada:
- Respect and acknowledge aboriginal rights and title as defined by the Constitution and case law.
- First Nations of the Central Coast should be engaged with the governments of BC and Canada in a process to reconcile outstanding land issues involving aboriginal rights and title including securing interim measures agreements.
- Support the efforts of First Nations to establish government-to-government to government tables with the objective of developing interim measures agreements.
- Aboriginal settlements must be based upon mutual trust, respect and understanding. They must be fair and equitable and recognize the interests and aspirations of individual First Nations including providing tools and resources to enable social and economic prosperity for First Nation people as well as other people of BC.

1.1 ———————————

[45] sustainability, for the purpose of this discussion is defined as "A state or process that can be maintained indefinitely." The principles of sustainability integrate three closely interlined elements—the environment, the economy and the social system—into a system that can be maintained in a healthy state indefinitely

Ecological principles

- Sustain the biological richness and the biological services provided by natural terrestrial and marine processes at all scales through time (e.g. water quality, soils and vegetative productivity, species richness, predator/prey interactions, etc.).
- Conserve hydro riparian areas and maintain hydro riparian functions.
- Ensure an appropriate level of ecological representation and habitat connectivity.
- Protect and conserve focal species, as well as rare, threatened and endangered species and their habitats as a priority[46].
- Conserve native species and their habitats within the range of natural variability.
- Protect sensitive soils and unstable terrain.
- Sustain the structure, function and composition of natural ecosystems including the land-sea interface.
- Incorporate ecological restoration of degraded landscapes, stands and sites into forest management.
- Avoid the introduction of alien species
- Sustain adequate levels of spawning biomass and population age structure of all aquatic species (e.g. Rock fish, lingcod, salmon).
- Recognize that the dynamics and resiliency of ecosystems vary.
- Establish a credible terrestrial and marine protection area system that contributes to sustaining the biological richness and the biological services provided by natural terrestrial and marine processes.
- Use zoning as a management and planning tool.
- Sustain human communities within the limits of ecosystem processes
- Ensure that the consumptive use of natural resources is maintained within limits that can be sustained.
- Employ resource use techniques that emphasise low environmental impact and ensure that activities do not degrade ecosystems or conflict with meeting conservation goals.
- Ensure that the harvesting of natural resources and rates of harvest are an output of planning and do not compromise the long-term ecological integrity of landscapes and watersheds.
- Ensure sustainable harvest of old growth (250 years +) and second growth timber.
- Ensure that the development of non-renewable resources is undertaken in a manner that is consistent with the ecosystem framework.
- Redefine tenure arrangements to make them more ecologically relevant.

1.1 ———————

[46] Identify focal, rare, threatened and endangered species based on credible scientific opinion.

Socio-economic principles

- Promote the well being of the communities in the Central Coast for this and future generations.
- Recognise the interests of work communities on the Central Coast whose residents live outside the Central Coast.
- Maintain the historical, current and future unique qualities of life on the Central Coast as a basis for diversified economic activity.
- A diversity of economic opportunities is key to healthy communities and sustainable economies. Diversification should include both the local development of different economic activities as well as local involvement in different levels of existing activities.
- Provide greater local employment and economic benefits to communities through increased local access to local resources.
- Build community economic capacity including employment and business opportunities beginning with communities in the Plan Area. Ensure access to leadership, decision-making, business planning and management skills training.
- Redefine tenure arrangements to make them more equitable.
- Encourage diverse and innovative options that increase the employment, economic development, revenue, cultural and environmental amenities and other benefits derived from resources.
- Recognize the financial investment and economic contribution of the full range of existing economic enterprises and their employees and shareholders.
- Seek new ways of deploying existing investments within the context of these principles and goals.
- Increase the economic viability and sustainability of existing investments within the context of these principles and goals.
- Incorporate potential economic contributions of local, regional and global interests.
- Seek out and encourage new and innovative investment opportunities in the region in support of these goals and attract capital investments in those opportunities.
- Explore innovative ownership structures (including private ownership), rights allocations and opportunities to share assets or business functions.
- Ensure the full range of impacts and opportunities are considered in decision-making. Develop full-cost accounting tools and models to assess opportunities and impacts of resource management alternatives.
- Do more with less: prioritize business and economic strategies based on quality, adding value and decreasing material throughput thereby improving economic and ecological outcomes.
- When land use decisions are made in the public's best interests the costs of such decisions should not be visited on individual parties. Thus, direct loss of economic livelihood or employment resulting from a breach of contract resulting from the CCLCRMP land use planning decision must be subject to mitigation first and fair and timely compensation as a last resort.

Principles of Information and Adaptive Management

- Practice Adaptive Management
    - Identify benchmarks against which future management performance can be measured.
    - Establish explicit objectives for managing risk.
    - Incorporate science, local and traditional knowledge and available data into management decisions.
    - Identify research and inventory priorities that will increase the effectiveness of ecosystem-based planning and management in the future.
    - Monitor performance and outcomes for the purpose of adapting and improving planning and management.
- Adopt a coordinated approach to information management.

Principles for managing ecosystem based planning processes

<u>Follow up processes shall be:</u>

- neutrally administered
- transparent
- ensure full public access to relevant information necessary to make informed decisions
- consider all community and other interests affected
- look to find common ground
- respectful of the diverse values, traditions and aspirations of local communities
- fair
- efficient and effective (efficient use of time and resources)
- measurable and enforceable (decisions must be properly monitored and enforced)
- adaptive and flexible (capable of modifying decisions in response to technological innovations, field experience, shifts in social preferences and new information)
- comprehensive and integrated (cross sector and addressing the full range of economic, social and environmental concerns and values)
- accountable (decision makers must be accountable to all participants in the process as well as to the broader public)
- Recognizing regional, provincial, national and international interests establish collaborative, land use planning and decision-making processes that empower, and build capacity, within local communities.
- Resolve conflicts with generosity, compassion and clear understanding.
- Engage independent expertise in a manner that reveals the consensus of opinion and the differences of opinion on issues of concern.

Appendix XVIII

Kitasoo / Xai'xais First Nation

Protocol on the Environment

Press Release

KITASOO/XAI'XAIS ADOPT LAND USE PLAN AND ENVIRONMENTAL PROTOCOL TO PROTECT ENVIRONMENT, CREATE JOBS AND STIMULATE ECONOMIC DEVELOPMENT

Klemtu, B.C., June 28, 2000 – The Kitasoo/Xai'xais First Nation Council and Hereditary Chiefs have announced an historic Land Use Plan that will see them designate 40% of their traditional territory on British Columbia's central coast as a protected area. In addition, the Kitasoo/Xai'xais have adopted a Protocol on the Environment that will govern future use and conservation of all their land and resources.

"We hold aboriginal rights and title to the land and resources within our traditional territory," said Percy Starr, Chief Negotiator for the Kitasoo/Xai'xais. "This Land Use Plan and Environmental Protocol will allow us to regain our rightful control of our lands and resources. We will work with all those who choose to cooperate with us to protect both the environmental values for our land and the economic growth for our people."

Hereditary Chief Archie Robinson said this initiative allows the Kitasoo/Xai'xais to take charge of their destiny. "In recent years, we have seen economic and environmental interests move into our territory with their views on how things should be done here. We have responded with a plan that will protect environmental values in our territory, including the habitat of the Kermode or Spirit Bear. The plan will also provide jobs for our people and economic development for our community." He said the designation of the protected area may have some short-term impact on employment but in the long run, the new land use arrangement will increase the number of forestry jobs in the area and add high-quality eco-tourism jobs.

The Land Use Plan calls for the protection of 40 per cent of the 530,000-hectare traditional territory that comprises their land and freshwater areas. The balance will be designated an integrated use area that will support jobs and economic development through ecologically sustainable forestry, fisheries and tourism activity. Only activity that protects the bears, fish and other parts of this region's eco-system as well as the Kitasoo/Xai'xais cultural values will be permitted in the integrated use area.

Both the plan and environment protocol provide a framework for the future of the Kitasoo/ Xai'xais people, a growing community hit hard in recent years by the decline of fishing, their main economic activity.

Kitasoo/ Xai'xais elected Chief Gary Hall said, "With this plan and our protocol we invite the BC government, Greenpeace, Sierra Club of BC, Valhalla Society, Suzuki Foundation, Spirit Bear Youth Coalition, Western Forest Products, Interfor and others to work with us to implement our plan. It is time for us to decide our future for ourselves."

Kitasoo Band Council, Klemtu, BC V0T 1L0
Tel: (250) 839-1255 • Fax: (250) 839-1256

Xai'xais Chief Ernest Mason, Jr. added, "It's about time. Our people have been pushing for us to become more active in the management of our lands and resources. This is an important first step that our people fully support."

The president of the Tsimshian Tribal Council Bob Hill supports the initiative. "We stand behind the Kitasoo/Xai'xais people and their desire to manage their resources. They are committed to working with our First Nations, government, environmental groups and industry, but on terms that respect their rights and title."

Approximately 85% of the 460-member Kitasoo/ Xai'xais First Nation live in the community of Klemtu, located 200 kilometres southeast of Prince Rupert on the BC coast. They are part of the Treaty Process but have felt frustrated by its lack of progress. "For a number of years we have discussed land use and the needs of our people through the government-to-government process," said Band Manager Mr. Starr. He said the plan and the protocol will bring aboriginal rights to the table. "We can't wait for the treaty talks or for the Central Coast Land and Resource Management Plan (LRMP) to be completed. We are moving forward now to assert how our rights and title will be respected. As we have in the past, we will work with any process or organization that will assist us to achieve our goals."

For further information:
Erin Airton Tel: 604-808-6420
Grant Scott Tel: 250-480-8193

KITASOO / XAIXAIS FIRST NATION
PROTOCOL ON THE ENVIRONMENT
June 1, 2000

The Kitasoo/Xaixais First Nation of British Columbia has controlled and managed the environment and natural resources within their territories for thousands of years. This territory takes in the southern three quarters of Princess Royal Island, mainland inlets of Altanhash, Khutze, Green, Mussel and Kynoc; Aristazabal, Roderick, Pooley and Dowager Islands, as well as the surrounding waters and outlying islands out to the middle of Hecate Straight. We share some of these lands and waters with our aboriginal neighbours. This is the area known by some people as "Spirit Bear Park" or "Great Bear Rainforest". To us it is home. We call it "Neeso Wakwis" - our lands. This area is defined on the attached map.

The Kitasoo/Xaixais First Nation-holds aboriginal rights and title to all the land and resources in these territories and these rights are protected under the Canadian Constitution. No other group in Canada or elsewhere have this form of land and resource ownership and this right will be respected.

Recently, we have been forming working relationships with governments, environmental groups, companies and others to assist us in building our community and strengthening our people. This is being done by creating jobs and economic development opportunities while respecting our government, culture and environment. Some organizations do not respect our government, or our rights and title, nor our traditions and have mounted world wide campaigns without consultation with, and consent of, the Kitasoo / Xaixais people who are the original owners of these lands and resources. We are always open to visitors and new ideas but we insist that respect will be shown for our people, our government, our environment and our resources.

THEREFORE, THE COUNCIL AND HEREDITARY CHIEFS OF THE KITASOO / XAIXAIS FIRST NATION RESOLVE THAT:

1. The Kitasoo / Xaixais First Nation holds aboriginal rights and title to their traditional territories defined on the attached Map.
2. The Kitasoo / Xaixais First Nation has managed these lands, waters, resources and ecosystems in a sustainable way for thousands of years and will continue to manage these lands.
3. The Kitasoo / Xaixais First Nation has adopted a land use plan that is shown on the attached Map that identifies:

   1. **Nakami Weld Protected Areas:**
      Lands and resources that will be protected from logging, mining and other resources extraction and will be used by our people forfood, traditional uses, trapping and tourism

2. **Integrated Use Areas**:
   Lands and resources that will be utilized in a sustainable way so as to create jobs and economic development opportunities for our people and revenue for our government while conserving our wildlife and fisheries.

4. Those entering Kitasoo / Xaixais First Nation territories with the intent of exploiting our resources will adopt our land use plan and show respect for our people, our government, our environment and our resources. They will meet with our Chiefs, Councils and communities to gain our permission before any action is taken..
5. Those using our territories through media campaigns, or otherwise, with the intent of protecting and conserving our environment or to exploit our resources for tourism or other purposes will show a similar respect as outlined in 4. above and adopt our land use plan.
6. No one except the rightful Kitasoo / Xaixais owners will use our crests, totems, dances, songs, photographs or other symbols of our culture.
7. Anyone planning to use our land based or aquatic resources for harvest, sale or any financial gain will, prior to any activities, adopt our Environmental Protocol and negotiate a management agreement with the Kitasoo / Xaixais government,
8. Any economic development or tourism activity that is planned for our land or marine areas will be fully discussed with us and plans and agreements developed that ensure that our people are hired and trained and that economic development will benefit our community.
9. The Kitasoo / Xaixais First Nation will discuss with Canada, British Columbia and other interest groups the most effective way to establish of our Nakami Weld Protected Area that will implement our plan.

SIGNED BY HEREDITARY CHIEFS:

Nies'los – Archie Robinsion Sr.

Lag'ax'niits – Eric Robinson

Nis'muu'tk – Ernest Mason Jr.

K'exe'tasu – Larry Robinson

Tsu'tse'lewe – Brian Mason Sr.

T'u't'uwa – Roderick Neasloss Sr.

Elected Chief Gary Hall

June 2, 2000

Dated in Klemtu, B.C.

KITASOO / XAIXAIS FIRST NATION
LAND AND RESOURCE PROTECTION AND MANAGEMENT PLAN
June 26, 2000

1.0 VISION

The Kitasoo and Xaixais people live on the central coast of British Columbia, Canada. The following "Statement of Comprehensive Claim" in section 2.0 was made in 1982 to explain to Canada and the world who we are and where we live.

Since 1982 a lot has happened. Other people from Canada and around the world have become more interested in our place on this planet. Logging companies are interested in our forests, tourists in our incredibly beautiful mountains, inlets and wildlife, fishers in our aquatic resources and environmentalists who are concerned for our forests, fish and wildlife. We also are concerned about all of these things. As our Statement of Claim indicates, we have been concerned about these lands and resources for thousands of years. We have another concern, and that is for our people.

We have always had a land and resource use plan for our lands, forests, fish and wildlife. It lives in our heritage, in our oral history and in our everyday decisions as to where we collect food and where we fish and cut trees. Since the modem world doesn't understand our way of managing lands and resources, we will write it down in order to explain our intentions.

Our vision for our land and resources is based on the best definition of the term "'sustainable". To us this means that the wealth of forests, fish, wildlife and the complexity of all life will be here forever. It also means that we will be here forever. To remain here as Kitasoo, and Xaixais people we need to protect and enhance our culture and protect our heritage. We also need to live in the modem world. We need jobs to sustain our families. We need revenue and economic development to sustain our community.

The following "Kitasoo / Xaixais First Nation Land and Resource Protection and Management Plan" explains how we intend to manage and protect our lands and resources. We invite other people and governments to work with us to implement the plan but we seek no permission. Our right to implement this plan comes from our aboriginal rights and title and from our connection to this land for thousands of years.

No one speaks for us. Mutual respect and understanding comes from meeting with us and gaining an understanding of our people and our lands. Listen, learn and understand, then we can work together.

2.0 STATEMENT OF COMPREHENSIVE CLAIM - 1982

"Since time immemorial, we the peoples of the Kitasoo Indian Band, situated in what is now called the Province of British Columbia, have been and remain the rightful owners, users and sovereign occupants of our tribal territories, as outlined on the map attached.

The peoples of the Kitasoo Indian Band, namely the Xixis and the Gvuquayaitxv peoples who are Heiltsuk in language and cultural tradition, and the Kitasoo people who are Tsimshian linguistically and culturally, created a permanent settlement at Klemtu in the late 19th century, on the lands of our ancestors. Our peoples have traditionally used, occupied and exercised jurisdiction over our tribal territories for countless thousands of years. We have never surrendered our tribal territories or jurisdiction through conquest, treaty or any other means to the British Crown or its colonial governments or to the Crown in the right of Canada or to any other government or people.

Nor has this original ownership, occupancy and use by our people and jurisdiction over our tribal territories ever been superseded by law.

Nor have we ever received any compensation for the use and occupation of our tribal territories by peoples non-indigenous to our tribal area.

Therefore, we assert our right and claim to our tribal area, including all land forms, air and subsurface, fresh and tidal waters, foreshores, and watersheds of all streams and rivers flowing into these fresh and tidal waters, extending into the Hecate Strait. We assert our right to our land and to its preservation, development and management; and to the benefits that have been and may be derived from all resources and development of resources within our tribal territories.

We hereby present this statement of comprehensive claim to the Government of Canada, through the Department of Indian and Northern Affairs, as an assertion and statement of our right.

We, the elected Council of the Kitasoo Indian Band, are authorized to act on behalf of our people for the purposes of the statement of claim. We represent the Indian population of the Band and also the descendants of Heiltsuk and Kitasoo peoples in our tribal area. We are also signatories to the Declaration of Claim of the Tsimshian Nation."

Signed by:	**Chief:**	**Percy Starr,**	
	Councilors:	**Archie Robinson**	**Ernest Mason Jr.**

3.0 PRINCIPLES FOR LAND AND RESOURCE MANAGEMENT

3.1 Goal:

Since the Declaration in 1982 the Kitasoo/Xaixais First Nation has entered into the process of negotiating a treaty with Canada and British Columbia. Many of the land and resource planning and management issues expressed in this plan are being discussed at the Treaty Table. Therefore, the following plan is without prejudice to the Treaty process. The Kitasoo/Xaixais feel the need to develop this plan at this time because of the slow progress being made at the Treaty Table and the immediate need to protect the environment and valuable resources. We also need jobs and economic development opportunities for our people now. The lack of meaningful jobs has created serious social problems in our community. We cannot let another generation pass idly by. With this goal in mind the objectives of the land and resource management plan are to provide for:

- Sustainable and stable Kitasoo/Xaixais communities,
- The social development of Kitasoo/Xaixais families and individuals,
- The spiritual and cultural integrity of the Kitasoo/Xaixais way of life,
- The protection and enhancement of the environment,
- Economic self-reliance in employment for Kitasoo/Xaixais people and revenue to Kitasoo/Xaixais government.

3.2 Aboriginal Rights

- The Kitasoo/Xaixais hold aboriginal rights and title to 100% of the traditional territory including land and marine resources.
- Kitasoo/Xaixais shares aboriginal rights and title to overlap areas with other First Nations,
- The designation of land and resources will create certainty for present and future Kitasoo/Xaixais people,
- Kitasoo/Xaixais will ensure aboriginal rights and title are protected within the entire territory,
- Kitasoo/Xaixais rights includes the rights to self government and this includes the right to cooperate with other people who want to work with us in our areas.

4.0 KITASOO / XAIXAIS LANDS AND RESOURCES

KITASOO / XAIXAIS PROTECTED AREAS

Primary objective: Protection of fish, wildlife, cultural and bio-diversity values.

- Protect Kitasoo and Xaixais cultural and heritage values,
- Protect areas of high wildlife and environment values,
- Protect fish and wildlife habitat, Protect Kermode bear habitat,
- Protect scenic corridors,
- No timber harvesting, mining or resource extraction,
- Kitasoo/Xaixais continue to hunt and fish,
- Opportunities for low impact tourism and co-management of Protected Areas.

Area 1 Kitasu / Higgins Pass Protected Area

Kitasoo/Xaixais Values:

- Original home of the Kitasoo/Xaixais people,
- Old village sites, burial grounds,
- Very high archaeological and heritage values,
- Very high fish and wildlife habitat,
- Wolf and deer habitat,
- Foreshore and uplands to protect high fisheries values,
- Kitasoo/Xaixais Rediscovery site,
- High use area of the Kitasoo/Xaixais people.

Kitasoo/Xaixais Management Objectives:

- No logging or mining,
- Kitasoo/Xaixais exclusive use area for fisheries or tourism development.

Area 2 Laredo Inlet Protected Area

Kitasoo/Xaixais Values:

- High archaeological and cultural values,
- High central coast biodiversity values,
- Very high wildlife and biodiversity values,
- Home of the Kermode and black bears and wolves,
- Very high scenic values for coastal fiords and mountains,
- High potential for low-impact ecotourism.

Kitasoo/Xaixais Management Objectives:

- No logging or mining
- Management as Laredo / Canoona / Khutze Tribal Park,
- Low impact Kitasoo/Xaixais ecotourism to create jobs and economic development opportunities,
- Kitasoo/Xaixais Youth Rediscovery program to train Kitasoo/Xaixais youth,

- Co-management Agreement with Kitasoo/Xaixais before any resource planning or tourism development begins.

Area 3 Canoona Protected Area

Kitasoo/Xaixais Values:

- Kitasoo/Xaixais/Xaixais Indian Reserve at the mouth of Canoona River,
- The highest fisheries habitat values in the Kitasoo/Xaixais traditional territories,
- Very high wildlife and bio-diversity values,
- Home of the Kermode bear and wolves,
- Very high scenic values for inland fiords and mountains,
- High potential for low-impact eco-tourism.

Kitasoo/Xaixais Management Objectives:

- No logging or mining,
- Part of Laredo / Canoona / Khutze Tribal Park,
- Protect visual quality of the Inside Passage,
- Low impact Kitasoo/Xaixais eco-tourism to create jobs and economic development opportunities,
- Co-management Agreement with Kitasoo/Xaixais before any resource planning or tourism development begins.

Area 4 Khutze Inlet Protected Area

Kitasoo/Xaixais Values:

- High value fish, grizzly bear, mountain goat and wolf habitat,
- Overall high bio-diversity values,
- Very high scenic values for fiords and mountains,
- High potential for low-impact eco-tourism.

Kitasoo/Xaixais Management Objectives:

- No logging or mining,
- No guide outfitting or trophy hunting,
- Part of Laredo / Canoona / Khutze Tribal park,
- Protect visual quality,
- Low impact Kitasoo/Xaixais eco-tourisin to create jobs and economic development opportunities,
- Co-management Agreement with Kitasoo/Xaixais before any resource planning or tourism development begins.

Area 5 Kynoc / Mussel Inlets Protected Area

Kitasoo/Xaixais Values:

- Original home of the Xaixais people,
- Old village sites, burial grounds,
- Very high archaeological and heritage values,
- Very high fish and wildlife habitat,
- Grizzly bear, mountain goat and wolf habitat,
- High bio-diversity values,
- Very high scenic values for fiords and mountains.

Kitasoo/Xaixais Management Objectives:

- No guide outfitting or trophy hunting,
- Protection of grizzly, fish, wolf and other wildlife habitat.
- No mining or logging,
- No roads or vehicle access,
- Protect visual quality,
- Low impact Kitasoo/Xaixais eco-tourisin to create jobs and economic development opportunities,
- Co-management Agreement with Kitasoo/Xaixais before any resource planning or tourism development begins.

Area 6 Green Inlet Marine Park Protected Area

Kitasoo/Xaixais Values:

- Small Marine Park established by the Province of BC at the mouth of Green Inlet
- Wet, High scenic and recreation values,

Kitasoo/Xaixais Management Objectives:

- Low impact Kitasoo/Xaixais eco-tourism to create jobs and economic development opportunities.
- Protect visual quality,
- No timber harvesting or other resource extraction,
- Co-management Agreement with Kitasoo/Xaixais before any resource planning or tourism development begins.

Area 7 Jackson Narrows Marine Park Protected Area

Kitasoo/Xaixais Values:

- Small Marine Park established by the Province of BC at the east end of Jackson narrows,
- High scenic and recreation values.

Kitasoo/Xaixais Management Objectives:

- Low impact Kitasoo/Xaixais eco-tourism to create jobs and economic development opportunities,
- Protect visual quality
- No timber harvesting or other resource extraction,

- Co-management Agreement with Kitasoo/Xaixais before any resource planning or tourism development begins.

Area 8 Oliver Cove Marine Park Protected Area

Kitasoo/Xaixais Values:

- Small Marine Park established by the Province of BC at the south end of Mathieson Channel,
- High scenic and recreation values.

Kitasoo/Xaixais Management Objectives:

- Low impact Kitasoo/Xaixais eco-tourism to create jobs and economic development opportunities,
- Protect visual quality,
- No timber harvesting or other resource extraction,
- Co-management Agreement with Kitasoo/Xaixais before any resource planning or tourism development begins.

KITASOO / XAIXAIS INTEGRATED USE AREAS

Primary Objective: **To create jobs and economic development opportunities for Kitasoo/Xaixais / Xaixais people with minimum impact on the environment and protect cultural and heritage values to sustain Kitasoo/Xaixais people and communities.**

Area 9 Aristazabal Integrated Use Area

Kitasoo/Xaixais Values:

- Kitasoo/Xaixais archaeological and heritage values,
- Traditional hunting and fishing area of the Kitasoo/Xaixais people,
- Numerous fishing camps around the island,
- Important salmon spawning and fisheries habitat,
- Wildlife values including deer and wolf,
- Recreation and eco-tourism potential,
- Employment and economic development potential,
- Scenic values of Laredo Channel.

Kitasoo/Xaixais Management Objectives:

- Resource use while protecting cultural values,
- Archaeological studies for all areas during resource planning process,
- Kitasoo/Xaixais continue hunting and fishing,
- Resource use while maintaining wildlife habitat,
- Minimize impact on scenic values,
- Create jobs and economic development activities for Kitasoo/Xaixais workers,
- Co-management Agreement with Kitasoo/Xaixais before any resource planning or development begins.

Area 10 Surf Inlet Integrated Use Area

Ktasoo/Xaixais Values:

- Kitasoo/Xaixais archaeological and heritage values,
- Traditional hunting and fishing area of the Kitasoo/Xaixais people,
- Important salmon spawning and fisheries habitat,
- Wildlife values including deer, bear and wolf,
- Recreation and eco-tourism potential,
- Employment and economic development potential,
- Scenic values of Surf Inlet.

Kitasoo/Xaixais Management Objectives:

- Resource use while protecting cultural values,
- Archaeological studies for all areas during resource planning process,
- Kitasoo/Xaixais continue hunting and fishing,
- Resource use while maintaining wildlife habitat,
- Minimize impact on scenic values,
- Create jobs and economic development activities for Kitasoo/Xaixais workers,
- Co-management Agreement with Kitasoo/Xaixais before any resource planning or development begins.

Area 11 Aaltanhash / Butedale Integrated Use Area

Kitasoo/Xaixais Values:

- Kitasoo/Xaixais archaeological and heritage values,
- Traditional hunting and fishing area of the Kitasoo/Xaixais people,
- Important salmon spawning habitat,
- Recreation and eco-tourism potential.
- Wildlife values including bear, deer and wolf,
- Scenic values of the Inside Passage.

Kitasoo/Xaixais Management Objectives:

- Resource use while protecting cultural values,
- Archaeological studies for all areas during resource planning process,
- Kitasoo/Xaixais continue hunting and fishing,
- Low impact Kitasoo/Xaixais eco-tourism to create jobs and economic development opportunities,
- Resource use while maintaining wildlife habitat,
- Minimize impact on scenic values,
- Co-management Agreement with Kitasoo/Xaixais before any resource planning or development begins.

Area 12 Green Inlet / Carter Lake Integrated Use Area

Kitasoo/Xaixais Values:

- Kitasoo/Xaixais archaeological and heritage values,
- Traditional hunting and fishing area of the Kitasoo/Xaixais people,
- Important salmon spawning habitat,
- Wildlife values including deer, black and grizzly bear and wolf,
- Scenic values of the Inside Passage,
- Visual quality and recreation values of Green Wet Marine Park,
- Jobs and economic development opportunities for Kitasoo/Xaixais / Xaixais.

Kitasoo/Xaixais Management Objectives:

- Resource use while protecting cultural values,
- Archaeological studies for all areas during resource planning process,
- Kitasoo/Xaixais continue hunting and fishing,
- Resource use while maintaining wildlife habitat,
- Minimize impact on scenic values,
- In Green Inlet heli-logging is preferred over conventional logging to minimize roads and access,
- Co-management Agreement with Kitasoo/Xaixais before any resource planning or development begins.

Area 13 Tolmie Channel Integrated Use Area

Kitasoo/Xaixais Values:

- High cultural, heritage and fisheries values in Cougar Bay, Meyers Pass and Alexander Inlet,
- Traditional uses such as berry picking, use of medicines and wood for crafts and housing,
- Traditional hunting and fishing area of the Kitasoo/Xaixais people,
- Important salmon spawning habitat,
- High wildlife values including Kermode and black bear, deer and wolf,
- Create jobs and economic development activities for Kitasoo/Xaixais workers,
- Scenic values of the Inside Passage and Meyers Pass

Kitasoo/Xaixais Management Objectives:

- Resource use while protecting cultural values,
- Archaeological studies for all areas during resource planning process,
- Special environmental and archaeological assessment before low impact development in Cougar Bay or Alexander Inlet,
- Kitasoo/Xaixais continue hunting and fishing,
- Resource use while maintaining wildlife habitat,
- Minimize impact on scenic values
- Co-management Agreement with Kitasoo/Xaixais before any resource planning or development begins.

Area 14 Pooley / Roderick Islands Integrated Use Area

Kitasoo/Xaixais Values:

- High cultural, heritage and fisheries values in Windy Bay, Griffin Pass and James Bay,
- Traditional uses such as berry picking, use of medicines and wood for crafts and housing,
- Traditional hunting and fishing area of the Kitasoo/Xaixais people,
- Important salmon spawning habitat,
- Wildlife values including bear, deer and wolf,
- Create jobs and economic development activities for Kitasoo/Xaixais workers,
- Scenic values of the Inside Passage.

Kitasoo/Xaixais Management Objectives:

- Resource use while protecting cultural values,
- Archaeological studies for all areas during resource planning process,
- Special environmental and archaeological assessment before low impact development in Windy Bay, Griffin Pass or James Bay,
- Kitasoo/Xaixais continue hunting and fishing,
- Resource use while maintaining wildlife habitat,
- Minimize impact on scenic values,
- Co-management Agreement with Kitasoo/Xaixais before any resource planning or development begins.

Area 15 Mary's Cove / Roderick Lake Integrated Use Area

Kitasoo/Xaixais Values:

- Nearest traditional Kitasoo/Xaixais / Xaixais salmon fishery to the village of Klemtu
- Kitasoo/Xaixais salmon enhancement in Roderick Lake and Mary Cove creek,
- Important salmon spawning and rearing habitat,
- Deer, bear and wolf habitat,
- Kitasoo/Xaixais hunting and fishing area,
- Scenic values for the Inside Passage.

Kitasoo/Xaixais Management Objectives:

- Protect sockeye and other salmon habitat,
- Protect visual quality of the Inside Passage,
- All resources uses in the watersheds will be done by Kitasoo/Xaixais,
- Exclusive use area of the Kitasoo/Xaixais people.

Area 16 Swindle / Price Islands Integrated Use Area

Kitasoo/Xaixais Values:

- Present home of the Kitasoo/Xaixais people at Klemtu,
- High cultural, heritage and fisheries values around the village of Klemtu,
- Traditional uses such as berry picking, use of medicines and wood for crafts and housing,
- Traditional hunting and fishing area of the Kitasoo/Xaixais people,
- Water and hydro sources for Klemtu,

- Important salmon spawning habitat, Wildlife values including bear, deer and wolf,
- Create jobs and economic development activities for Kitasoo/Xaixais workers,
- Scenic values of the Inside Passage and near Klemtu.

Kitasoo/Xaixais Management Objectives:

- Resource use while protecting cultural values,
- Archaeological studies for all areas during resource planning process,
- Special environmental and archaeological assessment before low impact development near Klemtu,
- Protect water and hydro sources for Klemtu,
- Kitasoo/Xaixais continue hunting and fishing,
- Resource use while maintaining wildlife and fisheries habitat,
- Minimize impact on scenic values,
- Kitasoo/Xaixais exclusive resource use area.

Area 17 Mathieson Channel / Dowager Island Integrated Use Area

Kitasoo/Xaixais Values:

- Kitasoo/Xaixais archaeological and heritage values,
- Traditional hunting and fishing area of the Kitasoo/Xaixais people,
- Important salmon spawning habitat,
- Wildlife values including deer and wolf,
- Scenic values of Mathieson Channel and access to Kynoc Protected Area.

Kitasoo/Xaixais Management Objectives:

- Resource use while protecting cultural values,
- Archaeological studies for all areas during resource planning process,
- Kitasoo/Xaixais continue hunting and fishing,
- Resource use while maintaining wildlife habitat,
- Minimize impact on scenic values,
- Co-management Agreement with Kitasoo/Xaixais before any resource planning or development begins.

4.0 IMPLEMENTATION

As stated in Section 3.0 the Kitasoo/Xaixais people are negotiating a Treaty with Canada and British Columbia. As outlined in the "Statement of Comprehensive Claim" in Section 2.0 the Kitasoo and Xaixais First Peoples of Canada hold aboriginal rights and title to their traditional territories. This land and resource plan is an important mechanism for the Kitasoo/Xaixais to exert their rights and title.

To implement this plan the Kitasoo/Xaixais will be reaching out to other governments, environmental groups and resource developers to serve the objectives of creating a sustainable environment, culture and economy. We welcome those who want to work with us. Before any development takes place, or any outside interests, attempts to plan or manage Kitasoo/Xaixais lands or resources a **Co-Management Agreement (CMA)** will be negotiated that will include the following:

1. The parties will adopt the "Kitasoo/Xaixais First Nation Land and Resource Protection and Management Plan".
2. Companies or governments who want to use or develop Kitasoo/Xaixais lands or resources will negotiate a Co-Management Agreement prior to any planning or development. The CMA will include:

A. A process of consultation with the Kitasoo/Xaixais for the following during planning and development processes:

I. Environmental planning,

II. Parks and protected area designation,

III. Forest development including:

- Timber Supply Review,
- Forest Management Planning,
- Forest Development Planning,
- Silviculture Prescriptions,
- Cutting Permits Application,
- Field review of the above.

IV Mining development including:

- Mining Development Permits,
- Applications to Lands Branch,
- Environmental Assessment,
- Archaeological Impact Assessment,

V Tourism Development.

B. Provisions for the preparations of inventories and information sharing in Traditional Use Studies and Archaeological Impact Assessments.

C. Planning or development will not proceed without the written consent of the Kitasoo/Xaixais people.

D. Compensation would be paid to the Kitasoo/Xaixais First Nation in the following ways:

- Right of First Refusal on all tourism forestry or mining jobs,
- Training for Kitasoo/Xaixais loggers,
- Encourage logging contractors to hire Kitasoo/Xaixais people,
- Funding for capacity, etc.,
- Assistance with community infrastructure,
- Assistance with planning and management of Kitasoo/Xaixais Timber Sale Licence.

E. The Co-Management Agreement will be linked to a Kitasoo/Xaixais Land and Resource Protection and Management Plan that will identify areas that will be protected and areas where integrated management, including logging could take place.

F. The establishment of rates of harvest and resource extraction will be based on the Kitasoo/Xaixais Land and Resource Protection and Management Plan and what is sustainable.

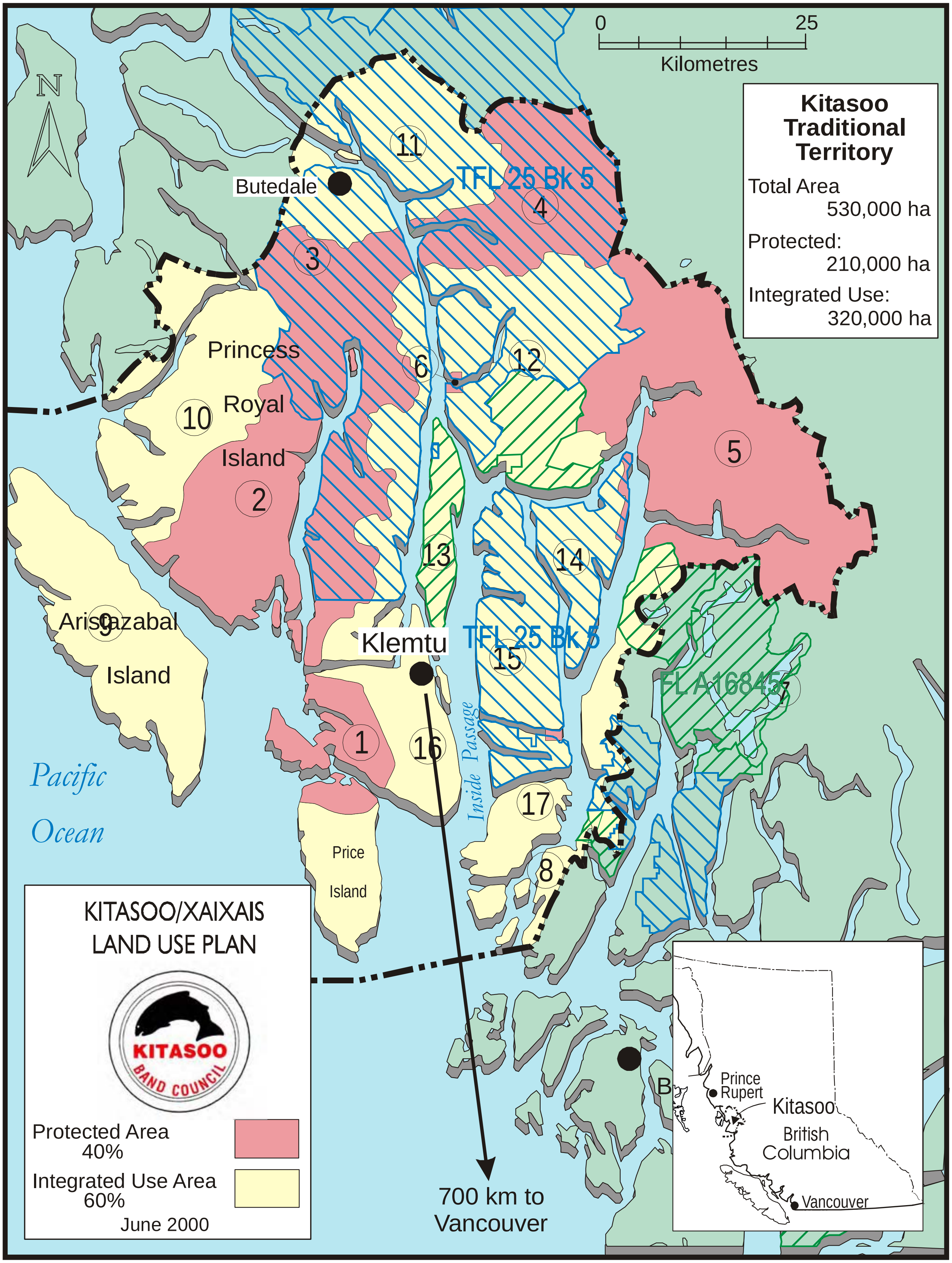
G. The Co-Management Agreement will also include Kitasoo/Xaixais acknowledgment that the wood and resources from the area will meet certification standards.

3. Environmental Action

All environmental actions affecting Kitasoo/Xaixais Lands and Resources will be controlled by the Kitasoo/Xaixais government. The hereditary Chiefs of the Kitasoo/Xaixais speak for the Kitasoo/Xaixais people, No one but our chiefs has the authority to use our crests, emblems, dances or stories. Other First Nations understand and respect this protocol. Others should respect the culture and rights of our people before speaking on behalf of us or on issues that affect our lands, resources, wildlife and environment. The Kitasoo/Xaixais people want to work with those who respect our laws and traditions.

Therefore, before speaking on behalf of our people or territory an "Environmental Protocol" will be developed with us so that we can stand up and speak together on environmental issues. An Environmental Protocol will include the following:

1. Acceptance of the "Kitasoo/Xaixais First Nation Land and Resource Protection and Management Plan",
2. Meeting with the community, Chiefs, and elders in Klemtu to discuss environmental issues,
3. Public relations that will define the environmental message and who will deliver the message,
4. The hiring of Kitasoo/Xaixais people when environmental studies, media film or eco-tourism ventures are developed.



0
25
Kilometres
N
Kitasoo Traditional Territory
Total Area
530,000 ha
Protected:
210,000 ha
Integrated Use:
320,000 ha
Butedale
TFL 25 Bk 5
Princess Royal Island
Aristazabal Island
Klemtu
TFL 25 Bk 5
FL A16845
Inside Passage
Pacific Ocean
Price Island
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
KITASOO/XAIXAIS LAND USE PLAN
KITASOO BAND COUNCIL
Protected Area 40%
Integrated Use Area 60%
June 2000
700 km to Vancouver
B
Prince Rupert
Kitasoo
British Columbia
Vancouver

THE KITASOO/XAI'XAIS NATION AND THE COMMUNITY OF KLEMTU

Klemtu is a small village on Swindle Island, situated on the province's spectacularly beautiful central coast. Two distinct tribal organizations live there: the Kitasoo who were originally from Kitasu Bay and the Xai'xais of Kynoc Inlet. The Kitasoo/Xai'xais people are the only permanent residents within the traditional territories of the First Nation.

The Kitasoo/Xai'xais Nation has a total membership of approximately 460 people. The population of the community has doubled in the past two decades and is expected to continue growing at that same rate.

For years, the mainstay of the Kitasoo/Xai'xais economy was commercial and food fishing. However, the severe downturn in fish stocks has had a devastating impact on employment levels. To cope with this situation, the Kitasoo/Xai'xais felt it was imperative to diversify their economy. They are now turning to tourism, aquaculture and forestry to create employment opportunities for their people.

While deeply aware of the need to provide jobs for their people, the Kitasoo/Xai'xais also embrace the important environmental, cultural and ecological values of their territory. They want to protect fish and wildlife habitats, including that of the Kermode White Bear, flora, and all the other important elements of a forest's ecosystem. They wish to preserve their cultural values as well. Their task is to balance the ecological values with the rights and needs of their community for economic health, including lasting job creation.

They believe the landmark environmental protocol that will set aside 40 per cent of their territory, as a protected area is the way to preserve all of these fundamental values.

For Further Information:
Erin Airton Tel: 604-808-6420
Grant Scott Tel: 250-480-8193

Kermode Bear

The Kermode bear is thought by scientists to be a genetic variation of the black bear that roams throughout British Columbia. They believe that the presence of a single recessive gene in these creatures is responsible for the white coat that as many as one in ten of these bears is born with and retain throughout their lives.

While the Kermode bear has been sighted in northeastern British Columbia and as far east in North America as Minnesota, it lives in the greatest numbers on the islands off the north-central coast of British Columbia. White coat Kemode bears are found most frequently on Gribbell Island and Princess Royal Island, situated between the coastal mainland and the Queen Charlotte Islands. Scientists believe there is such a high concentration of the white coat Kermode bears on these islands because they are geographically isolated from other black bear populations.

Scientists estimate there are 1,200 black and white Kermode bears in the coast area that stretches from around the northern tip of Vancouver Island northwards to the Alaska panhandle. On Gribbell Island, up to 30 per cent of the bears can be white while on the larger Princess Royal Island, about 10 per cent have the white coat.

The Kermode white bear fascinates geneticists and wilderness lovers. Scientists, keen to isolate the gene that causes the white coat, are conducting DNA analysis on the bear so that they can determine how common it is elsewhere on the continent. They also want to determine whether the Kermode white bear is a race or simply the product of a concentration of a gene in a given area. Researchers have been analyzing fur samples from “rubbing” trees used by the bears, and have set out snares across trails to capture hairs to examine for genetic information.

For further information:
Erin Airton Tel: 604-808-6420
Grant Scott Tel: 250-480-8193

IMPLEMENTATION PROTOCOL
FOR GITGA'AT/KITAS00/XAIXAIS TRADITIONAL TERRITORIES

Whereas the parties acknowledge the importance of breathing new life into the Aboriginal Rights of the Gitga'at and Kitasoo/Xaixais First Nations; and

Whereas the parties acknowledge the interconnectedness of life and the importance of protecting biodiversity for future generations; and

Whereas the parties acknowledge the need for sustainable Gitga'at and Kitasoo/Xaixais community economic development; and

Whereas the parties acknowledge the benefits of a collaborative process;

Be it resolved that the parties who have signed this protocol agree:

1. To use the Gitga'at and Kitasoo/Xaixais sponsored land use planning processes and decisions as the initial foundation for conservation, resource planning and development in the region.

2. To integrate Turning Point, the Joint Solutions Project, the Land and Resource Management Process and other relevant processes.

3. To pursue an approach to the implementation of conservation, resource planning and development in the traditional territories of the Gitga'at and Kitasoo/Xaixais, which includes possible joint work on:
   - Ecological research and analysis;
   - Implementation of Ecosystem Based Management;
   - Development of a local Ecosystem Based Management infrastructure;
   - Development of a regional ecologically and culturally sensitive tourism strategy;
   - Restoration of fish and fish habitat; and,
   - Other issues as may be identified

4. To explore ways to create sustainable jobs, economic and social development opportunities for First Nations communities.

5. This protocol is without prejudice to Treaty processes and to other protocols and agreements between any of the signatories.

6. To establish a trust or other organizational mechanisms and funding opportunities to help pursue activities envisioned in this protocol.

7. To develop and implement an action plan upon the signing of this protocol.

Signed April 20, 2001

Kitasoo/Xaixais First Nation

Chief Archie Robinson

Chief Gary Hall

Percy Starr - Negotiator

Ben Robinson - Negotiator

Chief Brian Mason Sr.

Chief Darren Edgar

Gitga'at First Nation

Chief Heber Clifton

Chief Ernest Hill jr.

Chief Albert Clifton

Art Sterritt - Negotiator

Chief William Clifton

Natural Resource Defence Council

Matt Price

Greenpeace Canada

Catherine Stewart

David Suzuki Foundation

Tara Cullis

Sierra Club of British Columbia

Merran Smith

Weyerhaeuser

Linda Coady

International Forest Products

Tom Lundgren

Western Forest Products

Bill Dumont

Olsen Management Group

Tom Olsen

Appendix XIX

Protocol Agreement on

Land Use Planning and Interim Measures

GENERAL PROTOCOL AGREEMENT ON
LAND USE PLANNING AND INTERIM MEASURES

Between

Gitga'at First Nation
Haida Nation
Haisla Nation
Heiltsuk Nation
Kitasoo/Xaixais First Nation
Metlakatla First Nation
Old Massett Village Council
Skidegate Band Council

(The First Nation(s))

And

THE GOVERNMENT OF THE PROVINCE OF BRITISH COLUMBIA
(The Province)
(The Parties)

1.0 PREAMBLE

WHEREAS the Parties are committed to work together in the spirit of mutual recognition, respect and reconciliation on a government-to-government basis to resolve land-use conflicts and to implement interim measures initiatives;

WHEREAS the Parties agree upon the importance of establishing and maintaining processes that are open and inclusive;

WHEREAS the Parties acknowledge that the First Nations will negotiate a parallel agreement with Canada on Interim Measures, including aquatic and fisheries resources; and

WHEREAS this " General Protocol Agreement" may provide the framework to support specific Protocol Agreements between the Province and First Nations.

2.0 UNDERSTANDINGS OF INTERIM MEASURES

(a) Interim Measures should be seen as an implementation vehicle to provide First Nations with cultural and economic benefits arising from land use decisions.

(b) Interim Measures will be implemented within the framework of existing legislation, and in specific circumstances, the Province may want to initiate legislative amendments that support implementation of interim measures.

(c) This Protocol recognizes two categories of interim measures:

   i.) In conjunction with the geographic specific land use planning process, British Columbia and the First Nation(s) may enter into an agreement regarding interim measures arrangement that will be pursued parallel to the start-up of the land use planning process. The agreement would define opportunities for capacity building and training, economic development, business planning and provide linkages to front-end decisions made in the land use planning process concerning land and resources.

   ii.) Following completion of the land use planning process, government and First Nations may consider interim measures that flow from the recommendations of the land use plan and land use decisions of government. These interim measures may be stand-alone agreements or may be linked to negotiations of treaties.

(d) The Parties acknowledge that the understandings in this Protocol of interim measures apply only to this agreement and the implementation of this Protocol.

3.0 LAND USE PLANNING

(a) Government-to-Government Process

i.) Where the Province intends to undertake a land use planning process in a designated geographic area, the Province will work with First Nations to define principles, anticipated scope and outcomes of the land use planning process.

ii.) Land use planning recommendations will be developed in an inclusive planning forum in which First Nation(s), British Columbia, communities, stakeholders are all participants. The inclusive planning forum will operate on the principle of shared decision making with the objectives that all participants will commit to seek a consensus on land use recommendations.

iii.) The First Nation(s) in the development of their land use plans will be guided by the Ecosystem Based Management Framework[47] and will also use and support the Information Body[48].

iv.) British Columbia will also be guided by the Ecosystem Based Management Framework and will use and support the Information Body for future land use plans covered by this agreement.

v.) Where a First Nation(s) cannot agree to a recommendation(s) from the inclusive planning forum, a government-to-government process will be established to attempt to resolve the outstanding matter(s) directly with the Province of British Columbia.

vi.) Land use planning does not change the jurisdiction and authorities of the Parties.

(b) Land Use Plans for the Central Coast, Kalum, Haida Gwaii and North Coast

i.) First Nations that have linkages to the Central Coast and Kalum LRMP processes can meet with the Province to review land use recommendations (i.e. Kitasoo Land Use Plan).

ii.) In the development of the Land Use Plans for Haida Gwaii, in addition to the process identified in 3.0(a), the Haida and the Province will identify issues of concerns that require immediate resolution. As part of a specific agreement the Haida Nation may bring forward potential deferrals that would help maintain options while land use planning is underway.

iii.) In the development of the Land Use Plan for the North Coast, the Tsimshian First Nations whose traditional territory is on the North Coast and who are signatories to this Agreement will be guided by the understandings in this Protocol Agreement and the Tsimshian Nation Tripartite Accord on Land and Resources. The Parties involved in the Land Use Plan for the North Coast will identify issues of concerns that require immediate resolution. As part of a specific agreement First Nation(s) may bring forward potential deferrals that would help maintain options while land use planning is underway.

1.1

[47] Ecosystem Based Management Framework is as defined in Appendix I.
[48] Information Body is as defined in Appendix II.

4.0 INTERIM MEASURES

(a) Forestry Interim Measures

i) The Province agrees to identify opportunities and assist to develop measures to facilitate First Nation involvement in forestry economic development initiatives including:

- joint ventures with existing forest licensees and contractors;
- forest tenures, which may include Community Forest Pilot Agreements;
- the development of a forest management workforce, including silviculture crews;
- involvement in contracting for forest management services; and
- other forest related opportunities.

ii) The Province agrees to enter into discussions with the representatives of First Nation(s) who are signatories, to identify timber availability, forest business opportunities, and negotiate a forest resourcing plan to support the development of strong business plans and capacity building for First Nation. Canada and the Licence Holders will be asked to participate in these discussions.

iii) The Parties recognize and acknowledge that opportunities that currently exist and are in place will be part of the considerations under 4 (a).

(b) Tourism Interim Measures

- First Nations and the Province will work together to develop a comprehensive tourism strategy for the Coast. Canada and the tourism industry will be asked to participate in these discussions.

5.0 LINKAGE – Specific Agreements

British Columbia may enter into Agreements with specific First Nations, consistent with this General Protocol Agreement. The major features of these Agreements will be as follows:

(a) Land Use Planning

- The Agreement concerning land use planning may contain the following:

i) the scope and intent of the land use plan and the principles upon which land use planning would be based;

ii) resources to enable the First Nation to undertake land use planning and to prepare for engagement in the inclusive land use planning process;

iii) mechanisms and processes for the First Nation participation in the inclusive provincial land use planning process;

iv) definition of the government to government forum to discuss outstanding issues not resolved in the inclusive process; and

v) definition on how interim measures will proceed both during and following the completion of the land use plan and provides linkages to inclusive strategies that support economic diversification and mitigation.

(b) Interim Measures Agreements

- Forestry Interim Measures may be negotiated to support the following:

i) identify opportunities to facilitate First Nation's involvement in forestry economic development initiatives (see 4 (a) i)); and

ii) development of a detailed business plan from the First Nations.

- Tourism Interim Measures may be negotiated to support the development of business plans to advance tourism developments.

6.0 NOTWITHSTANDING

This Protocol document is a statement of political intent by the Parties and is not legally binding and is not intended to define, create, recognize, deny or amend any of the rights of the Parties, including Aboriginal or treaty rights within the meaning of section 25 and 35 of the Constitution Act 1982.

This Protocol does not create any financial obligations on the part of the Parties.

The Parties agree that other First Nations that have traditional territories in the central and north coast may at a later date be appended as a signatory to this Protocol.

First Nations Representatives		***Government of British Columbia***	
Council of the Haida Nation	Date	Minister of Environment	Date
Gitga'at First Nation	Date	Minister of Forests	Date
Haisla Nation	Date	Minister of Aboriginal Affairs	Date
Heiltsuk Nation	Date	Minister of Small Business Tourism and Culture	Date
Kitasoo/Xaixais First Nation	Date		
Metlakatla First Nation	Date		
Old Massett Village Council	Date		
Skidegate Band Council	Date		

APPENDIX I: Definition, Principles and Goals of Ecosystem Based Management

Included as Appendix XVII of TFL 25 Management Plan 10

APPENDIX II: Information Body

This is a multi-disciplinary Team dedicated to the provision of relevant ecological, socio-economic, technical, traditional and local information that will assist the Central Coast Completion Table in developing practical recommendations to resolve land use and natural resource management issues. This information is intended to complement the technical resources normally provided by Governments to these planning tables. The Team will adopt a " participatory approach" to information development by engaging with affected interests through the Team Steering Committee as well as other mechanism's (such as workshops). The Team is brought together with resources from Provincial Government, First Nations, Non-Government Organizations and the Private Sector. The Team includes representatives from First Nations, local communities and expertise in all of the relevant fields organized into several working groups. The Team provides information to the land use planning tables formed on the central and north coast. The Team also provides technical and data support to the development Central and implementation of Pilot Projects which are testing and demonstrating Ecosystem Based Management and Planning at the landscape and stand level.

Appendix XX

Twenty-Year Plan &

Operability Criteria

(Twenty-Year Plan submitted to
MOF District Managers Under Separate Cover)

Operability Classification - TFL 25

TERMS OF REFERENCE
April 24, 2000

1) SOURCES OF INFORMATION

a) Resource Inventories

(i) Operational mapping
Forest cover and topography - K.C. Hoel; 1:5,000 scale; 7.6 meter and/or 10 meter contour intervals
(ii) Forest cover mapping - 1: 20,000 scale
(iii) Terrain stability overview mapping (TSIL "C") - T. Lewis; MoF 5 Class System; 1:20,000 scale; (TFL 25 Block 5 – Partial)
(iv) Stream classification mapping - WFP; known fish streams; 1:20,000 scale

b) Reconnaissance

(i) Aerial
(ii) Ground

c) Photography

(i) 1:15,000 scale aerial photography (1995)

2. ASSUMPTIONS AND PLANNING CONSIDERATIONS

Terrain Stability Note:

The level "C" terrain stability overview mapping is by definition, a relatively coarse filter. Local knowledge and historical evidence show that, at a more refined level, Class 4 and Class 5 terrain as identified on the overview may include terrain of more stable classifications. There will, therefore, be areas identified as operable, which will be in apparent conflict with the overview mapping.

Prior to any development activity, terrain stability field assessments are conducted on all areas identified on the overview as having stability concerns, and as required by the Forest Practices Code.

a) Forest Road Specifications

(i) Grades
(1) Favourable
(a) Maximum sustained grades of +20%
(b) Switchbacks and short pitches up to +24%
(2) Adverse
(a) Maximum sustained grades of -10%
(b) Switchbacks and short pitches up to -15%
(ii) Terrain
(1) Historically, it has been demonstrated that roads can be successfully constructed through inclusions of Class 4 and 5 terrain to access timber (terrain field assessments will be conducted prior to development as per the Forest Road Regulation).

(2) Roads can be constructed on Class 1 through 3 terrain.

b) Yarding Systems - Physical Constraints

(i) Conventional Yarding Systems (OC or OCE)

Conventional yarding is subdivided into two operable types based on forest cover: "**O**perable **C**onventional" (**O$_C$**) and "**O**perable **C**onventional with **E**conomic constraints based on forest cover" (**O$_{CE}$**). (Refer to section 2)c); Yarding Systems - Forest Cover Constraints). The physical constraints described hereafter apply to both conventionally operable subtypes.

(1) Highlead (includes 27.4 meter tower and grapple yarders)

(a) Square Lead
- (i) 200 meters preferred maximum yarding distance.
- (ii) 250 meters acceptable in occasional situations with adequate deflection.

(b) Corners
- (i) 300 meters preferred maximum yarding distance.
- (ii) 350 meters acceptable in occasional situations with adequate deflection.

(c) Terrain
- (i) Adequate deflection is required on Class 4 terrain.
- (ii) Not considered on Class 5 mapped polygons.

(2) Longline

(a) Distance Constraints - Uphill Yarding
- (i) Maximum yarding - 800 meters
- (ii) Optimum yarding – 450 meters
- (iii) Maximum tail hold - 1000 meters

(b) Distance Constraints - Downhill Yarding
- (i) Maximum yarding and tail hold - 650 m
- (ii) Optimum yarding – 350 meters

(c) Considered on Class 5 terrain with drop-line carriage.

(d) Situations indicating consideration for use
- (i) Terrain stability concerns
  1. Largely continuous terrain Class 4 road development required to yard conventionally.
  2. Improve deflection to minimize ground disturbance.
- (ii) Portion of setting inaccessible by road due to terrain constraints.
  1. Class 5 terrain
  2. Rock bluffs
  3. Canyons
- (iii) Minimize isolation of timber
- (iv) Economics dictates skyline over additional and / or expensive road.

(3) Ground based (hydraulic hoe forwarders) (note: this type may also include ground based systems used in alternative systems such as forwarders and skidders where suitable).

(a) Distance Constraints
- (i) 200 meters maximum distance to road site.
- (ii) May be used, where economically feasible, to forward to cable system.

(b) Terrain
- (i) Class 1 and 2 terrain with minor inclusions of Class 3.

(ii) 30% maximum sustained slope.
(iii) Inclusions of broken and steeper ground acceptable.
(iv) May be used on wetter ecosystems where suitable puncheon material and/or drier hummocks are available.

(ii) Non-Conventional Yarding Systems

Non-conventional yarding is subdivided into two operable types, **O**perable **H**elicopter (**O_H**) or **O**perable **H**elicopter with **E**conomic constraints (**O_{HE}**). (Refer to section 2) c); Yarding Systems - Forest Cover Constraints). The physical constraints hereafter apply to both the economically constrained and non-economically constrained helicopter operable types.

(1) Helicopter (**O_H** or **O_{HE}**)
(a) Flight Distance
(i) Less than 1.0 kilometer preferred.
(ii) Up to 2.0 kilometers acceptable where no alternative exists.
(b) Both water and land drops are considered.
(c) Uphill flight acceptable using same constraints as in (1) above.
(d) Situations indicating consideration for use;
(i) Timber inaccessible by road due to terrain constraints
1. Class 5 terrain
2. Rock bluffs
3. Canyons

c) Yarding Systems - Forest Cover Constraints

As previously mentioned, forest cover is broken into two operable types, one with economic constraints (denoted by the subscript "E" in the operability descriptor) and the other without economic constraints (and no modifier in the descriptor).

The economic constraint is indicative of timber which is on the margin of operability in terms of volume, quality and species. In good economic times, operability types with the "E" modifier will be operable. In poor economic times these same types may not be operable. These types are seen as opportunity timber and given the unpredictability of the economy, should have no associated requirement to harvest for cut control purposes.

(i) Conventional yarding systems (OC)
(1) All height class 4 and greater.
(2) All height class 3 with cedar, cypress, Douglas fir or spruce as primary or secondary species with the exception of stocking class 3 stands (< 40% crown closure) which are excluded.

(ii) Conventional Yarding Systems with Economic Constraints (OCE)
(1) Height class 3 standards with hemlock or balsam as primary species which are not in close proximity to OC types described in points (1) and (2) above.
(2) Stocking class 3 (< 40% crown closure) stands Douglas fir, cedar, cypress or spruce as primary or secondary species.
(3) Deciduous stands - operability determination based upon stand attributes and topography.

(iii) Non-Conventional Yarding Systems

(1) Helicopter (OH)

(a) All height class 4 and greater

(b) All height class 3 stands with cedar, cypress, spruce or Douglas fir as primary species (excluding stocking class 3 stands) that are in close proximity to $\mathbf{O_H}$ (height class 4 and better) and/or $\mathbf{O_C}$ types

(2) Helicopter with Economic Constraints (O $\mathbf{O_{HE}}$)

(a) Height class 3 stands with cedar, cypress, spruce or Douglas fir as primary species (excluding stocking class 3 (< 40% crown closure) stands) which are not in close proximity to $\mathbf{O_H}$ or $\mathbf{O_C}$ types

(b) Height class 3 stands with cedar, cypress, spruce or Douglas fir as secondary species with the exception of all height class 3 stocking class 3 combinations which are excluded.

(c) Pure hemlock balsam height class 3 stands are excluded

d) Economically Inoperable Forest Cover (IE)

(1) All mature height class 1 and 2

(2) Pure hemlock balsam height class 3 stocking class 3 open stands

(3) Pine dominant stands

e) Physically Inoperable Lands (IP)

(1) All non-productive types (i.e. rock, brush, swamp, alpine, lakes, rivers, dryland sorts, camps, quarries, etc.)

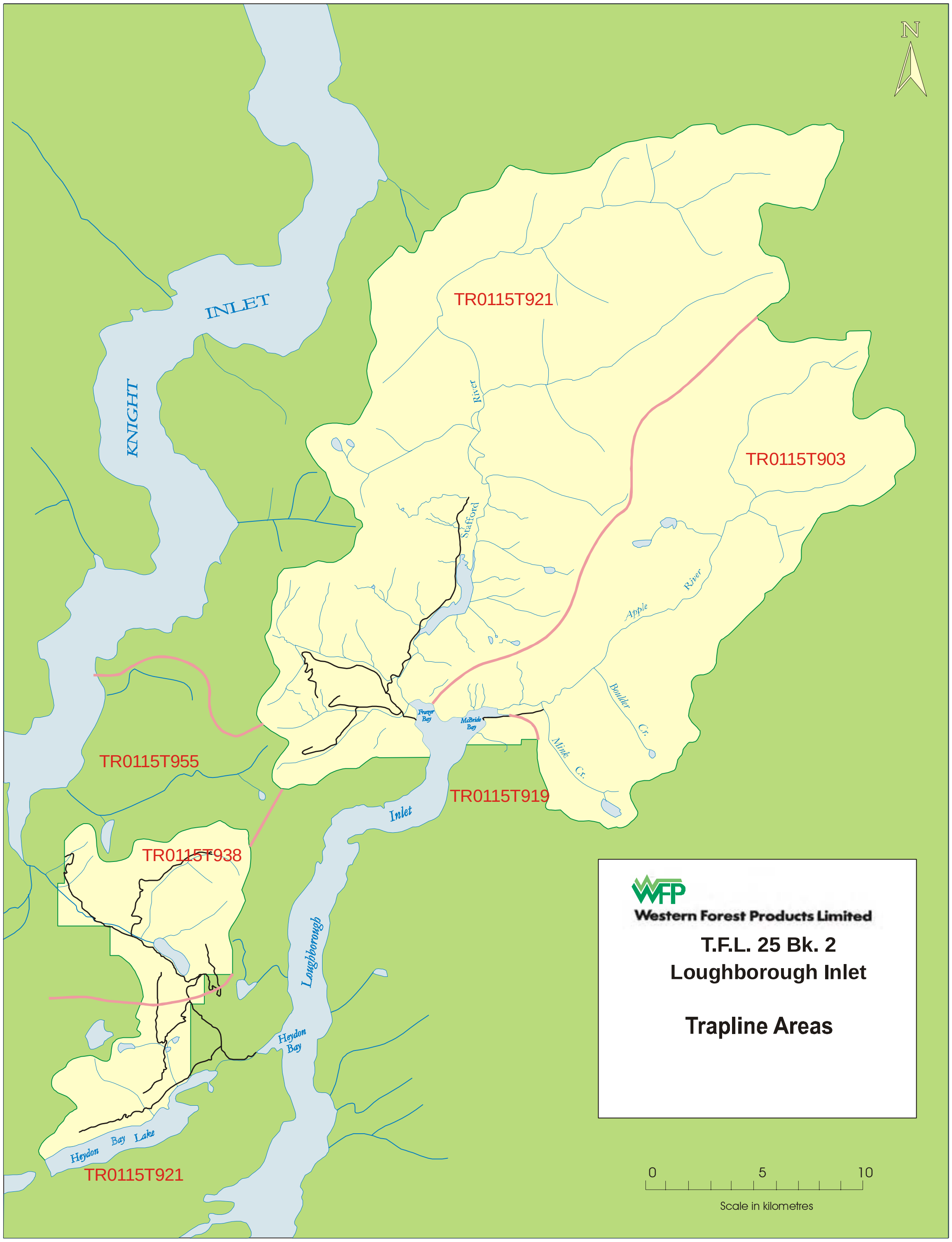
(2) Land feature limitations (eg. major gullies)

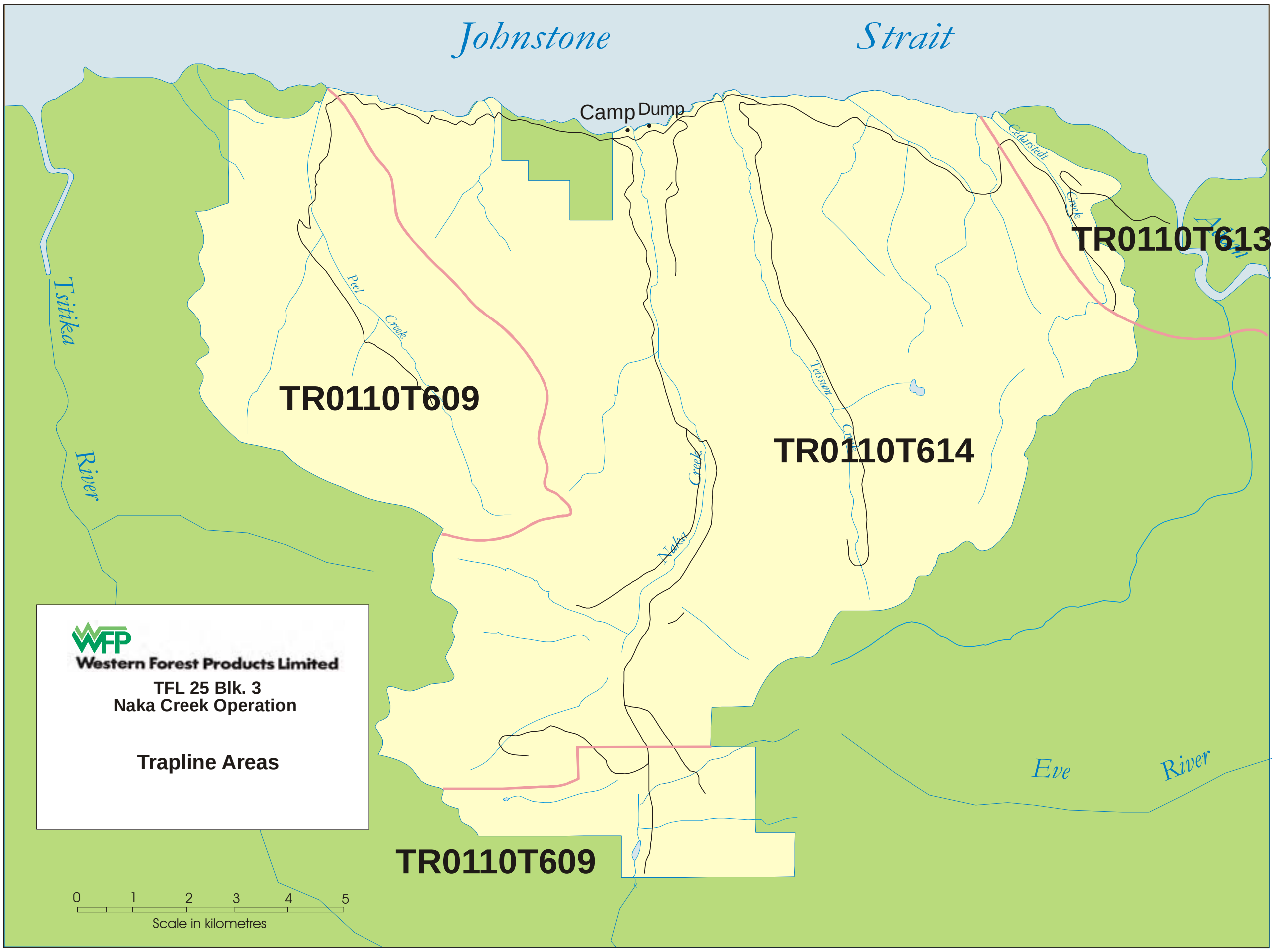
(3) Areas rendered physically and/or economically inaccessible by extreme terrain and/or distance (including those areas to which access is physically possible, but so onerous that it is economically prohibitive).

Appendix XXI

Designated Trapping Areas


TR0103T105
Currently Vacant
TR0103T100
TR0103T108
Kludahk
Trail
Parking
Lot
TR0103T107
TR0103T112
Loss Creek
Prov. Park
Magdelena
Point
San Simon
Point
Point No Point
(Glacier)
Sheringham
Point
Otter
Point
Sooke
Pothole
Prov. Park
TR0103T112
Western Forest Products Limited
TFL 25 BK 1 Jordan River
Trapline Areas
0
2
4
6
Scale in kilometers


INLET
KNIGHT
TR0115T921
TR0115T903
TR0115T955
TR0115T919
TR0115T938
TR0115T921
Stafford
River
Apple
River
Boulder
Cr.
Mink
Cr.
Inlet
Loughborough
Heydon
Bay
Heydon Bay Lake
N
Western Forest Products Limited
T.F.L. 25 Bk. 2
Loughborough Inlet
Trapline Areas
0
5
10
Scale in kilometres


Johnstone Strait
Camp
Dump
Tsitika River
Peel Creek
Naka Creek
Tessum Creek
Cedarstedt Creek
Eve River
TR0110T609
TR0110T614
TR0110T613
TR0110T609
Western Forest Products Limited
TFL 25 Blk. 3
Naka Creek Operation
Trapline Areas
0 1 2 3 4 5
Scale in kilometres


Western Forest Products Limited
TFL 25 Bk 5
Trapping Areas
KITIMAT
Hawkesbury
Island
Gribbell
Island
Gill
Island
Princess
Royal
Island
Aristazoba
Island
BUTEDALE
KLEMTU
Swindle
Island
Sarah
Island
Roderick
Island
Price
Island
Dowager
Island
Pooley
Coldwell
Peninsula
Florence
Peninsula
Yeo
Island
Chatfield
Island
Cunningham
Island
Denny
Island
King
Island
BELLA
BELLA
RANGE 4
COAST L.D.
RANGE 3
COAST L.D.
Kitlope
Provincial
Park
Fiordland
Recreational
Area
TR0603T052
TR0603T051
TR0603T050
TR0603T044
TR0603T062
TR0603T049
TR0603T043
TR0603T091
TR0603T061
TR0603T097
TR0603T060
TR0603T048
TR0603T092
TR0603T011
TR0603T006
TR0603T020
TR0603T023
TR0603T016
TR0603T007
TR0603T010
TR0603T004
TR0603T019
TR0603T110
TR0603T111
TR0603T003
TR0603T107
TR0603T109
TR0603T108
TR0509T021
TR0509T013
TR0509T014
0 5 10 15 20
Scale in kilometers


Western Forest Products Limited
TFL 25 Bk 6
Sewell Inlet
Trapline Areas
GRAHAM ISLAND
Skidegate Channel
Skidegate Lake
Blk. 1
TR0612T019
Moresby
Gillat Arm
Dawson Cove
Cumshewa Inlet
Carmichael Pass
TR0612T020
Hibben Island
Kuper Inlet
LOUISE ISLAND
TR0612T017
Lagoon Inlet
Moresby Lake
MORESBY
TR0612T015
Sewell Inlet
Selwyn Inlet
Laskeek Bay
Newcombe Inlet
Blk. 2
TR0612T013
TALUNKWAN IS.
TR0612T014
TR0612T012
Dana Inlet
Barrier Bay
Tasu Sound
Westfrob Mines
Wilson Bay
Logan Inlet
TANU IS.
Richardson Inlet
Darwin Sound
0612T010
Pacific Ocean
0
5
10
Scale in kilometres
ISLAND
Gwaii Haanas
South Moresby National Park Reserve
LYELL IS.

Appendix XXII

Silviculture Standards for TFL 25

WESTERN FOREST PRODUCTS LIMITED
SILVICULTURE STANDARDS

BIOGEOCLIMATIC SUBZONE CWHxm | TFL 25 Block 1 | Location: Jordan River

Description						Targets						Standards												
													Min. Intertree Distance (m)[2]		Free Growing						Juvenile Spacing Density[5]			
							Recommended Species																	
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives[7]	Preferred Site Prep. Method[1]	Preferred (P)	Acceptable (A)[4]	Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. sph[3]	Ht (m)	Min. sph	Max sph	Target
A1	01	3-4	B-C	M	S+F+P	B,M,PB	Pw[p1] Fd[f1] Dr[d1]Vb[d1]	Cw[c2c4]	900	500	400	P+N	2.0	2.0	3	150	Pw 2.5 Fd 3.0 Cw 1.5	8	11	10,000	4.0-8.0	800	1200	1000
A2	01	2-3	B-C	M	S+F+P	B,M,PB	Fd[f1]	Pw[p1] Cw[c2]	900	500	400	P+N	2.0	2.0	3	150	Pw 2.5 Fd 3.0 Cw 1.3	8	11	10,000	4.0-8.0	800	1200	1000
A3	03	1-2	A-B	M	S+F	PB	Fd[f1]	Pl	800	400	400	P+N	2.0	2.0	3	150	Fd 2.0 Pl 1.3	8	11	10,000	N/A	N/A	N/A	N/A
A4	02	0-1	A-C	M	S+F	PB	Fd[f1] Pl		400	200	200	P+N	2.0	2.0	3	150	Fd 2.0 Pl 1.3	8	11	10,000	N/A	N/A	N/A	N/A
A5	05	3-4	D-E	H	S+F+P	B,M,PB	Fd[f1] Cw[c2] Bg[b1] Dr[d1]		900	500	500	P+N	2.0	2.0	3	150	Fd 4.0 Cw 2.0 Bg 3.5 Dr 4.0	8	11	10,000	4.0-8.0	800	1200	1000
A6	12	7	C-E	VH	S+F	B,M	Cw[c2] Dr[d1]		800	400	400	P+N	2.0	2.0	3	150	Cw 1.0 Dr 3.0	8	11	5,000	4.0-8.0	800	1200	1000
A13	04	1-2	D-E	L	S+F+P	M,PB	Pw[p1] Fd[f1]	Cw[c2c4]	900	500	400	P+N	2.0	2.0	3	150	Fd 2.5 Cw 1.3 Pw 2.5	8	11	5,000	4.0-8.0	800	1200	1000

Comments: Natural stocking is achieved by natural regeneration.

1. Site preparation objective is to secure plantable spots. Not required if stocking level is achieved. NT=No Treatment.
2. Intertree spacing on roadside management units may be reduced to 1.0 metres.
3. Maximum density is applicable as long as Section 41 of the Timber Harvesting and Silviculture Practices Regulation remains in force.
4. Any coniferous species not listed may be accepted up to 10% of target stocking if height is greater than the lowest minimum height listed for the EA.
5. Target assumes typical stocking. Minimum and maximum stocking range is to accommodate variable stocking conditions.
6. Corporate policy is to manage towards targets. As guidance, any site units less than 80% of target and/or any subpolygons (>0.5 ha) less than 50% of target are to be evaluated, and at the Resident Forester's discretion, treated to increase stocking levels.
7. S=Sawlogs, F=Fibre, P=Poles

[b1] Where wooley aphid infestations are nearby or expected to spread to, no more than 10% of well-spaced *Abies* stocking can be deemed Preferred or Acceptable.
[c2] Cw (or Yc) may be moderately to heavily browsed by deer in certain locales necessitating browse protection when necessary.
[c4] Cw becomes preferred in root rot pockets.
[d1] Deciduous species may be preferred only in preidentified trial patches < 2ha.
[f1] *Phellinus* root rot pockets can limit reforestation to this species unless mitigative actions (e.g. stumping or resistant species) are taken in root rot pockets. This species is not to be counted as well-spaced within root rot centers.
[p1] White pine blister rust hampers reforestation with this species. No more than 10% and no more than 30% of well-spaced stocking can be deemed Preferred or Acceptable respectively. Where a pruning regime or/and resistant stock is used up to 50% of well-spaced stocking may be Preferred or Acceptable.

WESTERN FOREST PRODUCTS LIMITED
SILVICULTURE STANDARDS

BIOGEOCLIMATIC VARIANT CWHvm1 — TFL 25 Block 1 — Location: Jordan River

Description						Targets						Standards												
													Min. Intertree Distance (m)[2]		Free Growing						Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives[7]	Preferred Site Prep. Method[1]	Recommended Species		Target Stocking P + A	Min Stocking P + A[6]	Min Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. Sph[3]	Ht (m)	Min. sph	Max Sph	Target
							Preferred (P)	Acceptable (A)[4]																
S1ch	01s	3-5	B-C	H (salal)	S+ F+ P	B, M, PB	Cw Yc[y2]	Hw[h3]	1200	500	400	P+N	2.0	2.0	3	150	Yc 1.5 Cw 1.5 Hw 1.5	8	14	10,000	N/A	N/A	N/A	N/A
S1ha	01	3-5	C	L	S+F	M, PB, B	Hw Ba	Ss[s1] Cw Fd[f2]	900	500	400	N+P	2.0	2.0	6	150	Hw 3.0 Ba 1.8 Cw 1.5 Fd 3.0 Ss 3.0	8	14	10,000	4.0-8.0	800	1200	1000
S2	03	2-3	B-C	M (salal)	S+F	PB, M	Hw Cw	Fd	800	400	400	P+N	2.0	2.0	6	150	Hw 1.8 Cw 1.0 Fd 2.0	8	14	10,000	N/A	N/A	N/A	N/A
S3	05	4-5	D	H-VH	S+F	M, PB, B	Ss[s1] Ba	Hw Cw	900	500	400	P	2.0	2.0	3	150	Ss 3.5 Ba 2.0 Hw 3.0 Cw 1.8	6	12	10,000	4.0-8.0	800	1200	1000
	09	5	D																					
	07	5-6	D																					
S4	10	5	D	H-VH	S+F	M, PB	Dr	Ss[s1]	900	500	400	P+N	1.5	2.0	3	150	Ss 3.0 Dr 4.0	6	12	10,000	4.0-8.0	800	1200	1000
S5	14	6-7	D-E	H	S+F	PB, B	Ss[s1] Cw		900	400	400	P+N	1.5	1.5	3	150	Ss 4.0 Cw 2.0	6	12	10,000	4.0-8.0	700	1000	850
S6	14	6-7	C-D	M-H (salal)	S+P+F	B, M, PB	Cw	Pl Hw[h2] Yc[?]	900	400	400	P+N	1.5	2.0	6	150	Cw 1.3 Pl 1.5 Hw 1.5 Yc 1.3	8	14	10,000	N/A	N/A	N/A	N/A

Description						Targets						Standards												
													Min. Intertree Distance (m)[2]		Free Growing							Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives[7]	Preferred Site Prep. Method[1]	Recommended Species: Preferred (P)	Recommended Species: Acceptable (A)[4]	Target Stocking P + A	Min Stocking P + A[6]	Min Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. Sph[3]	Ht (m)	Min. sph	Max Sph	Target
S7	14	7-8	C-D	L	S+P+F	B, PB	Pl Cw		800	400	400	P+N	1.5	2.0	6	150	Cw 1.0 Yc 1.0 Pl 1.3	8	14	10,000	N/A	N/A	N/A	N/A
S8	13	7	A-B	L	Avoid Harvest*	NT	Pl	Cw	400	100	100	P+N	0.5	0.5	6	125	Cw 0.8 Pl 1.0	8	14	10,000	N/A	N/A	N/A	N/A
S13	05	4-5	D	M-H	S+F+P	B, M, PB	Ss[s1] Fd[f2] Ba Hw[h1] Cw		900	500	500	P+N	2.0	2.0	3	150	Cw 1.8 Hw 2.4 Fd 3.5 Ss 3.0 Ba 2.0	8	14	10,000	4.0-8.0	800	1200	1000
	07	5-6	D																					
S15	06	5-6	B-C	M-H	S+P+F	B,M,PB	Cw Hw	Ba	900	500	400	P+N	2.0	2.0	6	150	Hw 2.4 Ba 2.0 Cw 1.8	8	14	10,000	4.0-8.0	800	1200	1000

Comments:

1. Site preparation objective is to secure plantable spots. Not required if stocking level is achieved. B=Broadcast burn. M=Mechanical. PB = Pile + Burn. NT= No Treatment
2. Intertree spacing on roadside management units, rubbly talus, or wet, hummocky ground may be reduced to 1.0 metres.
3. Maximum density is applicable as long as Section 41 of the Timber Harvesting and Silviculture Practices Regulation remains in force.
4. Any coniferous species not listed may be accepted up to 10% of target stocking if height is greater than the lowest minimum height listed for the EA.
5. Target assumes typical stocking. Minimum and maximum stocking range is to accommodate variable stocking conditions.
6. Corporate policy is to manage towards targets. As guidance, any site units less than 80% of target and/or any subpolygons (>0.5 ha) less than 50% of target are to be evaluated, and at the Resident Forester's discretion, treated to increase stocking levels.
7. S=Sawlogs, F=Fibre, P=Poles

[f2] Fd suitable on lower elevation southerly aspects only.
[h1] H productivity is limited and should not exceed 20% of target stocking.
[h3] H productivity is limited and should not exceed 20% of target stocking unless under a fertilization regime with multiple treatments, in which case Hw may be Preferred and S1ha standards apply.
[s1] *Pissodes* terminal weevil hampers reforestation with Ss. In high hazard areas, Ss cannot be counted as well-spaced unless bred for resistance. In moderate hazard areas, no more than 25% of well-spaced stocking can be deemed preferred or Acceptable. Where resistant stock or other measures are used up to 30% (high hazard) or 60% (moderate hazard) of well-spaced stocking may be Preferred or Acceptable and is countable.
[y2] Yc based on trials near Port McNeill; limit Yc leading stands to <10% of stands on this EA.

1.1

* May be harvested as inclusions in larger site units or as lesser part of mosaic

WESTERN FOREST PRODUCTS LIMITED
SILVICULTURE STANDARDS

BIOGEOCLIMATIC VARIANT CWHvm2 TFL 25 Block 1 Location: Jordan River

Description						Targets						Standards												
													Min. Intertree Distance (m)[2]		Free Growing						Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives[7]	Preferred Site Prep. Method[1]	Recommended Species Preferred (P)	Recommended Species Acceptable (A)[4]	Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. Sph[3]	Ht (m)	Min. sph	Max sph	Target
M1	01	3-5	B-C	L-M	S+F	M, PB	Hw Pw[p1] Ba Yc	Fd[f2] Cw[c3]	900	500	400	N+P	2.0	2.0	6	150	Hw 2.5 Ba 1.8 Yc 1.5 Cw 1.5 Fd 2.3 Pw 2.5	8	14	10,000	4.0-8.0	700	1100	900
M2	03	2-3	B	L	S+F	M, PB	Hw Yc	Cw[c3] Pw[p]	800	400	400	N+P	2.0	2.0	6	150	Hw 1.8 Yc 1.0	8	14	10,000	3.0-7.0	500	900	700
M3	05	4-5	D	L-M	S+F	M, PB	Ba Pw[p1]	Hw Yc Cw[c3]	900	500	400	N+P	2.0	2.0	4	150	Hw 2.5 Ba 2.0 Yc 1.8 Pw 2.8	8	14	10,000	4.0-8.0	800	1200	1000
M4	09	6	A-C	L	S+F	M, PB	Yc	Pw[p1] Hm[h2] Cw[c3]	900	400	400	N+P	2.0	2.0	6	150	Pw 2.5 Hm 1.8 Yc 1.0	8	14	10,000	N/A	N/A	N/A	N/A
M5	08	4-5	D	L	S+F	M, PB	Ba Yc	Hw[h1] Cw[c3]	900	500	400	N+P	2.0	2.0	6	150	Hw 3.0 Ba 2.0 Yc 1.8	8	14	10,000	4.0-8.0	800	1200	1000

Comments:
1. Site preparation objective is to secure plantable spots. Not required if stocking level is achieved. B=Broadcast burn. M=Mechanical. PB = Pile + Burn. NT= No Treatment
2. Intertree spacing on roadside management units, rubbly talus, or wet, hummocky ground may be reduced to 1.0 metres.
3. Maximum density is applicable as long as Section 41 of the Timber Harvesting and Silviculture Practices Regulation remains in force.
4. Any coniferous species not listed may be accepted up to 10% of target stocking if height is greater than the lowest minimum height listed for the EA.
5. Target assumes typical stocking. Minimum and maximum stocking range is to accommodate variable stocking conditions.
6. Corporate policy is to manage towards targets. As guidance, any site units less than 80% of target and/or any subpolygons (>0.5 ha) less than 50% of target are to be evaluated, and at the Resident Forester's discretion, treated to increase stocking levels.
7. S=Sawlogs, F=Fibre, P=Poles

1.1

[b1] Where wooley aphid infestations are nearby or expected to spread to, no more than 10% of well-spaced *Abies* stocking can be deemed Preferred or Acceptable.
[c3] Cw only at lower elevations of BEC variant.
[f2] Fd suitable on lower elevation southerly aspects only.
[p1] White pine blister rust hampers reforestation with this species. No more than 10% and no more than 30% of well-spaced stocking can be deemed Preferred or Acceptable respectively. Where a pruning regime or/and resistant stock is used up to 50% of well-spaced stocking may be Preferred or Acceptable.
[h1] H productivity is limited and should not exceed 20% of target stocking.
[h2] H species countable as well-spaced on hummocks or raised microsites only.

WESTERN FOREST PRODUCTS LIMITED
SILVICULTURE STANDARDS

BIOGEOCLIMATIC VARIANT CWHmm1 TFL 25 Block 1 Location: Jordan River

Description						Targets						Standards												
													Min. Intertree Distance (m)[2]		Free Growing						Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives Sawlogs or fibre[7]	Preferred Site Prep. Method[1]	Recommended Species Preferred (P)	Recommended Species Acceptable (A)[4]	Target Stocking P + A	Min Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. sph[3]	Ht (m)	Min. Sph	Max sph	Target
L1	01	3-4	B-C	L	S+F	PB, B	Pw[p1] Fd	Cw[c2] Hw	900	500	400	P+N	2.0	2.0	6	150	Fd 3.0 Pw 3.0 Cw 1.5 Hw 2.0	8	14	10,000	4.0-8.0	800	1200	1000
L2	03	0-2	A-B	M	S+F	PB, M	Fd	Cw[c2] Pl	800	400	400	P+N	2.0	2.0	6	150	Fd 2.0 Cw 1.0 Pl 1.3	8	14	10,000	3.0-7.0	500	900	700
L4	07	5-6	D-E	VH	S+F	M, PB	Fd	Cw[c2] Ss[s1]	900	500	400	P+N	2.0	2.0	3	150	Cw 2.0 Fd 4.0 Ss 3.0	8	14	10,000	4.0-8.0	800	1200	1000
L12	04	1-2	D-E	L	S+F	M, PB	Fd Pw[p1]	Cw[c2]	900	500	400	P+N	2.0	2.0	6	150	Fd 2.0 Cw 1.0 Pw 2.0	8	14	10,000	4.0-8.0	800	1200	1000
L13	04	1-2	D-E	L	S+F	M, PB	Fd Pw[p1]	Cw[c2]	900	500	400	P+N	2.0	2.0	6	150	Fd 2.0 Cw 1.0 Pw 2.0	8	14	10,000	4.0-8.0	800	1200	1000

Comments:

1. Site preparation objective is to secure plantable spots. Not required if stocking level is achieved. B=Broadcast burn. M=Mechanical. PB = Pile + Burn. NT= No Treatment
2. Intertree spacing on roadside management units, rubbly talus, or wet, hummocky ground may be reduced to 1.0 metres.
3. Maximum density is applicable as long as Section 41 of the Timber Harvesting and Silviculture Practices Regulation remains in force.
4. Any coniferous species not listed may be accepted up to 10% of target stocking if height is greater than the lowest minimum height listed for the EA.
5. Target assumes typical stocking. Minimum and maximum stocking range is to accommodate variable stocking conditions.
6. Corporate policy is to manage towards targets. As guidance, any site units less than 80% of target and/or any subpolygons (>0.5 ha) less than 50% of target are to be evaluated, and at the Resident Forester's discretion, treated to increase stocking levels.
7. S=Sawlogs, F=Fibre, P=Poles

1.1

[c2] Cw (or Yc) may be moderately to heavily browsed by deer in certain locales necessitating browse protection when necessary.
[p1] White pine blister rust hampers reforestation with this species. No more than 10% and no more than 30% of well-spaced stocking can be deemed Preferred or Acceptable respectively. Where a pruning regime or/and resistant stock is used up to 50% of well-spaced stocking may be Preferred or Acceptable.
[s1] *Pissodes* terminal weevil hampers reforestation with Ss. In high hazard areas, Ss cannot be counted as well-spaced unless bred for resistance. In moderate hazard areas, no more than 25% of well-spaced stocking is countable. Where resistant stock or other measures are used up to 30% (high hazard) or 60% (moderate hazard) of well-spaced stocking is countable.

WESTERN FOREST PRODUCTS LIMITED
SILVICULTURE STANDARDS

BIOGEOCLIMATIC VARIANT CWHmm2 | TFL 25 Block 1 | Location: Jordan River

Description						Targets						Standards													
													Min. Intertree Distance (m)[2]		Free Growing							Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives[7]	Preferred Site Prep. Method[1]	Recommended Species		Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. sph[3]	Ht (m)	Min. sph	Max sph	Target
							Preferred (P)	Acceptable (A)[4]																
N1	01	3-4	B-C	L-M	S+F	PB	Fd Yc Pw[p1]	Hw Cw[c3]	900	500	400	P+N	2.0	2.0	6	150	Cw 1.0 Yc 1.0 Hw 1.3 Fd 2.3 Pw 2.3	8	14	10,000	4.0-8.0	800	1200	1000
N2	03	0-2	A-B	L	S+F	PB, M	Pw[p1] Fd Yc	Hw Cw[c3]	800	400	400	P+N	2.0	2.0	6	150	Fd 1.5 Cw 0.8 Yc 0.8 Hw 1.0 Pw 1.5	8	14	10,000	3.0-7.0	550	900	700
N3	05	3-4	D	M	S+F	M, PB, B	Pw[p1] Fd Yc	Hw Ba[b1]	900	500	400	P+N	2.0	2.0	4	150	Yc 1.0 Ba 0.8 Hw 1.3 Fd 2.3 Pw 2.3	8	14	10,000	4.0-8.0	800	1200	1000
N12	04	1-2	D-E	M	S+F	M, PB	Fd Yc Pw[p1]	Hw Cw[c3]	900	500	400	P+N	2.0	2.0	4	150	Pw 2.3 Cw 1.0 Yc 1.0 Fd 2.3 Hw 1.3	8	14	10,000	4.0-8.0	800	1200	1000

Comments:
1. Site preparation objective is to secure plantable spots. Not required if stocking level is achieved. B=Broadcast burn. M=Mechanical. PB = Pile + Burn. NT= No Treatment
2. Intertree spacing on roadside management units, rubbly talus, or wet, hummocky ground may be reduced to 1.0 metres.
3. Maximum density is applicable as long as Section 41 of the Timber Harvesting and Silviculture Practices Regulation remains in force.
4. Any coniferous species not listed may be accepted up to 10% of target stocking if height is greater than the lowest minimum height listed for the EA.
5. Target assumes typical stocking. Minimum and maximum stocking range is to accommodate variable stocking conditions.
6. Corporate policy is to manage towards targets. As guidance, any site units less than 80% of target and/or any subpolygons (>0.5 ha) less than 50% of target are to be evaluated, and at the Resident Forester's discretion, treated to increase stocking levels.
7. S=Sawlogs, F=Fibre, P=Poles

[b1] Where wooley aphid infestations are nearby or expected to spread to, no more than 10% of well-spaced *Abies* stocking can be deemed Preferred or Acceptable.
[c3] Cw only at lower elevations of BEC variant.
[p1] White pine blister rust hampers reforestation with this species. No more than 10% and no more than 30% of well-spaced stocking can be deemed Preferred or Acceptable respectively. Where a pruning regime or/and resistant stock is used up to 50% of well-spaced stocking may be Preferred or Acceptable.

WESTERN FOREST PRODUCTS LIMITED
SILVICULTURE STANDARDS

BIOGEOCLIMATIC VARIANT MHmm1 | TFL 25 Block 1 | Location: Jordan River

Description						Targets						Standards											
													Min. Intertree Distance (m)[2]		Free Growing						Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation otential	Product Objectives[7]	Preferred Site Prep. Method[1]	Recommended Species Preferred (P)	Recommended Species Acceptable (A)[4]	Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. sph[3]	Ht (m)	Min. sph	Max sph	Target
MH1	01	2-4	B-C	M	S+F	M, PB	Hm Ba Yc		900	500	500	P+N	2.0	2.0	6	125	Yc 1.0 Ba 0.6 Hm 1.0	12	20	10,000	N/A	N/A	N/A	N/A
MH2	02	0-1	A-B	L	S+F	PB, M	Hm Yc		800	400	400	P+N	2.0	2.0	6	125	Hm 0.8 Yc 0.8	12	20	10,000	N/A	N/A	N/A	N/A
MH4	06	6	A-C	M	S+F	PB, M	Yc	Hm[h2]	800	400	400	P+N	2.0	2.0	6	125	Hm 0.8 Yc 0.8	12	20	10,000	N/A	N/A	N/A	N/A

Comments:
1. Site preparation objective is to secure plantable spots. Not required if stocking level is achieved. B=Broadcast burn. M=Mechanical. PB = Pile + Burn. NT= No Treatment
2. Intertree spacing on roadside management units, rubbly talus, or wet, hummocky ground may be reduced to 1.0 metres.
3. Maximum density is applicable as long as Section 41 of the Timber Harvesting and Silviculture Practices Regulation remains in force.
4. Any coniferous species not listed may be accepted up to 10% of target stocking if height is greater than the lowest minimum height listed for the EA.
5. Target assumes typical stocking. Minimum and maximum stocking range is to accommodate variable stocking conditions.
6. Corporate policy is to manage towards targets. As guidance, any site units less than 80% of target and/or any subpolygons (>0.5 ha) less than 50% of target are to be evaluated, and at the Resident Forester's discretion, treated to increase stocking levels.
7. S=Sawlogs, F=Fibre, P=Poles

1.1

[h2] H species countable as well-spaced on hummocks or raised microsites only.

WESTERN FOREST PRODUCTS LIMITED
SILVICULTURE STANDARDS

BIOGEOCLIMATIC VARIANT CWHvm1 | TFL 25 Block 2 | Location: Stafford Lake

Description						Targets						Standards												
													Min. Intertree Distance (m)[2]		Free Growing						Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives[7]	Preferred Site Prep. Method[1]	Recommended Species: Preferred (P)	Recommended Species: Acceptable (A)[4]	Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % Of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. sph[3]	Ht (m)	Min. Sph	Max Sph	Target
ST1	01	3-4	B-C	L	S+F	M, PB	Hw Cw Ba Fd[f2]		900	500	500	N+P	2.0	2.0	6	150	Hw 3.0 Ba 1.8 Cw 1.5 Fd 3.0	8	14	10,000	4.0-8.0	800	1200	1000
ST2	03	1-2	A-B	M (salal)	S+F	PB, M	Fd Cw	Hw	800	400	400	N+P	2.0	2.0	6	150	Hw 1.8 Cw 1.0 Fd 2.0	8	14	10,000	4.0-8.0	800	1200	1000
ST3	09	5-6	D-E	H-VH	S+F	M, PB, B	Ba Cw	Hw	900	500	400	P+N	2.0	2.0	3	150	Cw 2.0 Ba 2.3 Hw 3.0	6	12	10,000	4.0-8.0	800	1200	1000
	08	5-6	D-E																					
ST4	09	4-5	D-E	VH	S+F	M, PB	Ac Dr Ss[s1s4]	Cw Ba	900	500	400	P+N	1.5	2.0	3	150	Ac 4.0 Ss 4.0 Dr 4.0	6	12	10,000	4.0-8.0	800	1200	1000
ST4dec	10	4-5	D-E	VH	F+S	M, PB	Ac Dr		900	500	500	P+N	1.5	2.0	3	150	Ac 4.0 Dr 4.0	6	10	N/A	4.0-8.0	500	900	700
ST5	14	7	D-E	VH	S+F	PB	Cw Dr Ss[s1]		900	500	500	P+N	1.5	1.5	3	150	Cw 2.0 Dr 4.0 Ss 4.0	6	12	10,000	4.0-8.0	700	1000	800
ST6	14	7	C-D	M-H	S+P+F	PB, M	Cw	Hw	900	400	400	P+N	1.5	2.0	6	150	Cw 1.3 Hw 1.5	8	14	10,000	N/A	N/A	N/A	N/A

Description						Targets						Standards												
													Min. Intertree Distance (m)[2]		Free Growing						Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives[7]	Preferred Site Prep. Method[1]	Recommended Species		Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. sph[3]	Ht (m)	Min sph	Max Sph	Target
							Preferred (P)	Acceptable (A)[4]																
ST9	13	7-8	B-C	L	Avoid harvest*																			
ST11	32	8	D-E	L	Avoid harvest*																			
	05	3-4	D	H	S+F+P	B, M, PB	Ba Hw Cw																	
ST13	04	2	D	H			Fd[f2] Cw	Hw	900	500	400	P+N	2.0	2.0	3	150	Ba 2.0 Hw 3.0 Cw 1.8 Fd 3.5	8	14	10,000	4.0-8.0	800	1200	1000
	08	5-6	D-E	H			Cw Ba																	
ST15	06	5-6	A-C	M-H	S+F+P	B, M, PB	Cw	Hw Ba	900	500	400	P+N	2.0	2.0	6	150	Cw 1.8 Ba 1.8 Hw 2.8	8	14	10,000	4.0-8.0	800	1200	1000

Comments:
1. Site preparation objective is to secure plantable spots. Not required if stocking level is achieved. B=Broadcast burn. M=Mechanical. PB = Pile + Burn. NT= No Treatment
2. Intertree spacing on roadside management units, rubbly talus, or wet, hummocky ground may be reduced to 1.0 metres.
3. Maximum density is applicable as long as Section 41 of the Timber Harvesting and Silviculture Practices Regulation remains in force.
4. Any coniferous species not listed may be accepted up to 10% of target stocking if height is greater than the lowest minimum height listed for the EA.
5. Target assumes typical stocking. Minimum and maximum stocking range is to accommodate variable stocking conditions.
6. Corporate policy is to manage towards targets. As guidance, any site units less than 80% of target and/or any subpolygons (>0.5 ha) less than 50% of target are to be evaluated, and at the Resident Forester's discretion, treated to increase stocking levels.
7. S=Sawlogs, F=Fibre, P=Poles

[f2] Fd suitable on lower elevation southerly aspects only.
[s1] *Pissodes* terminal weevil hampers reforestation with Ss. In high hazard areas, Ss cannot be counted as well-spaced unless bred for resistance. In moderate hazard areas, no more than 25% of well-spaced stocking is countable. Where resistant stock or other measures are used up to 30% (high hazard) or 60% (moderate hazard) of well-spaced stocking is countable.
[s4] Partial cutting recommended to avoid terminal weevil damage.
* May be harvested as inclusions in larger site units or as lesser part of mosaic

WESTERN FOREST PRODUCTS LIMITED
SILVICULTURE STANDARDS

BIOGEOCLIMATIC VARIANT CWHvm2 TFL 25 Block 2 Location: Stafford Lake

Description						Targets						Standards												
													Min. Intertree Distance (m)[2]		Free Growing						Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives[7]	Preferred Site Prep. Method[1]	Recommended Species		Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. sph[3]	Ht (m)	Min sph	Max sph[5]	Target
							Preferred (P)	Acceptable (A)[4]																
MT1	01	3-5	B-C	L-M	S+F+P	PB, M	Hw Ba Yc	Cw[c3]	900	500	400	N+P	2.0	2.0	6	150	Hw 2.5 Ba 1.8 Cw 1.5 Yc 1.5	8	14	10,000	4.0-8.0	700	1100	900
MT2	03	1-2	A-B	M	S+F+P	PB, M	Hw Yc	Cw[c3]	800	400	400	N+P	2.0	2.0	6	150	Hw 1.8 Cw 1.0 Yc 1.0	8	14	10,000	3.0-7.0	500	900	700
MT4	11	6	C-D	L	S+F+P	PB, M	Yc Hm[h2]	Hw[h2]	800	400	400	N+P	2.0	2.0	6	150	Yc 1.0 Hw 1.8 Hm 1.8	8	14	10,000	N/A	N/A	N/A	N/A
MT5	08	5-6	D-E	H	S+F	M, PB	Ba Hw	Yc	900	500	400	P+N	2.0	2.0	4	150	Ba 2.2 Hw 2.5 Yc 2.0	8	14	10,000	4.0-8.0	800	1200	1000
MT15	06	5-6	B-C	M	S+F+P	M, PB	Hw Ba Yc		900	500	500	P+N	2.0	2.0	6	150	Ba 1.8 Hw 2.2 Yc 1.6	8	14	10,000	4.0-8.0	800	1200	1000

Comments:

1. Site preparation objective is to secure plantable spots. Not required if stocking level is achieved. B=Broadcast burn. M=Mechanical. PB = Pile + Burn. NT= No Treatment
2. Intertree spacing on roadside management units, rubbly talus, or wet, hummocky ground may be reduced to 1.0 metres.
3. Maximum density is applicable as long as Section 41 of the Timber Harvesting and Silviculture Practices Regulation remains in force.
4. Any coniferous species not listed may be accepted up to 10% of target stocking if height is greater than the lowest minimum height listed for the EA.
5. Target assumes typical stocking. Minimum and maximum stocking range is to accommodate variable stocking conditions
6. Corporate policy is to manage towards targets. As guidance, any site units less than 80% of target and/or any subpolygons (>0.5 ha) less than 50% of target are to be evaluated, and at the Resident Forester's discretion, treated to increase stocking levels.
7. S=Sawlogs, F=Fibre, P=Poles

1.1

[c3] Cw only at lower elevations of BEC variant.
[h2] H species countable as well-spaced on hummocks or raised microsites only.

WESTERN FOREST PRODUCTS LIMITED
SILVICULTURE STANDARDS

BIOGEOCLIMATIC VARIANT MHmm1 | TFL 25 Block 2 | Location: Stafford Lake

Description						Targets						Standards												
													Min. Intertree Distance (m)[2]		Free Growing							Juvenile Spacing Density[5]		
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives[7]	Preferred Site Prep. Method[1]	Recommended Species: Preferred (P)	Recommended Species: Acceptable (A)[4]	Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. sph[3]	Ht (m)	Min. sph	Max sph	Target
MH1	01	2-4	C	M	S+F	M	Hm Ba Yc		900	500	500	P+N	2.0	2.0	6	125	Yc 1.0 Ba 0.6 Hm 1.0	12	20	10,000	N/A	N/A	N/A	N/A
MH2	02	0-1	A-B	L	S+F	M	Hm Yc		800	400	400	P+N	2.0	2.0	6	125	Hm 0.8 Yc 0.8 Ba 0.6	12	20	10,000	N/A	N/A	N/A	N/A
MH4	06	6	A-C	M	S+F	M	Yc	Hm[h2]	800	400	400	P+N	2.0	2.0	6	125	Hm 0.8 Yc 0.8 Ba 0.6	12	20	10,000	N/A	N/A	N/A	N/A

Comments:
1. Site preparation objective is to secure plantable spots. Not required if stocking level is achieved. B=Broadcast burn. M=Mechanical. PB = Pile + Burn. NT= No Treatment
2. Intertree spacing on roadside management units, rubbly talus, or wet, hummocky ground may be reduced to 1.0 metres.
3. Maximum density is applicable as long as Section 41 of the Timber Harvesting and Silviculture Practices Regulation remains in force.
4. Any coniferous species not listed may be accepted up to 10% of target stocking if height is greater than the lowest minimum height listed for the EA.
5. Target assumes typical stocking. Minimum and maximum stocking range is to accommodate variable stocking conditions.
6. Corporate policy is to manage towards targets. As guidance, any site units less than 80% of target and/or any subpolygons (>0.5 ha) less than 50% of target are to be evaluated, and at the Resident Forester's discretion, treated to increase stocking levels.
7. S=Sawlogs, F=Fibre, P=Poles

1.1

[h2] H species countable as well-spaced on hummocks or raised microsites only.

WESTERN FOREST PRODUCTS LIMITED
SILVICULTURE STANDARDS

BIOGEOCLIMATIC VARIANT: CWHvm1 TFL 25 Block 2 Location Heydon Bay

Description						Targets						Standards												
													Min. Intertree Distance (m)[2]		Free Growing						Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives[7]	Preferred Site Prep. Method[1]	Recommended Species Preferred (P)	Recommended Species Acceptable (A)[4]	Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. sph3	Ht (m)	Min sph	Max sph	Target
S1ch	01s	3-5	B-C	L-M (salal)	S+P+F	B,M,PB	Cw Yc[y2]	Hw[h1]	1200	500	400	P+N	2.0	2.0	6	150	Cw 1.5 Hw 1.5 Yc 1.3	8	14	10,000	4.0-8.0	N/A	N/A	N/A
S1ha	01	3-5	C	L	S+F	PB, M, B	Hw Ba	Ss[s1] Cw Fd[f2]	900	500	400	N+P	2.0	2.0	6	150	Cw 1.5 Fd 3.0 Hw 3.0 Ba 1.8 Ss 3.0	8	14	10,000	4.0-8.0	800	1200	1000
S2	03	2-3	B-C	M (salal)	S+F+P	PB, M	Hw Cw	Fd[f2]	800	400	400	P+N	2.0	2.0	6	150	Cw 1.0 Hw 1.8 Fd 2.0	8	14	10,000	N/A	N/A	N/A	N/A
S3	09	5	D	H	S+F+P	M, PB, B	Ss[s1] Ba	Hw Cw	900	500	400	P	2.0	2.0	3	150	Cw 1.8 Hw 3.0 Ba 2.0 Ss 3.5	6	12	10,000	4.0-8.0	800	1200	1000
	07	5-6	D																					
	05	4-5	D																					
S4	10	5	D	VH	S+F	M,PB	Dr	Ss	900	500	400	P+N	2.	2.0	3	150	Dr 4.0 Ss 3.0	8	14	10,000	4.0-8.0	800	1200	1000
S5	14	6-7	D-E	VH	S+F+P	PB, B	Cw Ss[s1]		900	400	400	P+N	1.5	1.5	3	150	Cw 2.0 Ss 4.0	6	12	10,000	4.0-8.0	700	1000	850

Description						Targets						Standards												
													Min. Intertree Distance (m)[2]		Free Growing						Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives[7]	Preferred Site Prep Method[1]	Recommended Species		Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. sph[3]	Ht (m)	Min sph	Max sph	Target
							Preferred (P)	Acceptable (A)[4]																
S6	14	6-7	C-D	M-H (salal)	S+P+F	B, M, PB	Cw	Pl Hw[h2] Yc	900	400	400	P	1.5	2.0	3	150	Cw 1.3 Hw 1.5 Pl 1.5 Yc 1.3	8	14	10,000	N/A	N/A	N/A	N/A
S7	14	7-8	C-D	L	S+F	B, PB	PlCw		800	400	400	P+N	1.5	2.0	6	150	Pl 1.3 Cw 1.0	8	14	10,000	N/A	N/A	N/A	N/A
S8	13	7	A-B	L	Avoid harvest*	NT	Pl		400	100	100	P+N	0.5	0.5	6	150	Pl 1.0	8	14	10,000	N/A	N/A	N/A	N/A
S9	99	7-8	B-C		Avoid harvest*																			
S11	99	8	D-E		Avoid harvest*																			
S13	05	4-5	D	M-H	S+F+P	M, B, PB	Ss[s1] Fd[f2] Ba Hw Cw		900	500	500	P+N	2.0	2.0	3	150	Cw 1.8 Hw 2.4 Fd 3.5 Ss 3.0 Ba 2.0	8	14	10,000	4.0-8.0	800	1200	1000
	07	5-6	D																					
S15	06	5-6	B-C	M-H	S+P+F	B, M, PB	Cw Hw	Ba	900	500	400	P+N	2.0	2.0	6	150	Cw 1.8 Hw 2.4 Ba 2.0	8	14	10,000	4.0-8.0	800	1200	1000

Comments:

1. Site preparation objective is to secure plantable spots. Not required if stocking level is achieved. B=Broadcast burn. M=Mechanical. PB = Pile + Burn. NT= No Treatment
2. Intertree spacing on roadside management units, rubbly talus, or wet, hummocky ground may be reduced to 1.0 metres.
3. Maximum density is applicable as long as Section 41 of the Timber Harvesting and Silviculture Practices Regulation remains in force.
4. Any coniferous species not listed may be accepted up to 10% of target stocking if height is greater than the lowest minimum height listed for the EA.

a. Target assumes typical stocking. Minimum and maximum stocking range is to accommodate variable stocking conditions.
b. Corporate policy is to manage towards targets. As guidance, any site units less than 80% of target and/or any subpolygons (>0.5 ha) less than 50% of target are to be evaluated, and at the Resident Forester's discretion, treated to increase stocking levels.

7. S=Sawlogs, F=Fibre, P=Poles

[f2] Fd suitable on lower elevation southerly aspects only.
[h1] H productivity is limited and should not exceed 50% of target stocking
[h2] H species countable as well-spaced on hummocks or raised microsites only.
[s1] *Pissodes* terminal weevil hampers reforestation with Ss. In high hazard areas, Ss cannot be counted as well-spaced unless bred for resistance. In moderate hazard areas, no more than 25% of well-spaced stocking can be deemed Preferred or Acceptable. Where resistant stock or other measures are used up to 30% (high hazard) or 60% (moderate hazard) of well-spaced stocking may be Preferred or Acceptable and is countable.
[y2] Yc based on trials near Port McNeill; limit Yc leading stands to <10% of stands on this EA.
* May be harvested as inclusions in larger site units or as lesser part of mosaic

PRODUCTS LIMITED
SILVICULTURE STANDARDS

BIOGEOCLIMATIC VARIANT CWHvm2 | TFL 25 Block 2 | Location: Heydon Bay

Description						Targets						Standards												
													Min. Intertree Distance (m)[2]		Free Growing						Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives[7]	Preferred Site Prep. Method[1]	Recommended Species		Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. sph[3]	Ht (m)	Min. sph	Max sph	Target
							Preferred (P)	Acceptable (A)[4]																
M1	01	3-5	B-C	L-M	S+F+P	PB, M	Hw Ba Yc	Pw[p1] Fd[f2] Cw[c3]	900	500	400	N+P	2.0	2.0	6	150	Yc 1.5 Ba 1.8 Cw 1.5 Hw 2.5 Pw 2.5 Fd 2.3	8	14	10,000	4.0-8.0	700	1100	900
M2	03	2-3	B	M	S+F+P	PB, M	Hw Yc	Cw[c3]	800	400	400	N+P	2.0	2.0	6	150	Cw 1.0 Hw 1.8 Yc 1.0	8	14	10,000	3.0-7.0	500	900	700
M3	05	4-5	D	H	S+F	M, PB	Ba	Hw Pw Yc	900	500	400	P+N	2.0	2.0	4	150	Pw 2.8 Ba 2.0 Hw 2.5 Yc 1.8	8	14	10,000	4.0-8.0	800	1200	1000
M4	11	6-7	D	H	S+P+F	PB	Yc	Pw[p1] Hm[h2]	800	400	400	P+N	2.0	2.0	4	150	Yc 1.0 Pw 2.5 Hm 1.8	8	14	10,000	N/A	N/A	N/A	N/A
M5	08	4-5	D	H	S+F+P	M, PB	Ba Yc	Hw[h1]	900	500	400	P+N	2.0	2.0	4	150	Ba 2.0 Hw 3.0 Yc 1.8	8	14	10,000	4.0-8.0	800	1200	1000

Comments:
1. Site preparation objective is to secure plantable spots. Not required if stocking level is achieved. B=Broadcast burn. M=Mechanical. PB = Pile + Burn. NT= No Treatment
2. Intertree spacing on roadside management units, rubbly talus, or wet, hummocky ground may be reduced to 1.0 metres.
3. Maximum density is applicable as long as Section 41 of the Timber Harvesting and Silviculture Practices Regulation remains in force.
4. Any coniferous species not listed may be accepted up to 10% of target stocking if height is greater than the lowest minimum height listed for the EA.
5. Target assumes typical stocking. Minimum and maximum stocking range is to accommodate variable stocking conditions.
6. Corporate policy is to manage towards targets. As guidance, any site units less than 80% of target and/or any subpolygons (>0.5 ha) less than 50% of target are to be evaluated, and at the Resident Forester's discretion, treated to increase stocking levels.
7. S=Sawlogs, F=Fibre, P=Poles

[c3] Cw only at lower elevations of BEC variant.
[f2] Fd suitable on lower elevation southerly aspects only.
[h1] H productivity is limited and should not exceed 50% of target stocking.
[h2] H species countable as well-spaced on hummocks or raised microsite only.
[p1] White pine blister rust hampers reforestation with this species. No more than 10% and no more than 30% of well-spaced stocking can be deemed Preferred or Acceptable respectively. Where a pruning regime or/and resistant stock is used up to 50% of well-spaced stocking may be Preferred or Acceptable.

WESTERN FOREST PRODUCTS LIMITED
SILVICULTURE STANDARDS

BIOGEOCLIMATIC VARIANT MHmm1 | TFL 25 Block 2 | Location: Heydon Bay

Description						Targets						Standards												
													Min. Intertree Distance (m)[2]		Free Growing						Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives[7]	Preferred Site Prep Method[1]	Recommended Species		Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. sph[3]	Ht (m)	Min. sph	Max sph	Target
							Preferred (P)	Acceptable (A)[4]																
MH1	01	2-4	B-C	M	S+F	M	Hm Ba Yc		900	500	500	P+N	2.0	2.0	6	125	Yc 1.0 Ba 0.6 Hm 1.0	12	20	10,000	N/A	N/A	N/A	N/A
MH2	02	0-1	A-B	L	S+F	M	Hm Yc		800	400	400	P+N	2.0	2.0	6	125	Hm 0.8 Yc 0.8 Ba 0.6	12	20	10,000	N/A	N/A	N/A	N/A
MH4	06	6	A-C	M	S+F	M	Yc	Hm[h2]	800	400	400	P+N	2.0	2.0	6	125	Hm 0.8 Yc 0.8 Ba 0.6	12	20	10,000	N/A	N/A	N/A	N/A

Comments:
1. Site preparation objective is to secure plantable spots. Not required if stocking level is achieved. B=Broadcast burn. M=Mechanical. PB = Pile + Burn. NT= No Treatment
2. Intertree spacing on roadside management units, rubbly talus, or wet, hummocky ground may be reduced to 1.0 metres.
3. Maximum density is applicable as long as Section 41 of the Timber Harvesting and Silviculture Practices Regulation remains in force.
4. Any coniferous species not listed may be accepted up to 10% of target stocking if height is greater than the lowest minimum height listed for the EA.
5. Target assumes typical stocking. Minimum and maximum stocking range is to accommodate variable stocking conditions.
6. Corporate policy is to manage towards targets. As guidance, any site units less than 80% of target and/or any subpolygons (>0.5 ha) less than 50% of target are to be evaluated, and at the Resident Forester's discretion, treated to increase stocking levels.
7. S=Sawlogs, F=Fibre, P=Poles

1.1

[h2] H species countable as well-spaced on hummocks or raised microsites only.

WESTERN FOREST PRODUCTS LIMITED
SILVICULTURE STANDARDS

BIOGEOCLIMATIC VARIANT CWHvm1 | TFL 25 Block 3 | Location: Naka Creek

Description						Targets						Standards												
													Min. Intertree Distance (m)[2]		Free Growing						Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives[7]	Site Prep. Method[1]	Recommended Species Preferred (P)	Recommended Species Acceptable (A)[4]	Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. sph[3]	Ht (m)	Min. sph	Max sph	Target
S1ch	01S	3-5	B-C	H (salal)	S, F, P	B, M, PB	Cw Yc[y2]	Hw[h1]	1200	500	400	P+N	2.0	2.0	3	150	Pl 1.3 Yc 1.5 Cw 1.5 Hw 1.5	8	14	10,000	N/A	N/A	N/A	N/A
S1ha	01	3-5	C	L	S+F	M, PB, B	Hw Ba	Ss[s1] Cw Fd[f2]	900	500	400	N+P	2.0	2.0	6	150	Hw 3.0 Ba 1.8 Cw 1.5 Fd 3.0 Ss 3.0	8	14	10,000	4.0-8.0	800	1200	1000
S2	03	2-3	B-C	M (salal)	S+F	PB, M	Hw Cw	Fd	800	400	400	P+N	2.0	2.0	6	150	Hw 1.8 Cw 1.0 Fd 2.0	8	14	10,000	N/A	N/A	N/A	N/A
	05	4-5	D																					
S3	09	5	D	H-VH	S+F	M, PB,B	Ss[s1] Ba	Hw Cw	900	500	400	P	2.0	2.0	3	150	Ss 3.5 Ba 2.0 Hw 3.0 Cw 1.8	6	12	10,000	4.0-8.0	800	1200	1000
	07	5-6	D																					
S4	10	5	D	H-VH	S+F	M, PB	Dr	Ss[s1]	900	500	400	P+N	1.5	2.0	3	150	Ss 3.0 Cw 1.8	8	14	10,000	4.0-8.0	800	1200	1000
S5	14	6-7	D-E	H	S+F	PB, B	Ss[s1] Cw		900	400	400	P+N	1.5	1.5	3	150	Ss 4.0 Cw 2.0	6	12	10,000	4.0-8.0	700	1000	850
S6	14	6-7	C-D	M (salal)	S+P+F	B, PB, M	Cw	Pl Hw[h2] Yc[y2]	900	400	400	P+N	1.5	2.0	3	150	Cw 1.3 Pl 1.5 Hw 1.5 Yc 1.3	8	14	10,000	N/A	N/A	N/A	N/A

Description						Targets						Standards												
													Min. Intertree Distance (m)[2]		Free Growing						Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives[7]	Site Prep. Method[1]	Recommended Species: Preferred (P)	Recommended Species: Acceptable (A)[4]	Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. sph[3]	Ht (m)	Min. sph	Max sph	Target
S7	14	7-8	C-D	L	S+P+F	B, PB	Pl Cw		800	400	400	P+N	1.5	2.0	6	150	Cw 1.0 Yc 1.0 Pl 1.3	8	14	10,000	N/A	N/A	N/A	N/A
S8	13	7	A-B	L	Avoid harvest*		Pl		400	100	100	P+N	0.5	0.5	6	N/A	Pl 0.8	8	18	N/A	N/A	N/A	N/A	N/A
S9	99	7-8	B-C	L	Avoid harvest*																			
S11	99	8	D-E	L	Avoid harvest*																			
S13	05	4-5	D	M-H	S+F+P	PB, B, M	Ss[s1] Fd[f2] Ba Hw[h1] Cw		900	500	500	P+N	2.0	2.0	3	150	Ba 2.0 Cw 1.8 Hw 2.4 Fd 3.5 Ss 3.0	8	14	10,000	4.0-8.0	800	1200	1000
	07	5-6	D																					
S15	06	5-6	B-C	M	S+P+F	M, PB, B	Cw Hw	Ba	900	500	400	P+N	2.0	2.0	6	150	Hw 2.4 Ba 2.0 Cw 1.8	8	14	10,000	4.0-8.0	800	1200	1000

Comments:

1. Site preparation objective is to secure plantable spots. Not required if stocking level is achieved. B=Broadcast burn. M=Mechanical. PB = Pile + Burn. NT= No Treatment
2. Intertree spacing on roadside management units, rubbly talus, or wet, hummocky ground may be reduced to 1.0 metres.
3. Maximum density is applicable as long as Section 41 of the Timber Harvesting and Silviculture Practices Regulation remains in force.
4. Any coniferous species not listed may be accepted up to 10% of target stocking if height is greater than the lowest minimum height listed for the EA.
5. Target assumes typical stocking. Minimum and maximum stocking range is to accommodate variable stocking conditions.
6. Corporate policy is to manage towards targets. As guidance, any site units less than 80% of target and/or any subpolygons (>0.5 ha) less than 50% of target are to be evaluated, and at the Resident Forester's discretion, treated to increase stocking levels.
7. S=Sawlogs, F=Fibre, P=Poles

[f2] Fd suitable on lower elevation southerly aspects only.
[h1] H productivity is limited and should not exceed 50% of target stocking.
[h2] H species countable as well-spaced on hummocks or raised microsites only.
[s1] *Pissodes* terminal weevil hampers reforestation with Ss. In high hazard areas, Ss cannot be counted as well-spaced unless bred for resistance. In moderate hazard areas, no more than 25% of well-spaced stocking can be deemed preferred or Acceptable. Where resistant stock or other measures are used up to 30% (high hazard) or 60% (moderate hazard) of well-spaced stocking may be Preferred or Acceptable and is countable.
[y2] Yc based on trials near Port McNeill; limit Yc leading stands to <10% of stands on this EA.
* May be harvested as inclusions in larger site units or as lesser part of mosaic

BIOGEOCLIMATIC VARIANT CWHvm2 TFL 25 Block 3 Location: Naka Creek

Description						Targets						Standards												
													Min. Intertree Distance (m)[2]		Free Growing						Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives[7]	Preferred Site Prep Method[1]	Recommended Species		Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. sph[3]	Ht (m)	Min. sph	Max sph	Target
							Preferred (P)	Acceptable (A)[4]																
M1	01	3-5	B-C	L-M	S+F+P	M, PB	Hw Ba Yc	Fd[f2] Pw[p1] Cw[c3]	900	500	400	N+P	2.0	2.0	6	150	Fd 2.3 Hw 2.5 Ba 1.8 Yc 1.5 Pw 2.5	8	14	5000	4.0-8.0	700	1100	900
M2	03	2-3	B	L	S+F+P	PB, M	Hw Yc	Cw[c3]	800	400	400	N+P	2.0	2.0	6	150	Hw 1.8 Yc 1.0 Cw 1.0	8	14	10,000	3.0-7.0	500	900	700
M3	05	4-5	D	L-M	S+F	M, PB	Ba	Hw Pw[p1] Yc	900	500	400	N+P	2.0	2.0	4	150	Hw 2.5 Ba 2.0 Yc 1.8 Pw 2.8	8	14	10,000	4.0-8.0	800	1200	1000
M4	09	6	A-C	L	S+P+F	PB	Yc	Pw[p1] Hm[h2]	900	400	400	N+P	2.0	2.0	6	150	Hm 1.8 Yc 1.0 Pw 2.5	8	14	10,000	N/A	N/A	N/A	N/A
M5	08	4-5	D	L	S+F+P	M, PB	Ba Yc	Hw	900	500	400	N+P	2.0	2.0	6	150	Hw 2.2 Ba 1.8 Yc 1.6	8	14	10,000	4.0-8.0	800	1200	1000

Comments:
1. Site preparation objective is to secure plantable spots. Not required if stocking level is achieved. B=Broadcast burn. M=Mechanical. PB = Pile + Burn. NT= No Treatment
2. Intertree spacing on roadside management units, rubbly talus, or wet, hummocky ground may be reduced to 1.0 metres.
3. Maximum density is applicable as long as Section 41 of the Timber Harvesting and Silviculture Practices Regulation remains in force.
4. Any coniferous species not listed may be accepted up to 10% of target stocking if height is greater than the lowest minimum height listed for the EA.
5. Target assumes typical stocking. Minimum and maximum stocking range is to accommodate variable stocking conditions.
6. Corporate policy is to manage towards targets. As guidance, any site units less than 80% of target and/or any subpolygons (>0.5 ha) less than 50% of target are to be evaluated, and at the Resident Forester's discretion, treated to increase stocking levels.
7. S=Sawlogs, F=Fibre, P=Poles

1.1

[c3] Cw only at lower elevations of BEC variant.
[f2] Fd suitable on lower elevation southerly aspects only.
[h2] H species countable as well-spaced on hummocks or raised microsites only.
[p1] White pine blister rust hampers reforestation with this Species. No more than 10% and no more than 30% of well-spaced stocking can be deemed Preferred or Acceptable respectively. Where a pruning regime or/and resistant stock is used up to 50% of well-spaced stocking may be Preferred or Acceptable.

WESTERN FOREST PRODUCTS LIMITED
SILVICULTURE STANDARDS

BIOGEOCLIMATIC VARIANT MHmm1 — TFL 25 Block 3 — Location: Naka Creek

Description						Targets						Standards												
													Min. Intertree Distance (m)[2]		Free Growing							Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives[7]	Preferred Site Prep. Method[1]	Recommended Species: Preferred (P)	Recommended Species: Acceptable (A)[4]	Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. sph[3]	Ht (m)	Min. sph	Max sph	Target
MH1	01	2-4	B-C	M	S+F	M	Hm Ba Yc		900	500	500	P+N	2.0	2.0	6	125	Yc 1.0 Ba 0.6 Hm 1.0	12	20	10,000	N/A	N/A	N/A	N/A
MH2	02	0-1	A-B	L	S+F	M	Hm Yc		800	400	400	P+N	2.0	2.0	6	125	Hm 0.8 Yc 0.8 Ba 0.6	12	20	10,000	N/A	N/A	N/A	N/A
MH4	06	6	A-C	M	S+F	M	Yc	Hm[h2]	800	400	400	P+N	2.0	2.0	6	125	Hm 0.8 Yc 0.8 Ba 0.6	12	20	10,000	N/A	N/A	N/A	N/A

Comments:
1. Site preparation objective is to secure plantable spots. Not required if stocking level is achieved. B=Broadcast burn. M=Mechanical. PB = Pile + Burn. NT= No Treatment
2. Intertree spacing on roadside management units, rubbly talus, or wet, hummocky ground may be reduced to 1.0 metres.
3. Maximum density is applicable as long as Section 41 of the Timber Harvesting and Silviculture Practices Regulation remains in force.
4. Any coniferous species not listed may be accepted up to 10% of target stocking if height is greater than the lowest minimum height listed for the EA.
5. Target assumes typical stocking. Minimum and maximum stocking range is to accommodate variable stocking conditions.
6. Corporate policy is to manage towards targets. As guidance, any site units less than 80% of target and/or any subpolygons (>0.5 ha) less than 50% of target are to be evaluated, and at the Resident Forester's discretion, treated to increase stocking levels.
7. S=Sawlogs, F=Fibre, P=Poles

1.1 ______________________

[h2] H species countable as well-spaced on hummocks or raised microsites only.

WESTERN FOREST PRODUCTS LIMITED
SILVICULTURE STANDARDS

BIOGEOCLIMATIC SUBZONE CWHvm1 | TFL 25 Block 5 | Location Swanson Bay

Description						Targets						Standards												
													Min. Intertree Distance (m)[2]		Free Growing						Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives[7]	Site Prep Method[1]	Recommended Species		Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. sph[3]	Ht (m)	Min sph	Max. sph	Target
							Preferred (P)	Acceptable (A)[4]																
S1ha	01	3-4	B-C	L-M	S+F	M, PB, B	Hw Ba	Ss Cw	900	500	400	N+P	2.0	2.0	6	150	Ba 1.8 Cw 1.5 Hw 3.0 Ss 3.0	8	14	10,000	4.0-8.0	800	1200	1000
S2	03	1-2	A-B	L (salal)	S+F+P	PB, M	Hw Cw[c2]		800	400	400	P+N	2.0	2.0	6	150	Cw 1.0 Hw 1.8	8	14	10,000	N/A	N/A	N/A	N/A
S3	08	5-6	D-E	VH	S+F	M, PB, B	Ss Ba	Hw Cw	900	500	400	P	2.0	2.0	3	150	Ss 3.5 Ba 2.0 Hw 3.0 Cw 1.8	6	12	10,000	4.0-8.0	800	1200	1000
	09	5-6	D																					
S4	10	3-4	D	H	S+F	M, PB	Ac Dr	Ss	900	500	400	P+N	1.5	2.0	3	150	Ss 3.0 Ac 4.0 Dr 3.5	6	12	10,000	4.0-8.0	800	1200	1000
S5	14	5-6	D-E	H	S+F	M, PB	Cw[c2] Ss		900	400	400	P+N	1.5	1.5	3	150	Ss 4.0 Cw 2.0	6	12	10,000	4.0-8.0	800	1200	1000
S6	14	5-6	C-D	M-H (salal)	S+F+P	B, PB, M	Cw[c2]	Hw[h2]	900	400	400	P+N	1.5	2.0	6	150	Cw 1.3 Hw 1.5	8	14	10,000	N/A	N/A	N/A	N/A
S9	99	7-8	B-C		Avoid harvest*																			
S13	05	4-5	D	M-H	S+F+P	PB, M, B	Ss Ba Cw[c2] Hw		900	500	400	P+N	2.0	2.0	3	150	Cw 1.6 Ba 2.0 Hw 2.4 Ss 3.0	8	14	10,000	4.0-8.0	800	1200	1000

Description						Targets						Standards												
													Min. Intertree Distance (m)[2]		Free Growing						Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives[7]	Site Prep Method[1]	Recommended Species		Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. sph[3]	Ht (m)	Min sph	Max. sph	Target
							Preferred (P)	Acceptable (A)[4]																
S15	06	5-6	B-C	M	S+P+F	B, M, PB	Cw[c2] Hw	Ba	900	500	400	P+N	2.0	2.0	6	150	Ba 1.8 Cw 1.6 Hw 2.2	8	14	10,000	4.0-8.0	800	1200	1000

Comments:
1. Site preparation objective is to secure plantable spots. Not required if stocking level is achieved. B=Broadcast burn. M=Mechanical. PB = Pile + Burn. NT= No Treatment
2. Intertree spacing on roadside management units, rubbly talus, or wet, hummocky ground may be reduced to 1.0 metres.
3. Maximum density is applicable as long as Section 41 of the Timber Harvesting and Silviculture Practices Regulation remains in force.
4. Any coniferous species not listed may be accepted up to 10% of target stocking if height is greater than the lowest minimum height listed for the EA.
5. Target assumes typical stocking. Minimum and maximum stocking range is to accommodate variable stocking conditions.
6. Corporate policy is to manage towards targets. As guidance, any site units less than 80% of target and/or any subpolygons (>0.5 ha) less than 50% of target are to be evaluated, and at the Resident Forester's discretion, treated to increase stocking levels.
7. S=Sawlogs, F=Fibre, P=Poles

1.1

[c2] Cw (or Yc) may be moderately to heavily browsed by deer in certain locales necessitating browse protection when necessary.
[h2] H species countable as well-spaced on hummocks or raised microsites only.
*May be harvested as inclusions in larger site units or as lesser part of mosaic.

WESTERN FOREST PRODUCTS LIMITED
SILVICULTURE STANDARDS

BIOGEOCLIMATIC VARIANT CWHvm2 TFL 25 Block 5 Location: Swanson Bay

Description						Targets						Standards												
													Min. Intertree Distance (m)[2]		Free Growing						Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives[7]	Site Prep Method[1]	Recommended Species		Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. sph[3]	Ht (m)	Min sph	Max. sph	Target
							Preferred (P)	Acceptable (A)																
M1	01	3-4	B-C	L	S+F+P	PB, M	Hw Ba Yc		900	500	500	P+N	2.0	2.0	6	150	Yc 1.4 Ba 1.6 Hw 2.3	8	14	10,000	4.0-8.0	700	1100	900
M2	03	1-2	A-B	M	S+F+P	M, PB	Hw Yc		800	400	400	P+N	2.0	2.0	6	150	Hw 1.8 Yc 1.0	8	14	10,000	3.0-7.0	500	900	700
M3	05	3-4	D-E	M	S+F	M, PB	Ba	Hw Yc	900	500	400	P+N	2.0	2,0	4	150	Ba 1.7 Yc 1.7 Hw 2.3	8	14	10,000	4.0-8.0	800	1200	1000
M4	11	7	C-D	H	S+P+F	PB	Yc	Hm[h2]	800	400	400	P+N	1.5	2.0	4	150	Yc 1.0 Hm 1.6	8	14	10,000	N/A	N/A	N/A	N/A

Comments:

1. Site preparation objective is to secure plantable spots. Not required if stocking level is achieved. B=Broadcast burn. M=Mechanical. PB = Pile + Burn. NT= No Treatment
2. Intertree spacing on roadside management units, rubbly talus, or wet, hummocky ground may be reduced to 1.0 metres.
3. Maximum density is applicable as long as Section 41 of the Timber Harvesting and Silviculture Practices Regulation remains in force.
4. Any coniferous species not listed may be accepted up to 10% of target stocking if height is greater than the lowest minimum height listed for the EA.
5. Target assumes typical stocking. Minimum and maximum stocking range is to accommodate variable stocking conditions.
6. Corporate policy is to manage towards targets. As guidance, any site units less than 80% of target and/or any subpolygons (>0.5 ha) less than 50% of target are to be evaluated, and at the Resident Forester's discretion, treated to increase stocking levels.
7. S=Sawlogs, F=Fibre, P=Poles

1.1

[h2] H species countable as well-spaced on hummocks or raised microsites only.

WESTERN FOREST PRODUCTS LIMITED
SILVICULTURE STANDARDS

BIOGEOCLIMATIC VARIANT CWHvh2 TFL 25 Block 5 Location: Swanson Bay

Description						Targets						Standards												
													Min. Intertree Distance (m)[2]		Free Growing						Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives[7]	Site Prep Method[1]	Recommended Species		Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. sph[3]	Ht (m)	Min sph	Max. sph	Target
							Preferred (P)	Acceptable (A)[4]																
H1	01	4-5	B-C	M (salal)	S+F+P	M, PB, B	Cw[c2] Yc	Hw[h1]	900	500	400	N+P	20	2.0	6	150	Yc 1.5 Cw 1.5 Hw 2.0	8	14	10,000	N/A	N/A	N/A	N/A
H1M	01	4-5	B-C	L-M (salal)	S+F	M, PB	Yc	Hw[h1]	900	500	400	N+P	2.0	2.0	6	150	Yc 1.5 Hw 2.0	8	14	10,000	N/A	N/A	N/A	N/A
H2	02	1-3	A	L	F	PB, M	Pl		400	200	200	P+N	2.0	2.0	6	150	Pl 1.3	8	14	10,000	N/A	N/A	N/A	N/A
H3	03	3	B-C	M (salal)	S+P+F	M, PB, B	Cw[c2] Yc	Hw	900	400	400	N+P	2.0	2.0	6	150	Cw 1.0 Hw 1.3 Yc 1.0	8	14	10,000	N/A	N/A	N/A	N/A
H3Fo	03	2-3	B-C	M (salal)	S+P+F	PB	Cw[c2] Yc[y1]	Hw Hm	900	400	400	P+N	2.0	2.0	6	150	Hw 1.3 Hm 1.3 Cw 1.0 Yc 1.0	8	14	10,000	N/A	N/A	N/A	N/A
H4	04	1-2	B-C	L	S+F	M, PB	Hw Ba Ss	Cw[c2]	900	500	400	N+P	2.0	2.0	6	150	Hw 1.8 Ba 1.5 Ss 3.0 Cw 2.0	8	14	10,000	3.0-7.0	650	1000	800
H4cs	04	1-2	B-C	L (salal)	S+P+F	M, PB	Cw[c2]	Hw[h1]	900	500	400	P+N	2.0	2.0	6	150	Cw 2.0 Hw 1.8	8	14	10,000	N/A	N/A	N/A	N/A
H4Fo	04	1	B-C	L	S+F	PB, M	Hw	Ss Cw[c2]	800	400	400	N+P	2.0	2.0	6	150	Hw 1.8 Ss 3.0 Cw 2.0	8	14	10,000	N/A	N/A	N/A	N/A
H4M	04	1-2	B-C	L	S+F	B/M	Hw Yc Ba		900	400	400	N+P	2.0	2.0	6	150	Hw 1.6 Ba 1.8 Yc 1.8	8	14	10,000	3.0-7.0	650	1000	800
H5	05	0-1	D-E	M-H	S+F	M,PB	Ss Ba	Cw[c2] Hw[h1]	900	500	400	P+N	2.0	2.0	6	150	Ba 2.3 Cw 2.0 Ss 3.5 Hw 1.8	8	14	10,000	4.0-8.0	800	1200	1000
H5FoL	05	0	D-E	M	S+F	PB	Ss Ba Cw[c2]		900	400	400	P+N	2.0	2.0	6	150	Ba 2.3 Cw 2.0 Ss 3.5	8	14	10,000	4.0-8.0	800	1200	1000

Description: EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives[7]	Targets: Site Prep Method[1]	Recommended Species: Preferred (P)	Recommended Species: Acceptable (A)[4]	Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Standards: Stocking Method	Min. Intertree Distance (m)[2]: Ptd	Min. Intertree Distance (m)[2]: Nat	Free Growing: Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. sph[3]	Juvenile Spacing Density[5]: Ht (m)	Min sph	Max. sph	Target
H6	06	2-3	D	H	S+F	M,PB	Ss Ba Hw	Cw[c2]	900	500	400	P+N	2.0	2.0	3	150	Ba 2.3 Ss 4.0 Hw 1.8 Cw 2.0	8	14	10,000	4.0-8.0	800	1200	1000
H6C	06	2-3	D	H	S+F	PB, M	Ss Ba	Cw[c2] Hw	900	500	400	P+N	2.0	2.0	3	150	Ba 2.3 Ss 4.0 Hw 1.8 Cw 2.0	8	14	10,000	4.0-8.0	800	1200	1000
H6cs	06	2-3	D	H	S+P+F	M, PB, B	Cw[c2] Ba	Hw[h1]	900	500	400	P+N	2.0	2.0	3	150	Ba 1.8 Cw 2.0 Hw 1.8	8	14	10,000	4.0-8.0	800	1200	1000
H6F	06	2-3	D	H	S+F+P	M, PB, B	Ss Ba	Hw Cw[c2]	900	500	400	P+N	2.0	2.0	3	150	Ba 2.3 Cw 2.0 Ss 4.0 Hw 1.8	8	14	10,000	4.0-8.0	800	1200	1000
H6M	06	2-3	D	H	S+F	M, PB	Yc Ba Hw	Ss	900	500	400	P+N	2.0	2.0	3	150	Ba 2.0 Ss 3.5 Hw 1.6 Yc 1.8	8	14	10,000	4.0-8.0	800	1200	1000
H7	07	2-3	E	VH	S+F	M, PB, B	Ss Ba	Hw[h1]	900	500	400	P+N	2.0	2.0	3	150	Ba 2.3 Ss 4.0 Hw 1.8	6	12	10,000	4.0-8.0	800	1200	1000
H8	08	1-2	D	VH	S+F	M, PB	Ss Ba	Hw[h1] Cw[c2]	900	500	400	P+N	1.5	2.0	3	150	Cw 2.0 Ss 4.0 Ba 2.3 Hw 1.8	8	12	10,000	4.0-8.0	800	1200	1000
H10	10	6-7	E	VH	F+S	PB	Ac	Dr	900	500	400	P+N	1.8	2.0	3	150	Ac 4.0 Dr 4.0	8	12	N/A	4.0-7.0	600	1000	700
H11	11	6-7	B-C	M	S+F	B/M	Pl Yc	Cw[c2]	800	400	400	P+N	1.5	2.0	6	150	Cw 1.0 Yc 1.0 Pl 1.3	8	14	10,000	N/A	N/A	N/A	N/A
H11M	11	6-7	B-C	M	S+F	PB	Pl Yc[y2]		800	400	400	P+N	1.5	2.0	6	150	Yc 1.0 Pl 1.3	8	14	10,000	N/A	N/A	N/A	N/A
H12	12		A-B	M	Avoid harvest		Pl		400	200	200	P+N	1.5	2.0	6	150	Pl 1.3	8	14	10,000	N/A	N/A	N/A	N/A
H13	13	5-6	D	M	P+S	PB, M	Cw[c2] Yc[y1]		800	400	400	P+N	1.5	2.0	6	150	Cw 1.2 Yc 1.2	8	14	10,000	N/A	N/A	N/A	N/A
H13F	13	6-7	D-E	M	S+F	PB, M	Ss	Cw[c2]	800	400	400	P	1.8	1.8	6	150	Ss 2.5	8	14	10,000	4.0-8.0	800	1200	1000

Description						Targets						Standards												
													Min. Intertree Distance (m)[2]		Free Growing							Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Product Objectives[7]	Site Prep Method[1]	Recommended Species: Preferred (P)	Recommended Species: Acceptable (A)[4]	Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. sph[3]	Ht (m)	Min sph	Max. sph	Target
																	Cw 1.2							
H13M	13	5-6	D	M	S+F	PB, M	Cw Yc		800	400	400	P	2.0	2.0	6	150	Cw 1.0 Yc 1.0	8	14	10,000	N/A	N/A	N/A	N/A
H32	32	8	A-B		Avoid harvest*																			
H33	33	8	D-E		Avoid harvest*																			

Comments:
1. Site preparation objective is to secure plantable spots. Not required if stocking level is achieved. B=Broadcast burn. M=Mechanical. PB = Pile + Burn. NT= No Treatment
2. Intertree spacing on roadside management units, rubbly talus, or wet, hummocky ground may be reduced to 1.0 metres.
3. Maximum density is applicable as long as Section 41 of the Timber Harvesting and Silviculture Practices Regulation remains in force.
4. Any coniferous species not listed may be accepted up to 10% of target stocking if height is greater than the lowest minimum height listed for the EA.
5. Target assumes typical stocking. Minimum and maximum stocking range is to accommodate variable stocking conditions.
6. Corporate policy is to manage towards targets. As guidance, any site units less than 80% of target and/or any subpolygons (>0.5 ha) less than 50% of target are to be evaluated, and at the Resident Forester's discretion, treated to increase stocking levels.
7. S=Sawlogs, F=Fibre, P=Poles

[c2] Cw (or Yc) may be moderately to heavily browsed by deer in certain locales necessitating browse protection when necessary.
[h1] H productivity is limited and should not exceed 20% of target stocking.
[y1] Yc is heavily browsed by introduced deer and cannot be used for reforestation unless browse protection (e.g. seedling protectors, fencing) is deployed. Unprotected seedlings < breast height cannot be counted as well-spaced.
[y2] Limit Yc leading stands to <10% of stands on this EA.
*May be harvested as inclusions in larger site units or as lesser part of mosaic.

BIOGEOCLIMATIC VARIANT CWHvh2 TFL 25 Block 6 Location: Sewell Inlet

Description						Targets							Min. Intertree Distance (m)[2]		Regeneration Delay and Free Growing Standards						Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Primary Product Objectives[7]	Site Prep. Method[1]	Recommended Species: Preferred (P)	Recommended Species: Acceptable (A)[4]	Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. Sph[3]	Ht (m)	Min. sph	Max sph	Target
H1	01	4-5	B - C	L	P+S	M, PB, B	Cw[c1] Yc[y1] Hw[h0] Hm[h0]		900	500	400	P+N	2.0	2.0	6	150	Cw 1.5 Yc 1.5 Hw 2.0 Hm 1.8	8	14	10,000	N/A	N/A	N/A	N/A
H3	03	3-4	B-C	L	S+P	M, PB, B	Cw[c1] Yc[y1] Hw Hm	Ss	900	500	400	P+N	2.0	2.0	6	150	Hw 1.3 Hm 1.3 Ss 2.0 Cw 1.0 Yc 1.0	8	14	10,000	N/A	N/A	N/A	N/A
H3Fo	03	2-3	B-C	L	S+P	PB, M	Cw[c1] Yc[y1] Hw Hm		900	400	400	P+N	2.0	2.0	6	150	Hw 1.3 Hm 1.3 Cw 1.0 Yc 1.0	8	14	10,000	N/A	N/A	N/A	N/A
H4	04	1 - 2	B - C	L	S+F	PB, M	Hw Ss	Cw[c2]	900	500	400	N+P	2.0	2.0	6	150	Hw 1.8 Ss 3.0 Cw 2.0	8	14	10,000	3.0-7.0	650	1000	800
H4cs	04	1-2	B-C	M (salal)	P+S	PB, M, B	Cw[c1] Hw[h0]		900	500	500	P+N	2.0	2.0	6		Cw 2.0 Hw 1.8	8	14	10,000	N/A	N/A	N/A	N/A
H4Fo	04	1	B-C	L	F+S	PB	Hw	Cw[c2]	800	400	400	N+P	2.0	2.0	6	150	Cw 2.0 Hw 1.8	8	14	10,000	N/A	N/A	N/A	N/A
H4FoM	04	1	B-C	L	S+F	PB	Hw Yc[y1]		800	400	400	N+P	2.0	2.0	6	150	Hw 1.8 Yc 1.8	8	14	10,000	N/A	N/A	N/A	N/A

Description						Targets							Min. Inter-tree Distance (m)[2]		Regeneration Delay and Free Growing Standards						Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Primary Product Objectives[7]	Site Prep. Method	Recommended Species Preferred (P)	Recommended Species Acceptable (A)[4]	Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. Sph[3]	Ht (m)	Min. sph	Max sph	Target
H4M	04	1-2	B-C	L	S+F	M, PB	Hw Yc[y1]		900	400	400	N+P	2.0	2.0	6	150	Hw 1.8 Yc 1.8	8	14	10,000	3.0-7.0	650	1000	800
H5	05	0-1	E	M	S+F	M, PB	Ss Hw		900	500	400	P+N	2.0	2.0	4	150	Ss 3.5 Hw 1.8	8	14	10,000	4.0-8.0	800	1200	1000
H5EM	05	1-2	D	M	S+F	PB	Hw Ss	Yc[y1]	900	500	400	P+N	2.0	2.0	4	150	Ss 3.0 Hw 1.8 Yc 1.8	8	14	10,000	4.0-8.0	800	1200	1000
H5FoL	05	0	D-E	M	S+F	PB	Cw[c1] Ss	Hw	900	500	400	P+N	2.0	2.0	4	150	Cw 2.0 Hw 1.8 Ss 3.5	8	14	10,000	4.0-8.0	800	1200	1000
H5L	05	0-1	E	M	S+F+P	PB	Ss Cw[c1]	Hw	900	500	400	P+N	2.0	2.0	4	150	Cw 2.0 Hw 1.8 Ss 3.5	8	14	10,000	4.0-8.0	800	1200	1000
H5M	05	0-1	D	M	S+F+P	M, PB	Hw Ss	Yc[y1]	900	500	400	P+N	2.0	2.0	4	150	Yc 1.8 Hw 1.8 Ss 3.0	8	14	10,000	4.0-8.0	800	1200	1000
H6	06	2-3	D	H	S+F	M, PB	Ss Hw	Cw[c1]	900	500	400	P	2.0	2.0	3	150	Cw 2.0 Hw 1.8 Ss 4.0	8	14	10,000	4.0-8.0	800	1200	1000
H6C	06	2	D	H	S+F	PB	Ss Hw	Cw[c1]	900	500	400	P	2.0	2.0	3	150	Cw 2.0 Hw 1.8 Ss 4.0	8	14	10,000	4.0-8.0	800	1200	1000
H6F	06	2-3	D	H	S+F	M, PB	Ss Hw	Cw[c1]	900	500	400	P	2.0	2.0	3	150	Cw 2.0 Hw 1.8 Ss 4.0	8	14	10,000	4.0-8.0	800	1200	1000
H6FM	06	2-3	D	H	S+F	M, PB	Yc[y1] Hw Ss[s0]		900	500	500	P	2.0	2.0	3	150	Yc 1.8 Hw 1.6 Ss 3.5	8	14	10,000	4.0-8.0	800	1200	1000

Description						Targets								Min. Inter-tree Distance (m)[2]		Regeneration Delay and Free Growing Standards						Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Primary Product Objectives[7]	Site Prep. Method[1]	Recommended Species		Target Stocking P+ A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. Sph[3]	Ht (m)	Min. sph	Max sph	Target
							Preferred (P)	Acceptable (A)[4]																
H6M	06	2-3	D	H	S+F	M, PB	Yc[y1] Hw Ss		900	500	500	P+N	2.0	2.0	4	150	Yc 2.0 Hw 1.8 Ss 3.5	8	12	10,000	4.0-8.0	800	1200	1000
H8	08	2-3	D-E	VH	S+F	M, PB	Ss	Hw Cw[c1]	900	500	400	P+N	2.0	2.0	3	150	Hw 1.8 Cw 2.0 Ss 4.0	8	12	10,000	4.0-8.0	800	1200	1000
H9	09	2-3	E	VH	S+F	M, PB	Ss Dr		900	500	500	P+N	2.0	2.0	3	150	Dr 3.0 Ss 4.0	8	12	10,000	4.0-8.0	800	1200	1000
H11	11	6-7	B-C	M	S+F	PB	Pl Yc[y1]	Cw[c1]	800	400	400	P	1.8	1.8	6	150	Pl 1.3 Yc 1.0 Cw 1.0	8	14	10,000	N/A	N/A	N/A	N/A
H12	12		A-B	M	Avoid harvest*	PB	Pl		400	200	200	P	2.0	2.0	6	150	Pl 1.3	8	14	10,000	N/A	N/A	N/A	N/A
H13	13	5-6	D	M	P+S+F	PB, M	Cw[c1] Yc[y1]	Hw[h2] Hm	800	500	400	P+N	2.0	2.0	6	150	Cw 1.0 Yc 1.0 Hw 1.3 Hm 1.0	8	14	10,000	N/A	N/A	N/A	N/A
H13F	13	6-7	D-E	M	S+P+F	PB, M	Ss Cw[c1]		800	400	400	P	1.8	1.8	6	150	Ss 2.5 Cw 1.0	8	14	10,000	4.0-8.0	800	1200	1000
H13M	13	5-6	D	M	P+S	PB, M	Cw[c1] Yc[y1]		800	400	400	P	2.0	2.0	6	150	Cw 1.0 Yc 1.0	8	14	10,000	N/A	N/A	N/A	N/A
H16	16	1-3	D-E	H	S+F	M, PB, B	Ss		800	400	400	P	2.0	2.0	6	150	Ss 3.0	8	14	10,000	4.0-8.0	800	1200	1000
H32	32	8	B		Avoid harvest*																			
H33	33	8	D-E		Avoid harvest*																			

Comments:
1. Site preparation objective is to secure plantable spots. Not required if stocking level is achieved. B=Broadcast burn. M=Mechanical. PB = Pile + Burn. NT= No Treatment
2. Intertree spacing on roadside management units, rubbly talus, or wet, hummocky ground may be reduced to 1.0 metres.
3. Maximum density is applicable as long as Section 41 of the Timber Harvesting and Silviculture Practices Regulation remains in force.
4. Any coniferous species not listed may be accepted up to 10% of target stocking if height is greater than the lowest minimum height listed for the EA.
5. Target assumes typical stocking. Minimum and maximum stocking range is to accommodate variable stocking conditions
6. Corporate policy is to manage towards targets. As guidance, any site units less than 80% of target and/or any subpolygons (>0.5 ha) less than 50% of target are to be evaluated, and at the Resident Forester's discretion, treated to increase stocking levels.
7. S=Sawlogs, F=Fibre, P=Poles

1.1

[c1] Cw is heavily browsed by introduced deer and cannot be used for reforestation unless browse protection (e.g. seedling protectors, fencing) is deployed. Unprotected seedlings < breast height can not be counted as well-spaced.
[c2] Cw (or Yc) may be moderately to heavily browsed by deer in certain locales necessitating browse protection when necessary.
[h0, s0] H or Ss stocking to be less than 50% of target.
[c1] Cw is heavily browsed by introduced deer and cannot be used for reforestation unless browse protection (e.g. seedling protectors, fencing) is deployed. Unprotected seedlings < breast height can not be counted as well-spaced.
[c2] Cw (or Yc) may be moderately to heavily browsed by deer in certain locales necessitating browse protection when necessary.
[h0, s0] H or Ss stocking to be less than 50% of target.
[h2] H species countable as well-spaced on hummocks or raised microsites only.
[y1] Yc is heavily browsed by introduced deer and cannot be used for reforestation unless browse protection (e.g. seedling protectors, fencing) is employed. Unprotected seedling cannot be counted as well-spaced.
*May be harvested as inclusions in larger site units or as lesser part of mosaic.

WESTERN FOREST PRODUCTS LIMITED
SILVICULTURE STANDARDS

BIOGEOCLIMATIC VARIANT CWHwh1 | TFL 25 Block 6 | Location: Sewell Inlet

Description: EA	Description: Site Series	Description: SMR	Description: SNR	Description: Competing Vegetation Potential	Targets: Primary Product Objectives[7]	Targets: Site Prep. Method[1]	Targets: Recommended Species – Preferred (P)	Targets: Recommended Species – Acceptable (A)[4]	Targets: Target Stocking P + A	Targets: Min. Stocking P + A[6]	Targets: Min. Stocking Preferred	Targets: Stocking Method	Min. Intertree Distance (m)[2]: Ptd	Min. Intertree Distance (m)[2]: Nat	Regeneration Delay and Free Growing Standards: Regen Delay (yrs)	Regeneration Delay and Free Growing Standards: Size % of Brush	Regeneration Delay and Free Growing Standards: Min Ht. (m)	Regeneration Delay and Free Growing Standards: Earliest (yrs)	Regeneration Delay and Free Growing Standards: Latest (yrs)	Regeneration Delay and Free Growing Standards: Max. sph[3]	Juvenile Spacing[5]: Ht (m)	Juvenile Spacing[5]: Min. sph	Juvenile Spacing[5]: Max ph	Juvenile Spacing[5]: Target sph
Q1	01	4-5	C	L	S+F	M, PB	Ss Hw	Cw[c1]	900	500	400	P+N	2.0	2.0	6	150	Ss 3.0 Hw 2.0 Cw 1.5	8	14	10,000	4.0 - 8.0	800	1200	1000
Q1C	01	4-5	C	M	S+F	PB, M	Ss Hw	Cw[c1]	900	500	400	P+N	2.0	2.0	6	150	Ss 3.5 Hw 2.5 Cw 2.0	8	14	10,000	4.0 - 8.0	800	1200	1000
Q1s	01s	4-5	B-C	M	S+F+P	B, M, PB	Cw[c1] Hw[h0]		900	500	500	P+N	2.0	2.0	6	150	Cw 1.5 Hw 1.5	8	14	10,000	N/A	N/A	N/A	N/A
Q2	02	2-3	B-C	L	F+P	PB	Hw Ss	Cw[c1]	900	500	400	N+P	2.0	2.0	6	150	Hw 1.2 Ss 2.0 Cw 1.0	8	14	10,000	N/A	N/A	N/A	N/A
Q2P	02	0-1	B	L	F	PB	Pl		800	400	400	P+N	2.0	2.0	6	150	Pl 1.3	8	14	10,000	N/A	N/A	N/A	N/A
Q3	03	2-4	D	H	S+F	M, PB	Ss Hw[h0]	Cw[c1]	900	500	400	P	2.0	2.0	3	150	Ss 3.5 Hw 2.7 Cw 2.0	8	12	10,000	4.0 - 8.0	800	1200	1000
Q5C	05	4-5	D	H	S+F	M, PB	Ss Hw	Cw[c1]	800	400	400	P	2.0	2.0	3	150	Ss 4.0 Cw 2.0 Hw 2.8	8	12	10,000	4.0 - 8.0	800	1200	1000
Q5F	05	5	D	H	S+F	M, PB	Ss	Hw[h1]	900	500	400	P	2.0	2.0	3	150	Ss 4.0 Hw 2.8	8	12	10,000	4.0 - 8.0	800	1200	1000
Q6	06	6	D-E	L-M	S+P	PB	Ss Cw		800	400	400	P	1.5	1.5	6	150	Cw 2.0 Ss 4.0	8	14	10,000	4.0 - 8.0	600	1000	800
Q7	07	5	D	M	S+F	M, PB	Ss	Hw	900	500	400	P	2.0	2.0	3	150	Ss 4.0	8	14	10,000	4.0 - 8.0	800	1200	1000

Description					Targets								Minimum Intertree Distance (m)[2]		Regeneration Delay and Free Growing Standards						Juvenile Spacing[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Primary Product Objectives[7]	Site Prep. Method[1]	Recommended Species		Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. Sph[3]	Ht (m)	Min. sph	Max sph	Target sph
							Preferred (P)	Acceptable (A)[4]																
Q8	08	5	D-E	H	S+F	M, PB	Ss Dr		900	500	500	P	2.0	2.0	3	150	Ss 4.0 Dr 4.0	8	14	10,000	4.0 - 8.0	800	1200	1000
Q10	10	6	B	L	F+S	PB	Pl Yc		800	400	400	P	1.5	1.5	6	150	Pl 1.3 Yc 1.0	8	14	10,000	N/A	N/A	N/A	N/A
Q12	12	7	D	L	F+S	PB	Cw[c1]	Hw[h1] Yc	800	400	400	P	1.5	1.5	6	150	Cw 1.0 Hw 1.0 Yc 1.0	8	14	10,000	N/A	N/A	N/A	N/A
Q15	15	3-5	D-E	H	S	M, PB	Ss		900	200	200	P	2.0	2.0	3	150	Ss 3.0	8	14	10,000	4.0 - 8.0	800	1200	1000

Comments:

1. Site preparation objective is to secure plantable spots. Not required if stocking level is achieved. B=Broadcast burn. M=Mechanical. PB = Pile + Burn. NT= No Treatment
2. Intertree spacing on roadside management units, rubbly talus, or wet, hummocky ground may be reduced to 1.0 metres.
3. Maximum density is applicable as long as Section 41 of the Timber Harvesting and Silviculture Practices Regulation remains in force.
4. Any coniferous species not listed may be accepted up to 10% of target stocking if height is greater than the lowest minimum height listed for the EA.
5. Target assumes typical stocking. Minimum and maximum stocking range is to accommodate variable stocking conditions
6. Corporate policy is to manage towards targets. As guidance, any site units less than 80% of target and/or any subpolygons (>0.5 ha) less than 50% of target are to be evaluated, and at the Resident Forester's discretion, treated to increase stocking levels.
7. 7. S=Sawlogs, F=Fibre, P=Poles

1.1

[c1] Cw is heavily browsed by introduced deer and cannot be used for reforestation unless browse protection (e.g. seedling protectors, fencing) is deployed. Unprotected seedlings < breast height can not be counted as well-spaced.
[h0] H component not to exceed 50% of target stocking
[h1] H productivity is limited and should not exceed 20% of target stocking.

WESTERN FOREST PRODUCTS LIMITED
SILVICULTURE STANDARDS

BIOGEOCLIMATIC VARIANT CWHwh2 TFL 25 Block 6 Location: Sewell Inlet

Description					Targets								Min. Inter-tree Distance (m)[2]		Regeneration Delay and Free Growing Standards						Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Primary Product Objectives[7]	Site Prep. Method[1]	Recommended Species		Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. Sph[3]	Ht (m)	Min sph	Max sph	Target
							Preferred (P)	Acceptable (A)[4]																
QM1	01	3-4	B-C	L	S+F	PB, M	Hw Yc[y1]	Hm Ss	900	500	400	N+P	2.0	2.0	6	150%	Hw 2.0 Yc 1.5 Ss 1.5 Hm 1.8	8	14	10,000	4.0 – 8.0	650	1000	800
QM1C	01	3-4	B-C	L	S+F	PB	Hw Yc[y1]	Ss	800	400	400	P+N	2.0	2.0	6	150%	Hw 2.0 Yc 1.5 Ss 1.5	8	14	10,000	4.0 – 8.0	650	1000	800
QM5	05	6-7	B	L	S+F	PB	Yc[y1]	Hm	600	200	200	P+N	2.0	2.0	6	150%	Hm 1.0 Yc 1.3	8	14	10,000	N/A	N/A	N/A	N/A
QM7	03	3-4	D	H	S	PB, M	Ss Hw Yc[y1]		900	500	500	P+N	2.0	2.0	6	150%	Hw 2.0 Yc 1.5 Ss 1.8	8	14	10,000	4.0 – 8.0	800	1200	1000

Comments:
1. Site preparation objective is to secure plantable spots. Not required if stocking level is achieved. B=Broadcast burn. M=Mechanical. PB = Pile + Burn. NT= No Treatment
2. Intertree spacing on roadside management units, rubbly talus, or wet, hummocky ground may be reduced to 1.0 metres.
3. Maximum density is applicable as long as Section 41 of the Timber Harvesting and Silviculture Practices Regulation remains in force.
4. Any coniferous species not listed may be accepted up to 10% of target stocking if height is greater than the lowest minimum height listed for the EA.
5. Target assumes typical stocking. Minimum and maximum stocking range is to accommodate variable stocking conditions.
6. Corporate policy is to manage towards targets. As guidance, any site units less than 80% of target and/or any subpolygons (>0.5 ha) less than 50% of target are to be evaluated, and at the Resident Forester's discretion, treated to increase stocking levels.
7. S=Sawlogs, F=Fibre, P=Poles

1.1

[y1] Yc is heavily browsed by introduced deer and cannot be used for reforestation unless browse protection (e.g. seedling protectors, fencing) is deployed. Unprotected seedlings < breast height cannot be counted as well-spaced.

WESTERN FOREST PRODUCTS LIMITED
SILVICULTURE STANDARDS

BIOGEOCLIMATIC VARIANT MHwh1 TFL 25 Block 6 Location Sewell Inlet

Description						Targets						Standards												
													Min. Intertree Distance (m)[2]		Free Growing							Juvenile Spacing Density[5]			
EA	Site Series	SMR	SNR	Competing Vegetation Potential	Primary Product Objectives[7]	Site Prep. Method[1]	Recommended Species Preferred (P)	Recommended Species Acceptable (A)[4]	Target Stocking P + A	Min. Stocking P + A[6]	Min. Stocking Preferred	Stocking Method	Ptd	Nat	Regen Delay (yrs)	Size % of Brush	Min Ht. (m)	Earliest (yrs)	Latest (yrs)	Max. Sph[3]	Ht (m)	Min. sph	Max sph	Target
HMH1	01	3-5	B-C	M	S+F	PB, M	Hm Yc[y1]		700	400	400	N+P	2.0	2.0	7	150	Hm 1.0 Yc 1.0	15	20	10,000	3.0-7.0	400	900	600
HMH4	04	5-6	B-C	M	S+F	PB, M	Yc[y1] Hm		700	400	400	N+P	2.0	2.0	7	150	Hm 1.0 Yc 1.0	15	20	10,000	3.0-7.0	400	900	600

Comments:

1. Site preparation objective is to secure plantable spots. Not required if stocking level is achieved. B=Broadcast burn. M=Mechanical. PB = Pile + Burn. NT= No Treatment
2. Intertree spacing on roadside management units, rubbly talus, or wet, hummocky ground may be reduced to 1.0 metres.
3. Maximum density is applicable as long as Section 41 of the Timber Harvesting and Silviculture Practices Regulation remains in force.
4. Any coniferous species not listed may be accepted up to 10% of target stocking if height is greater than the lowest minimum height listed for the EA.
5. Target assumes typical stocking. Minimum and maximum stocking range is to accommodate variable stocking conditions
6. Corporate policy is to manage towards targets. As guidance, any site units less than 80% of target and/or any subpolygons (>0.5 ha) less than 50% of target are to be evaluated, and at the Resident Forester's discretion, treated to increase stocking levels.
7. S=Sawlogs, F=Fibre, P=Poles

[y1] Yc is heavily browsed by introduced deer and cannot be used for reforestation unless browse protection (e.g. seedling protectors, fencing) is employed. Unprotected seedling cannot be counted as well-spaced.

Appendix XXIII

Fire Preparedness Plan

Sample Only

WESTERN FOREST PRODUCTS LIMITED

2001 FIRE PREPAREDNESS PLAN

TFL 25, BLOCK 2

STAFFORD LAKE FOREST OPERATION

IN CASE OF A FIRE
CALL WFP DUTY OFFICER
(REFER TO APPENDIX B FOR ROSTER LIST)
MAINLAND ISLANDS REGION OFFICE (250) 286-3767
DUTY OFFICER PAGER NUMBER (250) 830-6030

FIRE DETECTION

Routine patrols by the camp foreman are used during normal operation periods with extra patrols and watchmen during periods of warmer weather. Ground patrols are maintained during shutdowns and aerial patrols will be used if hazard conditions warrant it.

Initial Fire Suppression

Crews

The initial attack crews are made up from camp employees and are supervised by camp management.

Method of Contact

During operating hours the men are contacted personally on the operating sites. After working hours the men are contacted in the bunkhouses.

Staging Point

During operating hours, when a site receives an order to standby, the engineer brings the crew to the landing. The yarder or loader is shut down and the crew waits in the crummy for further instruction. After work and during non-operating periods, key personnel are informed who, in turn, notify other employees.

Responsibilities of Personnel

Camp Manager – Fire Boss

Is responsible for supervising control of all fires; shuts down logging sites as required; notifies Forest Service and WFP head office; provides overall direction and fire fighting strategy.

Woods Foreman – Suppression Boss

Is responsible to carry out fire fighting plans and organizes crews; provides fire equipment as required; assists in evaluating the fire and determining equipment needs; directs setting up and distribution of equipment at the fire; locates water sources; sees that all pumping crews and pumps are operating efficiently and that water tanker schedules are maintained; identifies a centralized place for unused equipment and instructs the fire crew bosses accordingly; keeps accurate records of equipment and hose taken out and returned to the fire hall and landing storage points; maintains fire weather records; reports to the camp manager.

Hook Tenders and Head loaders – Fire Crew Bosses

When notified of a fire, brings the crew into the landing; upon receiving instructions from the woods foreman or assistant woods foreman, proceeds to the fire; takes charge of fire equipment from the fire warden and sets it up as instructed. The hooker is responsible for the efficiency of his crew, turning in time cards for all members of his crew at shift changes. He is also responsible for all equipment issued to his crew and sees that fire tools are brought to a designated point at the end of a shift; reports to the woods foreman or assistant woods foreman at night.

Fallers

Responsible for snag falling and windfall bucking on fire lines.

Mechanic

Organizes shop crews to give the best possible services to fire fighting equipment; sets up a special pump service.

Road Foreman

Responsible for water supply. Sets up volume pumps at nearest water supply to fill tankers. Directs tankers as requested by the woods foreman.

First Aid Man

On call 24 hours a day while a fire is burning.

Fire Reporting Numbers

Ministry of Forests Fire Response Center	1-800-663-5555
Coastal Fire Center Vancouver Forest Region	(250) 951-4200 (Fire calls only)
	(250) 951-4222 (Non-fire calls)

Key Company Personnel

Corporate Office (xxx) xxx-xxx

	Office	Home	Cell
General Manager	(xxx) xxx-xxxx	(xxx) xxx-xxxx	(xxx) xxx-xxxx
Chief Forester	(xxx) xxx-xxxx	(xxx) xxx-xxxx	(xxx) xxx-xxxx
Manager, Timber Supply & Planning	(xxx) xxx-xxxx	(xxx) xxx-xxxx	

Mainland/Islands Region (xxx) xxx-xxx

	Office	Home	Cell
Area Manager	(xxx) xxx-xxxx	(xxx) xxx-xxxx	(xxx) xxx-xxxx
Regional Engineer	(xxx) xxx-xxxx	(xxx) xxx-xxxx	(xxx) xxx-xxxx
Regional Forester	(xxx) xxx-xxxx	(xxx) xxx-xxxx	(xxx) xxx-xxxx
Resident Engineer	(xxx) xxx-xxxx	(xxx) xxx-xxxx	(xxx) xxx-xxxx
Resident Forester	(xxx) xxx-xxxx	(xxx) xxx-xxxx	(xxx) xxx-xxxx
Assistant Forester	(xxx) xxx-xxxx	(xxx) xxx-xxxx	
Operations Engineer	(xxx) xxx-xxxx	(xxx) xxx-xxxx	

Stafford Lake Operation (xxx) xxx-xxx

Owner/Contractor (250) 286-2391 Camp Frequency: 166.740

Men And Equipment Available

Resource	Number
Men working at operation	25
Bulldozers	2
Excavators	3
Low Beds	1
Front End Loaders	1
Line Loaders	3
Tanker Trucks	2
Pressure Pump Units	6
Volume Pump Units	4
Hose	6000 feet
Hand Tools	
Shovels	30
Pulaskis	30
Hand Tank Pumps	25
Power Saws	15
Pick-ups	10

Personnel With Prescribed Training Qualification

The following people have completed the S-100 Fire Suppression and Safety course:

Al Atwood	Brian Oakford
Matts Axelsson	Fred Koch
Greg Schneider	Clark Tarr
Byron Brown	

Central Cache Tools And Equipment

Resource	Number
Portable pump units	2
Shovels	6
Pulaski/Mattocks	6
Hand-tank pumps	4

Weather Station Location

The weather station will be located in block 1 (see appendix A).

Schedule Of Industrial Activity

There will be industrial activity throughout the fire season except when the fire hazard rating warrants a closure of the logging and road building operations. The following is a list of areas where road building and logging activities will occur. See appendix A for the location of these activities.

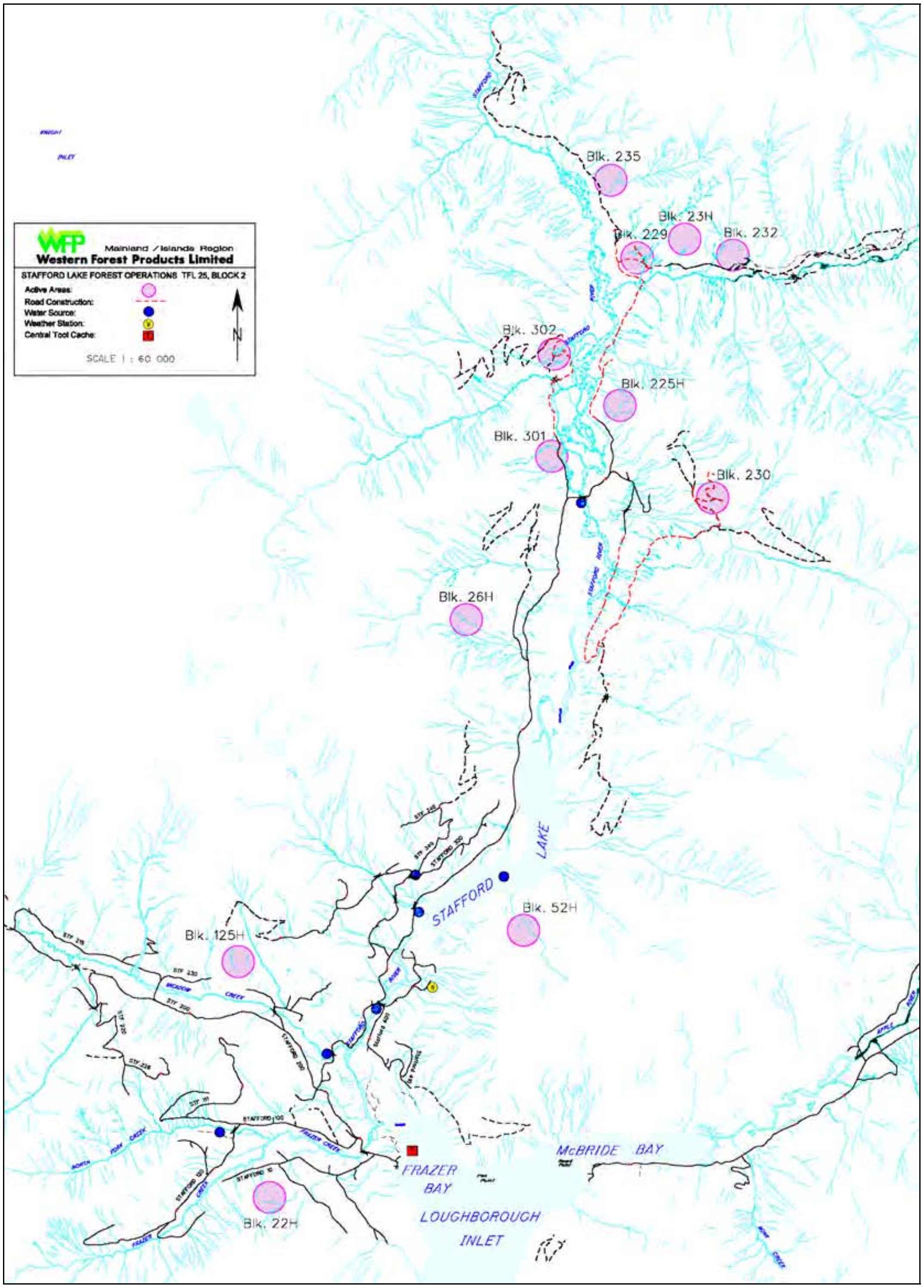
Logging Activities

Block	CP	Timbermark	Coordinates
22H	207	25/207	50°42'/125°30'
23H	206	25/206	50°51'/125°24'
26H	206	25/206	50°47'/125°27'
52H	207	25/207	50°45'/125°26'
125H	207	25/207	50°44'/125°30'
225H	207	25/207	50°47'/125°27'
229	206	25/206	50°50'/125°26'
301	206	25/206	50°49'/125°26'
302	206	25/206	50°50'/125°26'

Road Building Activities

Block	CP	Timbermark	Coordinates
230	207	25/207	50°49'/125°24'
232	207	25/207	50°51'/125°24'
235		25/	50°21'/125°25'

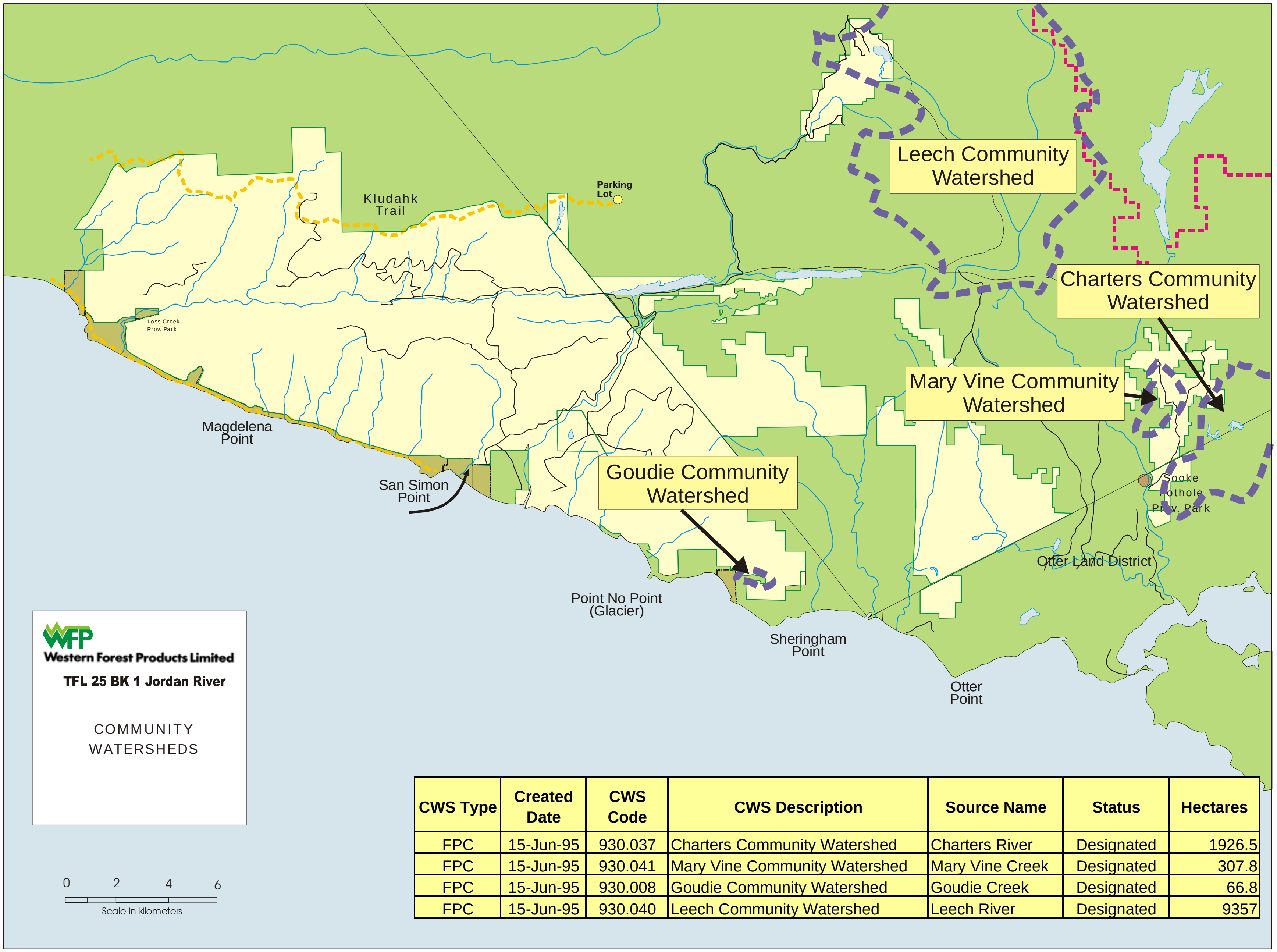
There will also be silviculture, surveying, and engineering activities occurring throughout the operation during the fire season.



Mainland / Islands Region
Western Forest Products Limited
STAFFORD LAKE FOREST OPERATIONS TFL 25, BLOCK 2
Active Areas:
Road Construction:
Water Source:
Weather Station:
Central Tool Cache:
N
SCALE 1 : 60 000
Blk. 235
Blk. 23H
Blk. 229
Blk. 232
Blk. 302
Blk. 225H
Blk. 301
Blk. 230
Blk. 26H
LAKE
STAFFORD
Blk. 52H
Blk. 125H
McBRIDE BAY
FRAZER BAY
LOUGHBOROUGH INLET
Blk. 22H

Appendix XXIV

Community Watersheds



CWS Type	Created Date	CWS Code	CWS Description	Source Name	Status	Hectares
FPC	15-Jun-95	930.037	Charters Community Watershed	Charters River	Designated	1926.5
FPC	15-Jun-95	930.041	Mary Vine Community Watershed	Mary Vine Creek	Designated	307.8
FPC	15-Jun-95	930.008	Goudie Community Watershed	Goudie Creek	Designated	66.8
FPC	15-Jun-95	930.040	Leech Community Watershed	Leech River	Designated	9357

Appendix XXV

Western Matters

Western Matters

Western Forest Products Limited Volume 1, Issue 2 Fall 2002

Retention...Or Not?

by Bill Day, Regional Engineer, NVIR

Is the retention silviculture system appropriate for all coastal forest types? All forests are not made equal so why should this system, as narrowly defined in the Operational Planning Regulation, be suitable in all circumstances?

The 'retention' silviculture system requires that retained standing timber be evenly distributed across a cutblock. It will generally be constituted of more, smaller patches dispersed over a cutblock than the fewer, larger patches which distinguish the 'clearcut with reserve' system.

What is the purpose of the retention system?

The primary rationale typically put forth is that the retention system is a component of ecologically based forest management.

A second purpose might be to achieve societal goals such as moderating the visual impacts of harvest in a scenic corridor or protecting cultural artifacts such as middens.

Third, a higher level plan imposed by government may dictate the retention system is to be used in certain landscape zones.

The fourth and probably truest reason for widespread use of the retention system is to adjust the public's perception of forest harvesting. It is used as a public relations exercise to deal with market pressures being faced at any given time. This is the poorest reason from a forest stewardship standpoint.

"Perfection is not achievable. Excellence is."

Dean McGeough

Generally, because northern Vancouver Island stands are subject to repeated catastrophic windthrow events over time, the safety issues and operational costs associated with windfall recovery make them unsuitable for the retention system. Further, large scale disturbance seems to be the norm for these stands so lower levels of dispersed retention may be more ecologically appropriate. Having said that, we may use the retention system in these areas in two instances: to achieve short term visual quality goals; or to meet the requirements of the Vancouver Island Land Use Plan.

In addition to meeting visual quality and higher level plan objectives we consider using the retention system in gentler (hoe forwarding) terrain, characterized by more windfirm cedar - hemlock types. Such conditions are more favourable from the perspective of safety and provide for a reasonable logging chance. From an ecological standpoint, retention patches will be more enduring in these stands and the result may be more in tune with the smaller disturbances

(continued on page 5)

Inside this Issue

Western Matters is an official newsletter of Western Forest Products Limited. Content may be reproduced provided the author and WFP are credited.

***Western Matters* is also available at www.westernforest.com**

North Vancouver Island Region (NVIR) Forest Management Certification

by Shannon Janzen, Holberg and Dave Mogensen, NVIR

NVIR had its first Canadian Standards Association (CSA) surveillance audit in July 2002. Independent auditors, Quality Management Institute (QMI), found full conformance, excellent public involvement, and an excellent continual improvement process. So how do we get these results?

To meet the CSA standard, NVIR maintains a plan to address sustainability for all forest values, including biological, economic, social, and cultural aspects. The plan meets the CSA international sustainability criteria developed though United Nations processes. CSA is also considered the National Standard of Canada.

CSA Certification is well suited to BC Crown lands because it has a strong public participation requirement. To meet the requirement, NVIR hosts a public advisory group, called Vancouver Island North Woodlands Advisory Group (VINWAG). It consists of 13 diverse stakeholders, such as small business, local government, environment, and recreation. In addition, NVIR conducts a complementary First Nations' advisory process.

(continued on page 8)

The Company Line

Burleith Log Sort and Safety!

by Ken Hallberg, Manager Andy's Bay/Burleith Log Sort

Standing from left: Art Kayes, Lorne Wright, Gary Harris, Gary Ryan, Derrin Good, Robert Brown, Perry Seymour. Kneeling from left: Harvey Seymour Jr., Douglas Kolosoff, Randy Hughes, Don Louie, Bob Greenhalgh, Bruce Harris, Harvey Seymour Sr., Gordon Whitelaw, Bill Perry. Missing: Mack Seymour, Dan Olsen, George Phillion.

Congratulations to the crew at Burleith Log Sort who have operated 3240 days without a time loss accident. This is an outstanding achievement!

I've only been at Burleith since January of this year. I can't take credit for the last 13 years without a time lost accident. The credit belongs to the crew themselves and to the late Ken Rhode. Sadly, Ken passed away last January. He managed Burleith Log Sort since 1997 and deserves much of the credit for our safety record.

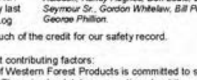
The following are some important contributing factors:

1. The top management of Western Forest Products is committed to safety. When it comes to safety issues, they support us 100%. There is absolutely no question about it.
2. The equipment and facilities at Burleith are well maintained. Maintenance is very important. It reduces risk and increases moral.
3. There is good communication. This is extremely important. There shouldn't be any hesitation in voicing safety concerns.
4. Safety issues are addressed without delay. Corrective action is taken immediately.

Most important, it's the crew themselves that make it work. They can be very proud of this outstanding achievement. They are a great bunch of guys with the right attitude when it comes to safety. They all get along well and look out for each other. Their moral is high, even during uncertain times in the forest industry. Jointly, they have a ton of experience and they share this experience with each other.

I am very fortunate to be working with this crew and working for a company like Western Forest Products. Hopefully, we can continue accident free. ❖

WFP Team Highlight



The Central Warehouse Team: Troy Maulding, Sharon Moffat, and Graham MacPherson.

Our Central Warehouse Team is important to the smooth running of our operations.

Central Warehouse is located within Arrow Transport's property on Mitchell Island in Richmond. The facility includes a 4000 sq.ft. warehouse with an adjoining 18,000 sq.ft. yard. A fleet of flat deck trailers and vans is used to amalgamate freight for our Sewell Inlet (Queen Charlottes) and Midcoast operations. Additionally, Central Warehouse functions as a storage and shipping facility for our printed forms, log marking tags, forestry supplies and historical records.

As an integral part of the ISO system, Central Warehouse receives, recycles and disposes of waste in addition to coordinating equipment repairs, drum and core returns etc. During the recent ISO surveillance audit, QMI credited Central Warehouse with outstanding conformance to the Environmental Management System.

The Central Warehouse Team is ready to assist us at any time! ❖

Business Connection

by Berni Zimmermann, General Manager

While we tend to look south across the 49th parallel for the cause, many problems associated with the Coastal Forest Industry are 'home grown'. No doubt the current softwood lumber disagreement has placed a very damaging and unjust cost burden on our industry, but coastal B.C. in particular, had major problems even before the last agreement expired. Unfortunately, most of these problems, if not all, are still facing us today. Issues that we continue to work hard to progress on include:

Excessive Stumpage – WFP has been the highest stumpage paying major licencee on the coast. Our current government, along with representatives from industry and TLA are developing and evaluating various market-based stumpage systems. As options are examined, WFP is steadfast in the notion that changes not take AAC way from licencees. Stumpage changes must result in a system that is fair and equitable and not subject to manipulation.

Forest Policy – Some aspects of forest policy impose excessive costs and need to be reformed. 'Bill 13' for example, which protects contractors rights, needs a workable cost effective dispute resolution process that assures competitive rates. Industry, government and TLA have developed numerous mutually acceptable proposals to this Bill. The Forest Practices Code is being modified. All WFP RPFs have had the opportunity to input on this reform. Forest policy needs reform to be attractive to investors.

Tenure – We paid dearly to buy our licences and have managed them for the long term, investing in infrastructure and silviculture. Converting Crown Land to a form of private ownership has not passed the court of public opinion, but licencees need long term, secure tenures.

Labour Costs – While coastal labour costs tend to be higher than in most other regions, logging costs are directly related to productivity. The innovation and productivity improvement efforts of all our staff and crews at WFP establishes our competitive edge. This is recognized and appreciated.

Environmental Boycott Campaign – the environmental movement remains relentlessly aggressive, insatiable, diverse and emotionally appealing to our customers. We need to stand firm on the principles entrenched in our Environmental Management Systems and Standard Operating Procedures associated with our successful ISO 14001 certification. ❖

Fiftieth Anniversary

by Pearl Y. Myhres, Zeballos Operation and Mayor of Zeballos

The Village of Zeballos more than doubled its population on the weekend of August 17/18, 2002. Over 200 people came back to Zeballos to help celebrate the 50th Anniversary of our Incorporation as a Village. The cries of "I haven't seen you in years" and "I would never have recognized you" could be heard throughout the Village in the week leading up to the celebrations as old friends greeted each other on the streets. Friday evening everyone had their old albums and scrapbooks out to share as they enjoyed the wine and cheese sponsored by the Zeballos Board of Trade.

Terry Anonson did a great job on the Western Forest Products float and walked away with the $50.00 first prize which was donated back to the Zeballos Volunteer Fire Department towards their "Jaws of Life" fund raiser.

We held our first Umbrella Contest to celebrate our rainfall. The judges had a very difficult time choosing from the 30+ contestants parading to "Singing in the Rain".

The Ehattesaht First Nation put on a Salmon Barbecue at the waterfront on Saturday evening. From there it was back to the Community Hall for the Zeballos Fish and Wildlife "Tarts and Jam" (dessert and a musical jam) session. Saturday night the Zeballos Hotel was full to overflowing to hear "Doug Folkins" belt out his new lyrics to crown a very busy weekend. ❖

After the Pencil Drops

by Pat Wylie, Temporary Forest Technician Gold River Forest Operation

As I put down my pencil after the last question on my last final exam for the year I breathed a sigh of relief. It wasn't because I did particularly well on the exam, rather that it was time to leave the classroom and return to the woods for another four months.

Every year WFP takes on roughly 40 summer students from colleges and universities across Canada including UBC, UNBC, Malaspina, NVIT and UNB. The summer w[illegible] is employed in both forestry and engineering runnin[illegible] traversing cut-block boundaries and "spinning the c[illegible] silviculture surveys. Summer students do their fair share of the work here at Western - last year alone Gold River students walked an estimated 8,200 km while engineering 640 ha and surveying 1,476 ha. That's the equivalent of walking from Vancouver to Halifax - round trip! Summers are also like extended interviews for the company, assessing students for potential future WFP employees.

(continued on page 4)

('Pencil' continued from page 3)

It may appear as though the summer experience for a student is that of a workhorse, but summers at Western are beneficial for both WFP and students. By working daily with full-time engineers and foresters, the next generation learns about working within the regulatory framework, gets a chance to practice concepts "learned" in school, and becomes comfortable with working in an office environment. After graduation, students who have survived a summer of Sitka spruce spacing layout in Sewell Inlet, or a "summer" in Holberg are more likely to be hired post-graduation than a student that worked the beach for the summer.

Left to right: Corey Peterson (WFP Crewman III) with summer students Larry Snook, Pat Wiley and Lindley Little

Benefits to summer students are not only work related. Being in small towns in Coastal BC affords benefits many students would otherwise never experience: salmon-fishing, hunting, hiking, rock climbing, sea kayaking etc. Working in Coastal BC gives us views and wilderness experiences that many Canadians can only see in calendars and coffee-table books.

Sitting here at the computer I see that there are only 16 days left in my summer here in Gold River. Where did the summer go? It seems like only yesterday that my pencil was hitting the desk and I was wondering what the summer would be like. Judging from the smile on my face, and the stories I'll come away with I'd say another summer on the Coast went just right. ❖

Mainland Islands Golf Tourney

Seventy-two avid golfers participated in the '4th Annual WFP Ltd. - Buz Vidal Memorial Golf Tournament 'hosted by Sunnydale Golf Course Saturday, July 20, 2002.

One thousand dollars was raised for the Heart & Stroke Foundation of B.C. and Yukon.

Andy Hyland *(above, right, with Terry Anderson)* made a short, but very touching speech before accepting the cheque on behalf of the foundation. Mr. Hyland also acknowledged and thanked the employees of WFP Ltd. for last year's donation. ❖

Talent recognition

excerpts from a presentation by Diane M. Hoffmann, President, Hoffmann-Rondeau Communications Inc., Campbell River

According to experts in the field of hiring and training development, there is a great potential within our own companies for talented individuals. Why are we not recognizing those already in our midst? An explanation is: when people are working at lower levels than their management abilities, you can't see what they can really do.

We just don't recognize who's working for us or with us. We limit our people by their current titles, functions and departments.

Yet getting to know our people is not hard to do — we just need to talk to them! It's up to management to initiate such talks.

Some companies have implemented 'Talent Development Programs'. What we really need are 'Talent Recognition Programs'. Management needs to take the time to recognize whom we have amongst those employees currently working as 'latent talent'.

There are scores of qualified, skilled individuals who have had to take on jobs many levels below their business capabilities and experiences because of economic downturn or simply because nobody has recognized their abilities and given them a chance to prove themselves.

Dig up your employees' resumes again, from the interviewer's forgotten files, and get familiar with them. Let's not leave these highly personal information papers to die in the aftermath of the initial interviews. Then let's talk to our people and ask the right questions.

Test with projects that the individual can work on for short periods of time -- say a week, a month or three months. All this should happen with proper delegating, empowerment and regular meetings.

Finally, let's assess ourselves and recognize the assets that we have in our people. ❖

Western Matters Fall 2002 page 5

Visual sensitivity was the driving factor in this block, across Neroutsos Inlet from Port Alice, being 'retention' logged.

('Retention' continued from page 1)
experienced by the associated ecosystems over time.

Our approach considers that retention harvesting includes the range of retention, from clearcut with reserves through the retention silviculture system. At the margin these two systems may well look the same. Over time a variety of retention patch sizes and dispersion characteristics will evolve across the landscape.

SCHIRP Research of Value

by Annette Van Niejenhuis, Saanich Forestry Centre

The Salal Cedar Hemlock Integrated Research Program – SCHIRP – has published its latest findings. Research Update #2: March 2002 was distributed this spring by the project leaders, Leandra Blevins and Dr. Cindy Prescott of UBC. It contains the most recent reports on numerous trials examining the response to nutrient amendments of seedling and sapling stands on salal-dominated ecosystems.

Western Forest Products founded the program with UBC, and has championed this research for almost two decades. Other major contributors include the Canadian Forest Service, Weyerhaeuser, and the BC Ministry of Forests. Funding for the program has come from Forest Renewal BC, and continues under the Forestry Innovation Investment of the Forest Investment Account.

(continued on page 9)

The key is to recognize that we can not truly 'emulate natural disturbance patterns' with harvesting but rather that we can do two things: create some important post harvest similarities in our managed ecosystems, and strive for variety.

In 2001 this region completed a retention harvesting trial consisting of one cutblock in each of the three company operations. While this was not a statistically defensible trial with detailed information collection and controls, it did provide us with some anecdotal information on the system and our "where it makes sense" approach.

The trial confirmed that every cutblock will be different depending upon such variables as terrain and the number, size, location, and form of retention patches. It does seem intuitive however, that even the addition of one internal retention patch will increase costs, if only through extra engineering time. Good communication between planning and yarding and loading personnel is crucial to limiting adverse safety and productivity outcomes. Experience with the retention system is likely to yield improved cost results in the longer term but can never eliminate all of the associated cost differential above clearcut with reserves.

While there may be appropriate places to use the retention silviculture system, blindly implementing it everywhere does not make good operational or ecological sense. The prescribing individual must know why it is being used and must be keenly aware of associated safety and operational issues.

NVIR Retention Trials

(comparisons refer to the clearcut with reserves system):

- Approximately 20% of the total of the trial area was grapple yarded, the rest was supersnorkled and hoe-forwarded;
- A total of 3 ha. (or 2.7% of the gross area) and 2,100 m3 was retained over and above standard Riparian Reserve Zone / Wildlife Tree Patch requirements;
- Aggregate retention was used and patches varied in size from 0.05 ha. to 0.5 ha. in size and from 3 patches to 10 patches per cutblock;
- Patches were established to take advantage of ecological attributes and to minimize adverse impacts on safety and falling and yarding productivity;
- Layout costs increased by approximately 17% due to the extra time required;
- Unit costs for road construction, maintenance and deactivation increased by 3 to 6%. Some extra road was required but even if this were not the case, slightly less harvestable volume was developed, thereby increasing unit costs;
- Falling and yarding costs appear to have increased approximately 4 to 6%, presumably as a result of working around retention patches;
- Total costs increased by approximately 3% over the clearcut with reserve system. ❖

Environment Matters

Spills: To Report or Not Report? ... That is the Question

by the Environmental Department

You have probably been asked by either a fellow worker or an auditor, "how much fuel can you spill before it has to be reported?"

To refresh our memories, all spills should be reported to your supervisor. In turn, supervisors should understand that generally the following quantities must be documented using a Spill Report Form (located in the Spill Contingency Plan), and reported as described on the form:

- Any size spill to water
- Petroleum Products >100L on land
- Pesticide >5L on land
- Fertilizer >100kg on land or any amount outside of the work area
- Antifreeze >5L on land

Recently, Managers have asked the question, "what if a spill takes place on a concrete dryland sort or shop floor, but does not hit the ground (soil, dirt) or water? Do we contact the Provincial Emergency Program (PEP)?" In this situation, because concrete is an impermeable surface that is not considered the "environment", the spill should be recorded (using a Spill Report Form) but there is no requirement to call PEP or any other government agency. These spills will not be considered a 'reportable spill'.

Additional information can be found in the Spill Contingency Plan for your area. It is also important for workers to realise **that no matter what size the spill is**, we must follow containment and clean-up procedures. ❖


Lewie Da Loser says: "Don't wonder if you should report a spill, REPORT ALL SPILLS to your supervisor!"

Storage of Propane Powered Equipment

by the Environmental Department

According to the Propane Installation Code, published by the Canadian Gas Association, propane powered equipment such as forklifts, can be stored indoors.

Our HazMat binder is incorrect where it indicates that propane fuelled forklifts require outdoor storage. Be cautious though. All other propane storage tanks, unless mounted and in use on a vehicle, must continue to be stored outside. When choosing an indoor storage location for equipment ensure:

- there are no leaks in the propane system.
- the container is not filled beyond its maximum permitted filling density.
- the vehicle has container shut-off valves closed when being serviced.
- the propane container is not exposed to temperatures in excess 38°C.
- the vehicle is not parked within 10 feet of an open flame , a source of ignition, an open pit or drain.

Look for revisions to the HazMat next year. ❖

Clarification of WFP Standard Field Marking Procedures

by Paul Bavis, M/IR Regional Forester and Chris Harvey, Environmental Department

A recent audit finding indicated that there is some confusion regarding the interpretation of the "Field Marking SOP" specifically in silviculture activities.

As a rule-of-thumb, when conducting silviculture activities, pink and black striped ribbon should be hung to indicate "do not cross" - much like a falling boundary line. Solid red indicates "Its ok to do what you are doing, but change how you're doing it" as in a split line between treatment units. Finally yellow ribbon indicates "it is dangerous to cross" This ribbon should only be hung as a warning flag to workers where crossing the ribbon line would compromise worker safety or damage environmentally sensitive areas.

The bottom line is that the **SOPs are company wide standards and must be followed by everyone**. If individuals choose to deviate from the SOPs unforeseen consequences may be encountered. ❖

Western Matters Fall 2002 page 7

New TDG Regs - Clarifying the "Clear Language"

by Jason Zimmermann, Environmental Department

Do you transport or ship dangerous goods? If you work on the grade, in a shop or in a warehouse, the likely answer is 'yes'.

Last August, the Federal Act that regulates what types of containers, signage (or placards) and the content of shipping documents used for transporting dangerous goods was significantly overhauled. The government's goal was to provide 'Clear Language' to the Transportation of Dangerous Goods Act, which in the past, more or less required the full time interpretation services of a lawyer.

The following are just some of the changes that affect the forest industry. If you require more information, you can expect to have access to a TDG training video package this fall. Those people who have had TDG training in the past must update their training. Training certificates must indicate that the 'Clear Language' regulations have been covered. Remember, MSDS (Material Safety Data Sheets) contain most of the information concerning the shipping and transport of goods. It is important to keep them up to date.

Some TDG changes affecting the forest industry:

- Tidy Tanks: As of January 1, 2003, Gasoline in containers less than 450 L, must be certified to codes such as ULC/ORD C142.13 if the container was built before 2003. (Note: look at the fine print stamped on the top or side of the tank, it will typically tell you a 'manufactured in conformance to' number.)
- Jerry Cans: Gasoline in containers holding 30 L or less, may be exempt provided the container is marked 'Ltd. Qty.'
- Mobile Tanker Trucks and Trailers: After January 1, 2003, tankers between 450 and 3000 L (containing gasoline or diesel) must be certified to the UN standard (e.g. CGSB 43.146 or TC 306/406).
- After January 1, 2003, only purchase containers, which carry the 'UN' certification mark.
- Explosives Placard: the orange diamond (Class 1 Explosives) with the exploding bomb no longer has 'Explosives' written across the placard
- 'Miscellaneous Dangerous Good' Placard: The former white diamond placard (Class 9 Miscellaneous) with a red exclamation mark has been replaced with a white and black striped placard.
- Herbicide Placard: For those herbicides that are classified as Class 6 Toxic Substances, the placard which contained the 'grain of wheat' on it has been replaced with a white placard containing a skull and cross bones.
- One List of Dangerous Goods: There is now only one list instead of three. The Act contains every good listed by the common shipping name or by UN number (See the schedules of the Act).
- TDG Training Requirements: Anyone who has received TDG Clear Language training is required to have a copy of their training certificate that has been signed by the employee and current employer. Training is good for three years. ❖

New and Improved

New to WFP is the **s-100 Refresher Course Basic Fire Fighting Safety booklet** (August 2002). The booklet outlines the components that should be included in the Safety s-100 refresher (course #S012), including: basic fire behavior, safety reminder (WATCH OUT), a discussion of responsibilities within the operations and the field session (equipment review and demonstrations). All staff, employees and contractors who have previously completed the s-100 Basic Fire Fighting course must take this course at least once a year. As a reminder, only personnel who have received s-100 training themselves, are in a supervisory role (e.g., Foremen, Chargehand, etc.) and have adequate field experience can deliver this refresher training. If you are in doubt about your qualifications, contact the Environmental Department.

The Environmental Awareness Training Tailgate Sessions: This booklet has been updated (July 2002). The general content remains unchanged, however the Environmental Policy, Safety Policy and the Standard Operating Procedure diagram were revised. This booklet continues to be used in conjunction with, or as an alternative to the EMS Training video to satisfy the requirement of basic environmental awareness (course # I021). All staff, employees and contractors must take this course at least once a year. Please make every effort to remove or dispose of packages dated March 2001. ❖

Western Matters Fall 2002 page 8

ISO Surveillance Audit - 2002 Audits

By Jason Zimmermann, Environmental Department

Congratulations to all WFP personnel and contractors. We have just completed our second surveillance audit with QMI and we will continue to be registered to ISO 14001, as well as the Canadian Standards Association (CSA) Sustainable Forest Management standard. The awareness amongst WFP personnel and the level of seriousness that the operations take in protecting the environment was visible throughout the three Regions.

Keeping in line with the goal of continuous improvement, a number of areas for improvement were identified. Use the following list as a self check for your operation. Do any of these issues apply to you? If so, ensure you have a system in place to address the concerns.

- **Out of date documents**: Ensure that manuals, such as the SOP, EMS and HazMat binders are up to date. Make sure that old SOP booklets and out of date MSDS sheets are destroyed.
- **Uncertainty about reportable spills**: If a controlled product such as antifreeze, diesel or pesticides are spilled, when am I required to report it? – Generally, report ALL spills to your supervisor. Specific volumes can be found in the Spill Contingency Plan.
- **Unmarked empty storage tanks**: It is important to look around your Boneyard or shop area to ensure that all storage containers are labelled. Even if they contain water or are empty, the tank must be labelled as such.
- **Lack of familiarity with Petroleum & Hazardous Waste Management Standard (HazMat):** This manual has recently been updated (March 2002) and contains a lot of important information. In some instances, camps may not be in compliance with the standard or are unfamiliar with how to find the information they are looking for. Remember, if you have questions, contact the Environmental Department.
- **Uncertainty about the use of 'WIN'**: The Western Information Network (or WIN database) is used to track obligations such as Action Items for audits or inspections. The system is a valuable tool and should be used where possible. Ensure that as part of your next Environment Committee Meeting, a printout listing the Action Items associated with CPARs (Corrective/Preventative Action Requests) is reviewed and attached to the minutes. ❖

('Certification' continued from page 1)

The public group holds regular meetings to assess progress of our plan, review forest-related issues of interest, or learn from guest speakers. We have excellent participation from the North Island's five communities.

With the group, WFP developed a Sustainable Forest Management (SFM) Plan. The Plan contains 64 'indicators' of the broad range of environmental and social values. For example, 'hectares of reserves created versus hectares harvested' is a measure of the 'maintenance of diverse habitats'. Whereas, the 'percent of new hires that are locals' determines the 'opportunity for people who grow up in North Island communities to stay and work within these communities'.

To keep it relevant, the SFM Plan is improved as needed based on new research and data. WFP produces a CSA annual report of progress. New developments must be considered in NVIR forest practices.

The CSA 'Chain of Custody' is important for some pulp and lumber customers. Chain of Custody is a marketing guarantee that wood has been harvested under a Sustainable Forest Management Plan, and is traceable back to the point of origin. Workers responsible at each stage of wood delivery (loading, hauling, dryland sort, booming, accounting, and towing) check the certified status of the wood, and identify any non-certified wood for separate processing.

The CSA certification relates closely to WFP's ISO 14001 certification. This is because the ISO Environmental Management System (EMS) is an integral component in the CSA system. The EMS and its Standard Operating Procedures address the environmental concerns in our everyday work.

WFP's long history on the North Island of community programs, environmental initiatives, and forest research, made a strong certification possible. The CSA and ISO audits now provide an independent verification for employees, customers, markets, and the public.

Peter Ackhurst, QMI Auditor, said "The enthusiasm and involvement of WFP employees and contractors in the system is impressive. The quality of the VINWAG public advisory group and the First Nations process are noteworthy".

With such a strong team supporting CSA certification, audits will continue to be very rewarding. ❖

2002 Audits – Internal Audit Status

By Ken Hall, Manager, Environmental Restoration & Certification Audits

The 2002 field season represented the start of the fourth year for internal auditing on our ISO 14001 Environmental Management System. Western has 41 operations certified under the ISO 14001 system. As a requirement to maintain that certification, WFP must internally audit each of the operations a minimum of once every three (3) years. At the end of 2001, three sites remained outstanding; Andy's Bay Log Sort, Winter Harbour Contract Forest Operations and Mahatta Contract Forest Operations. These operations ceased operating in August 2001 due to the economic constraints that Doman Industries and the industry in general faced. Both Winter Harbour and Mahatta have now been audited. Andy's Bay remains outstanding, as this operation is not running.

In fiscal 2002 the audit teams' role was expanded to include performing an internal audit for the Chemainus Value Added Sawmill and performing 'inspections for compliance' for both contract operations and WFP operations.

As of the end of August 2002 our internal audit team had completed:

- 6 internal audits (10 yet to be done)
- 2 additional internal inspections
- 1 sawmill audit (1yet to be done)

Common non conformances or 'opportunities for improvement' found during internal audits:

- **The interpretation and use of boundary marking** and treatment area marking for silviculture treatments (specifically tree planting) has been identified as an issue. The current SOP for ribboning has left the door open for interpretation and this is evidenced by the variance between operations in field marking layout.
- **Utilization standards** exhibit inconsistencies between the Provincial Waste and Residue Manual, WFP bucking practices and our corporate EMS waste target. Clarification is required to bring requirements, practices and targets into line.
- **Many issues related to hazardous materials handling** including - barriers for propane tanks; proper labels on drums, tanks, jugs etc.; color coding of tank farm fuel lines; shop waste recycling programs incomplete; bilge water handling procedures requiring reinforcement.

Identifying opportunities for improvement is one of the primary functions of our internal audit program. These opportunities should change as our EMS deals successfully with identified issues and continues to promote awareness.❖

(Research continued from page 5)

Recent trials have confirmed the findings of original SCHIRP studies. Foresters wanted to confirm that the findings of North Island studies applied to other sites on the Island. In the Ucluelet area, Weyerhaeuser's results mirror the original SCHIRP study established in the Port McNeill operation. Recently Western Forest Products has shown that hemlock-salal transitional sites also benefit from fertilization.

Recent intriguing results from the original SCHIRP trial include the overwhelming response of hemlock to fertilizer on hemlock-balsam ecosystems. In all cases tested (redcedar on salal ecosystems, hemlock on salal ecosystems, red-cedar on hemlock-balsam ecosystems, hemlock on hemlock-balsam ecosystems), **after ten years the average stand volume of fertilized plots was more than double that of control plots.** These trials will be monitored again this year, fifteen growing seasons after establishment. Currently fertilization of hemlock is not carried out operationally because scientists believed that hemlock did not respond to fertilizer.

If the responses found at SCHIRP can be operationally proven and confirmed elsewhere, the potential improvement in long term sustainable harvest levels could be staggering when considered in light of the amount of second growth hemlock in the North Island and elsewhere.

Dr. John Barker contributed a financial evaluation to the Research Update. Simulations based on the data collected to date indicate that site index on salal sites improves dramatically with the addition of fertilizer and that fertilization is a very good silvicultural investment to make.

Copies of the latest publication have been forwarded to all Forestry Operations. For further information, or to request a copy, please contact Annette van Niejenhuis, Tree Improvement and Research Coordinator, Saanich Forestry Centre (avanniejenhuis@westernforest.com, 250-652-4023).❖

Western Spirit

First Nations Partnerships

Larry Andrews Retires

On May 7, 1962, in the days when work opportunities were plentiful, Larry Andrews dressed up in his "Sunday-go-to-meeting" outfit to ask for a job in Tahsis. Gerry Hill, the personnel manager, had him fill out an application. Then Larry headed to the Co-op store for a bit of grocery shopping. Ten minutes later, Gerry found him in the store, tapped him on the shoulder and told Larry to report to the planer-mill foreman at 1:00 p.m. that very day. Thus began Larry's forty year stint with the company.

Larry stayed at Tahsis for seven years, becoming a longshoreman and then charge-hand for the mill yard. Larry moved on to work at the Tahsis pulp mill and then to the Gold River pulp mill to work on the booms as a boatman. In 1970 he transferred to the Logging Division as a boat operator progressing to head boom man by 1972.

In 1975 Larry joined the Logging Division staff as assistant boom foreman. Later he became the boom foreman and held this position until the late 80's when his position was re-described as Native Liason.

Larry became one of the Chief Councilors of the Muchalaht Band. He was instrumental in the relocation of the community on IR #12 by the pulp mill, to Tsaxana near Gold River in 1996. He also was involved in securing 20,000 m3 per year in a nonrenewable forest license for the Band.

He served on the Nootka Resource Board for several years, had a two year term with the Provincial Special Management Zone Working Group and worked on the committee of the B.C. Salmon Farming Association for three years.

Larry married his wife, Shirley, in August of 1962. Together they run the Tuta Marina on Hannah Channel. He has three daughters, Christina, Arlene and Laurie-Lynne. May the whole family enjoy Larry's well-earned retirement!❖

Quatsino First Nations Point of View

by Ralph Wallas, Forestry Co-ordinator Quatsino First Nations

The Quatsino Nation and WFP have had a significant history of working together in logging and silviculture.

Back in 1994, the Quatsino First Nation got wind of the work that Western Forest Products and Doman Industries were doing with the Heiltsuk Band Council. We decided to travel down to the Big Smoke (Vancouver) to see if we could hop on the bandwagon. Our initial discussions were with the former vice president of Doman Industries, Vic Woods. At that meeting, a figure of 30,000 cubic meters was discussed and agreed upon. By about May of 1995, we were logging. This contract has employed about 6 of our members full time plus support staff and given them valuable experience and training for the future.

We started production on our own 072 Woodlot in 1995 as well. It has an AAC of 6000 m3 per year. We made an agreement that WFP prepare the woodlot development plans in conjunction with their own. The forest profile is the same as their TFL 6 (which I continually remind Bernie Zimmerman is on short term lease to them by Quatsino), which surrounds our woodlot so they are able to do it for us at a competitive price.

For the last few years, Quatsino Band, with Kwakiutl Band members and contractors, worked in silviculture in TFL 6 conducting most of the spacing and pruning in Port McNeill Operation as well as some other areas. Our goal is to be a competitive silviculture services provider. This has provided significant employment for about a dozen people between Kwakiutl and Quatsino Nations. Among other things, our people are fully trained in riparian restoration and have completed two major projects on the Goodspeed and Keogh Rivers. This year has been very slow as the new Government's direction reduced funding under FIA and affected the jobs formerly funded by FRBC.

The latest initiative that we have been involved in with Western has been the undercut sale TSL A66259. Western's former chief forester, Bill Dumont was instrumental in giving this ball its first push. The three Bands on the North Island got together to apply for it. The three Bands are Quatsino (first naturally), Kwakiutl (Fort Rupert) and

(continued on page 11)

Forest Investment Account (FIA) Update

by W.K. (Ken) Hall, Manager
Environmental Restoration & Certification Audits

By now most everyone has heard that Forest Renewal BC (FRBC) has been put to death by the Liberals and has been replaced by the Forest Investment Account (FIA). That's about all the majority of people know. Many still see the new FIA as another FRBC, government sponsored program, but this is not the case. True, both FRBC and FIA are forestry programs funded by industry through government, but the similarities end there. We have traded bureaucrats for accountants, we have less money to work with, the administrative burden has increased and our overhead allowances have been reduced. (For further information on the FIA program call 250-286-4120 or khall@westernforest.com.)

Major differences:

FRBC	FIA
FRBC was Multi Year Funding at an average of $12.5M per year. Bureaucrats, through a crown corporation, administered the money.	FIA funding is annual. For fiscal 2002 the funding level is $4.4M. The administration function was tendered out to professional accountants Pricewaterhouse Coopers.
Funding was derived from superstumpage, and for the most part was returned to Licensees based on their contributions. WFP recouped approximately $85M of the $90M that it contributed in superstumpage to the Crown over the lifespan of FRBC.	Funding is in the form of a vote whereby the government in power must approach Treasury Branch with a budget for the entire FIA program. This is done annually as part of the government's requirement for spending.
FRBC allocations were by MOF district.	FIA money is allocated by Management Unit (tenure) rather than by forest district. This adds to the internal administrative burden as WFP now handles separate accounts for Western, Doman Industries and Doman Western Lumber.
FRBC would approve work plans on a district level.	Up front planning for FIA is much more rigorous and done on a project by project basis.
FRBC overhead allowances were for actual costs incurred by WFP and based on the annual multi year funding level. For the entire duration of FRBC, WFP prided itself on the lowest overhead costs of any licensee at an average of 8% (+/-) annually.	Overhead allowances under FIA are allocated based on fixed percentages of total budget for the specific Management Unit; 12% for the first $100K, 6% on the next $900K and 3% on anything over $1M.
As FRBC was multi year, funding could be advanced (brought forward) or rolled over from one year to the next.	Under FIA, funds cannot be rolled over from one fiscal to the next. Under FIA it is a "use it or lose it" approach.
Planning functions and preset funding allocations that used to exist under FRBC have disappeared.	Licensees are now responsible for setting the priorities and funding allocations within the Management Unit. This can be particularly difficult on TSA tenures where MOF has downloaded planning obligations to the Licensees. ❖

('Quatsino' continued from page 10)

Tlaklasikwala (Hope Island). Finally, on August 1, 2002, Forest Minister Mike DeJong awarded the seven-year forest licence to the three Bands. Among the challenges is the responsibility of planning. Since BC is supposed to have the toughest forestry regulations in the world, the requirements are incredibly complex.

In January, I was hired as Forestry Co-ordinator jointly by all the major forest companies who operate within our traditional territories. One of the companies was Western and with their TFL 6 taking up most of our traditional territories, they pay the lion's share of the co-ordinator salary. This position is a pilot project and is supposed to be for one year. We are hopeful that this program will continue for at least another year. The funding structure would change a bit if we could get Canfor and MoF involved. (If not, my comments to their Forest Development Plans will reflect this!)

The new licence will give us the scope and wood supply to allow opportunities, new jobs, business directions and full participation in the forest industry. Where this will lead we do not know. Quatsino is looking at past business relationships to determine what form future relationships are going to take. ❖

Letters

Dear Editor:

Just to say Hello and tell you that I read your Western Matters (formerly Environment Matters) as soon as it arrives. I carried out some of the first ISO 14001 audits on your operations and reference your company as an example of a 'Can Do" operation that, in spite of its size, fragmentation and difficult challenges, succeeded in implementing an EMS.

It was good to read about the Machmell bridge being completed as well as the Sockeye Side Channel. I wish you and your company much success in 2002 and trust that a better market and no more duties or tariffs will follow in quick order.

Herb Bax, R.P.F., CEA(LA)

Dear Editor:

I read with interest your current newsletter. I hope that your company keeps up the good work. As a contract residue and waste surveyor, I know that your company has the best values and most professional people in the West Coast forest industry. Very few companies talk the talk and walk the walk. I know that your company is just too good to founder.

Dan Burke

The Last Word - This time it's...

Bruce McMillan, MIR Regional Accountant

Countervail and anti-dumping duties - we've all heard the words, we know that they're having a serious impact on our industry, our company and ourselves. Euphemistically they are considered "non" tariff barriers to free trade. But what do the words really mean?

- *Countervailing Duty - is a duty imposed to 'offset' government subsidies in the exporting country.*
- *Dumping is the act of exporting a commodity at an average price lower than either the exporter's average domestic price or their average cost of production. Anti-Dumping duties therefore are an attempt by the 'importing' country to add sufficient cost to the imported commodity to eliminate that price advantage.*

This means that the U.S. Commerce Department has decided that our softwood industry is selling lumber at prices into the U.S. below our domestic prices. Additionally, that Canada through our crown tenure system and the related stumpage system, is subsidizing the Canadian softwood industry thereby harming the American lumber industry.

Each and every country continues, no matter what bilateral or multilateral agreements they sign or organizations they belong to, to make their own rules regarding trade issues. Duties and tariffs may be reduced to nothing, but that has not stopped other barriers to free trade being implemented. These barriers can be items such as currency restrictions, procurement policies, reference pricing, market restrictions or "anti-dumping" duties.

As we are all aware, Canada and the United States are signatories to FTA and NAFTA, and both are members of the World Trade Organization. These organizations have as their mission to liberalize trade amongst member countries. However, they are at best arbiters of dispute with little real power.

Free trade appears to be an idealized concept not founded in reality. Until all barriers are eliminated worldwide, be they socio-economic, environmental, political or financial , free trade is a pipe dream. All we can hope for is 'freer' trade. ❖

POINT OF INTEREST

As of July 15th the U.S. Government has (or had) 124 cases being reviewed by the WTO. Fifty nine of those cases had the U.S. as the complainant and sixty five as the defendant. Of the 65 cases where the U.S. is the defendant (for imposing unfair trade practices) it has resolved 14 cases (12 by negotiation), lost 17 cases, merged 9 cases with other complaints and has 25 (including 3 softwood lumber complaints) in various on-going processes. The U.S. never took the Canadian Softwood "subsidy?" issue to the WTO, it is Canada who has taken the American response to the WTO for arbitration.

****

Next time the last word can be yours!

Many thanks to all contributors to this issue: Bruce McMillan, Heather Brown, Kathy Wood, Chris Clements, Berni Zimmermann, Bill Day, Shannon Janzen, Dave Mogensen, Ken Hallberg, Sharon Moffat, Troy Maulding, Ralph Wallas, Pearl Myhres, Pat Wylie, Terry Anderson, Tony Pineda, Diane Hoffmann, Annette Van Niejenhuis, Jason Zimmermann, Chris Harvey, Paul Bavis, Dean McGeough, Ken Hall, Ron Todd.

Western Matters is published Spring and Fall.
We welcome your contributions on our company's activities and any other relevant news, plus humor, quotes, photos, cartoons and poetry.
Reach editor, Lisa Perrault, at (250)286-4137 or e-mail westernmatters@westernforest.com

Appendix XXVI

Watershed Restoration Program Summary

1997 - 2001

TFL 25 Watershed Restoration Program Summary
1997 through 2001

Year	TFL Block	Watershed	Activity	Status	Expenditures
1997	1	Sombrio Loss Creek	Level 1 Bio-engineering Assessments	Complete In-Progress	$64,316
	4	Keogh	Level 2 Assessments	Complete	$69,367
	5	Europa South Kiltuish East Kiltuish West	Level 1 Level 1 & 2 Level 1	In progress In progress In progress	$22,391
	5	Hot Springs	Road Deactivation	33.8 km Complete	$506,747
	6	Big Goose	Road Deactivation	20.3 km Complete	$3,062,093
		Little Goose	Road Deactivation	11.2 km Complete	
		Mosquito	Road Deactivation	38.9 km Complete	
		Talunkwan Island	Talunkwan Island	25.8 km Complete	
		Pallant	Planting	In Progress	$21,113
		Tasu	Planting	In Progress	
		Shale	Planting	In Progress	
		Porter South Crescent Lomgon Bay Dana South North Crescent Pacofi Lomgon Creek Edwards Shearer Wilson Bay Flat Crescent Newcombe Clint Dump Waterfall Blunt Swan East Sewell Sewell Point Crazy Lunker Gillatt Thorsen	Level 1 Level 1 Level 1 Level 1 Level 1 & 2 Level 1 Level 1 Level 1 Level 1 Level 1 Level 1 & 2 Level 1 Level 1 Level 1 & 2 Level 1 Level 1 Level 1 Level 1 Level 1 Level 1 Level 1 Level 1 Level 1 & 2	In Progress In Progress In Progress In Progress In Progress In Progress In Progress In Progress In Progress In Progress In Progress In Progress In Progress In Progress In Progress In Progress In Progress In Progress In Progress In Progress In Progress In Progress In Progress	$228,340
1997 Total					**$3,974,327**

Year	TFL Block	Watershed	Activity	Status	Expenditures
1998	1	Loss Creek Sombrio River	Bio-Engineering Report Bio-Engineering Monitoring	Complete Complete	$9,580
	2	Glendale	Road Deactivation	4.0 km	$41,487
	3	Cedarstadt	LRAP	In Progress	$4,071
	5	Kilutish East	Road Deactivation	13 km	$297,227
	6	Thorsen	Level 2 Road Deactivation Fish Habitat Restoration	Complete 12 km In Progress	$229,245
		Flat	Level 2 Road Deactivation	Complete 19 km	$228,222
		North Crescent	Level 2 Road Deactivation	Complete 6 km	$151,632
		Clint / Sewell	Level 2 Road Deactivation	Complete 7 km	$147,631
		Shearer	Level 2	Complete	$17,530
		Tasu	Fish Habitat Restoration	1 km	$53,549
		Moresby Road	Road Deactivation	1 km	$242,222
		Talunkwan	Road Deactivation	Report	$70
		QCI North QCI South	Level 1 Level 1	Complete Complete	$44,658
		Little Goose, Tasu/Slim, Big Goose, Shale, Talunkwan, Flat, Thorsen, Waterfall	Fish Habitat Restoration	Monitoring	$18,738
1998 Total					**$1,485,862**

Year	TFL Block	Watershed	Activity	Status	Expenditures
1999	1	Loss Creek	Monitoring	1 report	$1,702
	3	Cedarstadt	LRAP Bio-Engineering	6 ha 6 ah	$146,130
	5	Hot Springs Cove	Level 2	13 ha	$15,750
	6	Thorsen	Level 2 Road Deactivation Fish Habitat Restoration	2 ha 2 km 2 km	$71,005
	6	Flat	Fish Habitat Assessment	22.6 km	$6,000
		Clint	Road Deactivation	8 km	$26,685
		Shearer	Level 2	23 km	$16,434
		Tasu	Level 2 Road Deactivation	5 km 5 km	$124,032
		Pallent /Moresby Road	Road Deactivation	.1 km	$96,473
		Lagoon	Fish Habitat Assessment	14.2 km	$3,769
		Sewell Point	Fish Habitat Assessment	12.0 km	$3,186
		Lomgon	Fish Habitat Assessment	12.9 km	$3,425
		Flat, Thorsen, Clint, North Crescent	Bio-Engineering	5 ha	$55,755
		Flat, Thorsen, Little Goose, Mosquito, Big Goose	Monitoring	1 report	$21,863
1999 Total					**$592,209**
2000	2	Glendale	Level 2 Road Deactivation	13 km 13 km	$60,000
	5	Hot Springs Cove	Bio-Engineering	13 ha	$55,000
	6	Thorsen	Fish Habitat Restoration	.5 km	$4,500
		Thorsen, Little Goose, Flat, Slim/Tasu, Waterfall, Big Goose. Shale, Thurston Hbr	Monitoring	2 Reports	$17,000
2000 Total					**$136,500**

Year	TFL Block	Watershed	Activity	Status	Expenditures
2001	1	Jordan River	Road Deactivation	28 km	$174,130
	2	Stafford Lake	Road Deactivation	2.3 km	
	3	Naka Creek	Road Deactivation	8.3 km	
	6	Sewell Inlet	Road Deactivation	8 km	
	6	QCI	Upslope Monitoring		$58,602
		Tasu PU	Assessments	13.7 km	
		Little Goose	Assesments Fish Habitat Restoration	.4 km .4 km	
2001 Total					**$232,732**
Grand Total					***$6,421,630***

Appendix XXVII

Public Review Plan MP 10

File: 254-9
June 1, 2001
Revised

Tree Farm Licence 25 – Management Plan 10

Stakeholder and Public Review Strategy

Management Plan 10 (MP 10) for Tree Farm Licence 25 (TFL 25) is scheduled for approval and to be effective December 29, 2001 for a period of five years. As part of the preparation of Management Plan 10, this strategy has been developed to address legislation and policy requirements for the stakeholder and public review and involvement in the preparation of MP 10. TFL 25 MP preparation is mandated by the revised (2000) strategy for TFLs. There are 2 phases to the revised TFL 25 Public Review Strategy:

Phase I Public review of the current Management Plan 9 for TFL 25

Phase II Review of the draft Management Plan 10. The draft MP will be ready by June 1, 2001 and the public reviews will be conducted in June and July 2001.

Phase 1 of the public review strategy was completed in the fall of 1999 after several months of extended public access to the currently approved Management Plan 9.

A primary vehicle for TFL 25 reviews is the stakeholder contact list (attached) prepared from a number of sources. The more than 400 individuals and groups are categorized as follows:

A. Resource Agencies
B. Trappers, Guide Outfitters and other licenced resource users
C. First Nations
D. Local Government/Resource Boards
E. Employees, labor unions and contractors
F. Conservation and Community groups
G. General public
H. Suppliers
I. Other forest licensees
J. Forest users and others

The following format and strategy is in agreement with that outlined in the Tree Farm Licence 25 (2000) and revised procedures.

1. Advertisements, Public and Stakeholder Notification

Phase I – Public Viewing of Current Management Plan

- The attached advertisement (A) appeared twice in the following publications:
  - Sooke Mirror
  - North Island Gazette
  - Campbell River Courier/Islander
  - Coast Mountain News
  - Prince Rupert daily News
  - Queen Charlotte Observer

  in July 1999 to inform the public that the current Management Plan 9 was available for review in various WFP and Ministry of Forests offices and at WFP's website.

- The advertisement was inserted for two weeks prior to the viewing opportunity.
- The area of distribution of the advertising was Sooke, Campbell River, Port McNeill, Port Hardy, Bella Coola, Bella Bella, Prince Rupert, Sandspit and Queen Charlotte City.
- The public comment and review process for Management Plan 9 is focused on making the existing plan available to the public in 13 convenient locations outlined in the advertisement and on WFP's web site.

Phase II – Public viewing of Draft Management Plan

1. The attached display advertisement (B) will appear twice in the B.C. Gazette, Sooke Mirror, Campbell River Courier, North Island Gazette, Mid-Coast Beacon, Coast Mountain News, Prince Rupert Daily News and Queen Charlotte Observer to inform the public that the draft MP 10 are available at 6 open houses in Sooke, Campbell River, Bella Bella, Prince Rupert and Queen Charlotte City on each of five days from 1:00 pm to 8:00 pm. These sessions will be conducted in June 2001.
2. The ad will be posted on WFP's website and distributed to the stakeholder list.

2. Individual Notification Letters

Phase I The attached letter (C) was distributed to the stakeholder list. A guest list (D) and comment response sheet (E) was provided to those reviewing MP 9.

Phase II The stakeholder list will be contacted by letter (F) to inform them of a series of 5 open houses and an offer of special presentations if so desired. As well, WFP will meet the company's Environmental Committees to review the draft plan. It is also the intent to also present the Plan to various First Nations as follows: Sooke, Pacheedaht, Campbell River, Tlowitsis-Mumtagila, Heiltsuk, Kitasoo, Haisla, Hartley Bay and Haida First Nation. If time permits we will also meet with municipal and regional governments and other stakeholders who express an interest in the meetings.

3. Public Reviews and Viewing Format and Reports

Phase I

1. This phase was completed in July and August 1999. WFP supplied a letter and comment form (C & E) to each person who took the opportunity to review MP 9.
2. A summary report was prepared with the results of the review and there were no written comments recorded.

Phase II

1. The strategy involves notification of the public using display advertising (B) the B.C. Gazette, Sooke Mirror, Campbell River Courier, North Island Gazette, Mid-Coast Beacon, Coast Mountain News, Prince Rupert Daily News and Queen Charlotte Observer and contacting the TFL 25 stakeholder list with the notice of public viewings and an executive summary of the draft MP
2. The five open houses will be staffed by senior WFP foresters and planners to provide details on the draft plan.
3. WFP has an excellent format for presenting complex technical information in a display that is easily understood by the public
4. A guest list will be maintained (D)

5. All attendees will be interviewed and requested to complete a comment sheet on site or to be mailed in. An award will be offered for return of comment sheets (See comment sheet (H) and summary sheet (G).
6. Comments from the interviews of open house attendees will be posted on a flip chart for review by other visitors. These comments will be summarized and recorded.
7. A summary report will be prepared on the public viewings re:
   - All activities in Phase II
   - Number of attendees
   - Verbal and written comments received
   - Changes to the draft MP 9 in response to the comments
   - Other pertinent information

4. Proposed Schedule of Public Reviews

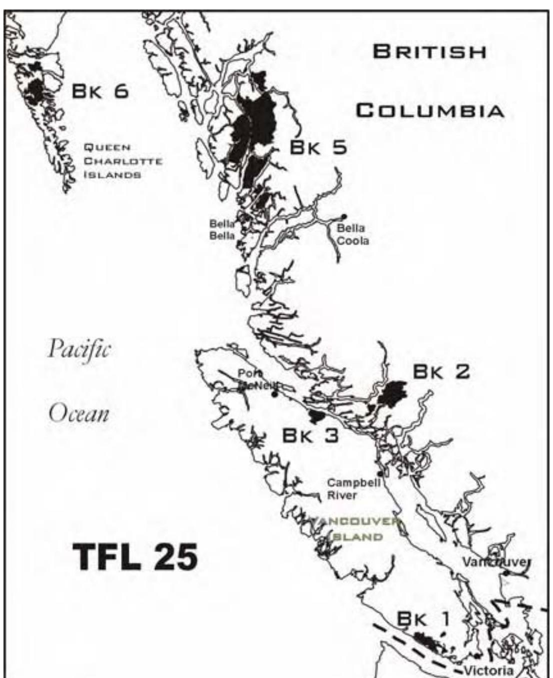
Phase	Item	Proposed or Actual Dates
I	Public comment on MP 9	July, August 1999
II	Public review of Draft MP 10	June 2001

Your comments and ideas are welcome on Tree Farm Licence 25

TFL 25, held by Western Forest Products Limited covers 250,000 hectares of forests in 5 blocks near Jordan River, Loughborough Inlet, Naka Creek on Vancouver Island, Bella Bella, Klemtu, Kitimat, and on north Moresby Island in the Queen Charlotte Islands. Every five years a new Management Plan and Allowable Annual Cut must be prepared and submitted to B.C.'s Chief Forester for review and approval. The first phase of the 30-month process for preparing Management Plan 10 is an opportunity for the public to comment on our performance and offer ideas and identify issues considered important for TFL 25.

As part of this phase, the existing Management Plan 9 is now available for review by the public during normal business hours at the following locations:

- WFP Jordan River Forestry Office, Jordan River
- WFP Campbell River Office, 118 - 1334 Island Highway, Campbell River
- WFP Northern Region Office, 1594 Beach Drive, Port McNeill
- WFP Corporate Office, 2300 - 1111 W. Georgia St., Vancouver
- Ministry of Forests office, 2217 Mine Road, Port McNeill
- Ministry of Forests office, 4885 Cherry Creek Road, Port Alberni, B.C.
- Ministry of Forests office, Duncan Field Office, 3817 Trans Canada Highway, Duncan, B.C.
- Ministry of Forests office, 370 South Dogwood Street, Campbell River, B.C.
- Ministry of Forests office, Sawmill Road, Hagensborg, B.C.
- Ministry of Forests office, 125 Market Place, Prince Rupert, B.C.
- Ministry of Forests office, 1229 Cemetary Road, Queen Charlotte City, B.C.
- Ministry of Forests office, 2100 Labieux Road, Nanaimo
- Ministry of Forests office, Resource Tenures and Engineering Branch,1450 Government Street, Victoria



You can also find MP 9 on WFP's website at *www.westernforest.com*

Your comments are welcome before **August 15, 1999**.
Write, Fax or E-mail to:

Chief Forester
Western Forest Products Limited
2300 – 1111 W. Georgia St.
Vancouver, B.C., V6E 4M3
Fax: 604-665-6268
E-mail: chiefforester@westernforest.com

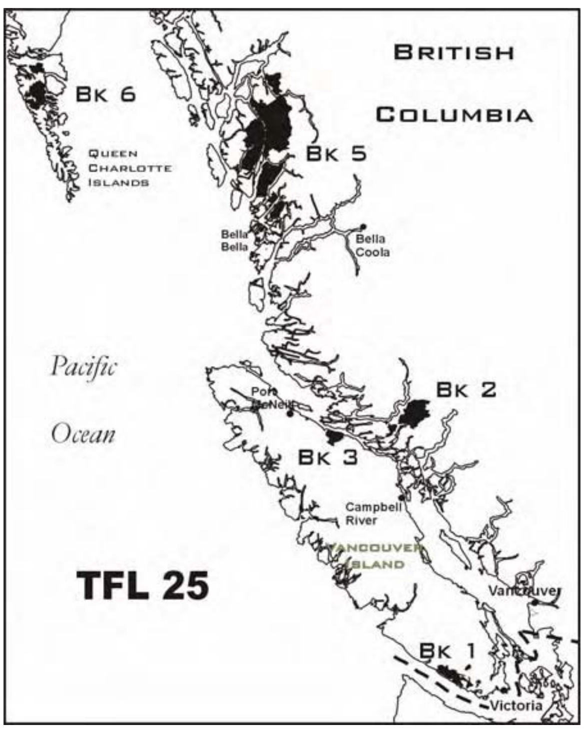
Western Forest Products Limited

We'd like to hear from you on our Draft Management Plan 10 for Tree Farm Licence 25

TFL 25, held by Western Forest Products Limited covers 250,000 hectares of forests in 5 blocks near Jordan River, Loughborough Inlet, Naka Creek on Vancouver Island, Bella Bella and Kitimat in the Central Coast, and on north Moresby Island in the Queen Charlotte Islands (Haida Gwaii). Every five years a new Management Plan and associated Allowable Annual Cut proposal must be prepared and submitted to B.C.'s Chief Forester for review and approval. The second phase of the process for preparing Management Plan 10 is an opportunity for the public and others to comment on our Draft Management Plan 10.

As part of this phase, the draft Management Plan 10 is now available until August 15, 2001 for review by the public during normal business hours at the following locations:

- WFP Jordan River Forestry Office, Jordan River
- WFP Campbell River Office, 118 - 1334 Island Highway, Campbell River
- WFP Northern Region Office, 1594 Beach Drive, Port McNeill
- WFP Corporate Office, 2300 - 1111 W. Georgia St., Vancouver
- Ministry of Forests office, 4885 Cherry Creek Road, Port Alberni, B.C.
- Ministry of Forests office, Duncan Field Office, 3817 Trans Canada Highway, Duncan, B.C.
- Ministry of Forests office, 370 South Dogwood Street, Campbell River, B.C.
- Ministry of Forests office, Sawmill Road, Hagensborg, B.C.
- Ministry of Forests office, 125 Market Place, Prince Rupert, B.C.
- Ministry of Forests office, 1229 Cemetary Road, Queen Charlotte City, B.C.
- Ministry of Forests office, 2100 Labieux Road, Nanaimo
- Ministry of Forests office, Resource Tenures and Engineering Branch,1450 Government Street, Victoria



You can also find Draft MP 10 on WFP's website at *www.westernforest.com*

As well, the Draft Plan and WFP's staff will be available as follows for an Open House to hear your comments:

Sooke: Seaparc Centre, 2168 Phillps Road
1:00 pm – 8:00 pm June 19, 2001

Campbell River: Ramada Anchor Inn
1:00 pm – 8:00 pm June 20, 2001

Bella Bella: United Church
1:00 pm – 8:00 pm June 25, 2001

Prince Rupert: Crest Motor Hotel
1:00 pm – 8:00 pm June 27, 2001

Queen Charlotte City: Skidegate Hall
1:00 pm – 8:00 pm June 28, 2001

Your comments are welcome before **August 31, 2001**.
Write, Fax or E-mail to:

Chief Forester
Western Forest Products Limited
2300 – 1111 W. Georgia St.
Vancouver, B.C., V6E 4M3
Fax: 604-665-6268
E-mail: chiefforester@westernforest.com

Western Forest Products Limited

July 7, 1999

Dear Sir / Madam;

Thank you for participating in this first step of the preparation for Management Plan 10 for Tree Farm Licence 25. There is a 30 month process that Western Forest Products will follow. The current Management Plan 9 expires on December 28, 2001

The first step involves an opportunity for the public to comment on our performance, offer ideas and identify issues that you feel are important to the management of Tree Farm Licence 25. From this information I will take your views and comments and prepare a Statement of Management Objectives Options and Procedures. This second step will also be available for public review and comment.

As part of the public review, the existing Management Plan 9 is available in various offices as per the attached advertisement, to assist with preparation of your comments. I would very much appreciate if you would complete and return the attached questionnaire to me no later than August 15, 1999 so that your comments can be an important part of the Management Plan process for TFL 25.

Yours truly

WESTERN FOREST PRODUCTS LIMITED
General Partner of
Western Pulp Limited Partnership

W.E. Dumont, R.P.F.
Chief Forester

WED/dg

Page ____ of ____

Western Forest Products Limited

Management Plan 10 - Tree Farm Licence 25

Public Review

Date: ______________________ **Location:** ______________________

NAME	FULL ADDRESS	PHONE	CONCERN / ISSUE

July 1999

Western Forest Products Limited

TFL 25 Management Plan 10, Step 1 – Public Review of MP 9

We are seeking public input with respect to our performance under the current Management Plan 10. In addition we are inviting interested parties to identify issues, concerns and values that should be considered in the preparation of Management Plan 10 for TFL 25.

The results of the public input will be compiled and forwarded to the Ministry of Forests. Please be as candid and constructive as possible.

Thank you for your participation in this process.

Comments and suggestions forward to: Chief Forester, Western Forest Products
2300 – 1111 W. Georgia Street
Vancouver, B.C., V6E 4M3

____

____

____

____

____

____

____

____

____

____

____

____

Optional: **Your Name:** ____________________

Address: ____________________

Phone: ____________________

Fax: ____________________

You can also access MP 9 on WFP's Website at www.westernforest.com

File: 254-9

June 2001

(Stakeholders)

Dear FIELD (Salutation);

Draft Management Plan 10 - TFL 25

In 1999, I wrote you regarding the first phase in the preparation of Management Plan 10 for Tree Farm Licence 25. I appreciated the input and information we received in that process. As the second and final phase in the preparation of draft Management Plan 10, I am pleased to inform you that the draft Plan is now available for public review at a series of open houses to be held as follows:

Location	Time	Date	Place
Sooke	1 pm – 8 p.m.	June 19, 2001	Seaparc Centre
Campbell River	1 pm – 8 p.m.	June 20, 2001	Ramada Anchor Inn
Bella Bella	1 pm – 8 p.m.	June 25, 2001	United Church
Prince Rupert	1 pm – 8 p.m.	June 27, 2001	Crest Motor Hotel
Queen Charlotte City	1 pm – 8 p.m.	June 28, 2001	Skidegate Hall

The draft plan is also available on Western Forest Products website at www.westernforest.com. We welcome your involvement in the open houses. If you are unable to attend these open houses, we would appreciate receiving any written comments you have regarding our plans. If you or your organization would like to have WFP arrange a special presentation, please contact me at (604) 665-6224. I can best use your comments if we receive them no later than August 31, 2001. Thank you for your assistance.

Yours truly

WESTERN FOREST PRODUCTS LIMITED
General Partner of
Western Pulp Limited Partnership

W.E. Dumont, R.P.F.
Chief Forester

WED/dg

Western Forest Products Limited

Public and Stakeholder Response Summary
TFL 25 Public Viewings
For Draft Management Plan 10

Date	Location	No. of Participants	Response Sheets Taken	Response Sheets Returned	Letters Received
Total					

Western Forest Products Limited

TREE FARM LICENCE 25 - DRAFT MANAGEMENT PLAN 10

PUBLIC REVIEW AND OPEN HOUSE COMMENTS

DATE: __________________ **LOCATION:** ____________________

Thank you for taking an interest in the draft Management Plan 10. We appreciate the completion of this questionnaire so that your ideas, views, comments and concerns can be part of the Management Plan process. Your answers and comments will also help us evaluate our performance at this viewing and improve future presentations.

Please be as candid and constructive as possible. If space is insufficient please use extra pages.

1. What do you consider to be the 3 most important values of Tree Farm Licence 25?

	Important Value	Why?
1.		
2.		
3.		

2. Do you have any comments/concerns about logging and forestry programs in TFL 25?

☐ Yes ☐ No If yes, these are: ____________________

3. What concerns were addressed in the review meeting?

4. Do you have any comments/concerns about Management Plan 10 that we could address to improve the Plan?

5 Are there any aspects of TFL 25 you would like to know more about?

☐ Yes ☐ No If yes, what are these? ____________________

____

6. Did you know anything about TFL 25 before this review? ☐ Yes ☐ No If yes, please describe: ____________________

____

____

7. How did you hear about this review session? ☐ Newspaper ad ☐ Invitation ☐ Other

8. How well did WFP staff on hand answer your questions?

Excellent		Satisfactory		poor
☐	☐	☐	☐	☐

9. Was the information presented in an understandable manner?

Very		Easily		Too complex
☐	☐	☐	☐	☐

10. How can we encourage more people to attend these sessions? Any ideas for improvement? __

____

____

____

Please tell us about yourself:

☐ Male ☐ Female Occupation ____________________

Age: ☐ Under 14 ☐ 14-19 ☐ 19-25 ☐ 26-40 ☐ 41-55 ☐ over 55

If you wish a written response to your comments please provide your:

Name: ____________________ Address: ____________________

Postal Code: ____________________ Phone: ____________________

We can best use your comments if we receive them by August 31, 2001.

Please return this to the box provided or mail in the addressed, stamped envelope to:

Chief Forester
Western Forest Products Limited
2300 - 1111 West Georgia Street
Vancouver, B.C., V6E 4M3
Phone: 665-6224 FAX: 665-6268
E-Mail: chiefforester@westernforest.com