



TFL FOREST LTD. (TimberWest)

TREE FARM LICENCE No. 46

MANAGEMENT PLAN No. 4

December 1, 2001 - November 30, 2006

Licence Signatory:

Prepared by:

A handwritten signature in blue ink, reading "S. Lorimer", written over a horizontal line.

Steve Lorimer, R.P.F.
Land Use Forester

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Jim Hackett, R.P.F.
Sterling Wood Group Inc.

September 2001



Tree Farm License No. 46

Management Plan No. 4

2001 - 2006

Our File(s): Management Plan No. 4 – Tree Farm Licence No. 46

October 2nd, 2001

Ministry of Forests
Ministry Executive
Chief Forester
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RECEIVED
11 OCT 2001
EXECUTIVE
MINISTRY OF FORESTS
(+ RSEB)

Attention: Larry Pedersen

Regarding: Proposed Management Plan No. 4 (Tree Farm Licence No. 46)

Please accept the attached submission of the Proposed Management Plan (PMP) for Tree Farm Licence No. 46 for the period December 1, 2001 to November 30, 2006. In preparing the PMP, we have considered the review comments we received on the Draft Management Plan. Should you require any further information regarding this submission or if there is any way we can assist you in expediting its approval, please do not hesitate to contact us. Your prompt attention to this matter is greatly appreciated.

Yours truly,



Kenneth E. Kaps, R.P.F.
Administrative Forester
Coast Timberlands

Encl/ (a) Proposed Management Plan No. 4
(b) Map Folio Reports Binder
(c) Map Folio (Paper and Digital Copies)

Cc/ Ken Collingwood – Vancouver Forest Region
Cindy Stern - South Island Forest District
Judy Teskey - Ministry of Water, Lands and Air Protection



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Our File(s): Management Plan No. 4 – Tree Farm Licence No. 46

October 2nd, 2001

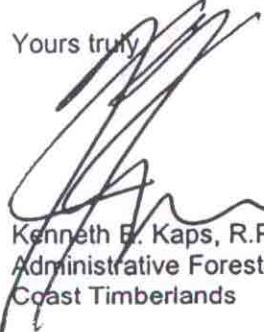
Ministry of Forests
Vancouver Forest Region
Regional Manager
2100 Labieux Rd.
Nanaimo, BC
V9T 6E9

Attention: Ken Collingwood

Regarding: Proposed Management Plan No. 4 (Tree Farm Licence No. 46)

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1.0 INTRODUCTION

1.1 Description of TFL 46

Tree Farm Licence (TFL) 46 consists of seven individual units referred to in the Licence Document as Blocks 1, 2, 3, and 6 to 9. The blocks are located mainly on the Western Coast of Vancouver Island between Muir Creek in the south and Nitinat River and Cowichan Lake in the west and north. Smaller portions of the TFL are located on the southeast part of the Island. An overview map of TFL 46 is presented in Figure 1.

Most areas of the TFL are located in watersheds with rivers running westward toward the west coast of Vancouver Island. Slopes vary from flat, alluvial river valleys to steep, rugged and rocky terrain. In contrast, areas of TFL 46 located in the Cowichan Valley drain eastward and have more gentle topographic features. The maximum elevation within the TFL is approximately 1,200 m, with many of the mountain ridges attaining elevations of 800 m.

Although the geology of Vancouver Island is complex and varied, pedologists believe that soils within the TFL developed following the last ice age of 10,000 years ago. Soils are composed of glacial tills at medium and upper elevations, while other tills occur in the valley bottoms. Glacial out-washes are found near the main rivers and moraine silts and clays occur at lower elevations on flat and concave slopes.

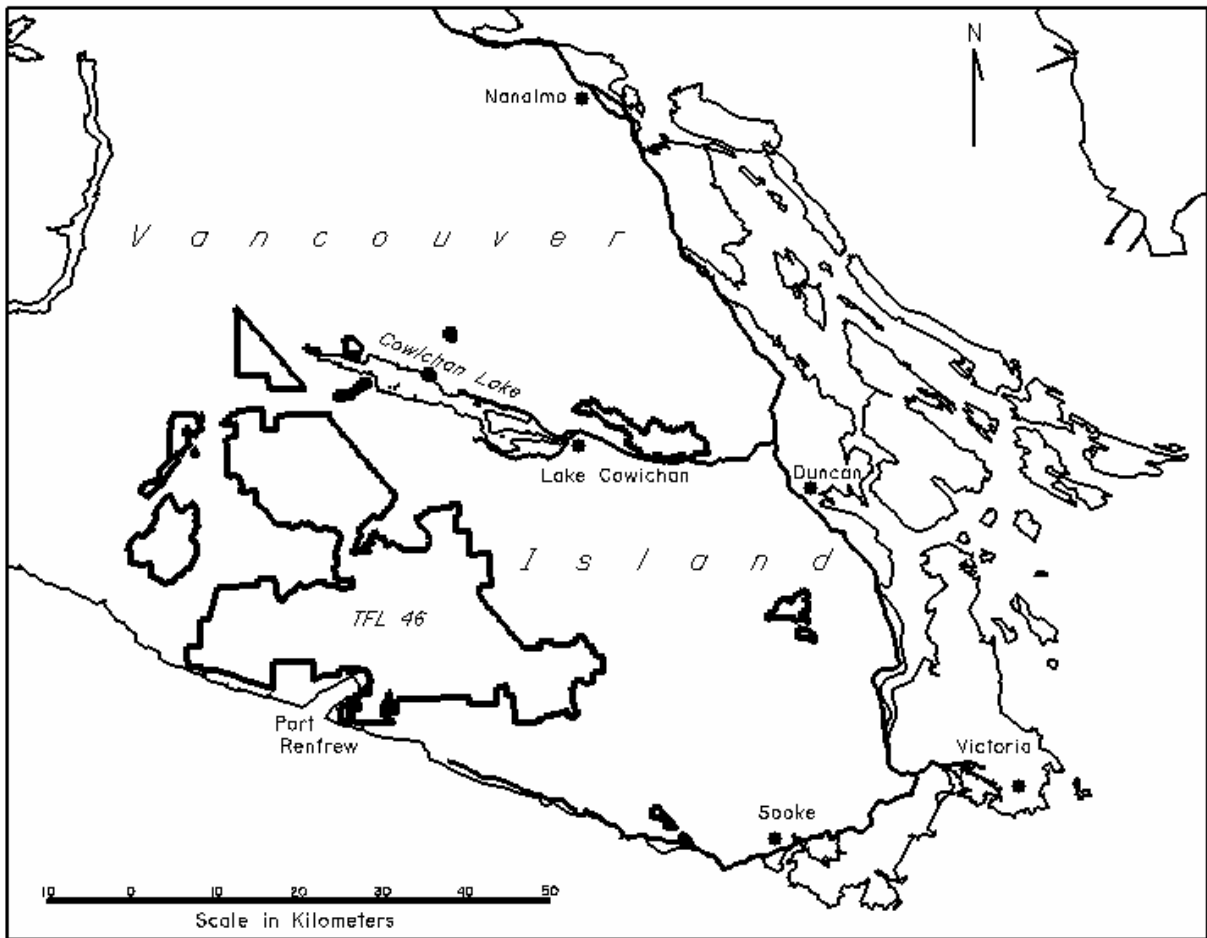


Figure 1. TFL 46

The climate of most of the TFL is temperate and rainy. Average snowfall varies from minimal amounts at sea level to 100 cm at high elevations. Average temperature ranges between -8° and 27°C with an annual average of 10°C . Average annual precipitation is approximately 380 cm.

The combination of topography, soils and climate have resulted in a full range of growing sites for coniferous species with most of the TFL situated on medium quality growing sites.

Of the total area of 90,870 ha on TFL 46, 80,545 ha are classified as productive forest land. The productive forest land area is broken down into 77,659 ha of physically operable land and 2,886 ha of inoperable land. Following netdowns for such items as Environmentally Sensitive Areas (ESAs), low site land, and riparian management zones, the remaining timber harvesting land base totals 63,777 ha.

Timber types contain western hemlock (*Tsuga heterophylla*), western red cedar (*Thuja plicata*), balsam (*Abies amabilis*, *Abies grandis*), Douglas-fir (*Pseudotsuga menziesii*), yellow cedar (*Chamaecyparis nootkatensis*) and minor volumes of spruce, pine and alder.

1.2 History

Harvesting started in the Port Renfrew area approximately eighty-five years ago, when a shingle mill was established and selective logging was carried out close to the beach to extract large cedar logs.

A railroad logging operation started in 1925 on the north side of the San Juan River and was operated by several companies before British Columbia Forest Products Limited (BCFP) acquired the operation from the Hemmingsen-Cameron Company in 1946. The Malahat Logging Company logged on the south side of the San Juan River during the period 1937 to 1946 before it was acquired by BCFP.

Harvesting in the Cowichan Valley began near the turn of the 19th Century. One of the first sawmills in the Valley was established in 1913 at Cottonwood Creek. Industrial Timber Mills built one of the first sawmills on Cowichan Lake in 1929. The owners of that mill, Mssrs. Yount and Bouton, combined their names to give Youbou its name. In 1946, British Columbia Forest Products Ltd. (BCFP) purchased Industrial Timber Mills. The mill became known as Cowichan Wood Products and ran until it's permanent

closure in January, 2001.

BCFP was granted Forest Management Licence No. 22 in 1955. The licence encompassed two blocks of land on the West Coast of Vancouver Island near Tofino, one block at Renfrew and two in the Lake Cowichan area. Conditions for granting the licence required construction of the Crofton pulp mill and development of road access to Port Renfrew, Tofino and Ucluelet.

Tree Farm Licence No. 27 was awarded in 1958 to the Moore-Whittington Lumber Company. Despite some early evidence of scattered logging along the western shores of Nitinat Lake, there was very little production prior to the granting of the Licence. In 1963, BCFP purchased Tree Farm Licence No. 27.

Approval was granted in 1982 to amalgamate Tree Farm Licences 22 and 27 to form Tree Farm Licence No. 46. The new Licence was granted in July 1, 1983 to provide a renewable term of 20 years and six months.

In 1969, the formation of a new National Park was proposed for the West Coast of Vancouver Island. The proposed park called the Pacific Rim National Park, was to be located to a great extent within the predecessor TFL's, extracting from the TFL thousands of hectares along the Coastal areas and to the west of Nitinat Lake. Negotiations between BCFP and the Provincial and Federal Governments for lands and timber to replace those designated for the Park continued for 18 years and culminated with the signing of the Exchange Agreement on December 9, 1986.

Fletcher Challenge became a major shareholder of British Columbia Forest Products Limited and in September of 1988, shareholders approved a name change to Fletcher Challenge Canada Limited.

Approval was granted in late 1991 to partition TFL 46 into two TFL's. Blocks 1, 2, 3, 6

to 9 were to remain as TFL 46 and Blocks 4 and 5 became TFL 54, which was then transferred to International Forest Products Limited.

In December, 1993, Fletcher Challenge Canada Ltd. assigned its assets to TimberWest Forest Limited. Fletcher Challenge Canada Ltd. remained the majority shareholder in TimberWest Forest Ltd. until June 23, 1997, when the Minister of Forests consented to the change in control of TimberWest Forest Limited to TAL Acquisition Ltd.

On September 30, 1998, TimberWest Forest Limited changed its name to TFL Holdings Ltd. that was subsequently changed to TFL Forest Ltd. on October 5, 1998. TFL Forest Ltd. currently holds TFL 46.

1.2.1 Changes to TFL Area

Since its inception in 1983, a number of area changes have occurred to TFL 46 and they are summarized in Appendix 1. Since the last management plan the land base of TFL 46 has been reduced from 99,130 hectares to 90,870 hectares as a result of the Land Exchange Agreement, the deletion for the San Juan Marine Park Trail and two small deletions for a parking area and a sawmill site. The major area deletions are presented below in Figure 2.

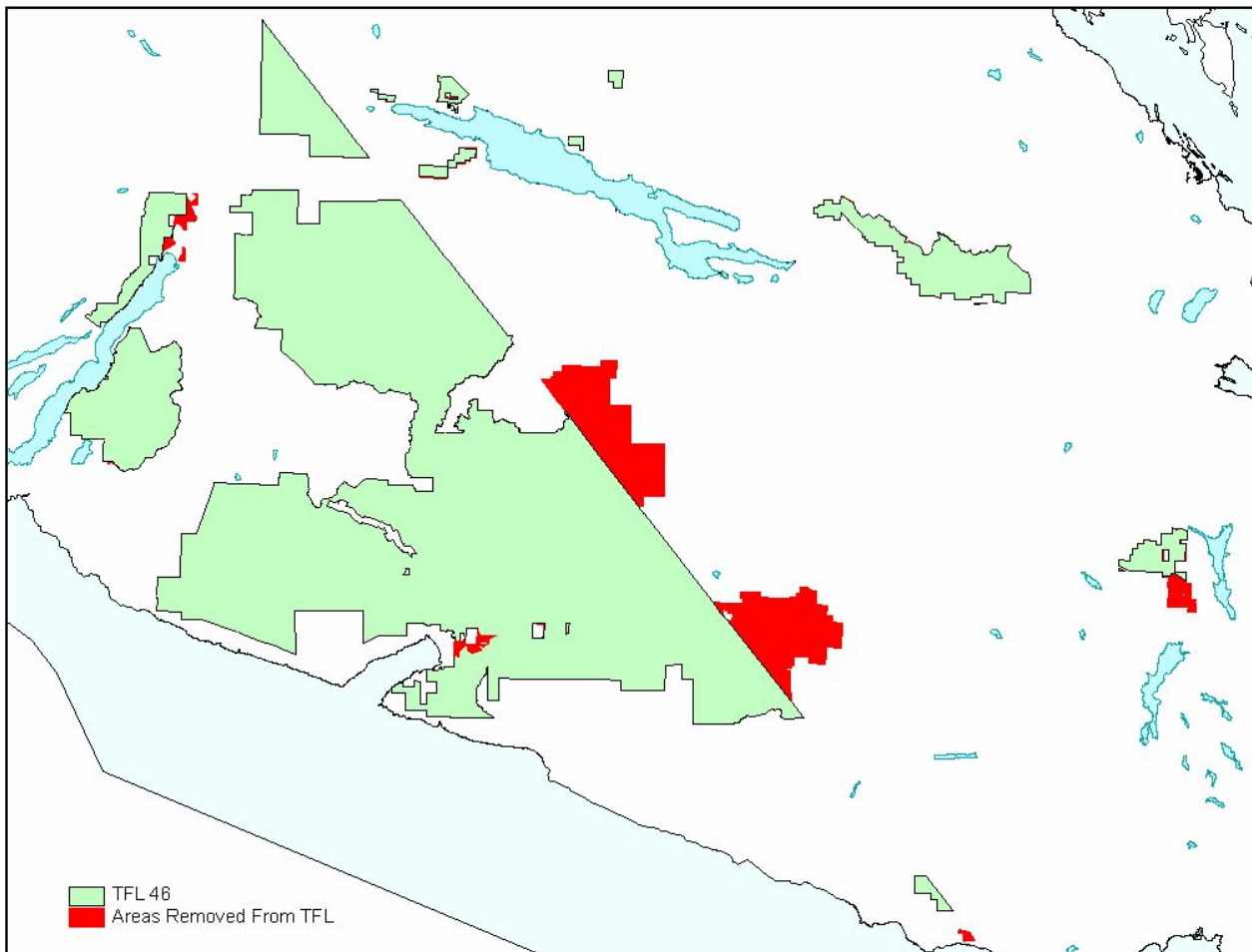


Figure 2. Area Deletions from TFL 46.

1.3 Licence Holder and Administration

TimberWest is one of Canada's largest businesses operating exclusively in the solid wood segment of the forest industry. It operates entirely in the coastal region of British Columbia, and is engaged in the harvesting and sale of logs, the processing and sale of softwood lumber and the sale of higher use properties. TimberWest owns an extensive estate of private timberlands with an annual sustainable harvest of 2.4 million

m³ of logs, annual Crown land harvest rights of 1.2 million m³ of logs, a lumbermill and approximately 6,500 hectares of properties that are constantly being made available for higher uses.

2.0 PLANNING

2.1 Higher Level Plans

The Vancouver Island Land Use Plan (VILUP) – Higher Level Plan (HLP) Order became effective on December 1, 2000. TimberWest will comply with the objectives of the HLP. The Plan defines three Resource Management Zones (RMZs) including Special, Enhanced Forestry and General Management Zones. The Higher Level Plan (HLP) order defines all three zones on Vancouver Island. Within TFL 46 there are two special management zones (SMZs), the Walbran Periphery (SMZ # 21) and the San Juan Ridge (SMZ # 22). There is one Enhanced Forestry Zone, EFZ Unit 47: Loss-Jordan and three General Management Zones, GMZ Units 34 (E&N South), 45 (Nitinat), and 46, Gordon-Caycuse-San Juan. A summary description of the RMZs within TFL 46 is included in the supplemental map folio report in Appendix 2.

2.2 TFL Management Objectives

TFL Forest Ltd.'s (the Company's) objectives for timber, range and resource management on TFL 46 are as follows:

Forest Inventory

- To carry out annual harvesting and silviculture updates and periodic updating of resource information.

Planning

- To plan operations which will optimise the values flowing from the land base.
- To provide the public and First Nations with input opportunities into

operational and strategic resource management plans.

Employment

- To maintain a financially viable and world-competitive forest products company that will contribute to the economic stability of the communities where it operates.
- To constantly innovate in ways that add value, increase production performance, improve product quality and provide an acceptable return on investment.
- To utilize the expertise of company employees.
- To balance the available fibre supply with market demands and economics.

Environment

- To manage both lands and forest resources according to sound forest management and environmental protection principles, in ways that minimise detrimental impacts to other resource values as demonstrated through third party certification.

Engineering Development

- To construct, maintain and deactivate all future roads and bridges in accordance with the *Forest Practices Code of BC Act (FPC)*.

Harvesting

- To conduct harvesting operations according to the *Forest Act* and the FPC.
- To minimise impacts on non-timber resource values identified in higher level plans, and operational plans to the standards established by the FPC.
- To phase out clearcutting and move towards a forest management system

where structural elements of the stand are retained throughout the harvested area for at least one rotation.

- To help sustain harvest levels during the transition from old growth to second growth harvesting by adopting first entry rotation ages.

Utilization

- To utilize the operable timber-type profile including deciduous species.
- To utilize the timber resources in accordance with the Ministry of Forests (MoF's) Utilization Standards as laid out in Schedule C of the TFL agreement.
- To allocate logs to customers best able to utilise the species, quality and size available.
- To harvest outside the limits of the operable land-base where it is determined to be economically and environmentally practicable.

Silviculture

- To fund and implement basic silviculture in a manner that will ensure that all areas requiring reforestation reach "free-growing" status within the acceptable standards as specified in the approved Silviculture Prescriptions (SP).

Protection

- To manage the forest to prevent, recover or reduce losses caused by wind, fire, insects or disease.

Access Management

- To allow public access unless safety, fire hazard or environmental conditions dictate otherwise.

Research

- To carry out operational silviculture trials as needed.
- To support research organisations, such as the Forest Engineering Research Institute of Canada, which carry out research activities that may benefit the management of TFL 46.
- To support graduate level forestry related research that may benefit the management of TFL 46.

2.3 Non-Timber Resource Management

Recreation

- To consider recreation values in timber management decisions in accordance with principles of integrated resource management.

Visual Landscape

- To meet visual quality classes recommended for management in known scenic areas by utilizing landscape management techniques in forest management planning and operations.

Biodiversity

- To manage for biological diversity by assisting the Ministry of Sustainable Natural Resources and the MoF in setting objectives for the priority biodiversity elements of old growth management areas and wildlife tree retention for each Landscape Unit in TFL 46.

Fish, Wildlife & Soils

- To operate in a manner that will conserve the productive capacity of soils, fish streams, marine areas and other sensitive wildlife habitat.

- To incorporate wildlife habitat needs in operational planning.

Watershed Management

- To carry out watershed assessment procedures (WAPs) on watersheds as required by the FPC.

Trappers and Guides

- To advise known registered trappers and guides of Company harvest plans through the forest development plan review process.

Culture and Historic Values

- To abide by the *Heritage Conservation Act* and refer heritage sites and culturally modified trees discovered on TFL 46 to the relevant First Nation, the MoF, and the B.C. Archaeology Branch.

Aboriginal Rights

- To refer forest development plans and management plans to First Nations where they may directly affect an aboriginal right on Crown land.
- To promote communications regarding forest development issues by participating in the Ditidaht/Pacheedaht resource planning working group initiated under an Interim Measures Agreement.

Resource Inventories

- To update resource inventories (Visuals, Recreation, Terrain) periodically to reflect better information as it becomes available.
- To assist in the confirmation of ungulate winter ranges in accordance with the FPC.

Professional Assessments

- To conduct detailed stand level assessments where indicated by resource inventories and where required by the FPC.

2.4 TFL 46 Management Strategies

2.4.1 Communities

Forest management of TFL 46 contributes to the community stability of Cowichan Lake, Crofton, Port Renfrew and to a lesser extent, Duncan and Sooke. The Company will support the stability of these communities by maximizing the value of harvested timber and managing the forest resources within current operating constraints. Current fibre agreements will help ensure that logs can be directed to the manufacturing plants best suited to extract the maximum value of the species and grade available.

In the year 2000 TimberWest's combined operations at Honeymoon Bay, Cowichan Woodlands, Shoal Island and Stuart Channel Wharves have contributed to the Cowichan Valley as follows:

Employment	835 people
Annual payroll	\$32 million
Payments to Contractors	\$56 million
Purchases of Supplies	\$20 million

In late October of 2000, TimberWest announced the permanent closure of the Cowichan Lumber mill at Youbou. This announcement was made after a lengthy effort to sell both the lumber mill and TFL 46 as a package. Despite negotiations with specific interested parties, no sale was completed. The mill was shut down at the end of January, 2001 and an Industrial Adjustment Committee was set up to aid former employees with job searches.

In an effort to mitigate the impact of the lumber mill closure, TimberWest, in conjunction with the Lake Cowichan Community Forest Co-operative, has helped fund a consultant to look for opportunities in the Cowichan Lake area aimed at setting up a speciality mill to be operated by the Co-operative. TimberWest also commits to provide additional funding from the de-commissioning of the Cowichan Lumber mill toward construction of a speciality mill and is prepared to help supply logs should such a project be approved by the Co-operative.

2.4.2 Employment

Table 1 identifies the current level of employment for full time equivalent Company employees associated with TFL 46.

Table 1. Company Employment Levels (2001)	
Operation	Salary & Wage Employees
Administration	12
Forestry & Logging	228
TOTAL	240

The Company also employs contractors who carry out one or more phases of a timber harvesting operation as well as full (stump to dump) contractors. Contractors are also employed in such forestry projects as timber salvage, road deactivation, stream cleaning, silvicultural surveys, planting, brushing and weeding, and fertilization. Contractors have also been employed in planning, and developing recreation and visual landscape inventories. TimberWest contracts the Pacheedaht and Ditidaht First Nations to carry out stream cleaning and other related Forest Renewal B.C. (FRBC) projects.

2.4.3 Environment

2.4.3.1 Policy

TimberWest's environmental policy is a statement by the Company of its intentions and principles in relation to its overall environmental performance, and provides a framework for action and setting environmental objectives and targets. TimberWest updated its environmental policy in July, 2001 and a copy is included in this management plan at Appendix 3.

2.4.3.2 Environmental Committee

The Environmental Committee of the Board of Directors was established in late 1993 and is a key organization within the Company. It is chaired by a designated member of the Board and is responsible for implementing and maintaining an Environmental Management System (EMS), and for reviewing and communicating issues within and outside the Company that are related to the environment. The Committee commissions' independent environmental audits of operations and monitors the Company's environmental performance, environmental management system and internal audits.

2.4.3.3 Environmental Management System

In 1994, TimberWest formalised the EMS for the Company. The system, substantially implemented by the end of 1995, is designed to ensure the Company will be in compliance with all regulatory requirements and includes organizational structure, planning activities, responsibilities, practices, procedures, processes, and resources for developing, implementing, achieving, reviewing, and maintaining the environmental policy. In 1999, in preparation for International Standards Organization (ISO) 14001 certification, each TimberWest operation developed individual EMS's in support of the Company EMS.

2.4.3.4 Certification

All of TimberWest's operations were awarded registration under the International Standards Organization (ISO) by November 26, 1999, certifying that its operations were being managed in accordance with the EMS.

2.5.3.5 Internal Audits

Environmental audits, associated with ISO certification, are conducted to review action plans on a periodic basis to ensure the Company's commitment to continuous improvement is being met. Follow-up audits confirm that action plans have been completed.

2.5 Other Planning Initiatives

2.5.1 Wildlife Management

Since 1987, TimberWest has been collecting data on deer habitat, deer population levels, and snow depth and duration. The information was used to prepare a "habitat capability map" which depicted old-growth winter ranges, potential spring forage areas and candidate second-growth areas for enhancement to provide old-growth characteristics. In 1999, the Ministry of Environment, Lands and Parks (MoELP) requested that the information on forage conditions around winter ranges be updated. This project has been initiated and will be completed during the term of MP 4 with funding from FRBC.

TimberWest has participated in Marbled Murrelet and Queen Charlotte Goshawk planning projects.

2.5.2 Interim Timber Harvesting Strategy

On January 21, 1992, as part of the provincial government's regional land use planning process for Vancouver Island, the MoF and MoELP jointly announced an "Interim Timber Harvest Strategy" (ITHS) to defer harvesting in approximately 5,000 ha of the Walbran and Cullite Creek drainages. In 1995, the provincial government announced the designation of approximately 6,900 hectares in the Walbran, Cullite and Logan drainages as a Class "A" provincial park. The licence has yet to be amended to formally remove the designated lands. In addition, Hitchey Creek Park, with an estimated area of 18.6 ha., is also still within TFL 46.

2.5.3 Ecological Inventory

A comprehensive Terrestrial Ecosystem Mapping (TEM) project of TFL 46 was completed during MP3. This inventory provides important ecological classification information to Company forest managers. Funding for the project was provided through FRBC.

2.5.4 Site Index Validation

A comprehensive project aimed at correlating second growth site index with groupings of site series of the new ecological inventory was finalized in July, 2000¹. The project developed potential site index (PSI) estimates for coastal Douglas-fir (Fd), western hemlock (Hw), Pacific silver fir (Ba), and western red cedar (Cw) for forested ecosystems on TFL 46. The report estimates that the average PSI for Fd and Hw are approximately 24% and 10% higher, respectively, than the current forest cover

¹ See "Second-Growth Site Index Estimates for Douglas-fir, Western Hemlock, Pacific Silver Fir, and Western Redcedar for Jim McPhalen, RPF, TimberWest Forest Ltd., J.S. Thrower & Associates Ltd., Kamloops, B.C., July 17, 2000.

inventory site index estimates. PSI for Ba decreased 10% while Cw PSI remained unchanged. An analysis of the findings of this study will be incorporated into the MP 4 timber supply analysis. Funding for this project was provided through FRBC.

3.0 RESOURCE INVENTORIES

The resource inventory information for TFL 46 has been prepared and presented in the accompanying Map Folio. A Map Folio Reports binder accompanies the Map Folio and includes copies of the visual landscape and recreation inventory reports, ESA Terms of Reference, operability mapping Terms of Reference and associated approval letters.

3.1 *Forest Inventory*

The original forest inventory of old growth timber was prepared during the period 1967 to 1970. During the period 1972 to 1980, numerous intensive inventories were completed for the purpose of operational planning and these were combined with the original inventory to produce the maps and values for Management and Working Plan No. 1. Approximately 10,300 volume sample plots were established.

The current forest inventory has been updated for harvesting, road construction, forestry activities, and amendments to the licence area. The MoF is currently completing an audit of the forest inventory for TFL 46 but findings were not available to be incorporated into the TFL 46 timber supply analysis.

3.2 *Operability*

Mapping of TFL operable areas provides an estimate of merchantable forest-stands that are available to harvest under current market conditions and according to current harvesting and road-construction techniques. TimberWest's operability mapping was prepared using the March 6, 1992 "Terms of Reference". The Regional Manager approved the mapping on August 6, 1993. MoF South Island Forest District staff has reviewed the operability mapping, and compared it to current performance as portrayed

in the forest development plan. The existing operability mapping has been approved for use in MP 4. The Terms of Reference and mapping are both included in the map folio reports binder and map folio that accompany this management plan (see Appendix 2).

3.3 Recreation

The recreation features inventory and recreational opportunity spectrum were updated to the 1998 Resource Inventory Committee (RIC) standards during MP3. The new inventory was submitted to the MoF - South Island Forest District on May 16, 2000 and was approved by the Regional Manager in August, 2001. The Company has not been able to incorporate it into the timber supply analysis for MP 4, but will apply the new inventory in operational plans.

3.4 Visual Landscape

The existing visual landscape inventory was prepared according to the methodology outlined in the MoF Recreation Manual. The inventory records the location, attributes and quality of existing visual resources and values. Visual sensitivity unit codes are identified on the map and a corresponding description is provided in the report. This inventory has been updated to 1997 Resource Inventory Committee standards. The new inventory was reviewed and approved by the MoF on December 13, 2000 and it has been included in the timber supply analysis for MP 4.

3.5 ESAs

The MoF regional office has reviewed the ESA inventories and approved them.

3.6 Archaeological

An Archaeological Overview Assessment has been prepared for those portions of the TFL where the Ditidaht assert as their Traditional Territories. This project was completed in co-operation with the Ditidaht First Nation, MoF, Ministry of Aboriginal Affairs (MoAA), and the Weyerhaeuser Company, with funding from FRBC and MoAA.

Table 2 below summarizes the current non-timber inventories prepared for TFL 46.

Table 2. Status of Non-Timber Resource Inventories

Non-Timber Resource Inventory	Standard/Source	Mapped At	Date Completed	Date Accepted By
Soils (Es)	Terrain Classification System for BC, MOE Manual December 1988 Mapped by A.N. Chatterton, RPF, P. Geo, IRAS of TimberWest.	1:20,000	1992	K. Ingram, MOF, Nov. 9, 1993
Plantation (Ep)	Mapped by A.N. Chatterton, RPF P. Geo., Forest Pedologist, IRAS of TimberWest Forest Limited	1:20,000	1993	K. Ingram, MOF, Nov. 9, 1993
Avalanche (Ea)	Forest Inventory Manual Chapter 21984 MOF Mapped by A.N. Chatterton, RPF, P. Geo, IRAS of TimberWest Forest Limited	1:20,000	1993	K. Ingram, MOF, Nov. 9, 1993
Ungulate Winter Range	Mapped by D.J. Lindsay, R.P. Bio.	1:20,000	1993	K. Ingram, MOF, Nov. 9,

² In MP 3, the majority of the mapped wildlife areas were ungulate winter ranges (UWR). During the planning period, TimberWest has been working with the Ministries of Forests and Water, Lands, and Air Protection to assess ungulate winter range boundaries and netdown procedures. These confirmed UWR

Non-Timber Resource Inventory	Standard/Source	Mapped At	Date Completed	Date Accepted By
(UWR) ²	Fish and Wildlife Biologist, IRAS of TimberWest Forest Limited			1993.
Riparian	1995 FPC Riparian Management Area Guidebook. Mapped by D.J. Lindsay, R.P. Bio., and T. Bakos., IRAS of TimberWest Forest Limited	1:20,000	1996	N/A
Visual Landscape	Resource Inventory Committee, May, 1997 Standards.	1:20,000	May, 2000	K. Collingwood, MOF December 13, 2000
Recreation	Chapter Six of MoF Recreation Manual MOF July 1988 Mapped by Jeremy B. Webb, Recreation Resource Consultant, 3156 Cobble Hill Road, Cobble Hill, B.C.	1:20,000	May, 2000	K. Ingram, MOF Oct. 23, 1993
Recreation Features Inventory (RFI) and Recreation Opportunity Spectrun	Resource Inventory Committee, October, 1998 Standards	1:20,000	May, 2000	Darrell Robb, MOF August 16, 2001
FENs	Guidelines to maintain biological diversity in TFL 44 & 46, Dec. 1991, Mapped by D.J. Lindsay, R.P. Bio. Fish and Wildlife Biologist,	1:20,000	1993	Grandparent ed

areas will replace the ESA wildlife mapping applied previously. The UWRs have been grandparented under the FPC Operational Planning Regulation, Section 1(1)c. Both TimberWest and the Ministry of Water, Land and Air Protection recognize that conflicting information exists over the accuracy of the UWRs and have clarified this issue in a memorandum dated April 26, 2001. See Appendix 1 of the TFL 46 Information Package.

Non-Timber Resource Inventory	Standard/Source	Mapped At	Date Completed	Date Accepted By
	IRAS, TimberWest Forest Limited			
Operability	Mapped as per TFL 46 Terms of Reference. Operability mapping by Tibor Bakus of TimberWest Forest Limited	1:20,000	1993	K. Ingram, MOF Aug. 6, 1993

4.0 MANAGEMENT OBJECTIVES

4.1 Management and Utilization of Timber Resources

The Company's primary timber objective is to harvest 100% of the AAC. In order to achieve this objective the Company will:

- Harvest outside the limits of the operable land-base when economically and environmentally feasible,
- Sustain harvest levels through flexible rotation ages,
- Protect non-timber values to the standards established by the FPC,
- Utilize operable timber-types subject to MoF harvesting constraints, market demand and economic viability,
- Utilize the timber resources in accordance with MoF utilization standards,
- Recover economically viable timber that is blowdown or damaged by insects, disease and fire or is in imminent danger of being damaged, and
- Encourage economically viable recovery of special forest products and fibre in excess of utilization standards.

4.1.1 General

TimberWest will prescribe silviculture systems in Silviculture Prescriptions (SPs) which are appropriate to the stand, site and terrain, which maintain safe, efficient, economically viable operations and which protect environmental values to the standards established by the FPC.

Harvesting of deciduous species will be carried out coincidentally with conifers in mixed stands and in lead species deciduous stands when market opportunities exist.

Commercial thinning opportunities may be initiated where economically feasible, silviculturally appropriate and strategically justified. Limited commercial thinning has occurred on TFL 46 to date.

4.1.2 Variable Retention Systems

TFL 46 is shifting to a Variable Retention (VR) system, consistent with TimberWest's announcement to phase out clearcutting. Under this new forest management system, portions of existing stands are retained in undisturbed patches of varying sizes or as individual trees. The VR system includes various silviculture and harvesting systems such as individual tree selection, group retention, strip selection, shelterwood and retention systems and requires that over 50% of the harvested area must remain under forest influence from the adjacent stands or retained patches. Forest influence is defined as the area within one tree height of the stand edge or tree. The size and distribution of the retained areas depends on site-specific conditions. An effort is made to retain both unique ecological characteristics as well as representative samples of the existing stand.

It is TimberWest's objective to maintain ecological processes and biodiversity across the landscape by working towards recommended tree spacing in dispersed retention and/or retaining a minimum of ten percent of the gross area harvested in aggregate retention. The Company will endeavour to retain stand structures such as closed and open canopies, multiple layered canopies, snags, coarse woody debris, understory vegetation, large branches, etc. The intent is to emulate natural disturbance patterns in the harvest design.

The Company will maintain minimum retention levels for at least one rotation but retention levels above the minimum may be subject to second pass logging at some time in the future, following green-up. Certain portions of the retained stands will be

kept for longer than one rotation in order to provide the habitat characteristics inherent in large, older trees. The decision to keep stands longer than one rotation will be made at the time future harvests are planned.

Where it is expected that variable retention will facilitate other forest management objectives for visual quality, wildlife values, and water quality, there may be more leave areas retained to reduce impacts on other resources. Where possible, VR will be designed to accommodate harvest constraints such as ESAs, visual quality, wildlife habitat, recreation, riparian concerns, and other planning requirements as necessary.

TimberWest intends to phase in the VR system by the year 2004. The reason for this phase-in period is that operational plans such as forest development plans, cutting permits and silviculture prescriptions require advanced planning. In addition, the layout and harvest crews require training, and harvest systems will need modification through experimentation to deliver the VR systems.

It is important to note that VR is a relatively new forest management system. While TimberWest has prepared its "Variable Retention Rationale and Guidelines", the application of this system will evolve over time as the Company gains experience. Consequently the current guidelines are viewed as a "living" document that is expected to develop further throughout the duration of the management plan. TimberWest expects to continue with the on-going scientific studies that are expected to result in new and better harvest planning models that better meet the need to balance environmental, social, and economic objectives through an adaptive management, or "learning by doing" approach. Application of the VR principles and guidelines will be monitored by the operations. The Company's periodic auditing functions will be expanded to include the variable retention system and its implementation. VR is expected to become one of several methods of meeting these objectives on certain sites. TimberWest is working continuously with the Weyerhaeuser Company to

evaluate VR programs and adapt to new information as it becomes available.

4.1.3 Harvest Methods

Harvest methods will include ground based, conventional cable, and aerial harvesting systems. During the period of MP 3, timber was harvested according to the following methods: ground-based – 23.4%, 52.4% cable and aerial systems – 24.2%. Cut blocks will be designed and managed to minimize blowdown. TimberWest expects that the impact of VR harvesting on the distribution of harvesting systems and road requirements on TFL 46 will be negligible.

4.1.4 20 year Harvesting Plan

The plan has been prepared in compliance with the FPC and the TFL licence agreement. The plan demonstrates that the “base case” of the timber supply analysis represents a realistic harvest scenario that can be spatially accommodated on the total harvestable land base of TFL 46.

4.1.5 Proposed Rate of Harvest

Refer to the Timber Supply Analysis Report for the proposed rate of harvest.

The proposed rate of harvest focuses on both old growth and second growth timber. The Company intends on harvesting second growth timber at first entry harvest ages. For purposes of the timber supply analysis first entry harvest age is defined as the age at which a stand reaches a minimum quadratic mean diameter at breast height of 30 cm and a minimum volume of 300 m³ per hectare. This rotation age approximates a financial rotation.

4.2 Protection and Conservation of Non-Timber Resources

4.2.1 Visual Landscape Quality

TimberWest will utilize the new visual landscape inventory and associated management objectives and the district manager's guidance regarding known scenic areas as the basis for planning and management decisions in scenic areas.

By applying accepted visual landscape design planning in known scenic areas, TimberWest will minimize the impact of proposed forest management and harvesting operations on visual resources.

4.2.2 Biodiversity

Biological diversity or biodiversity refers to the diversity of life in all its forms and levels of organization including genes, species and ecosystems, as well as the evolutionary and functional processes that link them. Biodiversity plans are currently in a state of transition. The forest ecosystem networks (FEN's), which are currently grand-parented under the FPC, will cease to exist after June 15th, 2003. At that time landscape unit planning is scheduled to be completed and provide measures to replace FENs.

4.2.2.1 Forest Ecosystem Networks

A system of FEN's has been established for TFL 46 according to the "Guidelines to Maintain Biological Diversity in TFL 44 and 46". These FEN's were delineated at a landscape level for the purpose of maintaining biodiversity within the TFL.

With the exception of linkage areas, FEN's have been delineated to incorporate the most constrained areas identified at a landscape level within the TFL. FEN boundaries have traditionally not been fixed and are modified to reflect the refinement of

constrained areas as better information becomes available at a stand level through assessments and field layout. To ensure that the values protected within FEN's are not compromised and that adjustments to FEN boundaries are recorded, a FEN amendment referral process has been established between the Company, MoF and the MWLAP.

Salvage operations or harvesting operations required to obtain minor volumes of timber for culvert/bridge construction/reconstruction and helipad construction/maintenance have not been allowed to occur in FEN's without written approval from the District Manager. Any of these proposed operations within the FEN's will be referred to the MWLAP for review and comment prior to or concurrent with submission of the application to the District Manager for approval. Proposed operations within FENs will be limited to the selective harvest of trees and shall not create patch cuts or clear-cuts.

4.2.2.2 Landscape Unit Planning

The Company will participate in Landscape Unit Planning following the principles and practices described in the Landscape Unit Planning Guide. TFL 46 is situated within ten landscape units that have been assigned either a low or intermediate biodiversity emphasis option (BEO). BEO's are a key part of biodiversity management that reflect the relative priority allocated to biodiversity conservation and timber production in a landscape unit. The current priority within each landscape unit is the development of objectives for old growth and wildlife tree retention.

4.2.2.3 Coarse Woody Debris

TimberWest recognizes that coarse woody debris (CWD) is an essential part of ecosystem function. It can be a key component of habitat or food supply for a wide variety of forest species, including black bears, pileated woodpeckers, small mammals, salamanders, and numerous forms of invertebrates. Guidelines that have attempted to

quantify targets for CWD have been unsuccessful to date. Regardless, TimberWest will continue to investigate ways to maintain adequate levels of CWD distributed throughout cutblocks on TFL 46.

4.2.2.4 Variable Retention

Although VR is primarily a stand-level tool for biodiversity, it also provides a mechanism for reducing the impact of landscape-level fragmentation. VR compliments wildlife tree retention and old growth management areas (OGMA's) objectives under landscape unit planning by providing linkages currently not identified as a priority biodiversity element.

4.2.3 Environmentally Sensitive Areas (ESAs)

The primary function of ESA mapping is to serve as a "red flag" system for identifying potential non-timber resource concerns or conflicts in the harvest planning process and its use, in part, for determining the allowable annual cut for TFL 46. In development situations where more detailed information is required, stand level assessments will be completed. ESA mapping is based, in large part, on the interpretation of map and air photo information.

Detailed Terrain Stability Mapping will replace the ESA layer for soils (Es) once it is completed. The inventory of mapped wildlife areas (ie. the grandparented ungulate winter ranges) has replaced the Ew mapping. TimberWest does not intend to replace the ESA mapping for regeneration (Ep) or avalanche areas (Ea).

4.2.4 Watershed Management

The two community watersheds designated under the FPC within TFL 46 are identified in Table 2 below:

Table 2. Community Watersheds in TFL 46

Status	Watershed Number	Source	Licence
Designated	920.061	Shawnigan Creek	Mill Bay Water Works District
Designated	930.013	Malachan Creek	Ditidaht First Nations

In addition to the two community watersheds, other watersheds have been identified as requiring further study. TimberWest has received direction from the DM to conduct watershed assessment procedures (WAPs) on the following watersheds within TFL 46:

- Gordon River – WAP was completed in October, 1998 and an update directed for February, 2001.
- Hatton Creek – WAP is currently in progress.
- Harris Creek – WAP was directed on February 6, 2001.
- Hemmingsen Creek – WAP was directed on February 6, 2001.
- TimberWest was granted an exemption from completing a WAP within the Shawnigan Community Watershed in December, 1999.

Although the Malachan Community Watershed is technically within TFL 46, the area is less than 2 hectares. No activities are proposed within this watershed under the authority of the TFL 46 forest development plan.

WAPs were designed as a method of evaluating the overall condition of watersheds for cumulative impacts associated with harvest activities. Level 1 WAPs have been completed for both the Gordon River and Hatton Creek watersheds. Specific

recommendations were set forth in the final WAP reports for both watersheds. These recommendations are being incorporated into subsequent operational planning as follows:

Gordon River WAP:

- Equivalent clearcut area (ECA) limits as recommended in the WAP report for each sub-basin, sensitive catchment area, and for collective sub-basins within the watershed are not exceeded in subsequent FDP proposals.
- TimberWest has continued to work closely with MoF, MWLAP and the Watershed Restoration Program (WRP) to clarify responsibility and protocol for mass wasting treatment to ensure prompt mitigation measures are undertaken.
- Areas where erosion and instability persists are being monitored and mitigation treatments developed and proposed.
- Active and seasonally deactivated roads are maintained, thereby decoupling sediment sources from downstream values.
- An orderly program of treating identified sediment sources within the watershed is being undertaken.
- Pre-harvest and post-harvest evaluation of sensitive terrain to identify mitigation opportunities continues.

Hatton Creek Watershed:

- Terrain Stability Field Assessments continue to be conducted for all harvest and road construction proposals within the watershed.
- A program of road deactivation and re-vegetation in areas of identified sediment sources continues.
- ECA levels have been limited to 33% of the watershed within TFL 46.

4.2.5 Recreation Resources

Recreation resource management on TFL 46 considers both diversity and abundance of recreational features available on the tree farm licence and the proximity of large population centres on Vancouver Island. Even though the new recreation inventories have not been incorporated into the timber supply analysis, they will be applied to operational plans during MP4.

TimberWest will manage the existing recreation sites and trails in co-operation and partnership with the MoF and develop new recreational opportunities according to public demand and availability of funding.

4.2.6 Cultural Heritage Resources

First Nations bands that assert an interest in TFL 46 include the Pacheedaht Band, the Ditidaht Band, and several bands associated with the Hul'Quim'num and Te'mexw Treaty Associations. The Company is committed to the following measures to identify and manage cultural heritage resources:

- The Company will meet with First Nations' to discuss forest development plans. Input provided will be considered in the final submission of the plan,
- TimberWest will continue to meet and conduct field reviews with First Nations' representatives in order to identify areas of value to First Nations,
- Retain qualified archaeological consultants where necessary to locate areas of archaeological significance. If such areas are found, First Nations will be consulted and field reviews undertaken,
- TimberWest will continue active efforts to communicate and develop good working relationships with First Nations peoples.

4.2.7 Fish and Wildlife Habitat

4.2.7.1 Fish Habitat

The Company will operate in a manner that will conserve the productive capacity of fish streams by following the FPC and utilizing the expertise of Company field engineering and Integrated Resource Analysis Section (IRAS) staff. Riparian management areas will be determined at the cut block level of planning.

The Company will co-operate with fisheries agencies where opportunities exist to enhance habitat. TimberWest will continue to participate in the San Juan Agreements, which focus on fisheries enhancement projects in the San Juan watershed.

4.2.7.2 Wildlife Habitat

TimberWest will manage wildlife habitat on TFL 46 according to the FPC. At the landscape level, this includes the currently grandparented FENs and ungulate winter ranges (UWRs). It is expected that OGMAs or wildlife habitat areas (WHAs) will replace or augment these reserves during the management plan period.

At the stand level, snags, live trees and wildlife tree patches (WTPs) will be identified and left following harvesting. Bear dens are described and inventoried during forestry and engineering field reconnaissance. Protection of dens is considered in cut block planning. Coarse woody debris may have habitat value and therefore be prescribed in the S.P.

The Company has carried out Marbled Murrelet (MAMU) inventories in the Walbran Creek, Gordon River, Nitinat River, San Juan River and Braden River drainages. These areas are monitored on a regular basis for bird counts, distribution and flight patterns. Recently TimberWest has worked voluntarily with the MoELP to develop management strategies that include temporary area deferrals for MAMU.

TimberWest has also worked cooperatively with government agencies to develop temporary nesting and foraging areas for the northern goshawk.

4.3 Integrating Harvesting and Non-Timber Activities

The Company considers the identification and integration of non-timber resources to be important aspects of TFL management. The development and protection of these resources is facilitated through the development plan process in which the Company takes a lead role in obtaining stakeholder input and incorporating public and agency concerns.

4.3.1 Consultation

The Company maintains a group of experts in various resource disciplines such as forest hydrology, biology and pedology at its IRAS office located at Crofton, B.C. Qualified consultants are also brought in as needed. Activities include collection and interpretation of field data to meet the requirements of the licence and the needs of Company operating people. They also liaise between the company and government agencies, at the request of company operations to find practical solutions to problems or to identify required studies.

4.3.2 Recreation

A new recreation analysis was prepared in 1999 to provide an assessment of recreation and landscape resources including current and future supply and demand for recreation opportunities. The analysis compares the supply of recreation opportunities such as features, activities and settings with existing use and demand for public/commercial recreation. TimberWest will utilize the new recreation inventory as the basis for planning and management decisions in those areas that have been

identified with a high-very high feature significance and high sensitivity to resource development.

Different recreational activities are considered in operational plans. For example, recreational fishing opportunities have been identified for the Gordon, San Juan, Caycuse and Harris/Hemmingsen River systems. A local spelunker (caver) is employed to review proposed cutblocks in Karst areas. Where caves are found, a management strategy is developed and included in the SP.

Road maps showing the location of roads on TFL 46 are available at TimberWest offices located in Honeymoon Bay and Crofton.

During MP 3 TimberWest built a recreational trail to the Harris Creek spruce site. The Company also re-established and maintained the trail around Lizard Lake. Currently the MoF operates three forestry campsites on TFL 46 throughout the camping season. FRBC funds most of the operating costs for these campsites with some costs offset with revenue from camp user fees. TimberWest contributes some maintenance that requires special equipment or skills such as welding or falling. In the fall, TimberWest winterises the campsites. Additional trail construction and maintenance is subject to funding by FRBC or user fees.

4.3.3 Visual Landscape

A new visual landscape inventory has also been completed in 1999. TimberWest prepares visual impact assessments in known scenic areas and incorporates recommendations from resource agencies in operational plans.

4.3.4 Public Access to TFL Lands

The Company will allow public access to "non-operational" areas of the TFL unless

safety, fire hazard or environmental conditions dictate otherwise. Gates will be used as approved by the MoF where criminal activity or unsafe conditions are prevalent. The Company recognizes the public right to access areas within TFL 46 that are suitable for outdoor recreation.

The Company will maintain directional road signs on operational roads within TFL 46 as an aid to access.

4.3.5 Traplines

Known registered trappers and guides who operate within the TFL will be advised of harvest plans through the FDP review process.

4.3.6 Cultural and Historic Values

Historical sites, which are discovered on TFL 46 during planning or development of the TFL that may have cultural or archaeological significance, will be managed in accordance with the *Heritage Conservation Act*. First Nations will also be notified.

4.3.7 Aboriginal Rights

On December 11, 1997 the Supreme Court of Canada in *Delgamuukw v. British Columbia* ruled that aboriginal rights on Crown land were not extinguished. As a result, resource management decisions must now be examined to determine if they will infringe on aboriginal rights. TimberWest will cooperate with the MoF in meeting government's obligation to consult with First Nations.

4.4 Forest Fire Protection and Health

4.4.1 Forest Fire Protection

Fire protection programs will be undertaken to minimize the risk of fire during operations, to minimize the impact of fires if they occur and to minimize the difficulties that are inherent in the control of fires. The programs will be structured to comply with Part 5 of the FPC.

Prevention

Fuel loading will be reduced through good utilization of the forest resource. Good utilization reduces the risk of forest fires by limiting fuel loading. Hazard reduction by burning or alternate means may be carried out.

Preparedness

A Fire Preparedness and Protection Plan outlining the company commitment to fire prevention, detection and suppression will be submitted annually. A duty roster identifying company personnel who can be contacted in an emergency will be prepared and submitted annually to the MoF.

Weather stations will be established in locations that are representative of the various operational areas and will collect information used to determine fire weather indices.

Suppression

The Company will take immediate, initial action on all forest fires detected by the Company on or adjacent to TFL 46 in an attempt to control fires as quickly as possible and preferably before 10 A.M. of the day following discovery. All fires will be reported to the MoF immediately upon detection. Prior to extensive suppression efforts, MoF and the Company will determine responsibilities and roles associated with extinguishing fires.

4.4.2 Forest Health

Historically, insect and disease infestations have had a relatively minor impact on TFL 46. TimberWest's forest health strategy has been and will continue to be focused on detecting epidemic-scale infestations early and taking decisive action to minimize timber losses and impacts to non-timber resources. Operational plans will identify and prescribe forest health management strategies when necessary.

Detection is possible only where symptoms are visible – usually from the air. As company personnel fly over TFL 46 regularly, they are able to spot outbreaks readily if they occur.

If epidemic pest activity is identified and is causing significant reductions in growth or mortality within stands, provided they are economically accessible, the Company will prioritise harvesting in order to eradicate the pests and recover the maximum volume and quality from the timber.

The Company will rely on a passive management strategy for treatment of endemic infestations on TFL 46. The most common endemic pest is root rot. Treatments in silviculture prescriptions are site specific, but usually prescribe planting of alternative species such as western red cedar, and, occasionally western white pine. On sites where root rot concentrations are high, soils are trafficable, and alternative species are not suitable, TimberWest may choose to remove stumps to limit the spread into newly established stands.

Another endemic pest common on TFL 46 is dwarf mistletoe. However mistletoe management is not a major problem. TimberWest will not target variable retention regimes in areas heavily infected by dwarf mistletoe.

Forest stands damaged by other common pests (ie. Sitka Spruce weevil and the

Balsam Woolly aphid) are not significant. Ambrosia beetles are trapped at Honeymoon Bay dry land sorts to reduce damage to logs and to prevent the spread of the beetles into adjacent stands of timber.

4.5 Silviculture

Silviculture is defined as the art and science of controlling the establishment, growth, composition, health and quality of forests.

The emphasis of TimberWest's silviculture program is to maximize volume on stems 20 to 50 cm in diameter of good form (e.g., straight boles with minimal taper and small branches). This can be achieved by ensuring excellence in basic forestry practices such as rapid reforestation using a suitable number of seedlings, of the most suitable tree species, of the best genetic stock and through careful attention to stand tending, including brushing and weeding.

4.5.1 Silviculture Planning

4.5.1.1 Silviculture Prescriptions

Silviculture Prescriptions (SP) describe the ecology of the site and facilitate the planning and management of forest lands to ensure the forest resources are adequately managed and conserved. The Company will obtain District Manager approval of a silviculture prescription before timber is cut under a cutting permit or as otherwise provided for in the *Forest Act*.

4.5.1.2 Stand Management Prescriptions

A stand management prescription describes the treatments to be carried out on a free growing stand to maintain or enhance stand productivity or to produce a stand to meet stated management objectives to accommodate other resource values. A stand

management prescription will be prepared and District Manager approval obtained prior to carrying out treatments such as pruning, spacing and fertilization.

4.5.2 Basic Silviculture

Basic silviculture is focused on insuring that all harvested areas are restocked and reach a "free-growing" state within a time period specified in the SP. The program will include a combination of activities necessary for the establishment and maintenance of a new forest following harvesting and/or other disturbances. Basic silviculture is part of the Company's legal obligation under the SP, and is undertaken at the Company's expense on lands that were harvested after October 1, 1987. The program will be carried out in accordance with relevant legislation.

4.5.2.1 Stand Establishment

The objective of the basic silviculture program is to attain free growing status within the time frame specified for the appropriate biogeoclimatic variant and site unit as defined in the approved SP. Where planting is required, stocking densities will consider target stocking standards by planting a sufficient number of high quality seedlings and allowing for historical rates of natural regeneration.

4.5.2.2 Reforestation Methods

All areas will be reassessed following harvesting to confirm the reforestation treatments as prescribed in the SP. Subject to the approval of the MoF, minor amendments may be made to the SP.

High quality seedlings will be grown for use by TimberWest and transported quickly to the planting site to maintain physiological vigour. On-site supervision will ensure that seedlings will be planted to obtain high survival rates and rapid early growth.

Currently, about 95% of reforested areas are planted and the balance utilizes natural regeneration. The major species planted have been Douglas fir, western red cedar, western hemlock, amabilis fir, grand fir and yellow cedar and Sitka spruce, mountain hemlock, alder and noble fir. Generally, planting occurs within one to two years following harvesting.

Rapid reforestation also assists in meeting green-up requirements to meet visual quality, hydrologic recovery and wildlife cover objectives.

Planting will be carried out as necessary to meet stocking requirements or to favour rapid early growth so that vegetation management treatments are minimized and free-growing status is achieved in advance of the latest time frame for Free Growing Assessment. The planting history on TFL 46 is presented in Table 3.

Table 3. History of Planting*

Year	Hectares	No. of Trees "000"	Year	Hectares	No. of Trees "000"
1955	368	358	1978	1,210	723
1956	300	250	1979	931	656
1957	492	470	1980	918	711
1958	655	685	1981	1,246	868
1959	579	530	1982	906	724
1960	518	343	1983	613	462
1961	1,029	712	1984	911	677
1962	1,268	916	1985	965	628
1963	1,003	762	1986	344	323
1964	1,134	954	1987	955	575
1965	1,499	1,238	1988	721	525
1966	1,727	1,364	1989	1,519	904
1967	1,731	1,185	1990	229	132
1968	1,294	980	1991	1,232	586
1969	1,175	909	1992	225	117
1970	1,279	1,143	1993	1,351	690
1971	1,144	1,010	1994	632	363
1972	881	758	1995	1,080	729
1973	1,216	1,071	1996	1019	747
1974	1,289	915	1997	768	735

Year	Hectares	No. of Trees "000"	Year	Hectares	No. of Trees "000"
1975	879	629	1998	365	353
1976	1,225	893	1999	288	263
1977	1,189	873			
			TOTAL	39,867	29,341

* Adjusted to reflect current TFL boundaries.

4.5.2.3 Seed Collection

TimberWest is committed to maintaining an adequate supply of seed to meet reforestation needs. Natural stand collections will be undertaken when seed orchard seed is not available.

4.5.2.4 Site Preparation

Site preparation will be carried out as necessary to facilitate reforestation and may involve a combination of prescribed burning or mechanical or chemical site preparation techniques.

During recent years, the number of hectares that have been broadcast burned has declined considerably due primarily to public concerns over air quality. During the period 1976-1980, an average of 700 hectares were burned each year, from 1981-1985 - 440 hectares each year, and from 1986-1990 – a total of 262 hectares were burned. TimberWest has not broadcast burned in over ten years but still considers this an effective site preparation technique under the appropriate circumstances.

During the MP 3 period, chemicals were not used for site preparation but instead

mechanical treatments were preferred. To create suitable areas free of impediments to reforestation, roadside accumulations were typically either piled or dispersed, depending whether logging slash was thought to hamper planting operations. This became the preferred treatment for logging slash during MP 3.

4.5.2.5 Stocking and Free Growing Surveys

Stocking and free growing surveys will be carried out as per the FPC and associated regulations using survey methods accepted by the MoF.

4.5.2.6 Vegetation Management

Control of brush species may be required to maintain healthy, coniferous crops. Where necessary, vegetation management will be carried out and will be accomplished by mechanical means or by chemical applications. Chemical treatment procedures will follow the regulations of the FPC and the Pesticide Control Act and may include foliar spraying, dormant spraying, "hack-and-squirt" and injection techniques. Chemical applications will be applied by or under the direct supervision of a Certified Pesticide Applicator according to the terms of approved pesticide permit. Mechanical treatment has typically been performed using powersaws. Over the period of MP 4, TimberWest expects a modest increase in treatment area in order to control maple coppice and very dense thickets of alder arising from mechanical harvesting of second growth stands.

4.5.2.7. Conifer Release

The basic silvicultural program should prevent the suppression of potential crop-trees by competing vegetation. However, if situations develop whereby crop-tree growth and survival is significantly threatened by competition, action will be taken to release the crop-trees by manual, mechanical, and/or chemical methods. Experienced staff will determine treatment needs after having considered environmental and worker protection, probability of treatment success, and expected benefits.

4.5.3 Incremental Silviculture

Incremental silviculture is applied to free growing stands to increase the yields of merchantable volume and/or wood quality, to reduce the time to future harvest, to increase wildlife capability or in the case of spacing, to increase employment in high unemployment areas. On crown lands, incremental silviculture will continue provided external funding is available. A number of incremental silviculture activities, including juvenile spacing, fertilization, tree improvement, and pruning will be considered. Market research however suggests that differentiating forest products and not the forest resource achieve the greatest value. This means that incremental silvicultural activities must be conducted judiciously. A brief description of each treatment and the reason(s) for application are provided below. Table 4 provides a summary of incremental silvicultural activities undertaken on TFL 46.

4.5.3.1 Juvenile Spacing

Juvenile spacing is applied to stands that can most benefit from stocking control or a tree species shift. Spacing is also a tool to enhance spring forage adjacent to designated deer winter ranges. A stand management prescription will be prepared and District Manager approval obtained before a treatment is carried out on a free-growing stand.

TimberWest will determine the need for juvenile spacing and other prescribed stand level management treatments to maintain or improve growth, on the basis of target forest conditions identified to fulfil market-driven product objectives. Research trials have shown that investments made on juvenile spacing provide a poor return and that densely stocked stands, on most coastal sites, differentiate in height and diameter adequately without treatment. However, if government funding is provided for employment and community stability purposes, TimberWest will consider undertaking

spacing projects provided that such treatments do not adversely affect the future physical quality of treated stands.

Under FRBC funding, juvenile spacing has also enhanced forage production in stands adjacent to UWRs and promotes old growth characteristics of younger stands in riparian reserve zones of S1 and S2 creeks.

4.5.3.2 Fertilization

The Company will consider aerial fertilization of suitable Douglas-fir leading stands having a site index of 25 meters or better at age 50 years. Application will be planned 5 to 15 years before harvest. Fertilization will be considered to accelerate green-up and hydrologic recovery. The Company will co-operate with the MoF to encourage provincial funding of fertilization of Crown lands within TFL lands.

Where the fisheries resource is of concern, MWLAP and the federal Department of Fisheries and Oceans will be consulted.

Table 4. History of Main Incremental Silviculture Activities*

- TFL 46

	Juvenile Spacing	Fertilization		Juvenile Spacing	Fertilization
Year	Ha. Completed	Ha. Completed	Year	Ha. Completed	Ha. Completed
1968	83	0	1984	200	0
1969	180	0	1985	569	0
1970	183	0	1986	628	0

	Juvenile Spacing	Fertilization		Juvenile Spacing	Fertilization
1971	192	0	1987	855	0
1972	210	0	1988	542	0
1973	588	0	1989	66	0
1984	597	0	1990	109	0
1975	512	233	1991	30	0
1976	1,914	255	1992	260	0
1977	2,703	404	1993	640	0
1978	2,587	764	1994	440	0
1979	1,827	986	1995	0	0
1980	1,870	2,021	1996	15.6	211.0
1981	2,038	2,362	1997	51.0	103.7
1982	910	3,885	1998	7.5	18.1
1983	1,315	0	1999	108.6	27.1
			TOTAL	22,230.7	11,269.9

*Adjusted to reflect current TFL boundaries.

4.5.3.3 Tree Improvement

Improved seed from controlled pollination of selected superior seed orchard trees will result in gains in both timber volume and wood quality. Where available, improved seed will be used on harvested areas.

The Company is a participant in the Coastal Tree Improvement Council, and has

established 10 Maritime seed orchards at its Mt. Newton site in Saanich to provide improved seed for company reforestation programs. A detailed listing of the tree species producing seed is provided in Table 5.

Mount Newton Seed Orchards currently produce seed at or near operational target levels for low elevation Coastal Douglas-fir, low to mid elevation Western Hemlock and low elevation Western Red Cedar sites within the coastal Maritime seed planning zone. Limited quantities of coastal Maritime Amabilis Fir and Yellow Cedar seed have also been produced. Yellow Cedar cuttings will supplement seedling production by providing vegetative cuttings for coastal Maritime sites.

Table 5. Mt. Newton Seed Orchard

Orchard		Species	Orchard Stage	Gen Stage	Seed Planning Zones	Elevation Range (m)	Latitude Range (deg min)
No.	Name						
129	<i>Mt. Newton</i>	<i>Ba</i>	<i>Est</i>	1.00	<i>M</i>	300-700	48.00-51.54
130	<i>Mt. Newton</i>	<i>Hw</i>	<i>Prod</i>	1.00	<i>M</i>	300-900	48.00-51.45
134	<i>Mt. Newton</i>	<i>Fdc</i>	<i>Prod</i>	1.00	<i>M</i>	0-700	48.00-51.00
138	<i>Mt. Newton</i>	<i>Yc</i>	<i>Est</i>	1.00	<i>M</i>	425-1225	48.00-52.30
140	<i>Mt. Newton</i>	<i>Cw</i>	<i>Prod</i>	1.00	<i>M</i>	0-625	48.00-52.30
152	<i>Mt. Newton</i>	<i>Cw</i>	<i>Prod</i>	1.00	<i>M</i>	0-600	48.00-

Orchard							
							52.30
154	<i>Mt. Newton</i>	<i>Fdc</i>	<i>Prod</i>	2.00	<i>M</i>	0-700	48.00- 51.00
403	<i>Mt. Newton</i>	<i>Pw</i>	<i>Est</i>	1.00	<i>M</i>
...*	<i>Mt. Newton</i>	<i>Yc</i>	<i>Prod</i>	1.00	<i>M</i>
...*	<i>Mt. Newton</i>	<i>Ax</i>	<i>Prod</i>	1.00	<i>M</i>

*Cutting Orchards

4.5.3.4 Pruning

Pruning projects will be undertaken to manage white pine blister rust where necessary, although pruning of white pine (*P. monticola*) has been negligible as most of these sites support western red cedar as an alternative species. Pruning is also used to achieve wildlife habitat objectives by creating spring forage habitats adjacent to UWRs when specified in a stand management prescription. Pruning is part of the strategy to provide continuous spring forage around the UWRs of TFL 46.

4.6 Roads

All future roads and bridges will be constructed, maintained, and deactivated in accordance with the FPC. Road location and construction will be planned to maintain natural drainage patterns of all continuous and seasonal streams and to control surface "run-off" during periods of high rainfall. Road construction and maintenance activities during wet periods will be carried out with due care to minimize the impact on water quality. These activities will cease when the following conditions develop:

- Soils are visibly soft or muddy and associated silty waters or sediment are flowing towards fish streams,
- Water is moving fine-textured soils towards fish streams,
- Visible siltation is being carried beyond the clearing width towards fish streams,
- Rilling is occurring on exposed soils and will carry sedimentation towards fish streams, or
- In areas of slope instability where during a 24 hour period in excess of 100 mm of rainfall occurs.

The area of occupancy of permanent and temporary access structures will be minimized and temporary access structures will be rehabilitated as specified in the silvicultural prescriptions.

An updated inventory and schedule of road maintenance and road deactivation will be included in the forest development plan as required by the FPC.

The Company's IRAS or qualified consultants will provide hydrologic, soils and terrain stability expertise on road construction activities that have the potential to adversely affect other resources.

The Company will carry out road deactivation and stream rehabilitation projects on current operating areas during the course of operations and on historic operations in accordance with FRBC approved projects.

Inter-company cooperation with regard to periodic use of roads have been actively encouraged and the company will continue to enter into formal road use agreements with forestry, mining, and other industrial users. The agreements will contain general terms and conditions, rights, privileges and a fee schedule for maintenance activities.

5.0 CONSULTATION WITH OTHER RESOURCE USERS

Other resource users and stakeholders are afforded opportunity to participate in the planning process for TFL 46 through public reviews of the draft Forest Development Plan and the Draft Management Plan. Letters of upcoming public reviews advises known resource users and stakeholders and advertisements are placed in local newspapers to notify the general public. A list of known resource users and stakeholders is maintained in the text of the Forest Development Plan and revised as warranted. It includes government agency contacts, First Nations, environmental organizations, mining and mineral licence holders, trappers, local and regional governments, etc. Where activities are to be conducted directly adjacent to private property holdings, efforts will be made to make prior contact to advise owners of such activities on the TFL.

6.0 MANAGEMENT PLAN COMPARISONS

This section summarizes some of the similarities and differences between MP 3 and MP 4. It is presented in three parts, including harvest levels, conservation of non-timber values, and planning.

6.1 Harvest Levels

In 1992, the initial allowable annual cut (AAC) was 558,860 m³/yr. It was subsequently reduced to 535,000 m³/yr in 1997, to 514,804 m³/yr in 1998, and finally to 462,544 m³/yr in 1999.

Refer to the MP 4 Timber Supply Analysis Report for TimberWest's recommended harvest level.

The major changes between the two management plans are:

1. a decrease in timber supply from MP 3 to MP 4 due to land deletions from TFL 46, which is ultimately reflected in the decrease in the timber harvesting land based described in Table 6 below.

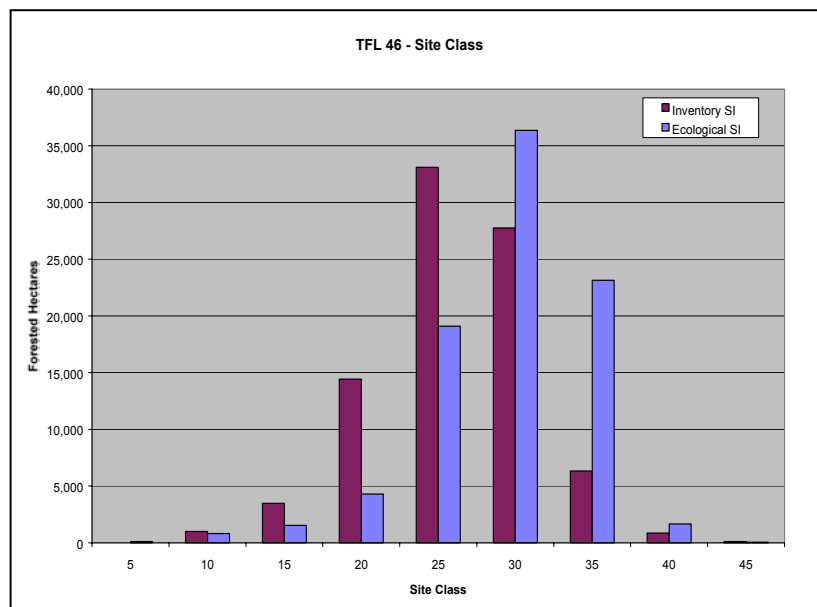
Table 6. Comparison of THLB Area.

	MP 3	MP 4	Difference
Total Area (ha)	99,130	90,870	8,260
Productive Forest Area (ha)	88,792	80,545	8,247
THLB (ha)	67,667	63,777	3,890

2. A decrease in timber supply created by the MoF Small Business Forest Enterprise Program take-back.

3. Revised estimates of ecologically-based site index for timber stands established in 1955 and later. The revised estimates of site index are compared to the inventory site index in Figure 3. This change partially offsets the decrease in timber supply due to the private land deletions and the small business program take-back.

Figure 3. TFL 46 Site Index Class Distribution Comparing Inventory to Ecologically-based Indexes



4. Reduced impacts from visual landscape management due to the provincial government's visual buy-back initiative reflected in the new visual landscape inventory and a relaxation of constraints due to changes in cutblock design.
5. TimberWest will complete its transition from clearcutting to a new forest management system called Variable Retention (VR) during the period of MP 4. VR will be applied in two ways, dispersed and aggregate VR. The estimated reduction to future yields is 5.6%, applied to 33% of the land base, with harvest projections under a dispersed VR regime. TimberWest assumes that aggregate VR will not have any impact on future yields.

6.2 *First Nations Relationships*

TimberWest has been developing relationships with First Nations over the course of MP 3 and this initiative is expected to continue during MP 4. The objective of this relationship is to provide a means for First Nations' to build capacity and take a more prominent role in the provincial economy. Initiatives such as business joint ventures are being explored.

6.3 *Conservation of Non-timber Values*

By June 15, 2003, the provincial government has scheduled to replace FENs with landscape unit planning. Landscape unit objectives for the priority biodiversity elements of old growth management areas and wildlife tree retention will be defined and in place on TFL 46. FENs will in turn either become part of the timber harvesting land base and contribute to increased harvesting levels or be used to satisfy landscape unit planning objectives for biodiversity representation.

During MP #3, TimberWest obtained ISO 14001 Certification and throughout MP 4, the

Company is committed to maintaining this certification and the standards established by this process.

6.4 Planning

The preparation of MP 4 has benefited from a new, more streamlined schedule that eliminated the Statement of Management Options, Objectives, and Procedures (SMOOP), and is set to a 20-month rather than a 28-month time period.

TimberWest has also been aided by developments in computer technology. During the course of MP 3 all map folios have been presented in digital form, thereby allowing for user-defined scales, and reducing production and replication costs while producing a more useful product. The Proposed Management Plan has been distributed in digital form also, thereby reducing production and distribution costs.

7.0 PRORATE OF SCHEDULE B LANDS

Table 7 below describes the pro-rate of Schedule B lands on TFL 46. Crown granted lands and timber licences (TLs) within a tree farm license are designated Schedule A lands while the remaining Crown lands are described as Schedule B lands. The prorate is 0.83.

Table 7. Prorate of Schedule B Lands on TFL 46.

		Area (ha)
Total Productive Operable Forest Area		77,659.264 (A)
Total Operable Fee Simple Lands	2,188.960	
Total Operable TL Lands	10,974.537	
Less Total Operable Schedule A Lands		13,163.497
Total Operable Schedule B Lands		64,495.766 (B)
Schedule B Prorate (B/A)		0.830