MacMILLAN BLOEDEL LIMITED

1998 ANNUAL REPORT

ALBERNI TREE FARM LICENCE

No. 44

AUGUST 1999

DISTRIBUTION LIST

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District Manager, South Island Forest District

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STATEMENT OF AUTHORSHIP

Duane W. Partee, RPF (Ret), prepared this TFL 44 Annual Report under the direction of P.J. Kofoed, RPF, Planning Forester for MacMillan Bloedel Limited.

The staff from the following Woodlands Divisions/Operations supplied information for this report: Franklin and Sproat Operations (West Island Woodlands), Clayoquot Operation, and Nanaimo Woodlands.

P.J. Kofoed, RPF
Planning Forester

MacMillan Bloedel Limited
Solid Wood Group

APPENDICES

Appendix I

Appendix II

1.0 SUMMARY

1998 was the first year of Management Plan No. 3 for TFL 44. It was the fourth of the five-year cut control period 1995–1999.

1.1 Organization of Operations

Reorganization of TFL 44 operations occurred in early 1998. Franklin Woodlands became Franklin Operation and given the responsibility for the Alberni East Working Circle, the Ucluelet Working Circle and the contract operations at Great Central Lake and Henderson Lake in the Alberni West Working Circle. The Sproat Lake Operation is responsible for the balance of the Alberni West Working Circle. Both operations are part of West Island Woodlands.

Nanaimo Woodlands administers the activities in the Clayoquot Working Circle of TFL 44.

1.2 General Comments

The continuation of poor markets in Japan, restricted access to the USA market and high costs (including stumpage) contributed to another difficult year.

Strategies initiated in 1997 were continued and expanded to improve safety in the workplace, business success and to become a highly respected forest products company.

- MB has a corporate commitment to become the safest forest company in North America. The indicator selected to measure safety is Medical Incident Rate (MIR)—the number of incidents per 100 workers that require a doctor's medical attention or result in lost work time. The target for 1998, to reduce the 1997 MIR by at least one third, was achieved by MB Woodlands. A further 33% reduction has been targeted for 1999. In December MB announced a new policy on safety, occupational health and the environment.

- MB and the IWA initiated a program of co-designing operations, of involving all employees in improving safety and productivity and reducing costs. The co-design process is occurring at all coastal woodlands operations and sawmills. The process has been successful in improving safety and production efficiencies.

- In December "re-engineering the business" was announced as a top priority for 1999. The goal is to significantly improve performance in quality, productivity, and cost. Co-design is an example of re-engineering at the operations level.

- MB Paper (comprising the paper mills at Port Alberni and Powell River) was sold. MB has a fibre supply agreement with the new company, Pacifica Papers.

- In June of 1998, MB announced a New Forest Management Strategy (named the Forest Project). Key components include phasing out clearcutting over a five-year period to be replaced by variable retention and an increase in conservation of old-growth forests and wildlife habitat on BC lands managed by the company.

- North Island Woodlands (TFL 39, Block 2 and some private land) initiated a program to apply for ISO (International Organization for Standardization) 14001 and CSA (Canadian Standards Association) Forest Certification in the first half of 1999. This process includes seeking public input (a Public Advisory Group was formed),

expanding environmental management systems and implementing a Sustainable Forest Management System.

The intent is to utilize the experience from the North Island Woodlands exercise in applying for certification in other MB operations. Application for Forest Stewardship Council (FSC) certification has been delayed, pending the development of Regional Standards.

- On November 16, 1998, MB and Ma-Mook Natural Resources (MNR) (owned by the Nuu-chah-nulth Central Region First Nations) signed a Shareholders Agreement setting out their relationship as shareholders of a new company to operate in the Clayoquot Sound area. This new company is called Iisaak Forest Products Ltd., the shares of which are owned 51% by MNR and 49% by MB.

Shutdowns of varying duration for different operations occurred throughout 1998, primarily because of markets, but also due to interruptions in log supply, weather and co-design efforts. The result was reduced harvest levels and lumber production below mill capacities.

The impacts of co-design and restructuring initiatives on reducing costs were noticeable, particularly in the latter part of 1998. In addition, operations began to benefit from reductions in stumpage payments and government implemented changes intended to streamline the Forest Practices Code.

1.3 1998 Highlights

- The Annual Allowable Cut for the fourth year of the current Cut Control Period is 1 800 127 m^3. This excludes the SBFEP allocation of 89 873 m^3. The total amount of timber harvested in 1998, including residue, was 1 190 533 m^3. The volume applied to Cut Control is 1 168 922 m^3 when the Undercut Carry Forward Adjustment (21 611 m^3) is applied. The AAC compliance is then 64.9%.

- Total contractor production was 349 920 m^3, a compliance of 95.9%.

- New road construction totaled 76 km.

- One publicly cause fire resulted in a small spot fire.

- Site preparation was completed on 320 ha.

- A total of 1 712 ha were planted using 1,724,000 trees. Fill planting 326 ha required 198,300 trees. The planting of the 100 millionth seedling was celebrated in October 1998.

- Brushing and Weeding was done on 1 317 ha.

- Stand tending (spacing, fertilization and pruning) was completed on 1 714 ha.

- Public input continued to influence the various plans being developed by MacMillan Bloedel.

2.0 PRODUCTION AND CUT CONTROL

Total TFL 44 production and performance in relation to the AAC is discussed in this section. Individual Working Circle statistics and activities are covered in Section 3.

2.1 Volumes Harvested by MacMillan Bloedel

MacMillan Bloedel harvested volumes (including residue) on private and Crown land within the TFL as follows:

Private	201 540 m^3	17%
Timber Licences	431 966 m^3	36%
Crown	557 027 m^3	47%
Total	1 190 533 m^3	100%

Details of harvested volumes by division, tenure and species are found in Appendix I, Table 1a.

The percentage of log scale by species and Working Circle is as follows:

	Working Circle				
Species	Alberni East	Alberni West	Clayoquot	Ucluelet	All
Douglas-fir	10	36			18
Cedar	30	12	97	56	25
Cypress	1	5	1		3
Spruce					
Hemlock	44	31	1	40	39
Balsam	15	16	1	4	15
Other					
TOTAL	100	100	100	100	100

2.2 Production by Harvest Profile

Details of the harvest profile by operability class and broad harvest method are shown in Appendix 1, Table 1b. These results are based on divisional harvest volume data (excluding residue) and on the inventory classification for operability. In 1998 there were 993 290 m^3 of first growth harvested in the conventional economic class, 5 250 m^3 in the non-conventional economic class, and 11 205 m^3 of marginal economic. A further 64 771 m^3 classified as conventional economic and 998 m^3 of non-conventional economic was harvested from second-growth stands.

Appendix I, Table 1c details harvest volumes by working circle and operability class for the period 1994 to 1998. Table 1d shows these harvest volumes adjusted to correspond (in total) to official cut control numbers.

2.3 Volumes Harvested by SBFEP

The Small Business Forest Enterprise Program continues to harvest timber in TFL 44. The billed volume in 1998 was 77 387 m^3 including residue. Details are found in Appendix I, Table 2. Note that the SBFEP harvest volumes are not required for the cut control calculations relative to MacMillan Bloedel's AAC allocation. The following table shows the

volume harvested over the last five years. Also note that residue may not be billed every year.

YEAR	1994	1995	1996	1997	1998
VOLUME HARVESTED (M^3)	42 036	25 555	121 802	39 740	77 387

2.4 Residue

Residue is measured and reported annually for the TFL. Residue and waste applied to Cut Control is the volume billed through the Stumpage and Royalty system in the reporting year, regardless of the year scaled.

A total of 428 plots were established in 49 openings (992 ha) in 1998 to measure residue and waste for Cut Control purposes. A total of 33 355 m^3 was charged to the AAC in 1998.

2.5 Cutting Balance

This is the fourth year in the 1995–1999 Cut Control period and the production amounted to 64.9% of the AAC.

YEAR	1995	1996	1997	1998	Total
MB AAC (m^3)	2 138 127	2 138 127	2 138 127	1 800 127	8 214 508
Actual Cut (m^3)					
Log Scale	1 983 963	1 643 863	1 312 810	1 157 178	6 097 814
Residue	168 182	118 962	76 598	33 355	397 097
Total Actual Cut (m^3)	2 152 145	1 762 825	1 389 408	1 190 533	6 494 911
Undercut Adj.	(21 612)	(21 612)	(21 612)	(21 611)	(86 447)
Total Cut Control Volume	2 130 533	1 741 213	1 367 796	1 168 922	6 408 464
Percent of AAC	99.6%	81.4%	64.0%	64.9%	78.0%

The Management Plan #3 AAC is partitioned between the Clayoquot Working Circle and the remainder of the TFL. The relatively low harvest (78% of AAC) for the four years (1995–1998) is accentuated by the Clayoquot Sound decision and planning process. If Clayoquot is excluded, (i.e., for TFL 44 less Clayoquot) the four-year harvest is approximately 88% of the AAC.

The following table shows the 1998 harvests in the two areas:

PARTITION	AAC Contribution m^3	Estimated SBFEP Allocation m^3	MB Allocation m^3	Volume Harvested Including Residue m^3
TFL 44 (excluding Clayoquot-economic)	1 720 000	59 980	1 660 020	1 159 319
Marginal Economic(1)	40 000		40 000	11 205
Clayoquot	130 000	29 893	100 107	20 009
Total	1 890 000	89 873	1 800 127	1 190 533

1) The AAC allocation to TFL 44 (excluding Clayoquot) includes 40 000 m^3 allocated to the marginal economic inventory category.

The low harvest in the Clayoquot Working Circle is largely a result of the Clayoquot Sound decision and planning process. Elsewhere harvests were depressed because of poor markets (particularly in Japan) and restricted access to the US market.

2.6 Contractor Production

The percent compliance achieved under the contractor clause regulation was 95.9 percent.

Summary of Contractor Production (m^3)

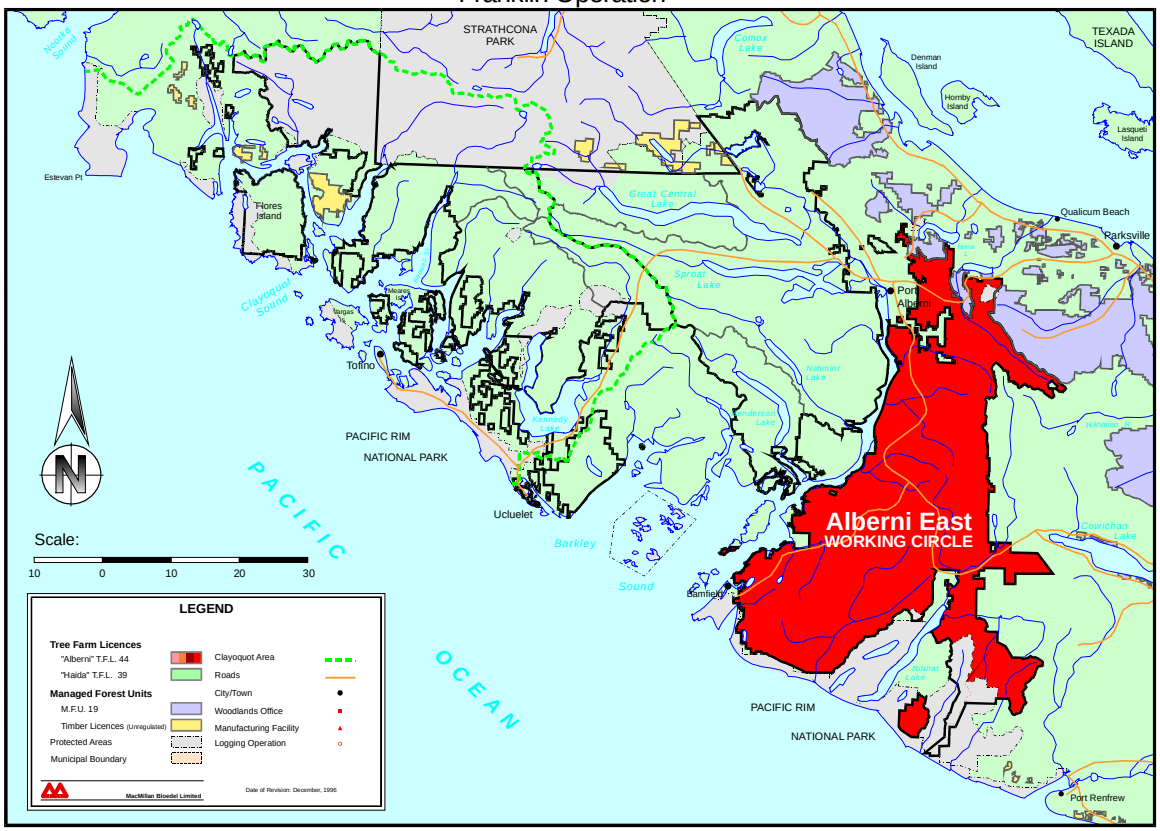
• Full		334 329	96%
• Phase (equivalent volume processed)			
– Roads	10 727		
– F&B	98		
– Yarding	240		
– Loading	2 213		
– Hauling	2 313	15 591	4%
• TOTAL		349 920	100%

3.0 WORKING CIRCLES

This portion of the Annual Report comments on the harvesting activities in each Working Circle.

Alberni East Working Circle

Administered by
Franklin Operation



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3.1 Alberni East Working Circle

The Alberni East Working Circle is located east of the Alberni Canal, from the town of Port Alberni south to the Pacific Ocean. Major drainages include the Cameron, Franklin, Sarita, and Klanawa Rivers and China, Coleman, and Carnation Creeks. It is made up of Blocks I and II of TFL 44 and has 139 500 ha of productive hemlock, balsam, cedar and fir forests. The Franklin Operation of West Island Woodlands administers this Working Circle.

3.1.1 Annual Harvesting

Franklin Operation harvested 796 353 m^3 in 1998. This volume includes 22 702 m^3 of residue or 2.8% of the total volume charged to the cut. In addition to conventional harvesting methods, longline and/or helicopter systems were used to harvest the timber. Possible future methods of harvesting include Variable Retention with dropline carriage on grapple and longline systems.

3.1.2 Engineering Development

The Gorge 300 mainline was extended in 1998. There were no major construction projects, such as bridges, during the year.

3.1.3 Development Plans

The approved Five-Year Development Plan for 1998 will be extended into 1999.

3.1.4 Cutting Permits

The following Cutting Permits were active in 1998:

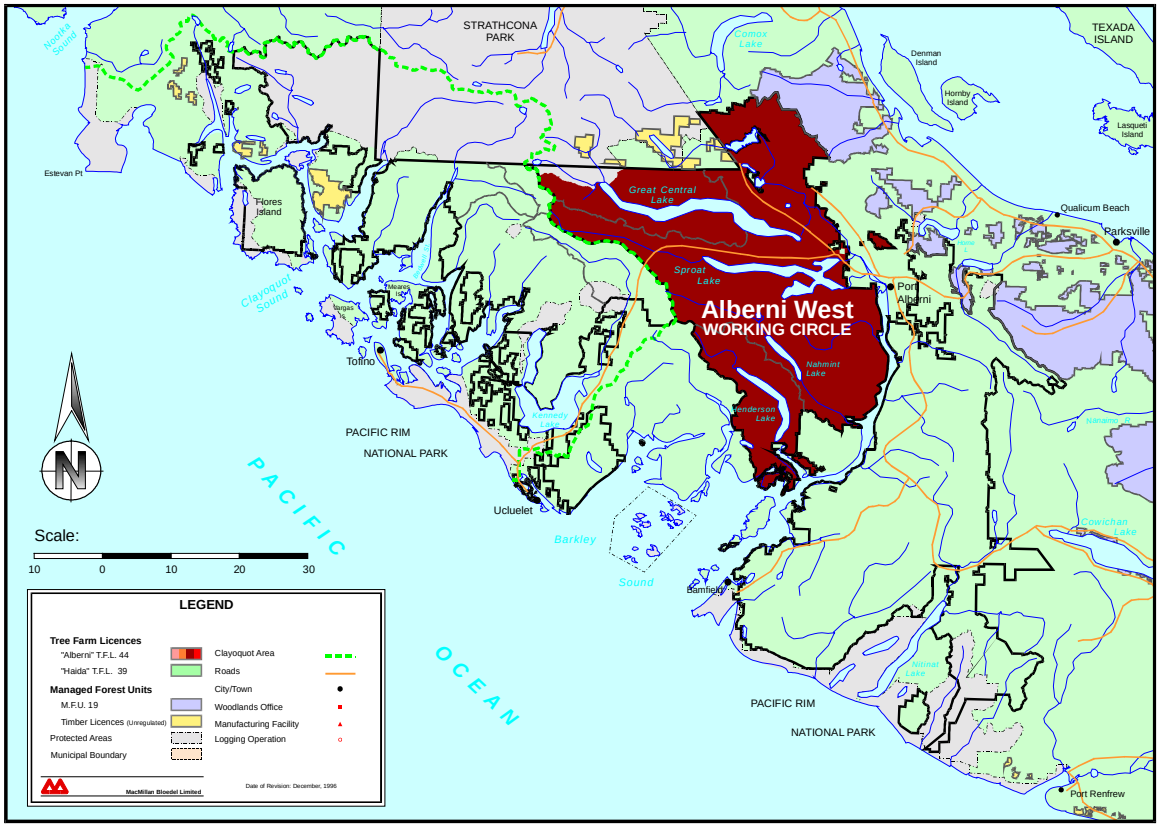
Cutting Permit No.	Location	**Cutting Permit No.**	Location
1, 102–105, 107, 108	Cameron	3, 305, 312, 313, 317, 327	Sarita
2	Franklin	303, 304, 306-311, 314–316, 318–326, 328, 329	Klanawa
202, 207,208, 209, 212, 216, 218–223, 226, 234, 238	Coleman	4, 401–403	Spencer
203, 210, 211, 213–215	Nitinat	506–510	Black Lake

3.1.5 Scaling

All harvested wood processed through China Creek, Sarita, and Caycuse dryland sorts were 100% stick scaled. Weight scaling was done at Pacifica Papers in Port Alberni and Coastland in Nanaimo. Insect control at the dryland sorts included pheromone-baited traps and piles of low value pulp logs.

Alberni West Working Circle

Administered by
Sproat Lake and Franklin Operations



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3.2 Alberni West Working Circle

The Alberni West Working Circle lies west of the Alberni Canal, south of Strathcona Provincial Park, and east of the main divide between the Taylor and Kennedy Rivers. The major drainages are the Taylor and Nahmint Rivers, and the Great Central, Sproat, and Henderson Lakes basins. It is made up of a major portion of Block III and all of Block IV of TFL 44 and contains 111 000 ha of productive hemlock, balsam, cedar and fir forests. The Franklin Operation is responsible for the administration of the contract logging done in the Great Central Lake and Henderson Lake areas. The Sproat Lake Operation is responsible for the balance of this Working Circle.

3.2.1 Annual Harvesting

Harvest during 1998 was 374 002 m^3. This volume includes 10 653 m^3 of residue, or 2.8% of the total wood harvested. Harvesting was mainly completed using conventional methods, but longline and heli-logging were also used.

3.2.2 Engineering Development

No extensions of mainline roads were completed in 1998. One bridge on the Gracie Mainline was rebuilt. Three new bridges were constructed, one on the Nahmint Main #1, one on N 750, and the third on Cous 406E.

3.2.3 Development Plans

The 1999–2003 Development Plan was prepared in 1998 and will be submitted in early 1999 after public review.

3.2.4 Cutting Permits

The following Cutting Permits were active in 1998

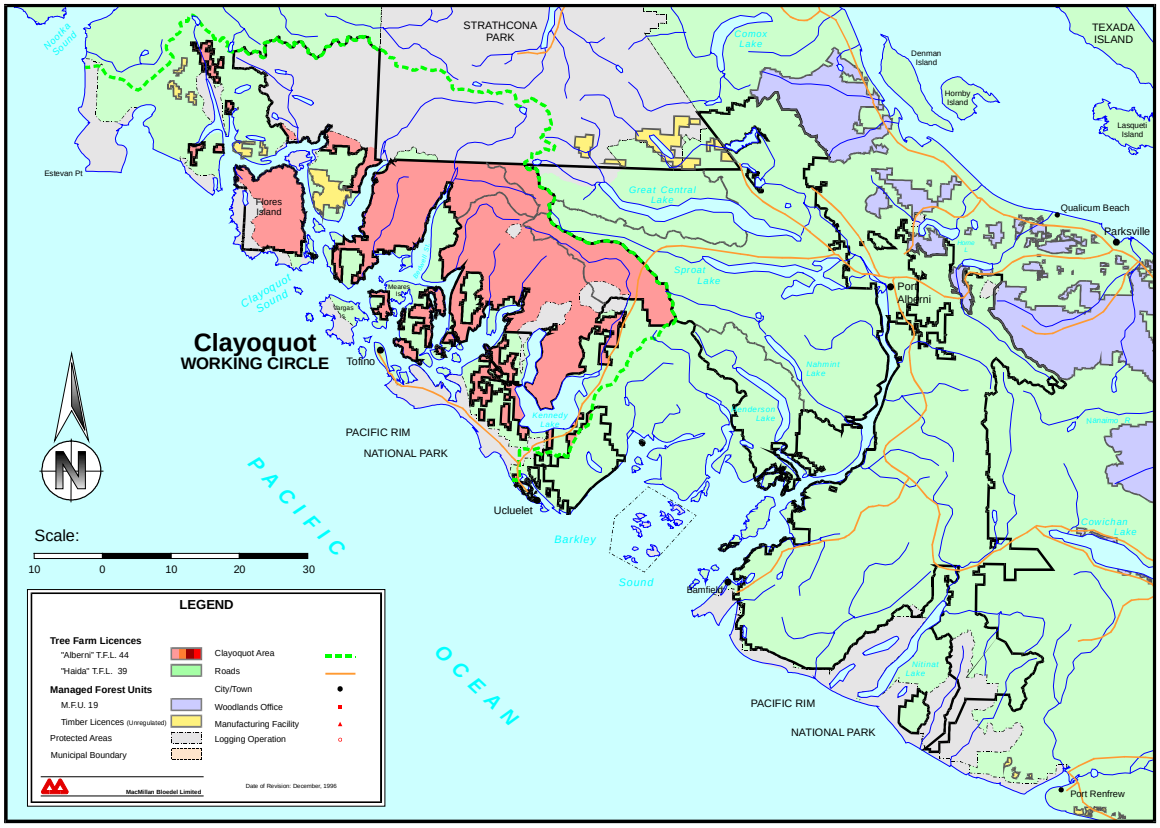
Cutting Permit No.	**Location**
616, 635	Cous
619	Gretchin
629	Taylor
635, 638	MacTush
638, 704, 708, 709, 711, 713, 715	NAHMINT
634, 627, 631	Sproat Lake
633, 638, 639	Great Central
632, 636	Ash
628, 632	Wolf
629	Canal
710	Beverly Creek
813, 815, 817, 820	Uchucklesit
839, 840	Great Central

3.2.5 Scaling

Logs taken to dryland sorts at Sproat Lake, Snug Cove, Silver Creek and Browns Bay were 100% stick scaled. The dryland sorts were protected by pheromone-baited traps.

Clayoquot Working Circle

Administered by
Corporate Forestry, Nanaimo



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3.3 Clayoquot Working Circle

The Clayoquot Working Circle is located west of the divide between the Kennedy and Taylor Rivers and extends to the Pacific Ocean to include Flores Island, but excludes the area southeast of Kennedy Lake. Major drainages include the Kennedy and Cypre Rivers, and Tofino and Tranquil Creeks. It is made up of a portion of Block III, the majority of Block V, and all of Blocks VI, VII and VIII of the TFL and contains 70 000 ha (excluding Meares Island) of productive cedar, hemlock and balsam forests. The current (1998) partitioned AAC is 130 000 m^3. During 1998 the Clayoquot Working Circle was administered by Corporate Forestry, Nanaimo.

3.3.1 Annual Harvesting

The volume harvested in the Clayoquot Working Circle was 20 009 m^3, all of it salvage. The Division was shut down during the year and there was limited log salvage and road deactivation activity.

3.3.2 Engineering Development

A total of 22 km of road was debuilt during 1998.

3.3.3 Developments in Clayoquot Sound

MB completed the shutdown of its Clayoquot operations on January 31, 1998. Work continued on the assessment and management of silvicultural obligations. Salvage operations and a road deactivation program provided some local employment. Operational planning during the first half of 1998 was focussed on assisting the transition to and the start up of Iisaak Forest Products Ltd.

On November 16, 1998, MB and Ma-Mook Natural Resources (MNR) (owned by the Nuu-chah-nulth Central Region First Nations) signed a Shareholders Agreement setting out their relationship as shareholders of a new company to operate in the Clayoquot Sound area. This new company is called Iisaak Forest Products Ltd., the shares of which are owned 51% by MNR and 49% by MB.

It is the desire of both MB and the First Nations that Iisaak achieve broadly based recognition as a leader in environmental innovation based on aboriginal values. To this end, and in preparation for the start-up of its operations, Iisaak is seeking support from environmental groups and from forest workers and community interests in the Ucluelet area.

It is expected that these organizational and relationship changes as well as policy changes and planning initiatives will enable a successful start-up of Iisaak operations in 1999.

3.3.4 Cutting Permits

The following Cutting Permit was active during 1998:

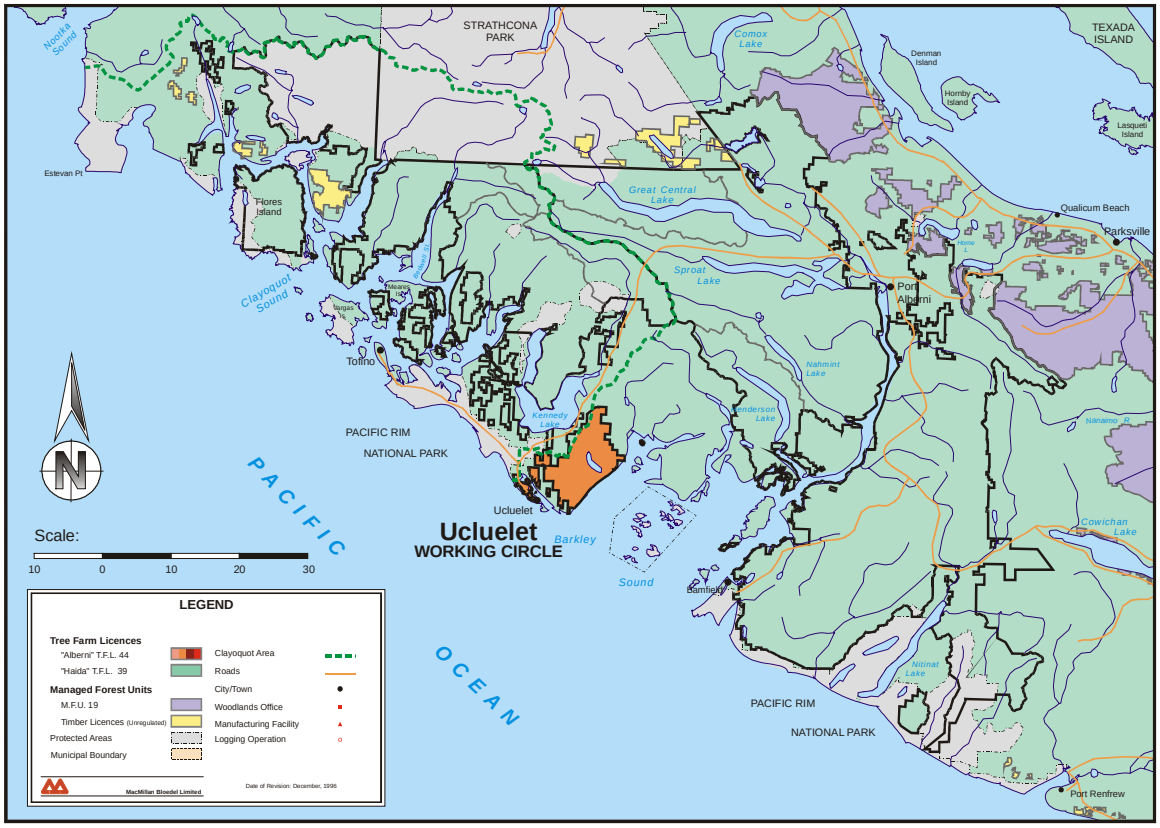
Cutting Permit No.	Location
853	Tranquil Creek

3.3.5 Scaling

Logs were 100% stick scaled at the Ucluelet or Cypre Dryland Sorts. Ambrosia beetles were controlled by the use of pheromone-baited traps.

Ucluelet Working Circle

Administered by
Franklin Operation



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3.4 Ucluelet Working Circle

The Ucluelet Working Circle is located northeast of the community of Ucluelet, lying between Kennedy Lake and Barkley Sound. This is a portion of TFL 44 Block V and contains 10 000 ha of productive cedar and hemlock forests. The Franklin Operation administered this Working Circle in 1998.

3.4.1 Annual Harvesting

A total of 169 m^3 was billed through the scaling system in 1998, the result of salvage operations. No residue was billed in 1998.

3.4.2 Engineering Development

No new road or bridge construction occurred in this Working Circle in 1998.

3.4.3 Development Plans

A new Development Plan has been written and is currently (May 1999) undergoing public viewing at the Sproat Lake office, the BCFS in Port Alberni and at Ucluelet.

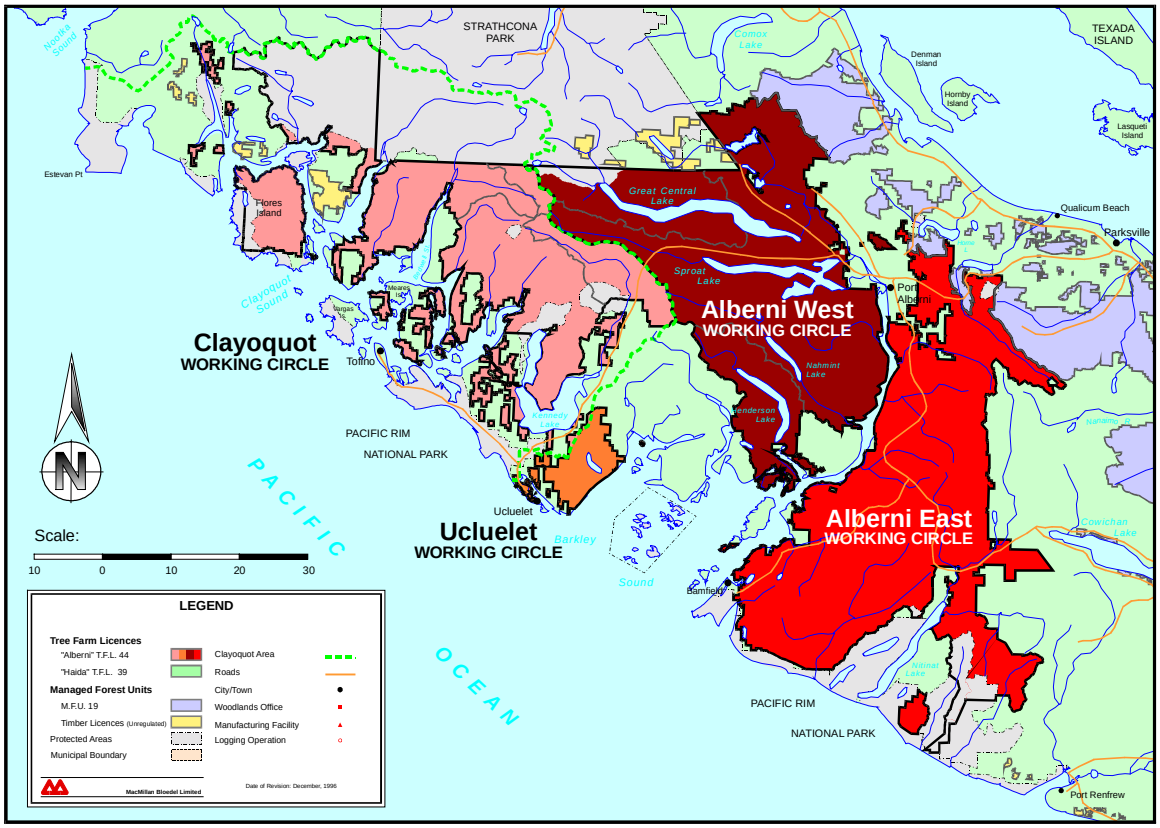
3.4.4 Cutting Permits

No Cutting Permits were active in the Ucluelet Working Circle in 1998.

3.4.5 Scaling

A small amount of salvage was scaled locally.

Inventory, Forest Protection, Silvicultural and Administrative Activities Map



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4.0 1998 GENERAL ACTIVITIES

The following sections describe the inventory, forest protection, silviculture and administrative activities completed during 1998.

4.1 Inventory Activities

Inventory Section, of Corporate Forestry, is responsible for obtaining data and maintaining records pertaining to timber inventory.

4.1.1 Operational Cruising

A total of 1 506 ha of Operational Cruising were completed in 1998 to supply timber volume and grade information for 48 Cutting Permit Applications.

4.1.2 Second-Growth Inventory

In order to maintain an accurate inventory of immature stands, MacMillan Bloedel has established a program of Second-Growth Inventory. Young stands are cruised as they become stabilized, usually at about Age 31. A total of 201 ha were sampled during the past year in the Alberni East and Alberni West Working Circles.

4.1.3 TFL 44 Inventory Audits

Block I was checked in 1998 with 74 random plots. The paired t-test has not yet been completed, but a visual comparison of the data showed no significant difference between the sample average volume and the inventory

4.1.4 Residue Sampling

Contractors established 428 plots to measure residue on 49 completed settings. The residue was measured to the standards set by the BC Forest Service. Inventory Section performed audits on the contractors at the request of the Divisions.

4.1.5 Inventory Maintenance

The updating of the forest cover and volume data is complete up to December 1997. Data for inventory maintenance is being collected annually, but the map update portion of the project has been put on hold until the new TRIM (NAD83) mapping project is complete.

4.2 Forest Protection

Forest Protection includes a wide range of activities to eliminate or minimize the effects of fire, disease and insects.

4.2.1 Forest Fires

Only one fire occurred in TFL 44 during 1998. A camper started a fire in a tree. See Appendix I, Table 4 for details.

4.2.2 Fire Control Planning/Protection

Prior to the fire season, each division prepared a pre-organization plan outlining the procedures and responsibilities for all phases of the divisional fire prevention and protection effort. Contact was maintained with operators in adjacent areas and with Small Business Forest Enterprise Program operators within the TFL to ensure coordination of prevention and suppression activities.

Roads providing fire protection access to inactive portions of the TFL were inspected prior to the onset of the fire season to ensure their usability.

4.2.3 Slash Disposal

Burning of roadside accumulations on grapple yarder operations and areas where piles were made by mechanical piling or windrowing decreased to 44 ha from the 84 ha burned in 1997 (see Appendix I, Table 5).

4.2.4 Fuel Management Plans

Approved Fuel Management Plans are in place for all divisions and are reviewed periodically to ensure their vlidity.

4.2.5 Fire Patrols

Aerial fire watch patrols were carried out by Forest Industries Flying Tankers (FIFT) within two hours after each shift whenever moderate fire hazard extended for more than three days. During the past year, a total of 113 fire watch patrols were flown. In addition, 59 patrol missions were flown during periods of high fire hazard.

Additional ground fire patrols were performed during periods of extreme fire hazard.

4.2.6 Fire Suppression Equipment

Suppression equipment to meet or exceed required levels was maintained at all divisions, including foam application equipment.

4.2.7 Weather Stations

- **Alberni East:** Eight weather stations were maintained during 1998. The stations were located in the following areas: Summit, Walbran, TMR, 213, Granite, 440, North Fork and N441.

- **Alberni West:** MB maintained the weather station on Branch 118 in the Ash River area. The Forest Service maintained a station at Beaver Creek. Another weather station was maintained at the Alberni airport.

4.2.8 Insects

Balsam woolly adelgid activity was noted in Blocks I and II. The infected areas were mapped in 1998.

4.2.9 Disease

Stumping and replanting treated an infestation of *Phellinus werri* in the Bainbridge area.

4.3 Forest Regeneration

The initial regeneration of harvested forests includes preparation of the growing site, production of seedlings, planting and measuring the results of regeneration activities.

4.3.1 Site Preparation

In addition to the areas treated by burning, a total of 122 ha were treated by mechanical scarification using excavators. Sproat Operation completed Three Metre Knockdown projects on 154 ha. Table 5 in Appendix I contains the details.

4.3.2 Artificial Reforestation

- **Tree Improvement:** The Coastal Tree Improvement Council has disbanded and an Interim Council was formed to develop a business plan for delivery of the Provincial Tree Improvement Program through FRBC. The business plan has been completed and presented to the Chief Forester and FRBC. The plan is to set up the Forest Genetics Council, use the business plan priority investment areas as a guide for FRBC investment and an arms-length company called SEEDCO to broker seed

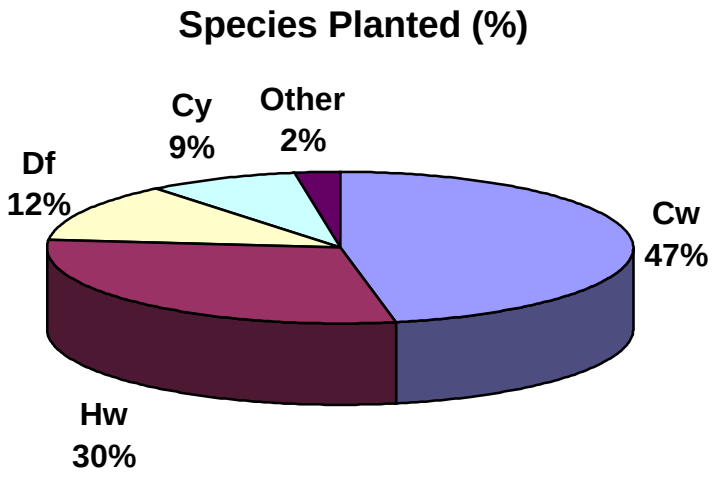
orchard seed purchases for members. The program would cover both breeding and seed orchard operations.

- **Seed Procurement:** No cone collections were made from seed orchards. Wild cone collections produced 36.32 hL of cones. Details by species are listed in Appendix II, Table 1.

- **MB Seed Inventory:** The 1998 seed inventory exceeds 765 kg. Details of the species distribution are found in Appendix II, Table 2.

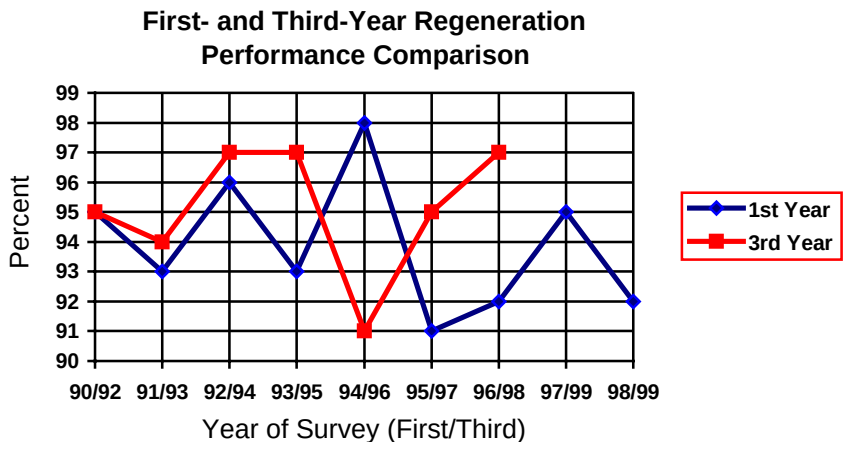
- **Planting Stock:** The seedling inventory held by MacMillan Bloedel at the end of 1998 was 6,628,000 trees. The sowing requests for the fall of 1999 and the spring of 2000 totaled 7,781,000 seedlings. Table 3 in Appendix II shows the details of the inventory.

- **Planting:** Planting was completed on 1 712 ha of Area Awaiting Restocking (AAR) using 1,724,000 seedlings. Fill planting was done on 326 ha using 198,300 trees to bring the stocking level on those areas to Management Plan standards. Appendix I, Table 6 shows the number of trees planted by Division and Appendix I, Table 7 details the hectares planted by Division and tenure. The following graph details the percent of species planted in 1998.



4.3.3 Survival

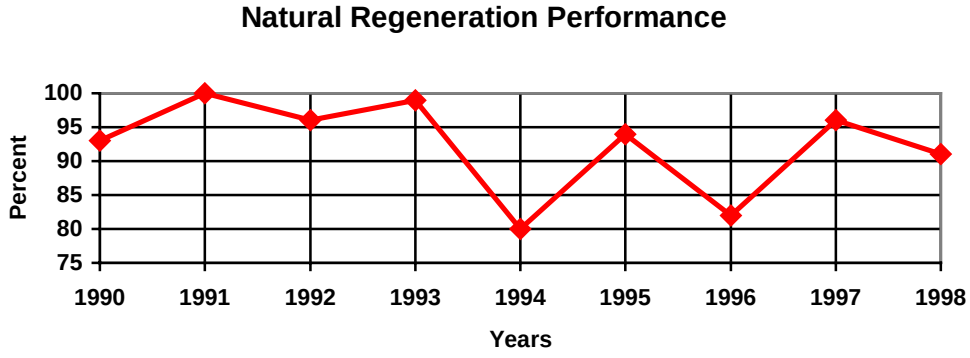
Survival surveys, completed one year after planting, on 1 475 ha showed a survival rate of 92%. Three years after planting, the survival rate remained at a high level, 97%, on the 1 601 ha surveyed in 1998. See Appendix I, Table 8 for details.



Re-examinations of third-year plantations showed regeneration performance exceeded survival performance on areas planted three years earlier for the Years 1992 through 1995. A number of factors contributed to the drop in third-year regeneration performance for 1996, namely: extreme weather conditions causing desiccation, stressed planting stock, poor planting quality, elk browsing, road deactivation and inadequate site preparation. The third-year regeneration performance again exceeded the first-year plantation survival in 1997 and this trend improved in 1998. The third-year data does not include plantations that failed the first year.

4.3.4 Natural Regeneration

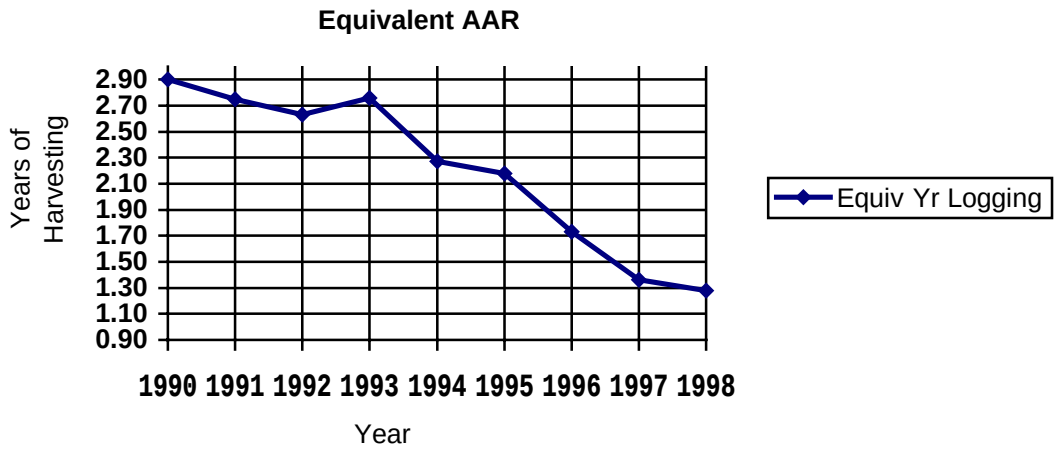
Stocking surveys were conducted on 1 669 ha and 35% were found to be stocked. After three years the naturally regenerated areas were 91% stocked, based on a survey of 460 ha. Details of these surveys by Division are found in Appendix I, Table 8. Natural stand regeneration has remained above 80% over the last nine years.



4.3.5 Areas Awaiting Restocking (AAR) Status

The inventory of Areas Awaiting Restocking in TFL 44 at the end of 1998 was 2 781 ha, a drop of 812 ha from the 1997 inventory (refer to Appendix I, Table 9).

The graph shows the trend of AAR expressed in terms of logging history.



When the annual AAR is compared to the average area harvested over the previous ten years, the 1998 area represents 1.28 years of logging. The downward trend in the ratio of unstocked area to logged area continues, with the exception of 1993. Over the past nine years the level of AAR has consistently been below the three-year benchmark.

4.3.6 Free-Growing Status

Appendix 1, Table 13 summarizes areas that require MoF approval for free-growing status. These areas, generally, have been harvested since October 1, 1987

4.4 Stand Tending

Silvicultural activities continue after reforestation. Several projects were completed in 1998. Details of Divisional activity are found in Appendix I, Table 10.

4.4.1 Brushing and Weeding

All Divisions within the TFL completed brushing and weeding projects. A total of 1 317 ha were treated by swathing, girdling and other methods.

4.4.2 Juvenile Spacing

Juvenile spacing was completed on 189 ha using chain saws.

4.4.3 Fertilizing

Most divisions applied fertilizer during planting operations, treating a total of 1 214 ha. A total of 253 ha were fertilized after planting in the Clayoquot and Ucluelet Working Circles.

4.4.4 Pruning

Pruning was done on 58 ha in all but the Alberni East Working Circle.

4.4.5 Erosion Control

A total of 154 ha were dry or hydroseeded during 1998. Both roadside and slide areas were treated. Details are found in Table 11 of Appendix I.

4.5 Assessments

Assessments and audits are performed to ensure work is done to prescribed standards.

4.5.1 Silvicultural Assessments

The results of various types of silvicultural assessments are used for planing future activities, monitoring the success of treatments, and to maintain up-to-date forest management records. Appendix I, Table 12 details the 24 926 ha surveyed for various assessments in 1998.

4.5.2 Silvicultural and Land Use Audits

Audits allow MacMillan Bloedel to evaluate performance compared to standards in a number of land use and forestry disciplines. Qualified personnel conduct these audits and the results are discussed with appropriate divisional staff.

4.6 Funding Credits

Funding credits received by MacMillan Bloedel from FRBC in 1998 totaled $1,286,757. This money was used for a variety of activities on 2 408 ha, as detailed in Appendix I, Table 14.

4.7 Public Involvement

A number of communities are within or adjacent to the licence. Many of the residents are directly or indirectly dependent on the forest.

Public interest in resource management planning has increased the need for review of development and management plans by the general public. In addition, MacMillan Bloedel's Forestry Information Centre in Port Alberni provides an opportunity for the general public to learn more about the total forest environment.

4.7.1 Development Plans

The Sproat Operation wrote a 1999–2003 Development Plan in 1998. It will be submitted for public review in 1999. The current Development Plan for the Franklin Operation was extended into 1999

4.7.2 Alberni Forest Information Centre

The Alberni Forest Information Centre, located on the Harbour Quay in Port Alberni, hosted over 27,234 visitors during 1998. School presentations/tours involved 1,943 students in 89 program activities. Public forestry and special tours were made available to an additional 644 visitors in 85 groups. During July and August mill tours for Pacifica Paper (formerly Alberni Specialties) and Somass were booked through the Information Centre (54 tours, 279 participants).

The Alberni Forest Information Centre participated in National Forest Week with public tours, a Tree Growing Contest for Grade Five students and a display at the Alberni Mall, which was visited by 300 people. As well, the Information Centre had a display booth at the Alberni District Fall Fair with over 2,050 people visiting the booth over the four-day event.

4.7.3 Public Information

A Recreation and Logging Road Guide, produced utilizing state-of-the-art digital cartographic technology, was made available to the general public at various locations in Port Alberni and Nanaimo.

4.8 Operational Research

Operational research is carried out in several of MacMillan Bloedel's divisions and managed forest units. Results can be applicable to TFL 44 when species, site index, terrain and biological conditions are considered.

4.8.1 Forest Renewal

Forest Renewal research in the Montane Alternative Silvicultural Systems (MASS) project focuses on performance of Douglas-fir, hemlock and western redcedar in various silvicultural systems in higher elevation forests. Activities/results during 1998 included:

A seedling experiment with two species (amabilis fir and western hemlock) and four treatments (fertilization, vegetation control, both and none) was established in 1996 on all five silvicultural settings (clearcutting, green-tree retention, shelterwood and patch cutting). Microclimate stations have been increased to two per silvicultural setting to provide replication. These are being operated by the CFS and a database has been created to allow all researchers access to the climate data. Preliminary results indicate the most significant single growth factor during the first four growing seasons is nitrogen nutrition. All seedlings, particularly western hemlock, had significantly higher first season growth with fertilization than with any other treatment. This effect has persisted but diminished through the four growing seasons. Excavations of whole trees and biomass allocation assessments were completed this year to determine if the pattern of biomass allocation was different than the height and volume growth performance. Biomass allocation (total, root shoot and shoot root) essentially matched the height and volume growth responses. The reduction in growth response to fertilization is more apparent in the western hemlock, particularly in the open-grown clearcut where supplemental Nutricote has caused no significant incremental growth response.

It is notable that silvicultural settings had limited effect on seedling growth other than exceptionally slow growth in the old-growth control. Seedling growth in clearcuts was not significantly different than growth under patch-cut, green tree retention or shelterwood. This was consistent with the microclimate evidence that indicated more similarity in temperature and light regimes than was expected

4.8.2 Ecology

MacMillan Bloedel's forest ecology program addresses issues pertaining to sustainable management of forest ecosystems. Its main project areas are silvicultural systems, site productivity, and ecosystem classification and mapping.

- Montane Alternative Silvicultural Systems (MASS)

Ecology research continued on the cooperative Montane Alternative Silvicultural Systems (MASS) project. The participating organizations include: MB, Canadian Forest Service, FERIC, UBC and UVIC. Forest Renewal BC provides funding. This project is designed to study the biological and economic consequences of various silvicultural systems in higher elevation forests. The systems being studied include: clearcutting, green tree retention, shelterwood and patch cutting. Harvesting was completed in 1993; post-harvest monitoring continued through 1998. MB studies included: regeneration, growth and yield, microclimate, hydrology, forest bird diversity and vegetation succession. Nearly 128 people visited the site in 1998, bringing the total number of visitors to almost 1,000. In addition, another 5,800 people around the world have participated in seminars given by the researchers. Activities in 1998 include:

- Windthrow monitoring: Windthrow is present in all of the cut blocks. A total of 50 newly windblown trees were observed in 1998. After five seasons, green tree retention has lost an average of 8 sph; patch cut—5.5 sph; shelterwood—10 sph and clearcut—8.5 sph due to windthrow. The greatest windthrow losses continue to be in the intermediate crown class. Trees in the more open green tree retention treatment were more vulnerable to wind damage; however, the shelterwood treatment resulted in greater numbers of windthrown stems because of the higher density of retention. Western redcedar appears to be more windfirm than either amabilis fir or western hemlock.

- Conifer seedfall and regeneration: Seedfall traps were sampled in May, August and November. The number of seeds collected was greatest in the first season, dropped off significantly in the second season, but rebounded in the last two seasons. Partial cutting seems to have stimulated the seed production as the greatest amount of seed has been collected from the shelterwood areas in the last two years. Seedfall from all seasons combined, however, still show significantly more seedfall in the old growth than in any of the harvested areas. Hemlock seeds were more abundant than the other species on all treatments, except for western redcedar in the shelterwood during the past year. The old growth and all partially cut areas had the greatest production of the species with heavier seed (amabilis fir and yellow-cedar). Low numbers of seeds reached the center of the 69 ha clearcut; however, natural stocking through advanced regeneration and seedlings has been adequate in most areas. Stocking in the partially cut stands is typically high.

- Natural Vegetation: The cover, frequency and number of species of understory plants decreased after all harvesting treatments. Three years after treatment the cover increased in the harvested areas primarily due to herbaceous colonizers. The shelterwood areas retained the greatest diversity of understory trees, shrubs and bryophytes compared to other systems. Shelterwood species richness and abundance were greater three years after harvesting than before harvesting, but changes in species composition were quite variable. Presence of bryophytes and herbs that prefer moist, shaded habitats generally decreased after harvesting. More intensive sampling of bryophytes was done because of the sensitivity to treatments. Fifth year data was collected and results will be reported in 1999.

  Vegetation cover was also assessed on sub-plots with herbicide and fertilizer treatments. Shrub cover was 9% to 10% in all plots immediately following harvest (pre-herbicide assessment). After 3 years, this cover (including *Irubus Pedatus*) has increased to about 30% in the untreated plots and has been reduced to less than 1% in the herbicide treated plots. Similarly, herb cover has been maintained at between 3% and 5% in the herbicide treated plots and has increased to about

35% in the untreated plots. Moss cover appears less affected by the herbicide treatments and ranges from 21% and 25% in both treated and untreated plots.

- Bird Diversity: Pre-harvest breeding bird communities were dominated by a few abundant species. Of the 26 species detected, 10 species accounted for 96% of the population. Different levels of canopy retention produced dramatic effects on the breeding birds. Species richness and bird abundance were reduced three years after harvesting. Most common species (9 species) showed evidence of population decline, 2 species showed significant increase, and 3 species showed unchanged abundance. Few species were completely lost or added to the avifauna. Only 17 species were recorded during winter surveys, of which 2 species accounted for the majority (68%) of detections. The vast majority (85%) of the winter resident birds was concentrated in the old growth and unlogged portions of patch cut blocks. Retention of relatively intact old-growth forest patches appears to be a more useful strategy for conservation of some plant and bird species and in maintaining stand structural elements than the uniform distribution of leave trees. This approach also appears to have cost, wind-firmness and safety advantages.

- Salal-Cedar-Hemlock Integrated Research Program (SCHIRP)

  MB has participated in a multi-agency cooperative Salal-Cedar-Hemlock Integrated Research Program (SCHIRP) since 1986. A field guide to site identification and treatment was published in 1996. In March 1996 a replicate trial was established near Ucluelet to test optimum combinations of species, fertilization, mechanical site preparation and planting density for CwHw-Salal sites. The new trial will expand the usefulness of the SCHIRP results to a wider range of sites.

  After two growing seasons (data collected in 1997) at the Ucluelet site, western redcedar survival ranged from 95% to 98% while western hemlock ranged from 70% to 83%. Site preparation alone did not produce increased seedling height or stem volume. Fertilization significantly increased second year height growth of both species. Combining fertilizer with site preparation further increased western redcedar height and significantly increased second year stem volume over fertilization alone. Fertilization significantly increased second year western hemlock stem volume and more than tripled western redcedar stem volume. When using fertilizer, "tea-bags" or applying granular fertilizer 10 cm deep produced the best results.

- Ecosystems 2000

  The objective of this project is to map the ecosystems (site series) on all of MacMillan Bloedel tenures at a scale of 1:20 000. This inventory will enable MacMillan Bloedel to meet the landscape-level planning recommendations in the Forest Practices Code Biodiversity Guidebook. Funding is provided by Forest Renewal BC. All projects use TRIM (NAD 83) base and follow the provincial Resource Inventory Committee mapping and database standards. Final digital products were completed for the Walbran-Caycuse, Sproat-Upper Nahmint, Lower Nahmint and Taylor-Maber LIA Special Management Zone (SMZ) areas in TFL 44. Completed products for Great Central East and Henderson Lake are expected in early 1999. The project is expected to be complete in 2002.

4.8.3 Growth and Yield

MacMillan Bloedel maintains an inventory of permanent sample plots in mature and second–growth stands to evaluate long-term growth trends. These sample plots are periodically remeasured. Company wide a total of 130 Second–Growth Plots, 31 Planting

Assessment Plots, 10 Sustained Yield Plots, 39 Spacing Assessment Plots, 31 nutrition plots and 25 Mature plots were remeasured. Specifically, in TFL 44, the respective numbers of plots measured in each category was 32, 10, 2, 9, 0, and 7.

4.9 Integrated Resource Management

MacMillan Bloedel is actively engaged in managing the forest resources within the TFL. This occurs in accordance with the Forest Practices Act (FPC) and Regulations and as directed by FPC Guidebooks. This involvement includes maintaining information (inventories) on a number of non-timber forest values. These inventories are updated on a regular basis. It also includes research as well as specific management actions. The following summarizes activities in 1998.

4.9.1 Forest Renewal BC Multi-Year Agreement

The Multi-Year Agreement between MacMillan Bloedel and Forest Renewal BC (FRBC) was signed in May 1998. The agreement runs to the end of March 2003. FRBC provides funds under the agreement for MB to carryout and complete approved activities on the forest land base. The major work activities included: Backlog (brushing, planting), Enhanced (spacing, pruning), Operational Inventory (ecosystem mapping, fish inventory, water quality testing), and Watershed Restoration (road deactivations, in-stream works). Three minor project activities included: Enhanced Forest Management Pilot Project (see Section 4.9.2), Bridge Replacement and Recreation.

Specific activities in 1998 involved a number of First Nations in spacing, brushing, pruning and in-stream work projects. The First Nations partners included Uchucklesaht, Huu-ay-aht, Ditidaht, Hupacasath, Tia-o-qui-aht and Ahousaht.

4.9.2 Forest Project

During 1998, Tom Stephens, the newly appointed President and CEO of MacMillan Bloedel commissioned a comprehensive review of the company's forest policy. Led by MB's Chief Forester, Bill Cafferata, MB's Forest Project assembled a team of internal and external experts to develop options that would enable the company to meet the following three objectives:

- ensure that employee safety is not compromised;
- develop MB into North America's most respected forest company, and
- find solutions to forest issues in British Columbia that will enhance shareholder value through improved market access and earnings.

The recommendations of the Forest Project analysis were accepted by MB in May/98 and publicly announced in BC in June/98. The Project recommended that the company implement management policies and practices designed to:

- increase conservation of old growth forest;
- replace clearcutting with a more ecologically driven approach through the adoption of a system of stewardship zones, and the introduction of variable retention harvesting and silviculture systems, and

- achieve both of the above in ways that will enable the company to be certified under any of the private systems currently emerging for forest certification.

Further details on the recommendations of the Forest Project and new forest policy initiatives subsequently undertaken by MB are available. It is recognized by the company that implementation of the Project's recommendations will take time and will require the cooperation and support of other forest stakeholders in BC, including First Nations, employees, local communities, environmental groups and the provincial government.

The ecological rationale for MacMillan Bloedel's new approach to forest management in the 21st century was developed in cooperation with the UBC Center for Applied Conservation Biology. The rationale was established on two broad objectives:

- explicitly addressing the public fear of losses of options and economic opportunities, healthy ecosystems and biological diversity, and

- learning from our actions through adaptive management.

The project describes the relationship between redefined public values and biodiversity, and shows how vertebrate species and their habitat requirements can be a pragmatic proxy for biodiversity. A thorough review of current forest ecology, landscape ecology and biogeography literature led to the conclusion that the major forest habitat elements relevant to maintaining vertebrate richness are: cavity sites, downed wood, shrubs, deciduous broad-leaved trees, riparian areas, and early and late seral stages. Each of these can be created or changed by forest practices. The review focused on structural requirements for terrestrial vertebrates on MB tenure and indicates how these can be used to guide the implementation of variable retention in a landscape-zoning framework.

4.9.3 Recreation/Landscape

Franklin Woodlands maintains a total of 30 campsites located in campgrounds on Sarita and Nitinat Lakes.

Alberni West has a campground at the MacTush Log Dump. Scouts Canada manages the 52-site campground.

The first part of an update to the TFL 44 visual landscape inventory was done in 1998. The remaining field work will be completed in 1999.

4.9.4 Wildlife

The company continued monitoring west coast Bald Eagle nest sites in partnership with the Canadian Wildlife Service. The objective of these surveys is to compare the productivity of west coast Bald Eagle nests with those in other areas of BC. Present indications are that west coast nests have a comparatively low productivity.

The company also participated in marbled murrelet habitat surveys in 1998.

4.9.5 Fisheries

- **Kennedy Lake Sockeye:** MB has supported a project to identify the number of sockeye stocks in Kennedy Lake (Clayoquot Sound) for several years. This work will help address concerns raised by the Clayoquot Scientific Panel about preservation of biological diversity. Information about three separate stocks, identified using DNA analysis, will be helpful in designing improvement projects by providing the necessary

data to prevent enhancement of one stock at the expense of another. The work will continue in 1999. The World Fisheries Trust, Department of Fisheries and Oceans, First Nations, local enhancement groups and MB are partners in the project.

- **FRBC Watershed Restoration Projects:** MB joined with the Ahousaht First Nations, MELP, DFO, FRBC, John Taylor and Associates and the Regional Aquatic Management Society to undertake a watershed restoration program in TFL 44. Instream projects were completed in the Sarita, Taylor, Cypre, Henderson and Kennedy Watersheds. The Cypre River project, as an example, included the construction of a 700 m groundwater-fed rearing channel for coho salmon. This project was initiated after assessments showed reduced overwinter rearing habitat following logging was limiting coho production in this system. After the completion of the project, stocking surveys counted over 4,400 fish, a good count compared to the DFO standards which predicted 3,100 fish for a channel of this type. FRBC training funds were used by John Taylor and Associates to train Ahousaht fisheries workers to monitor fish use in the channel.

  The Cypre River is also being enhanced by the Tofino Enhancement Society who collect eggs, incubate them at their hatchery and release them back into the River the following spring. A donation from MB funded the tagging of the fry released from the hatchery to permit an evaluation of the enhancement program and to permit restoration specialists to compare use of the newly constructed channel by hatchery and wild fish. This is the second year of a scheduled 3-year tagging program being funded by MB.

  Watershed restoration projects will continue in 1999 in all of the above watersheds and will start in the Caycuse River at Nitinat Lake.

- Other TFL 44

  West Islands Woodlands donated funds to a Huu ay aht First Nations enhancement project near Bamfield. Sustainable Forestry Division donated a computer required by the Uchucklesaht Band for their hatchery on Henderson Lake. Building Materials were donated to the Uchucklesaht Band to construct a fish counting fence on the Henderson River to help monitor the results of their enhancement and restoration efforts at Henderson Lake.

  San Juan Project
  A major project has been ongoing in the San Juan Watershed to restore impacted habitats. The participants include MB, Timberwest Inc., and Government Agencies. Industry provided over $800,000 for work on private lands and FRBC provided funds for work on Crown Lands. A high percent of the private funds were used in 1997 and FRBC provided much of the funding in 1998.

4.9.6 Water

Coastal Watershed Assessments processed during 1998 included 10 watersheds/basins (69 131 ha) and were conducted in the following Working Circles:

- Alberni East: Franklin Operation had projects in the Bainbridge, Caycuse Basin 2 (Hatton), and Klanawa watersheds.

- Alberni West: Franklin (contract) Operation had a project in Coeurd'Alene watershed. The Sproat Operation had projects in Cous, Great Central, Henderson, Nahmint, Sproat Basin 8 (Taylor), and Somass Basin 1 (Wolf).

A Watershed Resource Inventory was initiated in 1997 in the Upper Nahmint Watershed. The objective of this four year project is to obtain inventory information on key water resource parameters associated with seasonal precipitation and stream runoff characteristics in smaller drainage basins that contribute to the overall hydrologic behaviour of larger watershed areas. The collected data will allow the performance of the stream channels to be documented and compared over a period of time with forestland conditions and changes. Work in 1997 located and verified seven primary sites for data collection. The first data from the seven sites was collected in 1998 and five crest gauge sites were established to measure peak flow on associated tributary streams. In addition, channel surveys, stream reach inventories, and determination of representative snow pack conditions were carried out. The completed project will provide data to help MB to:

- better understand, evaluate and compare the performance of watershed areas,
- determine and validate levels of sensitivity by linking by monitoring current geologic and stream channel conditions,
- assist in developing useful procedures and tools to overcome technical issues associated with both strategic and operational forestry development planning.

The 1998 data will be analyzed in 1999 and the data collected during the current year will be made available to all operations on a monthly basis.

MacMillan Bloedel Limited is committed, as a part of the corporate safety strategy, to developing regional rainfall shutdown criteria for the purpose of shutting down operations in the woods during periods of high landslide hazard. The water balance method cited in the WCB regulations is the standard. Local guidelines were established using rainfall regions based on biogeoclimatic maps and are calibrated for each region using available precipitation data on known landslide events. The guidelines outline work site procedures for working at a fixed location (e.g., a cutblock or bridge site), variable work areas (e.g., timber cruising, road maintenance), and for road inspections. Guidelines were completed for the Franklin, Sproat and Contractor Operations in the West Island Woodlands area.

MacMillan Bloedel participated as a partner with the Ministry of Environment Lands and Parks in establishing the Walbran Hydrometric station to collect flow data from the Walbran watershed. The information will be added to the database of hydrometric and climatic information available from other stations located in the Vancouver Island Region of BC Environment.

4.9.7 Soils

Terrain mapping in the Sproat Operation included surface erosion potential mapping (at TSIL C) in the Sproat Lake Community Watershed for 50 cutblocks proposed for 1999–2001.

Work done in 1998 also included approximately 50 projects in the following areas:

- Terrain stability assessments of hillslopes and gullies for proposed roads and harvesting areas,
- Landslide investigations,
- Geotechnical assessments of problem areas on existing roads,

- Hydrotechnical assessments of floodplains, logged and unlogged stream channel fluvial geomorphology,
- Surface erosion potential for proposed harvesting areas, and
- Windthrow assessments.

A Woodlands Waste Management Standard was implemented in 1998. The standard was developed to reduce the environment impacts and liabilities associated with all aspects of waste management and in particular the ongoing problems of landfill fires, leachates and costly landfill closure requirements. Requirements for the storage and disposal of various waste materials are outlined and new 'best management practices' are proposed for implementation at all Divisions to reduce short- and long-term environmental risks from landfills, dryland sorts, debris burn sites, shops and camps. The first major revision will be completed in 1999 and the site-specific database containing geologic, hydrologic, site and maintenance data will be linked spatially in the GIS.

A project was initiated in mid-1998 to examine the management options associated with wood residue generated at dryland sorts and sawmill operations. The intent of this project is to look at MB's recycling and disposal options as well as ways in which MB can reduce the amount of wood waste generated. The expected project results include:

- determining where open burning is still necessary and acceptable at some remote sites,
- review of existing and emerging technologies with respect to wood residue recycling,
- a decision framework as to which technologies or management strategies are best suited to MB's operating areas, based on site specific criteria, and
- progressive improvement in management strategies by continually looking for the best solutions, taking into account environmental, business, community, and esthetic needs at each site.

The results will be announced in 1999 together with implementation plans for adopting different technologies or management strategies at various sites.

4.9.8 Biological Diversity

The biodiversity model developed at UBC's Institute for Applied Conservation Biology for the MoF has been incorporated into the MB GIS framework. The model has been calibrated to coastal conditions using our PSP data and help from Resource Analysis Section (RAS) and a graduate student. Partial harvesting and natural disturbance data has been successfully incorporated into the model and was tested in a new case study with the Adam/Eve landscape unit in 1998.

MB has reviewed the modeling approach with the MoF and MOELP biodiversity and planning specialists and received positive feedback suggesting that these analyses could provide an important comparative element for assessing alternative total resource plans. This approach will be tested in the context of Higher Level planning using the Enhanced Forest Management Pilot Project during 1999.

Reporting of landscape unit requirements was improved in 1998. The report allows the users to assess the incremental contribution of NTR netdowns to Biodiversity Guidebook targets and provides a framework for handling the requirements of the new Landscape

Planning Guidebook to be released in 1999. Compliance reports for all MB landscape units using the current MELP Landscape unit coverage were completed in 1998. The reports were used to assist in FDP approval processes with the Cous, Great Central Lake and Salmon landscape units.

4.10 Administration

The administration activities necessary to operate a TFL in 1998 are discussed in the following sections.

4.10.1 TFL 44 Amendments

There were no amendments made to the TFL 44 Agreement in 1998.

4.10.2 Property Additions/Deletions

The MacTush Creek Campground site of 18.10 ha was removed from TFL 44 in late 1997.

4.10.3 Managed Forest 74

Managed Forest 74, which comprises the privately owned lands in Schedule "A" of TFL 44, is managed to the standards adopted for all of TFL 44. There is no cut control requirement on MF 74.

4.10.4 Annual Allowable Cut

The Annual Allowable Cut in TFL 44 for 1998 is 1 890 000 m^3. The SBFEP allocation is 89 873 m^3, leaving 1 800 127 m^3 as MacMillan Bloedel's portion of the TFL AAC.

4.10.5 Regional and Landscape Planning

Refer to the 1997 Annual report for a summary of recent initiatives.

The Vancouver Island Land Use Plan report on the locations and management objectives and strategies for Enhanced Development and General Management Zones has not yet been approved.

The Regional Landscape Unit Planning Strategy is also awaiting approval.

4.10.6 TFL Annual Report

The Annual Report for the activities within TFL 44 in 1997 was submitted in August 1998.

APPENDIX I - Table 1a

TFL 44 Volume Harvested in 1998
Based on Cut Control Letter Issued by Vancouver Forest Region
Volumes (m^3)

Working Circle	Tenure	Ha	Fir	Pine	Cedar	Cypress	Spruce	Hemlock	Balsam	Decid	Total Billed	Residue	Total Cut Control
Alberni East	Private	127	43,338	229	13,113	737	19	54,582	7,316	63	119,397		119,397
	TL	346	15,381	1,850	93,274	4,241	416	140,197	56,662	12	312,033	13,473	325,506
	Crown	374	16,094	1,294	124,125	4,218	604	141,054	54,806	26	342,221	9,229	351,450
	Total	847	74,813	3,373	230,512	9,196	1,039	335,833	118,784	101	773,651	22,702	796,353
Alberni West	Private	92	66,690	57	3,553	6	41	6,647	613	20	77,627	2,853	80,480
	TL	119	30,117	387	21,034	1,757	33	37,155	10,936	3	101,422	2,179	103,601
	Crown	218	31,729	790	19,124	17,423	10	69,078	46,136	10	184,300	5,621	189,921
	Total	429	128,536	1,234	43,711	19,186	84	112,880	57,685	33	363,349	10,653	374,002
Clayoquot	Private		7		1,656						1,663		1,663
	TL		4	18	2,781	29		26	1		2,859		2,859
	Crown		6	14	14,935	194	4	204	130		15,487		15,487
	Total		17	32	19,372	223	4	230	131		20,009		20,009
Ucluelet	Private												
	TL												
	Crown				94			69	6		169		169
	Total				94			69	6		169		169
Total	Private	219	110,035	286	18,322	743	60	61,229	7,929	83	198,687	2,853	201,540
	TL	465	45,502	2,255	117,089	6,027	449	177,378	67,599	15	416,314	15,652	431,966
	Crown	592	47,829	2,098	158,278	21,835	618	210,405	101,078	36	542,177	14,850	557,027
	Total	**1,276**	**203,366**	**4,639**	**293,689**	**28,605**	**1,127**	**449,012**	**176,606**	**134**	**1,157,178**	**33,355**	**1,190,533**

Note: The volumes harvested in Clayoquot and Ucluelet Working Circles are salvage volumes and have no hectres recorded.

15-Feb-00

Appendix I - Table 1b

TFL 44 Production by Harvesting Profile and System - 1998

As Reported by the Woodlands Divisions [1]

Excludes Residue

Volumes (m^3)

	Harvest Profile[2]													
	Conventional				Non-conventional				Total				Grand Total	
	Economical		Marg. Economical		Economical		Marg. Economical		Economical		Marg. Economical			
Harvesting System	Volume	ha	Volume	ha	Volume	ha	Volume	ha	Volume	ha	Volume	ha	Volume	ha
First Growth														
Clear Cut	874 503	970	11 205		2 490	5			876 993	975	11 205		888 198	975
Clear Cut with reserves	108 322	142			2 760	5			111 082	147			111 082	147
Variable Retention	4 618	17							4 618	17			4 618	17
Shelterwood with reserves	5 847	11							5 847	11			5 847	11
Total	993 290	1 140	11 205		5 250	10			998 540	1 150	11 205		1 009 745	1 150
Second Growth														
Clear cut	20 617	39							20 617	39			20 617	39
Clear Cut with reserves	31 092	50							31 092	50			31 092	50
Seed Tree	8 173	12			363	1			8 536	13			8 536	13
Seed Tree with reserves	711	15							711	15			711	15
Shelterwood	1 316	2							1 316	2			1 316	2
Selection	212	2							212	2			212	2
Variable Retention	2 650	4			635	1			3 285	5			3 285	5
Total	64 771	124			998	2			65 769	126			65 769	126
Grand Total	**1 058 061**	**1 264**	**11 205**		**6 248**	**12**			**1 064 309**	**1 276**	**11 205**		**1 075 514**	**1 276**

[1] Volume data (m^3) based on Divisional records and may not agree with official BCFS billed volumes due to differing year-end dates.

[2] Conventional, Non-conventional and Marg-economic categories are based on inventory classification and not actual havest method.

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Appendix I - Table 1c

TFL 44 Production by Harvest Profile by Working Circle and Operability Class
From Divisional Records for 1994 to 1998
(000 m^3)

Working Circle and Operability Class	Year					5-Year Average
	1994	1995	1996	1997	1998	
a) First Growth						
Alberni East						
Conventional	888	1 028	1 121	941	664	928
Non-conventional	9	124	3		4	28
Marginal		25	1	2	11	8
Total	897	1 177	1 125	943	679	964
Alberni West						
Conventional	464	455	231	140	312	320
Non-conventional	85	117	74	46	2	65
Marginal	6	10	72	70		32
Total	555	582	377	256	314	417
Ucluelet						
Conventional	14	37	1	4		11
Non-conventional						
Marginal			7			1
Total	14	37	8	4		13
Clayoquot						
Conventional	244	100	44	8	16	82
Non-conventional	15	45		9		14
Marginal	9	5				3
Total	268	150	44	17	16	99
TOTAL						
Conventional	1 610	1 620	1 397	1 093	992	1 342
Non-conventional	109	286	77	55	6	107
Marginal	15	40	80	72	11	44
Total	**1 734**	**1 946**	**1 554**	**1 220**	**1 009**	**1 493**
b) Second Growth						
Alberni West						
Conventional	1			10	65	15
Non-conventional					1	
Total	1			10	66	15
c) TOTAL	**1 735**	**1 946**	**1 554**	**1 230**	**1 075**	**1 508**

1) The Division harvest estimates differ from the official MoF billed volumes.
2) Volumes exclude residue.
3) Harvest volumes do not include SBFEP.
4) Volumes for 1994 have been changed (corrected) from those reported in TFL 44 Management Plan #3, Appendix VIII, Table 4.12.2.
5) Conventional, Non-conventional and Marginal categories are based on inventory classification and not on actual harvest method.
6) The 1998 Clayoquot volumes are salvage volumes and are arbitrarily assigned to Conventional Operability Class.

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Appendix I - Table 1d

TFL 44 Production by Harvest Profile by Working Circle and Operability Class
Adjusted to Official Harvest Numbers for 1994 to 1998
(000 m^3)

Working Circle and Operability Class	Year					5-Year Average
	1994	1995	1996	1997	1998	
a) First Growth						
Alberni East						
Conventional	977	1 122	1 254	1 063	778	1 039
Non-conventional	10	135	3		5	31
Marginal		27	1	2	13	9
Total	987	1 284	1 258	1 065	796	1 078
Alberni West						
Conventional	494	461	271	155	307	338
Non-conventional	91	119	87	51	2	70
Marginal	6	10	85	78		36
Total	591	590	443	284	309	443
Ucluelet						
Conventional	26	62	1	9		20
Non-conventional						
Marginal			8			2
Total	26	62	9	9		21
Clayoquot						
Conventional	278	143	53	9	20	101
Non-conventional	17	65		11		19
Marginal	10	7				3
Total	305	215	53	20	20	123
TOTAL						
Conventional	1 775	1 788	1 579	1 236	1 105	1 497
Non-conventional	118	319	90	62	7	119
Marginal	16	44	94	80	13	49
Total	**1 909**	**2 151**	**1 763**	**1 378**	**1 125**	**1 665**
b) Second Growth						
Alberni West						
Conventional	1			11	64	15
Non-conventional					1	
Total	1			11	65	15
c) TOTAL	**1 910**	**2 151**	**1 763**	**1 389**	**1 190**	**1 681**

1) Volumes from Table 1c have been adjusted according to MoF billed volumes.
2) Volumes include residue.
3) Harvest volumes do not inclued SBFEP.
4) Volumes for 1994 have been changed (corrected from those reported in TFL 44 Management Plan #3, Appendix VIII, Table 4.12.2.
5) The Clayoquot partition is based on the distribution between conventional and non-conventional in the Chief Forester's letter of December 31, 1993 and the reduced AAC in the Chief Forester's letter of May 27, 1994.
6) Conventional, Non-conventional and Marginal categories are based on inventory classification and not on actual harvest method.

APPENDIX I - Table 2

TFL 44 SBFEP Timber Harvested - 1998
Based on Billing from Vancouver Forest Region
Volume (m^3)

BCFS District	Timber Sale	Billed Volume	Billed Residue	Total Volume
South Island Forest District	42278		290	290
	42276A	3 884		3 884
	45875A	17 794		17 794
	33539F	9		9
	33539G	37 431		37 431
	33539L	16 144	1835	17 979
Total		**75 262**	**2 125**	**77 387**

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APPENDIX I - Table 3

TFL 44 Road Construction Report - 1998

Working Circle	Operation	New Construction (km)			Debuilt Road (1) (km)
		Mainline Branch	Spur	Other	
Alberni East	Franklin	3.1	39.0		7.8
Alberni West	Franklin		4.0		
	Sproat		28.9		7.2
	Total		32.9		7.2
Clayoquot	Corp For, Nan	0.8			20.0
Ucluelet	Franklin				2.5
Total		**3.9**	**71.9**		**37.5**

(1) Debuilt roads are defined as those in which the road structure has been rehabilitated as close to the original land profile as is feasible and, where practicable, restored to forest growing production.

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APPENDIX I - Table 4

TFL 44 Fire Report - 1998

Number and Causes of Fires										
	Lightning		Escape Slash		Operational		Public		Total	
Working Circle	No.	Ha	No.	Ha	No.	Ha	No.	Ha	No.	Ha
Alberni West							1	Spot	1	Spot
Total							**1**		**1**	

Area Burned by Forest Fires (ha)					
Working Circle	Mature	Immature	AAR	NSR	Total
Alberni West	Spot				Spot
Total	**Spot**				**Spot**

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APPENDIX I - Table 5

TFL 44 Site Preparation - 1998
(Hectares)

Working Circle	Operation	Tenure	Broadcast Burn	Burn Accum.[1]	Mechanical	Three Metre Knockdown	Total Hectares
Alberin East	Franklin	Private			61		61
		Crown		18	46		64
		Total		18	107		125
Alberni West	Franklin	Private					
		Crown		2			2
		Total		2			2
	Sproat	Private			15	154	169
		Crown		2			2
		Total		2	15	154	171
	Total	Private			15	154	169
		Crown		4			4
		Total		4	15	154	173
Clayoquot	Corporate Forestry, Nanaimo	Private					
		Crown		22			22
		Total		22			22
Total		Private			76	154	230
		Crown		44	46		90
		Total		**44**	**122**	**154**	**320**

[1] Actual hectares of roadside accumulations burned.

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APPENDIX I - Table 6

TFL 44 Summary of Planting - 1998
(000s of trees)

		Woodlands Operation				
		Working Circles				Grand Total
		Alberni East	Alberni West	Clayoquot	Ucluelet	
Type of Planting	Species	No. Trees (000s)	No. Trees (000s)	No. Trees (000s)	No. Trees (000s)	No. Trees (000s)
Normal	Ba	4.6	10.1			14.7
	Cw	594.2	163.0	46.0	4.7	807.9
	Cy	77.8	64.3	6.2		148.3
	Df	152.9	51.5	7.9	1.1	213.4
	Ds	1.9				1.9
	Hm	7.1	11.0			18.1
	Hw	377.8	124.2	11.9		513.9
	Pl	5.8				5.8
	Total	**1 222.1**	**424.1**	**72.0**	**5.8**	**1 724.0**
Fill	Ba	1.0				1.0
	Cw	47.0	18.8	45.6	7.4	118.8
	Cy	14.4	0.4	6.5		21.3
	Df	14.7	3.5	2.8	0.7	21.7
	Ds	2.1				2.1
	Hm	4.9				4.9
	Hw	18.5	3.8	5.5	0.7	28.5
	Total	**102.6**	**26.5**	**60.4**	**8.8**	**198.3**

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APPENDIX I - Table 7

TFL 44 Hectares Planted - 1998

(hectares)

Working Circle	Tenure	Normal	Fill	Total Hectares	Plant + Fertilize
Alberni East	Private	149	41	190	190
	Crown	1 091	105	1 196	796
	Total	1 240	146	1 386	986
Alberni West	Private	21		21	
	Crown	360	52	412	228
	Total	381	52	433	228
Clayoquot	Private				
	Crown	86	115	201	
	Total	86	115	201	
Ucluelet	Private	1	2	3	
	Crown	4	11	15	
	Total	5	13	18	
Total	Private	171	43	214	190
	Crown	1 541	283	1 824	1 024
	Total	**1 712**	**326**	**2 038**	**1 214**

Note: Planted and Fertilize hectares included in hectares planted.

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APPENDIX I - Table 8

TFL 44 Plantation Survival And Regeneration Performance Report - 1998

Working Circle	Operation	Natural			Plantation		
		Examined (ha)	Stocked (ha)	Percent Stocked	Examined (ha)	Successful (ha)	Percent Successful
		Stocking Survey			Survival Survey (First Year)		
Alberni East	Franklin	1 325	394	30	587	536	91
Alberni West	Franklin	122	14	11	197	134	68
	Sproat	150	115	77	532	531	100
	Total	272	129	47	729	665	91
Clayoquot	Corp For, Nan	72	68	94	159	155	97
Total		**1 669**	**591**	**35**	**1 475**	**1 356**	**92**

		Regeneration Performance (Third Year)			Regeneration Performance (Third Year)		
Alberni East	Franklin	85	76	89	478	450	94
Alberni West	Franklin	60	59	98			
	Sproat				1 123	1 102	98
	Total	60	59	98	1 123	1 102	98
Clayoquot	Corp For, Nan	315	282	90			
Total		**460**	**417**	**91**	**1 601**	**1 552**	**97**

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APPENDIX I - Table 9

TFL 44 Restocking Statement to December 31, 1998
(Hectares)

Reconciliation of Denuded Lands	Backlog	TFL 20/21 M&WP #1 - 5	TFL 44 M&WP #1	TFL 44 M&WP #2 1991	1992	1993	1994	1995	1996	1997	Total	MP #3 1998	Grand Total
DENUDATION HISTORY													
- Logging	20 860	82 501	20 258	2 741	2 329	1 670	2 177	1 833	1 891	1 360	14 001	1 001	138 621
- Fire		1 420	250		18						18		1 688
- Other		196											196
Total Denuded	20 860	84 117	104 977	2 741	2 347	1 670	2 177	1 833	1 891	1 360	14 019	1 001	140 505
RESTOCKING RECONCILATION													
- Total at previous year end			414	23	33	125	160	343	1 338	1 157	3 179		3 593
- Add total denuded current year												1 001	1 001
- Regeneration failures			78	48	11	12	1	27	5		104		182
- Adjustments[1]			50	5	2	10	6	4	19	140	186	- 84	152
Total AAR for Reclassification			542	76	46	147	167	374	1 362	1 297	3 469	917	4 928
RESTOCKING CLASSIFICATION FOR 1998													
-Non-productive[2]			4									144	148
- Stocked[3]													
. Planted			261	52	26	120	130	237	600	286	1 451		1 712
.Seeded													
. Natural			85	1	11	15	28	55	73	19	202		287
Total stocked			346	53	37	135	158	292	673	305	1 653		1 999
Total Awaiting Restocking			192	23	9	12	9	82	689	992	1 816	773	2 781
Total Classified During 1998			**542**	**76**	**46**	**147**	**167**	**374**	**1 362**	**1 297**	**3 469**	**917**	4 928
AAR as of December 31,1998			192	23	9	12	9	82	689	992	1 816	773	2 781
Net Change from 1997			- 222		- 24	- 113	- 151	- 261	- 649	- 165	-1 363	773	- 812

[1] Adjustments due to area remeasurements, correction of denuded data, etc.

[2] Reclassification of Non-productive areas (roads, rock, swamp, etc.)

[3] Does not include "fill" planting (i.e., intensification of stocking) or planting in the 30-year reserve in Block I, Stillwater

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Appendix I - Table 10

TFL 44 Stand Tending - 1998
(hectares)

Working Circle	Operation	Tenure	Brushing/ Weeding	Spacing	Fertilize	Plant + Fertilize	Pruning	Total Hectares
Alberin East	Franklin	Private	30			190		220
		Crown	659	25		796		1 480
		Total	689	25		986		1 700
Alberni West	Franklin	Private						
		Crown	107	23		228	15	373
		Total	107	23		228	15	373
	Sproat	Private	22					22
		Crown	102	73			29	204
		Total	124	73			29	226
	Total	Private	22					22
		Crown	209	96		228	44	577
		Total	231	96		228	44	599
Clayoquot	Corporate	Private						
	Forestry,	Crown	380	48	247		2	677
	Nanaimo	Total	380	48	247		2	677
Ucluelet	Franklin	Private						
		Crown	17	20	6		12	55
		Total	17	20	6		12	55
Total		Private	52			190		242
		Crown	1 265	189	253	1 024	58	2 789
		Total	**1 317**	**189**	**253**	**1 214**	**58**	**3 031**

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Appendix I - Table 11

TFL 44 Erosion Control Seeding - 1998
(Hectares)

Working Circle	Operation	Tenure	Hydro Seeding	Dry Seeding	Total Hectares
Alberni East	Franklin	Private			
		Crown	58	18	76
		Total	58	18	76
Alberni West	Franklin	Private			
		Crown		3	3
		Total		3	3
	Sproat	Private	6		6
		Crown	24		24
		Total	30		30
	Total	Private	6		6
		Crown	24	3	27
		Total	30	3	33
Clayoquot	Corporate Forestry, Nananimo	Private			
		Crown		29	29
		Total		29	29
Ucluelet	Franklin	Private			
		Crown		16	16
		Total		16	16
Total		Private	6		6
		Crown	82	66	148
		Total	**88**	**66**	**154**

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APPENDIX I - Table 12

TFL 44 Miscellaneous Stand Surveys and Assessments - 1998
(hectares)

Working Circle	Operation	Pre-log Prescript	Post-log Prescript	Site Degradation Prescript	Stand Maintenance Prescript	Post Treatment Evaluation	Free Growing	Green-up Surveys	Total Area Assessed
Alberni East	Franklin	422	2 456	3 215	10 125	35	152	2 306	18 711
Alberni West	Franklin		406		943			101	1 450
	Sproat	570	77		207	121	1 623		2 598
	Total	570	483		1 150	121	1 623	101	4 048
Clayoquot	Corp For, Nan		818		910		85		1 813
Ucluelet	Franklin		354						354
Total		**992**	**4 111**	**3 215**	**12 185**	**156**	**1 860**	**2 407**	**24 926**

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APPENDIX I - Table 13

TFL 44 Free Growing Status Report for Openings Requiring MoF Approval [1]

As of December 31, 1998

Working Circle	Operation	Openings Not Free Growing					Openings Free Growing [3]	
		Number of Openings	Treatment Required (ha)	FG Survey Pending (ha)	Declared FG [2] (ha)	Total (ha)	Number of Openings	Hectares
Alberni East	Franklin	393.0	8,802.0	4,275.0	17.0	13,094.0	2	
Alberni West	Sproat, Estevan	319.0	4,071.0	4,020.0	474.0	8,565.0	1	24
Clayoquot								
Total		**712**	**12,873**	**8,295**	**491**	**21,659**	**3**	**24**

Notes:

[1] Only openings/cut blocks with a date of felling on or after October 1, 1987 or negotiated with the MoF, where felling spanned the cut-off date.

[2] Partial FG openings. An opening is not reported in the next column until it is declared completely Free Growing by MacMillan Bloedel.

[3] Openings declared Free Growing by MacMillan Bloeded and not yet approved by MoF.

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APPENDIX I - Table 14

TFL 44 Funding Credits - 1998

Working Circle	Operation	Source [1]	Activity/Description	$	Ha
Alberni East	Franklin	FRBC/IO	Spacing	38 887	21
		FRBC/IO	Brushing and Weeding	155 668	158
		FRBC/IO	Assessments	30 757	1 499
		FRBC/IO	Planting	22 106	14
		FRBC/IO	Grass Seeding	20 000	6
		FRBC/IO	WRP Assessment/Supervision	182 252	n/a
		Total		449 670	1 698
Alberni West	Sproat	FRBC	Brushing and Weeding	57 800	37
		FRBC	Spacing	204 000	73
		FRBC	Pruning	115 000	29
		FRBC	Watershed Restoration	276 000	n/a
		Total		652 800	139
Clayoquot	Corporate Forestry, Nanaimo	FRBC	Enhancement	78 400	
		FRBC	Road deactivation	860	n/a
		FRBC	Surveys	34 000	417
		Total		113 260	417
Ucluelet		FRBC	Enhancement	56 200	
		FRBC	Road deactivation	327	n/a
		FRBC	Surveys	14 500	154
		Total		71 027	154
Total				**1 286 757**	**2 408**

[1] Industry Outstanding, Forest Renewal Fund, FRDA, SMFRA, etc.

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APPENDIX I I - Table 1

MacMillan Bloedel Cone Collection - 1998
as of December 31, 1998

Species	Cone Collection (hectolitres)		
	MB Orchards	Wild Collections	Total
Yc		36.32	36.32
Total		**36.32**	**36.32**

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APPENDIX II - Table 2

MacMillan Bloedel Seed Inventory - 1998

Species	MacMillan Bloedel Seed Inventory[1]				
	Seed Orchard Seed (gm)	Seed Orchard Control Cross (gm)	Wild Seed[2] (gm)	Total Seed (gm)	Approx. Seedlings (000's)
Ba			388 734	388 734	1 703
Bg			14 360	14 360	150
Bn			44 205	44 205	213
Cw	222		19 235	19 457	3 763
Fd	151 077		26 566	177 643	5 692
Hm			521	521	56
Hw	33 883		41 249	75 132	9 726
Lw			617	617	24
Plc			2 941	2 941	400
Pli			40	40	6
Pw			890	890	13
Py			755	755	3
Ss	8 565		3 063	11 628	1 763
Sx			2 923	2 923	361
Sxs			611	611	34
Yc			25 093	25 093	683
Total	**193 747**		**571 803**	**765 550**	**24 590**

(1) Does not include seed from 1998 collections
(2) Wild seed from all seed zones are included

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APPENDIX II - Table 3

Planting Stock Inventory and Sowing Request
as of December 31. 1998

Species	Planting Stock Inventory plus Request 000s of Trees		
	Spring 1999	Fall 1999 / Spring 2000	Total
Ba	124	108	232
Bg	1	1	2
Bn	10	12	22
Cw	1 820	1 755	3 575
Dg	4	1	5
Fd	1 623	3 236	4 859
Hm	4	54	58
Hw	1 648	1 194	2 842
Plc	60	281	341
Pw	22	63	85
Ss	820	286	1 106
Sx	21	3	24
Yc	451	772	1 223
Ac	20	15	35
Total	**6 628**	**7 781**	**14 409**

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