

## **Appendix V Twenty Year Plan**

**CRESTBROOK FOREST INDUSTRIES LTD.**

**TWENTY YEAR PLAN**

**SPILLIMACHEEN FOREST**

**TREE FARM LICENCE 14**

**March 2000**

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## **Introduction**

This Twenty Year Plan, prepared by Crestbrook Forest Industries Ltd. (CFI), is presented as an alternative to the Critical Analysis of Schedules for Harvesting (CASH) / Timber Supply Review (TSR) Twenty Year Spatial Feasibility plan generated by Timberline Forest Inventory Consultants. Both were prepared in conjunction with the TFL 14 Management Plan No. 8 TSR. This operationally driven strategic plan (the Parson Option) identifies spatially where harvesting can occur at levels determined through the “base case” analysis. Please note that this plan has a number of differences from the CASH twenty year spatial feasibility version, the details of which are presented throughout the remainder of this document. For comparison, the descriptive text of the Spatial Feasibility option is included in Appendix 1.

A summary of the inputs and assumptions made in preparing the timber supply analysis is contained in the TFL 14 Spillimacheen Management Plan No. 8 Timber Supply Analysis Information Package – March 2000. This Twenty Year Plan describes how those assumptions were applied or amended in a spatial context. The plan follows the suggested format of the Ministry of Forests Tree Farm Licence Management Plan Guidelines (August 1998).

## **Tree Farm Licence 14 Area Description and Harvest Levels**

Tree Farm Licence 14 lies in the Purcell Mountains and falls within the Engelmann Spruce Subalpine Fir, Montane Spruce, Interior Cedar Hemlock, and Interior Douglas Fir zones of the biogeoclimatic ecosystem classification (BEC) system. It encompasses the watersheds of the Spillimacheen River, Bobbie Burns Creek and Vowell Creek drainages as well as the benches directly west of the Columbia River near Parson, B.C.

The total area of the licence is 150,431 hectares, of which 74,386 hectares (49%) is covered in productive forest. The other 76,045 hectares (51%) are alpine tundra, glaciers and snowfields, rock, lakes, swamps and roads. The productive forest contributes only 53,439 hectares (36%) to the net long-term operable forest area.

### ***Allowable Annual Cut (AAC)***

Due to time constraints, the Parson Option scheduling was based on harvest levels provided prior to the final base case identified in the TSR, therefore they differ from the CASH projections. The following table provides a comparison between the two:

**Table 1 Comparison of the AAC levels between the Twenty Year Plan and the CASH Spatial Feasibility Option.**

<b>Five year Period</b>	<b>Twenty Year Plan (m3/year)</b>	<b>CASH Option (m3/year)</b>
First Five years	164,000	164,000
Second Five Years	156,000	164,000
Third Five years	148,000	156,000
Fourth Five years	133,000	148,000

## **Methodology**

This plan spatially depicts where the projected harvest levels can be achieved in five year increments. The management practices defined in the base case scenario of the Information Package were generally followed. Where guidelines and constraints were applied differently, the associated variances are described below.

As recommended in the Management Plan Guidelines, the current Forest Development Plan constitutes the initial five year period of the 20 Year Plan. Thus the commencement date of this Plan is the year 2000 and a final year is 2019. The CASH Plan version commenced in 1999, utilizing actual blocks harvested that year, and continued to the year 2018. For information purposes, a 1999 harvesting summary has been included in Appendix 2. Further, the 1999 volume has been included in the harvesting table summary in Appendix 3.

We were fortunate to have a wide variety of expertise contribute to this Plan. Please refer to Appendix 4 for a list of team participants and their respective responsibilities.

A variety of information sources were utilized in preparing this Plan. Please refer to Appendix 5.

## **Guidelines and Constraints**

### ***Higher Level Plans***

Currently in the Invermere Forest District there are no higher level plans. However the Kootenay Boundary Land Use Plan (KBLUP) Implementation Strategy was incorporated into the planning process.

## ***General***

In general this Twenty Year Plan utilized the same guidelines and constraints outlined in the TFL 14 Timber Supply Analysis Information Package. It differed in that it better reflected operational realities and employed an ecologically based biodiversity option.

The following comments provide information as to where this Plan differs from the Analysis.

## ***Cutblock Design***

Cut block design and the associated harvesting and silviculture systems were planned utilizing current Forest Development Plan criteria. Planning guidelines were developed reflecting evolving philosophies and strategies. Replies received in response to the public review of the “MP No. 8 Statement of Management Objectives, Options and Procedures” were also considered.

For a detailed review of blocking criteria, please refer to Appendix 6, “TFL #14 Management Plan #8 – Twenty Year and Forest Development Plan Blocking, Harvesting and Silviculture System Guidelines”.

Cutblock design and harvesting systems in the CASH model Twenty Year Plan were a combination of blocks determined through the Parson Plan process and CASH model projections. The CASH model was directed to harvest the Parson Plan blocks first, and if prohibited by analysis constraint factors, predict where harvesting may occur.

## ***Volume Determination***

This plan utilized cruise volume information where it was available, otherwise the volume information was determined from the forest cover inventory. The percent of the volume allowed to contribute from each cutblock was dependant on the silviculture system applied (please refer to Appendix 6).

Volumes determined for the Parson Option were based on 1999 forest cover information, whereas the CASH model incorporated volume increments accrued throughout the term of the Plan.

The CASH model Plan did not utilize cruise volumes.

## ***Biodiversity***

All biodiversity scenarios were based on the current Kootenay Boundary Land Use Plan Landscape Unit boundaries.

The Analysis allowed for biodiversity as directed by the Chief Forester (May 25, 1998). Biodiversity emphases were 45% low, 45% intermediate and 10% high for each TFL Landscape Unit. Constraints were applied according to the goals defined in the September 1995 FPC Biodiversity Guidebook and subsequently updated through the FPC Landscape Unit Planning Guide, March 1999.

The CASH model Twenty Year Plan utilized the current KBLUP emphasis options and applied constraints according to the goals defined in the September 1995 FPC Biodiversity Guidebook and subsequently updated through the FPC Landscape Unit Planning Guide, March 1999.

The Parson Option is taking an adaptive management approach to ecosystem based management. The objective being to achieve “priority” and “full” biodiversity as well as landscape goals in a timber resource management environment.

This direction focused a greater emphasis on the ecological principles underlying biological diversity and ecosystems. Priorities were established using available information on a variety of forest resource issues such as rare and endangered species, riparian ecosystems, the survival needs of various birds and mammals as well as natural events.

Utilizing recent Terrestrial Ecosystem Mapping and forest cover data, a Biodiversity analysis was carried out based on the Kootenay Boundary Land Use Implementation Strategy. The analysis depicts the current TEM structural stage distribution measured against the goals defined in the September 1995 FPC Biodiversity Guidebook and subsequently updated through the FPC Landscape Unit Planning Guide, March 1999.

A “reserve and recruitment” strategy has been provided in conjunction with the analysis. Consideration was given to TFL goals, ecosystem management objectives, landscape connectivity, stand composition and structure, red and blue listed species, interior habitat conditions and old growth management. The strategy emphasizes ecosystems, natural disturbance patterns and stand structural attributes rather than current stand age. The strategy also provides direction on how to achieve goals at strategic and operational levels.

Details of the “Biodiversity Analysis and Old Growth Recruitment Strategy for TFL 14” – March 2000 were presented in an information package separate from this Plan.

The “Biodiversity Analysis and Old Growth Recruitment Strategy” provides the Statuary Decision Maker a sound basis for justifying the activities outlined in the Twenty Year and Forest Development Plans.

### ***Wildlife Tree Reserves (WTR)***

The TSR and CASH model Twenty Year Plan recognized existing and proposed wildlife tree patches identified through field activities to date. Additional WTR were spatially accounted for through the modeling process.

The Parson Option also included existing and proposed WTRs. Further, utilizing TEM, forest cover information and local knowledge, the Parson Option identified additional WTR candidate areas and “blocked” them along with candidate “reserve and recruitment” areas. Their focus of the candidate areas is centered on existing old growth, specific ecosystems, red and blue listed species habitats, ecosystems where establishment of a climax forest is more likely, and inoperable areas within the timber harvesting land base. Further, to enhance long-term structural diversity, allowance for single tree and group wildlife tree patches has been facilitated through silviculture system constraints. A percentage of the volume within each proposed cutblock has been identified to for recruitment of reserves during operational activities.

### ***Harvesting Priorities***

The CASH model was directed to harvest the Parson Plan blocks first, and if prohibited by Analysis constraint factors, predict where harvesting may occur.

The Parson Option based its scheduling on operational objectives including priorities due to ongoing insect infestations, the TFL Grizzly Bear management strategy, balances of harvesting systems, seasonal constraints and economics.

Please refer to Appendix 6, “TFL #14 Management Plan #8 – Twenty Year and Forest Development Plan Blocking, Harvesting and Silviculture System Guidelines”.

## **Twenty Year Plan Information**

### ***Tabular Information (appendices 3 and 4)***

Tabular presentation of the proposed harvesting areas, subtotaled by five year periods, is provided in Appendix 3. Areas harvested in 1999 are shown in Appendix 2. The following information is provided for each cutblock:

- landscape unit
- cutting permit
- block
- map reference
- geographic location
- biogeoclimatic zone and subzone
- standards unit
- approval status
- harvest method
- silviculture system
- gross area (ha)



- harvest volume (m<sup>3</sup>)
- scheduled year of harvest

### ***Mapsheet Presentation (appendix 7)***

To facilitate ease of referral, mapping information has been provided utilizing a base map and one overlay.

The base map pictorially presents:

- the name of the licensee
- tenure
- the term of the plan
- plan completion date
- a notation that this 20 Year Plan is a projection and not a definitive operational plan
- licence boundaries
- domestic watersheds
- timber types by leading species and age category
- existing roads and river crossings
- existing recreation sites

The overlay presents:

- licensee name
- tenure
- the term of the plan
- plan completion date
- existing five year development plan cutblock boundaries
- operability line
- 20 year plan blocks depicted by harvest period
- harvesting system
- future roads and river crossings
- landscape unit boundaries
- winter range boundaries
- visual quality objectives
- management zone boundaries

## **Status of Information**

### ***Forest Cover Inventory***

A re-inventory of the original TFL area was undertaken in the period 1984 through 1986. It was completed to MOF standards of the day and compiled in digital format. Ministry of Forests inventory data for the TFL “extension area” was added to the database in 1990. All maps were subsequently converted to the TRIM map base (NAD 83). The inventory has been updated to October 1998. Subsequent disturbance and stocking changes were referenced from CFI silviculture record keeping system up to December 31, 1999.

Further, an earlier Ministry of Forests inventory audit indicated Tree Farm forest cover volumes to be underestimated. As directed by the Chief Forester, CFI through Timberline undertook an Inventory Audit and Adjustment program to rectify the problem. Accordingly, the volume estimates were adjusted upward on an average of 21%. For additional detail please refer to “TFL 14, MP No. 8, Inventory Audit and Adjustment Strategy – April 1999.

Inventory site classes were updated through the “TFL 14 MP No.8 Ecologically Based Productivity Estimates” study completed in April 1999. Please refer to that report for further detail.

### ***Operability***

The “operability” and “economic operability” lines utilized for MP #7 have been replaced with a single “operability” line. The revised line is a reflection of ground reconnaissance, site classification, problem forest types, terrain hazard analysis and reconciliation between the two original lines.

### ***Ungulate Winter Range***

The “Ungulate Winter Range” boundaries were revised utilizing Terrestrial Ecosystem Mapping habitat classification, winter range studies previously conducted by Mirkwood Ecological Consultants, a study by Matrix Resources of wintering Elk, and local knowledge. The revised Range(s) have been classified according to the ungulate species primarily utilizing the area. There are three types, Moose, Elk and Mule deer. Local Ministry of Environment personnel participated in the revision process.

### ***Scenic Areas***

Within the Twelve Mile Landscape Unit, a “known” scenic area, the Visual Quality Objectives for mature Lodgepole Pine types were revised from “Partial Retention” to

“Modification”. These revisions better reflects the likelihood of clearcutting within these types in response to infestations by mountain pine beetle.

### ***Slope Stability Hazard***

“Terrain Stability Intensity Level D” surveys have been completed for the entire operable area and portions of the inoperable area of TFL 14. This Plan reflects the updated information.

### ***Streams, Wetlands and Lakes***

The 1995 TFL 14 Stream Inventory completed by Mirkwood Ecological Consultants has been updated. The update incorporated information from a stream crossing and ford assessments project, as well as Mirkwood’s 1998 review utilizing air photos, current field information and TRIM slope themes. The information has been incorporated into current stream mapping.

Additional inventory information regarding streams, wetlands, lakes and their associated ecosystems was gathered as part of the TFL Terrestrial Ecosystem Mapping project.

### ***Archaeological Information***

Archaeological Overview Assessments have been completed for Landscape Units I38 “Twelve Mile” and I35 “Lower Spillimacheen”. These assessments, along with information resulting from Preliminary Field Reviews and Archaeological Impact Assessments were referenced during plan preparation.

### ***Roads***

The forest cover inventory road data was updated using orthophotos, low-level photography, Global Positioning System information TRIM mapping and the TFL Access Management Plan.

Future road locations were approximated considering, topography, terrain hazards, harvesting constraints, and various management objectives related to other resources, for example stream protection.

## **Review Schedule**

- |                |                                 |
|----------------|---------------------------------|
| March 31, 2000 | - initial submittal to the MOF  |
| April 30, 2000 | - MOF approves Twenty Year Plan |

## Appendices

***Appendix 1 – Timber Supply Analysis Report - Twenty Year Spatial Feasibility***

This section has been extracted from the Timber Supply Analysis Report prepared by Timberline Forest Inventory Consultants (Section 7.0).

## 7.0. Twenty-Year Plan Option Analysis

In the context of spatial harvest modeling, the arrangement of harvest blocks within the forest landscape is critical to the results. Data input into the analysis included the following hierarchy of blocking sources:

1. Twenty-year plan blocks;
2. Total chance plan blocks (do not completely block the landbase); and
3. Remaining areas blocked based on forest cover polygons.

The following sections document management assumptions and timber flow profile changes from the base case implemented in this twenty-year spatial feasibility option.

### 7.1 Special Resource Management Zone

The special resource management zone (SRMZ) employed a minimum green-up height of 3 meters. This differs from the Current Management Scenario only because this run was finalized before the final green-up height was agreed to. Project schedule required the 20-Year planning to proceed at the time.

### 7.2 Regeneration Delay

Clear-cut areas were assigned a regeneration delay of 2 years as per the current aggressive silviculture regime practiced on the TFL.

### 7.3 Draft Biodiversity Emphasis Values

In the Current Management Scenario, landscape biodiversity constraint values were drawn from the Biodiversity Guidebook using weighted average biodiversity seral stage requirements assuming the following deployment: high emphasis 10%, intermediate emphasis 45%, and low emphasis 45%.

The Kootenay/Boundary Land Use Plan (KBLUP) identified draft biodiversity emphasis option values for landscape units falling within TFL 14 (Table 7.3). Constraint values based on these were used in this option (Table 7.4).

**Table 7.3 Draft biodiversity emphasis option – emphasis assignment**

<b>Landscape Unit Number</b>	<b>Landscape Unit</b>	<b>Biodiversity Emphasis</b>
I34	Bobbie Burns	Low
I35	Lower Spillimacheen	ESSF and others – Low, MS - Intermediate
I37	Upper Spillimacheen	ESSF and others – Low, MS - Intermediate
I38	Columbia Bench	Intermediate

**Table 7.4 Draft biodiversity emphasis option – old seral requirements**

NDT	BEC Variant	Emphasis	Mature Plus Old (% > years)	Old Seral Minimum Retention Area (%)			Old Seral Minimum Age (> years)
				First Rotation	Second Rotation	Third Rotation	
2	ESSFwm, wmu	Low	14 > 120	3	6	9	250
		Intermed.	28 > 120	9	9	9	250
	ICHmw1	Low	15 > 100	3	6	9	250
		Intermed.	31 > 100	9	9	9	250
3	ESSFdk, dku	Low	14 > 120	4.6	9.2	14	140
		Intermed.	23 > 120	14	14	14	140
	ICHmk1	Low	14 > 100	4.6	9.2	14	140
		Intermed.	23 > 100	14	14	14	140
	Msdk	Low	14 > 100	4.6	9.2	14	140
		Intermed.	26 > 100	14	14	14	140
4	IDFdm2	Low	17 > 100	4.3	8.6	13	250
		Intermed.	34 > 100	13	13	13	250

**7.4 Twenty-year Plan Option Results**

The harvest forecast and long term growing stock implications are shown in Table 7.5. The operable growing stock (harvestable stands), merchantable growing stock (operable stands of harvestable age), and available growing stock (stands of harvestable age not required to meet forest cover requirements) are depicted based on twenty-year spatial feasibility forest management assumptions.

**Table 7.5 Harvest and growing stock summary over time – Twenty-year Plan Option**

Decade	Current Management	Twenty-year Plan Option (m <sup>3</sup> /yr)			Decadal Growing Stock (000m <sup>3</sup> )		
		Clearcut	Shelterwood	Total	Available	Merchantable	Operable
1	160,000*	147,600	16,400	164,000	2,966	8,217	9,536
2	145,000*	146,025	5,975	152,000	1,847	7,673	8,894
3	134,000	131,061	3,939	135,000	1,521	7,713	8,886
4	150,000	149,734	266	150,000	3,032	7,122	8,768
5	150,000	149,780	220	150,000	2,809	6,470	8,638
6	150,000	148,312	1,689	150,000	2,357	6,372	8,620
7	150,000	146,184	3,816	150,000	2,013	6,171	8,694
8	150,000	150,000	0	150,000	1,602	6,112	8,840
9	150,000	150,000	0	150,000	1,791	6,215	9,108
10	150,000	150,000	0	150,000	1,728	6,604	9,363
11	162,000	157,606	4,394	162,000	1,719	6,773	9,537
12	162,000	149,788	12,212	162,000	2,105	6,898	9,557
13	162,000	157,912	4,088	162,000	1,743	6,759	9,567
14	162,000	161,693	307	162,000	1,895	6,919	9,634
15	162,000	161,398	602	162,000	2,203	6,940	9,694
16	162,000	160,913	1,087	162,000	2,483	7,250	9,741
17	162,000	158,910	3,091	162,000	2,623	7,213	9,689
18	162,000	157,217	4,783	162,000	2,818	7,216	9,595
19	162,000	162,000	0	162,000	2,578	6,826	9,501
20	162,000	162,000	0	162,000	2,269	6,498	9,514

\*The harvest for the first decade represents an average of the first 5 years (164,000 m<sup>3</sup>/yr) and the second 5 years (164,000 m<sup>3</sup>/yr).

The harvest for the second decade represents an average of third 5 years (156,000 m<sup>3</sup>/yr) and fourth 5 years (148,000 m<sup>3</sup>/yr).

The current harvest level of 164,000 m<sup>3</sup>/yr can be maintained for 1 decade. The harvest level must then decline in two 10% decrements until it reaches a mid term harvest level of 150,000 m<sup>3</sup>/yr. A long term harvest level of 162,000 m<sup>3</sup>/yr can be achieved 110 years from now (Figure 7.5).

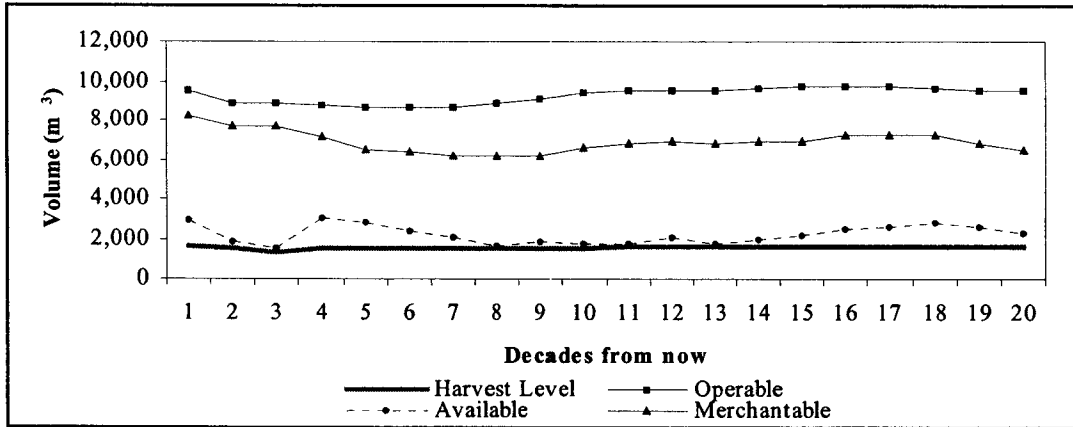


Figure 7.4 Harvest and growing stock profile over time – Twenty-year Plan Option

Figure 7.5 provides the timber harvest schedule over time given the Twenty-year Plan Option assumptions. A theoretical long run sustainable yield (LRSY) value based on the maximum average growth rate, or long term MAI (4.15 m<sup>3</sup>/yr), using the current managed yields is included in Figure 7.5.

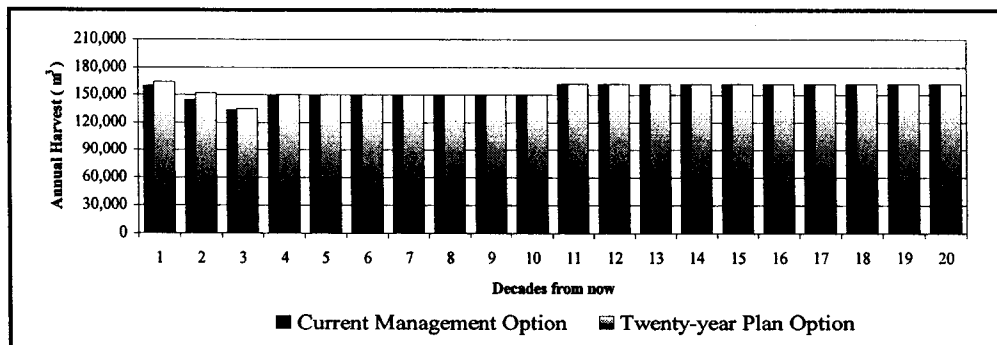


Figure 7.5 Harvest schedule – Current Management and Twenty-year Plan Option

The long term harvest level of 209,900 m<sup>3</sup>/yr (*long term timber harvesting landbase \* average weighted MAI – NRLs*) is not sustainable primarily because stands are not always harvested at ages that would maximize volume yield over the long term. This can occur because of minimum harvest ages, forest cover requirements, or harvest flow scenarios.

Overall, timber availability under the Twenty-year Plan Option is significantly constrained at two future points. The surplus averages 41% of the harvest over the entire



planning horizon (Figure 7.4). It reaches a low of approximately 7% in decade 8 and 6% in decade 11, which represent limiting points in time controlling harvest flow.

#### *7.5 Twenty-year Plan – Relax Forest Development Plan Priority*

Under the Current Management Option forest development plan blocks are prioritized during the simulation. It is assumed that this will be the pattern of harvest in the short term. To address issues associated with pre-defined blocking patterns across the forest landscape this analysis does not prioritize forest development plan blocks during the simulation. Thus, a forest development plan block takes no precedence over another harvestable block within the TFL.

As seen in Table 7.6 and Figure 7.6, existing short, mid, and long term harvest levels were

*In progress*

***Appendix 2 – Harvest History Report – 1999***

***Appendix 3 – Twenty year Plan Harvesting Report 2000- 2019***

#### ***Appendix 4 - Local Planning Team Participants***

<u>Agency or Company</u>	<u>Personal</u>	<u>Responsibilities</u>
Crestbrook Forest Industries	George Richardson Paul Frasca	Management Direction Strategic and Operational Planning Text and Tables
	Bruce Pope	GIS and Data Management Biodiversity Data Preparation Forest Cover / TEM Themes Mapping Presentation
	Kellie Tegart	Forest Management System Input and Data Manipulation Submittal Preparation
	Lil Cacaci	History Records and Queries
	Grant Neville	Silviculture Strategies
Comfor Forestry Services Ltd.	Randy Appleton Rod Dempsy	Strategic and Operational Planning Data Management and Assembly
Timberline Forest Inventory Consultants Limited	David Carson Joanne White	TSR Predictive Modeling CASH 20-Year Plan
Matrix Resources Services	Bob Ferguson	Strategic and Operational Planning Terrestrial Ecosystem Data Interpretation Biodiversity Analysis and Old Growth Strategy Winter Range Strategy
Ministry of Forests	Russ Haas Steve Jablanczy Russ Hendry	Consultation, Direction and Approvals
Ministry of Environment	Peter Holmes	Consultation, Direction and Approvals

## ***Appendix 5 - Information Sources***

The following information was referred to when preparing the Twenty Year Plan:

- Ministry of Forests Tree Farm Licence Management Plan Guidelines – August 1998
- The Forest Practices Code (FPC) of British Columbia Act
- Ministry of Forests Tree Farm Licence Management Plan Guidelines - August 1998
- FPC Operational Planning Regulation
- FPC Forest Development Plan Guidebook - December 1995
- FPC Biodiversity Guidebook - September 1995
- FPC Managing Identified Wildlife Procedures and Measures - February 1999
- FPC Landscape Unit Planning Guide - March 1999
- Kootenay / Boundary Land Use Plan, Implementation Strategy - June 1997
- MOF Supplement to The Forest Development Plan Guidebook For The Invermere Forest District - November 1995
- MOF Supplement to The Forest Development Plan Guidebook For The Invermere Forest District - updated January 1998
- Invermere Forest District Guidance for preparation of the 2000 Forest Development Plan Update- December 6, 1999
- Memorandum of Understanding between Ministry of Forests and Ministry of Environment, Lands and Parks Regarding Instruction for the Preparation of the 1998 Forest Development Plans - October, 1997
- Crestbrook Forest Industries Limited, TFL 14 - Spillimacheen Management Plan No. 8 Timber Supply Analysis Package - Timberline, December 1999
- Tree Farm Licence 14, Management Plan #8 Statement of Management Objectives, Options, and Procedures - January 29, 1999
- TFL 14 MP No. 8, Ecologically Based Productivity Estimates - Timberline, September, 1999
- TFL 14 MP No. 8 Inventory Audit and Adjustment Strategy - Timberline, 1999

- TFL 14 Stream Inventory - Mirkwood Ecological Consultants Ltd., 1995 Update
  - TFL 14 Stream Crossing and Ford Assessments FRBC Project #: 97 - WRP - FRBC - 15 Mirkwood Ecological Consultants Ltd., March 1998
  - March 1999 update, source air photos and TRIM slope theme - Mirkwood, Comfor
- TFL 14 Terrestrial Ecosystem Mapping Project- JMJ Holdings Inc., April 30, 1999
- TFL 14 Slope Stability Hazard Review (Terrain Survey Intensity Level D) - Wells, Newcomen , Banting- 1995 to 1999,
  - TFL operable area +complete
- TFL Ungulate Winter Range Inventory - Mirkwood Ecological Consultants Ltd., March 1998
- TFL 14 Owl, Woodpecker and Wildlife Tree Inventory - Mirkwood Ecological Consultants Ltd., April 1997
- Avalanche Paths in TFL 14, Inventory, Description, Classification and Management - Faculty of Environmental Design, University of Calgary, Michael Quinn and James Phillips, August 1999
- Winter Food Habits Of Rocky Mountain Elk and Experimental Burning Of Elk Winter Range At Twelve Mile Creek, Columbia Wetlands Wildlife Management Area, British Columbia - Matrix Resources Services, December 1997
- TFL 14 Highway 95 Visual Corridor Landscape Analysis - Larry Price and George Richardson, July 1991
  - Computer analysis of visible topography - Bruce Pope, Crestbrook 1996
    - revision of VQOs for mature Lodgepole Pine leading types from “Partial Retention” to “Modified (with additional sensitivity)” – Richardson / MOF 1999
- TFL 14 Recreation Inventory and Analysis – Cairn Resource Consultants, May 1995
  - Updated to new labeling format - Ministry of Forests, October 1998
- Forest Cover Inventory - Crestbrook Forest Industries, Timberline
  - Forest Cover - updated to October 1998
  - Silviculture history records, including harvesting - updated to December 1999
  - TFL roads overlay - updated to December 1999

## **Appendix 6-Blocking and Harvesting Guidelines for Twenty year Plan and Forest Development Plan**

January 2000

### **TFL #14 MANAGEMENT PLAN #8 TWENTY YEAR AND FOREST DEVELOPMENT PLAN**

#### **BLOCKING, HARVESTING AND SILVICULTURE SYSTEM GUIDELINES**

##### **General Design Guidelines**

- use Resource Management Plan (RMP) boundaries as Cutting Permit units
- block on 1:20000 map base
- blocking information to be summarized in the standard FDP format
  - Parson to enter blocking data into Forest Management System
  - information input form provided to be completed
  - Timberline to generate volumes based on analysis assumptions where no cruise information exists
  - indicate five year period in which block is available, prioritize availability of older blocks earlier
- block for mature stands first:
  - Pl leading: age class 5+, age class 8 consider for OGMA
  - Spruce/Balsam: age class 7+ first priority, age class 6 - second priority, age class 5 - third priority, consider age class 9 for OGMA
  - Fir leading: consider fir to be a more stable species over the long term and where reserves are necessary consider fir first, particularly vets; fir leading stands will often be planned for selective harvest; block and scheduling priorities as for spruce/balsam stands
- if possible, avoid having block boundaries straddle boundaries that influence timber availability on a broad scale eg:
  - winter range
  - “known” visual management zone(s)
  - SRMZ in the North Spilli (Baird Planning Cell)
- consider TEM ecosystem lines (refer to theme maps)
- block to reflect the revised operability line
- site index blocking guidelines
  - Pl stands >8 to be included
  - O/S stands >10 to be included
  - obviously consider economics associated with poorer stands
- stocking classes Pl stands:
  - stocking class 3: >50% slope less than 70% of the stands will be addressed

- stocking class 4: 0% contribution
- “reserve / modified harvesting” areas directed at meeting biodiversity objectives, have been delineated considering TEM ecosystem and structural information as well as information from standard sources. Bob Ferguson will partake in this portion of the blocking exercise
  - Bob is to be consulted with respect to the type of cut and % removal within the reserve / modified harvesting areas
- Streams: if appropriate, block to stream boundaries, % removal will be governed by stream class reserve, management zone and timber type (primarily pine leading types)
- lakes and wetlands: unless there is a specific reason, block outside of the reserve zone, timber availability within management zone will depend on class, forest type and TEM rating.
- refer to previous RMP Habitat Attribute Emphasis Area information, these are being rethought utilizing TEM data
- mature and OGMA areas to be directed towards critical habitats first
- refer to previous the Planning Cell Terms of Reference for information purposes, these will be updated but based on the KBLUP proposed LUs
- green-up:
  - prioritize blocking and availability against polygons SR>3m first, SR 2 - 3m second, then NSR
  - refer to the scheduling timeline guidelines below
- use roads as boundaries where reasonable to do so
- blocks may or may not encompass two harvesting systems:
  - conventional - up to 40-45% slope
  - cable is the first priority for aerial
    - downhill 200m
    - uphill 250m
    - general 400m between roads
  - long-line is the second priority for aerial
    - base on economics - heli / cable vs long-line, consider access costs
  - heli is the third priority for aerial
- terrain: no blocking on Unstable polygons (note exceptions in Shaw’s Crossing area will have to be level A verified), mitigate Partially Unstable polygons with harvesting system.
- avalanche – design blocks to avoid “avalanche spread” and resultant restocking problems, refer to natural disturbance pattern maps, air photos, etc
- mimic natural fire patterns



- generally soften visual impact of clear / seed tree cuts:
  - mimic natural opening patterns on adjacent landscapes
  - avoid straight lines
  - consider landscape patterns
- avoid visual and harvesting impacts directly adjacent to recreation sites - harvesting within and adjacent to these sites can occur to facilitate “stand attribute management” in the interests of the landscape feature being addressed
- protect and facilitate domestic watershed intakes
- scheduling season and year available (see guidelines below):
  - geographic areas where current impact is lowest will generally be harvested first
  - susceptible pine a priority
  - balance winter, start-up and no restriction profile
    - TEM theme to depict dry sites - insight into start up areas
  - minimize entry period in small drainage units with emphasis on bear management

## Landscape Unit Guidelines (consider in addition to the General Design Guidelines)

### 134 Bobbie Burns

- emphasis on grizzly habitat in high elevation valleys
  - minimize human interface
    - establish “pass rotation” on a valley basis rather than a three pass system within a particular valley
      - maximize volume from a drainage in the first pass, plan to leave the valley void of activity for the next 25 - 30 years
      - quick entry for harvesting and silviculture
      - close access when no industrial activity ongoing
      - consider existing development patterns between drainages
      - review Malachite and Upper Bobbie drainage recce’s, schedule the Malachite first as portions of Upper Bobbie are immature
    - maintain cover attributes adjacent to “high” value habitats (see avalanche habitat classification, contact U of C re any info available yet, use air photos)
    - connectivity to be provided through inoperable first, follow by considering high value habitats
- block configurations revised to consider concerns expressed by CMH (see CMH response letter)
- new and aggregate block size can be greater than 40 ha if necessary, but should not be a goal
- buffer the hunting lodge site

### 135 - Lower Spillimacheen

- old growth deficit in this LU
- maintain VET fir fragments and stands, provide for rotations thereof
- emphasis on riparian networks and endangered ecosystems (mainly riparian)
- provide for horizontal and vertical structural diversity when applying the silviculture system (refer to silviculture system removal percentages below)
- within “critical winter wildlife range”: block and schedule according to objectives established working through TEM:
  - cover, recruitment and reserves directed according to ecosystem and topographic feature
  - reduced block size, configurations and distribution will parallel mpb harvesting activities that have historically occurred in the area
  - mix of mature/old and early structural stages
- critical habitat attributes to be identified and prescribed for in conjunction with Bob Ferguson
- emphasis on removal of pine - prioritize according to mountain pine beetle susceptibility
- new and aggregate blocks up to 200 ha + can be considered on occasion, but wildlife tree patches, connectivity etc. must be provided within the block
- consider recent blow down patterns in previous selective harvest areas - piece size (stocking class), crown closure and stand composition - plan for avoidance of reoccurrence
- consider proposed Southern Main haul route
- note commercial thinning pulp opportunities, emphasis on P1 leading stands
- pulp opportunities in P1 and suppressed fir stands will be addressed through the TFL type 2 analysis and follow-up.

### 137 - Upper Spillimacheen

- mimic natural disturbance patterns
  - larger blocks on SW aspects - blocks and aggregates up to 200 ha+ can be considered
  - NE aspects - new and aggregate block size can be greater than 40 if necessary, but should not be a goal
- note old growth deficit in MSdk areas and portions of ESSFdk
- note streams, including ephemeral, important to Spilli fisheries
- emphasis on susceptible pine stands

### Landscape Unit 138 - Twelve Mile

- old growth deficit in this LU
- where applicable, design as LU 135 with additional emphasis as follows;
- visual landscape management is a priority as this LU is within a “known” visual corridor, refer to Bruce Pope’s visual analysis and the visual classification assessment
- note, anticipate some small clear cuts in PI leading areas due to mpb
- respect the interface with the Columbia wetlands as it is a main landscape ecosystem associated with the TFL
- to accommodate visual impact management objectives, blocking and scheduling should facilitate 6m green-up on average in open areas, note the influence of slope
- current mpb infestations have resulted in removal of scattered vet PI from thrifty immature stands - plan for this to continue
- review inaccessible areas on Jubilee face for OGMA - refer to 1998 FDP
- consider SW Jubilee exposure for ungulate habitat enhancement

### Standard Silviculture Systems

CCRES	PC 85% removal
CLEAR	CC 95% removal
PATCT	SC 60% removal
SEEDT	PC 90% removal
SELEC	SC 50% removal
SHELT	PC 60% removal
RETEN	PC 85% removal

### Scheduling Timing Guidelines

- when determining the period available, generally allow the following time delays commencing from the year of adjacent harvest:
  - cold air drainages – 30 years
  - other areas - 20 years

	Cold Air	Other
2000 – 2005	as per five year plan	as per five year plan
2006 – 2010	1976 – 1980	1986 – 1990
2011 – 2015	1981 – 1985	1991 – 1995
2016 – 2020	1986 – 1990	1996 – 2005
2021+	high elevation valleys deferred on multiple valley entry scenario	

## ***Appendix 7***

### **Mapping**

The “Base Map” and “Blocking Overlay” have been provided under separate cover.