Sustainable Harvest RMP -- TFL 49 (2000 – 2005)

1. Introduction

This five year (2000 – 2005) Resource Management Plan has been prepared for the Management Unit of TFL 49 towards the development of a Regional Resource Management Plan as requested by Forest Renewal BC. This plan uses the format provided for the Sustainable Harvest Program and includes references to the programs known as Strengthening Sustainable Forest Management and Enhancing Environmental Values.

2. Basic data on TFL 49

2.1 Location And Manufacturing Facilities

TFL 49 (approximately 144,000 ha) consists of three blocks. The TFL was designated as a result of an amalgamation in 1984 of Tree Farm Licences No. 9 (Block A), No. 16 (Block B), and No. 32 (Block C). Management on this area-based licence has been conducted for over 45 years. Block A is situated West of Okanagan Lake to the height of land between the Okanagan and Nicola drainages, and north of Lambly Creek, to the Naswhito Creek drainage. Block B adjoins the North West portion of Block A, runs West of Bouleau Lake, bounded on the South by the Salmon River drainage, to Salmon Lake, North to Monte Lake and West to the Monte Hills and Weyman Creek drainage. Block C is separate from the rest of the TFL. It is located north of Falkland and east of Pillar Lake towards the Salmon River.

Riverside's two main manufacturing facilities supplied by TFL 49 are located on the East side of Okanagan Lake at Armstrong and Kelowna. Logs that are not suitable for plywood manufacture, or do not fit our sawmill configuration, are generally sold or traded to other local manufacturers.

2.2 Timber Management Objectives

The short and long-term availability of timber on TFL 49 has been examined in the Timber Supply Analysis Report. The analysis evaluates how current management, and non-timber resources, affects the supply of harvestable timber over a 250-year period. It also quantifies the sensitivity of the results to uncertainty associated with modelling inputs. The timber supply analysis provides the technical basis for the Chief Forester of British Columbia to determine an AAC for TFL 49 for the term of this plan.

Riverside's management plan maintains the currently approved AAC of 380,000 cubic metres per year, not including unrecoverable losses. This goal is inclusive of the small business allocation of 36,905 cubic metres per year (9.7%). For the purposes of timber supply analysis, the objective is to maintain the harvest at or above the long run sustainable yield level. Short-term harvests may be above a basic sustainable level without compromising future harvests.

The long-term objective of Riverside is to produce logs of suitable species and quality for the profitable manufacture of lumber and plywood.

3.0 Total Area

The total area of TFL 49 is 143,760 ha. This is composed of 1,449 ha of water, 6,887 ha of non-forest and non-productive land and 135,424 ha of productive forest land.

4.0 Current Harvest Forecast

The Current Management Option includes the following assumptions or inputs as defined in the Timber Supply Analysis Information Package:

- Management activity as defined by operations over the last 5 years;
- Implementation of the Forest Practices Code (FPC) as it was interpreted August 1997, including riparian management, stand level biodiversity, and low emphasis landscape biodiversity guidelines;
- An up-to-date Vegetation Resources Inventory (VRI);
- Partial implementation of adjustments for negative site index bias in old growth stands;
- VDYP natural stand yields and WinTIPSY managed stand yields;
- Current utilization standards;
- Visual quality objectives;
- Wildlife management;
- Genetic gains from tree improvement;
- Basic silviculture; and
- Consideration of problem forest types and forest health consistent with current management.

Figure 4.1 presents the harvest forecast resulting from the current management assumptions and the harvest flow assumptions discussed above. The current AAC of 380,000 m^3 can be maintained for two decades after which harvests decline through six decades to a minimum level followed by an increase to a long-term sustainable level of 290,000 m^3. Figure 4.1 also displays the theoretical long run sustainable yield figure based on managed stand yields. IRM constraints, which retain timber past culmination age, are the main cause of the difference between the theoretical value and attainable levels. Table 4.2 provides the actual harvest values used in Figure 4.1.

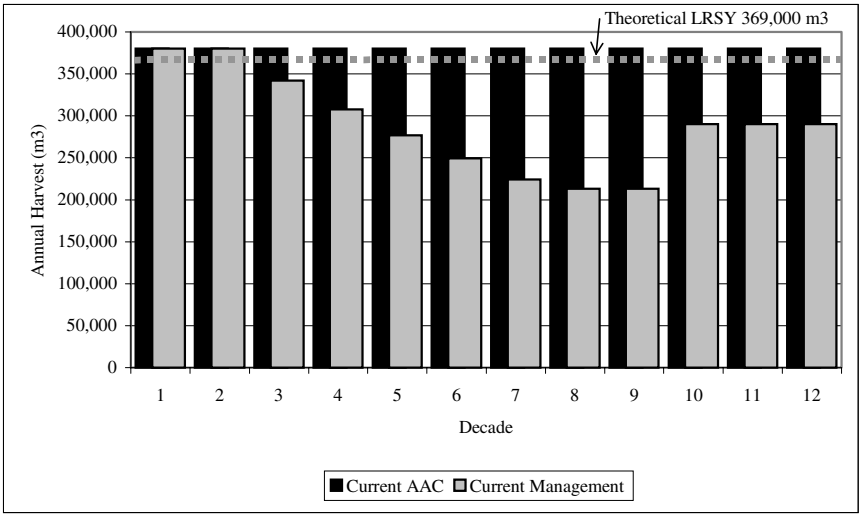

Figure 4.1 Current Management harvest schedule

Table 4.2 Harvest schedule – Current Management Option

Decade	Current AAC	Current Management
1	380,000	380,000
2	380,000	380,000
3	380,000	342,000
4	380,000	307,800
5	380,000	277,020
6	380,000	249,318
7	380,000	224,386
8	380,000	213,167
9	380,000	213,167
10	380,000	290,000
11	380,000	290,000
12	380,000	290,000

Table 4-3 Site Class Profile and Analysis Units

Analysis Unit #	Species	TSA Block	Site Index Class	Net Area (ha)	% of Net Land Base
1	Douglas-fir	A,B,C	1	4,905	3.92
2	(<= 140 years)		2	11,555	9.24
3			3	9,330	7.46
4	Pine	A,B,C	1	5,294	4.23
5	(<= 140 years)		2	21,669	17.33
6			3	20,834	16.66
7	Balsam	A,B,C	1	1,876	1.50
8	(<= 140 years)		2	4,801	3.84
9			3	4,927	3.94
10	Spruce	A,B,C	1	1,326	1.06
11	(<= 140 years)		2	4,171	3.34
12			3	2,948	2.36
31	Douglas-fir	A,C	1	625	0.50
32	(> 140 years)		2	3,321	2.66
33			3	2,838	2.27
34	Pine	A,C	1	791	0.63
35	(> 140 years)		2	3,061	2.45
36			3	1,624	1.30
37	Balsam	A,C	1	73	0.06
38	(> 140 years)		2	1,132	0.91
39			3	2,288	1.83
40	Spruce	A,C	1	1,452	1.16
41	(> 140 years)		2	4,256	3.40
42			3	3,131	2.50
51	Douglas-fir	B	1	125	0.10
52	(> 140 years)		2	910	0.73
53			3	3,044	2.43
54	Pine	B	1	48	0.04
55	(> 140 years)		2	438	0.35
56			3	433	0.35
57	Balsam (> 140 years)	B	1	15	0.01
58			2	50	0.04
59			3	415	0.33
60	Spruce	B	1	207	0.17
61	(> 140 years)		2	227	0.18
62			3	879	0.70
97	Deciduous	A,B,C	1	0	0
98			2	0	0
99			3	0	0
Total				125,022	99.98

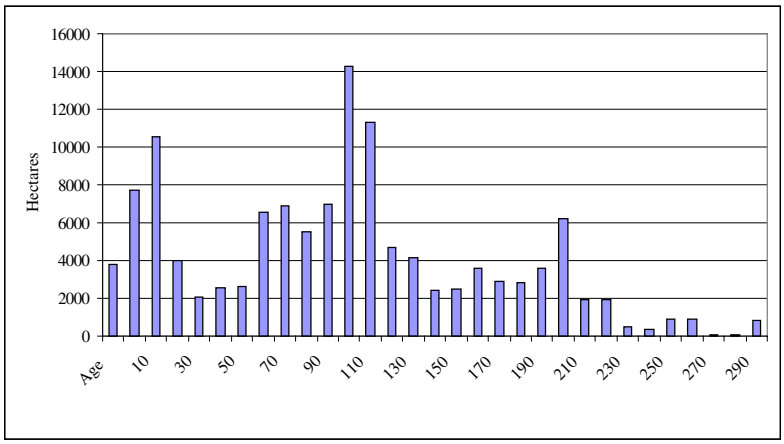

Figure 4.2 Age Class Profile

Table 4.4 Age class distribution

Leading Age	Area (ha)
0	3,782
10	7,743
20	10,549
30	4,025
40	2,042
50	2,563
60	2,593
70	6,560
80	6,902
90	5,519
100	6,955
110	14,273
120	11,331
130	4,662
140	4,146
150	2,380
160	2,478
170	3,603
180	2,869
190	2,846
200	3,585
210	6,212
220	1,910
230	1,952
240	484
250	333
260	893
270	869
280	46
290	91
300	825

5.0 Timber Supply Issues

5.1 Sensitivities

Sensitivities involving aggressive basic silviculture indicated no short-term effect. Switching to all regeneration by planting yields long-term benefits due to the increased productivity of the stands and pushes mid-term levels up slightly due to lower average culmination values. Two metre green-up significantly increases short-term harvest flexibility due to earlier availability of stands but can not overcome the problem of limited mature harvestable timber in the short-term. No harvest level benefits are realized. More stringent constraint regimes could change the balance and make aggressive basic silviculture a positive pressure.
Using 'current management' as the criteria, community watershed management was addressed in a sensitivity run. Application of a 20% maximum disturbance constraint, using a six-metre definition of green-up, in community watersheds has a relatively small negative short-term effect in the context of other current management assumptions.
The Land and Resource Management Plan process will deal with both biodiversity emphasis and the designation of protected areas. Until direction is provided it is speculative to consider the impacts. However several sensitivity analyses were prepared to investigate the possible effects on timber supply. The removal from the timber harvesting land base of Goal One Areas and Areas of Interest as defined for the Protected Areas Strategy (a 9% reduction to the net harvesting land base) has significant impacts throughout the analysis period. The way in which biodiversity constraints are being applied masks the impact of switching emphasis levels, and the sensitivities on this show little effect. If full implementation of the Biodiversity Guidebook were implemented the impact is severe and immediate (Figure 5.1).

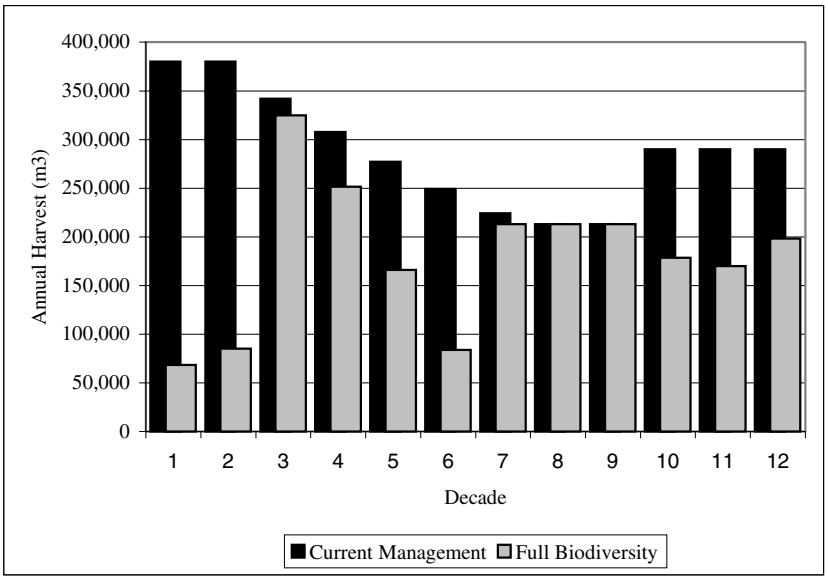

Figure 5.1 Full biodiversity constraints using a 45/45/10 average emphasis
(from Timber Supply Analysis Report, February, 1998)

Landscape biodiversity constraints applied at the subzone level, rather than the biogeoclimatic zone level, had little impact on the analysis. These are the only levels to which the biodiversity constraints could practically be applied on the TFL.
Wildlife tree patches, by virtue of their operational nature, are difficult to deal with in a strategic analysis. The full spectrum of structures able to contribute to stand level biodiversity can not be identified. By following the recognized methodology for determining a land base reduction for tree patches the need has likely been overestimated.
A sensitivity analysis setting a harvest priority for pine (98% of the harvest from pine stands in the first 50 years) indicated only a small mid-term positive impact. From an operational point of view, such a restriction is unrealistic.
The effect of partial harvesting on cover constraints in a forest level analysis is difficult to assess with certainty. Similarly, the productivity characteristics and future yields from partially harvested stands are very uncertain. One would expect the timber supply impacts from partial harvests to be a trade-off between long-

term productivity losses and short term increases in operational flexibility. The balance will depend on the characteristics of the forest estate in question. The selective harvest sensitivity indicates no effect in the short-term, but does have a long-term impact.

From the Riverside Management Option as a base, positive pressures on short-term harvest levels include:

- Aggressive silviculture; and
- Wildlife tree patches.

Negative pressures on short-term harvests include:

- Community watersheds;
- Protected areas strategy; and
- Landscape biodiversity guidelines.

5.2 Information Gaps

Information gaps that contribute to uncertainty in the planning and management process of the Timber Supply Analysis for TFL 49 and that are considered within the scope of FRBC have been identified as follows:

- A rigorous inventory of streams, wetlands and lakes to FPC standards;
- Data to support the full implementation of adjustments for negative old growth site index bias. This may include a complete site series level biogeoclimatic classification of the TFL that would improve the confidence in productivity estimates used, as well as be useful in the management of non-timber resources;
- Silviculture records including growth intercept data that will improve productivity estimates of plantations;
- Information on the impact on managed stand yields with respect to strict stocking control;
- Documentation of gains from successive generations of genetically improved seed;
- A rigorous methodology to confirm natural stand yields;
- Forest cover constraints for IRM based on the specific requirements and characteristics of TFL 49;
- Data to support revised estimates of unsalvaged losses; and
- Localized operational adjustment factors (OAFs) for managed stand yields.

6.0 Silviculture History

All stands age 30 or less were assigned to managed stand yield curves, reflecting the silviculture history of the licence. Please see Figure 6.1 below. Site preparation and planting began on the TFL in 1971. Stands older than 30 years will be assigned to the appropriate VDYP curves. All regenerated stands, natural or planted will be assigned to managed stand yields reflecting adherence to minimum stocking standards.

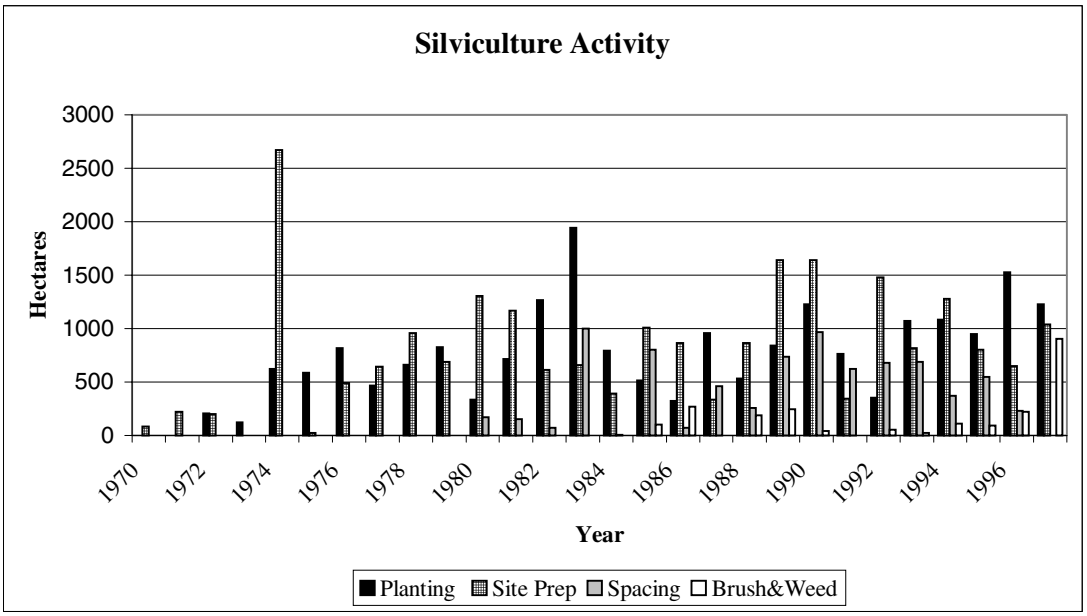

Figure 6.1 Silviculture History on TFL 49

7.0 Opportunities

The Enhanced Forest Management Project will be completed by March, 2000.

The following summary outlines the issues and opportunities that are anticipated. Once the project is complete, working targets will be available for the 2001/02 RMP. In the meantime, the plan for 2000/01 has been based on comparable programs of recent years.

7.1 Sensitivity Analysis

A sensitivity analysis will be completed to assess the impact of Forest Practices Code guidelines on:

- short and long-term timber availability;
- inventory and growth and yield database enhancements; and
- mitigative effects of enhanced silviculture activities and innovative harvesting techniques.

The Timber Supply Analysis has provided an initial sensitivity analysis using CASH_FM which will be supplemented by additional COMPLAN runs to take into account the spatial considerations.

A key objective of undertaking the sensitivity analysis will be the identification of management strategies which will provide the greatest benefit. In this way, it will be possible to prioritize the additional analysis that will be undertaken. Details of the sensitivity analyses follow:

7.2 Impact of FPC Guidelines

COMPLAN will be used to illustrate the impacts of the following FPC guidelines:

- various green-up standards for visual quality and hydrology;
- proposed Forest Ecosystem Networks (FENs);
- deer winter ranges;
- proposed marten corridors;
- lakeshore management zones; and
- proposed protected areas.

7.3 Inventory and Growth and Yield Database Enhancements

Preliminary analysis indicates that the volumes predicted by the VDYP model significantly underestimate the volume when compared with volume estimates obtained during cutting permit cruising. Furthermore, there is evidence that cruise volumes underestimate the delivered volumes measured at the weigh scale. If these two observations are correct, they have major implications for timber supply in TFL 49. At the current annual allowable cut of 380 000 m^3 per year, significantly less area is required to be harvested annually than that predicted in the Timber Supply Analysis. This will have the effect of extending the availability of mature timber so that the predicted shortfall in 60 to 70 years is mitigated.

A sensitivity analysis will be undertaken with COMPLAN to illustrate the effects that different levels of VDYP volume underestimation have on long-term timber supply. This analysis will be completed by modifying the yield tables to reflect increased volumes and will take into account any effects of spatial relationships and constraints.

There is also concern that the site index values for old growth stands are underestimated. While this does not have an effect on volumes realized from existing stands, it does have implications for height growth (i.e. green-up time), rotation age and volumes for second growth stands. The Timber Supply Analysis has completed a sensitivity analysis with respect to increased site index values as anticipated through the Old Growth Site Index project. Further analysis will be undertaken with COMPLAN to illustrate the effects on timber supply with full spatial resolution.

Several options can be undertaken to enhance the accuracy of the inventory and growth and yield databases. These include:

- a VDYP versus cruise volume study that will meet the requirements of the MoF;
- application of interim Old Growth Site Index (OGSI) adjustments throughout the TFL;
- biogeoclimatic classification of Blocks A and C (Block B has already been completed) of the TFL to allow SIBEC application throughout the TFL;
- an additional OGSI study to address balsam, fir and age class 6 and 7 stands; and
- field surveys to localize the operational adjustment factors (OAFs) used in TIPSY. The MoF is currently developing procedures for doing this.

7.4 Effect of Enhanced Silviculture Activities

Many different enhanced silviculture activities can be carried out on TFL 49. Several examples include:

- fertilization to reduce green-up times;
- shortening regeneration delay;
- increasing target and minimum stocking levels;

- using genetically improved seed;
- using improved site index information;
- using improved forest health information;
- pre-commercial thinning to provide commercial volume earlier in the rotation;
- commercial thinning to provide commercial volume earlier in the rotation;
- upgrading marginally stocked areas;
- site rehabilitation of stands with low productivity; and
- reducing site disturbance.

A sensitivity analysis is required to determine which of these activities can provide the greatest benefit in achieving the timber supply objectives of the TFL while providing adequate or improved levels of non-timber resource values. To complete this sensitivity analysis, it will be necessary to produce new yield tables that reflect the anticipated response of the stands to the various treatments. Research Branch has indicated willingness to assist with this task using the TASS/SYLVER model.

TASS/SYLVER provides a means to predict the effects of different initial spacing densities, pre-commercial spacing regimes and commercial thinning on volume and product mixes (i.e. log size distributions).

Once the yield tables have been produced, it will be possible to select those enhanced silviculture or mensurational activities that are anticipated to have the greatest benefit. COMPLAN will then be used to determine what effect spatial considerations have on realization of these benefits.

8.0 Proposed Sustainable Harvest Program

Backlog Program - Table A
Incremental Silviculture Program - Tables B and G
Forest Health Enhancement Program - Table C
Forest Health Maintenance Program - Table D
Habitat Supply Program - Table F
Summary Table for TFL 49
* no Current Fire and Pest Table E (covered in the Okanagan TSA plan)

9.0 Job Outcomes

Job Outcomes are provided in the Regional RMP Roll-up and have not been included in this plan.

10.0 References

- Proposed Management Plan No. 3 (Jan. 1, 1999 – Dec. 31, 2003) TFL 49, Riverside Forest Products Limited, October 23, 1998.
- Timber Supply Analysis Report, TFL 49 Management Plan No. 3, Riverside Forest Products Limited, February, 1998.
- Timber Supply Analysis Information Package, TFL 49 Management Plan #3, Riverside Forest Products Limited, January, 1998.
- Proposed Enhanced Forest Management Project, TFL 49, Simons Reid Collins., April, 1998