

**WEST FRASER MILLS LTD.
BOWRON-COTTONWOOD TREE FARM LICENCE
(TFL 52)**

**TYPE II
FOREST LEVEL
SILVICULTURE STRATEGY**

**PREFERRED SILVICULTURE
STRATEGY REPORT**

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EXECUTIVE SUMMARY

The objective of this Preferred Silviculture Strategy (PSS) is to provide strategic direction to silviculture planning by determining the level, type and scheduling of discretionary silviculture expenditures that maximize the financial return on the Bowron-Cottonwood Tree Farm Licence (TFL) 52. A number of individual treatments were tested in isolation on the TFL and evaluated based on the following criteria. These results are documented in the TFL 52 – Type II Analysis Report.

- The total financial return for the scenario, in comparison with the base case, as indicated by the net present value of the net revenue produced;
- The impact of the scenario on product value and timber quality;
- The short and long-term harvest forecast;
- The total silviculture cost; and
- An assessment of the risk associated with each scenario.

Based on the evaluation results, a composite scenario (the PSS) was developed and modelled using only silviculture treatments determined to have a significant positive impact on the future harvest forecast and financial return on the TFL. Silviculture treatments selected for inclusion in the PSS are as follows:

- Fertilization;
- Commercial thinning / fertilization;
- Use of enhanced genetic seed;
- Planting of a higher percentage of spruce on certain sites; and
- Rehabilitation of intermediate utilization balsam and NSR stands.

The resulting Preferred Silviculture Strategy scenario measures the cumulative impacts of the above silviculture treatments on the land base. The PSS increases the base case harvest level by 11.3% (to 767,712 m³/yr) in the short-term and 5.5% (to 785,443 m³/yr) in the long-term. From an economic perspective, the PSS increases the base case financial return on the TFL by 8.3% over the base case, over the entire planning horizon.

A spatial feasibility analysis of the PSS for the first 30 years of the planning horizon indicates that 81% of the PSS harvest forecast, or an average of 625,112 m³/yr can be allocated spatially to the land base given the current legislative spatial requirements for block size, green-up and adjacency.

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1.0 INTRODUCTION

The following Preferred Silviculture Strategy (PSS) Report provides strategic direction to silviculture planning by determining the level, type and scheduling of discretionary silviculture expenditures that maximize the financial return on the Bowron-Cottonwood Tree Farm Licence (TFL) 52. Specifically, the purpose of this project is to identify how to allocate discretionary silviculture expenditures to improve the quality and quantity of timber supply on the TFL.

This Preferred Silviculture Strategy Report is the last of three companion documents associated with the preparation of a silviculture strategy for TFL 52, namely:

- Information Package;
- Analysis Report; and
- Preferred Silviculture Strategy Report.

This document describes a silviculture investment strategy based on forest-level financial analysis of stand-level silviculture treatments that improve the quantity and quality of timber supply on the TFL. It includes recommendations for both incremental silviculture treatments of existing managed stands and changes to current crop planning regimes for future managed stands.

The assumptions used in this analysis follow closely the assumptions used for the TFL 52 – Management Plan (MP) #3 analysis. These assumptions, along with the assumptions used in each silviculture scenario are described in detail in the *West Fraser Mills Ltd Bowron-Cottonwood Tree Farm Licence (TFL 52) Type II Forest Level Silviculture Strategy – Information Package*.

An incremental silviculture strategy should not be confused with the allowable annual cut (AAC) determination process. Allowable annual cut levels are based on actual practice and current information at the time of the determination. This strategy is concerned with planning for the future state of our forests over a 175-year planning horizon. The degree to which the strategy proves appropriate and is implemented may influence future, but not necessarily present AAC determinations.

1.1 INFORMATION SOURCES

A variety of sources were used in developing the Type II Forest Level Silviculture Strategy. A complete list of sources is included in Section 5.0. The main sources of information are listed below:

- West Fraser Mills Ltd. Bowron-Cottonwood Tree Farm Licence TFL 52 Intensive Silviculture Management Strategy for TFL 52, Earl Spielman, RPF (October 1998);
- Management Options for Balsam Intermediate Utilization Stands on TFL 52, J.S. Thrower & Associates Ltd. (November, 2000);
- West Fraser Mills Ltd. Bowron-Cottonwood Tree Farm Licence TFL 52 Management Plan #3 Timber Supply Analysis Report, Timberline Forest Inventory Consultants (December, 2000);

- Incremental Silviculture Strategy for British Columbia, B.C. Ministry of Forests (1999); and
- TFL 52 Type-II Silviculture Analysis Workshop held at Quesnel, B.C. (February, 2001).

1.2 ACKNOWLEDGEMENTS

Integrated Silviculture Services Ltd. and Timberline Forest Inventory Consultants Ltd. were jointly selected by West Fraser Mills to undertake this project. This project is administered by Earl Spielman of West Fraser Mills and is jointly funded by Forest Renewal BC (FRBC) and West Fraser Mills. Representatives from the Ministry of Forests (MoF) and the Ministry of Environment, Lands and Parks (MoELP) provided valuable input through a stakeholder workshop and subsequent communication.

1.3 HOW THE STRATEGY WAS DEVELOPED

The development of this Preferred Silviculture Strategy represents the culmination of a series of steps including research and the collaboration with stakeholder and other experts. Following is a brief synopsis of the process:

- 1) Preparation of the *Preliminary Information Report – Stakeholder Workshop (February 2001)*. This document contains a description of the project objectives, land base summaries as per MP #3, and a list of potential scenarios for analysis.
- 2) Workshop #1 was held at West Fraser Mills' office in Quesnel on February 13, 2001. Input was solicited from the attendees representing West Fraser Mills, Ministry of Forests (MoF) and, Ministry of Environment, Lands and Parks (MoELP).
- 3) Input from the workshop and the results of further collaboration was summarized in the *TFL 52 – Type II Forest Level Silviculture Analysis – Consensus Document – Draft (May 2001)*. The document was sent to West Fraser Mills and MoF representatives for further review and comment. The assumptions contained within the *Consensus Document* are incorporated into the *TFL 52 – Type II Forest Level Silviculture Analysis – Information Package (December 2001)*.
- 4) This *Information Package* was submitted to West Fraser Mills for approval.
- 5) Base case and alternate silviculture scenario analysis was conducted as per the assumptions contained in the *Information Package*.
- 6) The results and interpretations of the analysis were presented to West Fraser Mills in the *TFL 52 – Type II Forest Level Silviculture Analysis – Analysis Report (July 2002)*.
- 7) From these results specific treatments were selected and combined into one composite scenario – the Preferred Silviculture Strategy. The results of this scenario and various sensitivity analyses are described in this report.

1.4 PROVINCIAL STRATEGY AND OBJECTIVES

In the document *"Incremental Silviculture Strategy for British Columbia (1999)"*, the MoF's broad goals are to provide for a sustainable use of the forest resources, create and maintain community stability, and encourage a strong, thriving forest sector. Incremental silviculture strategies must also be in keeping with higher-level plans under the Forest Practices Code. Until provincial targets for timber quantity and quality are established, management unit strategies are to consider the following interim provincial strategic objectives:

- 1) Maintain current harvest levels as long as possible, without creating disruptive shortfalls in future timber supply.
- 2) Create long-term timber supply capable of supporting a steady long-term provincial harvest level similar to current levels.
- 3) Minimize the interim shortfall in provincial harvest anticipated before a steady long-term timber supply is achieved.
- 4) Create a long-term timber supply that will enable the timber quality profile of future harvests to be the same or better than the current profile.

It is recognized that not every management unit has the same capacity to achieve these objectives and that the ability to do so is highly dependant on the availability of silviculture funding. The purpose of these objectives is to provide guidance to the silviculture investment planning and allocation of available funds.

1.5 WEST FRASER MILLS' MANAGEMENT OBJECTIVES

Since West Fraser Mills Ltd. inception in 1955, the company has maintained a strong commitment towards forest stewardship in the Quesnel TSA. This commitment to forest stewardship can be illustrated by various activities undertaken by the company in recent times, the most noteworthy being:

- 1) Forest management practices on TFL 52 that meet or exceed licensee tenure obligations.
- 2) West Fraser Mills' commitment to an \$800,000 Intensive Forest Management fund for TFL 52 in 1991.
- 3) The acquisition of TFL 52 in 1991, supported by capital investment and increased employment generation for the community of Quesnel.
- 4) Improved utilization of the forest resource through the acquisition, construction and/or modernization of local wood processing facilities.
- 5) Investments in data information systems for its woodlands operation to better track and analyze the forest estate.
- 6) The preparation of an Intensive Silviculture Management Strategy in 1998 identifying a number of forest management opportunities for application to the TFL land base.

Recently, the utility of developing a comprehensive and scientifically defensible forest management strategy, as opposed to applying traditional approaches of timber management, became apparent with MoF approval of Weyerhaeuser's TFL 35

Enhanced Forest Management Plan (AAC increase based on increased level of silviculture intervention), Weldwood's TFL 5 AAC increase (based on the development of localized site indices), and Forest Renewal BC's funding support for Type I and Type II Forest Level Silviculture Strategy.

West Fraser Mills' focus is to improve the economic efficiency of forest management decisions on managed stands by providing woodlands staff with better treatment response information and more localized, quantitative tools to assist them in making more informed decisions on post-harvesting treatments. This Preferred Silviculture Strategy is another step in the continuum of constant improvements sought by the management of West Fraser Mills Ltd.

WORKING TARGETS

Working targets are a means of strategically directing silviculture investment towards specific objectives. The following working targets are identified in West Fraser Mills' *TFL 52 Intensive Silviculture Management Strategy* (Spielman, 1998).

- 1) Identification of unique growth and financial capabilities on each site within the forest land base such as site series, site index and net present value (NPV).
- 2) Identification of the fibre flow goals in relation to the biological and financial capabilities of each site on the forest land base.
- 3) Presentation of an array of different density regimes for each site on the land base that increases yield, improves financial returns, allows for alternate management for longer rotations, larger diameters, and high value product.
- 4) Identification of realistic primary end product goals on the land base that ensures budget expenditures are allocated in a cost effective manner.
- 5) Development of a fibre flow strategy to maximize the sustainable harvest of timber volume largely dependent on the age class structure of the existing stands.
- 6) Identification of an intensive silviculture management strategy that can offset reductions in the AAC from future land withdrawals.

1.6 OPPORTUNITIES TO IMPROVE TIMBER AND HABITAT SUPPLY AND QUANTITY

The timber supply model aiding the development of this strategy is based on using financial return as a primary indicator, therefore changes to timber quality are quantified explicitly for each scenario. Product value as indicated by harvest revenue per cubic metre is shown for each scenario in Table 2 below. These results demonstrate how the average product value recovered from the TFL changes in response to various silviculture treatments.

It was determined at the stakeholder workshop that there was insufficient information available at that time to undertake analysis of improvements to habitat quality and supply. However, this analysis accounts for habitat supply through various maximum disturbance and minimum retention requirements. These requirements maintain a

supply of various levels of Caribou habitat and Mule Deer winter range. Biodiversity requirements also provide for a range of forest conditions and habitat types.

2.0 PREFERRED SILVICULTURE STRATEGY

In the document jointly prepared by the Ministry of Forests (MOF) and Forest Renewal BC (FRBC), entitled *“Forest Level Analysis for Silvicultural Investments (Draft July 1999)”*, the agencies embarked upon an initiative to implement strategic silviculture planning for crown forest land in British Columbia. The ultimate goal of the initiative is to improve the future quantity and quality of both timber and habitat supply by ensuring that silviculture investments are effective and strategically placed.

This project utilizes Type II analysis methods that encapsulate Management Plan #3, West Fraser Mills’ *“Intensive Silviculture Management Strategy”* and stakeholder input to identify the issues and opportunities for silviculture investment. Table 1 and Table 2 below show the results of each individual scenario as reported in the *Analysis Report*. These results were used in the selection of treatments included in the Preferred Silviculture Strategy.

Table 1: Summary of Silviculture Scenario Results.

Scenario	Total Harvest Volume (m³)	Total Harvest Revenue (\$ 1,000s)	Total Silviculture Cost (\$ 1,000s)	Total Net Revenue (\$ 1,000s)	NPV Net Revenue (\$ 1,000s)	NPV Net Revenue Rank
Base Case	124,553,994	6,956,846	704,788	6,252,058	1,150,343	n/a
% Difference from the Base Case						
Fertilization II	5.250	5.098	4.540	2.275	6.524	1
Basic Silviculture	-1.532	5.686	-25.987	8.285	3.351	2
Alternate Density – 1200 sph	-2.052	8.803	-23.590	11.421	2.695	3
Fertilization I	2.078	3.046	0.134	2.280	1.878	4
CT-Fert II	2.175	4.702	-2.375	4.586	1.574	5
CT-Fert II – 50% CT Revenue	1.967	3.469	-1.610	3.168	1.379	
Alternate Density – 1800 sph	-1.168	-2.550	3.452	-3.274	1.315	6
CT-Fert. I	0.555	1.562	-0.424	1.528	1.171	7
CT-Fert I – 50% CT Revenue	0.415	0.513	0.173	0.516	1.054	
Genetic	2.382	3.471	-2.404	4.092	0.826	8
Alternate Species	3.412	4.556	-3.002	5.339	0.279	9
NSR / BI IU Rehab.	0.495	0.606	0.090	0.625	0.145	10
NSR / BI IU Rehab. – 50% Rehab. Cost	1.146	1.406	0.015	1.516	0.325	
NSR / BI IU Rehab. MAX	1.753	2.412	-0.695	2.527	-1.129	
Conifer Release	0.025	-0.032	0.094	-0.050	0.058	11
Conifer Release MAX	-0.003	-0.085	0.140	-0.115	0.043	
Void Planting	0.061	0.021	0.088	0.001	0.049	12
Void Planting MAX	0.414	0.470	-0.035	0.428	-0.182	
Alternate Density – 2200 sph	-0.751	-2.629	6.796	-3.812	-0.931	13
Alternate Density – 3000 sph	-3.762	7.448	10.774	7.057	-4.236	14

Shaded areas represent sensitivity analyses of already ranked scenarios and are not ranked individually.

Table 2: Treatment Impacts on Average Product Value.

Scenario	Average Product Value (\$ / m ³)	Product Value Rank
Base Case	55.85	n/a
% Difference from the Base Case		
Alternate Density – 3000 sph	10.803	1
Alternate Density – 1200 sph	10.637	2
Basic Silviculture	7.109	3
CT-Fert II	2.583	4
CT-Fert II – 50% CT Revenue	1.532	
Alternate Species	1.184	5
Genetic	1.116	6
CT-Fert. I	1.013	7
CT-Fert I – 50% CT Revenue	0.098	
Fertilization I	0.989	8
NSR / BI IU Rehab.	0.111	9
NSR / BI IU Rehab. MAX	0.671	
NSR / BI IU Rehab. – 50% Rehab. Cost	0.262	
Void Planting	-0.041	10
Void Planting MAX	0.056	
Conifer Release	-0.057	11
Conifer Release MAX	-0.082	
Fertilization II	-0.160	12
Alternate Density – 1800 sph	-1.366	13
Alternate Density – 2200 sph	-1.864	14

Shaded areas represent sensitivity analyses of already ranked scenarios and are not ranked individually.

Individual scenarios were evaluated based on the following criteria:

- The total financial return for the scenario, in comparison with the base case, as indicated by the net present value of the net revenue produced;
- The impact of the scenario on product value and timber quality;
- The short and long-term harvest forecast;
- The total silviculture cost; and
- An assessment of the risk associated with each scenario. This includes consideration for factors not captured in the analysis such as the increased probability of crop failure at lower planting density or the dependence of results on less certain assumptions (i.e. product value and treatment cost).

Through this evaluation process, the “best” scenarios were selected and combined into a composite scenario – the Preferred Silviculture Strategy. The decision matrix below (Table 3) shows the considerations used in selecting the PSS treatments.

Table 3: Decision Matrix for PSS Treatment Selection.

Scenario Number / Name	Harvest Volume Short / Long-Term	Product Value	Silviculture Cost	Risk	Financial Return	Included in the PSS?
1 Basic Silviculture	↑ / ↓	↑	↓	H	↑	
2 Enhanced Genetic Gains	— / ↑	↑	↓	L	↑	YES
3 Fertilization I ¹	↑ / ↑	↑	—	M	↑	YES
4 Fertilization II ¹	↑ / ↑	—	↑	M	↑	YES
5 CT-Fertilization I ¹	— / —	↑	—	M	↑	YES
6 CT- Fertilization II ¹	— / —	↑	↓	M	↑	YES
7 NSR / BI IU Rehabilitation	— / ↑	↑	—	M	↑	YES
8 Conifer Release	— / —	—	—	L	—	
9 Alternate Density – 1200 sph	↓ / ↓	↑	↓	H	↑	
9 Alternate Density – 1800 sph	↑ / ↓	↓	↑	H	↑	
9 Alternate Density – 2200 sph	↓ / ↓	↓	↑	M	↓	
9 Alternate Density – 3000 sph	↓ / ↓	↑	↑	M	↓	
10 Alternate Species	— / ↑	↑	↓	L	—	YES
11 Void Planting	— / —	—	—	L	—	

¹These treatments were combined into one CT-Fertilization regime that captured the most beneficial portions of each scenario.

2.1 TREATMENTS NOT INCLUDED IN THE PSS

Based on the decision matrix above, some treatments were excluded from the PSS. The following is a discussion on which treatments were excluded and the reasons for these exclusions.

ALTERNATE DENSITY / BASIC SILVICULTURE

The two low density scenarios (1,200 sph and basic silviculture) are not included in the PSS primarily because of the potential risk of failing to meet free-growing on stands with low planting densities. It is thought that the costs associated with failing to achieve free-growing would counter any financial benefits demonstrated in this analysis. The other

two alternate density scenarios (2,200 sph and 3,000 sph) produce financial returns lower than the base case, mainly driven by higher planting costs and are therefore excluded from the PSS.

While none of the alternate density scenarios are included in the PSS they provide valuable indication that the current planting regimes practiced by West Fraser Mills are very close to the optimum for the TFL for both timber productivity and financial return.

CONIFER RELEASE / VOID PLANTING

Both the conifer release treatment and the void planting treatment had very little impact on results at the forest level. While these treatments likely have stand-level benefits, they were excluded from the PSS because of limitations on model complexity.

2.2 TREATMENTS INCLUDED IN THE PSS

The PSS models a composite of preferred silviculture treatments. The following silviculture treatments were selected for inclusion in the Preferred Silviculture Strategy based on the decision matrix above:

- Fertilization II regime as per the Analysis Report (Section 5.4);
- Planting of alternate species;
- Enhanced genetic gains assumptions;
- Commercial thinning / fertilization II with 50% reduction in commercial thinning revenue; and
- Rehabilitation of backlog NSR, balsam intermediate utilization (IU) high site and balsam IU low site.

COMMERCIAL THINNING (CT) / FERTILIZATION

In West Fraser Mills' *"Intensive Silviculture Management Strategy"* report, forest fertilization is recognized for its opportunity as a prominent activity in the future management of plantations and naturally regenerated harvest-origin stands in the BC interior. Recent research into soil fertility has produced a growing body of evidence about nutritional deficiencies in interior forest regions and the potential volume gains to be realized from operational fertilization.

Regenerated sites have been shown to have low levels of available nutrients for conifer growth. Initially, the canopy removal increases soil temperature and moisture resulting in the rapid decomposition of humus and increased mineralization of nutrients, particularly nitrogen and carbon, into the mineral soil. However, in most cases, this abundant nutrient supply declines rapidly due to leaching, impairing the long-term growth rates of plantations. The expectation with an operational forest fertilization program on the TFL is to improve plantation growth and performance by increasing the nutrient supply on plantations determined to have nutritional deficiencies.

Encouraging research results, although couched with information gaps and the on-going need for more research trials and screening tests, demonstrate individual tree volume gains and net volume growth with nitrogen fertilization. Further understanding of growth response mechanisms, with particular respect to lodgepole pine, will aid in the development of effective fertilization prescriptions.

In general, the decision to conduct operational broadcast fertilization on the TFL is reportedly dependent upon a number of important considerations including long-term strategic wood supply, harvesting constraints, stand productivity, product profiles and financial return. This Type II Silviculture Strategy incorporates these factors in determining where and when to apply fertilization treatments.

At the forest level, fertilization proves to be one of the most beneficial individual treatment regimes in terms of both volume production and financial return. This is primarily due to an increase in the amount of volume available for harvest at a time when available volume is limited, approximately 20 to 60 years in the future.

Utilization standards and merchantability limits of stands have changed dramatically over the past decade. With significant increases in prices for pulp chips during strong pulp markets and improvement in lumber recovery factors (LRF) for solid wood processing, even spacing slash has been considered as a potential source of fibre for chips, fence posts and rails. Recovery of natural fall-out in managed stands is considered a strategy worth pursuing. Further technological advances in the use of sawmill residues (i.e. Medium Density Fibreboard (MDF) Plant in Quesnel) indicate additional opportunities for utilization of fibre in the future.

Commercial thinning coupled with fertilization offers opportunities on TFL 52 to:

- 1) Optimize fibre flow on the land base;
- 2) Improve timber supply (increase AAC); and
- 3) Increase the stand value at rotation (premium log).

To some degree, the decline in the AAC of the TFL can be attributed to a limited amount of operable land base in the 35 to 60 year range. The possibility of improving this age class imbalance involves the intermediate thinning of existing and future managed stands. In West Fraser Mills' *Intensive Silviculture Management Strategy* report, evidence to support this scenario is conflicting. There is a growing body of evidence to suggest that commercially thinned stands will not grow at an accelerated rate (i.e. gross volume), resulting in a substantive increase in the total harvest volume in comparison to unthinned stands. Results from *Tree and Stand Simulator* (TASS) modelling indicates that commercially thinned stands will grow at a reduced growth curve, with less volume available at the time of harvest in comparison to unthinned stands. These stands generally recover the thinned volume after an extended rotation. The length of time required to achieve this recovery is dependent on the species and site productivity (i.e. site index) of the stand.

Research has indicated that the productive capacity of forest land can be dramatically increased by small, repeated applications of fertilizer, especially if coupled with density management. West Fraser currently has a plantation establishment density of 1,600 - 2,000 well-spaced stems per hectare to ensure opportunities for commercial thinning are maintained.

For the PSS, the two fertilization scenarios are combined with the two commercial thinning (CT)-fertilization scenarios to take advantage of opportunities for commercial thinning, while not limiting the effectiveness of fertilization alone. The CT-fertilization treatment regimes for existing and future managed stands, are shown in Table 4 and Table 5 respectively.

Table 4: Commercial Thinning / Fertilization Treatment Regime – Existing Managed Stands.

Existing Managed Stands									
BEC	Site Series	Species Composition	Fertilization Ages			Commercial Thin Age	CT Volume Removal (%)	Min. SI Value	THLB Area (ha)
Fertilization Only - Pine Leading									
SBSdw1	01	PI50Sx30Fd20	35	45	55			17.9	16
SBSmw	04	PI75Fd20At5	40	50	60			17.9	116
SBSwk1	01	PI70Sx25At5	30	40	50			18.3	15,558
SBSwk1	04	PI75Fd20At5	40	50	60			16.9	59
SBSwk1	05	PI70Sx30	30	40	50			18.2	5,873
Commercial Thin Only - Spruce Leading									
ICHmk3	04	Sx70PI30				55	20	22.9	101
ICHmk3	05	Sx70PI30				55	25	23.1	102
ICHmk3	06	Sx70PI30				50	25	24.3	82
SBSmw	07	Sx70PI30				60	25	21.0	514
SBSmw	08	Sx70PI30				50	25	23.7	19
SBSwk1	07	Sx70PI30				60	25	19.9	1,684
SBSwk1	08	Sx70PI30				55	25	21.0	370
Commercial Thin + Fertilization - Pine Leading									
ICHmk3	01	PI60Sx30Fd10	30	40	50	50	25	21.8	392
ICHwk4	01	PI60Sx30Fd10	30	40	50	50	25	22.9	175
SBSmw	01	PI70Sx25At05	25	35	45	45	20	20.4	6,267
SBSmw	06	PI70Sx25At05	25	35	45	45	20	22.6	116
TOTAL									31,447

It should be noted that the amount of area treated using alternate planting species will influence the area of future managed stands available for CT-fertilization. These areas are identified with ¹ and ² in Table 5.

Table 5: Commercial Thinning / Fertilization Treatment Regime – Future Managed Stands.

Table 3: Commercial Thinning / Fertilization Treatment Regime – Future Managed Stands									
BEC	Site Series	Species Composition	Fertilization Ages			Commercial Thin Age	CT Volume Removal (%)	Min. SI Value	THLB Area (ha)
Fertilization Only - Pine Leading									
SBSdw1	01	PI50Sx30Fd20	35	45	55			17.9	533
SBSdw1	04	PI100	40	50	60			17.1	42
SBSmw	04	PI75Fd20At5	40	50	60			17.9	486
SBSwk1	01	PI70Sx25At5 ²	30	40	50			18.3	38,112
SBSwk1	04	PI75Fd20At5	40	50	60			16.9	338
SBSwk1	05	PI70Sx30	30	40	50			18.2	15,483
Commercial Thin Only - Spruce Leading									
ICHmk3	04	Sx70PI30				55	20	22.9	120
ICHmk3	05	Sx70PI30				55	25	23.1	105
ICHmk3	06	Sx70PI30				50	25	24.3	212
ICHwk4	07	Sx70PI30				50	25	23.9	13
SBSdw1	08	Sx70PI30				60	25	20.2	77
SBSmw	07	Sx70PI30				60	25	21.0	3,386
SBSmw	08	Sx70PI30				50	25	23.7	120
SBSwk1	01	Sx60PI40 ¹				60	25	18.3	38,112
SBSwk1	07	Sx70PI30				60	25	19.9	6,920
SBSwk1	08	Sx70PI30				55	25	21.0	1,045
SBSmw	01	Sx60PI35At05 ¹				60	25	20.4	25,235
SBSmw	06	Sx60PI35At05 ¹				55	20	22.6	493
Commercial Thin + Fertilization									
ICHmk3	01	PI60Sx30Fd10	30	40	50	50	25	21.8	504
ICHwk4	01	PI60Sx30Fd10	30	40	50	50	25	22.9	237
SBSmw	01	PI70Sx25At05 ²	25	35	45	45	20	20.4	25,235
SBSmw	06	PI70Sx25At05 ²	25	35	45	45	20	22.6	493
TOTAL									93,461

¹ – Treatment areas will vary depending on the regeneration method selected by the model (standard or alternate species). These stands have been regenerated to the alternate species regime.

² – These stands have been regenerated to the standard species regime.

PLANTING OF ALTERNATE SPECIES

In West Fraser Mills' *Intensive Silviculture Management Strategy*, the report identified the need to develop a number of forest management strategies (i.e. stand densities, species composition) for each biogeoclimatic (BGC) subzone and site series and examine them at the stand level for economic efficiency and at the forest level for increases to the long-run sustained yield (LRSY). Initially, a crop planning guide was developed to promote discussion about the following issues for TFL 52:

- Site series based silviculture strategies;
- Site series based product objectives;
- Maximization of investment dollars (NPV);
- Preparation of effective silviculture prescriptions;
- Opportunities to improve yield and recover additional fibre; and
- Increased employment opportunities through commercial thinning.

The ultimate design of each crop plan includes density management regimes, tree species silvics and autecology, and the productive potential of the land base, as well as higher level, biodiversity objectives. Based on the gross area of TFL 52, the species profile consists of 53% interior spruce, 28% lodgepole pine, and 15% subalpine fir. Although six biogeoclimatic subzones are found on the TFL, the crop planning guide focuses on the three major subzones, namely ESSFwk1, SBSmw and SBSwk1, with estimated site index values that range from 15 to 22 m at 50 years.

As well, product objectives and assumptions play a role in the development of crop plans. The overall product strategy is to provide a variety of wood products at harvest by initially planting at higher densities, ensuring opportunities for both smaller diameter, short rotation stands and larger diameter, extended rotation stands are maintained. The larger target diameter sawlogs can be produced through a management regime of commercial thinning and extended rotations. This management regime is particularly applicable to interior spruce on the TFL because it is a long-lived species and yield projections do not decline significantly (i.e. linear growth) for 40-60 years after the culmination of mean annual increment (MAI). As well, spruce fibres tend to be more desirable for pulping.

Product objectives and assumptions play a role in the development of crop plans. Larger diameter sawlogs can be produced through a management regime of commercial thinning and extended rotations. This is particularly applicable to interior spruce on the TFL. Juvenile wood has shown to have excellent pulping characteristics due to lower fibre coarseness and thickness. Thinner fibres collapse easier during the pulping process for a tighter binding and smoother paper quality. Spruce fibres tend to be more desirable for pulping; suggesting that a larger proportion of spruce stands should be targeted for commercial thinning and extended rotation.

Species selection and design of crop plans are site series based and some site series have a greater plasticity for alternate species selection or composition. Altering the percent composition has an expected effect on the end products and financial return. This scenario tests changes to the crop plan for specific site series by increasing the component of spruce.

However, it is important to note that spruce stands are not available for fertilization treatment. Therefore, by increasing the proportion of spruce planted sites (through the alternate planting species regime), the area available for fertilization decreases. In the initial runs of the PSS scenario, stands were automatically planted using the alternate species regime; the model was not allowed to “decide” whether to use the base case or alternate regime, producing lower than expected results. The alternate species assumptions were revisited and the model was reformulated to allow the model to decide which planting regime to follow based on maximizing the financial return. As a result, the amount of area regenerated using the alternate species regime decreased and the overall financial return of the PSS scenario increased. These results are described in Section 2.3 below. Table 6 shows the alternate planting regime and area available for this treatment.

Table 6: Alternate Planting Regime.

BEC	Site Series	Base Case Planting Regime	New Planting Regime	Base Case Planting Cost (\$/ha)	Scenario Planting Cost (\$/ha)	Scenario Total Regen. Cost (\$/ha)	THLB Area (ha)
ESSFwk1	01	PI60Sx40	Sx60PI40	800	820	1,360	38,666
SBSmw	01	PI70Sx25At05	Sx60PI35At05	900	930	1,650	28,886
SBSmw	06	PI70Sx25At05	Sx60PI35At05	900	930	1,605	634
SBSwk1	01	PI70Sx25At05	Sx60PI40	800	930	1,605	40,516
TOTAL							108,701

ENHANCED GENETIC GAINS

For reforesting Crown Land, the Forest Practices Code requires foresters to use seed of the best genetic quality available. Genetic quality refers to three attributes: diversity, adaptability, and gain. The genetic gain is measured as the percentage height growth gain expected for a seedlot at or near harvest age. For this report, the focus is on the genetic gain as it relates to increases in stand volume.

As well, using select seed has the potential to increase timber supply indirectly through its effects on green-up, minimum harvest age and overall stand productivity. Genetic gains can be expressed as increased height, diameter or volume growth. Increased height growth can reduce the time to green-up and increase the overall productivity of managed stands. Increased volume and diameter growth can increase stand value as well as reduce minimum harvest ages.

In West Fraser Mills' *Intensive Silviculture Management Strategy* report, participation in a tree improvement program is viewed as an integral part of a sound forest management strategy for the TFL. In 1989, West Fraser Mills' entered into a joint venture with the Vernon Seed Orchard Company to develop an improved seed production facility using superior genotypes identified from the Ministry of Forest's tree improvement program.

Spruce seedlings from class A seed have been planted on the TFL since 1998, and by 2005 all planted pine and Douglas fir seedlings will be from class A seed. In this analysis, expected volume gains are estimated at 18% for spruce, 8% for pine and 19% for Douglas fir.

REHABILITATION OF BACKLOG NSR AND BALSAM INTERMEDIATE UTILIZATION STANDS

Not satisfactorily restocked (NSR) areas do not contribute to the potential site productivity even though sites occupied in this classification are often very productive and could be rehabilitated and reforested to current standards. This often equates to a very positive response in yield as area is being added to the timber harvesting land base (THLB) that is otherwise excluded. In Management Plan #2, West Fraser implemented a rigorous program that has reduced its NSR backlog to fewer than 1,800 ha.

Similarly, a significant portion of balsam IU has been deducted from the THLB in MP #3 as non-merchantable stands based on low stocking levels and volume. Once rehabilitated and sufficiently restocked, most of this area could be incorporated back into the THLB.

The report by JS Thrower and Associates Ltd. entitled "*Management Options for Balsam Intermediate Utilization Stands On TFL 52*", concludes that most of the area currently occupied by balsam IU stands is potentially very productive, as indicated by potential site index. It also found that in the three decades since logging, more than half of the balsam IU stands on TFL 52 are well stocked with vigorous trees. Most of the remaining area has adequate stocking levels that exceed minimum requirements for satisfactory stocking. These stands are now recognized as viable contributors and have been included in the THLB as part of the land base adjustments. Balsam IU areas identified as sub-optimal (i.e. poorly stocked) in the report were recommended as potentially good candidates for stand conversion into more productive plantations. Stand conversion would consist of felling the existing stand and regenerating to a site series specific silviculture regime as identified Table 34 of the *Information Package*. This treatment strategy has been included in the Preferred Silviculture Strategy.

As an individual treatment scenario, the benefits of NSR / balsam IU rehabilitation at the forest level are minimal. This is primarily due to the relatively small area available for treatment as well as the possibility that the treatment of these stands may result in additional short term "cover class constraints" (i.e. silviculture green-up) on the current THLB. Overall, it was decided the benefits of treating and including these stands in the THLB far outweigh any additional short-term constraints on available timber in the harvesting land base. The area identified for rehabilitation in the PSS is shown in Table 7.

Table 7: Balsam IU / Backlog NSR Treatable Area.

Category	THLB Area (ha)	Balsam IU – Excluded Area (ha)
Balsam IU (SI $\geq$ 19.6)	-	577
Balsam IU (SI < 19.6)	-	3,378
Backlog NSR	1,971	-
TOTAL	1,971	3,955

2.3 PREFERRED SILVICULTURE STRATEGY BASE SCENARIO

The Preferred Silviculture Strategy Base Scenario represents an intensive silviculture investment strategy that maximizes the financial return from the TFL. The individual treatments selected for this composite scenario produced the best overall results when

considered individually on the land base (using the criteria described in Section 2.0). This composite scenario demonstrates the cumulative effects of applied multiple treatments and provides a silviculture treatment and stand harvest schedule that maximizes the financial return on the TFL. The harvest flow policies used in the PSS scenario are the same as the base case scenario and there are no financial limitations on silviculture expenditure. As with all scenarios, silviculture investments are only applied if they produce a positive financial return.

As shown in Figure 1 and Table 8, the PSS produces a harvest forecast that exceeds the base case by 11% in the short-term and 5% in the long-term. Figure 2, operable growing stock for the PSS and base case scenarios, shows that the harvesting of this additional volume is a result of the applied silviculture treatments and is not at the expense of long-term sustainability

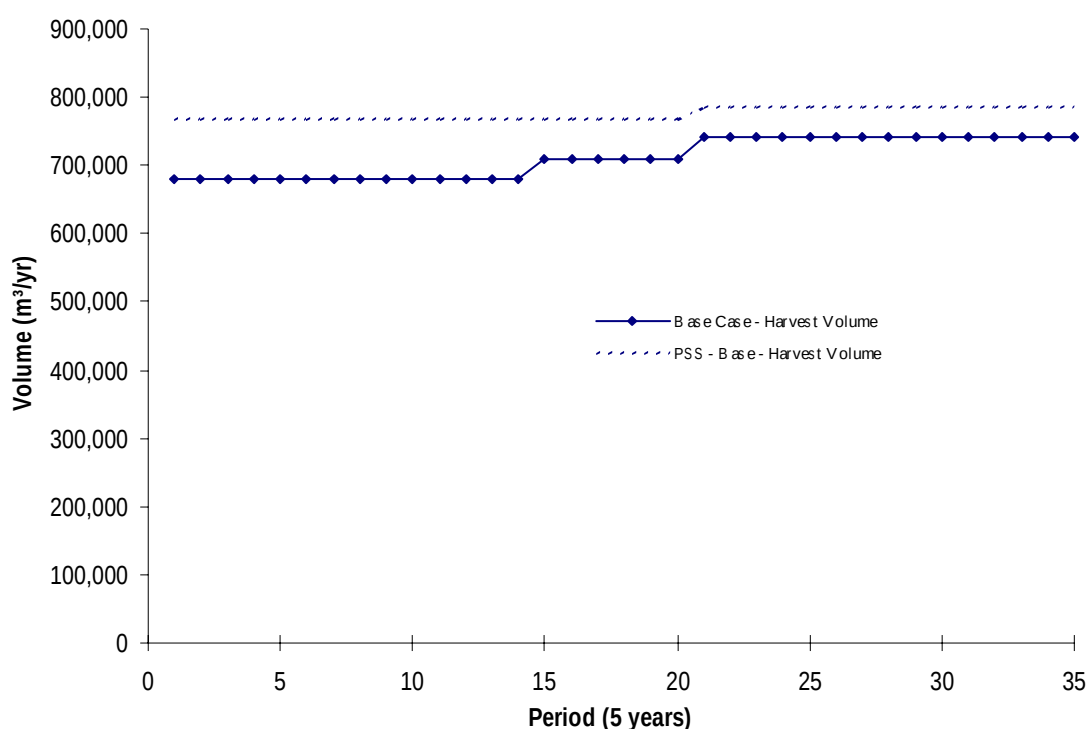


Figure 1: PSS Base – Harvest Forecast.

Table 8: PSS Base – Harvest Forecast.

Period (5-year)	Base Case (m ³ /yr)	PSS Base (m ³ /yr)	% Difference
1	680,899	767,712	11.3
2	680,899	767,712	11.3
3	680,899	767,712	11.3
4	680,899	767,712	11.3
5	680,899	767,712	11.3
6	680,899	767,712	11.3
7	680,899	767,712	11.3
8	680,899	767,712	11.3
9	680,898	767,712	11.3
10	680,899	767,712	11.3
11	680,899	767,712	11.3
12	680,899	767,712	11.3
13	680,899	767,712	11.3
14	680,899	767,712	11.3
15	709,850	767,712	7.5
16	709,850	767,712	7.5
17	709,850	767,712	7.5
18	709,850	767,712	7.5
19	709,850	767,712	7.5
20	709,850	767,712	7.5
21+	741,275	785,443	5.6
TOTAL	124,553,994	135,679,372	8.2

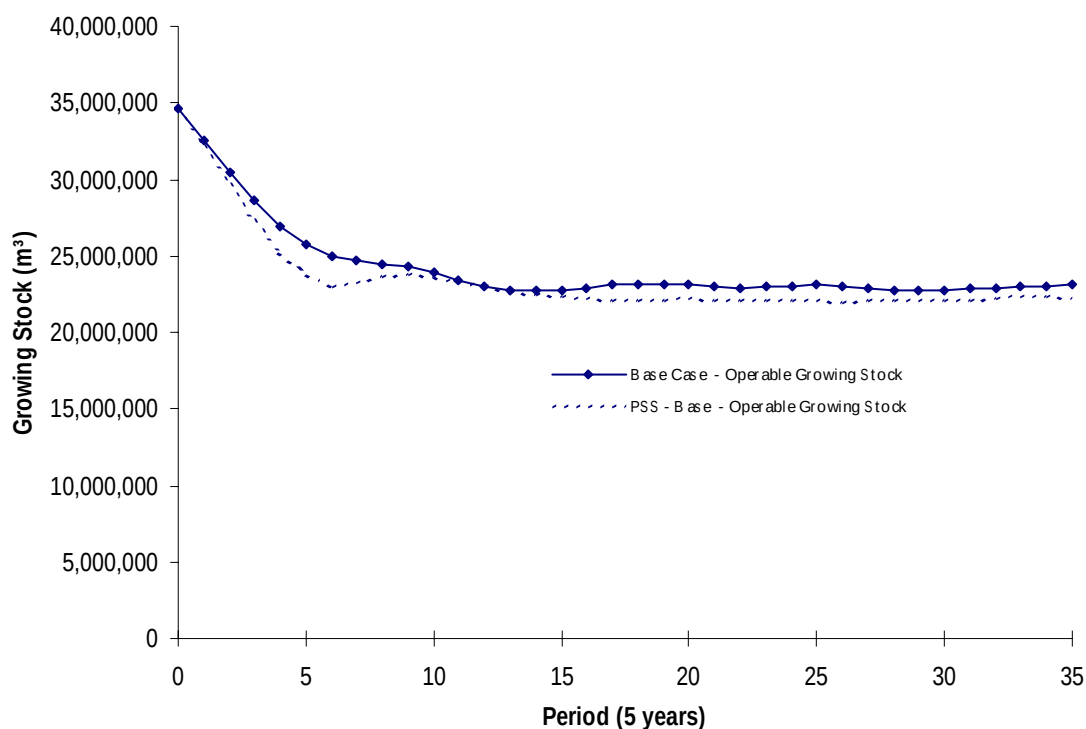
**Figure 2: PSS Base – Operable Growing Stock.**

Table 9 shows the total financial results for the PSS scenario in comparison with the base case. The significantly higher silviculture costs can be attributed to an increase in the amount of post-harvest treated area accompanying the higher harvest volumes. The

8.3% increase in net present value (NPV) net revenue indicates that the increased harvest revenue from additional silviculture investment produces a positive financial return.

Table 9: PSS Base – Financial Summary.

Scenario	Planning Horizon Totals (\$ 1,000s)				Average Product Value (\$/m3)
	Harvest Revenue	Silviculture Costs	Net Revenue	NPV Net Revenue	
Base Case	6,956,846	704,788	6,252,058	1,150,344	55.85
PSS Base	7,710,878	897,500	6,813,378	1,254,243	56.83
% Difference	9.8	21.5	8.2	8.3	1.7

Figure 3 shows how the total silviculture cost is distributed between regeneration and the other various intensive silviculture treatments.

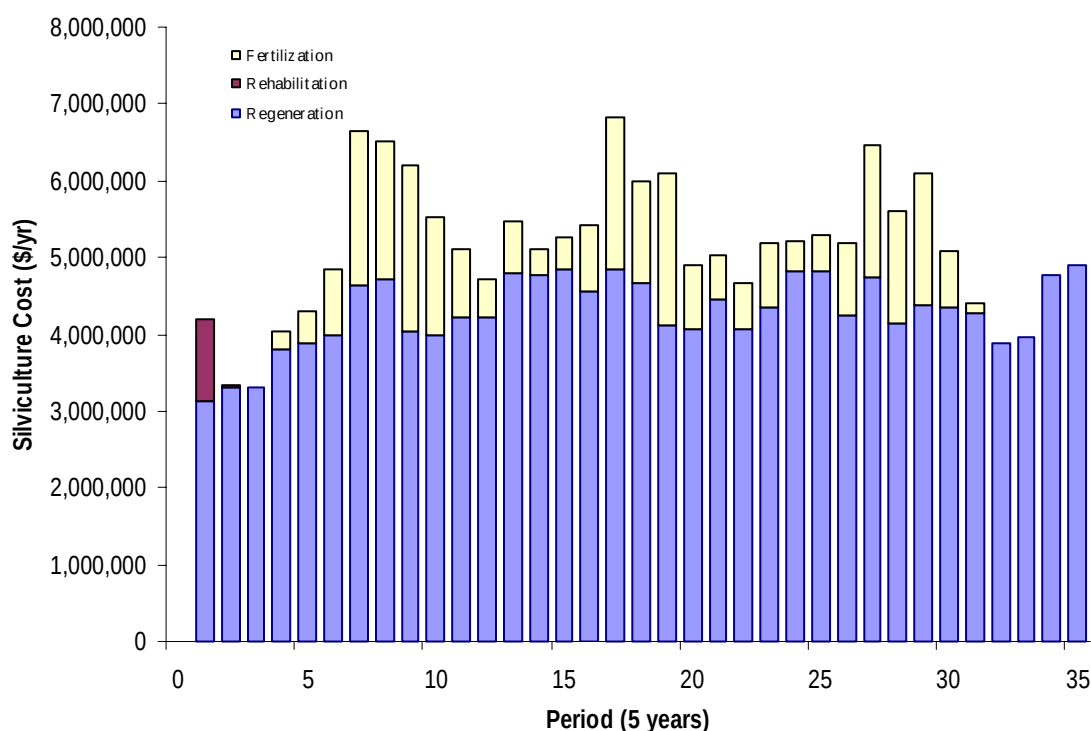


Figure 3: PSS Base – Silviculture Cost Breakdown.

One of the advantages of using optimization to develop a silviculture investment strategy is that the model is able make decisions on future management activities based on the changing forest composition and structure on the land base. The management strategy developed through optimization can change over time as the model is able to take advantage of, or create opportunities that may not currently exist on the land base. An example of this can be seen in the shift in the planted species through the planning horizon (Figure 4). Early in the planning horizon, when there is a significant age-class imbalance in the short to mid-term, constraining the harvest forecast, the model elects to

plant primarily shorter rotation, pine-leading stands to mitigate this imbalance. However, over time as the age-class distribution becomes more even and stable, the model is able to regenerate to higher value, slower growing, spruce-leading stands.

The area reported in Figure 4 represents species regeneration decisions made by the model on site series where both standard pine and alternate spruce planting regimes are possible (Table 6, above).

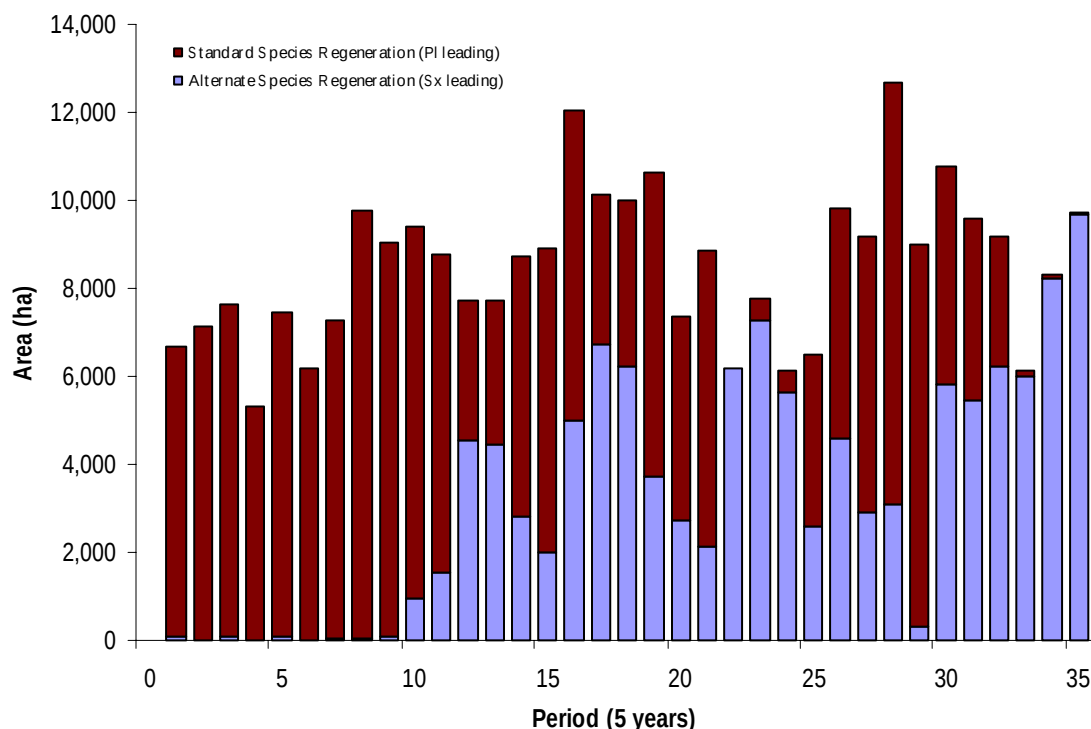


Figure 4: PSS Base – Optimized Regeneration Regime (Pine Leading vs. Spruce Leading).

2.4 ALTERNATE HARVEST FLOW POLICIES

An examination of alternate harvest flow policies provides insight into its implications on harvest flow and financial return. By relaxing harvest flow policy constraints from the PSS Base scenario we gain an understanding of how much of a factor harvest flow policy is in the PSS Base harvest forecast.

The harvest forecast of alternate harvest flow policies are examined in Figure 5 and Table 10. This scenario represents a relaxation of the harvest flow requirements of the PSS Base scenario. In this scenario harvest levels are allowed to reduce the harvest level at a rate of 10% per decade whereas the PSS Base scenario was forced to maintain and even flow harvest for the first 100 years. While the harvest flow forecast produced in this scenario is not considered economically feasible, it clearly demonstrates how and where the age class gap impacts harvest.

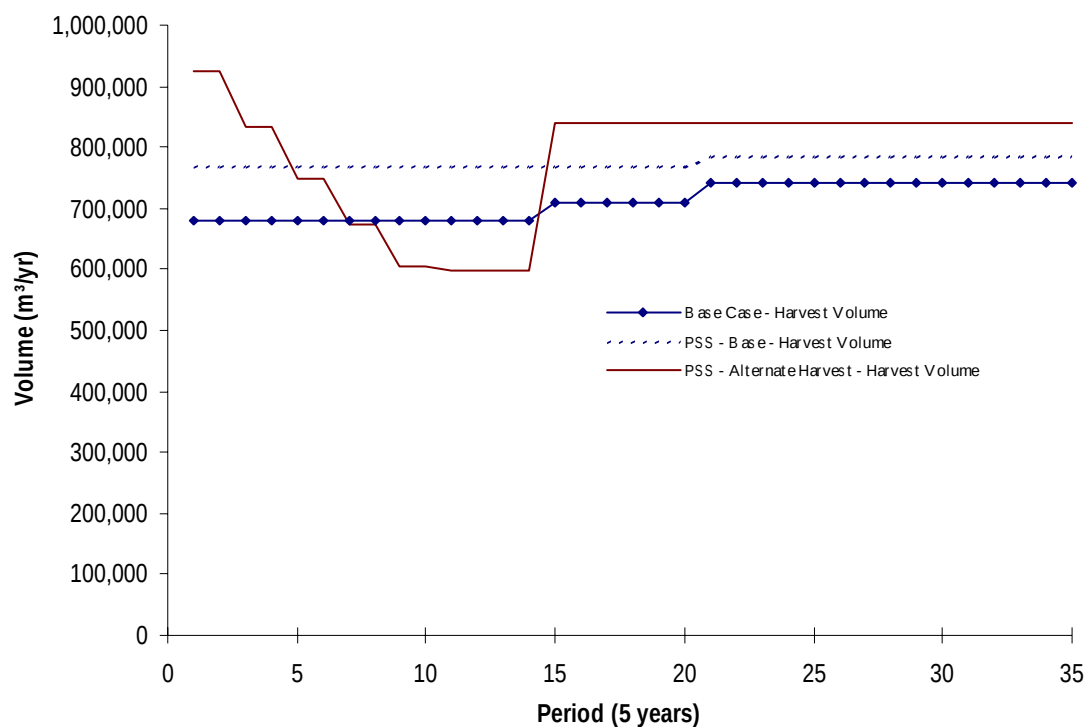


Figure 5: PSS Alternate Harvest Flow Policies – Harvest Forecast.

Table 10: PSS Alternate Harvest Flow Policies – Harvest Forecast.

Period (5-year)	PSS Base (m³/yr)	PSS - Alternate Harvest (m³/yr)	% Difference
1	767,712	925,652	17.1
2	767,712	925,652	17.1
3	767,712	832,412	7.8
4	767,712	832,412	7.8
5	767,712	748,495	-2.6
6	767,712	748,495	-2.6
7	767,712	672,971	-14.1
8	767,712	672,971	-14.1
9	767,712	604,999	-26.9
10	767,712	604,999	-26.9
11	767,712	596,850	-28.6
12	767,712	596,850	-28.6
13	767,712	596,850	-28.6
14	767,712	596,850	-28.6
15	767,712	841,035	8.7
16	767,712	841,035	8.7
17	767,712	841,035	8.7
18	767,712	841,035	8.7
19	767,712	841,035	8.7
20	767,712	841,035	8.7
21+	785,443	841,035	6.6
TOTAL	135,679,372	138,090,945	1.7

Table 11 shows the financial information for the alternate harvest flow policy scenario. When compared to the PSS Base scenario, this scenario produces higher financial return coupled with the negative consequence of a steadily declining harvest.

Table 11: PSS Alternate Harvest Flow Policies – Financial Summary.

Scenario	Planning Horizon Totals (\$ 1,000s)				Average Product Value (\$/m3)
	Harvest Revenue	Silviculture Costs	Net Revenue	NPV Net Revenue	
PSS Base	7,710,878	897,500	6,813,378	1,254,243	56.83
PSS - Alternate Harvest	8,143,135	844,161	7,298,974	1,321,950	58.97
% Difference	5.3	-6.3	6.7	5.1	3.6

2.5 SILVICULTURE BUDGET VARIATIONS

This section examines the implication of various levels of silviculture spending on the PSS. Figure 6, Figure 7, and Figure 8 show the resulting harvest forecast from imposing annual silviculture expenditure limits of \$3 million, \$4 million, and \$6 million respectively. These silviculture expenditure limits apply to both basic regeneration and incremental silviculture costs. Table 12 summarizes the harvest forecast levels for each of the three budget levels in comparison with the PSS Base scenario.

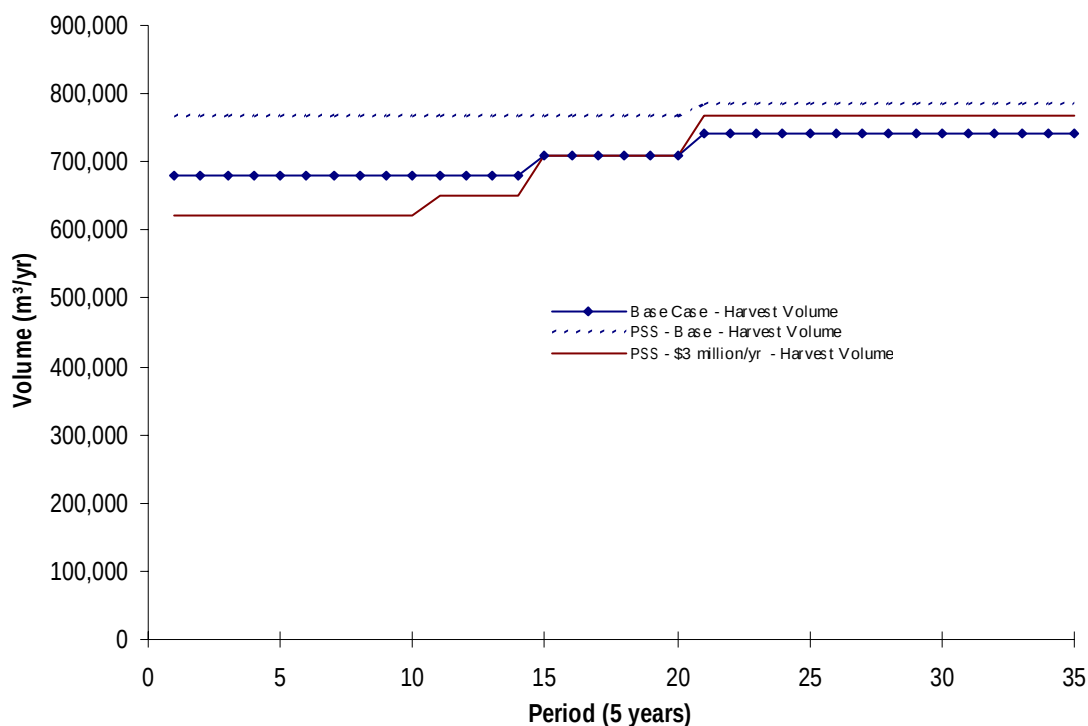


Figure 6: PSS \$3 million / yr Silviculture Budget – Harvest Forecast.

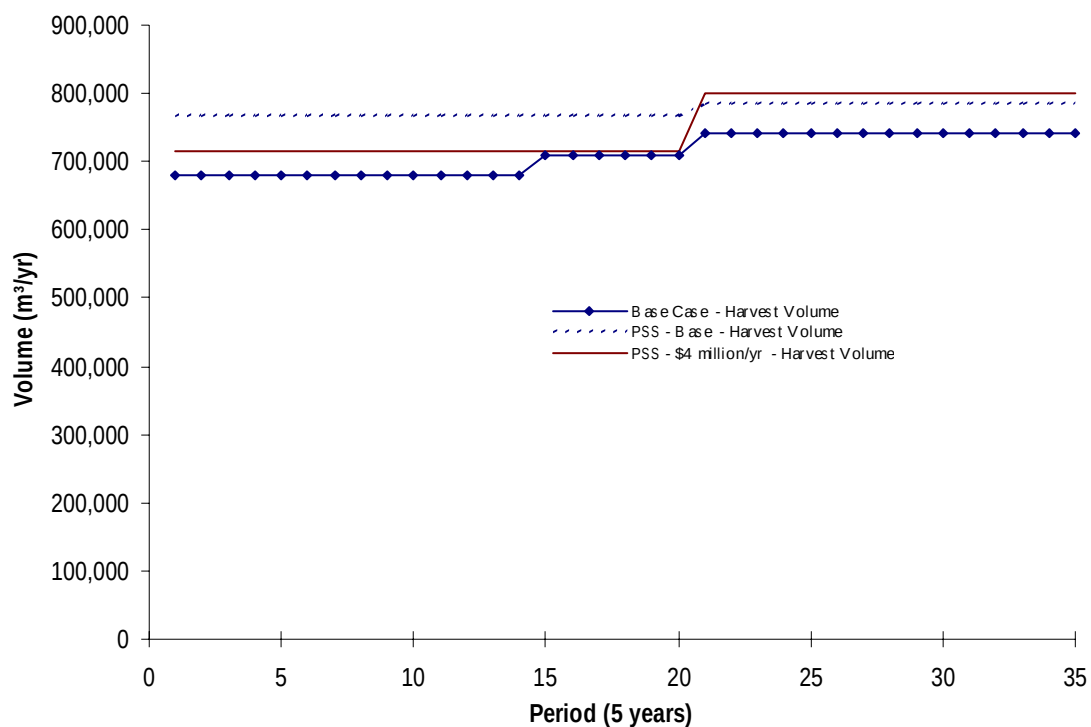


Figure 7: PSS \$4 million / yr Silviculture Budget – Harvest Forecast.

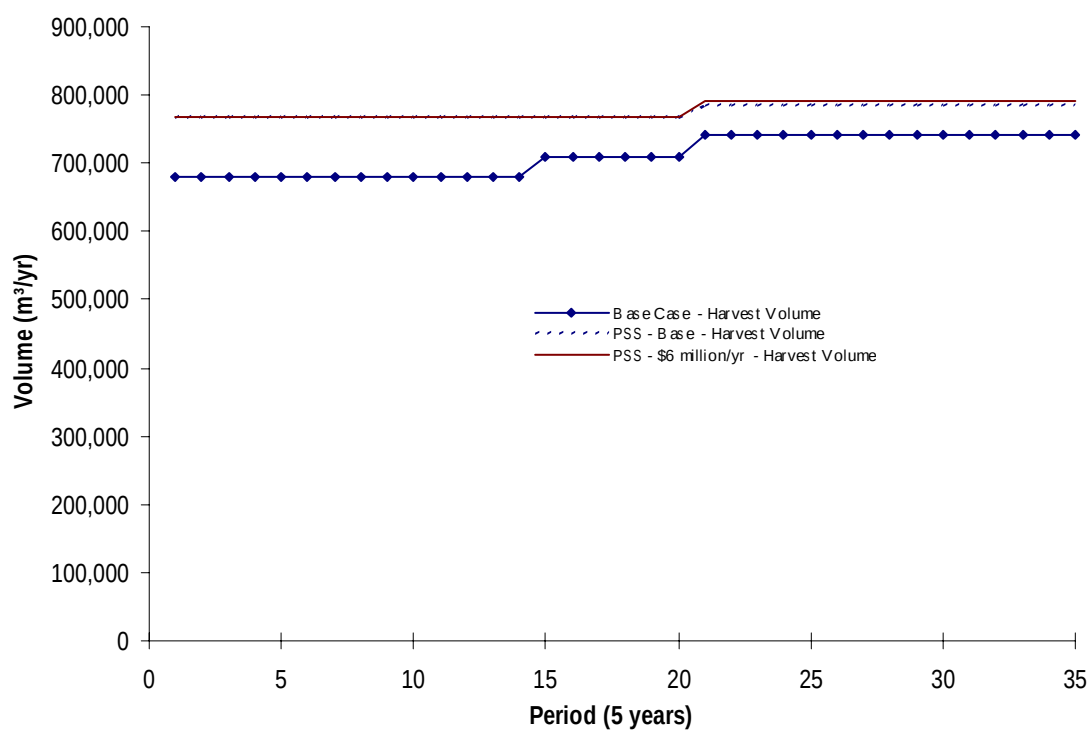


Figure 8: PSS \$6 million / yr Silviculture Budget – Harvest Forecast.

Table 12: PSS Silviculture Budget Levels – Harvest Forecast.

Period (5-year)	PSS Base (m ³ /yr)	PSS - \$3 million (m ³ /yr)	% Difference	PSS - \$4 million (m ³ /yr)	% Difference	PSS - \$6 million (m ³ /yr)	% Difference
1	767,712	620,077	-23.8	715,422	-7.3	766,779	-0.1
2	767,712	620,077	-23.8	715,422	-7.3	766,779	-0.1
3	767,712	620,077	-23.8	715,422	-7.3	766,779	-0.1
4	767,712	620,077	-23.8	715,422	-7.3	766,779	-0.1
5	767,712	620,077	-23.8	715,422	-7.3	766,779	-0.1
6	767,712	620,077	-23.8	715,422	-7.3	766,779	-0.1
7	767,712	620,077	-23.8	715,422	-7.3	766,779	-0.1
8	767,712	620,077	-23.8	715,422	-7.3	766,779	-0.1
9	767,712	620,076	-23.8	715,422	-7.3	766,779	-0.1
10	767,712	620,077	-23.8	715,422	-7.3	766,779	-0.1
11	767,712	650,050	-18.1	715,422	-7.3	766,779	-0.1
12	767,712	650,050	-18.1	715,422	-7.3	766,779	-0.1
13	767,712	650,050	-18.1	715,422	-7.3	766,779	-0.1
14	767,712	650,050	-18.1	715,422	-7.3	766,779	-0.1
15	767,712	709,850	-8.2	715,422	-7.3	766,779	-0.1
16	767,712	709,850	-8.2	715,422	-7.3	766,779	-0.1
17	767,712	709,850	-8.2	715,422	-7.3	766,779	-0.1
18	767,712	709,850	-8.2	715,422	-7.3	766,778	-0.1
19	767,712	709,850	-8.2	715,422	-7.3	766,779	-0.1
20	767,712	709,850	-8.2	715,422	-7.3	766,779	-0.1
21+	785,443	768,911	-2.2	800,897	1.9	791,354	0.7
TOTAL	135,679,372	122,968,668	-10.3	131,609,431	-3.1	136,029,452	0.3

Figure 9 and Figure 10 shows the silviculture cost (basic + incremental) and the treated area (rehabilitation + CT-fertilization) respectively, for each of the three budget levels. Because the base case contains no incremental silviculture spending, the silviculture costs reported for the base case are strictly basic regeneration costs. This would represent the minimum cost associated with harvesting efficiently at the Base Case harvest levels. In general, both the PSS Base and Base Case budgets are operating above the \$3 million and \$4 million budget limits indicating indirectly, that harvest levels are compromised by these limitations. However, in both of these scenarios, where the budget expenditures go below the \$3 million and \$4 million limits, the model still allocates some of these limited dollars towards incremental silviculture. This silviculture expenditure is probably surplus dollars that the model cannot direct towards additional harvesting (reforestation) due to harvest flow restrictions, suggesting that incremental silviculture still has value under tight budgetary constraints.

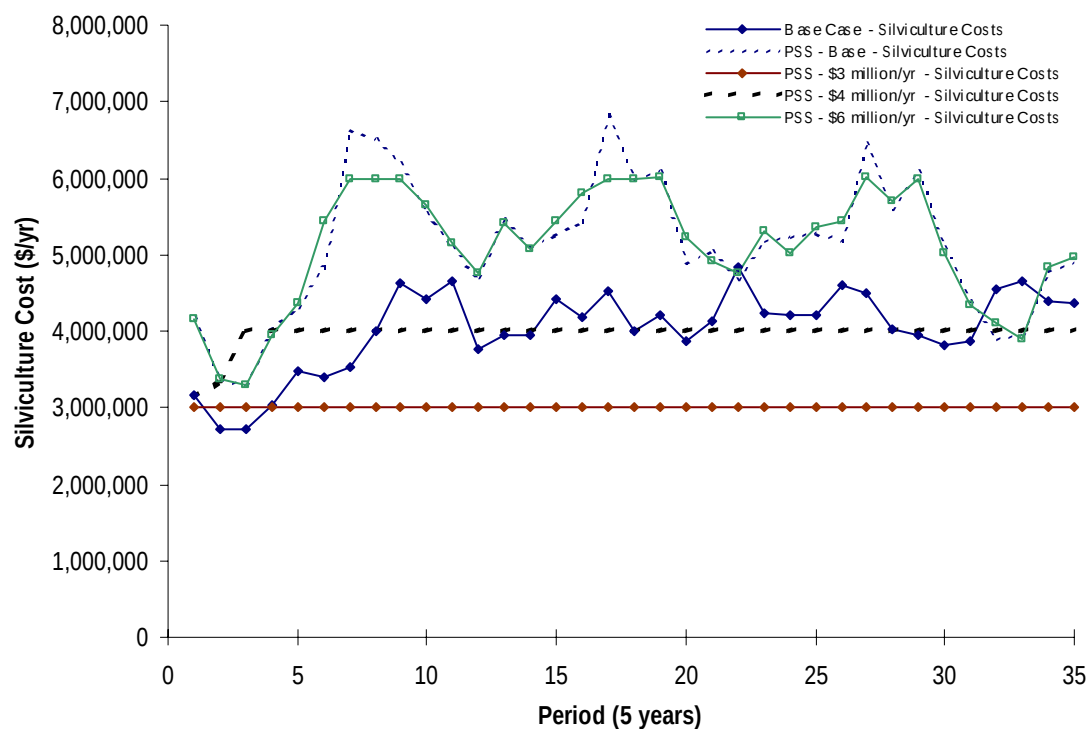


Figure 9: PSS Silviculture Budget Levels – Silviculture Costs.

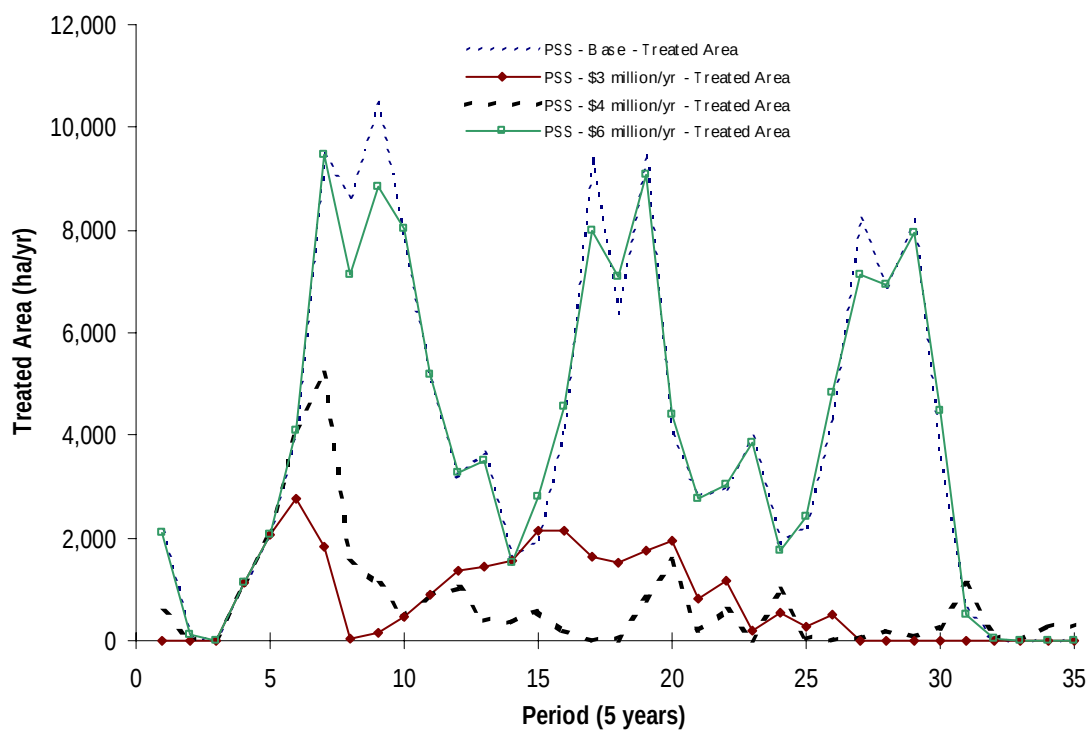


Figure 10: PSS Silviculture Budget Levels – Treated Area.

Table 13 shows that budgetary limits on silviculture expenditure (both incremental and basic) results in a reduction in financial return as compared with the PSS Base scenario. Both the \$4 million and \$6 million budget levels produce financial returns greater than that of the Base Case (no incremental silviculture). The NPV net revenue of the \$3 million scenario is approximately 5% lower than the base case; primarily due to harvest restriction imposed by the silviculture budget.

Table 13: PSS Silviculture Budget Levels – Financial Summary.

Scenario	Planning Horizon Totals (\$ 1,000s)				Average Product Value (\$/m3)
	Harvest Revenue	Silviculture Costs	Net Revenue	NPV Net Revenue	
PSS Base	7,710,878	897,500	6,813,378	1,254,243	56.83
PSS - \$3 million/yr	8,003,408	525,000	7,478,408	1,096,376	65.08
% Difference	3.7	-71.0	8.9	-14.4	12.7
PSS - \$4 million/yr	7,848,897	692,505	7,156,392	1,203,210	59.64
% Difference	1.8	-29.6	4.8	-4.2	4.7
PSS - \$6 million/yr	7,728,719	893,648	6,835,071	1,253,763	56.82
% Difference	0.2	-0.4	0.3	-0.0	-0.0

2.6 MANAGED STAND YIELDS REDUCED BY 10 PERCENT

Figure 11 and Table 14 show the harvest forecast resulting from a 10% reduction in the yields generated from managed stands. This scenario tests the sensitivity of the PSS results to the TASS yield assumptions and outputs. A 10% reduction in managed stand yield results in a harvest flow reduction through the entire planning horizon. Because of the amount of existing managed stands on TFL 52 as well as an even flow harvest policy, the reduction in managed stand volume impacts the harvest forecast of the short-term as well as the long-term. Allowing harvest to step down in the first 50 years would likely limit the impacts of this sensitivity to the mid and long-term.

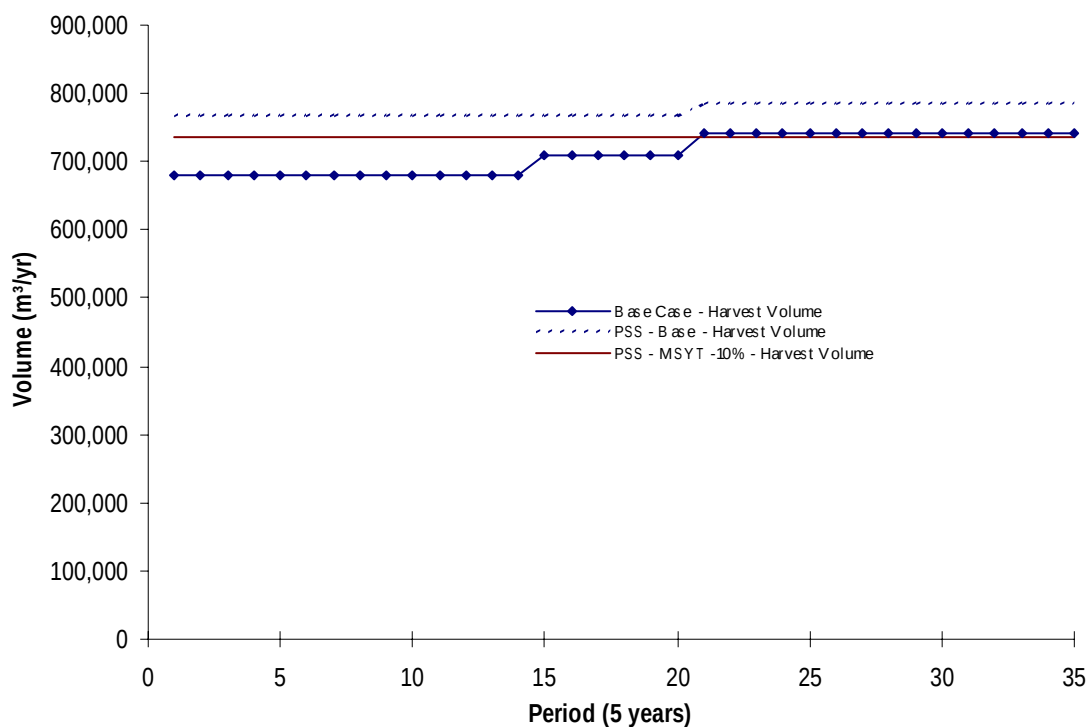


Figure 11: PSS Managed Stand Yields -10% – Harvest Forecast.

Table 14: PSS Managed Stand Yields -10% – Harvest Forecast.

Period (5-year)	PSS Base (m³/yr)	PSS – Managed Stand Yields -10 % (m³/yr)	% Difference
1	767,712	735,087	-4.4
2	767,712	735,087	-4.4
3	767,712	735,087	-4.4
4	767,712	735,087	-4.4
5	767,712	735,087	-4.4
6	767,712	735,087	-4.4
7	767,712	735,087	-4.4
8	767,712	735,087	-4.4
9	767,712	735,087	-4.4
10	767,712	735,087	-4.4
11	767,712	735,087	-4.4
12	767,712	735,087	-4.4
13	767,712	735,087	-4.4
14	767,712	735,087	-4.4
15	767,712	735,087	-4.4
16	767,712	735,087	-4.4
17	767,712	735,087	-4.4
18	767,712	735,087	-4.4
19	767,712	735,087	-4.4
20	767,712	735,087	-4.4
21+	785,443	735,087	-6.9
TOTAL	135,679,372	128,640,167	-5.5

Table 15 shows the financial implications of a 10 percent managed stand volume reduction. As expected, the reduced harvest flow results in lower financial returns. These impacts may be slightly exaggerated due to a lower short-term harvest level caused by the harvest flow policy.

Table 15: PSS Managed Stand Yields –10% – Financial Summary.

Scenario	Planning Horizon Totals (\$ 1,000s)				Average Product Value (\$/m3)
	Harvest Revenue	Silviculture Costs	Net Revenue	NPV Net Revenue	
PSS Base	7,710,878	897,500	6,813,378	1,254,243	56.83
PSS - MSYT -10%	7,320,450	969,879	6,350,572	1,215,619	56.91
% Difference	-5.3	7.5	-7.3	-3.2	0.1

3.0 SPATIAL FEASIBILITY ANALYSIS

This portion of the project involves a spatial feasibility analysis of the Preferred Silviculture Strategy. The main purpose is to determine the impacts of spatial parameters such as maximum block size and green-up and adjacency on the non-spatial PSS harvest levels reported in Section 2.3. As well, the harvest and treatment schedule maps produced through spatial feasibility analysis provide assistance in the planning and implementation of the PSS. Remsoft's spatial planning tool Stanley is used of the spatial feasibility analysis.

3.1 SPATIAL PARAMETERS

Spatial parameters are based on individual objectives for management zones within the TFL. The *Biodiversity Guidebook* recommends various patch size distribution targets by natural disturbance type (NDT). These values were used as a guide in the selection of block size parameters for this analysis. While Stanley does not currently have the capability to explicitly model landscape-level patch size distribution targets, it can however control the minimum, maximum and target cutblock size it creates, which ultimately controls patch size distribution.

Silviculture green-up and adjacency is the other primary spatial requirement that is accounted for in the spatial feasibility analysis. This parameter controls the spatial arrangement of cutblocks on the landscape to ensure that cutblocks are sufficiently "greened-up" before harvesting occurs proximal to the cutblock. Management zones from the Woodstock analysis are used to apply different green-up requirements. The block size and green-up requirements associated with the three blocking zones are shown in Table 16.

Table 16: Spatial Parameters - PSS Spatial Feasibility Analysis.

Spatial Blocking Zone	NDT	Resource Emphasis Areas Included	Min. Block Size (ha)	Max. Block Size (ha)	Green-up Age (years)
1	1	Caribou – Modified Harvest	5	125	20
2	1	NOT Caribou – Modified Harvest ¹	5	125	10
3	2	NOT Caribou – Modified Harvest ¹	5	250	10

¹ Areas of VQO – R & M and Caribou – Conventional Harvest are found within both NDT 1 and 2; both of which require a green-up age of 15 years. Because of differing maximum block size requirement these areas were blended with the 10-year green-up zones. The area weighted green-up ages for spatial blocking theme 1 and 2 is 10.7 and 10.2 years respectively.

3.2 PSS SPATIAL HARVEST SCHEDULE

Thirty years of the optimized harvest schedule are blocked spatially. Figure 12 and Table 17 show the spatially feasible harvest level in comparison with the PSS Base harvest level (non-spatial). Over the spatial planning horizon of 30 years, the model is able to spatially allocate an average of 81% of PSS Base harvest forecast or 625,112 m³/yr. As demonstrated below, the spatial harvest forecast fluctuates from period to period as more or less stands are unavailable due to green-up and adjacency requirements.

This spatial scenario uses a maximum deviation of one or two planning periods, depending on which spatial zone, meaning that Stanley is allowed to adjust the Woodstock blocking schedule by a maximum of one or two planning periods.

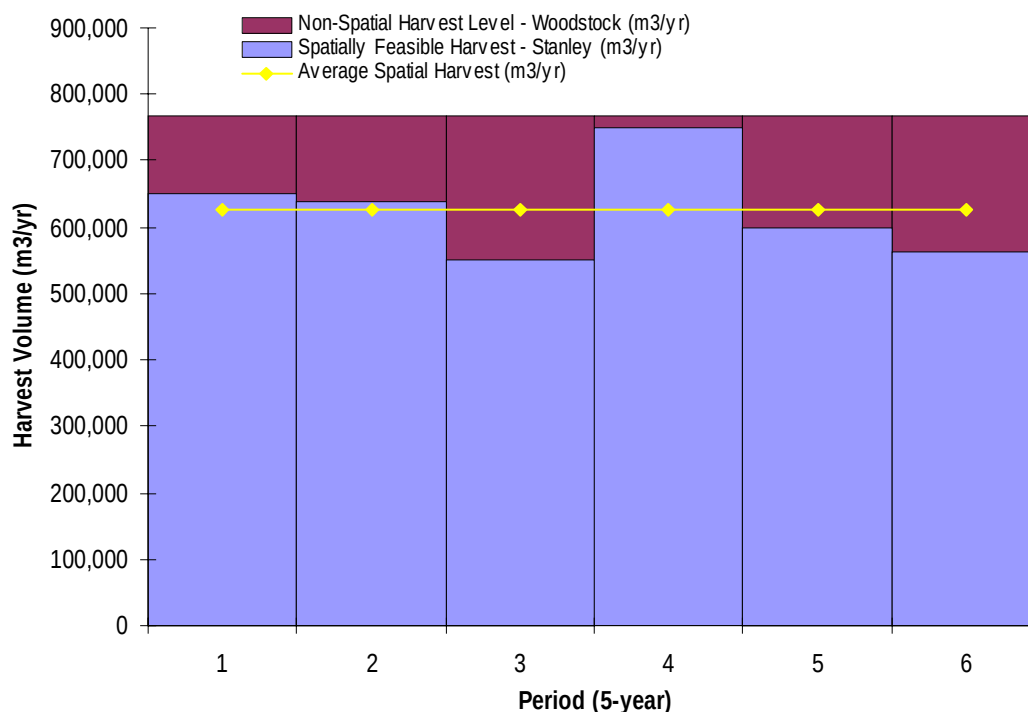
**Figure 12: Spatially Feasible Harvest Level - PSS Base.**

Table 17: Spatially Feasible Harvest Level – PSS Base.

Period (5-year)	Non-Spatial Harvest Level (m ³ /yr)	Spatially Feasible Harvest (m ³ /yr)	Percent Achieved
1	767,712	649,628	85
2	767,712	638,949	83
3	767,712	550,729	72
4	767,712	750,328	98
5	767,712	598,199	78
6	767,712	562,840	73
AVERAGE	767,712	625,112	81

The maximum deviation parameter provides Stanley with additional flexibility when constructing cutblocks and may have some impact on its capacity to do so effectively. In recognition of this, a sensitivity analysis was conducted where the maximum deviation was set to zero so that the Stanley model must block allocate volume exactly according to the Woodstock schedule.

Figure 13 and Table 18 show the spatial feasible harvest forecast with no deviation from the Woodstock schedule. By limiting the flexibility to deviate from the Woodstock schedule, the spatial harvest forecast is reduced by 44% to an average of 431,314 m³/yr, indicating that some flexibility is required to achieve reasonable spatial harvest levels.

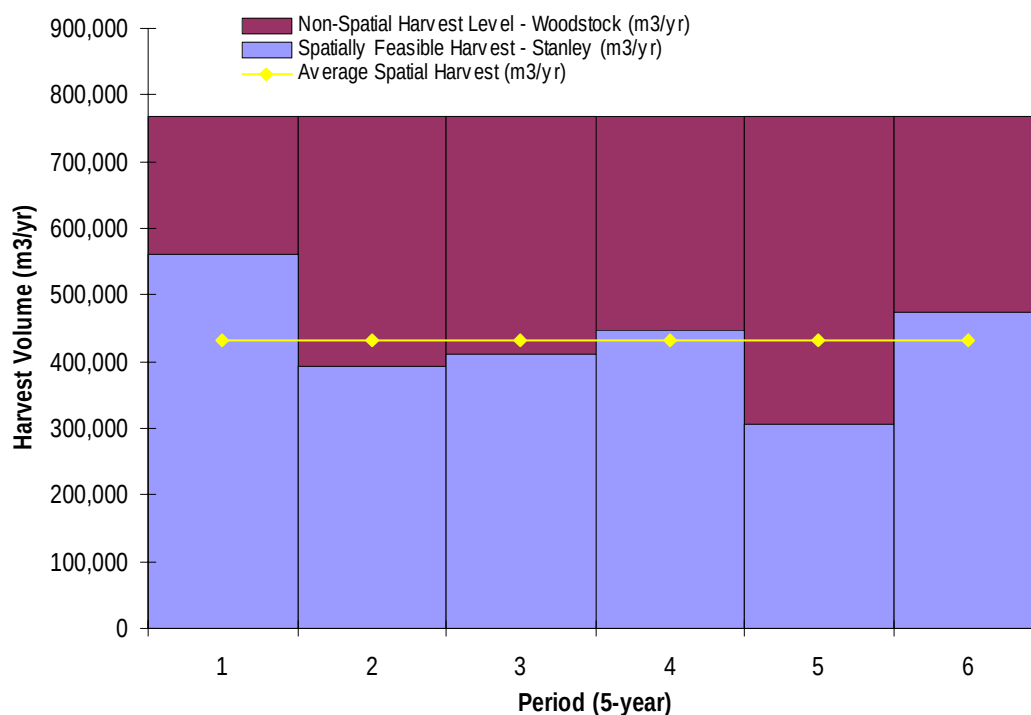
**Figure 13: Spatially Feasible Harvest Level – No Schedule Deviation.**

Table 18: Spatially Feasible Harvest Level – No Schedule Deviation.

Period (5-year)	Non-Spatial Harvest Level (m ³ /yr)	Spatially Feasible Harvest (m ³ /yr)	Percent Achieved
1	767,712	561,445	73
2	767,712	391,543	51
3	767,712	409,550	53
4	767,712	447,051	58
5	767,712	305,644	40
6	767,712	472,653	62
AVERAGE	767,712	431,314	56

Appendix I contains the following summaries for the spatial harvest schedule. These reports display harvest information by supply block and site series for each period in the spatial planning horizon:

- (a) Harvest volume by supply block and site series;
- (b) Harvest area by supply block and site series; and
- (c) Harvest revenue by supply block and site series.

1:100,000 scale spatial harvest schedule maps are included in Appendix II. These maps show blocks harvested in previous years as well as those scheduled for future harvest by Stanley.

3.3 PSS SPATIAL SILVICULTURE TREATMENT SCHEDULE

Figure 9 and Table 19 show the silviculture treatment schedule for a spatial planning horizon of 30 years. This treatment schedule below is the same as the non-spatial PSS Base scenario as silviculture treatments are not subject to harvesting constraints with respect to treatment area (block size) or adjacency (silviculture green-up)¹. The purpose of developing a spatial silviculture treatment schedule using Stanley is to provide maps of the optimized silviculture treatment schedule generated by Woodstock in order to facilitate the planning and implementation of these treatments. Appendix III contains reports on the area treatment schedule for each of the treatment type by supply block, site series and planning period.

¹ Stanley was unable to spatially allocate 5% of the scheduled area due to differences between available polygon sizes and the area scheduled for treatment. In reality, 100% of the area scheduled for treatment can be allocated spatially.

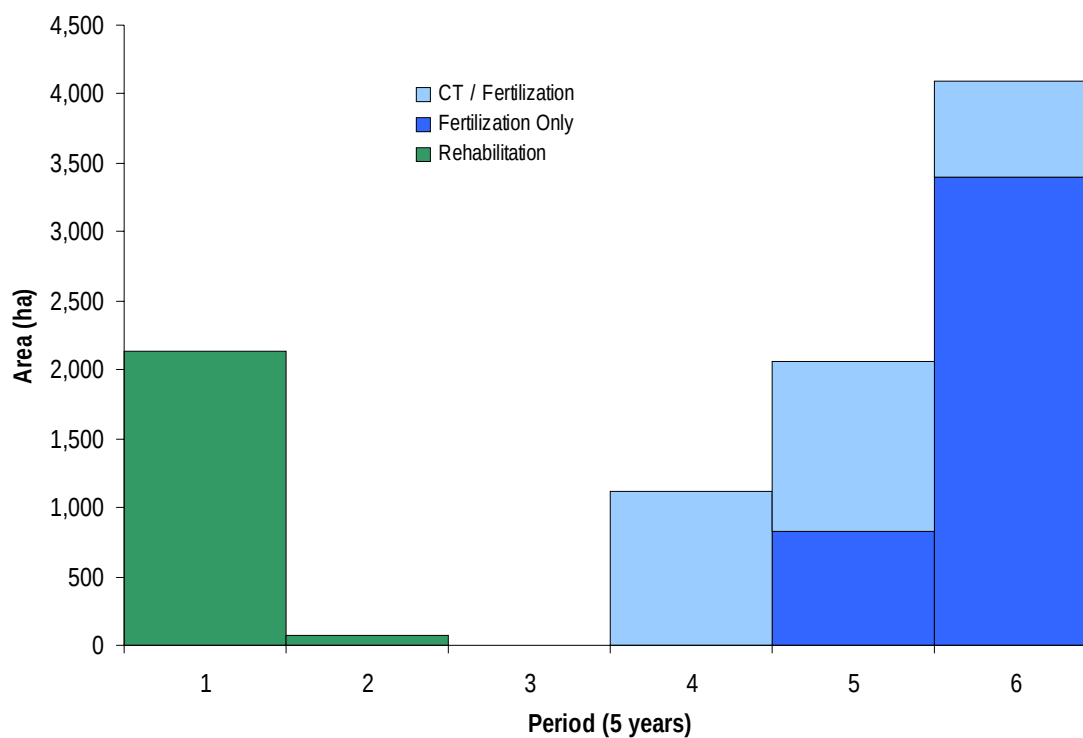


Figure 14: Spatial Silviculture Treatment Schedule.

Table 19: Spatial Silviculture Treatment Schedule.

Period (5-year)	Fertilization Only	CT Only	CT / Fertilization	Rehabilitation	Total
1	-	-	-	2,138	2,138
2	-	-	-	71	71
3	-	-	-	5	5
4	-	-	1,120	-	1,120
5	833	-	1,232	-	2,065
6	3,394	-	705	-	4,099
TOTAL	4,227	-	3,057	2,215	9,499

Appendix IV contains 1:100,000 and 1:50,000 scale maps of the silviculture treatments scheduled for the first 30 years.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Basic and intensive silviculture investments should focus on addressing the shortage of available harvest volume 20 to 60 years in the future. This shortage is caused by a lack of existing natural stands currently 35 to 60 years of age which make up most of the harvestable volume during the critical transition period from harvesting existing natural stands to future managed stands. This age-class imbalance, in combination with the harvest flow policy, results in a reduced harvest level during the first 75 years of the planning horizon (the short-term harvest).

Given that the immature natural stand volume is somewhat static, mitigating the impacts of this age class imbalance can be accomplished by increasing the number of managed stands available to harvest during this time period. For example, silviculture treatments designed to increase growth or reduce rotation times in both existing and future managed stands contribute more at the forest level (i.e. harvest volume, financial return) by providing available harvest volume during this critical transition period ("filling in" the age class gap). Treatments that do not provide additional volume during this period typically have lower financial return in comparison.

Intensive silviculture treatments shown to be more beneficial in mitigating the short-term timber supply problem are fertilization, A-seed planting, and commercial thinning. Additionally, West Fraser's basic silviculture strategy, as it relates to higher planting densities (1,800-2,000 sph), improves the short-term timber supply in the *Preferred Silviculture Strategy*, when combined with fertilization (i.e. shorter rotations and higher volumes). Higher densities scenarios (i.e. 2,200-3,000 sph), which increase stand rotation ages, contribute very little to mitigating this harvest flow "pinch point" in the short-term. However, higher densities have been shown to provide benefits in the long-term, through increased product value, when the age-class profile is more balanced. The planting of higher percentages of spruce also demonstrates some long-term benefits because of the increased harvest flexibility from longer rotation ages and higher stand product values.

The results of this project demonstrate that significant gains in harvest volume, product value and financial return can be realized through strategic, incremental silviculture investment. Specifically, the *Preferred Silviculture Strategy* demonstrates that increases in the harvest level by 11% in the short-term and 5% in the long-term are sustainable when the prescribed incremental silviculture treatments are applied. Results also demonstrate that in some cases silviculture investment may not produce a positive financial return, indicating the importance of strategic silviculture investment planning.

4.1 ADDITIONAL INFORMATION AND RESEARCH RECOMMENDATIONS

GROWTH AND YIELD

Many of the treatments included in the *Preferred Silviculture Strategy* are modelled according to TASS assumptions on treatment response. While TASS results are considered acceptable for use in silviculture investment planning (Type II Analysis), stand-level responses on TFL 52 may differ from those modelled in TASS. Therefore, it is recommended that where possible, on-the-ground information be used to validate these results. The following are some recommendations on future operational research projects for the TFL:

- 1) Continue Change Monitoring Inventory (CMI) to validate managed stand yield curves and site index adjustments increases - 52 out of 78 plots already established to date.
- 2) Additional site index adjustment (SIA) sampling in the ESSFwk1 to improve site index estimates in this subzone-variant.
- 3) Implement a fertilization monitoring program to validate treatment responses.
- 4) Identify stands candidate for fertilization by identifying nutrient deficiencies by BGC/site series.
- 5) Establish realized genetic gain trials for Fd, PI, and Sx genetically improved seed.
- 6) Establish CT treatment trials to validate treatment responses.

INVENTORY UPDATE / ENHANCEMENT

Inventories form the basis for all strategic planning and analysis. The following is a list of recommended inventory enhancements or updates:

- 1) Surveying of backlog stands to confirm/update forest cover and maintain/confirm THLB.
- 2) Improve quality of managed stand inventories before intensive strategy is implemented.

4.2 ADDITIONAL ANALYSIS RECOMMENDATIONS

Following is a brief description of recommendations for future analysis of silviculture treatment options:

Sensitivity to Discount Rate (IRR): The scenarios tested in this analysis all use a discount rate of 4%. By testing alternative discount rates and associated changes in the level of silviculture investment, a closer approximation of the internal rate of return (IRR) can be determined for each scenario. As the discount rate increases, the level of silviculture investment will decrease. The minimum discount rate at which no investment occurs will be the IRR.

Sensitivity to Product Value: A test of various assumptions regarding future product values will provide information on the sensitivity of results and conclusions to changes in future product values.

Sensitivity to Cost: Similarly, evaluating changes in investment decisions with changes in regeneration and treatment costs provides an understanding of the degree to which these assumptions factor into investment decisions.

Site-Specific Analysis: The objective of this project is to develop a forest-level silviculture strategy. Postitive stand level benefits are often masked at the forest-level because treatment areas may be relatively small compared to the total area under analysis. Through this process it has become evident that financial analysis of stand-level benefits may be of value to future silviculture investment planning by identifying additional

opportunities for forest-level benefits. An example of this may be an analysis of the financial return of low density, intensive management of highly productive sites.

Impacts of Field Trials Results and Inventory Update / Enhancement:

In the event that field trials and inventory updates / enhancements produce results significantly different than those used in this analysis, subsequent analysis should be conducted to evaluate the forest-level impacts of these differences.

Incorporation of Site-Specific Harvesting Costs: The current economic model used for this Type II analysis uses TFL-wide average logging costs values for each stand. By including site-specific logging costs, the economic model can make investment and harvesting decisions that consider a more accurate assessment of the true end value of harvested stands.

Examine the Financial Return of Sx Fertilization: Preliminary results of white spruce fertilization trials on TFL 53 show statistically significant volume, basal area, and height increment gains for young (17 year) stands under various fertilization regimes. While these stands are young and it is not clear that these gains can be realized at harvest, further investigation and subsequent analysis of forest level impacts may identify additional opportunities for increased harvest and financial return from the land base.

5.0 REFERENCES

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Appendix I – Spatial Harvest Schedule – Supply Block Reports

- ❖ Harvest Volume by Site Series
- ❖ Harvest Area by Site Series
- ❖ Harvest Revenue by Site Series

Table A I-1: Supply Block Report - Harvest Volume by Site Series.

Supply Block	Planning Period	Site Series	Harvest Volume (m³)
Big Valley	1 (2002-2006)	ESSFWC301	30,662
		ESSFWC302	1,044
		ESSFWC303	133
		ESSFWK101	131,472
		ESSFWK103	10,295
		ESSFWK104	295
		ESSFWK105	7,008
		SBSMW01	3,994
		SBSMW05	792
		SBSMW06	834
		SBSMW07	816
		SBSMW08	3,866
		SBSMW09	25
		SBSWK101	224,251
		SBSWK102	248
		SBSWK103	3,170
		SBSWK104	14,658
		SBSWK105	95,672
		SBSWK106	2,373
		SBSWK107	146,019
		SBSWK108	11,773
Total Volume Harvested in Big Valley Supply Block in Planning Period 1 (21 records)			689,401
2 (2007-2011)	ESSFWC301	24,144	
	ESSFWC303	2,344	
	ESSFWK101	202,216	
	ESSFWK102	273	
	ESSFWK103	69,128	
	ESSFWK104	18,886	
	ESSFWK105	3,007	
	SBSWK101	274,379	
	SBSWK102	686	
	SBSWK103	25,994	
	SBSWK104	1,002	
	SBSWK105	92,916	
	SBSWK106	1,389	
	SBSWK107	46,849	
	SBSWK108	43,714	
	SBSWK109	4,515	
	SBSWK111	16	
Total Volume Harvested in Big Valley Supply Block in Planning Period 2 (17 records)			811,459
3 (2012-2016)	ESSFWC301	20,159	
	ESSFWC302	4,059	
	ESSFWC303	1,606	

Supply Block	Planning Period	Site Series	Harvest Volume (m³)
		ESSFWK101	204,114
		ESSFWK102	1,826
		ESSFWK103	66,119
		ESSFWK104	9,740
		ESSFWK105	3,107
		SBSWK101	18,178
		SBSWK103	17
		SBSWK104	93
		SBSWK105	23,715
		SBSWK106	301
		SBSWK107	16,156
		Total Volume Harvested in Big Valley Supply Block in Planning Period 3 (14 records)	369,188
	4	(2017-2021)	
		ESSFWC301	113,194
		ESSFWC301C	46,367
		ESSFWC302	11,731
		ESSFWC302C	4,061
		ESSFWC303	4,329
		ESSFWC303C	261
		ESSFWK101	290,587
		ESSFWK101C	2,868
		ESSFWK102	599
		ESSFWK103	101,547
		ESSFWK103C	2,067
		ESSFWK104	13,684
		ESSFWK105	2,804
		ESSFWK106	3,350
		SBSWK101	120,048
		SBSWK102	355
		SBSWK103	25,482
		SBSWK105	38,119
		SBSWK106	228
		SBSWK107	22,958
		SBSWK108	14,657
		SBSWK109	9,859
		SBSWK111	626
		Total Volume Harvested in Big Valley Supply Block in Planning Period 4 (23 records)	829,783
	5	(2022-2026)	
		ESSFWC301	67,322
		ESSFWC301C	10,590
		ESSFWC302	897
		ESSFWC302C	424
		ESSFWC303	11
		ESSFWK101	148,100
		ESSFWK101C	558
		ESSFWK102	780
		ESSFWK103	112,602
		ESSFWK103C	264
		ESSFWK104	6,069

Supply Block	Planning Period	Site Series	Harvest Volume (m³)
		ESSFWK105	3,608
		ESSFWK106	440
		SBSMW01	6,197
		SBSMW06	11,146
		SBSMW07	12,261
		SBSMW08	19
		SBSWK101	46,194
		SBSWK102	1,978
		SBSWK103	12,857
		SBSWK104	377
		SBSWK105	30,474
		SBSWK106	62
		SBSWK107	12,979
		SBSWK108	1,099
		SBSWK109	5,638
		SBSWK111	1,685
Total Volume Harvested in Big Valley Supply Block in Planning Period 5 (27 records)			494,633
6	(2027-2031)		
		ESSFWC301	101,352
		ESSFWC301C	1,358
		ESSFWC302	1,160
		ESSFWC303	6,804
		ESSFWK101	263,822
		ESSFWK102	185
		ESSFWK103	132,935
		ESSFWK104	38,556
		ESSFWK105	23,897
		ESSFWK106	861
		SBSMW01	34,860
		SBSMW03	704
		SBSMW05	1,976
		SBSMW06	1,083
		SBSMW07	297
		SBSMW08	2,813
		SBSMW09	192
		SBSWK101	6,430
		SBSWK103	13,292
		SBSWK105	36,572
		SBSWK107	8,609
		SBSWK109	4,944
		SBSWK111	2,494
Total Volume Harvested in Big Valley Supply Block in Planning Period 6 (23 records)			685,193
Total Volume Harvested in Big Valley Supply Block (All Planning Periods) (125 records)			3,879,655
Average Annual Harvest in Big Valley Supply Block (m3/yr)			129,322

Site series ending with a "C" represent areas which have had their volume reduced by 67% to approximate partial cutting the Caribou – modified harvest areas.

Supply Block	Planning Period	Site Series	Harvest Volume (m³)
Bowron			
1	(2002-2006)		
		ESSFWK101	57,930
		ESSFWK103	7,232
		ICHMK301	10,869
		ICHMK304	33
		ICHMK305	1,781
		ICHMK306	42,061
		ICHWK401	44,088
		ICHWK407	5,526
		SBSWK101	226,192
		SBSWK103	1,973
		SBSWK104	2,921
		SBSWK105	182,964
		SBSWK107	34,906
		SBSWK109	349
Total Volume Harvested in Bowron Supply Block in Planning Period 1 (14 records)			618,823
2	(2007-2011)		
		ESSFWC301	1,589
		ESSFWC303	48
		ESSFWK101	25,867
		ESSFWK103	20,605
		SBSWK101	369,348
		SBSWK103	17,757
		SBSWK104	4,912
		SBSWK105	139,415
		SBSWK106	29
		SBSWK107	122,411
		SBSWK109	7,584
		SBSWK111	60
Total Volume Harvested in Bowron Supply Block in Planning Period 2 (12 records)			709,626
3	(2012-2016)		
		ESSFWC301	7,223
		ESSFWC302	253
		ESSFWK101	127,612
		ESSFWK102	364
		ESSFWK103	49,280
		ESSFWK104	619
		SBSWK101	67,188
		SBSWK103	1,353
		SBSWK104	99
		SBSWK105	73,053
		SBSWK107	3,670
		SBSWK109	5,081
Total Volume Harvested in Bowron Supply Block in Planning Period 3 (12 records)			335,794
4	(2017-2021)		
		ESSFWC301	82,496
		ESSFWC301C	14,239

Supply Block	Planning Period	Site Series	Harvest Volume (m³)	
		ESSFWC302	461	
		ESSFWC302C	1,688	
		ESSFWC303	1,516	
		ESSFWK101	196,903	
		ESSFWK101C	37	
		ESSFWK102	2,577	
		ESSFWK103	114,860	
		ESSFWK103C	182	
		ESSFWK104	4,966	
		ESSFWK105	146	
		ESSFWK106	1,216	
		ICHWK401	3,242	
		SBSWK101	265,569	
		SBSWK103	46,732	
		SBSWK104	1,731	
		SBSWK105	146,807	
		SBSWK106	826	
		SBSWK107	112,609	
		SBSWK109	35,604	
		SBSWK111	1,954	
		Total Volume Harvested in Bowron Supply Block in Planning Period 4 (22 records)		1,036,361
		5	(2022-2026)	
		ESSFWC301	44,500	
		ESSFWC301C	1,232	
		ESSFWC302	153	
		ESSFWC302C	228	
		ESSFWC303	1,231	
		ESSFWK101	152,342	
		ESSFWK102	2,366	
		ESSFWK103	94,387	
		ESSFWK104	8,437	
		ESSFWK106	577	
		SBSWK101	159,358	
		SBSWK103	57,986	
		SBSWK104	1,320	
		SBSWK105	144,137	
		SBSWK106	115	
		SBSWK107	12,216	
		SBSWK109	12,323	
		SBSWK111	3,909	
Total Volume Harvested in Bowron Supply Block in Planning Period 5 (18 records)		696,817		
6	(2027-2031)			
		ESSFWC301	48,047	
		ESSFWC302	2,585	
		ESSFWC303	860	
		ESSFWK101	200,763	
		ESSFWK102	28	
		ESSFWK103	115,875	
		ESSFWK104	10,005	

Supply Block	Planning Period	Site Series	Harvest Volume (m ³)
		ESSFWK105	6,140
		ESSFWK106	1,367
		ICHMK301	237
		ICHMK306	1,174
		ICHWK401	3,402
		ICHWK407	1,640
		SBSWK101	33,517
		SBSWK103	55,532
		SBSWK104	2,772
		SBSWK105	119,401
		SBSWK107	2,423
		SBSWK109	163
		SBSWK111	320
Total Volume Harvested in Bowron Supply Block in Planning Period 6 (20 records)			606,251
Total Volume Harvested in Bowron Supply Block (All Planning Periods) (98 records)			4,003,672
Average Annual Harvest in Bowron Supply Block (m3/yr)			133,456

Site series ending with a "C" represent areas which have had their volume reduced by 67% to approximate partial cutting the Caribou – modified harvest areas.

Supply Block	Planning Period	Site Series	Harvest Volume (m³)
Cottonwood			
1	(2002-2006)		
		ESSFWC301	27,294
		ESSFWC303	1,243
		ESSFWK101	211,645
		ESSFWK102	539
		ESSFWK103	52,830
		ESSFWK104	6,968
		ESSFWK105	185
		SBSMW01	708,881
		SBSMW03	576
		SBSMW04	5,207
		SBSMW05	2,480
		SBSMW06	16,167
		SBSMW07	65,254
		SBSMW10	450
		SBSWK101	558,358
		SBSWK103	5,164
		SBSWK104	391
		SBSWK105	158,285
		SBSWK106	1,611
		SBSWK107	121,932
		SBSWK108	25,938
		SBSWK109	2,258
Total Volume Harvested in Cottonwood Supply Block in Planning Period 1 (22 records)			1,973,655
2	(2007-2011)		
		ESSFWC301	50,880
		ESSFWC302	1,924
		ESSFWC303	6,701
		ESSFWK101	601,956
		ESSFWK102	1,074
		ESSFWK103	153,686
		ESSFWK104	45,885
		ESSFWK105	26,606
		ESSFWK106	88
		SBSMW01	348,389
		SBSMW04	10,340
		SBSMW05	9,101
		SBSMW07	33,288
		SBSMW09	2,541
		SBSMW10	140
		SBSWK101	195,621
		SBSWK102	501
		SBSWK104	4,528
		SBSWK105	133,639
		SBSWK107	70,603
		SBSWK108	9,640
		SBSWK109	270

Supply Block	Planning Period	Site Series	Harvest Volume (m³)
Total Volume Harvested in Cottonwood Supply Block in Planning Period 2 (22 records)			1,707,401
3	(2012-2016)		
		ESSFWC301	50,869
		ESSFWC301C	1,133
		ESSFWC302	357
		ESSFWC302C	42
		ESSFWC303	7,459
		ESSFWK101	263,948
		ESSFWK101C	9,900
		ESSFWK102	1,432
		ESSFWK103	38,445
		ESSFWK103C	2,233
		ESSFWK104	14,452
		ESSFWK105	23,999
		SBSDW101	21,328
		SBSMW01	971,727
		SBSMW03	769
		SBSMW04	2,697
		SBSMW05	30,923
		SBSMW06	18,138
		SBSMW07	43,945
		SBSMW10	1,675
		SBSWK101	335,989
		SBSWK103	2,330
		SBSWK104	2,668
		SBSWK105	193,433
		SBSWK106	910
		SBSWK107	39,713
		SBSWK108	3
		SBSWK109	1,858
		SBSWK111	22
Total Volume Harvested in Cottonwood Supply Block in Planning Period 3 (29 records)			2,082,399
4	(2017-2021)		
		ESSFWC301	90,844
		ESSFWC301C	40,009
		ESSFWC302	8,906
		ESSFWC302C	791
		ESSFWC303	3,783
		ESSFWC303C	1,880
		ESSFWK101	284,882
		ESSFWK101C	611
		ESSFWK102	7,553
		ESSFWK103	188,014
		ESSFWK103C	607
		ESSFWK104	35,880
		ESSFWK105	11,826
		ESSFWK106	548
		SBSDW101	3,970
		SBSDW104	1,502

Supply Block	Planning Period	Site Series	Harvest Volume (m³)
		SBSDW107	3,359
		SBSMW01	703,730
		SBSMW03	1,733
		SBSMW04	9,211
		SBSMW05	30,363
		SBSMW06	1,170
		SBSMW07	105,612
		SBSMW09	14,051
		SBSMW10	1,456
		SBSWK101	134,860
		SBSWK104	624
		SBSWK105	174,575
		SBSWK106	8,104
		SBSWK107	45,549
		SBSWK108	204
		SBSWK109	3,026
Total Volume Harvested in Cottonwood Supply Block in Planning Period 4 (32 records)			1,919,234
5	(2022-2026)		
		ESSFWC301	75,789
		ESSFWC301C	8,277
		ESSFWC302	6,752
		ESSFWC303	6,882
		ESSFWK101	234,423
		ESSFWK102	1,116
		ESSFWK103	67,524
		ESSFWK104	27,379
		ESSFWK105	6,912
		SBSDW101	53,698
		SBSDW103	1,084
		SBSDW104	3,347
		SBSDW107	512
		SBSDW108	403
		SBSMH01	12,145
		SBSMW01	574,378
		SBSMW03	45,186
		SBSMW04	4,374
		SBSMW05	116,226
		SBSMW06	37,948
		SBSMW07	66,122
		SBSMW09	2,420
		SBSMW10	4,168
		SBSWK101	334,298
		SBSWK105	97,576
		SBSWK106	4,634
		SBSWK107	20,893
		SBSWK108	15,961
		SBSWK109	333
		SBSWK111	2,527
Total Volume Harvested in Cottonwood Supply Block in Planning Period 5 (30 records)			1,833,287

Supply Block	Planning Period	Site Series	Harvest Volume (m ³)
6	(2027-2031)		
		ESSFWC301	79,521
		ESSFWC302	2,757
		ESSFWC303	1,094
		ESSFWK101	169,673
		ESSFWK102	2,928
		ESSFWK103	59,246
		ESSFWK104	36,882
		ESSFWK105	878
		SBSDW101	15,649
		SBSDW103	417
		SBSDW104	3,590
		SBSDW107	9,412
		SBSDW108	957
		SBSMW01	648,463
		SBSMW03	7,526
		SBSMW04	7,241
		SBSMW05	48,190
		SBSMW06	21,913
		SBSMW07	29,442
		SBSMW08	45
		SBSMW09	7,583
		SBSMW10	307
		SBSWK101	196,843
		SBSWK102	8,503
		SBSWK103	12,932
		SBSWK104	3,955
		SBSWK105	115,665
		SBSWK107	43,497
		SBSWK108	21,256
		SBSWK109	137
Total Volume Harvested in Cottonwood Supply Block in Planning Period 6 (30 records)			1,556,502
Total Volume Harvested in Cottonwood Supply Block (All Planning Periods) (165 records)			11,072,477
Average Annual Harvest in Cottonwood Supply Block (m ³ /yr)			369,083
Total Volume Harvested (All Planning Periods)			18,955,804
Average Annual Harvest (All Supply Blocks)			631,860
Non-Recoverable Losses (m ³ /yr)			-6,780
Net Average Annual Harvest (All Supply Blocks) (m ³ /yr)			625,080

Site series ending with a "C" represent areas which have had their volume reduced by 67% to approximate partial cutting the Caribou – modified harvest areas.

Table A I-2: Supply Block Report - Harvest Area by Site Series

Supply Block	Planning Period	Site Series	Harvest Area (ha)
Big Valley	1 (2002-2006)	ESSFWC301	106
		ESSFWC302	4
		ESSFWK101	431
		ESSFWK103	29
		ESSFWK104	3
		ESSFWK105	22
		SBSMW01	14
		SBSMW05	2
		SBSMW06	3
		SBSMW07	3
		SBSMW08	11
		SBSWK101	572
		SBSWK102	1
		SBSWK103	8
		SBSWK104	40
		SBSWK105	255
		SBSWK106	5
		SBSWK107	344
		SBSWK108	30
	Total Area Harvested in Big Valley Supply Block in Planning Period 1 (19 records)		1,882
2 (2007-2011)	ESSFWC301	103	
	ESSFWC303	10	
	ESSFWK101	589	
	ESSFWK102	1	
	ESSFWK103	214	
	ESSFWK104	47	
	ESSFWK105	9	
	SBSWK101	820	
	SBSWK102	2	
	SBSWK103	69	
	SBSWK104	4	
	SBSWK105	278	
	SBSWK106	4	
	SBSWK107	129	
	SBSWK108	131	
	SBSWK109	12	
	Total Area Harvested in Big Valley Supply Block in Planning Period 2 (16 records)		2,421
	3 (2012-2016)	ESSFWC301	76
		ESSFWC302	14
ESSFWC303		6	
ESSFWK101		652	
ESSFWK102		5	
ESSFWK103		227	
ESSFWK104		26	

Supply Block	Planning Period	Site Series	Harvest Area (ha)
		ESSFWK105	9
		SBSWK101	58
		SBSWK105	82
		SBSWK106	1
		SBSWK107	37
		Total Area Harvested in Big Valley Supply Block in Planning Period 3 (12 records)	1,194
		4 (2017-2021)	
		ESSFWC301	448
		ESSFWC301C	535
		ESSFWC302	41
		ESSFWC302C	53
		ESSFWC303	19
		ESSFWC303C	2
		ESSFWK101	998
		ESSFWK101C	33
		ESSFWK102	1
		ESSFWK103	335
		ESSFWK103C	16
		ESSFWK104	40
		ESSFWK105	9
		ESSFWK106	10
		SBSWK101	397
		SBSWK102	1
		SBSWK103	85
		SBSWK105	119
		SBSWK106	1
		SBSWK107	71
		SBSWK108	52
		SBSWK109	31
		SBSWK111	2
		Total Area Harvested in Big Valley Supply Block in Planning Period 4 (23 records)	3,301
		5 (2022-2026)	
		ESSFWC301	240
		ESSFWC301C	136
		ESSFWC302	3
		ESSFWC302C	6
		ESSFWK101	555
		ESSFWK101C	5
		ESSFWK102	2
		ESSFWK103	418
		ESSFWK103C	3
		ESSFWK104	21
		ESSFWK105	11
		ESSFWK106	1
		SBSMW01	24
		SBSMW06	43
		SBSMW07	37
		SBSWK101	165

Supply Block	Planning Period	Site Series	Harvest Area (ha)
		SBSWK102	6
		SBSWK103	40
		SBSWK104	2
		SBSWK105	100
		SBSWK107	41
		SBSWK108	4
		SBSWK109	14
		SBSWK111	5
Total Area Harvested in Big Valley Supply Block in Planning Period 5 (24 records)			1,884
6	(2027-2031)		
		ESSFWC301	397
		ESSFWC301C	18
		ESSFWC302	6
		ESSFWC303	29
		ESSFWK101	1,041
		ESSFWK102	1
		ESSFWK103	482
		ESSFWK104	120
		ESSFWK105	86
		ESSFWK106	3
		SBSMW01	126
		SBSMW03	2
		SBSMW05	6
		SBSMW06	4
		SBSMW07	1
		SBSMW08	10
		SBSMW09	1
		SBSWK101	24
		SBSWK103	42
		SBSWK105	123
		SBSWK107	27
		SBSWK109	14
		SBSWK111	8
Total Area Harvested in Big Valley Supply Block in Planning Period 6 (23 records)			2,571
Total Area Harvested in Big Valley Supply Block (All Planning Periods) (117 records)			13,254
Average Annual Harvest in Big Valley Supply Block (ha/yr)			442

Site series ending with a "C" represent areas which have had their volume reduced by 67% to approximate partial cutting the Caribou – modified harvest areas.

Supply Block	Planning Period	Site Series	Harvest Area (ha)
Bowron			
	1 (2002-2006)		
		ESSFWK101	149
		ESSFWK103	18
		ICHMK301	29
		ICHMK305	5
		ICHMK306	119
		ICHWK401	120
		ICHWK407	17
		SBSWK101	622
		SBSWK103	4
		SBSWK104	9
		SBSWK105	480
		SBSWK107	92
		SBSWK109	13
Total Area Harvested in Bowron Supply Block in Planning Period 1 (13 records)			1,677
	2 (2007-2011)		
		ESSFWC301	5
		ESSFWK101	81
		ESSFWK103	56
		ESSFWK104	2
		SBSWK101	1,087
		SBSWK103	43
		SBSWK104	16
		SBSWK105	408
		SBSWK107	334
		SBSWK109	21
Total Area Harvested in Bowron Supply Block in Planning Period 2 (10 records)			2,052
	3 (2012-2016)		
		ESSFWC301	20
		ESSFWC302	1
		ESSFWK101	422
		ESSFWK102	1
		ESSFWK103	149
		ESSFWK104	4
		SBSWK101	197
		SBSWK103	3
		SBSWK105	239
		SBSWK107	11
		SBSWK109	15
Total Area Harvested in Bowron Supply Block in Planning Period 3 (11 records)			1,060
	4 (2017-2021)		
		ESSFWC301	297
		ESSFWC301C	150
		ESSFWC302	2
		ESSFWC302C	19
		ESSFWC303	6

Supply Block	Planning Period	Site Series	Harvest Area (ha)
		ESSFWK101	680
		ESSFWK101C	1
		ESSFWK102	8
		ESSFWK103	388
		ESSFWK103C	1
		ESSFWK104	20
		ESSFWK106	4
		ICHWK401	28
		SBSWK101	751
		SBSWK103	126
		SBSWK104	6
		SBSWK105	434
		SBSWK106	2
		SBSWK107	306
		SBSWK109	91
		SBSWK111	6
Total Area Harvested in Bowron Supply Block in Planning Period 4 (21 records)			3,327
	5 (2022-2026)		
		ESSFWC301	159
		ESSFWC301C	12
		ESSFWC302	1
		ESSFWC302C	2
		ESSFWC303	5
		ESSFWK101	542
		ESSFWK102	8
		ESSFWK103	323
		ESSFWK104	28
		ESSFWK106	2
		SBSWK101	479
		SBSWK103	215
		SBSWK104	4
		SBSWK105	440
		SBSWK107	40
		SBSWK109	36
		SBSWK111	10
Total Area Harvested in Bowron Supply Block in Planning Period 5 (17 records)			2,306
	6 (2027-2031)		
		ESSFWC301	190
		ESSFWC302	11
		ESSFWC303	4
		ESSFWK101	694
		ESSFWK103	405
		ESSFWK104	33
		ESSFWK105	22
		ESSFWK106	5
		ICHMK301	1
		ICHMK306	6
		ICHWK401	8

Supply Block	Planning Period	Site Series	Harvest Area (ha)
		ICHWK407	4
		SBSWK101	98
		SBSWK103	147
		SBSWK104	9
		SBSWK105	362
		SBSWK107	7
		SBSWK111	1
Total Area Harvested in Bowron Supply Block in Planning Period 6 (18 records)			2,006
Total Area Harvested in Bowron Supply Block (All Planning Periods) (90 records)			12,429
Average Annual Harvest in Bowron Supply Block (ha/yr)			414

Site series ending with a "C" represent areas which have had their volume reduced by 67% to approximate partial cutting the Caribou – modified harvest areas.

Supply Block	Planning Period	Site Series	Harvest Area (ha)		
Cottonwood	1 (2002-2006)	ESSFWC301	76		
		ESSFWC303	3		
		ESSFWK101	525		
		ESSFWK102	1		
		ESSFWK103	140		
		ESSFWK104	15		
		ESSFWK105	1		
		SBSMW01	1,795		
		SBSMW03	1		
		SBSMW04	12		
		SBSMW05	7		
		SBSMW06	33		
		SBSMW07	136		
		SBSMW10	1		
		SBSWK101	1,371		
		SBSWK103	13		
		SBSWK104	1		
		SBSWK105	399		
		SBSWK106	3		
		SBSWK107	310		
		SBSWK108	67		
		SBSWK109	5		
		Total Area Harvested in Cottonwood Supply Block in Planning Period 1 (22 records)			4,917
	2 (2007-2011)	ESSFWC301	152		
		ESSFWC302	6		
		ESSFWC303	19		
		ESSFWK101	1,627		
		ESSFWK102	3		
		ESSFWK103	431		
		ESSFWK104	114		
		ESSFWK105	69		
		SBSMW01	852		
		SBSMW04	29		
		SBSMW05	22		
		SBSMW07	83		
		SBSMW09	6		
		SBSWK101	535		
		SBSWK102	1		
		SBSWK104	13		
		SBSWK105	357		
		SBSWK107	198		
		SBSWK108	24		
		SBSWK109	1		
		Total Area Harvested in Cottonwood Supply Block in Planning Period 2 (20 records)			4,542

Supply Block	Planning Period	Site Series	Harvest Area (ha)
	3 (2012-2016)		
		ESSFWC301	144
		ESSFWC301C	11
		ESSFWC302	1
		ESSFWC303	22
		ESSFWK101	772
		ESSFWK101C	102
		ESSFWK102	4
		ESSFWK103	108
		ESSFWK103C	23
		ESSFWK104	42
		ESSFWK105	72
		SBSDW101	57
		SBSMW01	2,629
		SBSMW03	2
		SBSMW04	7
		SBSMW05	81
		SBSMW06	52
		SBSMW07	103
		SBSMW10	4
		SBSWK101	875
		SBSWK103	8
		SBSWK104	8
		SBSWK105	512
		SBSWK106	2
		SBSWK107	106
		SBSWK109	4
Total Area Harvested in Cottonwood Supply Block in Planning Period 3 (26 records)			5,750
	4 (2017-2021)		
		ESSFWC301	305
		ESSFWC301C	463
		ESSFWC302	26
		ESSFWC302C	10
		ESSFWC303	13
		ESSFWC303C	20
		ESSFWK101	883
		ESSFWK101C	7
		ESSFWK102	20
		ESSFWK103	553
		ESSFWK103C	6
		ESSFWK104	100
		ESSFWK105	36
		ESSFWK106	2
		SBSDW101	9
		SBSDW104	4
		SBSDW107	8
		SBSMW01	1,873
		SBSMW03	3
		SBSMW04	21

Supply Block	Planning Period	Site Series	Harvest Area (ha)
		SBSMW05	78
		SBSMW06	4
		SBSMW07	256
		SBSMW09	33
		SBSMW10	3
		SBSWK101	389
		SBSWK104	2
		SBSWK105	478
		SBSWK106	21
		SBSWK107	142
		SBSWK108	1
		SBSWK109	11
		Total Area Harvested in Cottonwood Supply Block in Planning Period 4 (32 records)	5,777
		5 (2022-2026)	
		ESSFWC301	245
		ESSFWC301C	84
		ESSFWC302	19
		ESSFWC303	20
		ESSFWK101	788
		ESSFWK102	4
		ESSFWK103	241
		ESSFWK104	86
		ESSFWK105	23
		SBSDW101	152
		SBSDW103	3
		SBSDW104	11
		SBSDW107	1
		SBSDW108	1
		SBSMH01	25
		SBSMW01	1,603
		SBSMW03	103
		SBSMW04	11
		SBSMW05	317
		SBSMW06	109
		SBSMW07	158
		SBSMW09	5
		SBSMW10	9
		SBSWK101	866
		SBSWK105	278
		SBSWK106	11
		SBSWK107	57
		SBSWK108	45
		SBSWK109	1
		SBSWK111	7
		Total Area Harvested in Cottonwood Supply Block in Planning Period 5 (30 records)	5,282
		6 (2027-2031)	
		ESSFWC301	317
		ESSFWC302	13
		ESSFWC303	4

Supply Block	Planning Period	Site Series	Harvest Area (ha)
		ESSFWK101	648
		ESSFWK102	9
		ESSFWK103	255
		ESSFWK104	110
		ESSFWK105	2
		SBSDW101	45
		SBSDW103	1
		SBSDW104	11
		SBSDW107	24
		SBSDW108	3
		SBSMW01	2,022
		SBSMW03	18
		SBSMW04	20
		SBSMW05	140
		SBSMW06	68
		SBSMW07	86
		SBSMW09	18
		SBSMW10	1
		SBSWK101	586
		SBSWK102	25
		SBSWK103	29
		SBSWK104	11
		SBSWK105	337
		SBSWK107	119
		SBSWK108	52
Total Area Harvested in Cottonwood Supply Block in Planning Period 6 (28 records)			4,973
Total Area Harvested in Cottonwood Supply Block (All Planning Periods) (158 records)			31,241
Average Annual Harvest in Cottonwood Supply Block (ha/yr)			1,041
Total Area Harvested			56,923
Average Annual Harvest (All Supply Blocks) (ha/yr)			1,897

Site series ending with a "C" represent areas which have had their volume reduced by 67% to approximate partial cutting the Caribou – modified harvest areas.

Table A I-3: Supply Block Report - Harvest Revenue by Site Series.

Supply Block	Planning Period	Site Series	Harvest Revenue (\$)
Big Valley	1 (2002-2006)	ESSFWC301	2,361,542
		ESSFWC302	79,192
		ESSFWC303	10,390
		ESSFWK101	10,064,391
		ESSFWK103	782,312
		ESSFWK104	23,115
		ESSFWK105	526,357
		SBSMW01	283,951
		SBSMW05	61,642
		SBSMW06	61,302
		SBSMW07	60,337
		SBSMW08	297,267
		SBSMW09	1,947
		SBSWK101	17,289,141
		SBSWK102	19,485
		SBSWK103	248,915
		SBSWK104	1,109,586
		SBSWK105	7,276,279
		SBSWK106	185,149
		SBSWK107	11,457,733
		SBSWK108	910,552
		Total Harvest Revenue in Big Valley Supply Block in Planning Period 1 (21 records)	
	2 (2007-2011)	ESSFWC301	1,837,624
		ESSFWC303	176,252
		ESSFWK101	15,450,850
		ESSFWK102	20,772
		ESSFWK103	5,261,840
		ESSFWK104	1,460,111
		ESSFWK105	229,698
		SBSWK101	20,861,879
		SBSWK102	51,953
		SBSWK103	1,973,935
		SBSWK104	73,836
		SBSWK105	7,057,201
		SBSWK106	106,795
		SBSWK107	3,574,449
		SBSWK108	3,311,029
		SBSWK109	345,943
		SBSWK111	1,198
Total Harvest Revenue in Big Valley Supply Block in Planning Period 2 (17 records)			61,795,364
	3 (2012-2016)	ESSFWC301	1,536,139
		ESSFWC302	308,854
		ESSFWC303	121,475

Supply Block	Planning Period	Site Series	Harvest Revenue (\$)
		ESSFWK101	15,295,764
		ESSFWK102	138,479
		ESSFWK103	4,868,432
		ESSFWK104	758,895
		ESSFWK105	236,979
		SBSWK101	1,358,919
		SBSWK103	1,217
		SBSWK104	7,357
		SBSWK105	1,688,302
		SBSWK106	24,080
		SBSWK107	1,289,516
		Total Harvest Revenue in Big Valley Supply Block in Planning Period 3 (14 records)	27,634,407
		4 (2017-2021)	
		ESSFWC301	8,442,800
		ESSFWC301C	3,478,211
		ESSFWC302	887,004
		ESSFWC302C	303,059
		ESSFWC303	319,712
		ESSFWC303C	19,906
		ESSFWK101	21,564,724
		ESSFWK101C	211,025
		ESSFWK102	46,331
		ESSFWK103	7,544,780
		ESSFWK103C	161,909
		ESSFWK104	1,036,891
		ESSFWK105	207,626
		ESSFWK106	254,184
		SBSWK101	8,916,127
		SBSWK102	26,584
		SBSWK103	1,888,407
		SBSWK105	2,830,855
		SBSWK106	17,101
		SBSWK107	1,727,617
		SBSWK108	1,080,618
		SBSWK109	732,936
		SBSWK111	46,638
		Total Harvest Revenue in Big Valley Supply Block in Planning Period 4 (23 records)	61,745,043
		5 (2022-2026)	
		ESSFWC301	5,013,776
		ESSFWC301C	785,271
		ESSFWC302	65,982
		ESSFWC302C	31,526
		ESSFWC303	842
		ESSFWK101	10,816,722
		ESSFWK101C	41,990
		ESSFWK102	55,181
		ESSFWK103	8,132,379
		ESSFWK103C	19,370
		ESSFWK104	460,971

Supply Block	Planning Period	Site Series	Harvest Revenue (\$)
		ESSFWK105	271,330
		ESSFWK106	33,185
		SBSMW01	401,045
		SBSMW06	721,340
		SBSMW07	931,215
		SBSMW08	1,212
		SBSWK101	3,128,756
		SBSWK102	139,866
		SBSWK103	970,146
		SBSWK104	24,941
		SBSWK105	2,117,575
		SBSWK106	4,671
		SBSWK107	938,741
		SBSWK108	72,011
		SBSWK109	439,388
		SBSWK111	128,618
Total Harvest Revenue in Big Valley Supply Block in Planning Period 5 (27 records)			35,748,048
	6		(2027-2031)
		ESSFWC301	7,559,304
		ESSFWC301C	101,789
		ESSFWC302	85,290
		ESSFWC303	502,290
		ESSFWK101	19,175,602
		ESSFWK102	13,438
		ESSFWK103	9,669,033
		ESSFWK104	2,901,793
		ESSFWK105	1,789,143
		ESSFWK106	65,262
		SBSMW01	2,369,046
		SBSMW03	49,195
		SBSMW05	133,977
		SBSMW06	75,473
		SBSMW07	20,768
		SBSMW08	197,944
		SBSMW09	14,716
		SBSWK101	447,151
		SBSWK103	1,011,124
		SBSWK105	2,591,732
		SBSWK107	619,146
		SBSWK109	373,013
		SBSWK111	187,772
Total Harvest Revenue in Big Valley Supply Block in Planning Period 6 (23 records)			49,954,001
Total Harvest Revenue in Big Valley Supply Block (All Planning Periods) (125 records)			289,987,448
Average Annual Harvest Revenue in Big Valley Supply Block (\$/yr)			9,666,248

Site series ending with a "C" represent areas which have had their volume reduced by 67% to approximate partial cutting the Caribou – modified harvest areas.

Supply Block	Planning Period	Site Series	Harvest Revenue (\$)
Bowron			
	1 (2002-2006)		
		ESSFWK101	4,560,335
		ESSFWK103	583,504
		ICHMK301	857,164
		ICHMK304	2,477
		ICHMK305	138,437
		ICHMK306	3,276,646
		ICHWK401	3,623,241
		ICHWK407	434,561
		SBSWK101	17,667,111
		SBSWK103	151,721
		SBSWK104	221,654
		SBSWK105	14,037,735
		SBSWK107	2,696,187
		SBSWK109	27,569
Total Harvest Revenue in Bowron Supply Block in Planning Period 1 (14 records)			48,278,344
	2 (2007-2011)		
		ESSFWC301	118,632
		ESSFWC303	3,470
		ESSFWK101	1,994,896
		ESSFWK103	1,579,058
		SBSWK101	27,925,446
		SBSWK103	1,370,213
		SBSWK104	360,736
		SBSWK105	10,378,587
		SBSWK106	2,222
		SBSWK107	9,425,513
		SBSWK109	587,867
		SBSWK111	4,808
Total Harvest Revenue in Bowron Supply Block in Planning Period 2 (12 records)			53,751,448
	3 (2012-2016)		
		ESSFWC301	546,000
		ESSFWC302	18,838
		ESSFWK101	9,711,515
		ESSFWK102	28,853
		ESSFWK103	3,732,392
		ESSFWK104	48,856
		SBSWK101	4,981,251
		SBSWK103	105,975
		SBSWK104	7,330
		SBSWK105	5,065,899
		SBSWK107	269,976
		SBSWK109	384,178
Total Harvest Revenue in Bowron Supply Block in Planning Period 3 (12 records)			24,901,064
	4 (2017-2021)		
		ESSFWC301	6,208,747

Supply Block	Planning Period	Site Series	Harvest Revenue (\$)
		ESSFWC301C	1,075,351
		ESSFWC302	33,226
		ESSFWC302C	124,929
		ESSFWC303	111,651
		ESSFWK101	14,501,315
		ESSFWK101C	2,704
		ESSFWK102	192,309
		ESSFWK103	8,519,622
		ESSFWK103C	14,207
		ESSFWK104	365,709
		ESSFWK105	11,555
		ESSFWK106	89,466
		ICHWK401	220,285
		SBSWK101	19,756,157
		SBSWK103	3,576,923
		SBSWK104	130,616
		SBSWK105	10,796,458
		SBSWK106	61,944
		SBSWK107	8,540,862
		SBSWK109	2,734,655
		SBSWK111	148,792
		Total Harvest Revenue in Bowron Supply Block in Planning Period 4 (22 records)	
5	(2022-2026)		
		ESSFWC301	3,317,001
		ESSFWC301C	90,868
		ESSFWC302	11,170
		ESSFWC302C	16,843
		ESSFWC303	91,297
		ESSFWK101	10,896,608
		ESSFWK102	168,306
		ESSFWK103	6,776,776
		ESSFWK104	628,369
		ESSFWK106	42,696
		SBSWK101	11,408,528
		SBSWK103	4,153,441
		SBSWK104	95,105
		SBSWK105	10,319,726
		SBSWK106	7,865
		SBSWK107	874,138
		SBSWK109	903,886
		SBSWK111	293,633
Total Harvest Revenue in Bowron Supply Block in Planning Period 5 (18 records)		50,096,257	
6	(2027-2031)		
		ESSFWC301	3,540,516
		ESSFWC302	191,558
		ESSFWC303	63,649
		ESSFWK101	14,450,284
		ESSFWK102	2,015
		ESSFWK103	8,332,484

Supply Block	Planning Period	Site Series	Harvest Revenue (\$)
		ESSFWK104	728,253
		ESSFWK105	464,198
		ESSFWK106	99,455
		ICHMK301	15,758
		ICHMK306	78,055
		ICHWK401	16,763
		ICHWK407	8,084
		SBSWK101	2,392,854
		SBSWK103	4,177,705
		SBSWK104	191,146
		SBSWK105	8,580,315
		SBSWK107	182,343
		SBSWK109	12,884
		SBSWK111	23,443
Total Harvest Revenue in Bowron Supply Block in Planning Period 6 (20 records)			43,551,762
Total Harvest Revenue in Bowron Supply Block (All Planning Periods) (98 records)			297,796,357
Average Annual Harvest Revenue in Bowron Supply Block (\$/yr)			9,926,545

Site series ending with a "C" represent areas which have had their volume reduced by 67% to approximate partial cutting the Caribou – modified harvest areas.

Supply Block	Planning Period	Site Series	Harvest Revenue (\$)
Cottonwood	1 (2002-2006)	ESSFWC301	2,092,249
		ESSFWC303	97,292
		ESSFWK101	16,429,841
		ESSFWK102	41,758
		ESSFWK103	4,111,165
		ESSFWK104	550,237
		ESSFWK105	14,456
		SBSMW01	54,724,997
		SBSMW03	47,282
		SBSMW04	426,928
		SBSMW05	188,611
		SBSMW06	1,368,385
		SBSMW07	5,423,858
		SBSMW10	38,184
		SBSWK101	43,565,748
		SBSWK103	392,090
		SBSWK104	32,219
		SBSWK105	12,218,516
		SBSWK106	127,550
		SBSWK107	9,512,373
		SBSWK108	1,994,385
		SBSWK109	176,554
		Total Harvest Revenue in Cottonwood Supply Block in Planning Period 1 (22 records)	
	2 (2007-2011)	ESSFWC301	3,901,518
		ESSFWC302	146,111
		ESSFWC303	515,050
		ESSFWK101	46,511,751
		ESSFWK102	84,344
		ESSFWK103	11,813,210
		ESSFWK104	3,588,282
		ESSFWK105	2,078,192
		ESSFWK106	6,796
		SBSMW01	27,178,834
		SBSMW04	827,993
		SBSMW05	696,466
		SBSMW06	27
		SBSMW07	2,626,158
		SBSMW09	202,457
		SBSMW10	11,222
		SBSWK101	14,841,186
		SBSWK102	37,999
		SBSWK104	339,970
		SBSWK105	10,261,249
		SBSWK107	5,375,208

Supply Block	Planning Period	Site Series	Harvest Revenue (\$)
Total Harvest Revenue in Cottonwood Supply Block in Planning Period 2 (23 records)	3 (2012-2016)	SBSWK108	749,617
		SBSWK109	20,541
			131,814,184
		ESSFWC301	3,890,004
		ESSFWC301C	85,678
		ESSFWC302	27,368
		ESSFWC302C	3,171
		ESSFWC303	571,813
		ESSFWK101	20,077,565
		ESSFWK101C	727,027
		ESSFWK102	110,740
		ESSFWK103	2,952,507
		ESSFWK103C	163,451
		ESSFWK104	1,102,970
		ESSFWK105	1,806,532
		SBSDW101	1,513,047
		SBSMW01	72,296,556
		SBSMW03	56,951
		SBSMW04	192,043
		SBSMW05	2,337,339
		SBSMW06	1,299,029
		SBSMW07	3,404,484
		SBSMW10	127,444
Total Harvest Revenue in Cottonwood Supply Block in Planning Period 3 (29 records)	4 (2017-2021)	SBSWK101	25,288,699
		SBSWK103	174,876
		SBSWK104	197,127
		SBSWK105	14,537,552
		SBSWK106	69,029
		SBSWK107	3,057,509
		SBSWK108	211
		SBSWK109	145,036
		SBSWK111	1,651
			156,217,406
		ESSFWC301	6,901,408
		ESSFWC301C	3,025,285
		ESSFWC302	689,336
		ESSFWC302C	58,726
		ESSFWC303	288,615
		ESSFWC303C	141,886
		ESSFWK101	21,444,662
		ESSFWK101C	44,589
		ESSFWK102	582,461
		ESSFWK103	14,166,098
		ESSFWK103C	44,749
		ESSFWK104	2,762,151
		ESSFWK105	898,200
		ESSFWK106	40,378

Supply Block	Planning Period	Site Series	Harvest Revenue (\$)
		SBSDW101	283,139
		SBSDW104	109,564
		SBSDW107	240,293
		SBSMW01	51,881,474
		SBSMW03	139,807
		SBSMW04	739,825
		SBSMW05	2,272,690
		SBSMW06	77,218
		SBSMW07	8,109,154
		SBSMW09	1,096,773
		SBSMW10	111,085
		SBSWK101	10,076,062
		SBSWK104	47,117
		SBSWK105	13,080,009
		SBSWK106	618,775
		SBSWK107	3,426,481
		SBSWK108	14,323
		SBSWK109	230,438
Total Harvest Revenue in Cottonwood Supply Block in Planning Period 4 (32 records)			143,642,772
	5 (2022-2026)		
		ESSFWC301	5,741,598
		ESSFWC301C	609,053
		ESSFWC302	514,986
		ESSFWC303	523,121
		ESSFWK101	17,454,072
		ESSFWK102	82,388
		ESSFWK103	5,005,706
		ESSFWK104	2,062,096
		ESSFWK105	517,596
		SBSDW101	3,887,998
		SBSDW103	80,053
		SBSDW104	244,230
		SBSDW107	37,137
		SBSDW108	30,569
		SBSMH01	1,012,221
		SBSMW01	41,921,323
		SBSMW03	3,396,704
		SBSMW04	317,808
		SBSMW05	8,517,159
		SBSMW06	2,681,382
		SBSMW07	5,155,814
		SBSMW09	188,600
		SBSMW10	325,379
		SBSWK101	25,032,294
		SBSWK105	7,293,423
		SBSWK106	341,980
		SBSWK107	1,543,080
		SBSWK108	1,162,585
		SBSWK109	25,744

Supply Block	Planning Period	Site Series	Harvest Revenue (\$)
		SBSWK111	195,272
Total Harvest Revenue in Cottonwood Supply Block in Planning Period 5 (30 records)			135,901,369
	6 (2027-2031)		
		ESSFWC301	5,948,299
		ESSFWC302	203,007
		ESSFWC303	81,435
		ESSFWK101	12,384,918
		ESSFWK102	214,107
		ESSFWK103	4,327,840
		ESSFWK104	2,800,448
		ESSFWK105	69,039
		SBSDW101	1,111,089
		SBSDW103	30,838
		SBSDW104	249,931
		SBSDW107	696,786
		SBSDW108	68,883
		SBSMW01	45,279,199
		SBSMW03	586,327
		SBSMW04	528,475
		SBSMW05	3,423,287
		SBSMW06	1,512,905
		SBSMW07	2,171,119
		SBSMW08	3,041
		SBSMW09	591,058
		SBSMW10	22,789
		SBSWK101	14,239,884
		SBSWK102	644,796
		SBSWK103	990,073
		SBSWK104	302,062
		SBSWK105	8,533,060
		SBSWK107	3,132,702
		SBSWK108	1,652,239
		SBSWK109	10,456
Total Harvest Revenue in Cottonwood Supply Block in Planning Period 6 (30 records)			111,810,090
Total Harvest Revenue in Cottonwood Supply Block (All Planning Periods) (166 records)			832,960,498
Average Annual Harvest Revenue in Cottonwood Supply Block (\$/yr)			27,765,350
Total Harvest Revenue			1,420,744,302
Average Annual Harvest Revenue(All Supply Blocks) (\$/yr)			47,358,143

Site series ending with a "C" represent areas which have had their volume reduced by 67% to approximate partial cutting the Caribou – modified harvest areas.

Appendix II – Spatial Harvest Schedule – 1:100,000 Harvest Map

Appendix III – Spatial Silviculture Treatment Schedule – Supply Block Reports

❖ Silviculture Treatment Area by Site Series

Table A III-1: Supply Block Reports – Treatment Area by Site Series.

Supply Block	Planning Period	Treatment	Site Series	Area Treated (ha)
Big Valley				
1	(2002-2006)	Rehabilitation (bl/NSR)		
			SBSWK101	223
			SBSWK105	119
			SBSWK107	38
		Total Area for Rehabilitation (bl/NSR) (3 records)		381
		Total Treated Area in Cut Period 1 (3 records)		381
5	(2022-2026)	Fertilization		
			SBSWK101	92
			SBSWK105	25
		Total Area for Fertilization (2 records)		117
		Total Treated Area in Cut Period 5 (2 records)		117
6	(2027-2031)	Fertilization		
			SBSWK101	304
			SBSWK105	218
		Total Area for Fertilization (2 records)		522
		Total Treated Area in Cut Period 6 (2 records)		522
		Total Area Treated in Supply Block Big Valley (7 records)		1,021

Supply Block	Planning Period	Treatment	Site Series	Area Treated (ha)
Bowron				
1	(2002-2006)	Fertilization		
			SBSWK101	1
		Total Area for Fertilization (1 record)		1
		Rehabilitation (bl/NSR)		
			ICHMK301	34
			ICHMK304	13
			ICHMK305	2
			ICHMK306	12
			SBSWK101	352
			SBSWK105	52
			SBSWK106	3
			SBSWK107	9
		Total Area for Rehabilitation (bl/NSR) (8 records)		477
		Total Treated Area in Cut Period 1 (9 records)		479
3	(2012-2016)	Rehabilitation (bl/NSR)		
			SBSWK101	2
		Total Area for Rehabilitation (bl/NSR) (1 record)		2
		Total Treated Area in Cut Period 3 (1 record)		2
5	(2022-2026)	CT/Fertilization		
			ICHMK301	1
		Total Area for CT/Fertilization (1 record)		1
		Fertilization		
			SBSWK101	276
			SBSWK105	50
		Total Area for Fertilization (2 records)		326
		Total Treated Area in Cut Period 5 (3 records)		327
6	(2027-2031)	CT/Fertilization		
			ICHMK301	160
		Total Area for CT/Fertilization (1 record)		160
		Fertilization		

Supply Block	Planning Period	Treatment	Site Series	Area Treated (ha)
			<i>SBSWK101</i>	597
			<i>SBSWK105</i>	249
		<i>Total Area for Fertilization (2 records)</i>		846
		<i>Total Treated Area in Cut Period 6 (3 records)</i>		1,006
		<i>Total Area Treated in Supply Block Bowron (16 records)</i>		1,813

Supply Block	Planning Period	Treatment	Site Series	Area Treated (ha)
Cottonwood				
1	(2002-2006)	Rehabilitation (bl/NSR)		
			SBSMW01	475
			SBSMW05	6
			SBSMW06	2
			SBSMW07	38
			SBSWK101	493
			SBSWK105	110
			SBSWK107	9
			SBSWK108	3
		Total Area for Rehabilitation (bl/NSR) (8 records)		1,136
		Total Treated Area in Cut Period 1 (8 records)		1,136
2	(2007-2011)	Rehabilitation (bl/NSR)		
			SBSWK101	36
			SBSWK105	25
			SBSWK107	7
		Total Area for Rehabilitation (bl/NSR) (3 records)		68
		Total Treated Area in Cut Period 2 (3 records)		68
3	(2012-2016)	Rehabilitation (bl/NSR)		
			SBSWK101	2
		Total Area for Rehabilitation (bl/NSR) (1 record)		2
		Total Treated Area in Cut Period 3 (1 record)		2
4	(2017-2021)	CT/Fertilization		
			SBSMW01	1,114
			SBSMW06	8
		Total Area for CT/Fertilization (2 records)		1,122
		Total Treated Area in Cut Period 4 (2 records)		1,122
5	(2022-2026)	CT/Fertilization		
			SBSMW01	1,192

Supply Block	Planning Period	Treatment	Site Series	Area Treated (ha)
			<i>SBSMW06</i>	3
		<i>Total Area for CT/Fertilization (2 records)</i>		1,196
		Fertilization		
			<i>SBSWK101</i>	244
			<i>SBSWK105</i>	158
		<i>Total Area for Fertilization (2 records)</i>		402
		<i>Total Treated Area in Cut Period 5 (4 records)</i>		1,598
6	(2027-2031)	CT/Fertilization		
			<i>SBSMW01</i>	262
			<i>SBSMW06</i>	7
		<i>Total Area for CT/Fertilization (2 records)</i>		268
		Fertilization		
			<i>SBSWK101</i>	1,686
			<i>SBSWK105</i>	379
		<i>Total Area for Fertilization (2 records)</i>		2,066
		<i>Total Treated Area in Cut Period 6 (4 records)</i>		2,334
		<i>Total Area Treated in Supply Block Cottonwood (22 records)</i>		6,260
Total Area Treated				9,094

Appendix IV – Spatial Silviculture Treatment Schedule – 1:100,000 and 1:50,000 Treatment Maps