APPENDIX V

TIMBER SUPPLY ANALYSIS REPORT

SCOTT PAPER LIMITED

TIMBER SUPPLY ANALYSIS REPORT

TREE FARM LICENCE 43

MANAGEMENT PLAN NO. 4

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TREE FARM LICENCE #43
THE BROADLEAF TREE FARM LICENCE
MANAGEMENT PLAN 4

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1.0 INTRODUCTION

Tree Farm Licence #43 is a 10,106.2 hectare Broadleaf Tree Farm Licence located on the alluvial flood plains of the Lower Fraser, Homathko, and Kingcome Rivers. The timber management objective for the tree farm is to continue the rehabilitation and conversion harvesting of the existing mixed-wood (previously harvested deciduous/coniferous stands) to productive cottonwood/hybrid poplar stands.

The Timber Supply Analysis Report for TFL 43 describes the analysis and explains in detail the issues relevant to the analysis. A current and future timber supply is projected for TFL 43 based on the factors and options listed within the Information Package. The Timber Supply Analysis Report along with the 20 Year Plan and the Information Package provide part of the information used by the Chief Forester to determine the Allowable Annual Cut for TFL 43.

This Timber Supply Analysis Report has 2 distinct sections: one part of the report outlines an area-based analysis for all three Blocks of TFL 43, consistent with the objective to convert by harvesting the existing mixed-wood, stands to productive cottonwood/hybrid poplar stands. The second part illustrates the volume-based timber supply analysis for the Fraser Block of the TFL, as directed by the Chief Forester in the approval of Management Plan #3.

The methodology, results and recommended course of action are discussed below.

2.0 GENERAL INFORMATION

A. ANALYSIS UNITS

TFL 43 consists of three geographically distinct Blocks located in drainages dispersed along the lower coast of British Columbia. Scott Paper Limited will continue to manage the Lower Fraser, Homathko, and Kingcome tree farm Blocks as individual operating units of the tree farm licence. Each Block is analyzed separately and has a proposed individual annual allowable area cut based on its rotation length and net operable and available forest area. This management approach is considered the most appropriate insofar as integrating non timber resource values with timber harvesting activity, and it also balances wood supply costs and qualities.

Within each analysis unit, the total land area has been classified into productive and non-productive area. Productive forest is further classified as mature or immature forest which is comprised of operable , inoperable, or environmentally sensitive areas. The operable forest land is further subdivided by broad species types and grouped by site index reflecting productivity in order to facilitate management planning. Area and mature volume summaries were presented in the Timber Supply Analysis Information Package for Management Plan #4 (Information Package).

B. INVENTORY INFORMATION

The forest inventory information presented in Information Package has been updated to the end of September 1998. New aerial photography, flown by Scott Paper Limited for the TFL in the fall of 1997, formed the basis for this update. Mature timber volumes for the Homathko and Fraser Blocks were determined by using the updated forest type classifications and the Variable Density Yield Projection (VDYP) system. A further volume adjustment was made to the intensively managed hybrid poplar type within the Fraser Block based on the permanent sample plot data collected to date (refer to the Information Package for rationale regarding the adjustment). Mature timber volumes for the Kingcome Block were determined by an inventory cruise completed during the fall of 1988, which was updated to 1998. The classification standards and factors used for the inventory are as presented in the Information Package.

3.0 DATA AND MANAGEMENT ASSUMPTIONS FOR THE BASE CASE

A. DETERMINATION OF THE TIMBER HARVESTING LAND BASE

The long term timber harvesting land base (THLB) is determined by excluding areas where timber harvesting is unlikely to occur. The constrained areas are withdrawn from the productive forest to derive the operable land base available for timber production within MP #4. In summary the following areas have been excluded:

- Non-forest areas such as rock, river, gravel bars, swamps etc

- Protected areas. Lower Homathko Protected Area has been withdrawn from the operable land base although a formal TFL amending instrument has not been issued yet.

- Physically Inoperable and Economically Inoperable areas.

  ⇒ Land areas which were considered to be inoperable due to physical or economic considerations were identified on the forest cover polygon attribute lists under

an "I" and "EI" notation. Inoperable areas were netted out of the available land base at 100% for timber supply analysis purposes.

- Non-commercial Cover. Classified as NP BR type on forest cover maps. Areas containing brush species and minimal amount of cottonwood were deducted from the operable land base at 100%. Although it is difficult to estimate some of this area will be converted to productive forest in the course of normal harvesting activities.

- Environmentally Sensitive Areas deemed important for non-timber resources. These include:

  - Wildlife areas for grizzly bear and bald eagle

    ⇒ Sensitive wildlife habitat areas (including some forested ecological network [F.E.N.] areas) were delineated as Ew_1 or Ew_2 polygons included areas such as identified bald eagle nesting and roosting sites, and coniferous old growth grizzly bear habitat.

    ⇒ Ew_1 polygons were netted out at 98% and Ew_2 at 50%, from the available land base for timber supply analysis purposes. Specific Ew_1 polygons will be reduced by 90% in order to allow operational flexibility.

- Fisheries sensitive areas and riparian reserves

    ⇒ Specifically identified riparian areas were delineated as E_f polygons on the forest cover maps.

    ⇒ E_n polygon areas were netted out at 98% for timber supply analysis purposes.

    ⇒ In addition to the identified E_n polygons, 20 metre wide strips along side channels, back channels and sloughs, were netted out of the available land base at 100% in the Homathko and Kingcome Blocks. A 10 metre wide strip was applied within the Fraser Block to due to the Block's unique deciduous attribute, classification as an S1-Large River under the *Forest Practices Code of BC Act* and previous development history and structure.

After applying the above reductions to the total land base of 10,106.2 hectares, approximately 3304.4 hectares remains as the timber harvesting land base within Schedule "A" and "B" lands for this analysis. The detailed netdown process and the Timber Harvesting Land Base (THLB) derivation is contained within the Information Package.

Figure 1
Land Base Classification by Block and TFL 43

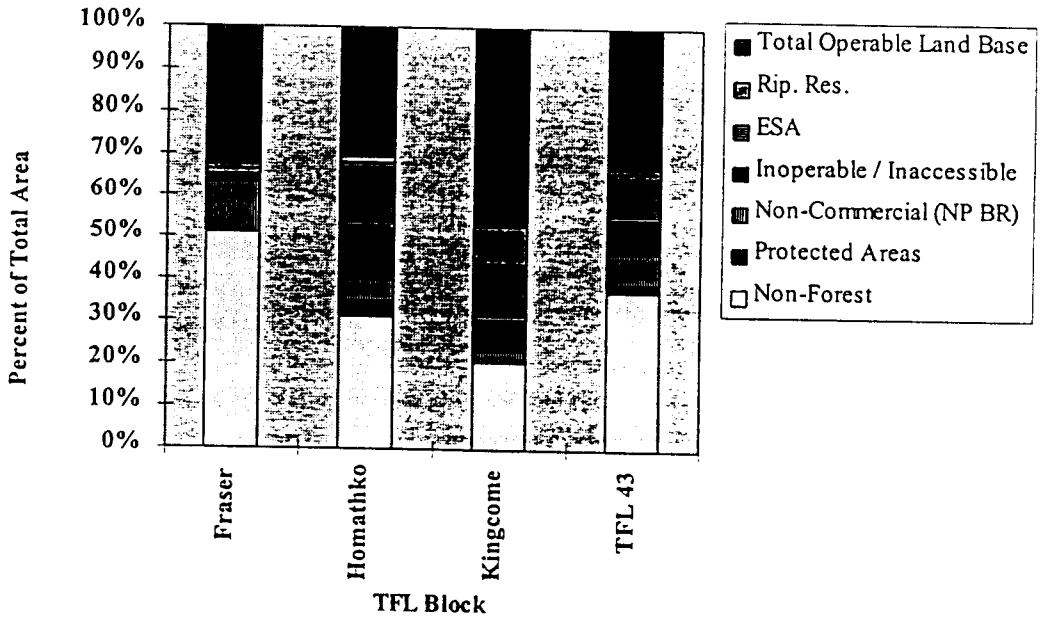


Figure 1 shows, by Block the TFL area categorized by non-forest, non-productive, non-commercial, inoperable, environmentally sensitive area, riparian reserves and operable area available for timber management. For the TFL, 33% of the land is available for timber production. The percentages range from a low of 31% within the Homathko Block to a high of 47% within the Kingcome Block. The Homathko Block includes the classification of 546 hectares of productive forest as economically inoperable.

i) Land Erosion/Accretion Management

Due to the proximity of the TFL to major river systems, the land base of the TFL is subject erosion and accretion. The change in land base due to erosion and accretion is documented during each Management Plan. The company uses the following process to track and account for land erosion/accretion:

(a) Every five years new aerial photography is flown by the company to update all land base and forest cover changes due to river erosion/accretion.

(b) Eroded areas are automatically withdrawn from the timber supply land base via the updated base mapping.

(c) Newly accreted areas are not included into the timber supply land base until the forest cover has reached three meters in height, and has 50% or greater crown closure, and are determined to be environmentally and economically operable.

A total decrease of 8.9 hectares in the THLB attributable to river erosion. The change is accounted for within the total land base of the TFL. Scott Paper Limited will continue to document land erosion/accretion via this process in the future.

B. MANAGEMENT ASSUMPTIONS FOR THE BASE CASE SCENARIO

The management practices followed on TFL 43 under the current management regime are described below. In addition, several assumptions are necessary in order to simulate future stand development and apply non-timber resource constraints.

i) Yield Projections And Assumptions

The mature volumes for existing stands were generated by using Variable Density Yield Projection (VDYP) system version 6.4. The Ministry of Forests waste, decay and breakage factors for the appropriate forest inventory zones were used for all species except cottonwood to derive mature volume figures. Volumes for cottonwood were produced by VDYP and were reduced for decay only, as the W_2B factors were not considered representative of the T.F.L. 43 area. This approach is used in consultation and agreement with the Resources Inventory Branch of Ministry of Forests.

The yield for intensively managed hybrid poplar/cottonwood pulpwood plantations were generated using VDYP with a 1.3 volume adjustment factor (VAF) in the Fraser Block and 1.1 VAF in the Kingcome and Homathko Blocks. These adjustments are based on the preliminary permanent sample plot data collected to date in the Fraser Block and knowledge and experience of company foresters in the Homathko and Kingcome Blocks. These adjustments have been accepted by the Research Branch for use within this analysis and as more information is collected in the future, the yield estimates will be revised accordingly.

ii) Harvesting Assumptions

(a) Harvest Profile

As part of the company's ongoing timber harvesting activities, the company will continue to harvest the full profile of the productive land base, and utilize or market the various species produced in accordance with the requirements in the T.F.L. document.

After converting the existing mixed deciduous/coniferous stands to cottonwood/hybrid poplar plantations, the planned minimum harvestable age on

the Fraser Block of the T.F.L. is 25 years, and on the Homathko and Kingcome Blocks it is 30 years. However, during the conversion period of the first rotation, older age classes of all species will be harvested and utilized. Salvage harvesting of merchantable stands will take precedence over other stands. This will be followed by stands at risk from erosion and thereafter older stands will be harvested. In addition, where feasible, harvesting of the low quality alder and coniferous species will be targeted during periods of favorable log market conditions.

(b) Adjacency and Visual Green-up Period

The proposed adjacency and visually green-up period that will follow on harvested Blocks prior to harvesting adjacent Blocks is planned at three metres of height which normally occurs at three years. Green-up conditions develop substantially faster on TFL 43 due to very fertile alluvial flood plain soils and the fast growing nature of Populus species.

(c) Management of Non-Recoverable Losses

Non-recoverable losses of significant size have not occurred on this TFL due to the high level of operational accessibility in all three Blocks. Minor losses are already accounted for by the very nature of the area based, rather than volume based AAC. However, in the unlikely event of a significant non-recoverable loss occurring, the company proposes to include the area of the non-recoverable loss within the area-based AAC during the year of loss.

iii) <u>Silviculture assumptions</u>

(a) Rotation Ages

Scott Paper Limited is currently managing the Fraser Block on a 26-year rotation (25 years growing time and one year regeneration delay). In the Homathko and Kingcome Blocks a 33-year rotation is planned. The company expects that pulpwood stands at rotation age will have an approximate average diameter at breast height of 35 centimeters with a targeted fibre brightness of 60-point photovolt reflectance.

These planned rotation lengths are based on actual operational experience gained from the first cottonwood plantations established by Scott Paper Limited on the Fraser Block since the 1950's and preliminary data permanent sample plots established in the late 1980's. Stands 25 years old or younger have produced the target size of pulpwood logs in the Fraser Block of the TFL.

The Homathko and Kingcome Blocks are being managed on a 33-year rotation mainly to allow for slower growing conditions in these colder northerly drainages. The additional 5 years of growing time is considered adequate to produce the size and quality of pulpwood trees described above.

The collection of growth and yield data from permanent sample plots and experience of growing hybrid poplars in all areas of the TFL will allow refinement of the current rotation lengths at an appropriate future date.

(b) Regeneration Delays

On most sites, artificial regeneration through planting unrooted hybrid poplar cuttings follows immediately after harvesting on the Fraser Block lands. A combination of artificial regeneration with unrooted hybrid poplar whips and natural regeneration is used on the Homathko and Kingcome Blocks.

Regeneration occurs within one year on lands harvested within the Fraser Block. Regeneration in the Kingcome and Homathko Blocks is accomplished within three years.

iv) Visual Landscape assumptions for the Fraser Block

The most constraining Visual Quality Objective (VQO) applicable to lands within the Fraser Block is the Partial Retention (PR). The maximum alteration limit of 15% is used in the volume-based timber supply analysis since the area has flat topography and a high visual absorption capability (VAC). The percent alteration limit is not applied in the area-based analysis as it is impractical and inefficient to attempt to achieve this limit on individual islands within the flood plain. The retention of riparian reserves around the perimeter of the islands, blending of the harvesting with the extensively modified adjacent landscape and rapid visual green-up will mitigate the visual impact and maintain the VQO. A 3 metre visually effective green-up (VEG) height will be used for operational and timber supply purposes.

v) Wildlife Tree Retention requirements within the Homathko Block

The Timber Harvesting Land Base (THLB) for the Homathko Block will be reduced by further 3% to account for Wildlife Tree Retention (WTR) requirements within cutblocks. This reduction is based on the current level of retention requirements within the approved 1998-2002 Forest Development Plan. The current requirements specify an 18% stand level retention requirement and approximately 3.8% is fulfilled

from the THLB while the remaining 14.2 % is met by using existing constrained areas. The company expects this 3% to be the maximum level of retention necessary to meet stand level retention given the requirements of Table 20A of the Biodiversity Guidebook and because existing constrained areas currently fulfill 75% of the requirements.

No reductions will be applied to the Fraser and Kingcome Blocks because riparian reserves and other constrained areas will be used to satisfy WTR retention requirements. This statement is supported by current Forest Development Plans for these Blocks as 100% of stand level requirements area met by the constrained areas.

vi) **Landscape Unit Planning and Landscape Level Biodiveristy**

The current Ministry of Forests and Ministry of Environment, Lands and Parks guidelines specify maintaining a minimum percentage of old growth forest within each biogeoclimatic variant in each landscape unit. The percentage of old growth to be retained is dependent upon the Biodiversity Emphasis Option (BEO). Low biodiversity emphasis requires less old seral forest than the high biodiversity emphasis.

The following old seral retention requirements would be applicable to each Block of the TFL based on the draft biodiversity emphasis option.

TFL Block and Biodiversity Emphasis Option	% Old Growth Required from BDG	% Old Growth Within Constrained Areas*
Fraser - Low BEO with 1/3 old seral	9*.33=2.97	4.7
Homathko - High BEO	13	29
Kingcome - Intermediate BEO	13	25

*Stands older than 41 years (age class 3 and older) for mainly cottonwood types

No specific land base withdrawals were made to account for Landscape Unit planning requirements since the emphasis assignments are draft and it is difficult to apply these requirements on a conversion licence such as TFL 43. In addition the Information Package documented the amount of older age classes within the Homathko and Kingcome Blocks and provided an explanation for not applying landscape level biodiversity requirements in the Fraser Block. The company believes that the significant areas reserved in the Homathko Block will adequately meet the old seral requirements listed in the Landscape Unit Planning Guide.

4.0 TIMBER SUPPLY ANALYSIS METHODOLOGY

A. METHODOLOGY

Scott Paper Limited has been authorized to manage TFL 43 on an area basis mainly due to the conversion management objective and uniform valley bottom land base. Area based cut control is planned for the TFL during the conversion period of the Homathko and Kingcome Blocks (approximately 25 years).

The timber supply will be calculated for each Block of the TFL since each Block has been managed as an individual operating unit. The following formula is used to calculate the TFL allowable annual cut:

$$\textit{Total TFL AAC} = \frac{\textit{Timber Harvesting Land Base of the Fraser Block}}{\textit{Rotation Length Fraser Block}} + \frac{\textit{Timber Harvesting Land Base of the Homathko Block}}{\textit{Rotation Length Homathko Block}} + \frac{\textit{Timber Harvesting Land Base of the Kingcome Block}}{\textit{Rotation Length Kingcome Block}}$$

The detailed Timber Harvesting Land Base calculations for each Block of the TFL are outlined in the Information Package.

B. TFL ADMINISTRATION BASED ON AN ALLOWABLE ANNUAL AREA CUT AND A VOLUMETRIC EQUIVALENT

i) Calculation of a Volumetric Equivalent

The assessment of annual fees and licensee performance under the Forest Act requires the determination of a volumetric equivalent to the area based allowable annual cut. Scott Paper Limited proposes that the projected average annual harvest volume for the fourth Management Plan period be used as the volumetric equivalent. To determine the projected average annual harvest volume, the stands planned for harvesting in the fourth Management Plan period have been assigned close utilization volume less decay, waste, and breakage (except for cottonwood/hybrid poplar). The sum of the net stand volume is then divided by five to arrive at the projected annual harvest volume. Section 5.0 (b) lists the

stands to be harvested during the fourth Management Plan period, and presents the calculation of the projected average annual harvest volumetric equivalent. The first 5 years of the 20 year plan identifies the actual stands proposed for harvesting.

ii) Cut Control Requirements

Scott Paper Limited proposes that the Ministry of Forest's assessment of cut control performance continue to be based on the ratio of actual area harvested and/or converted over the approved AAC area, multiplied by the total volumetric AAC equivalent as follows:

$$\frac{\text{Actual Area Harvested (ha)}}{\text{Approved AAC Area (ha)}} \times 39,763\ m^3 = \text{Cut Control Volume}$$

5.0 TIMBER SUPPLY ANALYSIS RESULTS

A. BASE CASE SCENARIO HARVEST FORECAST AND PROPOSED TFL 43 ALLOWABLE ANNUAL AREA CUTS

i) Fraser Block harvest level and proposed Allowable Annual Area Cut Calculation

Gross Area =			3,546.5	ha
Less				
Non-productive Areas	1,807.6	ha		
Non Commercial Land (NP BR)	438.8	ha		
Inoperable Areas	53.9	ha		
ESA	9.7	ha		
Riparian Reserves (RIP)	24.0	ha		
Riparian Reserves (Buffer)	56.4	ha		
Unclassified Roads, Trail & Landings	4.2	ha		
Long Term Timber Harvesting Land Base or Net Productive Operable and Available Area			1,151.9	ha

[redacted]

ii) **Homathko Block harvest level and proposed Allowable Annual Area Cut Calcul**

Gross Area =			5,603.8	ha
Less				
Protected Area	231.0	ha		
Non-productive Areas	1,719.9	ha		
Non Commercial Land (NP BR)	288.5	ha		
Inoperable Areas	687.6	ha		
ESA	883.5	ha		
Riparian Reserves (RIP)	0.0	ha		
Riparian Reserves (Buffer)	60.0	ha		
Roads, Trail & Landings	26.3	ha		
Wildlife Tree Retention	51.2	ha		
Long Term Timber Harvesting Land Base or Net Productive Operable and Available Area			1,655.7	ha

Homathko Block proposed AAC = 1,655.7 / 33 Year Rotation Length

= 50.1 hectares/year

iii) **Kingcome Block harvest level and proposed Allowable Annual Area Cut Calculation**

Gross Area =			955.9	ha
Less				
Non-productive Areas	195.1	ha		
Non Commercial Land (NP BR)	27.3	ha		
Inoperable Areas	66.4	ha		
ESA	52.7	ha		
Riparian Reserves (RIP)	0.0	ha		
Riparian Reserves (Buffer)	89.4	ha		
Unclassified Roads, Trail & Landings	6.5	ha		
Long Term Timber Harvesting Land Base or Net Productive Operable and Available Area			445.6	ha

$$\text{Kingcome Block proposed AAC} = \frac{445.6}{3\text{3 Year Rotation Length}}$$

$$= 13.8 \text{ hectares/year}$$

B. CALCULATION OF THE PROJECTED AVERAGE ANNUAL HARVEST VOLUMETRIC EQUIVALENT FOR THE FOURTH MANAGEMENT PLAN PERIOD.

i) Fraser Block Schedule "A" Lands

Map	Polygon	Stand Description	Area (ha)	Net Stand Volume (m^3) (Less Decay, Waste and Breakage)*
FR 1-1	13	AC_{10}	20.4	8345.6
FR 1-1	14	AG_{10}	4.5	1659.8
FR 1-1	21	AG_{10}	3.8	1386.9
FR 1-2	44	AR_{10}	22.6	8019.8
FR 1-2	68	AC_{10}	6.2	1980.3
FR 1-2	71	AC_{10}	5.0	1487.5
FR 1-2	74	AC_{10}	2.2	855.7
FR 1-2	75	AC_{10}	1.7	310.8
FR 1-2	86	AC_{10}	2.2	669.1
FR 1-2	94	AR_{10}	6.8	2394.6
FR 1-2	95	AR_{10}	3.5	1225.6
FR 2-2	4	AR_{10}	13.4	5018.3
FR 2-2	5	AR_{10}	8.7	3194.2
FR 2-2	75	AR_8AC_2	22.5	8155.1
FR 2-2	106	AI_{10}	2.6	477.3
FR 2-2	212	AR_{10}	0.7	262.9
FR 3-1	31	AC_{10}	0.3	101.4
TOTAL: FRASER SCHEDULE "A" LANDS 5 YEARS			**126.9**	**45,545.0 m^3**
PROJECTED ANNUAL FRASER SCHEDULE "A"			**25.4**	**9,109.0 m^3/yr**

*** Except cottonwood types**

ii) Fraser Block Schedule "B" Lands

Map	Polygon	Stand Description	Area (ha)	Net Stand Volume (m^3) (Less Decay, Waste and Breakage)*
FR 1-1	4	AC_5AO_5	18.5	6964.0
FR 1-1	18	AG_{10}	2.4	885.2
FR 2-2	73	AC_{10}	4.1	909.7
FR 2-2	74	AC_{10}	2.4	523.3
FR 2-2	87	AC_{10}	2.3	693.0
FR 3-1	7	AC_{10}	2.1	817.5
FR 3-1	8	AC_{10}	2.9	878.2
FR 3-1	10	AC_{10}	16.3	6226.6
FR 3-1	11	AC_{10}	3.7	612.0
FR 3-1	12	AC_{10}	6.1	1009.4
FR 3-1	13	AC_{10}	1.2	206.2
FR 3-1	14	AC_{10}	3.0	1161.3
FR 3-1	15	AC_{10}	0.7	208.2
FR 3-1	16	AC_{10}	0.5	144.0
FR 3-1	17	AC_{10}	1.9	564.5
FR 3-1	20	AC_{10}	3.1	931.9
FR 3-1	25	AC_{10}	2.9	1049.2
FR 3-1	30	AC_{10}	2.4	701.9
FR 3-1	32	AC_{10}	12.1	2671.7
FR 3-1	107	AC_{10}	6.2	2353.1
TOTAL: FRASER SCHEDULE "B" LANDS 5 YEARS			**94.9**	**29,511.0 m^3**
PROJECTED ANNUAL FRASER SCHEDULE "B"			**19.0**	**5,902.2 m^3/yr**

*** Except cottonwood types**

TOTAL: FRASER BLOCK 5 YEARS	**221.8**	**75,056.0 m^3**
PROJECTED ANNUAL FRASER BLOCK	**44.4**	**15,011.2 m^3/yr**

iii) Homathko Block Schedule "B" Lands

Map	Polygon	Stand Description	Area (ha)	Net Stand Volume (m^3) (Less Decay, Waste and Breakage)*
HO 1-1	101	$EW_6CW_1AC_1MB_1DR_1$	3.0	624.4
HO 1-1	247	$DR_5FD_3CW_2$	2.8	839.0
HO 1-2	67	$AC_4DR_4CW_1HW_1$	8.6	1,170.3
HO 1-2	87	$AC_4SS_3CW_2DR_1$	0.8	376.0
HO 1-2	197	$SS_4CW_3HW_1DR_1AC_1$	19.6	12,781.2
HO 1-2	200	$AC_8DR_1SS_1$	16.9	5,864.9
HO 1-2	201	$AC_4SS_3CW_2DR_1$	1.5	720.5
HO 1-2	229	$AC_4SS_3CW_2DR_1$	4.6	2,253.8
HO 1-3	1	$AC_5DR_2CW_2HW_1$	2.4	529.1
HO 1-3	2	$CW_4SS_2HW_2AC_2$	5.5	3,092.0
HO 1-3	4	$AC_6CW_2SS_1HW_1$	1.2	439.2
HO 1-3	17	$AC_5DR_3MB_2$	7.4	1,737.5
HO 1-3	18	AC_7DR_3	16.7	4,084.4
HO 1-3	19	$AC_4CW_3SS_1EW_1DR_1$	16.7	5,267.1
HO 1-3	20	$AC_4CW_3SS_1EW_1DR_1$	5.3	1,667.9
HO 1-3	36	AC_9DR_1	1.5	441.2
HO 1-3	38	$AC_6DR_3CW_1$	3.3	749.7
HO 1-3	40	$AC_6DR_2SS_1CW_1$	32.5	9,302.3
HO 1-3	41	$CW_7SS_1HW_1DR_1$	5.0	1,586.8
HO 1-3	51	$AC_7DR_2SS_1$	7.9	2,701.5
HO 1-3	53	DR_7AC_3	0.9	292.6
HO 1-3	163	$AC_4CW_3SS_1EW_1DR_1$	1.0	302.7
HO 1-3	232	$AC_6DR_2SS_1CW_1$	12.8	3,667.2
HO 1-3	296	AC_9DR_1	3.6	1,051.2
HO 1-3	420	$EW_7CW_2PL_1$	0.8	103.9
HO 2-1	134	$AC_6CW_2SS_1HW_1$	15.8	5,675.1
HO 2-1	274	$AC_5DR_2CW_2HW_1$	9.6	2,139.0
HO 2-1	336	DR_7AC_3	12.7	2,506.6
HO 2-1	337	GR PT	1.6	0.0
HO 2-1	359	DR_7AC_3	1.0	202.9
HO 2-1	365	DR_7AC_3	1.0	193.5
HO 2-2	221	$CW_7DR_2HW_1$	3.7	2,638.5
HO 2-2	265	$DR_5AC_3SS_1CW_1$	0.3	128.5
HO 2-2	266	$DR_5AC_3SS_1CW_1$	7.8	3,067.8
HO 2-2	272	NP BR	1.2	0.0
HO 2-2	273	DR_5AC_5	0.7	181.0
HO 2-2	376	$DR_5AC_3SS_1CW_1$	12.9	5,048.5
TOTAL: HOMATHKO BLOCK SCHEDULE "B" LANDS 5 YEARS			**250.5 ha**	**83,427.8 m^3**
PROJECTED ANNUAL HOMATHKO BLOCK SCHEDULE "B" LANDS			**50.1 ha**	**16,685.6 m^3/yr**

*Except for Cottonwood types

iv) Kingcome Block Schedule "B" Lands

Map	Polygon	Stand Description	Area (ha)	Net Stand Volume (m^3) (Less Decay, Waste and Breakage)*
KI 1-1	24	$HW_5AC_3SS_2$	9.3	7554.6
KI 1-1	28	$AC_6DR_2SS_1HW_1$	10.4	5387.2
KI 1-1	76	$AC_7HW_2DR_1$	16.1	8382.4
KI 1-1	80	HW_8SS_2	7.3	5895.7
KI 1-1	254	AC_6DR_4	1.4	715.8
KI 1-1	255	AC_6DR_4	0.9	460.2
KI 1-1	270	$AC_5HW_4SS_1$	1.7	940.8
KI 1-2	109	AC_8DR_2	4.9	2653.7
KI 1-2	181	$AC_4HW_3CW_2SS_1$	9.7	5291.2
KI 1-2	182	AC_6DR_4	3.0	1036.6
KI 1-2	183	DR_6AC_4	0.8	105.1
KI 1-2	327	AC_8DR_2	2.9	1598.8
KI 1-2	328	AC_9DR_1	0.9	308.2
TOTAL: KINGCOME BLOCK SCHEDULE "B" LANDS 5 YEARS			**69.2 ha**	**40,330.3 m^3**
PROJECTED ANNUAL KINGCOME BLOCK SCHEDULE "B" LANDS			**13.8 ha**	**8,066.1 m^3/yr**

*** Except Cottonwood types**

C. SUMMARY OF PROJECTED AVERAGE ANNUAL HARVEST VOLUMETRIC EQUIVALENTS BY BLOCK FOR THE FOURTH MANAGEMENT PLAN PERIOD

Supply Block	Rotation Length	Schedule "A"		Schedule "B"		Total	
		Area	Volume	Area	Volume	Area	Volume
Fraser	26	25.3	9,109.0	19.0	5,902.2	44.3	15,011.2
Homathko	33			50.1	16,685.6	50.1	16,685.6
Kingcome	33			13.8	8,066.1	13.8	8,066.1
Total		25.3	9,109	82.9	30,653.9	108.2	39,762.9

D. LONG RUN SUSTAINED YIELD (LRSY) PROJECTION

A Long Run Sustained Yield (LRSY) projection was calculated using VDYP yield data for cottonwood stands. The current analysis units are the basis for this yield projection and it is assumed that all areas regenerate to cottonwood at the current site indexes. The VDYP LRSY is 26, 997 m^3 if culmination of Mean Annual Increment (MAI) is used for setting the rotation ages. When the rotation ages are set at Scott Paper Limited's currently planned rotation ages, the LRSY decreases to 25, 531 m^3. Increasing the rotation ages by five years in Homathko and Kingcome Blocks increases the LRSY to 26, 274 m^3. The magnitude of change in LRSY indicates little sensitivity to rotation lengths within this range.

Although a decrease in harvest volumes is likely as the company moves from older mixed-wood natural stands to younger managed cottonwood/hybrid poplar stands, the VDYP LRSY calculations are considered extremely conservative for the following reasons:

i) The VDYP program uses unmanaged yield curves to predict volumes, whereas the vast majority of the regenerating stands on the TFL are managed plantations using improved hybrid poplar planting stock.

ii) The VDYP program's upper limit for site index is 45 meters at age 50. This restricts the projected growth on higher site indexes that occur within the Fraser Block. Furthermore the use of existing site index assignments for natural cottonwood regeneration underestimates the future growth and yield of managed cottonwood/hybrid poplar plantation established in the Kingcome and Homathko Blocks.

iii) The basis for VDYP yield predictions is cottonwood growth data collected from a wide range of sites and populations over the entire range of the species and from all site productivity classes. The highly productive alluvial flood plain sites within TFL 43 represent much better growing conditions than the provincial average.

Preliminary growth and yield information collected from permanent sample plots located on TFL 43 supports the above statements. In addition, the intensive silviculture management regime on TFL 43 should enhance future yields significantly. Scott Paper Limited anticipates the LRSY will range between 33, 000 m^3 and 43, 000 m^3 after full conversion of the available land base to cottonwood/hybrid poplar stands (average TFL MAI between 10 to 13 m^3/ha/yr). This assumes that there will be no further land base withdrawals in the future.

CALCULATION OF LONG RUN SUSTAINED YIELD USING VDYP
YIELD DATA FOR COTTONWOOD

Leading Species (>65%)	Total Operable Area	BEC/Site Index	Regen. Type to	Culmination Data (Gross Decay,Vol.@12cm)			MAI m3/yr	Current Harvest Age	Corresponding		MAI m3/yr	Alternate Harvest Age	Corresponding		MAI m3/yr
				Age	MAI	Vol/ha			MAI	Vol/ha			MAI	Vol/ha	
Ac SI 32	106.20	32	Cottonwood	44	5.73	252.2	609	30	4.89	146.7	519	35	5.46	191	580
Ac SI 34	5.70	34	Cottonwood	40	6.38	255	36	30	5.83	175	33	35	6.26	219.1	36
Ac SI 35	93.72	35	Cottonwood	39	6.72	262	630	30	6.3	189.1	590	35	6.66	233.1	624
Ac SI 36	19.90	36	Cottonwood	37	7.08	261.8	141	30	6.77	203.2	135	35	7.05	246.9	140
Ac SI 37	1065.99	37	Cottonwood	36	7.45	268.1	7942	30	7.24	217.1	7718	35	7.44	260.5	7931
Ac SI 40	273.92	40	Cottonwood	32	8.65	276.7	2369	30	8.62	258.5	2361	35	8.59	300.8	2353
Ac SI 45	380.47	45	Cottonwood	27	10.94	295.2	4162	25	10.88	272	4139	25	10.88	272	4139
Ac SI 49	672.34	49	Cottonwood	27	10.94	295.2	7355	25	10.88	272	7315	25	10.88	272	7315
Dr SI 16	33.88	16	Cottonwood	102	2.43	247.5	82	30	0	0	0	35	0	0	0
Dr SI 25	208.94	25	Cottonwood	61	3.91	238.3	817	30	1.58	47.5	330	35	2.58	90.3	539
Dr SI 34	121.14	34	Cottonwood	40	6.38	255	773	30	5.83	175	706	35	6.26	219.1	758
Dr SI 37	77.15	37	Cottonwood	36	7.45	268.1	575	30	7.24	217.1	559	35	7.44	260.5	574
Dr SI 45	13.30	45	Cottonwood	27	10.94	295.2	146	30	10.84	325.2	144	35	10.43	364.9	139
Other Deciduous SI 28	2.91	28	Cottonwood	53	4.61	244.3	13	30	3	89.9	9	35	3.82	133.7	11
Other Deciduous SI 36	4.27	36	Cottonwood	37	7.08	261.8	30	30	6.77	203.2	29	35	7.05	246.9	30
Other Deciduous SI 37	16.40	37	Cottonwood	36	7.45	268.1	122	30	7.24	217.1	119	35	7.44	260.5	122
Conifer SI 15-20	11.71	15	Cottonwood	108	2.31	249.6	27	30	0	0	0	35	0	0	0
Conifer SI 21-25	51.49	23	Cottonwood	68	3.5	238	180	30	0.65	19.6	33	35	1.75	61.3	90
Conifer SI 26-30	113.39	28	Cottonwood	53	4.61	244.3	523	30	3	89.9	340	35	3.82	133.7	433
Conifer SI 31-35	13.63	33	Cottonwood	42	6.05	254	82	30	5.36	160.9	73	35	5.86	205.1	80
NSR	18.90	45	Cottonwood	27	10.94	295.2	207	25	10.88	272	206	25	10.88	272	206
NSR	4.80	34	Cottonwood	40	6.38	255	31	30	5.83	175	28	35	6.26	219.1	30
NSR	16.70	40	Cottonwood	32	8.65	276.7	144	30	8.62	258.5	144	35	8.59	300.8	143
Total	3326.09						26,997				25,531				26,274

6.0 DISCUSSION OF TIMBER SUPPLY ANALYSIS RESULTS

A. BASE CASE SCENARIO

The harvest level for an area based analysis is 108.2 hectares, which is 20.2 hectares lower than the Allowable Annual Cut under Management Plan #3. This annual area conversion level represents an approximately 16% decrease compared to the current AAC of the TFL. The equivalent decrease in volume is about 11% (from 44 460 m^3 to 39 763 m^3) and it is not proportional to the area decrease mainly due to the harvesting of densely stocked overmature stands. The reduction in the timber harvesting land base is largely attributable to the designation of productive area as economically inoperable within the Homathko Block and establishment of additional riparian reserves areas. The end result is that lower area is available for conversion during Management Plan #4 than Management Plan #3 therefore reducing the harvest level. The end product of this conversion program is to achieve a fully regulated forest with an even age class distribution after the first rotation. This level of conversion is sustainable in the long run if further reductions to the operable land base are minimized. Future changes in the land base and stand attribute changes will be accommodated through subsequent revisions of the Management Plans for the TFL.

On an individual Block basis the decrease in harvest level compared to the current AAC ranges from 10 to 21%. The least amount of change is in the Fraser Block as the harvest level declines from 49.4 ha/ year to 44.3 ha/year with the projected annual harvest of 15 011 m^3. This 5.1 ha/year decrease represents an approximately 10% decline in area. The projected annual volume harvest increases by 99 m^3 mainly due to the harvesting of heavier stocked stands, particularly the overmature veneer plantations with much higher volume per hectare than the average for the Fraser Block.

In the Homathko Block the harvest level declines by 21% on an area basis, from 63.3 ha/year to 50.1 ha/year while the volumetric equivalent decreases from 20 350 m^3 to 16 686 m^3. This significant decline is attributable to the classification of economically inoperable areas within the Heakemie and Jewakwa River drainages and a 3% reduction to the operable land base for Cutblock level Wildlife Tree Retention requirements. The company proposes to review this economically inoperable category during the term of MP #4 and develop a strategy to deal with this area in the future.

The proposed Kingcome Block harvest level for Management Plan #4 is 13.8 ha/year producing a projected annual harvest volume of 8 066 m^3. This represents a 1.9 ha/year decrease from the current allowable annual area conversion in Management Plan #3. The projected annual volume decrease is approximately 12%. The main factors contributing to this decrease are the additional ESA and inoperable area net downs.

i) Maintenance of non timber resource values within the area-based analysis

In the area-based timber supply analysis non timber resource values are accommodated through specific area withdrawals to the productive forest. The designation of environmentally sensitive areas has been carried out to ensure significant wildlife, riparian, biodiversity and recreation values are protected.

The visual landscape values considered in the base case scenario for the Fraser Block are largely managed at the operational planning level. This is due to the mitigative factors such as a highly diverse surrounding urban landscape, flat topography of the area, riparian reserves zones around the perimeter of the islands, rapid visually effective green-up, deciduous forest cover and gravel bars within the flood plain that significantly reduce the visual impact of logged areas. The other factor is that approximately 94% (1342.4 ha) of the visually sensitive area has been assigned a Maximum Modification Visual Quality Objective. Under this VQO category a maximum of 40% of the area can be disturbed (i.e. less than 3 years old) and this represents a significantly higher area than the proposed total annual harvest area (1342.4 X 40% = 537 ha). Assuming a 4 pass harvesting approach this equates to a total of 134.3 ha available for harvesting on annual basis whereas the proposed annual harvest area is 44.3 ha. Within the remaining 6% (91.3 ha) that is classified as Partial Retention, the maximum allowable disturbance area is 3.4 ha on an annual basis. Since particular polygons of Partial Retention are single islands less than 25 ha it is impractical and inefficient to apply this alteration limit. In these circumstances the mitigation factors described above will be employed to meet the VQO requirement.

ii) Alternative Silviculture Systems

The ability to use selection silviculture systems on TFL 43 is very limited given the highly shade intolerant nature of cottonwood/hybrid poplar species. However, the use of clearcut with reserves is common on areas within the TFL and is primarily in combination with riparian or wildlife habitat reserves areas that have been previously removed from the timber harvesting land base. Furthermore, the company has made an effort to retain individual coniferous trees where it will not interfere with regeneration requirements. The additional impact on the TFL harvest level is anticipated to be minimal from this practice, while still preserving important wildlife habitat, biodiversity and other non-timber resource values.

B. THE SMALL BUSINESS FOREST ENTERPRISE PROGRAM AAC

The Small Business Forest Enterprise Program (SBFEP) allowable annual cut apportionment of the tree farm licence harvest is 2,803 m^3. Up to the present none of the SBFEP apportionment has been harvested from TFL 43. The accumulated SBFEP apportionment at the end of 1999 will be 16,263 m^3. This is a significant

amount of undercut in relation to the TFL AAC particularly since it is supposed to be harvested on a periodic. If allowed to accumulate much longer it will negatively impact the age class distribution of the TFL. A Timber Sale Licence has been advertised in the Kingcome Block which could lead to the harvesting of approximately 10,000 m^3 of this volume. Scott Paper Limited will cooperate with the Ministry of Forests to identify areas for Small Business Forest Enterprise Program timber sales with TFL 43.

7.0 SENSITIVITY ANALYSES

In an area based analysis, the two factors that impact the harvest level are rotation ages and size of operable land base. The sensitivity of the harvest levels to rotation ages is describe below.

A. ROTATION AGES

The base case scenario uses a rotation age of 26 years for the Fraser Block and 33 years for Homathko and Kingcome Blocks. These planned rotations are based on the company's experience in the Fraser Block. The effect of reducing the rotation by 5 years and increasing it by 5 years is shown below:

TFL Block	Annual Harvest Level (ha) after 5 year reduction in Rotation Ages	Annual Harvest Level (ha) after 5 year Extension in Rotation Ages
Fraser	54.9	37.2
Homathko	59.1	43.6
Kingcome	15.9	11.7
TOTAL	129.9	92.5

A 5 year reduction in the rotation age increases the projected annual harvest level by 20% in comparison to the base case harvest level. On the other hand a 5 year increase in the rotation results in an approximately 14% decrease in the annual harvest level. The amount of decrease varies slightly for each Block, proportional to the change represented by 5 years. Any increases in the harvest level must be considered in the context of the current age class distribution and ensuring that adequate area of appropriate age classes will be available in the future to accommodate an harvest increase. In addition, more accurate growth and yield data is required prior to adopting any changes in rotation ages particularly in the Homathko and Kingcome Blocks.

8.0 FRASER BLOCK VOLUME BASED TIMBER SUPPLY ANALYSIS

A INTRODUCTION

The spatially explicit forest estate model COMPLAN has been used to prepare this volume-based analysis. The model calculates the harvest level using the following binary search algorithm:

1. It first attempts to harvest the LRSY for the entire planning horizon.
2. If it fails, then it next attempts to harvest at a level based on 50% of the LRSY.
3. If it succeeds, then it next keeps doubling the harvest level until it finds a level that it cannot maintain.
4. The harvest level is then set at halfway between the last successful level and the last unsuccessful level. This step is repeated until two runs that are within 200 m^3/yr are completed successfully.

The model was instructed to calculate a non-declining even flow (NDEF) harvest level for the Fraser Block for the entire planning horizon.

The inventory data used in the COMPLAN analysis is current to September 31, 1998. The COMPLAN simulations begin in 1998 and use the actual harvest sequence from 1998 and 1999 to update the inventory to 2000, the first year of the Management Plan 4. In addition, the harvest of specific Blocks was forced from 2000 to 2003 based on the existing planned harvest sequence. This harvest sequence within COMPLAN is overstated by approximately 15-20 ha compared to the area-based analysis.

B. HARVEST FORECAST SUMMARY

The volume-based Timber Supply Analysis for the Fraser Block showed that a non-declining evenflow (NDEF) harvest level of 13 375 m^3/yr could be maintained for at least 75 years as shown in Figure 2.

The LRSY was calculated at 16 423 m^3/yr based on the peak MAIs (Mean Annual Increment) of the regenerating yield curves. The peak MAI for the 2 regenerating curves is 14.21 m^3/ha/yr and this was multiplied by the total available harvest area which is 1 155.7 ha (This number is different from the area-based analysis number due to the percent netdown for ESA 100% vs 98% and internal rounding). A Managed Sustained Yield of 16 000 m^3/yr was calculated by increasing the harvest at year 25 to a point which could be maintained for the remaining 50 years of the planning horizon.

The NDEF harvest level is supported by increasing average harvest volumes per hectare and a subsequent decrease in the area harvested as shown in Figures 3 and 4. This means that there is a substantial likelihood that harvest levels can be increased in the future as the regeneration assumptions of the silviculture program are verified. Figure 5 also shows that the average DBH also increases over time since the average harvest age increases over time. This is shown in Figure 6.

Figure 2
Average Annual Harvest by Decade

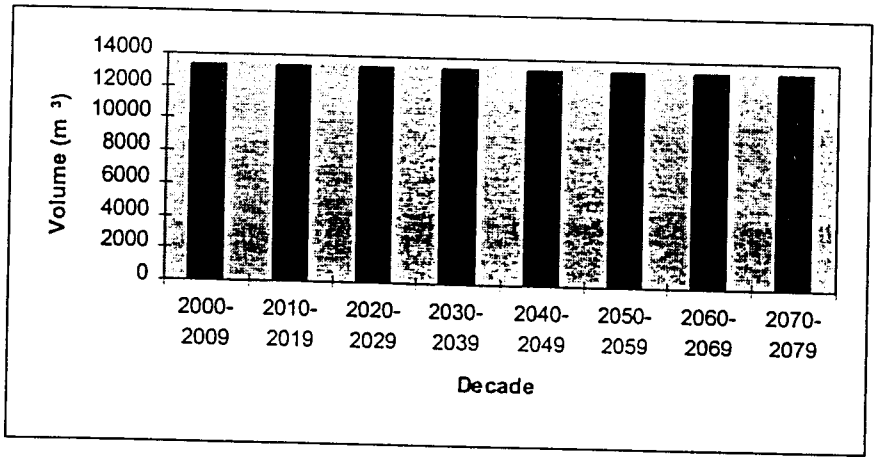


Figure 3
Average Annual Harvested Volume per Hectare

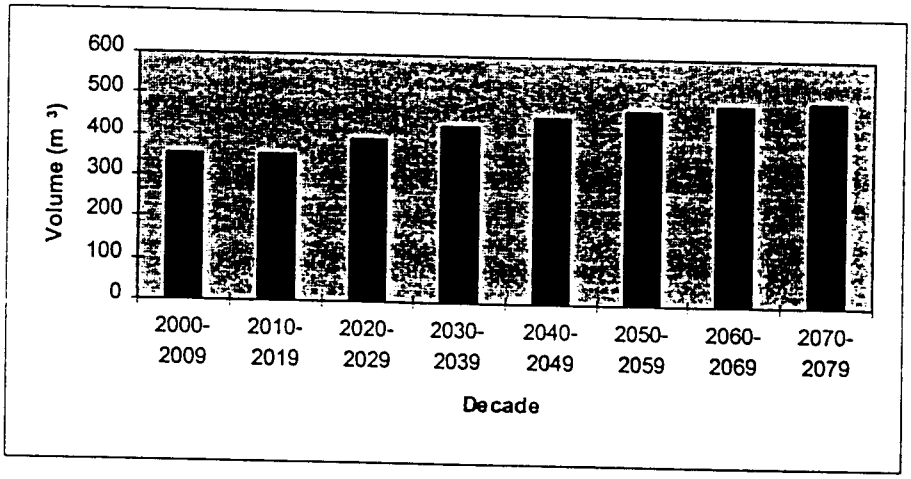


Figure 4
Average Annual Area Harvested

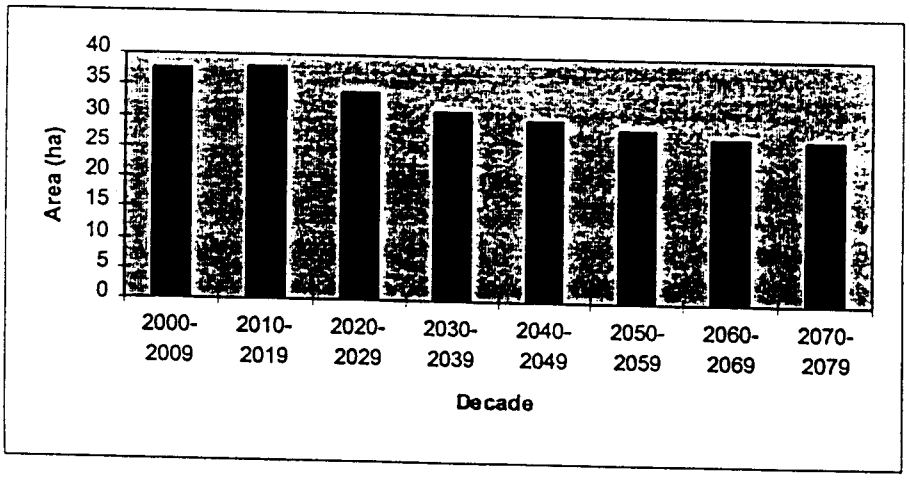


Figure 5
Average DBH of Harvested Volume

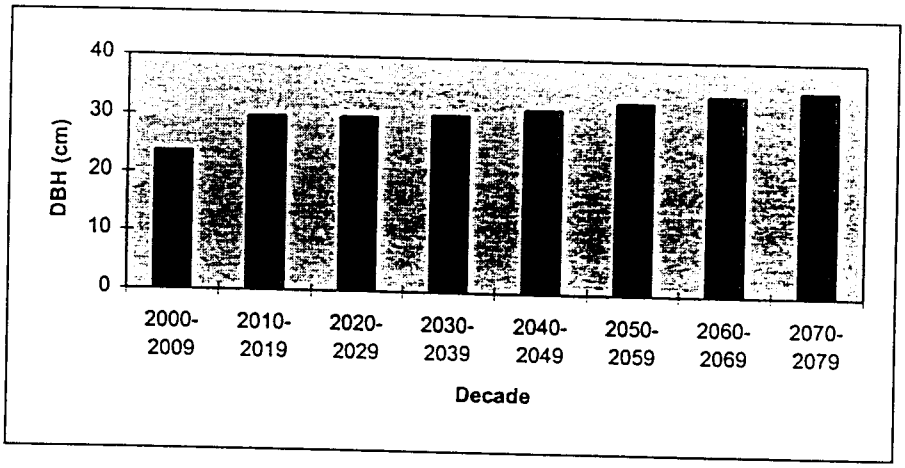
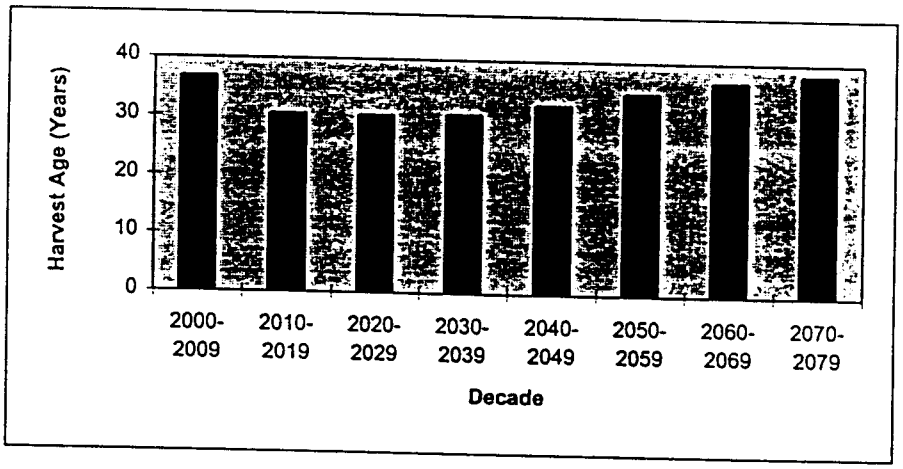


Figure 6
Average Harvest Age



i) Age Class Distributions

The age class distributions by area and volume are shown in Figures 7 through 10. Age classes are defined by 10-year intervals and are separated by harvest status; normal and reserve. Normal areas are those that are available for harvesting within the simulation. Reserve areas are those that are permanently unavailable for harvesting (e.g. stream riparian areas) and thus age indefinitely within the simulation since natural succession was not incorporated into the yield curves.

The area age class distribution that a normalized forest exhibits is achieved after 75 years while the distribution of volume within the age classes remains relatively constant during the planning horizon.

Figure 7
Age Class Distribution in 2000 - Area

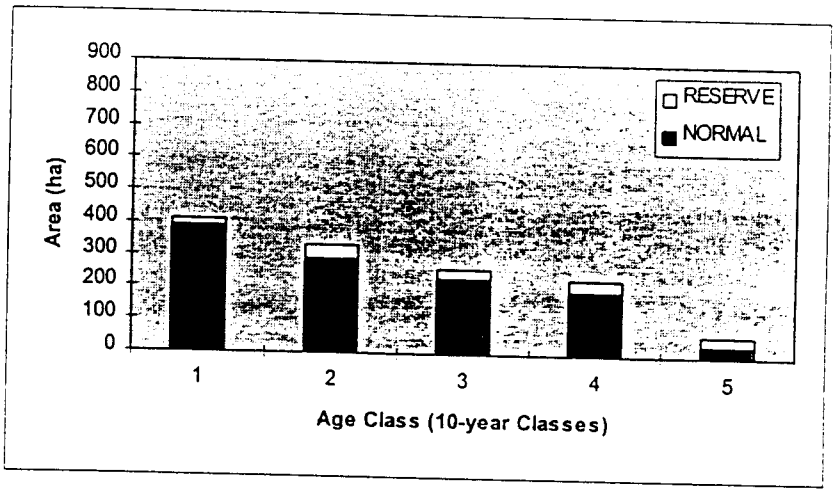


Figure 8
Age Class Distribution in 2075 - Area

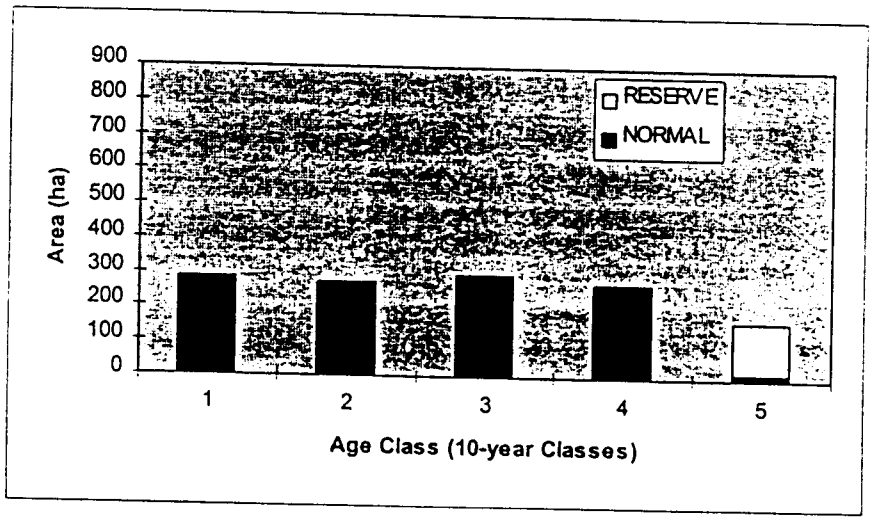


Figure 9
Age Class Distribution in 2000 - Volume

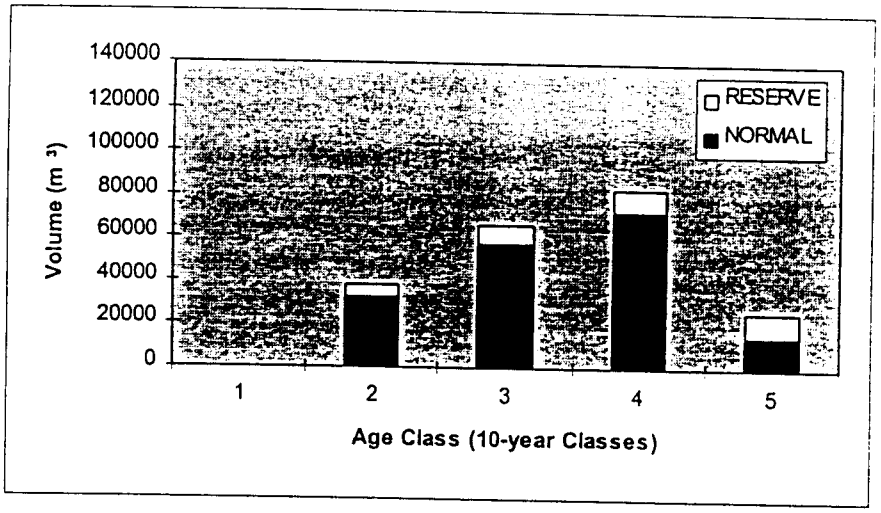
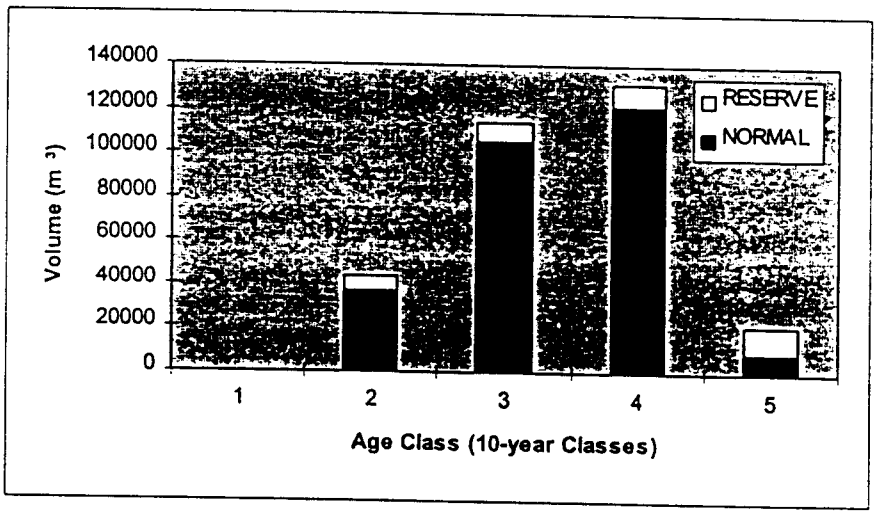


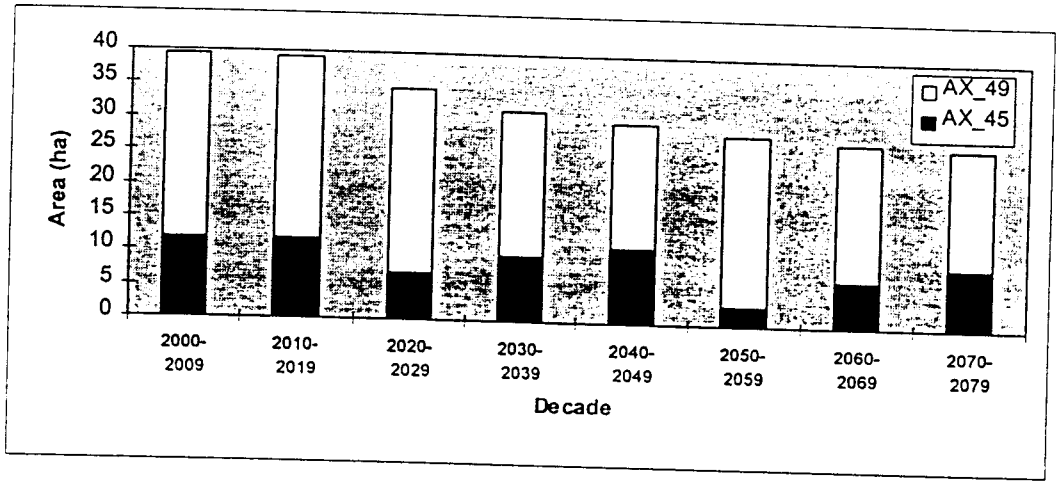
Figure 10
Age Class Distribution in 2075 - Volume



ii) Silviculture

All harvested areas were assumed to be replanted with a one-year delay after harvest. Figure 11 shows the projected average annual area for regeneration by decade. All harvested areas are regenerated to one of two Analysis Units; AX_45 and AX_49. The majority of area is regenerated to AX_49, the higher site class Analysis Unit.

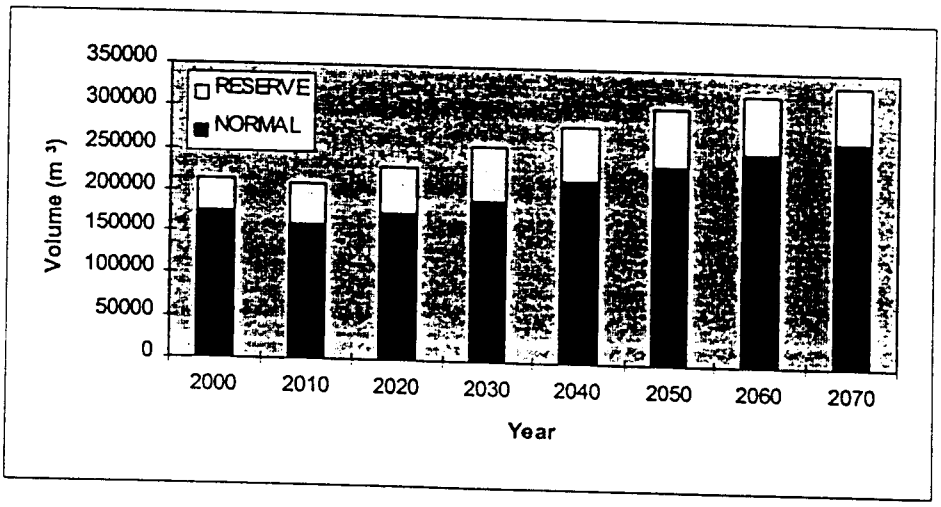
Figure 11
Average Annual Silviculture Area by Decade and Analysis Unit



iii) Standing Inventory and Periodic Growth

The standing inventory volume increases over the planning horizon as shown in Figure 12. This is expected since the regenerating yield curves show higher peak volumes than the standing yield tables, upon which the non-declining evenflow harvest level is calculated.

Figure 12
Standing Inventory by Decade

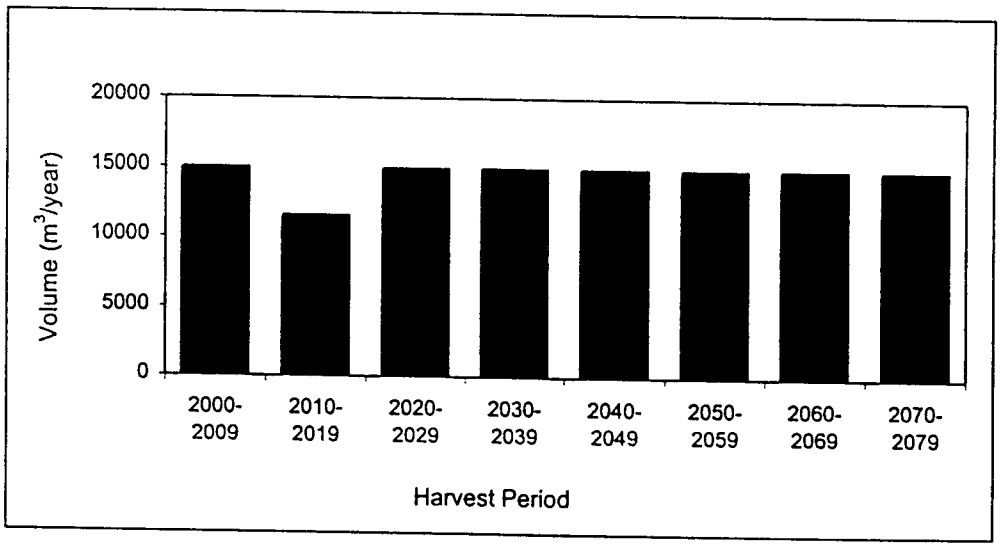


C. ALTERNATE HARVEST FLOW

Figure 13 shows an alternative harvest flow where the initial harvest level is set to the 15 000 m^3 as per the volume equivalent calculated in the area-based analysis. This harvest level in the area-based analysis is largely due to the harvesting of overmature high volume

stands in the next 5 year period and the company expects it to decrease as it shifts to the remaining stands within the Fraser Block. The results indicate that this harvest level can be achieved in the first decade but declines temporarily in the second decade to an average of 11 600 m^3 and is achieved again at the start of the third decade for the remaining planning period of the timber supply analysis. This decline is largely attributable to the conversion of remaining low site and low stocking natural cottonwood stands within the Fraser Block which are not expected to reach target tree size until the beginning of the second decade. Scott Paper Limited is aware of this situation and fully prepared for this transition. The expected harvest volume shortfalls will be offset by open market purchases along with harvesting of the unregulated private lands of the company to fulfill the fibre requirements. Another possible option available to the company is to begin harvesting of managed cottonwood/hybrid poplar stands as the model will not harvest these stands unless they have reached minimum harvesting age. Furthermore, Scott Paper Limited has been managing these fluctuations in harvest volumes as part of it's normal business practices from the inception of the licence as an inherent condition of the area-based harvest regulation.

Figure 13
Alternative harvest flow using 15 000 m^3/yr as target harvest



D. SENSITIVITY ANALYSES

A Sensitivity Analyses was undertaken to determine the sensitivity of the base case harvest level to changes in various yield assumptions including volume, minimum harvest age and green-up. Table 1 contains a description of each Sensitivity Analysis and the resulting NDEF harvest level. The Analysis showed that the base case harvest levels were most sensitive to changes in the minimum harvest age and yield curve volumes.

Table 1
Sensitivity Analysis Harvest Level Summary

Scenario	Description	NDEF Harvest Level (m^3/yr)
Base Case	• Forced harvest for Blocks in 1998-2003 • Subcompartment availability • Partial retention constraint set to 15% • Minimum harvest age of 25 for all yield curves	13 375
Scenario 1	• Same as base case • Inoperable areas are included in the normal forest land base (addition of approximately 50 ha)	13 390
Scenario 2	• Same as base case • Yield table volume decreased by 10%	12 000
Scenario 3	• Same as base case • Yield table volume increased by 10%	14 700
Scenario 4	• Same as base case • Minimum harvest age decreased by 5 years to 20 years	15 100
Scenario 5	• Same as base case • Minimum harvest age increased by 5 years to 30 years	10 900
Scenario 6	• Same as base case • Green-up age increased by 1 year to 4 years	13 300
Scenario 7	• Same as base case • Green-up age decreased by 1 year to 2 years	13 300
Scenario 8	• Same as base case • VQO constraint set to 10%	13 200
Scenario 9	• Same as base case • Forced harvest for Blocks in 1998-1999 only	13 500

The most important fact revealed by the Sensitivity Analysis is that the NDEF harvest level is quite sensitive to small changes in harvest pattern. This means that adjacency is one of the most critical factors in determining the NDEF. This is best shown by Scenario 8 which should, logically, result in an increased harvest level. However, the change in VQO results in a minor change in the harvest sequence within COMPLAN and thus brings different adjacency relationships into play. The result is that the harvest is actually reduced. While adjacency is important, Scenarios 6 and 7 show that there is limited flexibility in the actual harvest sequence and that a change of more than one year in the green-up rules would be required to significantly affect the NDEF harvest level. Furthermore, the initial harvest scheduling has a significant impact on the harvest level and adjacency relationships within the model. This point is illustrated by Scenario 9 where the initial harvest sequence is applied to 1998-1999 leading to an increased harvest level.

A minor difference exists in the available operable area used in the COMPLAN analysis and the area-based analysis presented in the Timber Supply Analysis report and Information Package. The COMPLAN analysis assumes a reduction of 100% for ESA1 while there is a 98% reduction in the Information Package. The COMPLAN analysis was a full-spatial analysis and thus land base reductions must be spatially-explicit. This minor difference between the planning dataset in COMPLAN and the Information Package will not have any significant effect on the Timber Supply Analysis.

9.0 CONCLUSIONS

The total proposed harvest level for Management Plan 4 is 108.2 hectares/year, yielding a projected average annual harvest volume of 39 763 m^3 per year. This level is consistent with the operable land base reductions that have been applied since the last AAC determination. This proposed harvest level represents a decrease of 20.1 ha/year or 16% in annual harvest area in comparison to the AAC for MP 3. The volumetric equivalent decline is 4 697 m^3 per year or 11%. This significant decrease is attributable to classification of economically inoperable areas within the Homathko Block, Wildlife Tree Retention requirement of 3% in the Homathko Block and additional reductions to the operable land base for non-timber resource values within the TFL. The lowest decline in the proposed annual harvest area is in the Fraser Block at 10% and the highest is in the Homathko Block at 21%. In the Fraser Block riparian reserve requirements are largely responsible for this decrease. Further reductions to the Timber Harvesting Land Base must be minimized in order to ensure sustainability of this harvest level. In particular, any additional reductions in the Kingcome Block will impact the company's ability to continue to manage this Block on an individual basis given the small annual conversion area. Scott Paper Limited expects to complete the conversion of the existing mixed-wood stands to cottonwood/hybrid poplar pulpwood plantations in the Homathko and Kingcome Blocks in approximately 20-25 years based on the proposed annual harvest area.

The volume based analysis for the Fraser Block resulted in a non-declining evenflow (NDEF) harvest level of 13 375 m^3/yr. The analysis showed that this harvest level can be increased after 20 years as existing natural cottonwood stands are converted to managed hybrid poplar. As expected this harvest level is sensitive to changes in rotation length and stand yields. The lowering of rotation length increases the harvest level while higher rotation length decreases the harvest level. The other important factors influencing the harvest level is the initial harvest sequence in the model which impacts the adjacency relationships within this spatial-explicit model. The alternative harvest flow temporarily declined during the second decade of the analysis as the remaining low site and low stocking areas are converted to hybrid poplar pulpwood plantations.

The area-based volume equivalent level is approximately 11% higher than and volume-based NDEF for the Fraser Block (15 011 m^3 vs. 13 375 m^3). The factors contributing to this difference are the harvesting of overmature high volume stands in the next 5 year period, on average harvesting 8-10 ha extra on an annual basis within the area-based analysis, the non-declining even flow requirements of the volume-based analysis, and in the volume-based analysis the 1998-1999 forced harvest is overestimated by approximately 15-20 ha. Further confirmation of the underlying growth and yield assumptions are necessary prior to implementing volume-based allowable annual cut regulation requirements on this Block of the TFL.

The company has been managing the TFL on an area-based harvest regulation from the beginning thus recognizing that volume fluctuations are inherent part of this approach and has develop a diversified fibre procurement strategy in order to meet it's fibre requirements.

10.0 RECOMMENDED HARVEST LEVEL

The company recommends continuation of setting of the Allowable Annual Cut on an area basis since the conversion process is still in progress and relatively limited growth and yield information is available for cottonwood/hybrid poplar. The recommended annual area harvest level is 108.2 ha/year with the following division amongst the three Blocks of the TFL:

Fraser	**44.3 ha**	**15, 011.2 m^3**
Homathko	**50.1 ha**	**16, 685.6 m^3**
Kingcome	**13.8 ha**	**8, 066.1 m^3**
Total	**108.2 ha**	**39, 763 m^3**

The area-based analysis supports this harvest level as long as there are no significant future reductions to the timber harvesting land base of the TFL. The implementation of volume-based harvest regulation should be deferred until better growth and yield information is available.