MISTIK MANAGEMENT LTD.

2019 20-YEAR FOREST MANAGEMENT PLAN

Volume II Document VI- Forest Estate Modeling

Background Information Document

2019 FOREST MANAGEMENT PLAN – VOLUME II FOREST ESTATE MODELING DOCUMENT

for the

Mistik and L&M Forest Management Agreement (FMA) Areas

For the 20-year period from April 1, 2019 to March 31, 2039

Box 9060
Meadow Lake, Saskatchewan
Canada, S9X 1V7

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Changes Since Previous Submission

This document was previously submitted to Saskatchewan Ministry of Environment on April 6, 2018. The only changes from the version submitted on that date to this current and final version are listed below.

Section	Page	Change
N/A	N/A	Headers (changed to "2019 Forest Estate Modeling")
N/A	2	Changed date: April 1, 2019 to March 31, 2039
N/A	3	Removed sign-off sheet and added this description of changes
N/A	N/A	Footers (changed to dates)
N/A	N/A	Changed footnotes: date changed from "2017…." to "2019…"
N/A	N/A	Changed throughout document any reference to "2017…." to "2019…"
N/A	N/A	In all of the Control Parameters in Section 5 the top diameter was placed in bold to ensure it is clear which utilization standard was used
2.4	18	Removed “District” from the planning unit names
3.5	22	Footnote changed to remove 5 inch top comment
4	29	Updated softwood LRSYA MAIs and volumes in the tables based on 10 cm top diameter. Also updated footnotes to 10 cm top diameter
5.5	35-36	Table 5.3 updated to include new scenario for 10 cm. Also added footnote
6	78	Updated wording for SMS to include "10 cm top diameter utilization standards"
6.2	79	Updated Yield curves parameter in Table 6.2 for model parameters to include "10 cm top diameter utilization standards"
6.3	80-82	Updated harvest profile volumes and figures for both companies
6.3.1	83-84	Updated planning unit volume summaries and figures
6.3.2	84	Updated Retention wording and summary table
6.3.3	85	Replaced tables 6.4 and 6.5 with one table which includes degrade, retention and additional volume from merch. trees. New wording in the section for the degrade, final HVS calculations, etc.

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EXECUTIVE SUMMARY

On behalf of Mistik Management Ltd. (Mistik) and L&M Forest Products Ltd. (L&M), I am pleased to present Mistik's 2019 20-Year FMP Volume II: Forest Estate Modeling document completed in fulfilment of the requirements of Saskatchewan's Forest Resources Management Act (1999), the Province of Saskatchewan's 2017 Forest Management Planning Standard Document (September 2017) and Mistik's and L&M's Forest Management Agreements with the Province of Saskatchewan.

Mistik's 2019 20-Year FMP Volume II: Forest Estate Modeling provides both the Province of Saskatchewan and the public with a variety of information related to sustainable forest management of Mistik's and L&M's Forest Management Agreements, hereby known as the Mistik FMP Area. This portion of the forest management plan describes the following topics:

- Modelling assumptions;
- Long run sustained yield average;
- Wood supply model;
- Selected management strategy
- Natural forest patterns
- Salvage harvesting

Given the requirements of the planning standard, Forest Management Scenario (FMS) 11 was selected as the strategy This FMS was determined to be the selected management strategy (SMS) as it maintained the desired harvest flows while also satisfying the non-timber constraints. The following is the HVS determined based on the selected management strategy:

SELECTED MANAGEMENT STRATEGY: HARVEST VOLUME RESULTS			
MISTIK		**L&M**	
SUMMARY TABLE		**SUMMARY TABLE**	
Net Productive Area	817,284 ha	**Net Productive Area**	61,226 ha
Softwood Harvest Level	549,986 m^3/yr	**Softwood Harvest Level**	79,429 m^3/yr
Hardwood Harvest Level	999,753 m^3/yr	**Hardwood Harvest Level**	49,899 m^3/yr

1. INTRODUCTION

As outlined in the Saskatchewan 2017 Forest Management Planning Standard, a key component of a 20-Year Forest Management Plan (FMP) is the Forest Estate Modeling (FEM) report. Part of the FEM is to produce a Wood Supply Analysis (WSA). The primary goal of the wood supply analysis is to determine an Harvest Volume Schedule (HVS) level that provides the desired flow of forest values and achieves the desired future forest state. This document contains a detailed description of the methods and processes used for the Mistik FMP area in the WSA.

HVS: the volume of timber that can be harvested under sustained-yield management in any one year, as identified in the Mistik 2019 Forest Management Plan.

In the process of identifying and using the best available information as inputs for the WSA, two supporting documents have been produced and submitted to Saskatchewan Environment Forest Service, including:

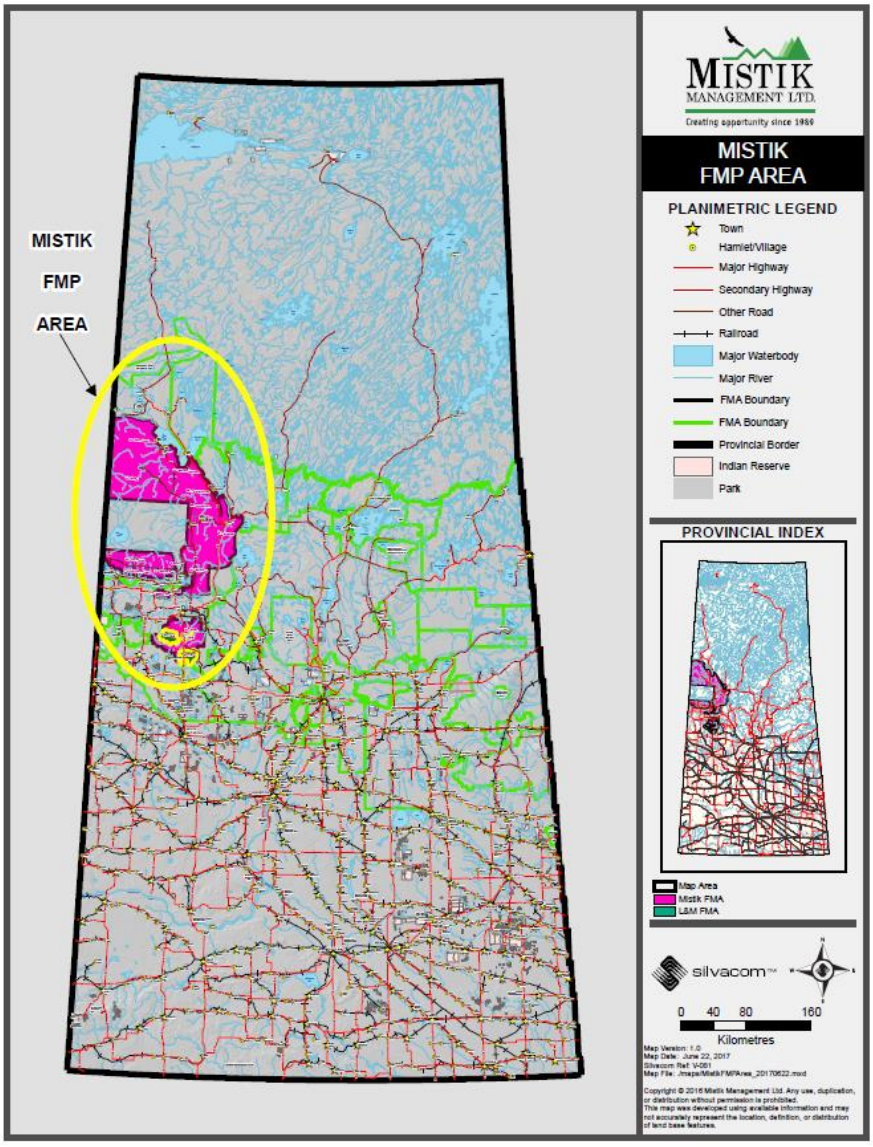
- Forest Characterization (2019) – Documents the data used and process followed to characterize the forest and determine the portions of the Mistik FMP area that are considered productive and are modeled as part of the WSA.
- Forest Development (2019) – Documents the data used and process followed to determine development types and yield curves used in the WSA for the portions of the Mistik FMP area that are identified as Net Productive Area as described in the Forest Characterization document.
- Modelling Assumptions (2019)- Documents the key assumptions and inputs that Mistik and L&M will be using in the WSA
- VOITS (2019) - Documents the values, objectives, indicators, and targets to be utilized within the Mistik FMP area

2. STUDY AREA

2.1. LOCATION

The Mistik and L&M FMAs are in the northwest central region of the province along the border of Alberta (Figure 2-1). The Mistik FMA surrounds the Department of the National Defence's air weapons range. The L&M FMA is located just south of the town of Meadow Lake. The area for both FMAs can be found in Table 2.1.

FIGURE 2.1: MAP OF THE MISTIK FMP AREA



2.2. LANDBASE DEFINITION

The following section outlines the landbase characterization categories developed in the forest characterization process. For more information on the development of the categories please refer to the Forest Characterization document. The area in each characterization category and the net productive forested area age class distribution by overstorey species group category are presented for the Mistik and L&M FMA areas in Table 2.1, Figure 2.2, and Figure 2.3.

TABLE 2.1 FOREST CHARACTERIZATION SUMMARY BY FMA AREA

LANDBASE CATEGORY	MISTIK AREA (HA)	L&M AREA (HA)	TOTAL AREA (HA)
Gross FMA Landbase Area	**1,809,288**	**69,211**	**1,878,499**
Water (Lakes and Rivers)	74,535	223	74,758
Landuse Dispositions (Recreation Areas and Timber Reserves)	6,767	0	6,767
Non-Forested: Anthropogenic	11,999	697	12,696
Non-Forested: Natural	149,638	2,953	152,591
Sub-Total (Permanent Exclusions)	*242,939*	*3,873*	*246,812*
FMA Managed Forested Area	**1,566,349**	**65,338**	**1,631,687**
Watercourse Buffers - 15 m	18,316	1,031	19,347
Watercourse Buffers - 30 m	5,814	107	5,921
Watercourse Buffers - 90 m	32,506	0	32,506
Inoperable	253	0	253
Operational Constraints - Low Productivity Class	111,511	332	111,843
Operational Constraints - Low Crown Closure	121,816	2,158	123,974
Operational Constraints - High Larch Component	175,096	0	175,096
Operational Constraints - Significant Disease on Pine	6,928	0	6,928
Operational Constraints - Black Spruce Considerations	276,824	484	277,308
FMA Net Productive Area	**817,284**	**61,226**	**878,510**
Forest Management Modification Area	0	0	0
Sub-Total (Partial Exclusions)	*749,064*	*4,112*	*753,176*
FMA Net Productive Area – No Constraints	**817,284**	**61,226**	**878,510**

FIGURE 2.2: NET PRODUCTIVE AREA AGE CLASS DISTRIBUTION BY OVERSTOREY SPECIES GROUP: MISTIK FMA

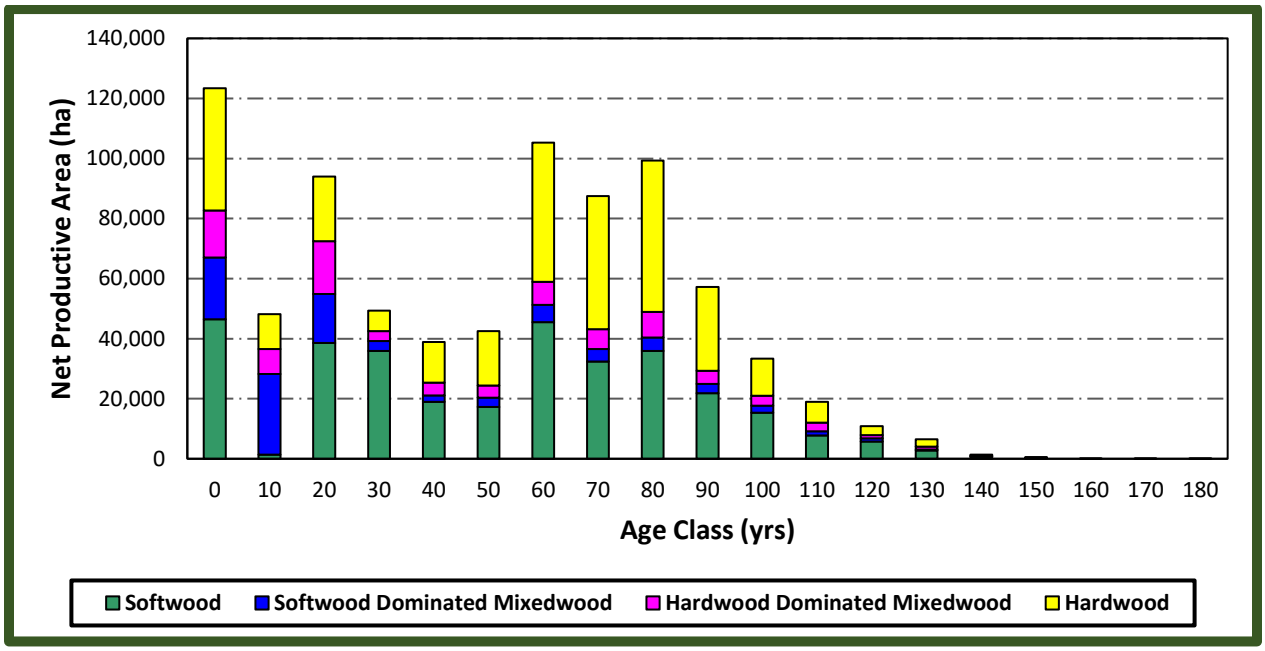
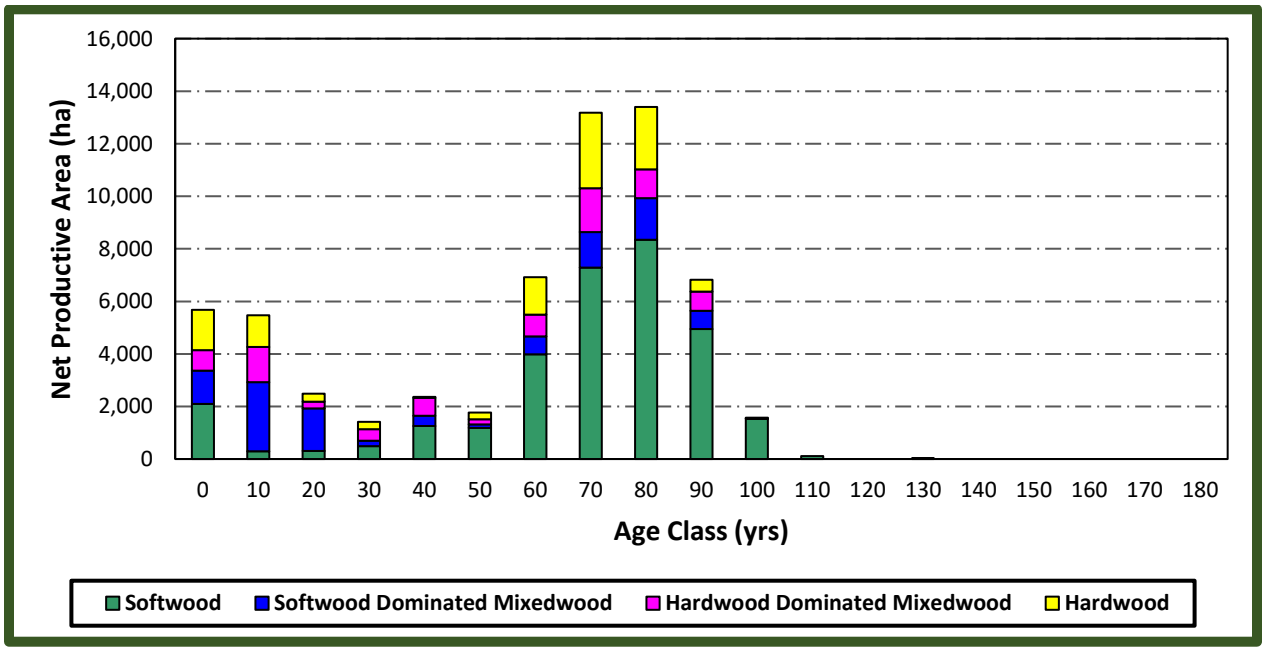


FIGURE 2.3: NET PRODUCTIVE AREA AGE CLASS DISTRIBUTION BY OVERSTOREY SPECIES GROUP: L&M FMA



2.3. MODELING LANDBASE

For the WSA it was required to develop a landbase which would be utilized within the WSA model. The landbase that will be utilized within the model will include the net productive areas of both the Mistik and L&M FMAs along with the eligible exclusions, consistent with the process agreed to and followed for the 2007 FMP. The eligible exclusions include forested areas that are in buffers and operational constraints. Table 2.2 provides a breakdown of the area included within the model.

TABLE 2.2 MODELED LANDBASE AREA SUMMARY BY FMA

LANDBASE CATEGORY	MISTIK AREA (HA)	L&M AREA (HA)	TOTAL AREA (HA)
FMA Net Productive Area	**817,284**	**61,226**	**878,510**
Dispositions	4,817	0	4,817
Watercourse Buffers - 15 m	8,170	636	8,807
Watercourse Buffers - 30 m	3,503	52	3,555
Watercourse Buffers - 90 m	20,770	0	20,770
Inoperable	243	0	243
Operational Constraints - Low Crown Closure	68,868	1,100	69,968
Operational Constraints - High Larch Component	23,669	0	23,669
Operational Constraints - Significant Disease on Pine	6,928	0	6,928
Operational Constraints - Black Spruce Considerations	0	4	4
Total Eligible Exclusions	136,970	1,792	138,762
Modeling Landbase Area	**954,254**	**63,018**	**1,017,272**

2.3.1. MODELING LANDBASE DEVELOPMENT

The modeling landbase was developed from the submitted planning inventory. It was necessary to overlay the caribou range along with the tactical plan onto the submitted planning inventory. This was necessary in order to assign the tactical blocks in the wood supply model and report activities in the caribou range. In addition, it was necessary to add a year of origin (YOO) field based on feedback from Saskatchewan Environment Forest Service.

2.4. PLANNING UNITS AND OPERATING AREAS

The Mistik FMP area will be managed or will be presented in the 2019 FMP within the context of five planning units, consisting of a total of thirteen landscape-level management units ranging in size from 13,706 ha to 355,677 ha. The management units were combined into larger planning units.

Table 2.3 identifies the larger planning units, the management units that are within each planning unit, and respective areas (ha) comprising the current Mistik FMP area. The average management unit size is 152,700 ha. On average, only 47% (ranging from 31% to 71%) of the Mistik FMP area is considered capable of supporting timber harvesting. Each management unit within the FMP area is subdivided into many operating areas. There are 416 operating areas comprising the Mistik FMA area with an average size of ~4,400 ha (Table 2.4). The L&M FMA area is subdivided into 10 operating areas and the FMA area contributes to the timber supply.

TABLE 2.3 PLANNING UNIT PRODUCTIVE AREA SUMMARY[1]

PLANNING UNIT	MANAGEMENT UNIT	MODELED AREA (HA)	NET PRODUCTIVE AREA WITHIN THE MODELED AREA (HA)	% PRODUCTIVE
West	20-Beaver River	9,005	8,044	89%
	03-Big Island Lake	27,745	26,751	96%
	12-Murray Bay	42,817	37,167	87%
	02-Pierceland	74,692	65,597	88%
Subtotal		154,259	137,558	89%
Central	09-Ile a la Crosse	40,928	34,463	84%
	10-Buffalo	54,977	50,060	91%
	07-Beauval	64,322	53,693	83%
	04-Waterhen	124,281	106,428	86%
	08-Canoe Lake	70,444	60,688	86%
Subtotal		354,952	305,333	86%
North	21-Peter Pond	131,351	102,577	78%
	11-Dillon	201,871	172,489	85%
Subtotal		333,222	275,066	83%
Divide	01-Divide	107,002	99,326	93%
Subtotal		107,002	99,326	93%
L&M	85- L&M	63,018	61,226	97%
Subtotal		63,018	61,226	97%
Total		**1,012,453**	**878,509**	**87%**

TABLE 2.4 PLANNING UNIT AND OPERATING AREA SUMMARY

PLANNING UNITS	MANAGEMENT UNIT	MODELED AREA (HA)	# OF OPERATING AREAS	AVERAGE OP. AREA SIZE WITHIN THE MODELED AREA (HA)
West	20-Beaver River	9,005	4	2,251
	03-Big Island Lake	27,745	8	3,468
	12-Murray Bay	42,817	16	2,676
	02-Pierceland	74,692	31	2,409
Subtotal		154,259	59	2,615
Central	09-Ile a la Crosse	40,928	27	1,516
	10-Buffalo Narrows	54,977	29	1,895
	07-Beauval	64,322	34	1,892
	04-Waterhen	124,281	45	2,762
	08-Canoe Lake	70,444	29	2,429
Subtotal		354,952	164	2,164
North	21-Peter Pond	131,351	35	3,753
	11-Dillon	201,871	113	1,786
Subtotal		333,222	148	2,252
Divide	01-Divide	107,002	45	2,378
Subtotal		107,002	45	2,378
L&M	85-L&M	63,018	10	6,302
Subtotal		63,018	10	6,302
Total		**1,012,453**	**426**	**2,377**

[1] The total modeled area in the planning units does not match the total gross area in Table 2.1 since management units 78 (Recreation Area) and 79 (Timber Reserve) are not included within a planning unit.

3. MODELING ASSUMPTIONS

This section summarizes the modeling assumptions utilized within the wood supply analysis. Further details related to the modeling assumptions can be located within the Modeling Assumptions document.

3.1. FOREST INVENTORY

The forest inventory involved a complete stratification of all forested and non-forested areas within the Mistik FMP area using Saskatchewan Forest Vegetation Inventory (SFVI) standards. This “census” of the entire landbase will accommodate complete FMA area-wide summaries by tile, species, age class or any other inventory attribute, and will facilitate short and long-term planning.

Medium scale (1:10,000 and 1:15,000) ‘leaf-on’, black and white panchromatic air photo coverage was obtained for Mistik’s entire FMA area beginning in 1994 and ending in 2005. The stratification of forested and non-forested lands was completed in accordance with SFVI specifications created by Silvacom Ltd. (approved, September 06, 2000).

Digital orthophotos (1:60,000) were produced by Land Data Technologies Inc., acquired (in combination with 50 metre digital elevation model data) between 1998 and 2001. Data stratified on the aerial photography was transferred to these orthophotos, digitized and entered into a database. Throughout the various processes strict quality control measures were implemented.

It should be noted the effective date of this planning inventory is 2015 meaning all disturbance data and stand ages were updated to this date. The one exception is that 2016 cutblocks were included in the modeling landbase and their ages were set to zero.

3.2. GROWTH & YIELD

Mistik and L&M compiled yield curves for the FMAs in 2007 during development of the previous FMPs. Descriptions of how these yield curves were developed can be found within the Forest Development document. A summary table (Table 3.1) below demonstrates how the development type was assigned to each forested stand. The net area within each development type and FMA can be found within Table 3.2.

TABLE 3.1: FOREST DEVELOPMENT TYPE ASSIGNMENT

SPECIES GROUP (DT_SPGP)	LEADING SPECIES (DT_SPECIES)	CROWN COVER (DT_CROWN)	PRODUCTIVITY CLASS (DT_PCLASS)	SIGNIFICANT SOFTWOOD (SIG_SOFT)	DEVELOPMENT TYPE (DEVTYPE)	DEVELOPMENT TYPE CODE (DEV_CODE)
S	WS	ALL	ALL	N/A	'S-WS-A-A'	1
S	BS	ALL	ALL	N/A	'S-BS-A-A'	2
S	JP	LD	1	N/A	'S-JP-LD-A-1'	3
S	JP	LD	2	N/A	'S-JP-LD-A-2'	4
S	JP	HD	1	N/A	'S-JP-HD-A-1'	5
S	JP	HD	2	N/A	'S-JP-HD-A-2'	6
S	JP	ALL	ALL	N/A	'S-JP-L&M'	7
SH	JP	ALL	ALL	N/A	'SH-JP-A-A'	8
SH	WS	ALL	ALL	N/A	'SH-WS-A-A'	9
HS	WS	ALL	ALL	N/A	'HS-WS-A-A'	10
HS	JP	ALL	ALL	N/A	'HS-JP-A-A'	11
H	N/A	LD	1	0	'H-A-LD-A-1'	12
H	N/A	LD	2	0	'H-A-LD-A-2'	13
H	N/A	HD	1	0	'H-A-HD-A-1'	14
H	N/A	HD	2	0	'H-A-HD-A-2'	15
H	N/A	LD	ALL	1	'H(S)-A-LD-A'	16
H	N/A	HD	ALL	1	'H(S)-A-HD-A'	17

TABLE 3.2: FOREST DEVELOPMENT TYPE ASSIGNMENT AREA SUMMARY

DEVELOPMENT TYPE CODE	DEVELOPMENT TYPE	MISTIK	L&M
		Area (ha)	
1	'S-WS-A-A'	20,052	2,963
2	'S-BS-A-A'	23,669	10,910
3	'S-JP-LD-A-1'	94,565	0
4	'S-JP-LD-A-2'	29,871	0
5	'S-JP-HD-A-1'	101,108	0
6	'S-JP-HD-A-2'	57,705	0
7	S-JP-L&M'	0	17,962
8	'SH-JP-A-A'	46,711	7,334
9	'SH-WS-A-A'	48,507	3,266
10	'HS-WS-A-A'	50,345	4,033
11	'HS-JP-A-A'	38,209	3,976
12	'H-A-LD-A-1'	16,625	570
13	'H-A-LD-A-2'	27,589	1,018
14	'H-A-HD-A-1'	61,877	2,362
15	'H-A-HD-A-2'	124,471	3,546
16	'H(S)-A-LD-A'	29,848	1,257
17	'H(S)-A-HD-A'	46,135	2,028
Total		**817,286**	**61,226**

3.3. UTILIZATION SPECIFICATIONS

The utilization standards used to calculate both softwood and hardwood net merchantable volume are described in detail in the Forest Development document. The utilization parameters for both the Mistik and L&M FMA areas can be found in Table 3.3. There were sensitivity scenarios explored testing on the impacts of increasing the minimum top diameters. For these tests the utilization standards are found within Table 3.4 and Table 3.5. Following discussion with the companies, Mistik and L&M will be using the 10 cm softwood top utilization for the SMS.

TABLE 3.3: UTILIZATION STANDARDS FOR MISTIK AND L&M

UTILIZATION PARAMETER	L&M YIELD CURVE # 7		MISTIK + L&M (ALL OTHER YIELD CURVES)	
	Hardwood	Softwood	Hardwood	Softwood
Stump Height (m)	0.3	0.3	0.3	0.3
Minimum Top Diameter Inside Bark (cm)	8	10	7.5	10
Log Length (m)	**n/a**	**n/a**	**2.6**	2.6
Merchantable Minimum Bole Length (m)	4.9	5.2	5.2	5.2

TABLE 3.4: CHANGING UTILIZATION STANDARDS FOR CONIFER TO A 7.5CM TOP

UTILIZATION PARAMETER	L&M YIELD CURVE # 7		MISTIK + L&M (ALL OTHER YIELD CURVES)	
	Hardwood	Softwood	Hardwood	Softwood
Stump Height (m)	0.3	0.3	0.3	0.3
Minimum Top Diameter Inside Bark (cm)	8	7.5	7.5	7.5
Log Length (m)	**n/a**	**n/a**	2.6	2.6
Merchantable Minimum Bole Length (m)	4.9	5.2	5.2	5.2

TABLE 3.5: CHANGING UTILIZATION STANDARDS FOR CONIFER TO A 12.5CM TOP[2]

UTILIZATION PARAMETER	L&M YIELD CURVE # 7		MISTIK + L&M (ALL OTHER YIELD CURVES)	
	Hardwood	Softwood	Hardwood	Softwood
Stump Height (m)	0.3	0.3	0.3	0.3
Minimum Top Diameter Inside Bark (cm)	8	12.7	7.5	12.7
Log Length (m)	**n/a**	**n/a**	2.6	2.6
Merchantable Minimum Bole Length (m)	4.9	5.2	5.2	5.2

[2] *The analysis was completed for a 5" top, which converts to 12.7 cm. However, as discussed with Saskatchewan Government at the August 10, 2017 Planning Team meeting, for consistency with analysis done throughout the province, we have used 12.5cm to label this scenario.*

3.4. CULL DEDUCTIONS

Cull deductions were applied to the yields of each development type to account for scalable defects in the wood volume. These defects include rot, checks, sweep, and crook. For the Mistik and L&M FMAs the cull deductions that will be used in the Wood Supply Analysis are 1.5% for softwood and 7.4% for hardwood. The cull factors used for the L&M FMA will be the same except for the jack pine yield curve, which are 0.4% for softwood and 4.0% for hardwood.

3.5. OPERABILITY LIMITS

The minimum harvest ages and volumes that were utilized in the Wood Supply Analysis can be found in Table 3.6 below. The companies had originally planned on using a minimum harvest volume of 60 m^3/ha, as noted in the modeling assumptions document. However, it was determined in later discussions that 50 m^3/ha was now a more appropriate minimum harvest volume.

TABLE 3.6: MINIMUM HARVEST AGES AND VOLUMES BY DEVELOPMENT TYPE

DEVELOPMENT TYPE CODE	DEVELOPMENT TYPE	MINIMUM HARVEST AGE	MINIMUM HARVEST VOLUME (m^3/ha)[3]
1	'S-WS-A-A'	100	50
2	'S-BS-A-A'	100	50
3	'S-JP-LD-A-1'	70	50
4	'S-JP-LD-A-2'	70	50
5	'S-JP-HD-A-1'	70	50
6	'S-JP-HD-A-2'	70	50
7	S-JP-L&M'	70	50
8	'SH-JP-A-A'	80	50
9	'SH-WS-A-A'	90	50
10	'HS-WS-A-A'	80	50
11	'HS-JP-A-A'	80	50
12	'H-A-LD-A-1'	70	50
13	'H-A-LD-A-2'	70	50
14	'H-A-HD-A-1'	70	50
15	'H-A-HD-A-2'	70	50
16	'H(S)-A-LD-A'	70	50
17	'H(S)-A-HD-A'	70	50

3.6. SILVICULTURE

There were no silvicultural assumptions utilized within the Wood Supply Analysis. The SGR transitions are described for each development type in section 3.7 below.

[3] *The original minimum harvest volume was set at 50 m^3/ha following discussions.*

3.7. DEVELOPMENT TYPE TRANSITIONS

The development type transitions are based on the Silvicultural Ground Rules (SGR). For further information regarding the SGR transitions please refer to the SGR document. The transitions for each development type which was used in the wood supply model can be found in Table 3.7 below.

TABLE 3.7: DEVELOPMENT TYPE TRANSITIONS

DEVELOPMENT TYPE CODE	DEVELOPMENT TYPE	SGR TARGET PERCENT	TRANSITION DEVELOPMENT TYPE
1	'S-WS-A-A'	100	1 - 'S-WS-A-A'
2	'S-BS-A-A'	10	1 - 'S-WS-A-A'
		90	2 - 'S-BS-A-A'
3	'S-JP-LD-A-1'	35	3 - 'S-JP-LD-A-1'
		55	5 - 'S-JP-HD-A-1'
		10	8 - 'SH-JP-A-A'
4	'S-JP-LD-A-2'	35	4 - 'S-JP-LD-A-2'
		55	6 - 'S-JP-HD-A-2'
		10	8 - 'SH-JP-A-A'
5	'S-JP-HD-A-1'	90	5 - 'S-JP-HD-A-1'
		10	8 - 'SH-JP-A-A'
6	'S-JP-HD-A-2'	90	6 - 'S-JP-HD-A-2'
		10	8 - 'SH-JP-A-A'
7	S-JP-L&M'	100	7 - 'S-JP-L&M'
8	'SH-JP-A-A'	65	8 - 'SH-JP-A-A'
		10	9 - 'SH-WS-A-A'
		20	11 - 'HS-JP-A-A'
		5	17 - 'H(S)-A-HD-A'
9	'SH-WS-A-A'	10	1 - 'S-WS-A-A'
		70	9 - 'SH-WS-A-A'
		20	10 - 'HS-WS-A-A'
10	'HS-WS-A-A'	40	9 - 'SH-WS-A-A'
		60	10 - 'HS-WS-A-A'
11	'HS-JP-A-A'	20	8 - 'SH-JP-A-A'
		20	9 - 'SH-WS-A-A'
		20	10 - 'HS-WS-A-A'
		30	11 - 'HS-JP-A-A'
		10	17 - 'H(S)-A-HD-A'
12	'H-A-LD-A-1'	15	9 - 'SH-WS-A-A'
		15	10 - 'HS-WS-A-A'
		5	12 - 'H-A-LD-A-1'
		65	14 - 'H-A-HD-A-1'
13	'H-A-LD-A-2'	15	9 - 'SH-WS-A-A'
		15	10 - 'HS-WS-A-A'
		5	13 - 'H-A-LD-A-2'
		65	15 - 'H-A-HD-A-2'
14	'H-A-HD-A-1'	15	9 - 'SH-WS-A-A'
		15	10 - 'HS-WS-A-A'
		5	12 - 'H-A-LD-A-1'

DEVELOPMENT TYPE CODE	DEVELOPMENT TYPE	SGR TARGET PERCENT	TRANSITION DEVELOPMENT TYPE
		65	14 - 'H-A-HD-A-1'
15	'H-A-HD-A-2'	5	9 - 'SH-WS-A-A'
		5	10 - 'HS-WS-A-A'
		90	15 - 'H-A-HD-A-2'
16	'H(S)-A-LD-A'	35	9 - 'SH-WS-A-A'
		35	10 - 'HS-WS-A-A'
		30	17 - 'H(S)-A-HD-A'
17	'H(S)-A-HD-A'	25	9 - 'SH-WS-A-A'
		25	10 - 'HS-WS-A-A'
		50	17 - 'H(S)-A-HD-A'

3.8. FOREST STAND BREAK-UP AGES

The yield curves were generated based on empirical data and the volumes start to decline at varying points in time based on the different development types. Within the Wood Supply Analysis there was a “stand break-up age” set at 400 years for all development types. If a stand in the model reaches 200 years, it’s volume and seral stage will remain constant from that point on until the model chooses to harvest it.

3.8.1. SENSITIVITY ANALYSIS

There was a sensitivity analysis completed for the break-up ages based on two times the rotation age for each development type. The rotation age is the point where the mean annual increment (MAI) intersects with the periodic annual increment (PAI) or where the slope of the MAI is equal to zero. In certain development types the rotation age was less than the minimum harvest age. In the cases where the rotation age was less than the minimum harvest age the minimum harvest age was used as the rotation age. Table 3.8 below displays the rotation and break-up ages for each development type for the sensitivity analysis.

TABLE 3.8: DEVELOPMENT TYPE ROTATION AND BREAK-UP AGES

DEVELOPMENT TYPE CODE	DEVELOPMENT TYPE	ROTATION AGE	BREAK-UP AGE[4]
0	‘non-net landbase eligible exclusions’	N/A	200
1	'S-WS-A-A'	100	200
2	'S-BS-A-A'	100	200
3	'S-JP-LD-A-1'	80	160
4	'S-JP-LD-A-2'	85	170
5	'S-JP-HD-A-1'	75	150
6	'S-JP-HD-A-2'	70	140
7	S-JP-L&M'	70	140

[4] For some of the development types the break-up age was required to be older as there was already area within the landbase that was older than the break-up age at the onset of the modeling.

DEVELOPMENT TYPE CODE	DEVELOPMENT TYPE	ROTATION AGE	BREAK-UP AGE[4]
8	'SH-JP-A-A'	80	160
9	'SH-WS-A-A'	90	180
10	'HS-WS-A-A'	80	160
11	'HS-JP-A-A'	80	160
12	'H-A-LD-A-1'	75	150
13	'H-A-LD-A-2'	75	150
14	'H-A-HD-A-1'	75	150
15	'H-A-HD-A-2'	70	140
16	'H(S)-A-LD-A'	70	140
17	'H(S)-A-HD-A'	70	140

Following the analysis of the sensitivity run there was less than 1% change in the HVS (m^3/yr) between the sensitivity run and the base forest management scenario (FMS 3).

3.9. RE-PLANNING THRESHOLD

For this FMP, consistent with Mistik's 2007 20-Year FMP, a re-planning threshold of 10% net area will be in place. In other words, if ≥ 87,851 ha (~10% of the net productive landbase) is impacted by natural disturbance, whereby the age class of that area is reset to 0, it would trigger the need for re-planning. For example, if in 2020, wildfire impacts 30,000 ha of the net productive landbase, no re-planning is required because the impact is less than 87,851 ha. If in 2022, wildfire impacts an additional 60,000 ha of the net productive area, re-planning would be initiated because the cumulative impact (90,000 ha) exceeds 87,851 ha of net productive area.

3.10. NON-TIMBER OBJECTIVES

There are multiple VOITs that have been established for the Mistik and L&M FMAs through the planning process. As there are many VOITs that do not affect the WSA only the VOITs affect the WSA will be briefly described. For further description of all of the VOITs please refer to the VOITs document. The VOITs that will be included within the WSA are the spatial and temporal VOITs that are affected by the harvest patterns on the landscape.

3.10.1. SERAL STAGE

The definitions for the age criteria for the seral stages for the Mistik FMP area is displayed in Table 3.9 below.

TABLE 3.9: SERAL STAGE AGE RANGES BY SPECIES GROUP

Species Group	Seral Stage				
	Young	Immature	Mature	Old	Very Old
S & SH Mixedwoods	0-20 yrs	21-80 yrs	81-100 yrs	>100 yrs	>120 yrs
H & HS Mixedwoods	0-20 yrs	21-70 yrs	71-90 yrs	>90 yrs	>120 yrs

The seral stage VOITs are affected by the harvest patterns on the landscape and therefore it is necessary to include them as non-timber targets in the wood supply modeling. The two main seral stage VOITs that will be included within the model are VOITs 1.1.1.1 (2a) and 1.1.1.1 (2b). These VOITs maintain specific targeted area of old and very old forested area. The current proposed targets for these two VOITs are briefly described in Table 3.10 below. Appendix C provides further details of the process used to develop the late seral stage retention targets and the processes followed to identify and retain the highest quality stands.

TABLE 3.10: SERAL STAGE TARGETS BY SGR TYPE

SGR TYPE	TARGET (%)	
	Old Forest (VOIT 1.1.1.1 2a)	Very Old Forest (VOIT 1.1.1.1 2b)[5]
S-BS	≥5%	≥0.5%
S-JP	≥5%	≥0.5%
S-WS	≥9%	≥0.9%
SH and HS Mixedwoods	≥10%	≥1%
H	≥14%	≥1.4%

3.10.2. INBLOCK-RETENTION

The final modeled HVS for softwood and hardwood in both the Mistik and L&M FMAs will be adjusted. The final adjusted HVS is dependent on the amount of in-block retention. The in-block retention target is 6% so the final HVS will be impacted by 6% (see Table 6.3). Mistik also plans for a maximum proximal retention of 3%, however according to the 2017 Saskatchewan Forest Management Planning Standard, proximal retention is not factored into an HVS reduction.

3.10.3. EVENT SIZE

The target for the harvest event size class distribution for the FMP is that over the next 10 years, at least 25% of all harvested areas will create disturbance events at least 1,000 ha in size. This target was developed using Dr. David Andison's "Pre-Industrial Forest Condition Analysis" (Andison, 2007). The study developed the targets using the natural range of variation for the FMA area. As the process for determining the event and overall event size is dependent on GIS processing it is not controlled within the wood supply model.

[5] *Very old forest targets are a percentage of the "Old forest" targets. Example: S-BS has a target of 5% of the working forest and eligible excluded landbase. Of the 5% of old forest ≥10% must be very old forest.*

3.10.4. OLD FOREST PATCH SIZE

Similar to event size the old forest patch size target was developed using Dr. David Andison's "Pre-Industrial Forest Condition Analysis" (Andison, 2007). There are three targets for old forest patch size based on the Andison analysis. These targets include:

1. Large Old forest Patches:
    a. Maintain the number of old forest patches larger than 500 ha on the Mistik FMA at three or greater over the next 10 years.
2. Small Old forest Patches:
    a. Maintain the proportion of old forest area in patches smaller than 50 ha between 60-75% over the next ten years.
3. Operable forest in Large Old forest Patches:
    a. For the next 10 years, the proportion of operable forest in each of the five largest old forest patches shall not be less than 20%.

As the process for determining the old forest patches is dependent on GIS processing it is not controlled within the wood supply model.

3.10.5. WOODLAND CARIBOU

At the time of the Forest Estate Modeling, the caribou related VOITs had not yet been identified. To limit harvesting within known caribou-use areas, the same model constraint that was used in 2007 was applied again in the 2019 FMP Forest Estate Model as follows: within a ten year period, the total area harvested will not exceed 3% of the total area of all woodland caribou ranges combined. It should be noted that the caribou ranges used for this model constraint were the same as in the 2007 FMP. Mistik operations will comply with the final caribou VOITs as described in the VOITs document and Volume III, Appendix A.

4. LONG RUN SUSTAINED YIELD AVERAGE (LRSYA)

This section summarizes the procedures, results and assumptions applied in determining the sustainable harvest levels for the Mistik and L&M FMA Areas.

4.1. LONG RUN SUSTAINED YIELD AVERAGE (LRSYA)

Long Run Sustained Yield Average (LRSYA) is a measure of forest productivity and is calculated as the sum of growth per year of regenerated stands at a selected rotation age. It is derived from the theoretical concept of a regulated forest with a static and uniform age class distribution, a single rotation age, and a single yield function operating across equally productive sites. Under this assumption, the annual harvest equates to the annual growth in the selected age class. LRSYA is calculated using the following formula:

$$LRSYA = \sum_{1}^{k} MAI_i \bullet A_i$$

Where:

LRSYA	=	long run sustained yield average (m^3/yr);
MAI_i	=	mean annual increment (m^3/ha/yr) for yield class *i*;
A_i	=	net area (ha) for yield class *i*;
k	=	number of yield strata.

LRSYA estimates are calculated for two scenarios. The first scenario is a “modeled” scenario where it is assumed that all stands are on a transition yield curve with the 10 cm top diameter utilization standard. This assumption is to address the effect of silviculture by regenerating low density sites after harvest to the modeled transitions. The second scenario is a “status quo” scenario where it is assumed that all stands will transition back to their current yield curve with the 10 cm top diameter utilization standard following harvest.

The LRSYA estimates for a modelled transition and status quo transition assumptions are provided for the Mistik FMA Area in Table 4.1 and Table 4.2 and for the L&M FMA Area in Table 4.3 and Table 4.4. Modelled transitions refer to the transitions used in the timber supply model. Status quo transitions refer to yield curves remaining the same as they currently are.

For the purposes of this Wood Supply Analysis, LRSYA estimates are consistently based off an 80 year rotation age for all development types. The following factors were considered when selecting the rotation age:

- 10 development types, representing 75% of the productive area, have a Mistik Suggested Rotation Age (Appendix A: Rotation Age Analysis) of 80 years (90% of the area is within 1 age class of 80);
- The total area weighted peak MAI is 70 years for all development types. This however was determined by Mistik to be too short considering piece size requirements etc. A rotation age for LRSYA estimates of 80 years is only one age class from the area weighted average peak MAI and more consistent with management objectives.

TABLE 4.1: Net LRSYA Estimates: "Modeled" Regeneration Transition – Mistik FMA Area

Development Type	Net Area (ha)	MAI[6] (m^3/ha/yr) @ 80 Years[7]		LRSYA[8] (m^3/yr) @ 80 Years	
		Softwood	Hardwood	Softwood	Hardwood
1 S-WS-A-A	20,052	2.16	0.56	43,248	11,229
2 S-BS-A-A	23,684	0.81	0.16	19,225	3,697
3 S-JP-LD-A-1	94,548	1.06	0.22	99,888	20,388
4 S-JP-LD-A-2	29,871	1.77	0.33	52,945	9,850
5 S-JP-HD-A-1	101,109	1.24	0.22	125,777	22,352
6 S-JP-HD-A-2	57,705	2.25	0.38	129,832	21,978
7 S-JP-L&M	0	0	0.20	0	0
8 SH-JP-A-A	46,711	1.05	1.18	49,097	54,929
9 SH-WS-A-A	48,507	1.54	1.44	74,820	69,763
10 HS-WS-A-A	50,345	1.10	1.61	55,261	81,177
11 HS-JP-A-A	38,209	0.88	1.48	33,653	56,542
12 H-A-LD-A-1	16,625	0.43	2.08	7,072	34,564
13 H-A-LD-A-2	27,589	0.41	2.52	11,329	69,603
14 H-A-HD-A-1	61,877	0.43	2.08	26,323	128,647
15 H-A-HD-A-2	124,471	0.19	2.81	23,483	350,107
16 H(S)-A-LD-A	29,848	0.98	1.82	29,394	54,206
17 H(S)-A-HD-A	46,135	0.84	1.97	38,898	90,673
Total	**817,284**			**820,244**	**1,079,706**

TABLE 4.2: Net LRSYA Estimates: "Status Quo" Regeneration Transition – Mistik FMA Area

Development Type	Net Area (ha)	MAI[6] (m^3/ha/yr) @ 80 Years[7]		LRSYA[8] (m^3/yr) @ 80 Years	
		Softwood	Hardwood	Softwood	Hardwood
1 S-WS-A-A	20,052	2.16	0.56	43,248	11,225
2 S-BS-A-A	23,684	0.66	0.11	15,686	2,635
3 S-JP-LD-A-1	94,548	0.71	0.12	67,391	11,513
4 S-JP-LD-A-2	29,871	1.25	0.17	37,426	5,041
5 S-JP-HD-A-1	101,109	1.25	0.14	126,232	13,880
6 S-JP-HD-A-2	57,705	2.21	0.31	127,327	18,168
7 S-JP-L&M	0	2.37	0.20	0	0
8 SH-JP-A-A	46,711	1.20	0.98	56,213	45,552
9 SH-WS-A-A	48,507	1.70	1.49	82,252	72,312
10 HS-WS-A-A	50,345	0.70	1.69	35,190	85,261
11 HS-JP-A-A	38,209	0.37	1.38	14,297	52,736
12 H-A-LD-A-1	16,625	0.09	2.22	1,578	36,975
13 H-A-LD-A-2	27,589	0.03	2.58	907	71,069
14 H-A-HD-A-1	61,877	0.09	2.29	5,851	141,862
15 H-A-HD-A-2	124,471	0.08	2.95	9,532	366,989
16 H(S)-A-LD-A	29,848	0.50	1.73	14,987	51,612
17 H(S)-A-HD-A	46,135	0.49	2.34	22,557	107,893
Total	**817,284**			**660,674**	**1,094,722**

[6] MAI includes cull deductions (1.5% Softwood, 7.4% Hardwood) and is based off the 10 cm top diameter utilization standard yield curves.
[7] MAI's for Softwood and Hardwood in the modeled transitions are weighted averages based on the transition percentages
[8] Minor differences in LRSYA calculations are a result of rounding.

TABLE 4.3: Net LRSYA Estimates: "Modeled" Regeneration Transition – L&M FMA Area

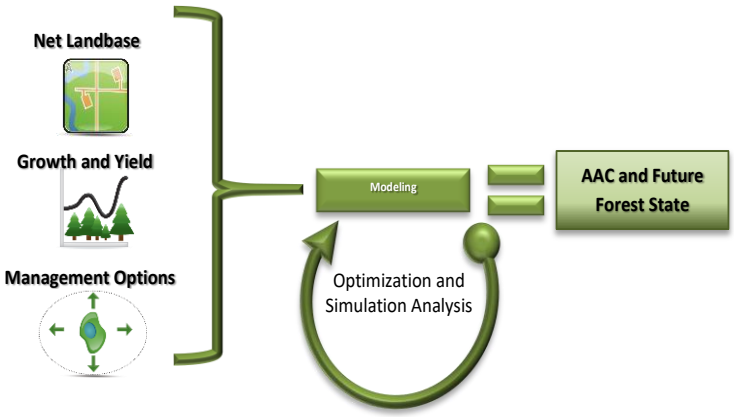
Development Type	Net Area (ha)	MAI[9] (m^3/ha/yr) @ 80 Years[10]		LRSYA[11] (m^3/yr) @ 80 Years	
		Softwood	Hardwood	Softwood	Hardwood
1 S-WS-A-A	2,963	2.16	0.56	6,391	1,659
2 S-BS-A-A	10,910	0.81	0.16	8,856	1,703
3 S-JP-LD-A-1	0	1.06	0.22	0	0
4 S-JP-LD-A-2	0	1.77	0.33	0	0
5 S-JP-HD-A-1	0	1.24	0.22	0	0
6 S-JP-HD-A-2	0	2.25	0.38	0	0
7 S-JP-L&M	17,962	0	0.20	42,503	3,647
8 SH-JP-A-A	7,334	1.05	1.18	7,708	8,624
9 SH-WS-A-A	3,266	1.54	1.44	5,038	4,697
10 HS-WS-A-A	4,033	1.10	1.61	4,426	6,502
11 HS-JP-A-A	3,976	0.88	1.48	3,502	5,884
12 H-A-LD-A-1	570	0.43	2.08	243	1,186
13 H-A-LD-A-2	1,018	0.41	2.52	418	2,568
14 H-A-HD-A-1	2,362	0.43	2.08	1,005	4,911
15 H-A-HD-A-2	3,546	0.19	2.81	669	9,973
16 H(S)-A-LD-A	1,257	0.98	1.82	1,238	2,282
17 H(S)-A-HD-A	2,028	0.84	1.97	1,710	3,986
Total	**61,226**			**83,707**	**57,623**

TABLE 4.4: Net LRSYA Estimates: "Status Quo" Regeneration Transition – L&M FMA Area

Development Type	Net Area (ha)	MAI[8] (m^3/ha/yr) @ 80 Years[10]		LRSYA[11] (m^3/yr) @ 80 Years	
		Softwood	Hardwood	Softwood	Hardwood
1 S-WS-A-A	2,963	2.16	0.56	6,391	1,659
2 S-BS-A-A	10,910	0.66	0.11	7,226	1,214
3 S-JP-LD-A-1	0	0.71	0.12	0	0
4 S-JP-LD-A-2	0	1.25	0.17	0	0
5 S-JP-HD-A-1	0	1.25	0.14	0	0
6 S-JP-HD-A-2	0	2.21	0.31	0	0
7 S-JP-L&M	17,962	2.37	0.20	42,503	3,647
8 SH-JP-A-A	7,334	1.20	0.98	8,826	7,152
9 SH-WS-A-A	3,266	1.70	1.49	5,538	4,869
10 HS-WS-A-A	4,033	0.70	1.69	2,819	6,829
11 HS-JP-A-A	3,976	0.37	1.38	1,488	5,488
12 H-A-LD-A-1	570	0.09	2.22	54	1,268
13 H-A-LD-A-2	1,018	0.03	2.58	33	2,622
14 H-A-HD-A-1	2,362	0.09	2.29	223	5,415
15 H-A-HD-A-2	3,546	0.08	2.95	272	10,454
16 H(S)-A-LD-A	1,257	0.50	1.73	631	2,173
17 H(S)-A-HD-A	2,028	0.49	2.34	992	4,743
Total	**61,226**			**76,996**	**57,534**

[9] MAI includes cull deductions (1.5% Softwood, 7.4% Hardwood) and is based off the 10 cm top diameter utilization standard yield curves.
[10] MAI's for Softwood and Hardwood in the modeled transitions are weighted averages based on the transition percentages
[11] Minor differences in LRSYA calculations are a result of rounding.

5. WOOD SUPPLY MODEL



Various forest management scenarios (FMS) were analyzed using Remsoft®, Spatial Planning System (RSPS) or formerly known as Woodstock™ (version 2017.1). For this WSA, aspatial modeling scenarios were completed in RSPS as optimization formulas with one objective function (e.g. maximize total volume, maximize conifer volume, etc.). Other constraints were placed on the model in order to achieve the desired future forest. The resulting linear programming matrix (aspatial solution) created by RSPS was solved using MOSEK, an interior point LP solver (version 7.0.).

The model simulates the effect of management strategies on sustainable harvest levels over a specified planning horizon. In its most basic form, RSPS is a model which cuts and grows each stand in the forest, according to user-defined yield functions and forest policy constraints. Operating unit sequencing can also be introduced to reflect “real-world” limitations, such as accessibility and multi-pass harvesting rules.

As the model is aspatial, it is necessary to create a spatial link to the planning layer for the planning horizon. Therefore, the aspatial solution generated in RSPS is run through Remsoft’s Spatial Optimizer (formerly known as STANLEY). The Spatial Optimizer uses the solution and the spatial planning layer (shapefile) within RSPS to make the solution spatial. Within the Spatial Optimizer, the user is able to apply adjacency or proximity constraints, green-up delays, etc. in order to:

- Control the distribution (or concentration) of the harvest, and;
- Mimic operational planning strategies.

5.1. WOOD SUPPLY MODEL PARAMETERS

RSPS is comprised of several “sections” which are used to setup the parameters for the wood supply. These sections are described in detail in the modeling assumptions document. One of the sections within the modeling assumptions document describes the “THEMEs” utilized in the wood supply model. Following the submission of the modeling assumptions document there were updates to THEME 7 related to the tactical plan. The updated THEME 7 values and descriptions can be found in Table 5.1 below.

TABLE 5.1: THEME 7 DESCRIPTION

THEME 7 VALUE	DESCRIPTION
OF	Area identified as old forest and not available for harvest in the first 20 years
P1	Area in planned blocks outside the tactical plan
P1T1	Area in planned blocks and the first priority tactical plan (T1)
P1T2	Area in planned blocks and the second priority tactical plan (T2)
T1	Area available for harvest within the first priority tactical plan
T2	Area available for harvest within the second priority tactical plan

The basic parameters are described below and the standard run control parameters used in analysis are defined Table 5.2.

5.1.1. BASIC PARAMETERS

The following standard assumptions will be used within all of the FMS in the WSA:

- 200 year planning horizon (40 five year periods = 200 years)
- Yield Curves described in Section 3.2
- Development type transitions described in Section 3.7
- Minimum harvest ages described in Section 3.5 (Operability limits)
- Cull deductions described in Section 3.4

TABLE 5.2: HARVEST SIMULATION CONTROL PARAMETER DEFINITIONS USED IN ANALYSIS

PARAMETER	DEFINITION
Objective:	Description of the objective function utilized in the scenario
Model Constraints:	Description of the constraints employed in the model in the specific scenario
Effective Date:	The effective date of the landbase (i.e. the year the latest updates were made)
Harvest Unit:	Description of the area(s) included within the specific scenario
Planning horizon:	Total time period for the analysis scenario (years)
Minimum harvest age:	Minimum age (years) of stands that are eligible for harvest scheduling; may vary by yield stratum[12]
Landbase:	Landbase available for analysis
Yield curves:	Predicted yields for individual strata
Cull deductions:	Percent reduction of predicted yields to account for losses from defects
Regeneration transition:	Assumptions applied for the regeneration of stands scheduled for harvest[13]
Regeneration lag:	Assumed time period for the establishment of regeneration after harvest
Introduce harvest plans:	Incorporation of existing harvest plans into the harvest sequence

[12] Appendix A – Rotation Age Analysis
[13] Appendix B – Mistik FMA Area Development Type Transitions

5.2. MODEL PRIORITIES

The following section outlines how various priorities were evaluated or considered.

5.2.1. PRODUCTIVE VERSUS NON-PRODUCTIVE LAND

The area utilized within the model included the net productive area and the eligible exclusions of each FMA (Table 2.2). The net productive area is the area available for timber harvesting activities. Consistent with the process agreed to and followed for the 2007 FMP, the eligible exclusions include forested areas that are in buffers and operational constraints. Eligible exclusions are included within the model to contribute to area within seral stage classes.

5.2.2. MATURE AND IMMATURE FOREST

Immature forested areas was not considered in the model as a constraint. Old and very old forest was constrained and described in section 3.10.1. These areas are reported on within the seral stage reporting.

5.2.3. FOREST AGE

The forest age is utilized in the model when dealing with the operability limits and in calculating the seral stage.

5.2.4. VOLUME

The total harvested volume (softwood volume + hardwood volume) is the key driver in the model. The objective function for many of the scenarios explored was to maximize the total harvested volume.

5.2.5. PROXIMITY TO MILL

The proximity of stands to the mill is not a limiting factor within the model. There is no constraint related to the proximity to the mill. The hauling distance to the mills is a metric that is reported on in the forest management scenario results.

5.2.6. RECENT BURNS

Recent burns were included in the landbase during the forest characterization. The landbase developed during the forest characterization serves as the base for the modeled landbase.

5.2.7. INSECT AND DISEASE

Insects and disease infestations are not evaluated or considered within the model. In the event that an infestation occurs it will be reported on. It should be noted that endemic insect and disease damage is implicitly factored into the empirical yield curves.

5.2.8. SOCIAL CONSIDERATIONS

Social considerations area not considered in the wood supply model and will be handled at the operational level.

5.2.8.1. VISUALLY SENSITIVE AREAS

Visual buffers were not included within the wood supply model. These will be handled at the operational level.

5.2.8.2. PUBLIC ENGAGEMENT

Input received through the public engagement process will be handled at the operational level.

5.2.9. ROAD INFRASTRUCTURE

Roads are not utilized within the wood supply model. Road infrastructure being developed for the tactical plan will be supplied with the tactical plan.

5.2.10. FOREST ECONOMICS

Forest economics was not evaluated or considered within the wood supply model.

5.3. MODEL LIMITATIONS

It is important to outline that as with any model there can be uncertainties associated with the model or the model inputs that may impact the results. There have been efforts to reduce the amount of uncertainties associated with this model. For instance, the yield curves and the transitions utilized within the model have been monitored and validated over the previous FMP. This reduces any uncertainties with respect to the growth and yield of the forested stands across the landscape being utilized in the model.

5.4. NATURAL DISTURBANCE RISKS

Natural disturbances such as fire, insect and disease, and wind are not included within the model. If a natural disturbance event takes place within either FMA the HVS could be impacted. The extent to which the timber supply is impacted would depend on the size of the natural

disturbance event. If the event is larger than the re-planning threshold identified in section 3.9 then there may be the need to re-run the WSA to determine the HVS.

5.5. SCENARIOS EXPLORED

The following Forest Management Scenarios (FMS) in Table 5.3 were explored in the WSA to determine the final selected management strategy. The results of each FMS is displayed in further detail in sections 5.5.1 to 5.5.10. The sensitivity of each non-timber target can be determined by comparing a particular scenario to the previous scenario, with the exception of FMS 6, which should be compared to FMS 3 (Maximize Total Volume). For example, the sensitivity of the Mistik softwood HVS to the caribou range constraint (FMS 3 minus FMS 6) is 5,963 m^3/yr (528,940 - 522,977). As another example, the sensitivity of the L&M softwood HVS to the seral stage constraint (FMS 6 minus FMS 7) is 5,097 m^3/yr (70,481 – 65,384).

TABLE 5.3: FOREST MANAGEMENT SCENARIOS EXPLORED

FOREST MANAGEMENT SCENARIOS		MISTIK		L&M	
SCENARIO	DESCRIPTION	SOFTWOOD HVS (M^3/YR)	HARDWOOD HVS (M^3/YR)	SOFTWOOD HVS (M^3/YR)	HARDWOOD HVS (M^3/YR)
FMS 1	Maximize total volume (10 cm)	653,245	1,089,256	84,238	54,523
FMS 2	Maximize total volume (7.5 cm)	828,876	1,091,949	98,900	54,398
FMS 3	Maximize total volume	528,940	1,083,832	70,481	54,794
FMS 4	Maximize hardwood volume	521,972	1,085,299	67,315	55,845
FMS 5	Maximize softwood volume	531,769	1,001,387	70,749	53,608
FMS 6	Maximize total volume with caribou range constraint	522,977	1,082,919	70,481	54,794
FMS 7	Maximize total volume with caribou and seral stage constraints	485,467	1,013,815	65,384	52,067
FMS 8	Maximize total volume with caribou, seral stage, and old forest constraints	472,738	1,005,514	66,992	52,214
FMS 9	Maximize total volume with caribou, seral stage, old forest, and planned block constraints	470,864	1,001,443	67,118	50,687
FMS 10	Maximize total volume with caribou, seral stage, old forest, planned and tactical block constraints	467,895	1,000,548	66,577	49,942
FMS 11	Maximize total volume with caribou, seral stage, old forest, planned and tactical block constraints with L&M black spruce constraint	467,896	1,000,545	66,591	49,928

FOREST MANAGEMENT SCENARIOS		MISTIK		L&M	
SCENARIO	**DESCRIPTION**	**SOFTWOOD HVS (M^3/YR)**	**HARDWOOD HVS (M^3/YR)**	**SOFTWOOD HVS (M^3/YR)**	**HARDWOOD HVS (M^3/YR)**
FMS 11 (12.7 CM, SPATIAL)	Maximize total volume with caribou, seral stage, old forest, planned and tactical block constraints with L&M black spruce constraint (12.7 cm top diameter utilization standards)	467,646	999,753	66,552	49,899
FMS 11 (10 CM, SPATIAL, SMS)[14]	Maximize total volume with caribou, seral stage, old forest, planned and tactical block constraints with L&M black spruce constraint (12.7 cm top diameter utilization standards)	549,986	999,753	79,429	49,899

[14] Following the original submission of the FEM document there was a decision to move back to the 10 cm top diameter utilization standards. FMS 11 was adjusted to utilize the 10 cm top diameter yield curves. This adjustment did not involve selecting new blocks but rather the volume of the already selected blocks.

5.5.1. FMS 1 TOTAL VOLUME (10 CM)

Forest Management Scenario (FMS) 1 is a single landbase approach for each FMA that maintains an even flow of softwood and hardwood volumes for the entire planning horizon. The parameter settings used in the analysis of this scenario are displayed in Table 5.4. The results of the strategy are illustrated in Figure 5.1. This FMS is used for sensitivity analysis only and does not determine the final HVS or harvest sequence.

TABLE 5.4: CONTROL PARAMETERS - FMS 1

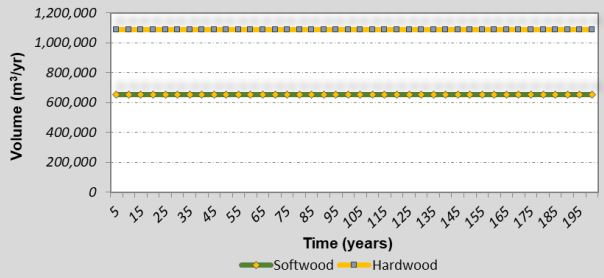
FMS 1: MAXIMIZE TOTAL VOLUME (10 CM)	
CONTROL PARAMETER	**PARAMETER SETTING**
Objective:	Maximize total volume harvested over the planning horizon
Model constraints:	1) Even flow softwood and hardwood volume harvest for the Mistik FMA area 2) Even flow softwood and hardwood volume harvest for the L&M FMA area 3) Non-declining softwood and hardwood operable growing stock in both the Mistik and L&M FMA areas
Effective Date	2015
Harvest unit:	Mistik and L&M FMA areas
Planning horizon:	200 yrs
Minimum harvest age:	100 Years- Black and White Spruce Softwood 70 Years- Jack Pine Softwood 80 Years- Jack Pine Leading Softwood Mixedwood (SH) 90 Years- Spruce Leading Softwood Mixedwood (SH) 80 Years- Jack Pine and Spruce Deciduous Mixedwood (HS) 70 Years- Hardwood
Landbase:	2016 submitted landbase which includes both Mistik and L&M FMA areas
Yield curves:	Net yield curves (17 yield curves/development types) based on **10 cm top diameter** utilization standards
Cull deductions:	Applied to yield curves (1.5% Softwood, 7.4% Hardwood)
Regeneration transition:	SGR transition rules
Regeneration lag:	Not applied
Introduce harvest plans:	Not applied

FIGURE 5.1: RESULTS - FMS 1 TOTAL VOLUME (10 CM)

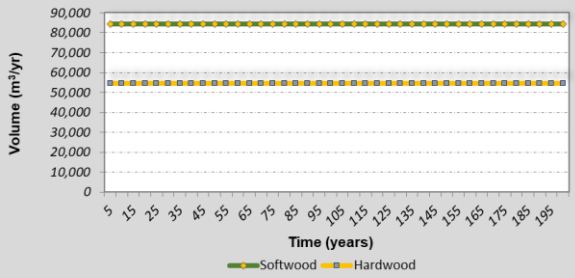
FMS 1: MAXIMIZE TOTAL VOLUME (10 CM)

MISTIK		L&M	
SUMMARY TABLE		**SUMMARY TABLE**	
Net Productive Area	817,284 ha	**Net Productive Area**	61,226 ha
Softwood Harvest Level	653,245 m^3/yr	**Softwood Harvest Level**	84,238 m^3/yr
Hardwood Harvest Level	1,089,256 m^3/yr	**Hardwood Harvest Level**	54,523 m^3/yr

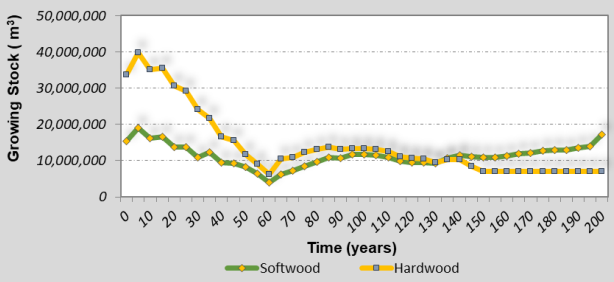
HARVEST FLOWS (M^3/YR)



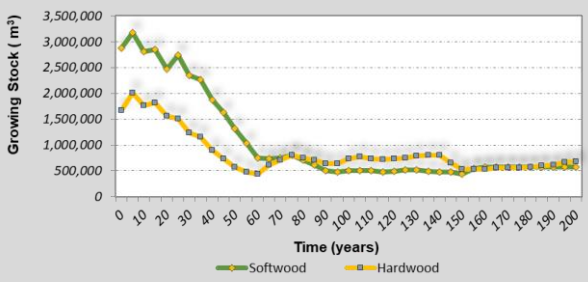
HARVEST FLOWS (M^3/YR)



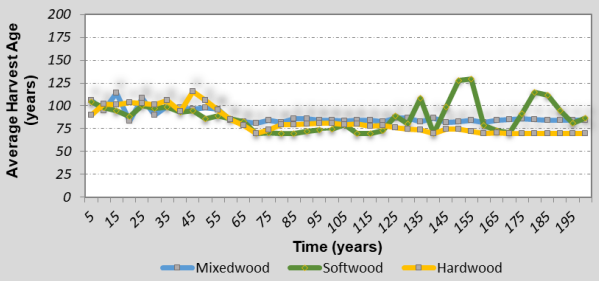
OPERABLE GROWING STOCK (M^3)



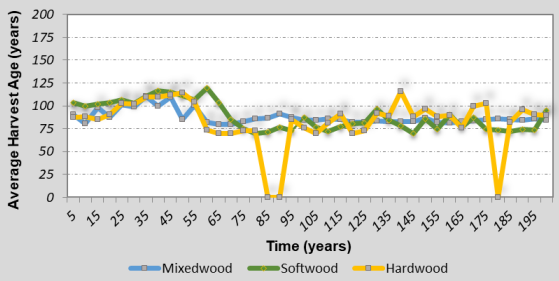
OPERABLE GROWING STOCK (M^3)



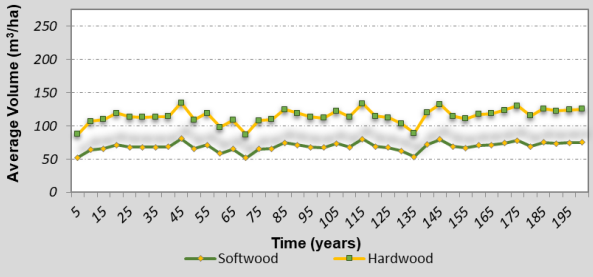
AVERAGE HARVEST AGE



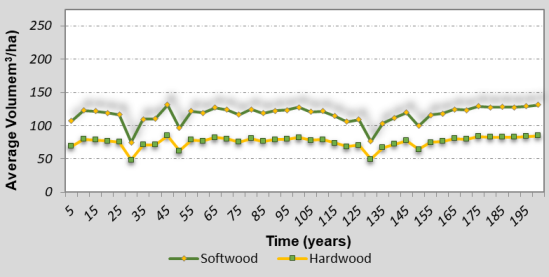
AVERAGE HARVEST AGE



AVERAGE VOLUME (M^3/HA)

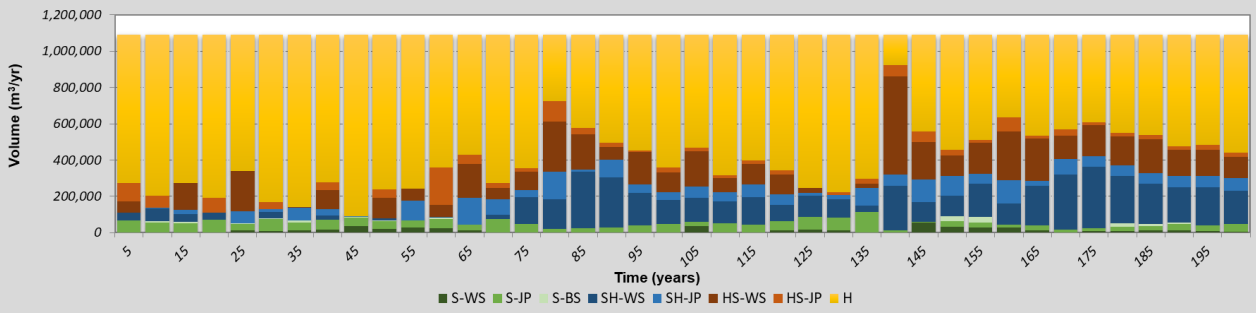


AVERAGE VOLUME (M^3/HA)

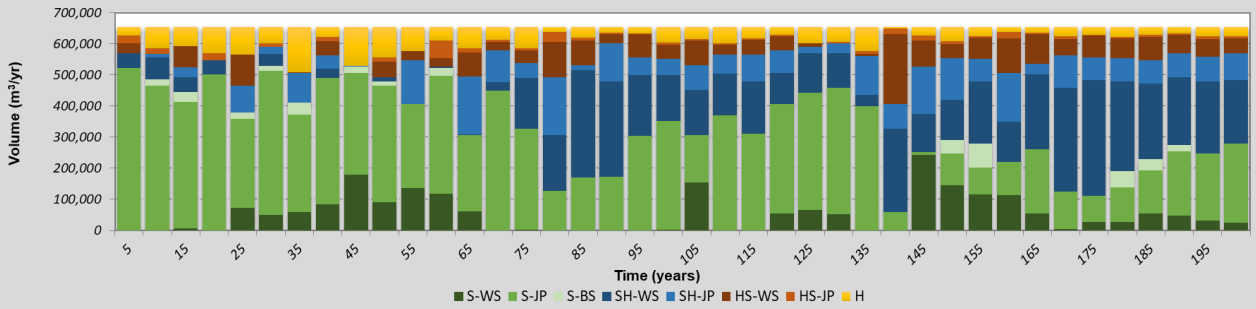


FMS 1: MAXIMIZE TOTAL VOLUME (10 CM)

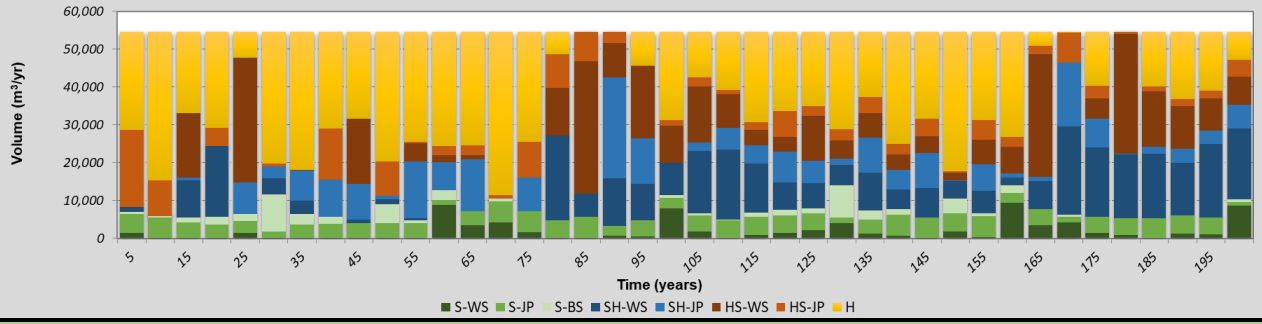
MISTIK HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



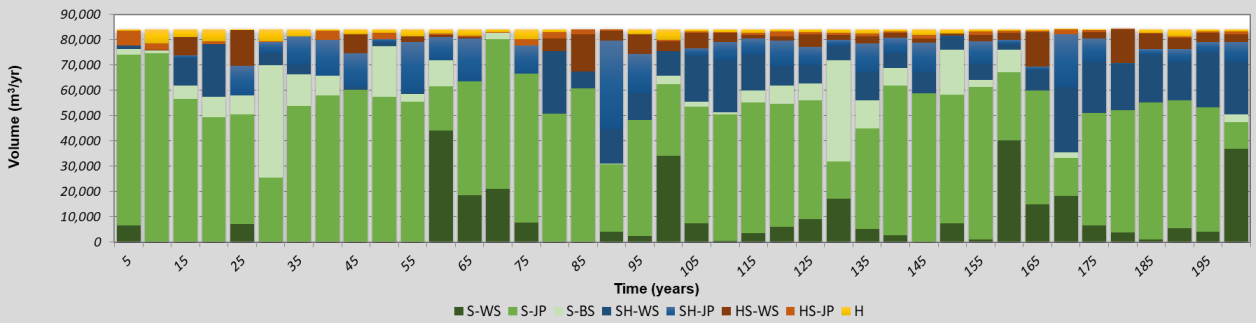
MISTIK SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



5.5.2. FMS 2 TOTAL VOLUME (7.5 CM)

Forest Management Scenario (FMS) 2 is a single landbase approach for each FMA that maintains an even flow of softwood and hardwood volumes for the entire planning horizon. The parameter settings used in the analysis of this scenario are displayed in Table 5.5. The results of the strategy are illustrated in Figure 5.2. This FMS is used for sensitivity analysis only and does not determine the final HVS or harvest sequence.

TABLE 5.5: CONTROL PARAMETERS - FMS 2

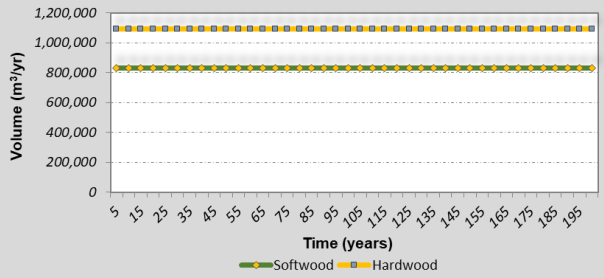
FMS 2: MAXIMIZE TOTAL VOLUME (7.5 CM)	
CONTROL PARAMETER	**PARAMETER SETTING**
Objective:	Maximize total volume harvested over the planning horizon
Model constraints:	1) Even flow softwood and hardwood volume harvest for the Mistik FMA area 2) Even flow softwood and hardwood volume harvest for the L&M FMA area 3) Non-declining softwood and hardwood operable growing stock in both the Mistik and L&M FMA areas
Effective Date	2015
Harvest unit:	Mistik and L&M FMA areas
Planning horizon:	200 yrs
Minimum harvest age:	100 Years- Black and White Spruce Softwood 70 Years- Jack Pine Softwood 80 Years- Jack Pine Leading Softwood Mixedwood (SH) 90 Years- Spruce Leading Softwood Mixedwood (SH) 80 Years- Jack Pine and Spruce Deciduous Mixedwood (HS) 70 Years- Hardwood
Landbase:	2016 submitted landbase which includes both Mistik and L&M FMA areas
Yield curves:	Net yield curves (17 yield curves/development types) based on **7.5 cm top diameter** utilization standards
Cull deductions:	Applied to yield curves (1.5% Softwood, 7.4% Hardwood)
Regeneration transition:	SGR transition rules
Regeneration lag:	Not applied
Introduce harvest plans:	Not applied

FIGURE 5.2: RESULTS - FMS 2 TOTAL VOLUME (7.5 CM)

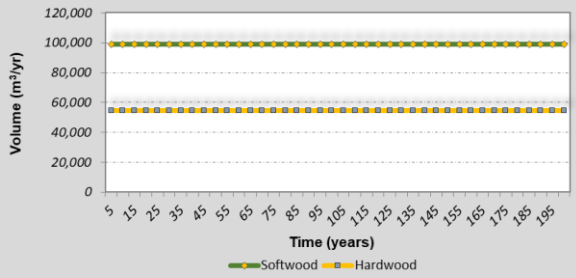
FMS 2: MAXIMIZE TOTAL VOLUME (7.5 CM)

MISTIK		L&M	
SUMMARY TABLE		**SUMMARY TABLE**	
Net Productive Area	817,284 ha	**Net Productive Area**	61,226 ha
Softwood Harvest Level	828,876 m^3/yr	**Softwood Harvest Level**	98,900 m^3/yr
Hardwood Harvest Level	1,091,949 m^3/yr	**Hardwood Harvest Level**	54,398 m^3/yr

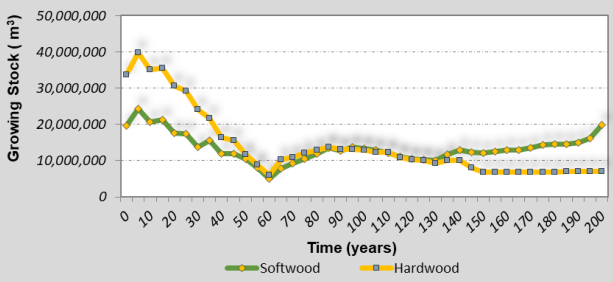
HARVEST FLOWS (M^3/YR)



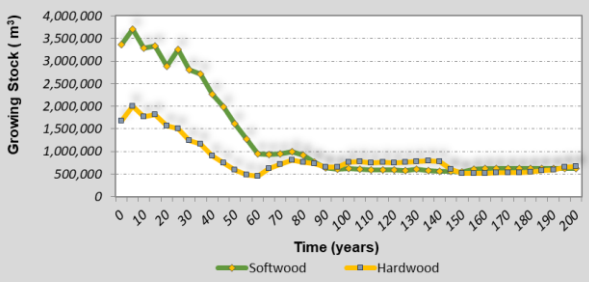
HARVEST FLOWS (M^3/YR)



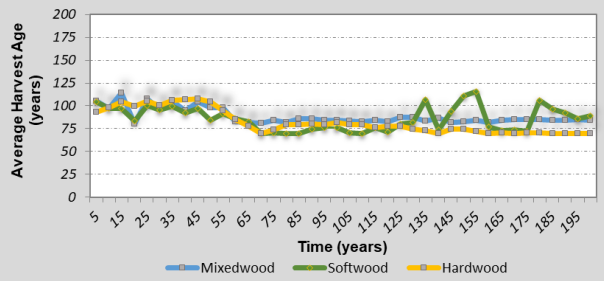
OPERABLE GROWING STOCK (M^3)



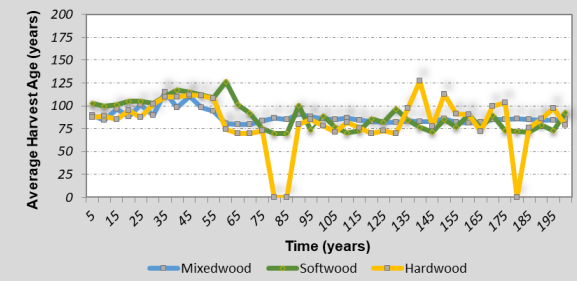
OPERABLE GROWING STOCK (M^3)



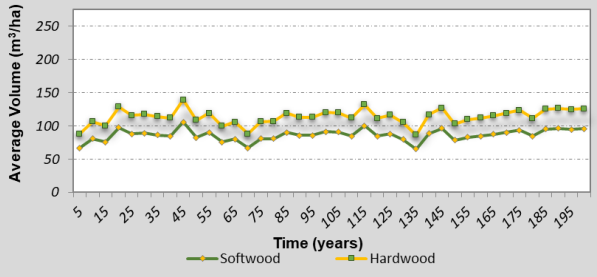
AVERAGE HARVEST AGE



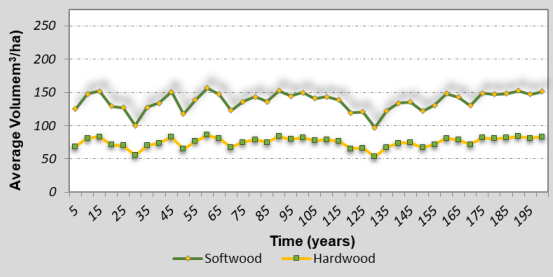
AVERAGE HARVEST AGE



AVERAGE VOLUME (M^3/HA)

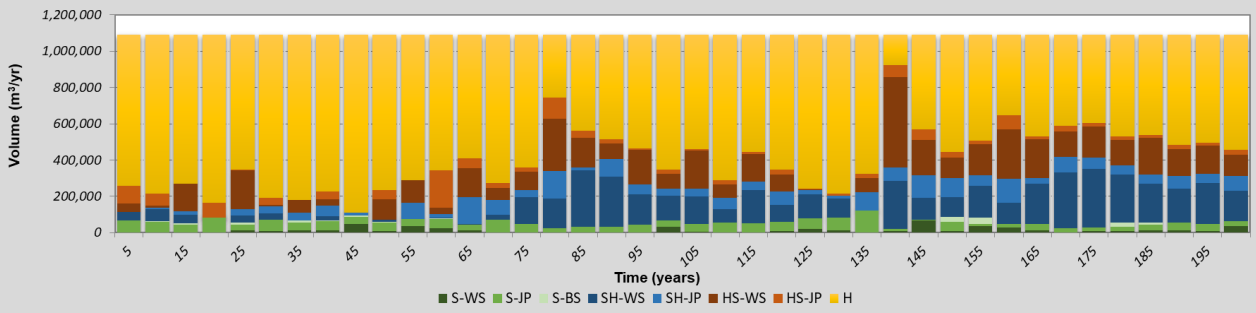


AVERAGE VOLUME (M^3/HA)

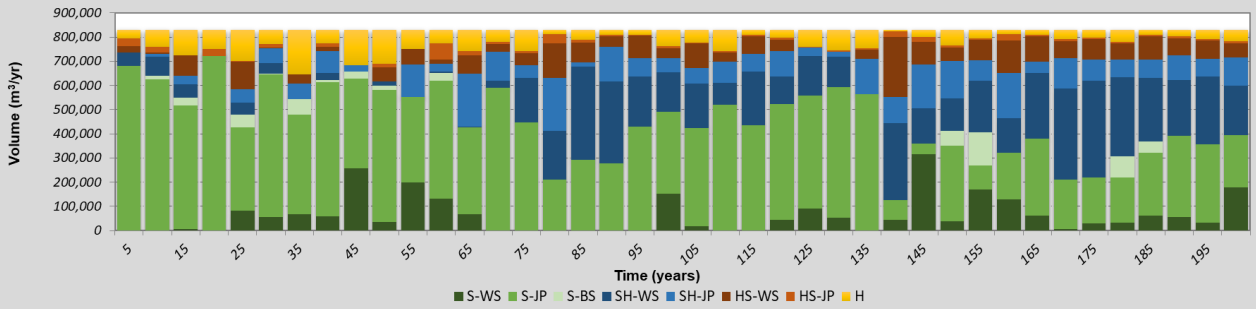


FMS 2: MAXIMIZE TOTAL VOLUME (7.5 CM)

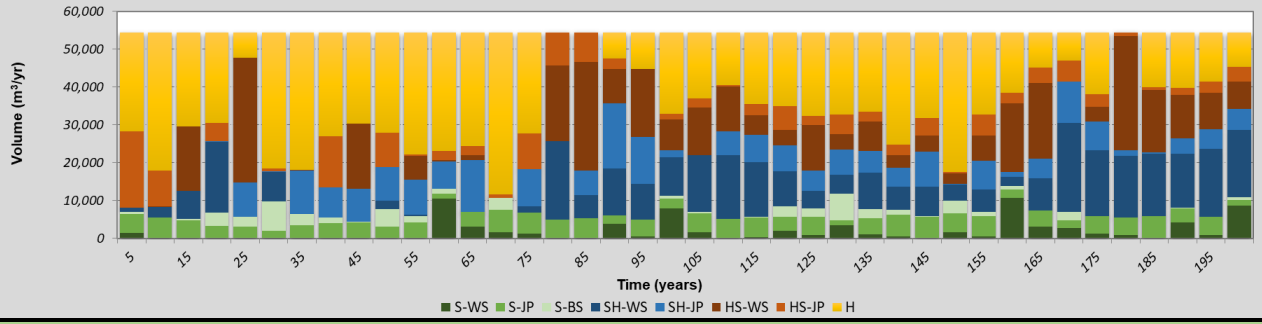
MISTIK HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



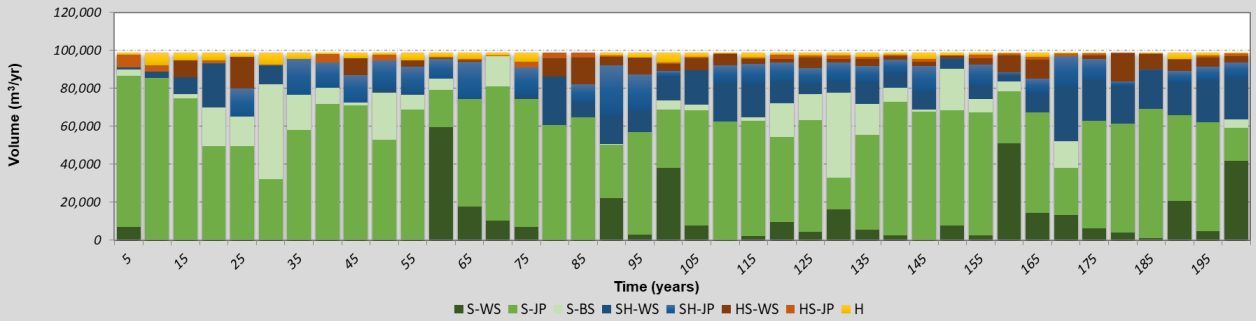
MISTIK SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



5.5.3. FMS 3 TOTAL VOLUME

Forest Management Scenario (FMS) 3 is a single landbase approach for each FMA that maintains an even flow of softwood and hardwood volumes for the entire planning horizon. The parameter settings used in the analysis of this scenario are displayed in Table 5.6. The results of the strategy are illustrated in Figure 5.3. This FMS is used for sensitivity analysis only and does not determine the final HVS or harvest sequence.

TABLE 5.6: CONTROL PARAMETERS - FMS 3

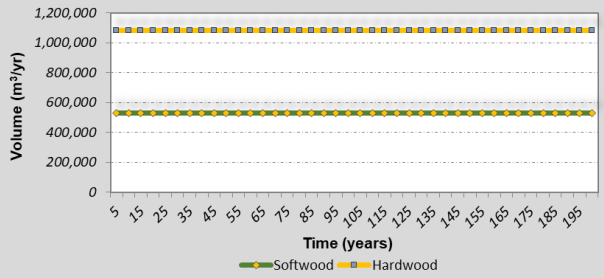
FMS 3: MAXIMIZE TOTAL VOLUME	
CONTROL PARAMETER	**PARAMETER SETTING**
Objective:	Maximize total volume harvested over the planning horizon
Model constraints:	1) Even flow softwood and hardwood volume harvest for the Mistik FMA area 2) Even flow softwood and hardwood volume harvest for the L&M FMA area 3) Non-declining softwood and hardwood operable growing stock in both the Mistik and L&M FMA areas
Effective Date	2015
Harvest unit:	Mistik and L&M FMA areas
Planning horizon:	200 yrs
Minimum harvest age:	100 Years- Black and White Spruce Softwood 70 Years- Jack Pine Softwood 80 Years- Jack Pine Leading Softwood Mixedwood (SH) 90 Years- Spruce Leading Softwood Mixedwood (SH) 80 Years- Jack Pine and Spruce Deciduous Mixedwood (HS) 70 Years- Hardwood
Landbase:	2016 submitted landbase which includes both Mistik and L&M FMA areas
Yield curves:	Net yield curves (17 yield curves/development types) based on **12.7 cm top diameter** utilization standards
Cull deductions:	Applied to yield curves (1.5% Softwood, 7.4% Hardwood)
Regeneration transition:	SGR transition rules
Regeneration lag:	Not applied
Introduce harvest plans:	Not applied

FIGURE 5.3: RESULTS - FMS 3 TOTAL VOLUME

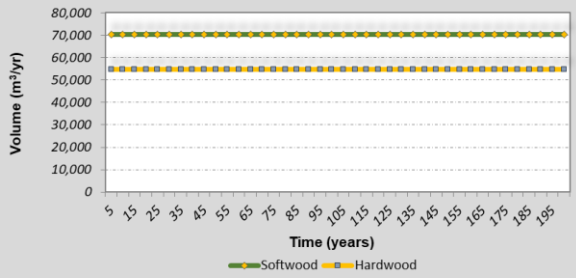
FMS 3: MAXIMIZE TOTAL VOLUME

MISTIK		L&M	
SUMMARY TABLE		**SUMMARY TABLE**	
Net Productive Area	817,284 ha	**Net Productive Area**	61,226 ha
Softwood Harvest Level	528,940 m^3/yr	**Softwood Harvest Level**	70,481 m^3/yr
Hardwood Harvest Level	1,083,832 m^3/yr	**Hardwood Harvest Level**	54,794 m^3/yr

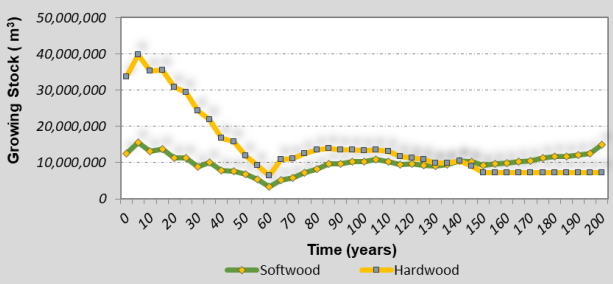
HARVEST FLOWS (M^3/YR)



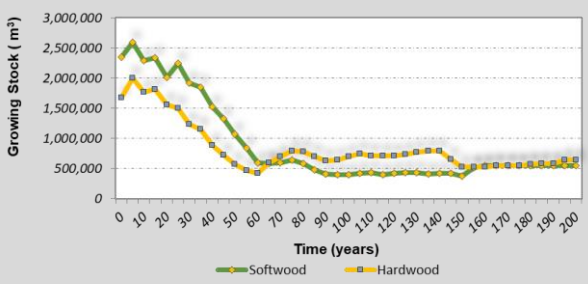
HARVEST FLOWS (M^3/YR)



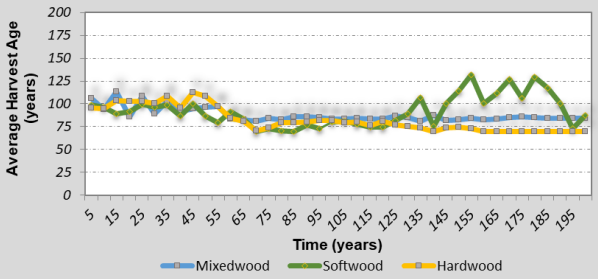
OPERABLE GROWING STOCK (M^3)



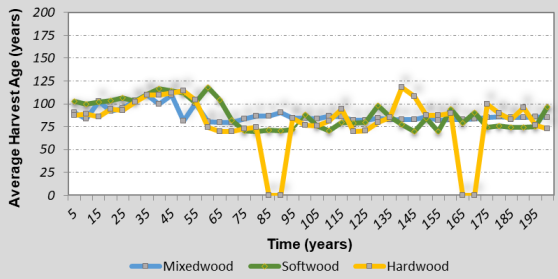
OPERABLE GROWING STOCK (M^3)



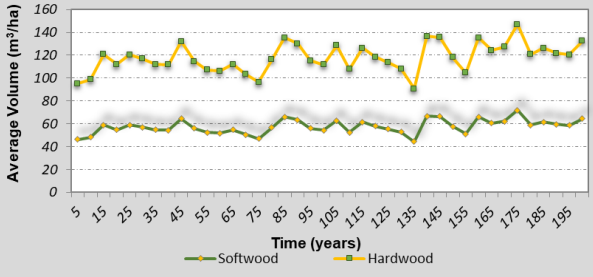
AVERAGE HARVEST AGE



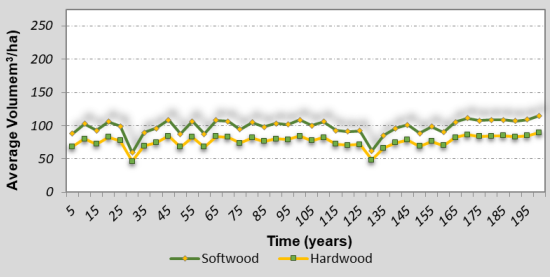
AVERAGE HARVEST AGE



AVERAGE VOLUME (M^3/HA)

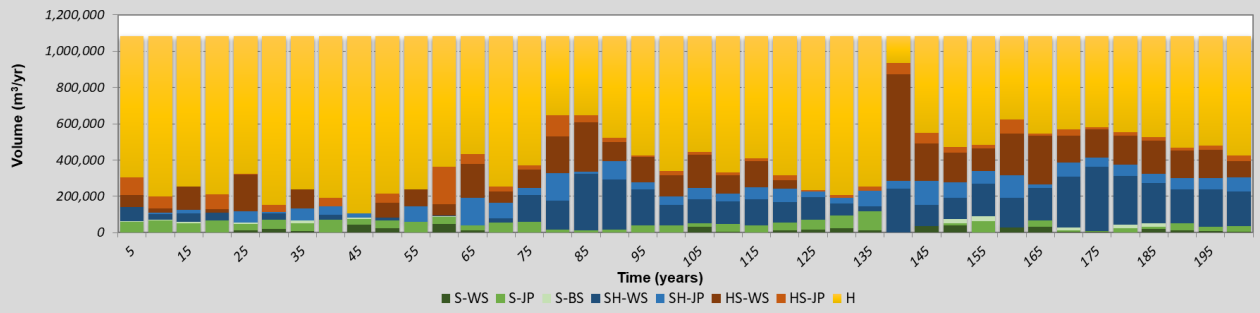


AVERAGE VOLUME (M^3/HA)

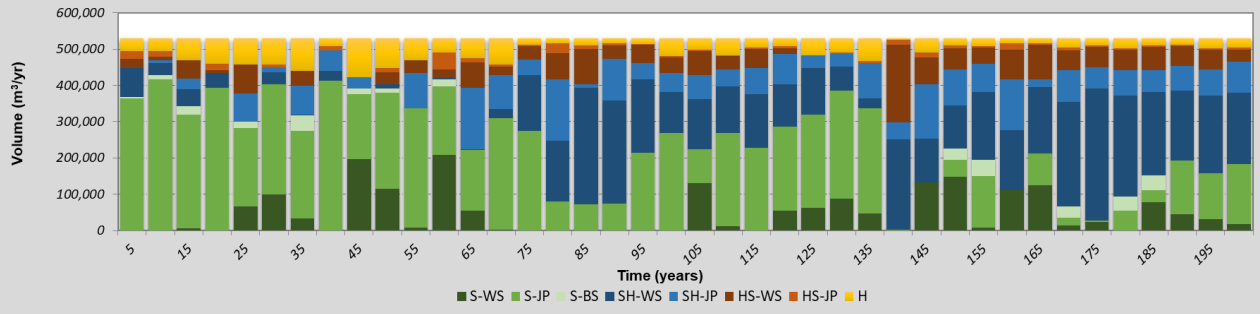


FMS 3: MAXIMIZE TOTAL VOLUME

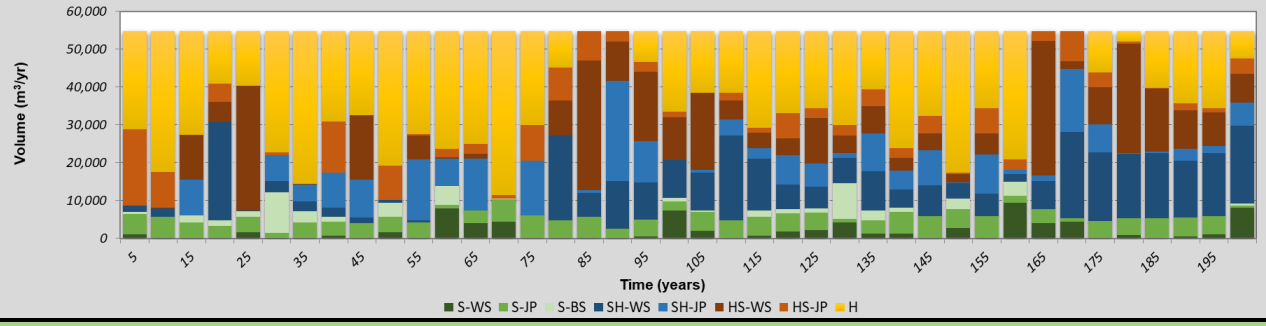
MISTIK HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



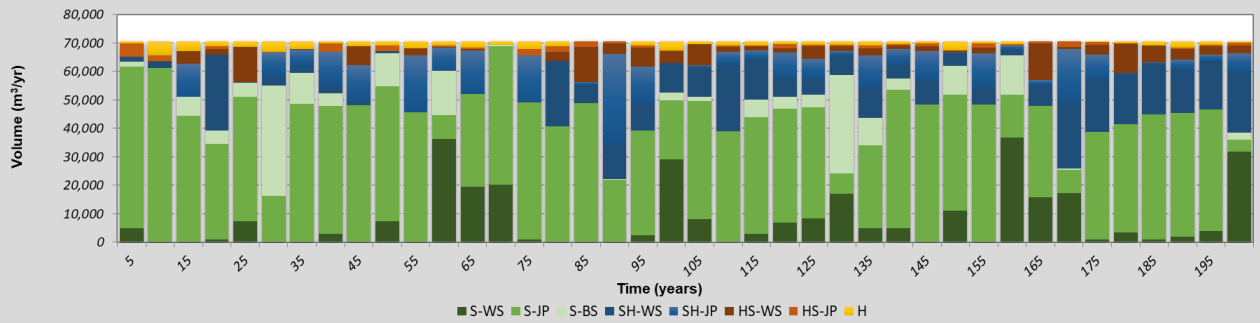
MISTIK SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



5.5.4. FMS 4 HARDWOOD

Forest Management Scenario (FMS) 4 is a single landbase approach that maintains an even flow of softwood and hardwood volumes for the entire planning horizon. The parameter settings used in the analysis of this scenario are displayed in Table 5.7. The results of the strategy are illustrated in Figure 5.4. This FMS is used for sensitivity analysis only and does not determine the final HVS or harvest sequence.

TABLE 5.7: CONTROL PARAMETERS - FMS 4

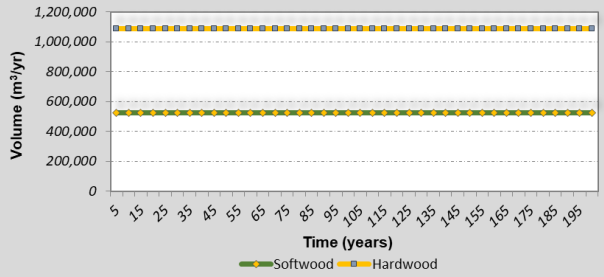
FMS 4: MAXIMIZE HARDWOOD VOLUME	
CONTROL PARAMETER	**PARAMETER SETTING**
Objective:	Maximize hardwood volume harvested over the planning horizon
Model constraints:	1) Even flow softwood and hardwood volume harvest for the Mistik FMA area 2) Even flow softwood and hardwood volume harvest for the L&M FMA area 3) Non-declining softwood and hardwood operable growing stock in both the Mistik and L&M FMA areas
Effective Date	2015
Harvest unit:	Mistik and L&M FMA areas
Planning horizon:	200 yrs
Minimum harvest age:	100 Years- Black and White Spruce Softwood 70 Years- Jack Pine Softwood 80 Years- Jack Pine Leading Softwood Mixedwood (SH) 90 Years- Spruce Leading Softwood Mixedwood (SH) 80 Years- Jack Pine and Spruce Deciduous Mixedwood (HS) 70 Years- Hardwood
Landbase:	2016 submitted landbase which includes both Mistik and L&M FMA areas
Yield curves:	Net yield curves (17 yield curves/development types) based on **12.7 cm** top diameter utilization standards
Cull deductions:	Applied to yield curves (1.5% Softwood, 7.4% Hardwood)
Regeneration transition:	SGR transition rules
Regeneration lag:	Not applied
Introduce harvest plans:	Not applied

FIGURE 5.4: RESULTS – FMS 4 HARDWOOD

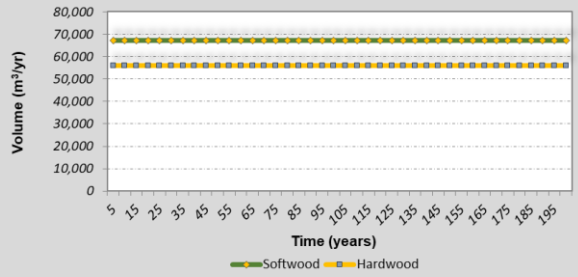
FMS 4: MAXIMIZE HARDWOOD VOLUME

MISTIK		L&M	
SUMMARY TABLE		**SUMMARY TABLE**	
Net Productive Area	817,284 ha	**Net Productive Area**	61,226 ha
Softwood Harvest Level	521,972 m^3/yr	**Softwood Harvest Level**	67,315 m^3/yr
Hardwood Harvest Level	1,085,299 m^3/yr	**Hardwood Harvest Level**	55,845 m^3/yr

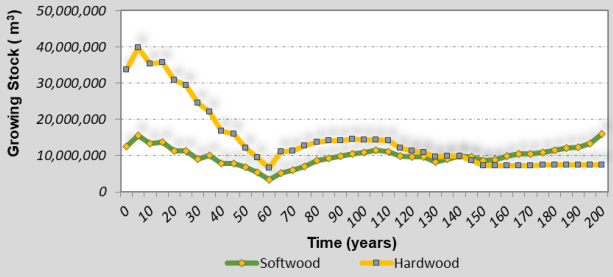
HARVEST FLOWS (M^3/YR)



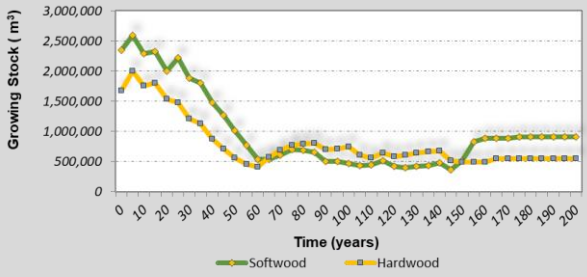
HARVEST FLOWS (M^3/YR)



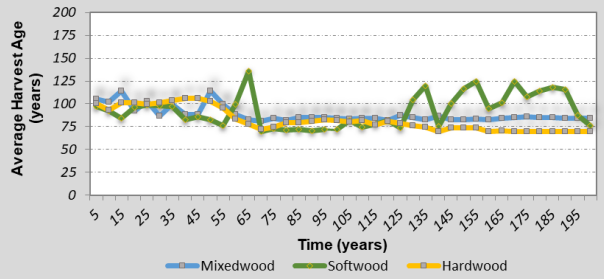
OPERABLE GROWING STOCK (M^3)



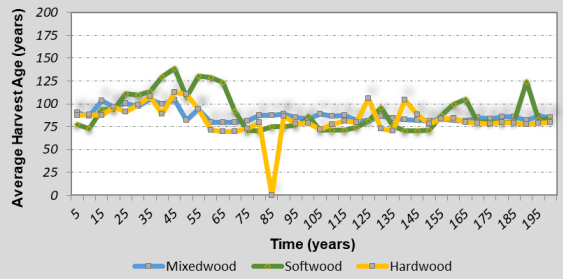
OPERABLE GROWING STOCK (M^3)



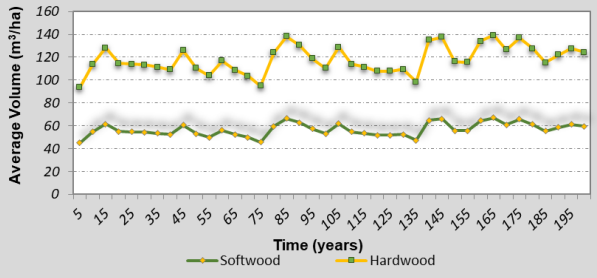
AVERAGE HARVEST AGE



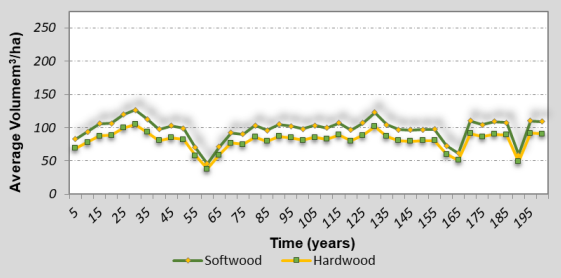
AVERAGE HARVEST AGE



AVERAGE VOLUME (M^3/HA)

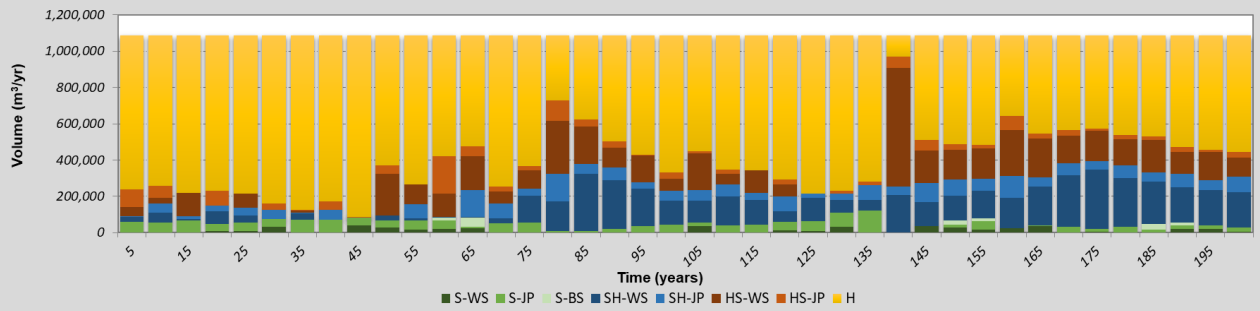


AVERAGE VOLUME (M^3/HA)

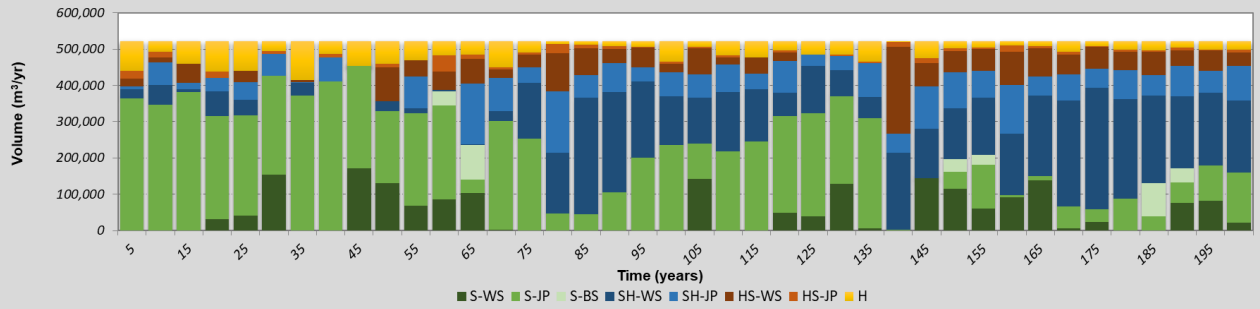


FMS 4: MAXIMIZE HARDWOOD VOLUME

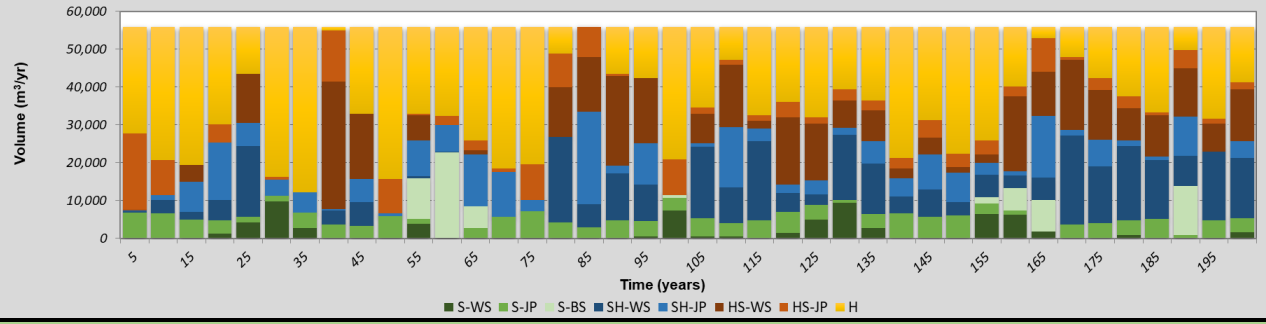
MISTIK HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



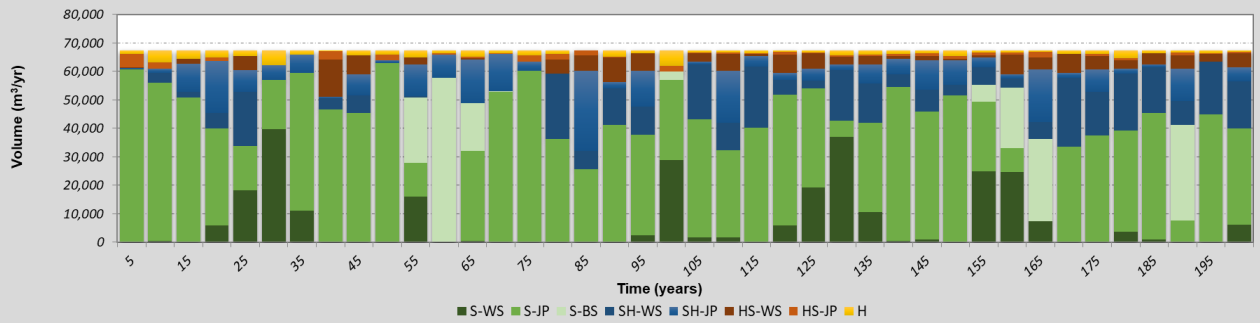
MISTIK SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



5.5.5. FMS 5 SOFTWOOD

Forest Management Scenario (FMS) 5 is a single landbase approach that maintains an even flow of softwood and hardwood volumes for the entire planning horizon. The parameter settings used in the analysis of this scenario are displayed in Table 5.8. The results of the strategy are illustrated in Figure 5.5. This FMS is used for sensitivity analysis only and does not determine the final HVS or harvest sequence.

TABLE 5.8: CONTROL PARAMETERS - FMS 5

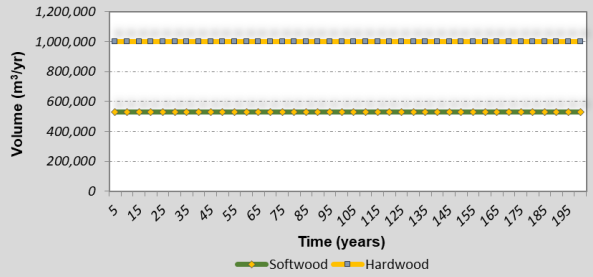
FMS 5: MAXIMIZE SOFTWOOD VOLUME	
CONTROL PARAMETER	**PARAMETER SETTING**
Objective:	Maximize softwood volume harvested over the planning horizon
Model constraints:	1) Even flow softwood and hardwood volume harvest for the Mistik FMA area 2) Even flow softwood and hardwood volume harvest for the L&M FMA area 3) Non-declining softwood and hardwood operable growing stock in both the Mistik and L&M FMA areas
Effective Date	2015
Harvest unit:	Mistik and L&M FMA areas
Planning horizon:	200 yrs
Minimum harvest age:	100 Years- Black and White Spruce Softwood 70 Years- Jack Pine Softwood 80 Years- Jack Pine Leading Softwood Mixedwood (SH) 90 Years- Spruce Leading Softwood Mixedwood (SH) 80 Years- Jack Pine and Spruce Deciduous Mixedwood (HS) 70 Years- Hardwood
Landbase:	2016 submitted landbase which includes both Mistik and L&M FMA areas
Yield curves:	Net yield curves (17 yield curves/development types) based on **12.7 cm** top diameter utilization standards
Cull deductions:	Applied to yield curves (1.5% Softwood, 7.4% Hardwood)
Regeneration transition:	SGR transition rules
Regeneration lag:	Not applied
Introduce harvest plans:	Not applied

FIGURE 5.5: RESULTS – FMS 5 SOFTWOOD

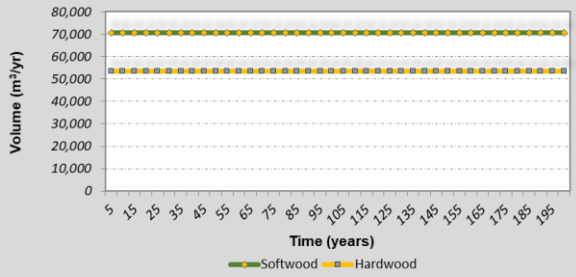
FMS 5: MAXIMIZE SOFTWOOD VOLUME

MISTIK		L&M	
SUMMARY TABLE		**SUMMARY TABLE**	
Net Productive Area	817,284 ha	**Net Productive Area**	61,226 ha
Softwood Harvest Level	531,769 m^3/yr	**Softwood Harvest Level**	70,749 m^3/yr
Hardwood Harvest Level	1,001,387 m^3/yr	**Hardwood Harvest Level**	53,608 m^3/yr

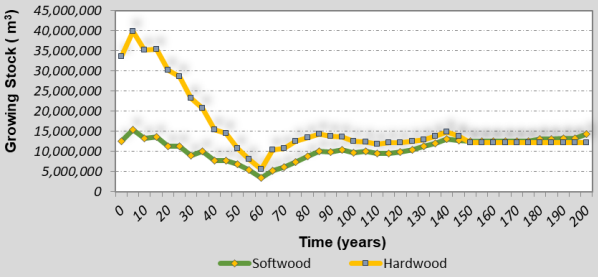
HARVEST FLOWS (M^3/YR)



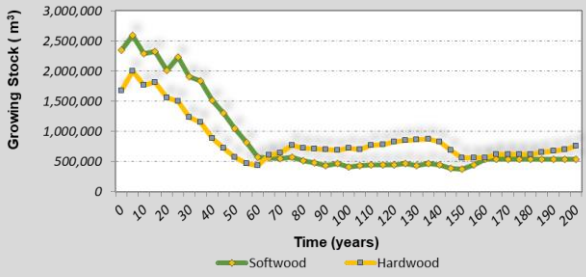
HARVEST FLOWS (M^3/YR)



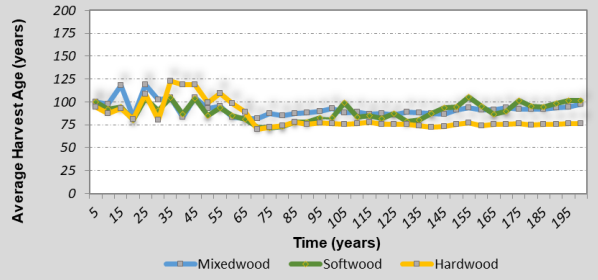
OPERABLE GROWING STOCK (M^3)



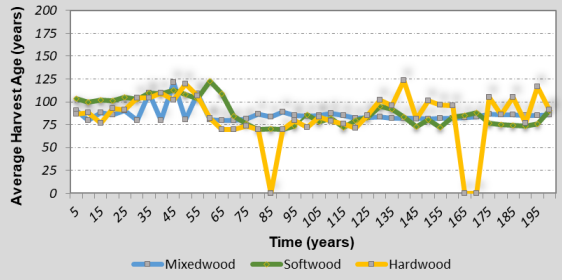
OPERABLE GROWING STOCK (M^3)



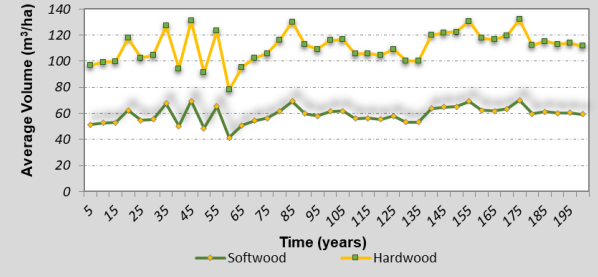
AVERAGE HARVEST AGE



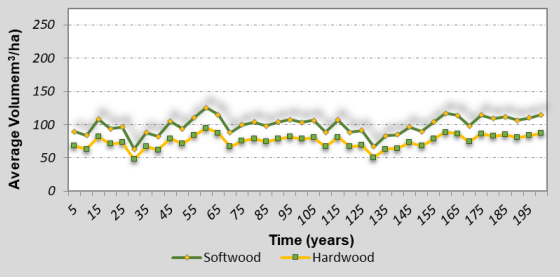
AVERAGE HARVEST AGE



AVERAGE VOLUME (M^3/HA)

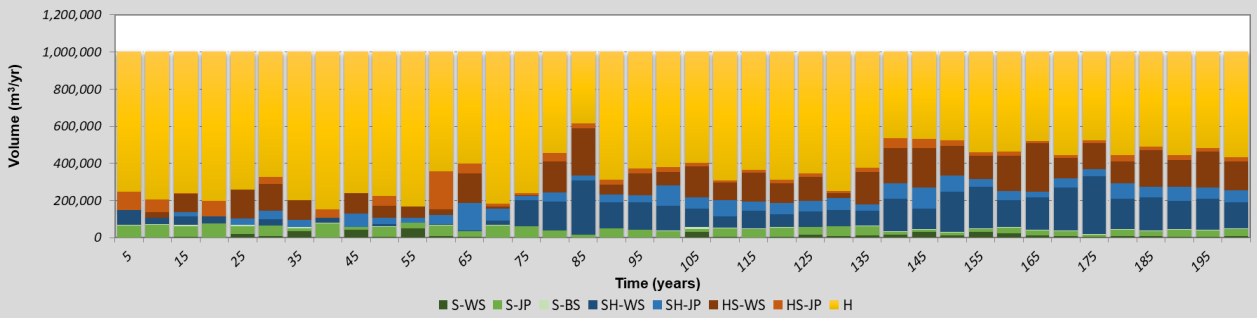


AVERAGE VOLUME (M^3/HA)

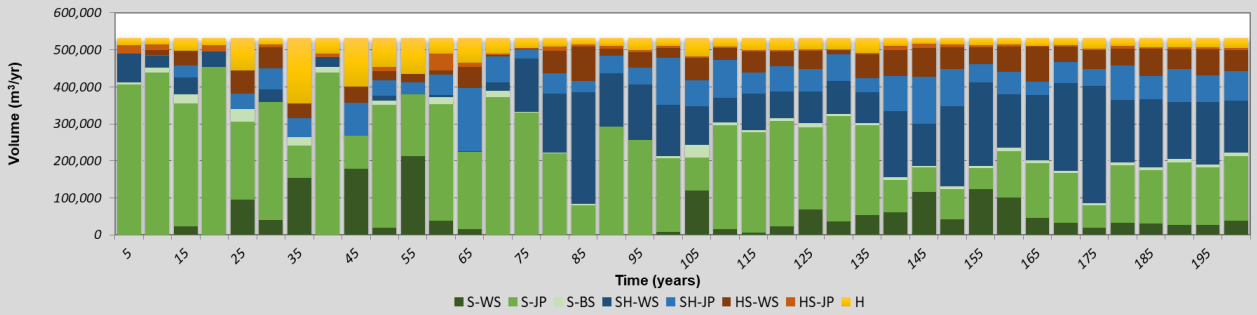


FMS 5: MAXIMIZE SOFTWOOD VOLUME

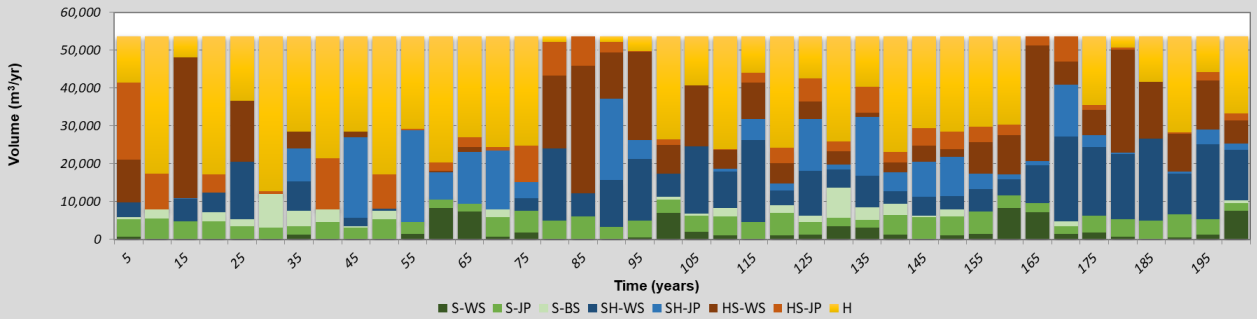
MISTIK HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



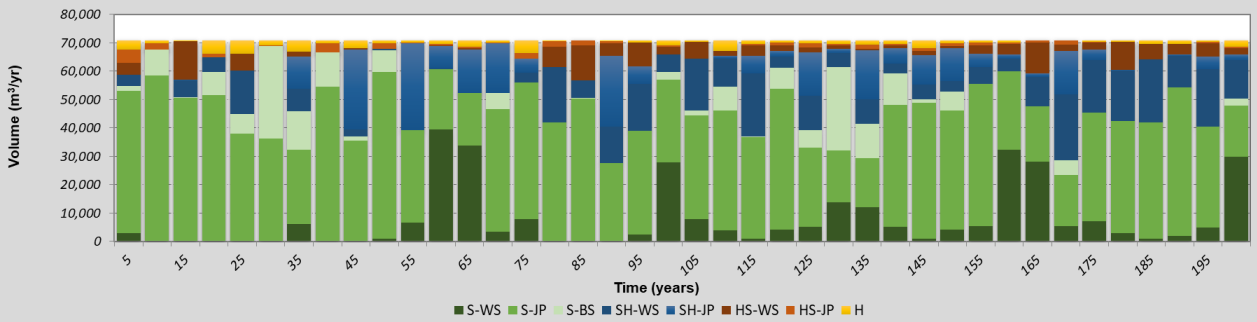
MISTIK SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



5.5.6. FMS 6 TOTAL VOLUME WITH CARIBOU CONSTRAINTS

Forest Management Scenario (FMS) 6 is a single landbase approach that maintains an even flow of softwood and hardwood volumes for the entire planning horizon. The parameter settings used in the analysis of this scenario are displayed in Table 5.9. The results of the strategy are illustrated in Figure 5.6. This FMS is used for sensitivity analysis only and does not determine the final HVS or harvest sequence.

TABLE 5.9: CONTROL PARAMETERS - FMS 6

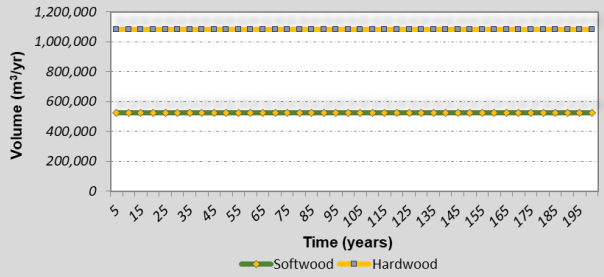
FMS 6: MAXIMIZE TOTAL VOLUME WITH CARIBOU CONSTRAINTS	
CONTROL PARAMETER	**PARAMETER SETTING**
Objective:	Maximize total volume harvested over the planning horizon
Model constraints:	1) Even flow softwood and hardwood volume harvest for the Mistik FMA area 2) Even flow softwood and hardwood volume harvest for the L&M FMA area 3) Non-declining softwood and hardwood operable growing stock in both the Mistik and L&M FMA areas 4) ≤3% of the 2006 caribou range can be harvested per decade
Effective Date	2015
Harvest unit:	Mistik and L&M FMA areas
Planning horizon:	200 yrs
Minimum harvest age:	100 Years- Black and White Spruce Softwood 70 Years- Jack Pine Softwood 80 Years- Jack Pine Leading Softwood Mixedwood (SH) 90 Years- Spruce Leading Softwood Mixedwood (SH) 80 Years- Jack Pine and Spruce Deciduous Mixedwood (HS) 70 Years- Hardwood
Landbase:	2016 submitted landbase which includes both Mistik and L&M FMA areas
Yield curves:	Net yield curves (17 yield curves/development types) based on **12.7 cm** top diameter utilization standards
Cull deductions:	Applied to yield curves (1.5% Softwood, 7.4% Hardwood)
Regeneration transition:	SGR transition rules
Regeneration lag:	Not applied
Introduce harvest plans:	Not applied

FIGURE 5.6: RESULTS – FMS 6 TOTAL VOLUME WITH CARIBOU CONSTRAINTS

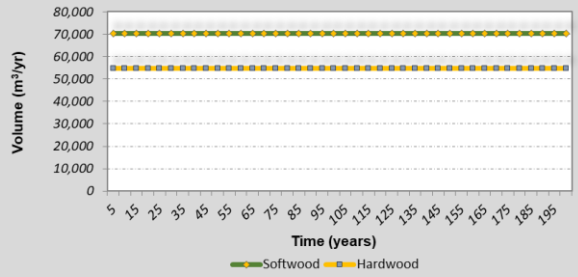
FMS 6: MAXIMIZE TOTAL VOLUME WITH CARIBOU CONSTRAINTS

MISTIK		L&M	
SUMMARY TABLE		**SUMMARY TABLE**	
Net Productive Area	817,284 ha	**Net Productive Area**	61,226 ha
Softwood Harvest Level	522,977 m^3/yr	**Softwood Harvest Level**	70,481 m^3/yr
Hardwood Harvest Level	1,082,919 m^3/yr	**Hardwood Harvest Level**	54,794 m^3/yr

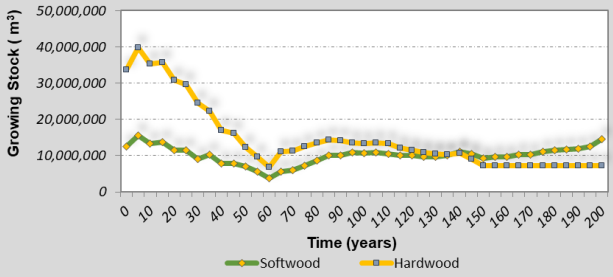
HARVEST FLOWS (M^3/YR)



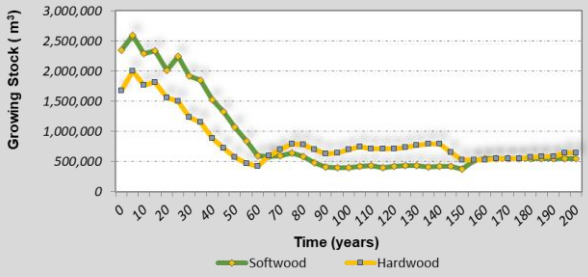
HARVEST FLOWS (M^3/YR)



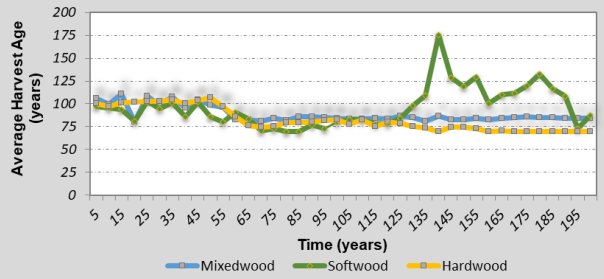
OPERABLE GROWING STOCK (M^3)



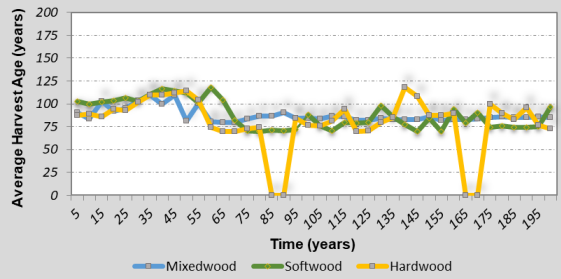
OPERABLE GROWING STOCK (M^3)



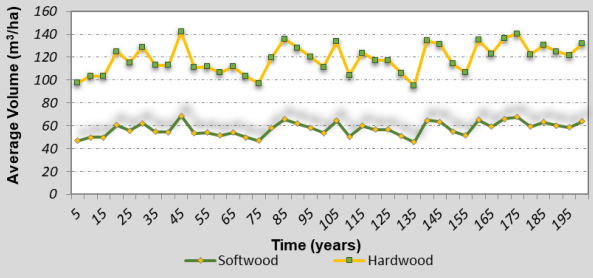
AVERAGE HARVEST AGE



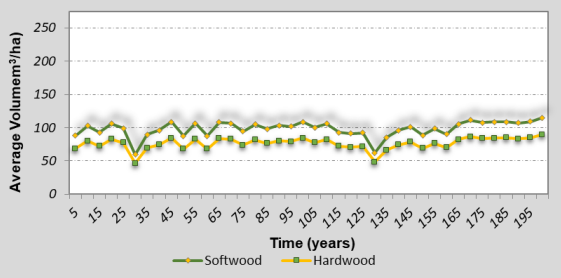
AVERAGE HARVEST AGE



AVERAGE VOLUME (M^3/HA)

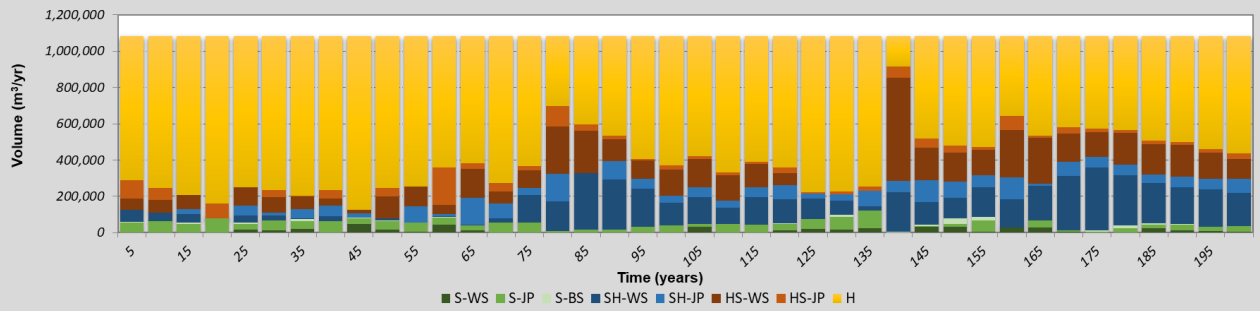


AVERAGE VOLUME (M^3/HA)

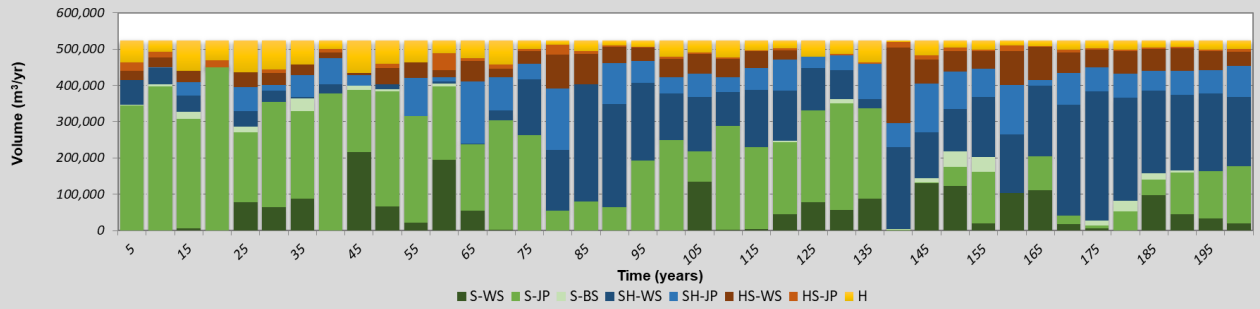


FMS 6: MAXIMIZE TOTAL VOLUME WITH CARIBOU CONSTRAINTS

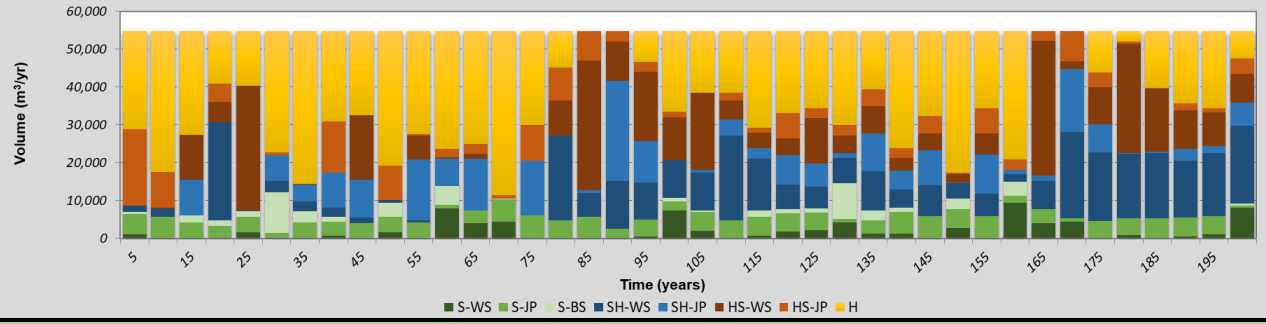
MISTIK HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



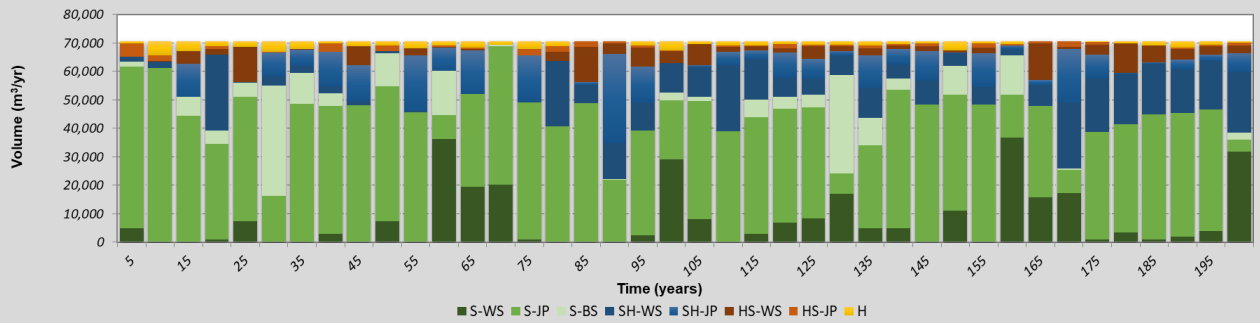
MISTIK SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



5.5.7. FMS 7 TOTAL VOLUME WITH CARIBOU AND SERAL STAGE CONSTRAINTS

Forest Management Scenario (FMS) 7 is a single landbase approach that maintains an even flow of softwood and hardwood volumes for the entire planning horizon. The parameter settings used in the analysis of this scenario are displayed in Table 5.10. The results of the strategy are illustrated in Figure 5.7. This FMS is used for sensitivity analysis only and does not determine the final HVS or harvest sequence.

TABLE 5.10: CONTROL PARAMETERS - FMS 7

FMS 7: MAXIMIZE TOTAL VOLUME WITH CARIBOU AND SERAL STAGE	
CONTROL PARAMETER	**PARAMETER SETTING**
Objective:	Maximize total volume harvested over the planning horizon
Model constraints:	1) Even flow softwood and hardwood volume harvest for the Mistik FMA area 2) Even flow softwood and hardwood volume harvest for the L&M FMA area 3) Non-declining softwood and hardwood operable growing stock in both the Mistik and L&M FMA areas 4) ≤3% of the 2006 caribou range can be harvested per decade 5) Old and Very old seral stage constraints applied based on targets in VOITs 2a and 2b[15].
Effective Date	2015
Harvest unit:	Mistik and L&M FMA areas
Planning horizon:	200 yrs
Minimum harvest age:	100 Years- Black and White Spruce Softwood 70 Years- Jack Pine Softwood 80 Years- Jack Pine Leading Softwood Mixedwood (SH) 90 Years- Spruce Leading Softwood Mixedwood (SH) 80 Years- Jack Pine and Spruce Deciduous Mixedwood (HS) 70 Years- Hardwood
Landbase:	2016 submitted landbase which includes both Mistik and L&M FMA areas
Yield curves:	Yield curves (17 yield curves/development types) based on **12.7 cm** top diameter utilization standards
Cull deductions:	Applied to yield curves (1.5% Softwood, 7.4% Hardwood)
Regeneration transition:	SGR transition rules
Regeneration lag:	Not applied
Introduce harvest plans:	Not applied

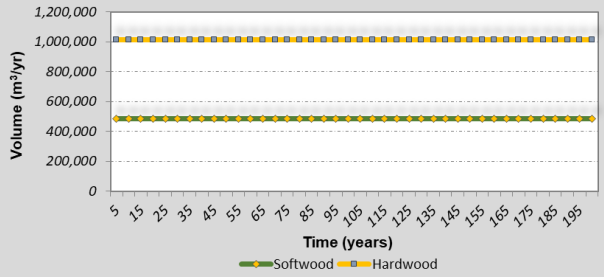
[15] See Appendix C for further details on specific seral stage targets

FIGURE 5.7: RESULTS – FMS 7 TOTAL VOLUME WITH CARIBOU AND SERAL STAGE CONSTRAINTS

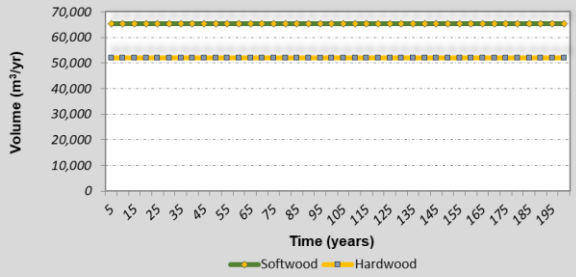
FMS 7: MAXIMIZE TOTAL VOLUME WITH CARIBOU AND SERAL STAGE

MISTIK		L&M	
SUMMARY TABLE		**SUMMARY TABLE**	
Net Productive Area	817,284 ha	**Net Productive Area**	61,226 ha
Softwood Harvest Level	485,467 m^3/yr	**Softwood Harvest Level**	65,384 m^3/yr
Hardwood Harvest Level	1,013,815 m^3/yr	**Hardwood Harvest Level**	52,067 m^3/yr

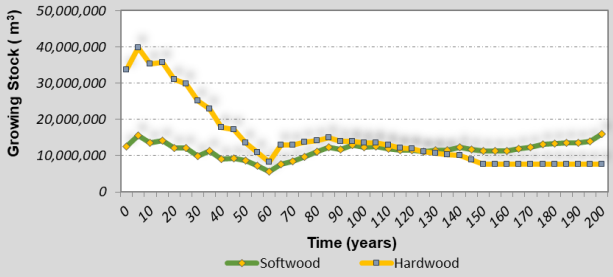
HARVEST FLOWS (M^3/YR)



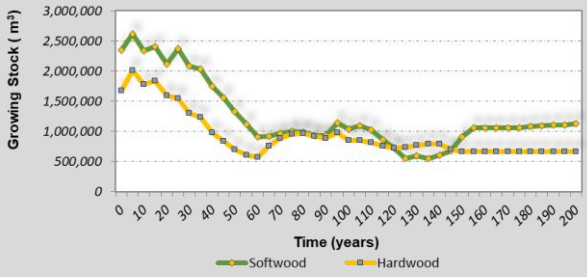
HARVEST FLOWS (M^3/YR)



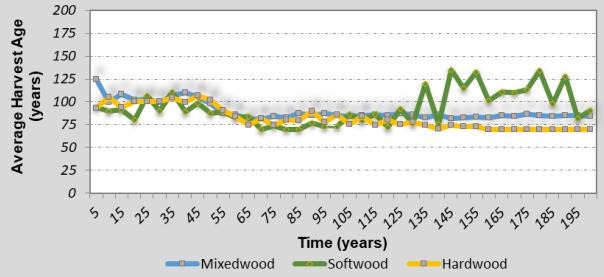
OPERABLE GROWING STOCK (M^3)



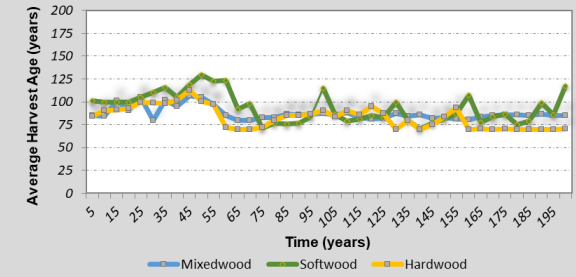
OPERABLE GROWING STOCK (M^3)



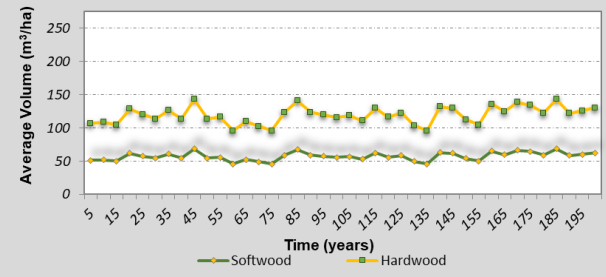
AVERAGE HARVEST AGE



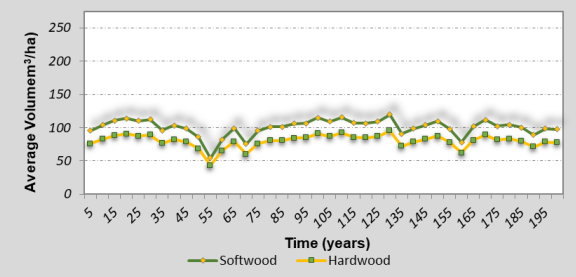
AVERAGE HARVEST AGE



AVERAGE VOLUME (M^3/HA)

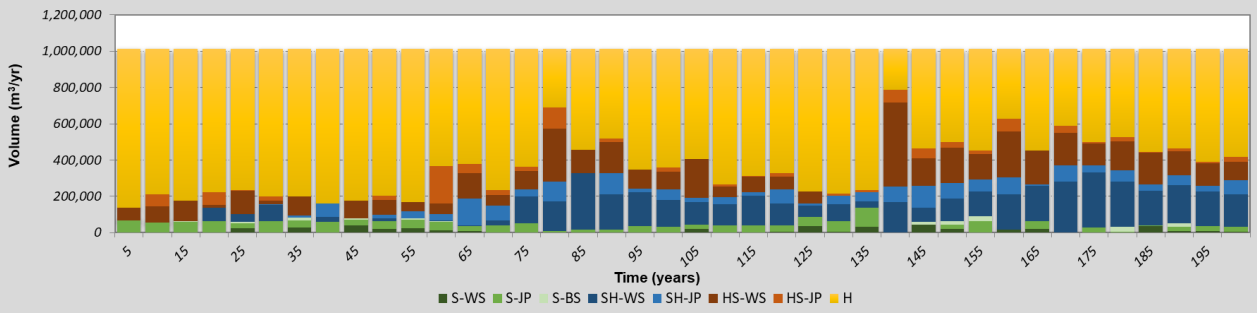


AVERAGE VOLUME (M^3/HA)

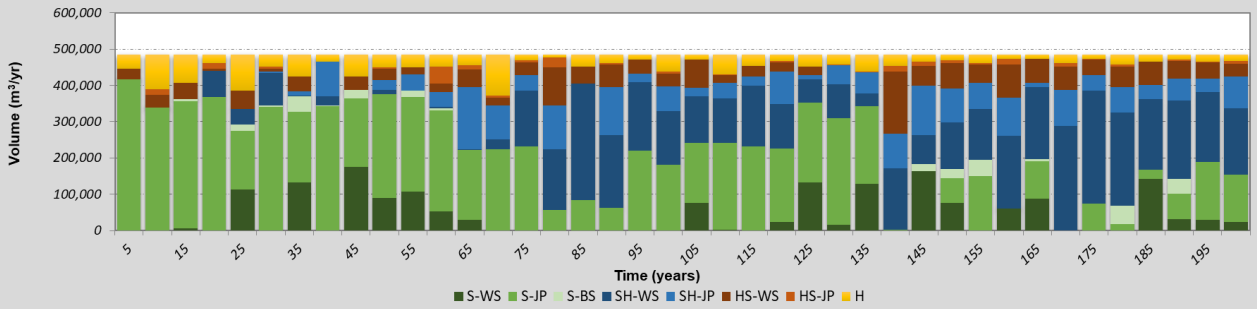


FMS 7: MAXIMIZE TOTAL VOLUME WITH CARIBOU AND SERAL STAGE

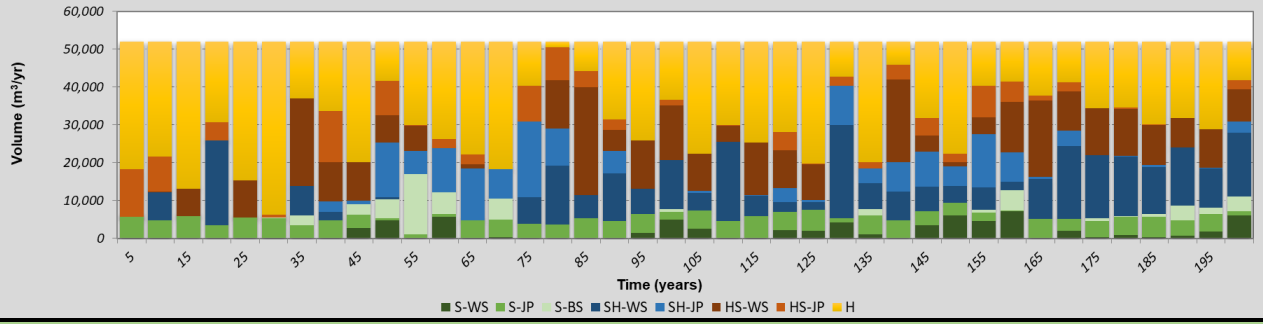
MISTIK HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



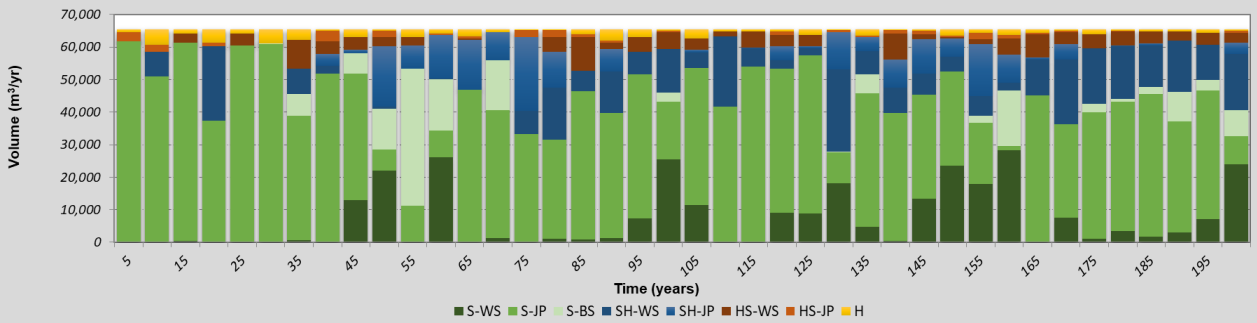
MISTIK SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



5.5.8. FMS 8 TOTAL VOLUME WITH CARIBOU, SERAL STAGE, AND OLD FOREST CONSTRAINTS

Forest Management Scenario (FMS) 8 is a single landbase approach that maintains an even flow of softwood and hardwood volumes for the entire planning horizon. The parameter settings used in the analysis of this scenario are displayed in Table 5.11. The results of the strategy are illustrated in Figure 5.8. This FMS is used for sensitivity analysis only and does not determine the final HVS or harvest sequence.

TABLE 5.11: CONTROL PARAMETERS - FMS 8

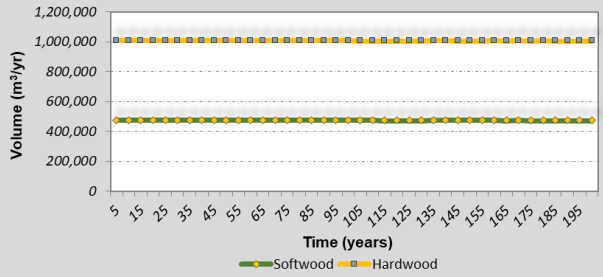
FMS 6: MAXIMIZE TOTAL VOLUME WITH CARIBOU, SERAL STAGE, AND OLD FOREST	
CONTROL PARAMETER	**PARAMETER SETTING**
Objective:	Maximize total volume harvested over the planning horizon
Model constraints:	1) Even flow softwood and hardwood volume harvest for the Mistik FMA area 2) Even flow softwood and hardwood volume harvest for the L&M FMA area 3) Non-declining softwood and hardwood operable growing stock in both the Mistik and L&M FMA areas 4) ≤3% of the 2006 caribou range can be harvested per decade 5) Old and Very old seral stage constraints applied based on targets in VOITs 2a and 2b 6) No identified old forest will be harvested in years 1-20
Effective Date	2015
Harvest unit:	Mistik and L&M FMA areas
Planning horizon:	200 yrs
Minimum harvest age:	100 Years- Black and White Spruce Softwood 70 Years- Jack Pine Softwood 80 Years- Jack Pine Leading Softwood Mixedwood (SH) 90 Years- Spruce Leading Softwood Mixedwood (SH) 80 Years- Jack Pine and Spruce Deciduous Mixedwood (HS) 70 Years- Hardwood
Landbase:	2016 submitted landbase which includes both Mistik and L&M FMA areas
Yield curves:	Yield curves (17 yield curves/development types) based on **12.7 cm** top diameter utilization standards
Cull deductions:	Applied to yield curves (1.5% Softwood, 7.4% Hardwood)
Regeneration transition:	SGR transition rules
Regeneration lag:	Not applied
Introduce harvest plans:	Not applied

FIGURE 5.8: RESULTS – FMS 8 TOTAL VOLUME WITH CARIBOU, SERAL STAGE, AND OLD FOREST CONSTRAINTS

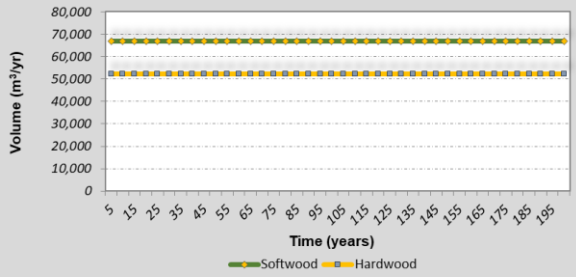
FMS 8: MAXIMIZE TOTAL VOLUME WITH CARIBOU, SERAL STAGE, AND OLD FOREST

MISTIK		L&M	
SUMMARY TABLE		**SUMMARY TABLE**	
Net Productive Area	817,284 ha	**Net Productive Area**	61,226 ha
Softwood Harvest Level	472,738 m^3/yr	**Softwood Harvest Level**	66,992 m^3/yr
Hardwood Harvest Level	1,005,514 m^3/yr	**Hardwood Harvest Level**	52,214 m^3/yr

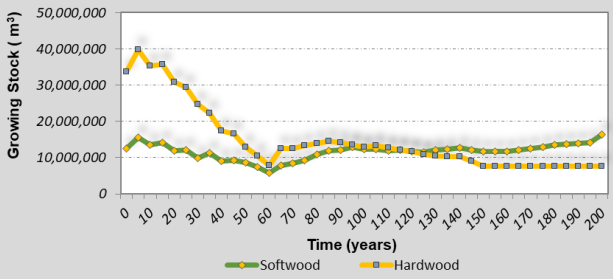
HARVEST FLOWS (M^3/YR)



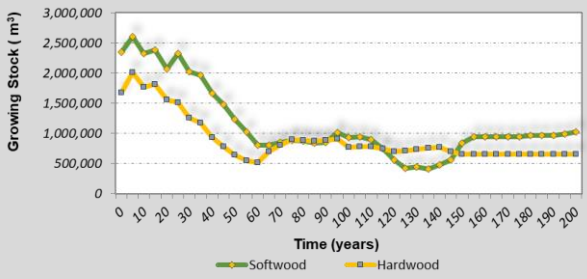
HARVEST FLOWS (M^3/YR)



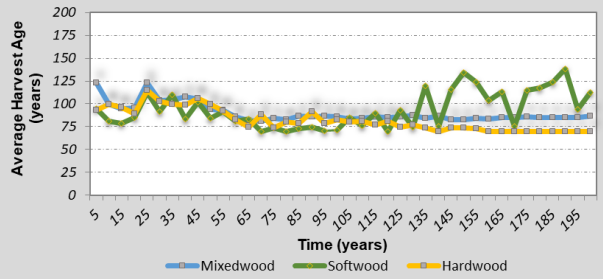
OPERABLE GROWING STOCK (M^3)



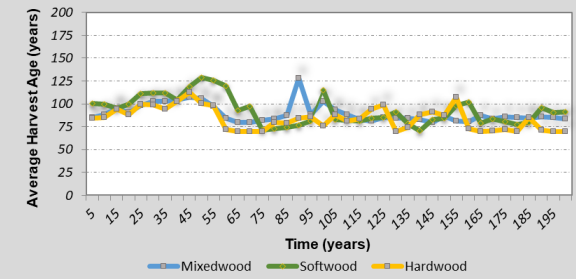
OPERABLE GROWING STOCK (M^3)



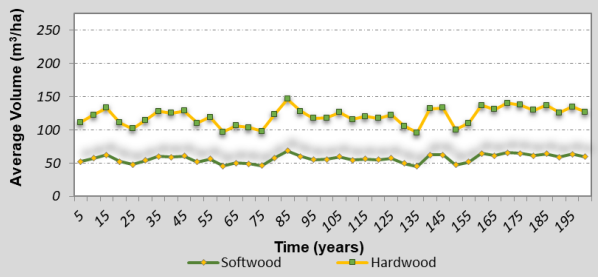
AVERAGE HARVEST AGE



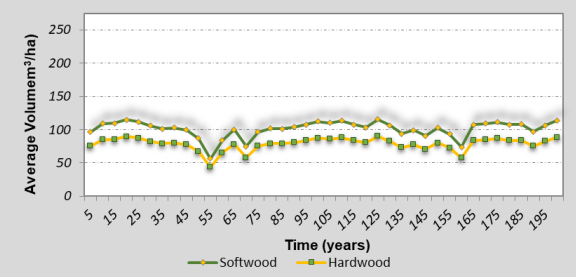
AVERAGE HARVEST AGE



AVERAGE VOLUME (M^3/HA)

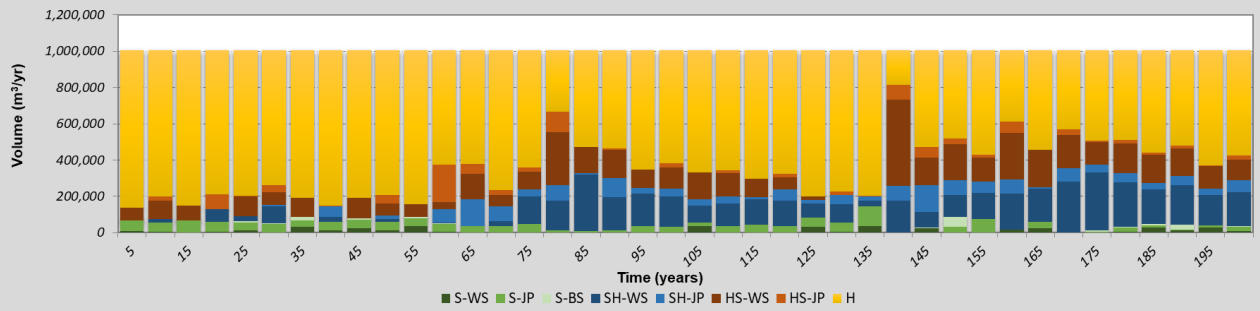


AVERAGE VOLUME (M^3/HA)

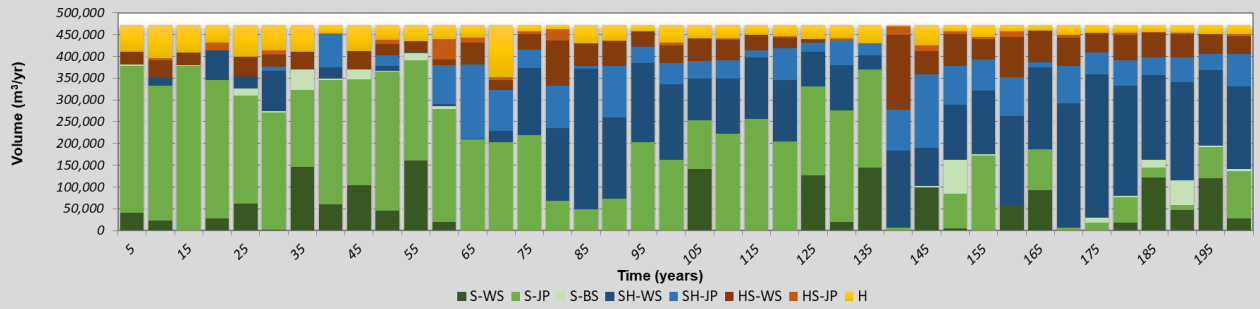


FMS 8: MAXIMIZE TOTAL VOLUME WITH CARIBOU, SERAL STAGE, AND OLD FOREST

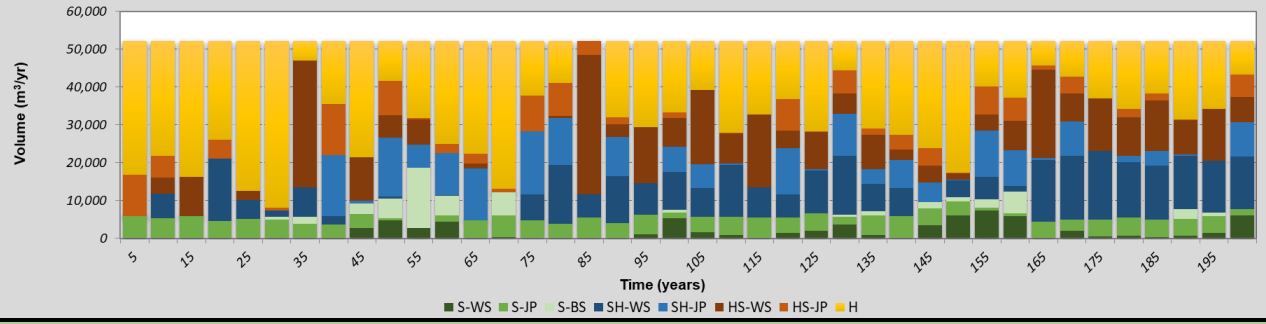
MISTIK HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



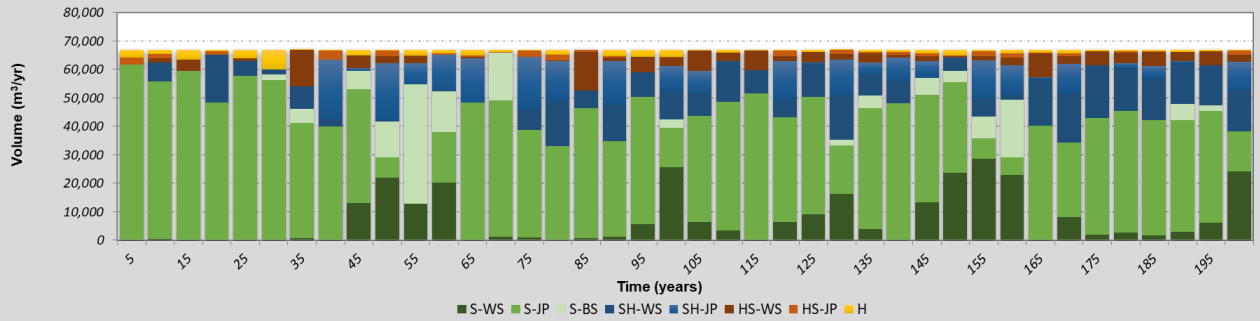
MISTIK SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



5.5.9. FMS 9 TOTAL VOLUME WITH CARIBOU, SERAL STAGE, OLD FOREST CONSTRAINTS AND PLANNED BLOCKS

Forest Management Scenario (FMS) 9 is a single landbase approach that maintains an even flow of softwood and hardwood volumes for the entire planning horizon. The parameter settings used in the analysis of this scenario are displayed in Table 5.12. The results of the strategy are illustrated in Figure 5.9. This FMS is used for sensitivity analysis only and does not determine the final HVS or harvest sequence. Planned blocks were forced through the model in this scenario. This was done regardless of operable age or volume as it was assumed these planned blocks had been confirmed to meet criteria for harvesting.

TABLE 5.12: CONTROL PARAMETERS - FMS 9

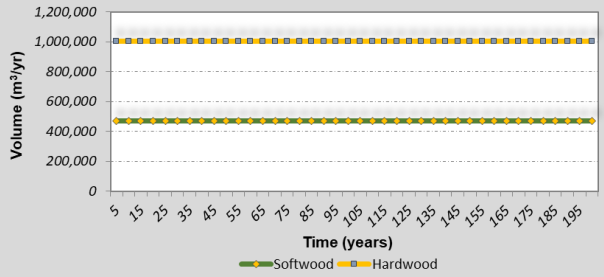
FMS 9: MAXIMIZE TOTAL VOLUME WITH CARIBOU, SERAL STAGE, OLD FOREST, AND PLANNED BLOCKS	
CONTROL PARAMETER	**PARAMETER SETTING**
Objective:	Maximize total volume harvested over the planning horizon
Model constraints:	1) Even flow softwood and hardwood volume harvest for the Mistik FMA area 2) Even flow softwood and hardwood volume harvest for the L&M FMA area 3) Non-declining softwood and hardwood operable growing stock in both the Mistik and L&M FMA areas 4) ≤3% of the 2006 caribou range can be harvested per decade 5) Old and Very old seral stage constraints applied based on targets in VOITs 2a and 2b 6) No identified old forest will be harvested in years 1-20
Effective Date	2015
Harvest unit:	Mistik and L&M FMA areas
Planning horizon:	200 yrs
Minimum harvest age:	100 Years- Black and White Spruce Softwood 70 Years- Jack Pine Softwood 80 Years- Jack Pine Leading Softwood Mixedwood (SH) 90 Years- Spruce Leading Softwood Mixedwood (SH) 80 Years- Jack Pine and Spruce Deciduous Mixedwood (HS) 70 Years- Hardwood
Landbase:	2016 submitted landbase which includes both Mistik and L&M FMA areas
Yield curves:	Yield curves (17 yield curves/development types) based on **12.7 cm** top diameter utilization standards
Cull deductions:	Applied to yield curves (1.5% Softwood, 7.4% Hardwood)
Regeneration transition:	SGR transition rules
Regeneration lag:	Not applied
Introduce harvest plans:	Planned blocks applied

FIGURE 5.9: RESULTS – FMS 9 TOTAL VOLUME WITH CARIBOU, SERAL STAGE, OLD FOREST CONSTRAINTS AND PLANNED BLOCKS

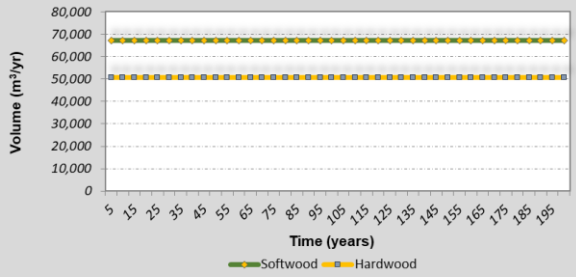
FMS 9: MAXIMIZE TOTAL VOLUME WITH CARIBOU, SS, OF, AND PLANNED BLOCKS

MISTIK		L&M	
SUMMARY TABLE		**SUMMARY TABLE**	
Net Productive Area	817,284 ha	**Net Productive Area**	61,226 ha
Softwood Harvest Level	470,864 m^3/yr	**Softwood Harvest Level**	67,118 m^3/yr
Hardwood Harvest Level	1,001,443 m^3/yr	**Hardwood Harvest Level**	50,687 m^3/yr

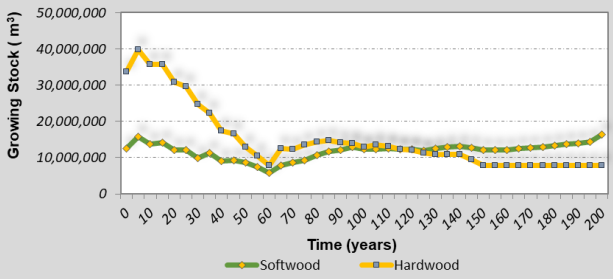
HARVEST FLOWS (M^3/YR)



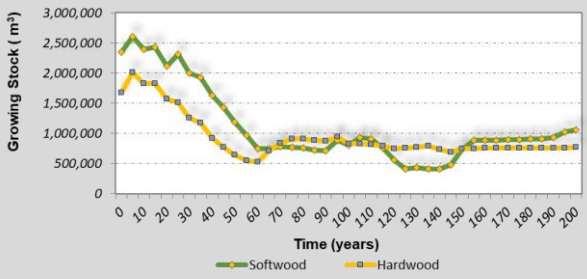
HARVEST FLOWS (M^3/YR)



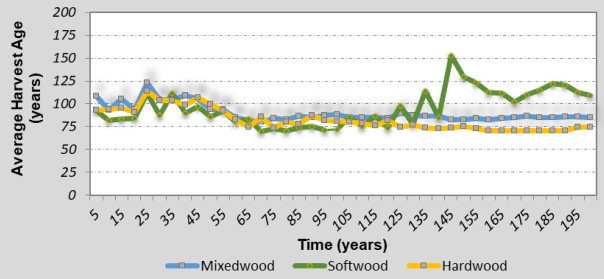
OPERABLE GROWING STOCK (M^3)



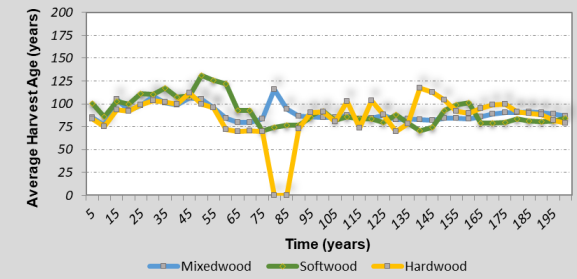
OPERABLE GROWING STOCK (M^3)



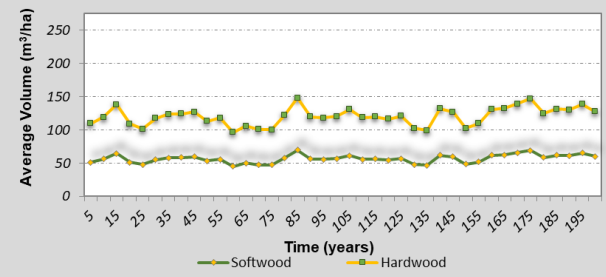
AVERAGE HARVEST AGE



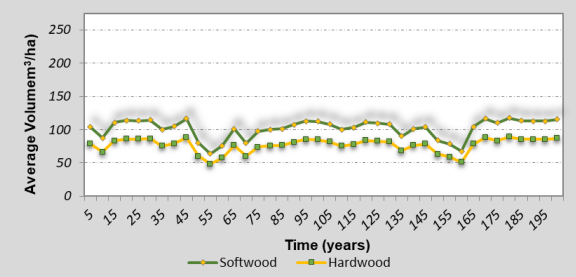
AVERAGE HARVEST AGE



AVERAGE VOLUME (M^3/HA)

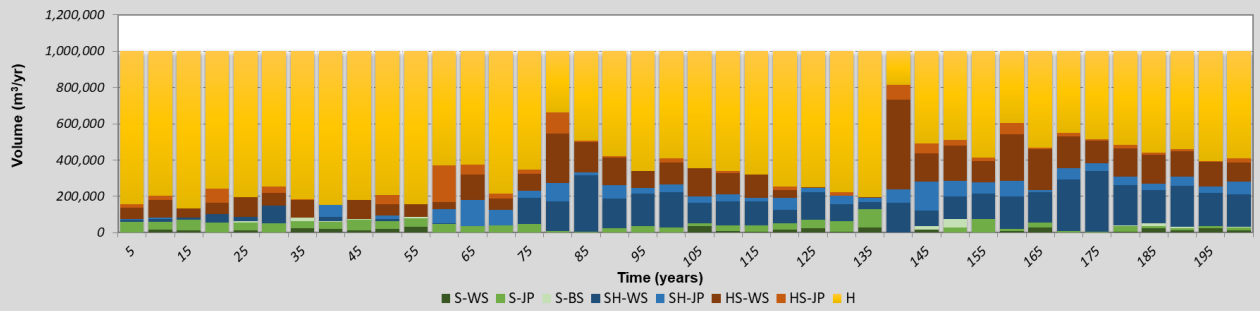


AVERAGE VOLUME (M^3/HA)

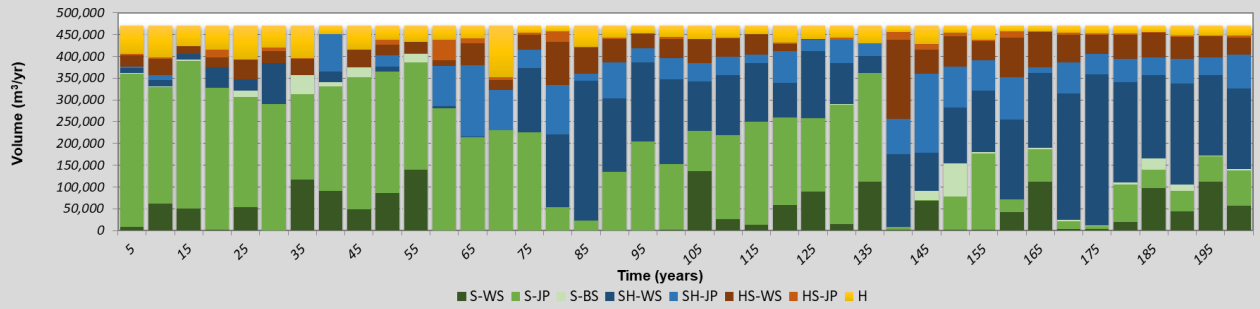


FMS 9: MAXIMIZE TOTAL VOLUME WITH CARIBOU, SS, OF, AND PLANNED BLOCKS

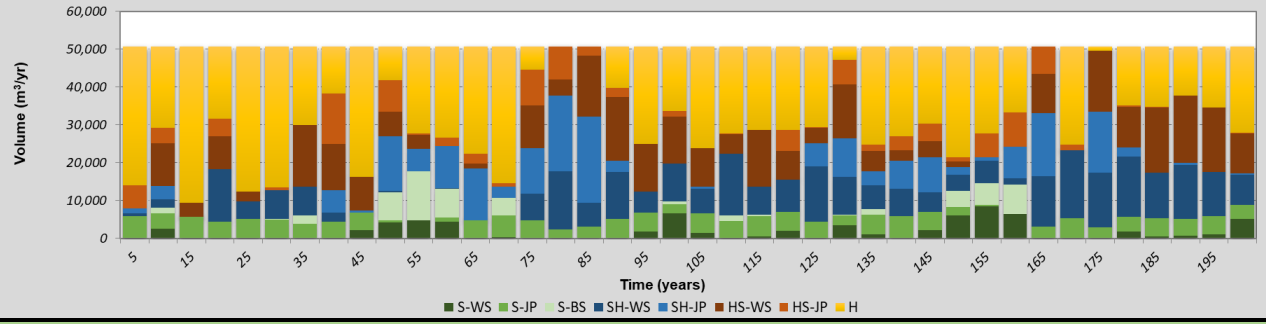
MISTIK HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



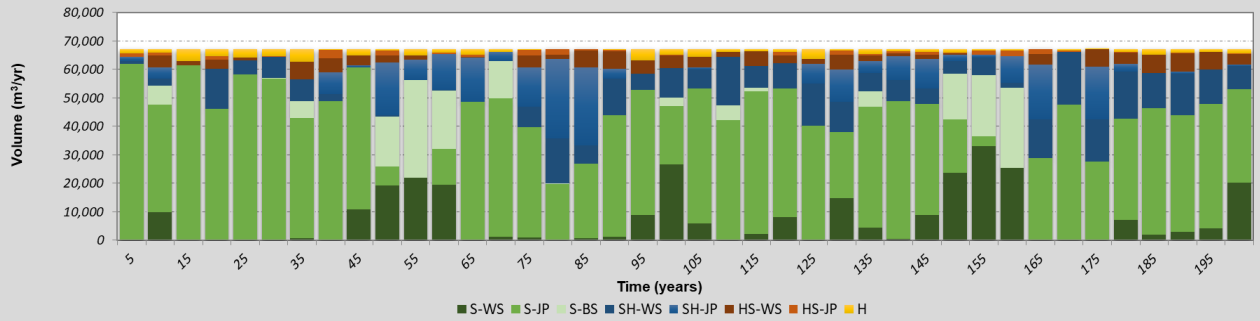
MISTIK SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



5.5.10. FMS 10 TOTAL VOLUME WITH CARIBOU, SERAL STAGE, OLD FOREST CONSTRAINTS AND PLANNED/TACTICAL BLOCKS

Forest Management Scenario (FMS) 10 is a single landbase approach that maintains an even flow of softwood and hardwood volumes for the entire planning horizon. The parameter settings used in the analysis of this scenario are displayed in Table 5.13. The results of the strategy are illustrated in Figure 5.10. This FMS is used for sensitivity analysis only and does not determine the final HVS or harvest sequence. The tactical plan was forced through the model in this scenario. This was done regardless of operable age or volume as the Tactical Plan was used during the consultation process and Mistik and L&M will be measured with respect to adherence to it.

TABLE 5.13: CONTROL PARAMETERS - FMS 10

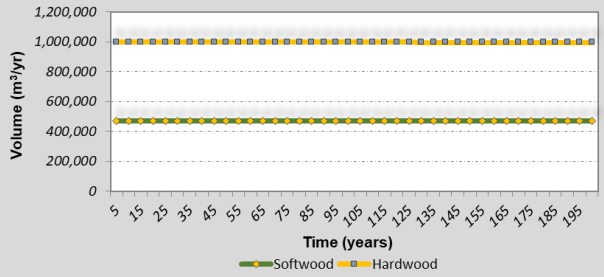
FMS 10: MAXIMIZE TOTAL VOLUME WITH CARIBOU, SERAL STAGE, OLD FOREST AND PLANNED/TACTICAL BLOCKS	
CONTROL PARAMETER	**PARAMETER SETTING**
Objective:	Maximize total volume harvested over the planning horizon
Model constraints:	1) Even flow softwood and hardwood volume harvest for the Mistik FMA area 2) Even flow softwood and hardwood volume harvest for the L&M FMA area 3) Non-declining softwood and hardwood operable growing stock in both the Mistik and L&M FMA areas 4) ≤3% of the 2006 caribou range can be harvested per decade 5) Old and Very old seral stage constraints applied based on targets in VOITs 2a and 2b 6) No identified old forest will be harvested in years 1-20
Effective Date	2015
Harvest unit:	Mistik and L&M FMA areas
Planning horizon:	200 yrs
Minimum harvest age:	100 Years- Black and White Spruce Softwood 70 Years- Jack Pine Softwood 80 Years- Jack Pine Leading Softwood Mixedwood (SH) 90 Years- Spruce Leading Softwood Mixedwood (SH) 80 Years- Jack Pine and Spruce Deciduous Mixedwood (HS) 70 Years- Hardwood
Landbase:	2016 submitted landbase which includes both Mistik and L&M FMA areas
Yield curves:	Yield curves (17 yield curves/development types) based on **12.7** cm top diameter utilization standards
Cull deductions:	Applied to yield curves (1.5% Softwood, 7.4% Hardwood)
Regeneration transition:	SGR transition rules
Regeneration lag:	Not applied
Introduce harvest plans:	Planned and tactical blocks applied

FIGURE 5.10: RESULTS – FMS 10 TOTAL VOLUME WITH CARIBOU, SERAL STAGE, OLD FOREST CONSTRAINTS AND PLANNED/TACTICAL BLOCKS

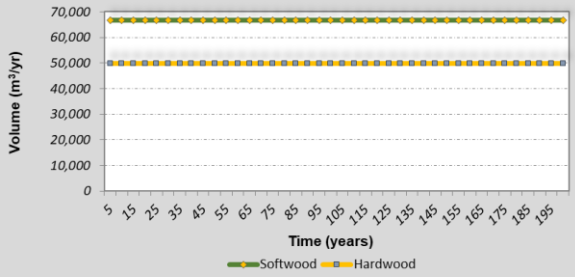
FMS 10: MAXIMIZE TOTAL VOLUME WITH CARIBOU, SS, OF, AND PLANNED/TACTICAL BLOCKS

MISTIK		L&M	
SUMMARY TABLE		**SUMMARY TABLE**	
Net Productive Area	817,284 ha	**Net Productive Area**	61,226 ha
Softwood Harvest Level	467,895 m^3/yr	**Softwood Harvest Level**	66,577 m^3/yr
Hardwood Harvest Level	1,000,548 m^3/yr	**Hardwood Harvest Level**	49,942 m^3/yr

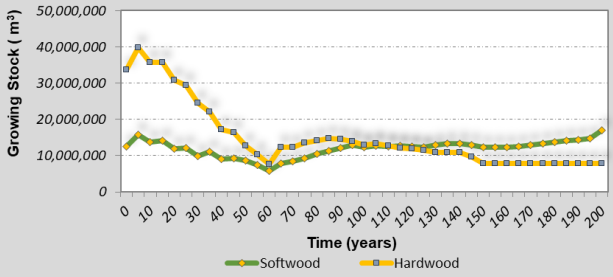
HARVEST FLOWS (M^3/YR)



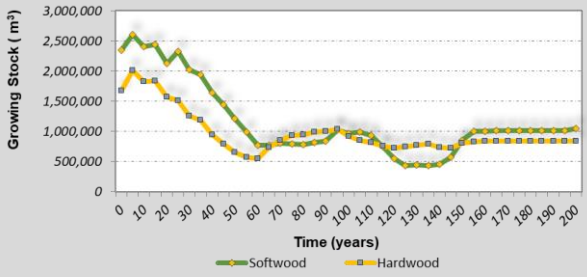
HARVEST FLOWS (M^3/YR)



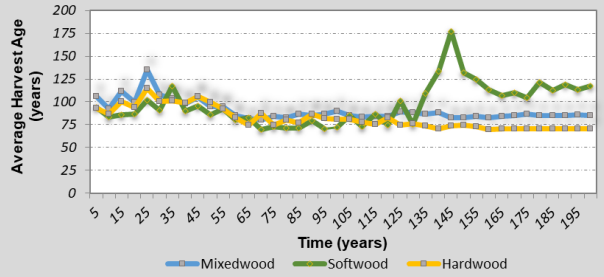
OPERABLE GROWING STOCK (M^3)



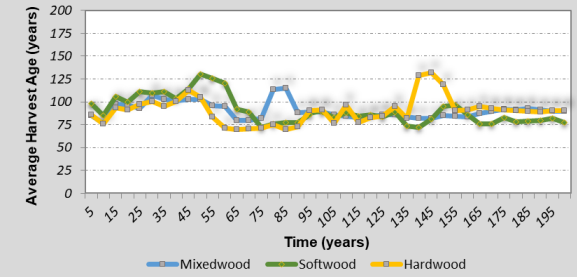
OPERABLE GROWING STOCK (M^3)



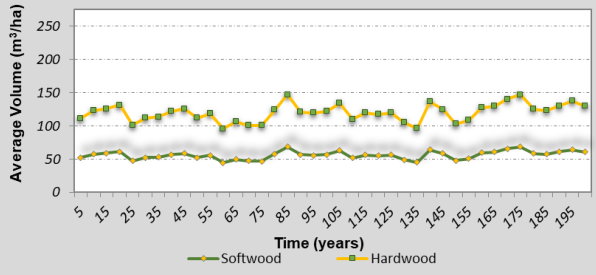
AVERAGE HARVEST AGE



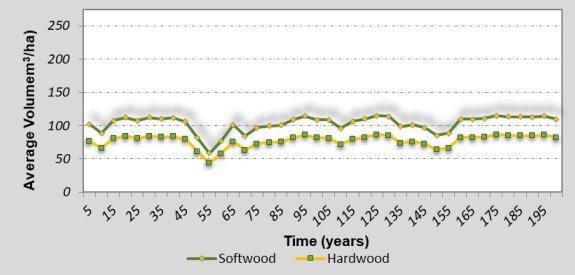
AVERAGE HARVEST AGE



AVERAGE VOLUME (M^3/HA)

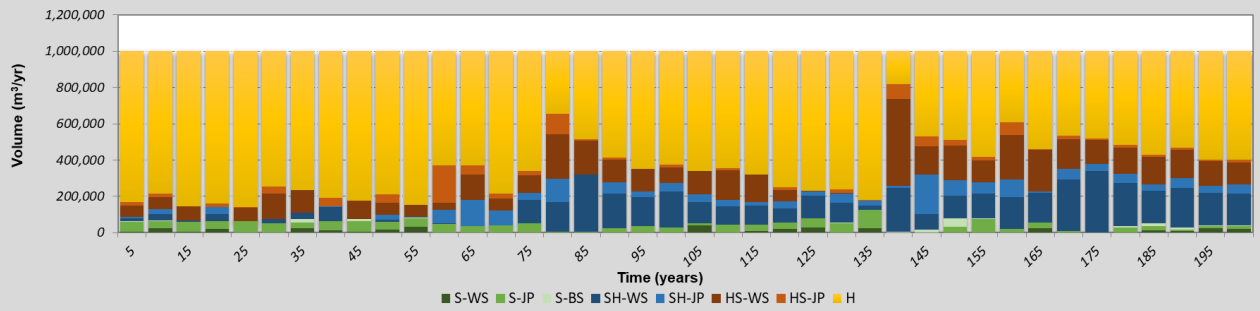


AVERAGE VOLUME (M^3/HA)

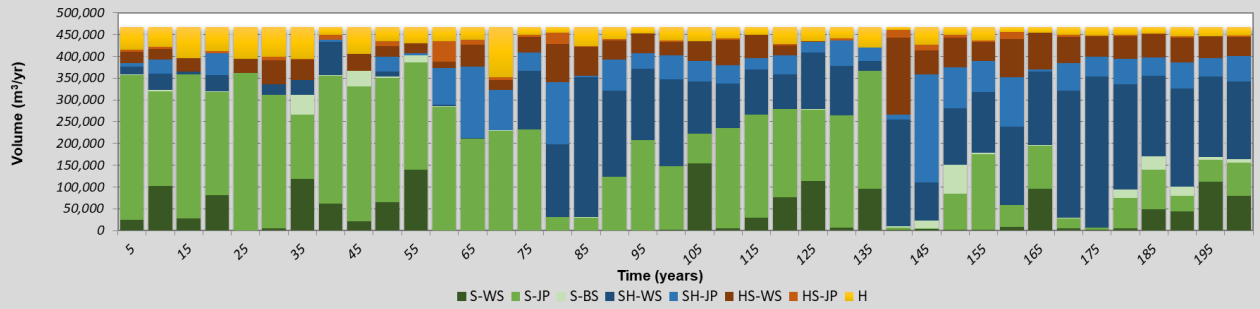


FMS 10: MAXIMIZE TOTAL VOLUME WITH CARIBOU, SS, OF, AND PLANNED/TACTICAL BLOCKS

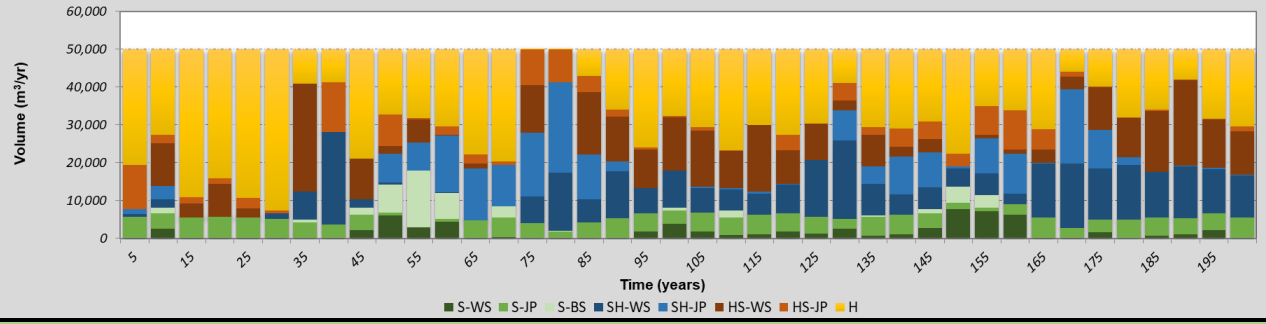
MISTIK HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



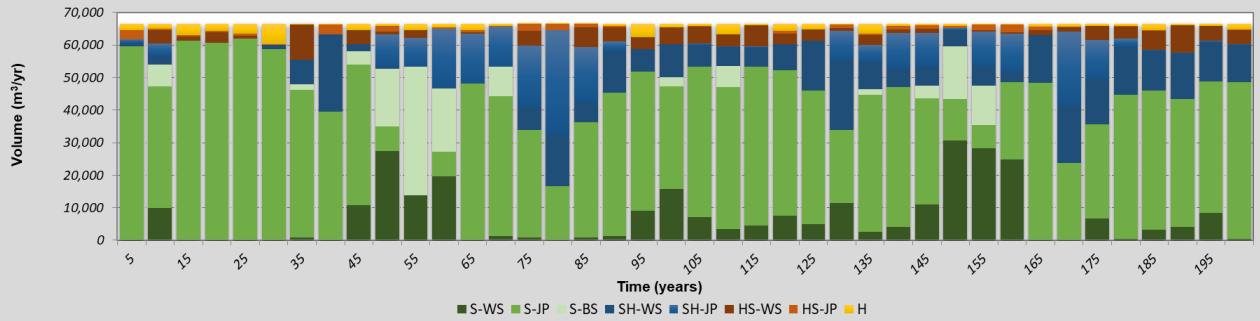
MISTIK SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



5.5.11. FMS 11 TOTAL VOLUME WITH CARIBOU, SERAL STAGE, OLD FOREST, L&M BLACK SPRUCE CONSTRAINTS, AND PLANNED/TACTICAL BLOCKS

Forest Management Scenario (FMS) 11 is a single landbase approach that maintains an even flow of softwood and hardwood volumes for the entire planning horizon. The parameter settings used in the analysis of this scenario are displayed in Table 5.14. The results of the strategy are illustrated in Figure 5.11. This FMS was determined to be the selected management strategy (SMS) as it maintained the desired harvest flows while also satisfying the non-timber constraints.

TABLE 5.14: CONTROL PARAMETERS - FMS 11

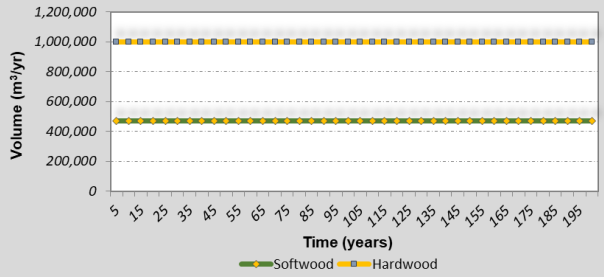
FMS 11: MAXIMIZE TOTAL VOLUME WITH CARIBOU, SERAL STAGE, OLD FOREST, BLACK SPRUCE AND PLANNED/TACTICAL BLOCKS CONSTRAINTS	
CONTROL PARAMETER	**PARAMETER SETTING**
Objective:	Maximize total volume harvested over the planning horizon
Model constraints:	1) Even flow softwood and hardwood volume harvest for the Mistik FMA area 2) Even flow softwood and hardwood volume harvest for the L&M FMA area 3) Non-declining softwood and hardwood operable growing stock in both the Mistik and L&M FMA areas 4) ≤3% of the 2006 caribou range can be harvested per decade 5) Old and Very old seral stage constraints applied based on targets in VOITs 2a and 2b 6) No identified old forest will be harvested in years 1-20 7) Limit black spruce harvest to ≤ 30,000 m^3/yr in L&M
Effective Date	2015
Harvest unit:	Mistik and L&M FMA areas
Planning horizon:	200 yrs
Minimum harvest age:	100 Years- Black and White Spruce Softwood 70 Years- Jack Pine Softwood 80 Years- Jack Pine Leading Softwood Mixedwood (SH) 90 Years- Spruce Leading Softwood Mixedwood (SH) 80 Years- Jack Pine and Spruce Deciduous Mixedwood (HS) 70 Years- Hardwood
Landbase:	2016 submitted landbase which includes both Mistik and L&M FMA areas
Yield curves:	Yield curves (17 yield curves/development types) based on **12.7** cm top diameter utilization standards
Cull deductions:	Applied to yield curves (1.5% Softwood, 7.4% Hardwood)
Regeneration transition:	SGR transition rules
Regeneration lag:	Not applied
Introduce harvest plans:	Planned and tactical blocks applied

FIGURE 5.11: RESULTS – FMS 11 TOTAL VOLUME WITH CARIBOU, SERAL STAGE, OLD FOREST, BLACK SPRUCE CONSTRAINTS AND PLANNED/TACTICAL BLOCKS

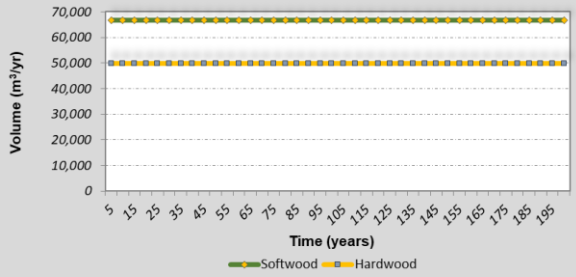
FMS 11: MAXIMIZE TOTAL VOLUME WITH CARIBOU, SS, OF, BS AND PLANNED/TACTICAL BLOCKS

MISTIK		L&M	
SUMMARY TABLE		**SUMMARY TABLE**	
Net Productive Area	817,284 ha	**Net Productive Area**	61,226 ha
Softwood Harvest Level	467,896 m^3/yr	**Softwood Harvest Level**	66,591 m^3/yr
Hardwood Harvest Level	1,000,545 m^3/yr	**Hardwood Harvest Level**	49,928 m^3/yr

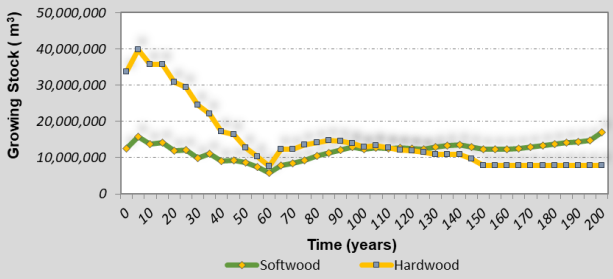
HARVEST FLOWS (M^3/YR)



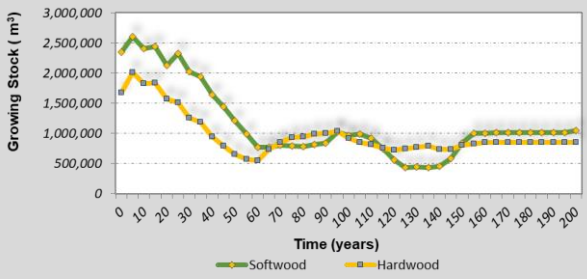
HARVEST FLOWS (M^3/YR)



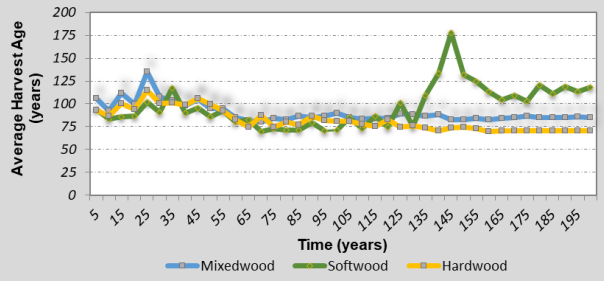
OPERABLE GROWING STOCK (M^3)



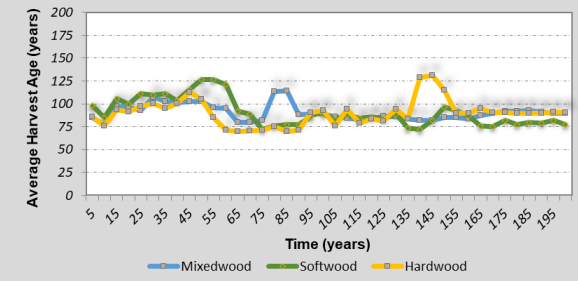
OPERABLE GROWING STOCK (M^3)



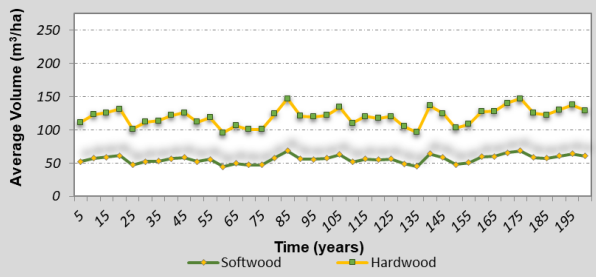
AVERAGE HARVEST AGE



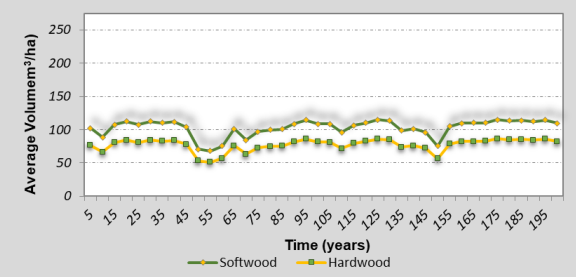
AVERAGE HARVEST AGE



AVERAGE VOLUME (M^3/HA)

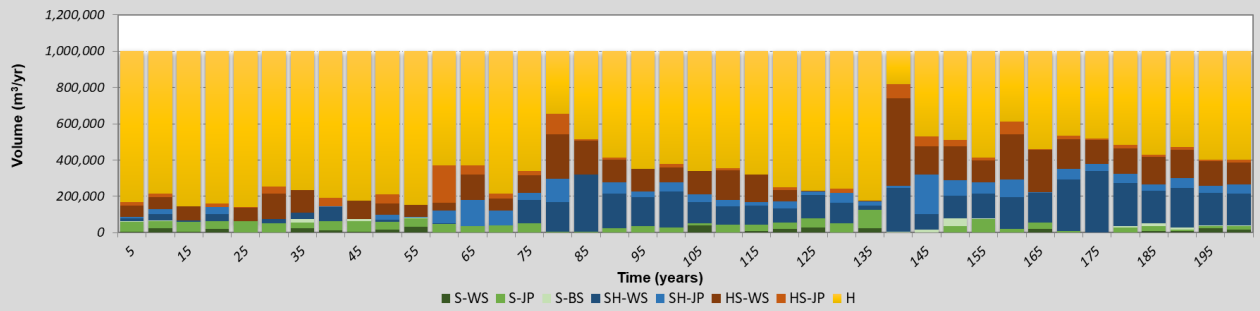


AVERAGE VOLUME (M^3/HA)

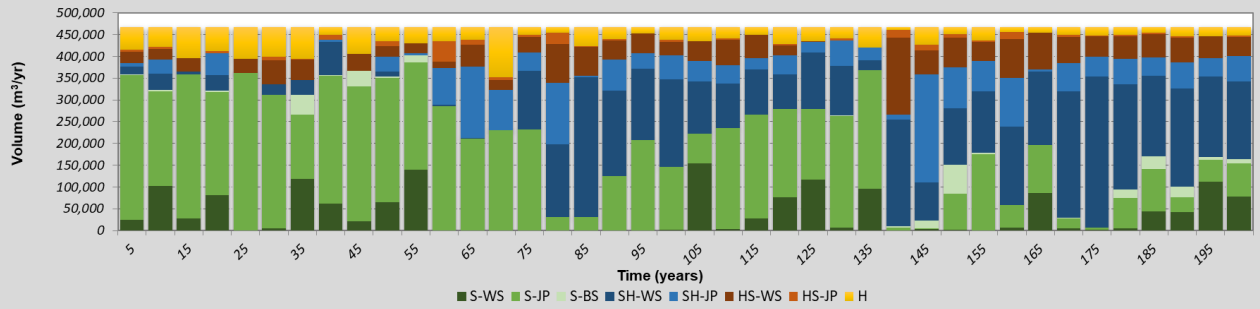


FMS 11: MAXIMIZE TOTAL VOLUME WITH CARIBOU, SS, OF, BS AND PLANNED/TACTICAL BLOCKS

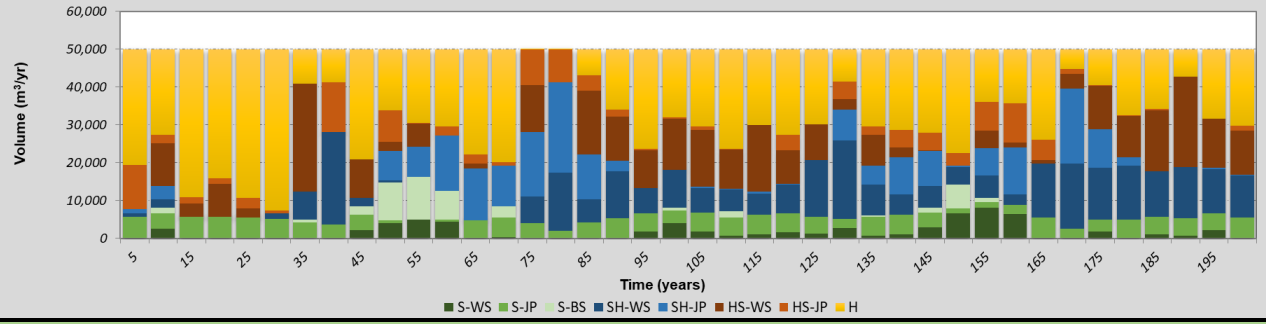
MISTIK HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



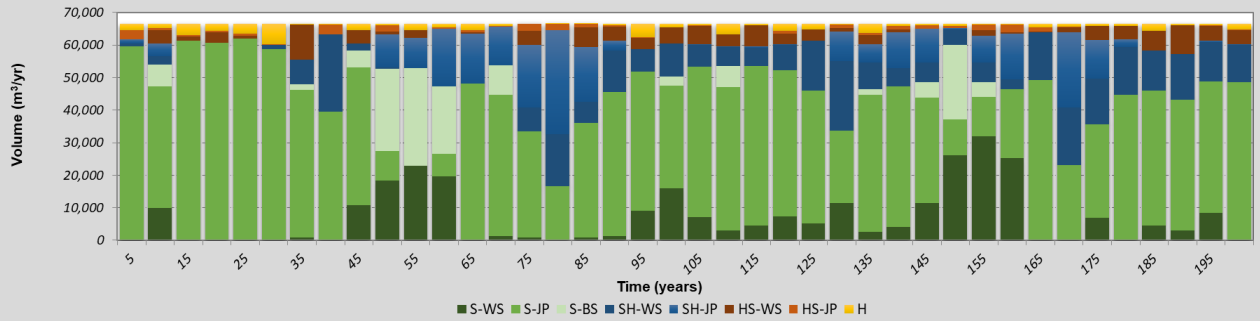
MISTIK SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



5.5.12. FMS 11 (SPATIAL, 12.7 CM TOP DIAMETER) TOTAL VOLUME WITH CARIBOU, SERAL STAGE, OLD FOREST, L&M BLACK SPRUCE CONSTRAINTS, AND PLANNED/TACTICAL BLOCKS

Forest Management Scenario (FMS) 11 is a single landbase approach that maintains an even flow of softwood and hardwood volumes for the entire planning horizon. The parameter settings used in the analysis of this scenario are displayed in Table 5.14. The results of the strategy are illustrated in Figure 5.11. This FMS was determined to be the selected management strategy (SMS) as it maintained the desired harvest flows while also satisfying the non-timber constraints.

TABLE 5.15: CONTROL PARAMETERS - FMS 11 (12.7 CM, SPATIAL)

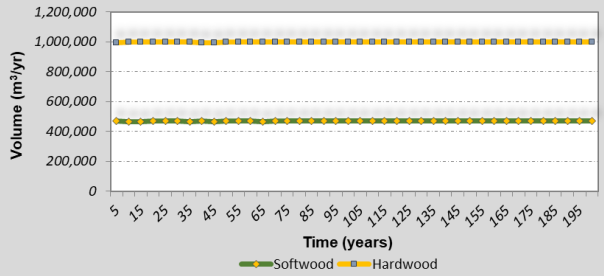
FMS 11: MAXIMIZE TOTAL VOLUME WITH CARIBOU, SERAL STAGE, OLD FOREST, BLACK SPRUCE AND PLANNED/TACTICAL BLOCKS CONSTRAINTS (12.7 CM, SPATIAL	
CONTROL PARAMETER	**PARAMETER SETTING**
Objective:	Maximize total volume harvested over the planning horizon
Model constraints:	1) Even flow softwood and hardwood volume harvest for the Mistik FMA area 2) Even flow softwood and hardwood volume harvest for the L&M FMA area 3) Non-declining softwood and hardwood operable growing stock in both the Mistik and L&M FMA areas 4) ≤3% of the 2006 caribou range can be harvested per decade 5) Old and Very old seral stage constraints applied based on targets in VOITs 2a and 2b 6) No identified old forest will be harvested in years 1-20 7) Limit black spruce harvest to ≤ 30,000 m^3/yr in L&M
Effective Date	2015
Harvest unit:	Mistik and L&M FMA areas
Planning horizon:	200 yrs
Minimum harvest age:	100 Years- Black and White Spruce Softwood 70 Years- Jack Pine Softwood 80 Years- Jack Pine Leading Softwood Mixedwood (SH) 90 Years- Spruce Leading Softwood Mixedwood (SH) 80 Years- Jack Pine and Spruce Deciduous Mixedwood (HS) 70 Years- Hardwood
Landbase:	2016 submitted landbase which includes both Mistik and L&M FMA areas
Yield curves:	Yield curves (17 yield curves/development types) based on **12.7 cm** top diameter utilization standards
Cull deductions:	Applied to yield curves (1.5% Softwood, 7.4% Hardwood)
Regeneration transition:	SGR transition rules
Regeneration lag:	Not applied
Introduce harvest plans:	Planned and tactical blocks applied

FIGURE 5.12: RESULTS – FMS 11 SPATIAL WITH 12.7 CM TOP DIAMETER

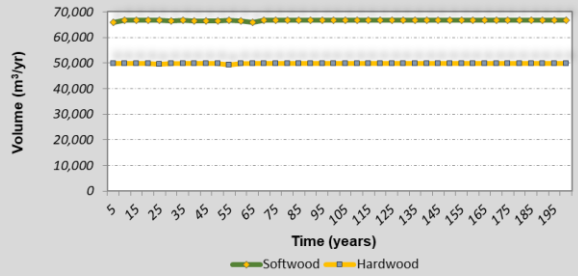
FMS 11: MAXIMIZE TOTAL VOLUME WITH CARIBOU, SS, OF, BS AND PLANNED/TACTICAL BLOCKS (12.7 CM, SPATIAL)

MISTIK		L&M	
SUMMARY TABLE		**SUMMARY TABLE**	
Net Productive Area	817,284 ha	**Net Productive Area**	61,226 ha
Softwood Harvest Level	467,646 m^3/yr	**Softwood Harvest Level**	66,552 m^3/yr
Hardwood Harvest Level	999,753 m^3/yr	**Hardwood Harvest Level**	49,899 m^3/yr

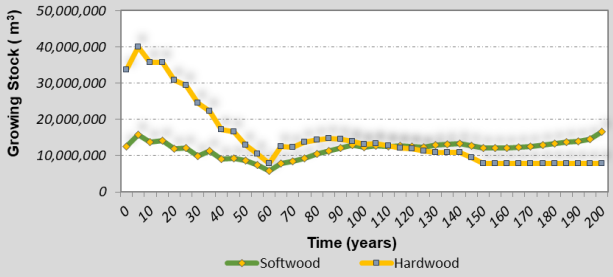
HARVEST FLOWS (M^3/YR)



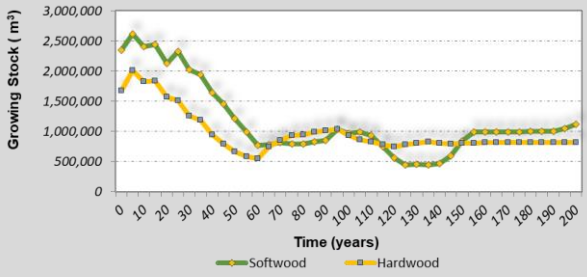
HARVEST FLOWS (M^3/YR)



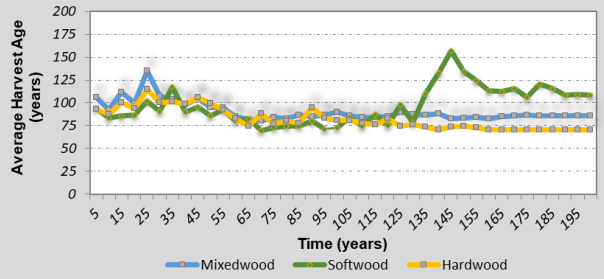
OPERABLE GROWING STOCK (M^3)



OPERABLE GROWING STOCK (M^3)



AVERAGE HARVEST AGE



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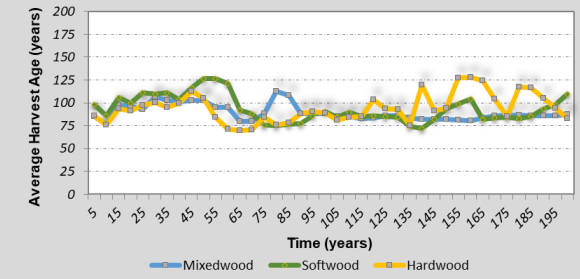
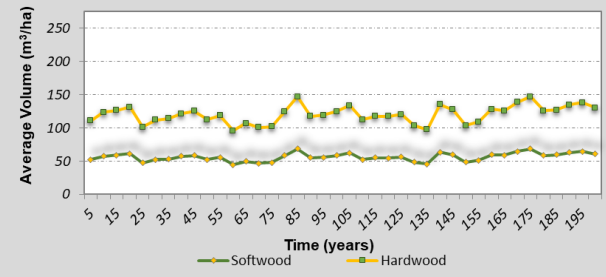
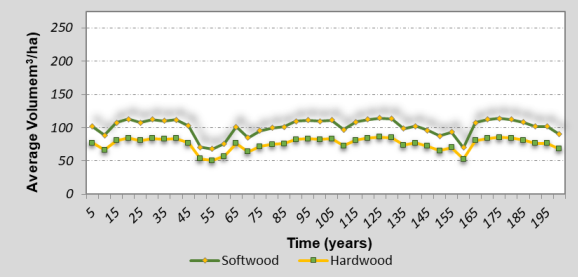


AVERAGE VOLUME (M^3/HA)

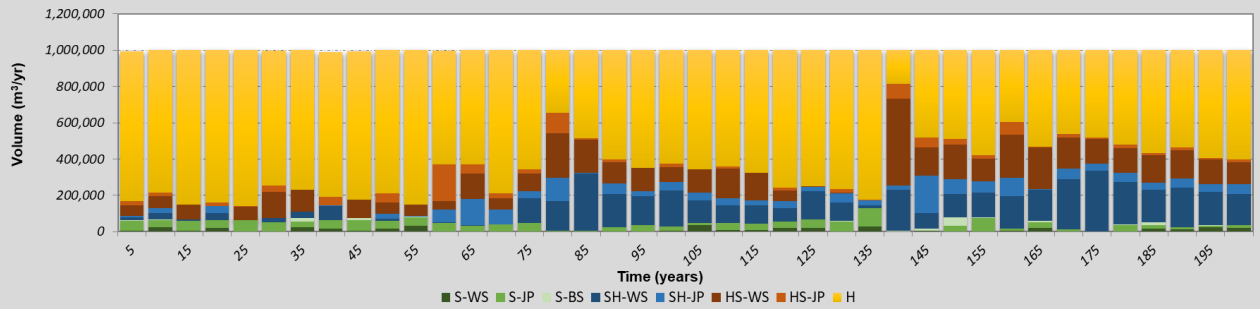


AVERAGE VOLUME (M^3/HA)

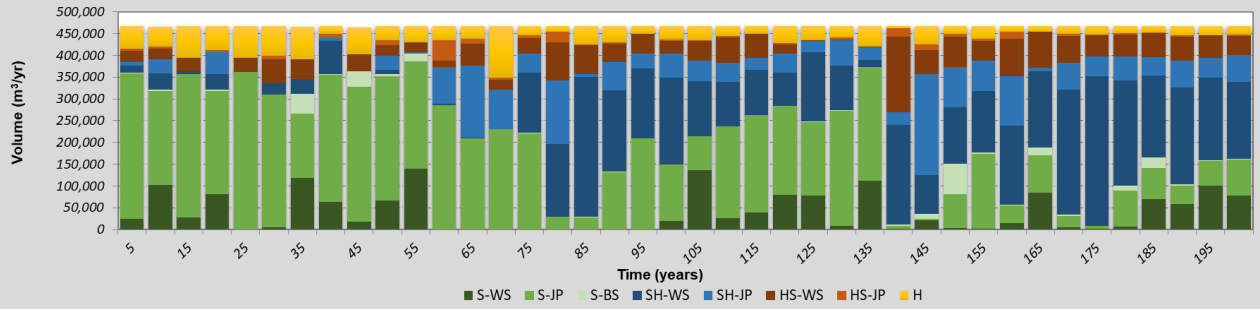


FMS 11: MAXIMIZE TOTAL VOLUME WITH CARIBOU, SS, OF, BS AND PLANNED/TACTICAL BLOCKS (12.7 CM, SPATIAL)

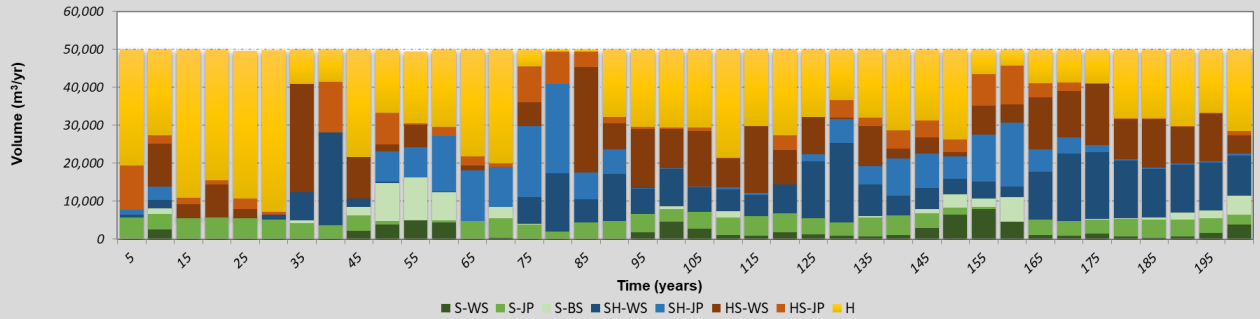
MISTIK HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



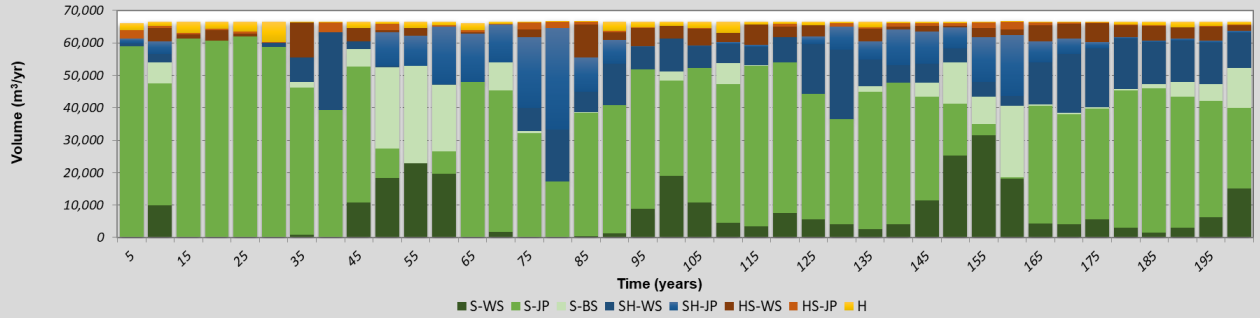
MISTIK SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



5.6. TACTICAL PLAN

The purpose of the tactical plan is to provide the general public, Saskatchewan Environment, Mistik, and L&M with a clear definition of the location, extent and profile of forest stands potentially scheduled for harvest and the location of the supporting access network that is potentially scheduled for construction within the active portion of the 2017 20-Year FMP (2017 to 2037). The tactical plan also provides a critical linkage between the strategic-level modeled Selected Management Strategy and actual operational plans.

Mistik and L&M have designed a tactical harvest and access plan (Map 5.1) for the period 2017 to 2037 comprised of two harvest pools (T1 and T2). For each of the two harvest pools (referred to as 'T1' and 'T2', respectively), Mistik and L&M have planned more area and volume than will be harvested. The additional planned area and volume allows for required flexibility in selection of harvest locations. In the wood supply model, a priority was given to the T1 harvest pool to be harvested first.

A profile of the tactical plan is presented in Figure 5.13 with the volumes, areas, and age class[16] distribution by T1 and T2.

In addition to the tactical plan there were some planned blocks in both Mistik and L&M that were outside of the tactical plan (Table 5.16).

TABLE 5.16: PLANNED BLOCK AREA AND VOLUME SUMMARY

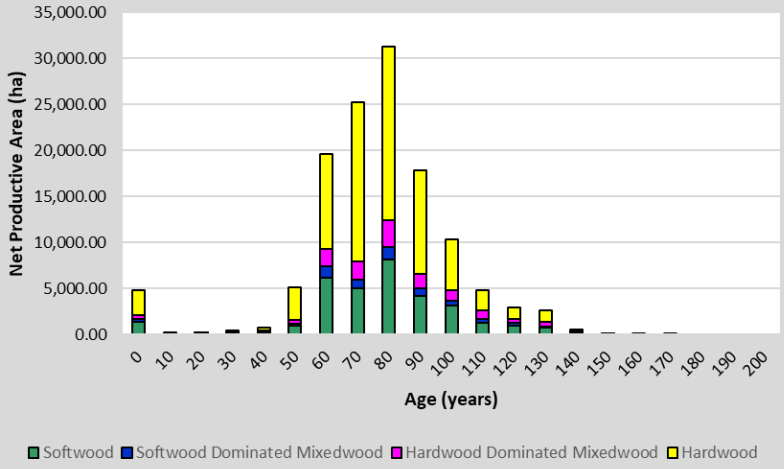
	Planned Block Summary	
	Mistik	**L&M**
Planned Area (ha)	*837*	*147*
Planned Current Softwood Volume (m^3)	*37,913*	*10,256*
Planned Current Hardwood Volume (m^3)	*48,803*	*4,277*

[16] Age class distributions were created using the modeled landbase areas

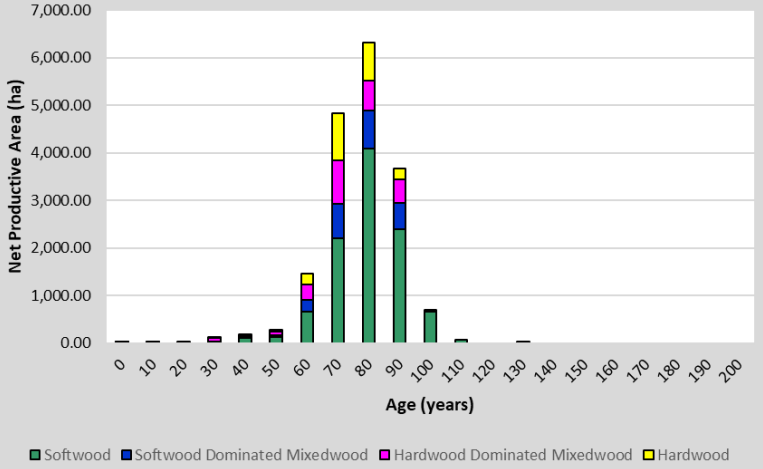
FIGURE 5.13: TACTICAL PLAN PROFILE

HVS Summary Table			Tactical Plan Initial Development Type Distribution						
	Mistik	L&M	Development Type	T1 Area (ha)		T2 Area (ha)		Total Area (ha)	
				Mistik	L&M	Mistik	L&M	Mistik	L&M
Tactical Plan Area (ha)	*T1 - 140,137* *T2 - 78,218*	*T1 - 18,497* *T2 - 12,126*	No Development Type	17,899	849	9,090	1,254	26,989	2,103
			1 S-WS-A-A	4,697	1,143	2,436	493	7,159	1,636
			2 S-BS-A-A	644	2,533	387	1,804	1,046	4,338
			3 S-JP-LD-A-1	4,744	0	3,733	0	8,478	0
			4 S-JP-LD-A-2	4,763	0	2,738	0	7,501	0
			5 S-JP-HD-A-1	6,469	0	5,784	0	12,254	0
			6 S-JP-HD-A-2	9,719	0	6,376	0	16,114	0
Tactical Plan Current Softwood Volume (m^3)	*T1 - 5,586,622* *T2 - 3,688,602*	*T1 - 1,985,417* *T2 - 1,087,511*	7 S-JP-L&M	0	6,681	0	4,046	0	10,726
			8 SH-JP-A-A	3,148	1,605	2,100	783	5,253	2,388
			9 SH-WS-A-A	3,000	828	1,873	326	4,867	1,154
			10 HS-WS-A-A	8,532	1,438	4,091	477	12,653	1,915
			11 HS-JP-A-A	3,393	1,128	2,535	422	5,940	1,549
			12 H-A-LD-A-1	3,355	41	2,000	259	5,341	301
Tactical Plan Current Hardwood Volume (m^3)	*T1 - 15,773,412* *T2 - 8,320,060*	*T1 - 1,101,367* *T2 - 739,050*	13 H-A-LD-A-2	8,933	276	3,908	446	12,840	722
			14 H-A-HD-A-1	10,736	357	6,489	497	17,199	855
			15 H-A-HD-A-2	29,843	898	14,256	523	44,116	1,421
			16 H(S)-A-LD-A	7,484	377	3,223	353	10,707	730
			17 H(S)-A-HD-A	12,779	342	7,199	443	19,978	785
			Total Area (ha)	*140,137*	*18,497*	*78,218*	*12,126*	*218,438*	*30,622*

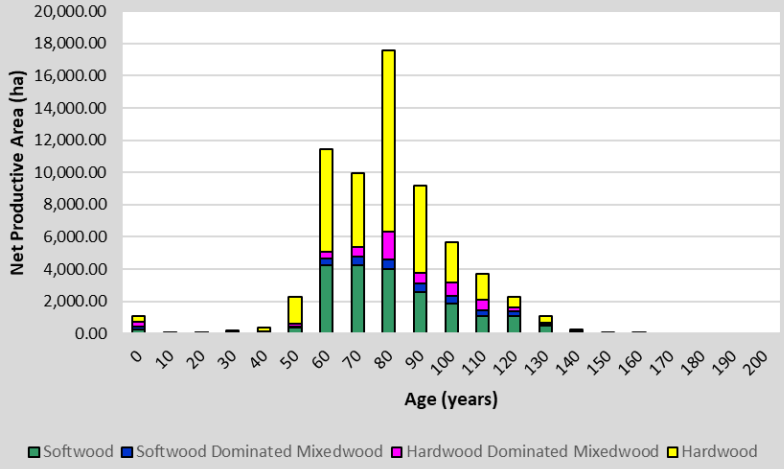
Tactical Plan T1 Initial Age Class Distribution (MISTIK)



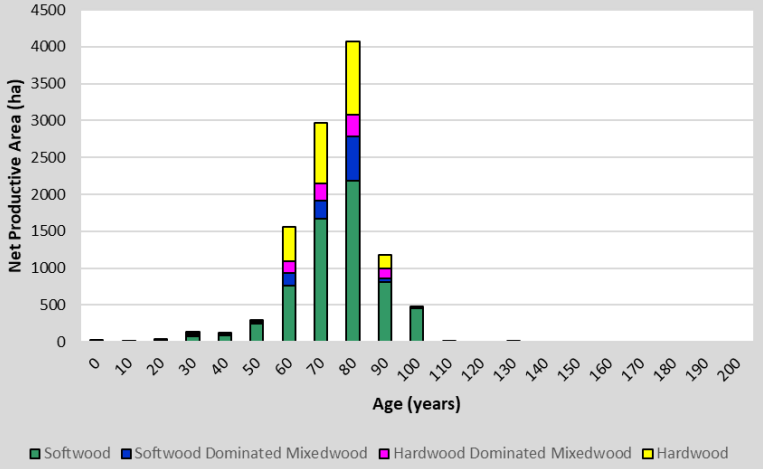
Tactical Plan T2 Initial Age Class Distribution (MISTIK)

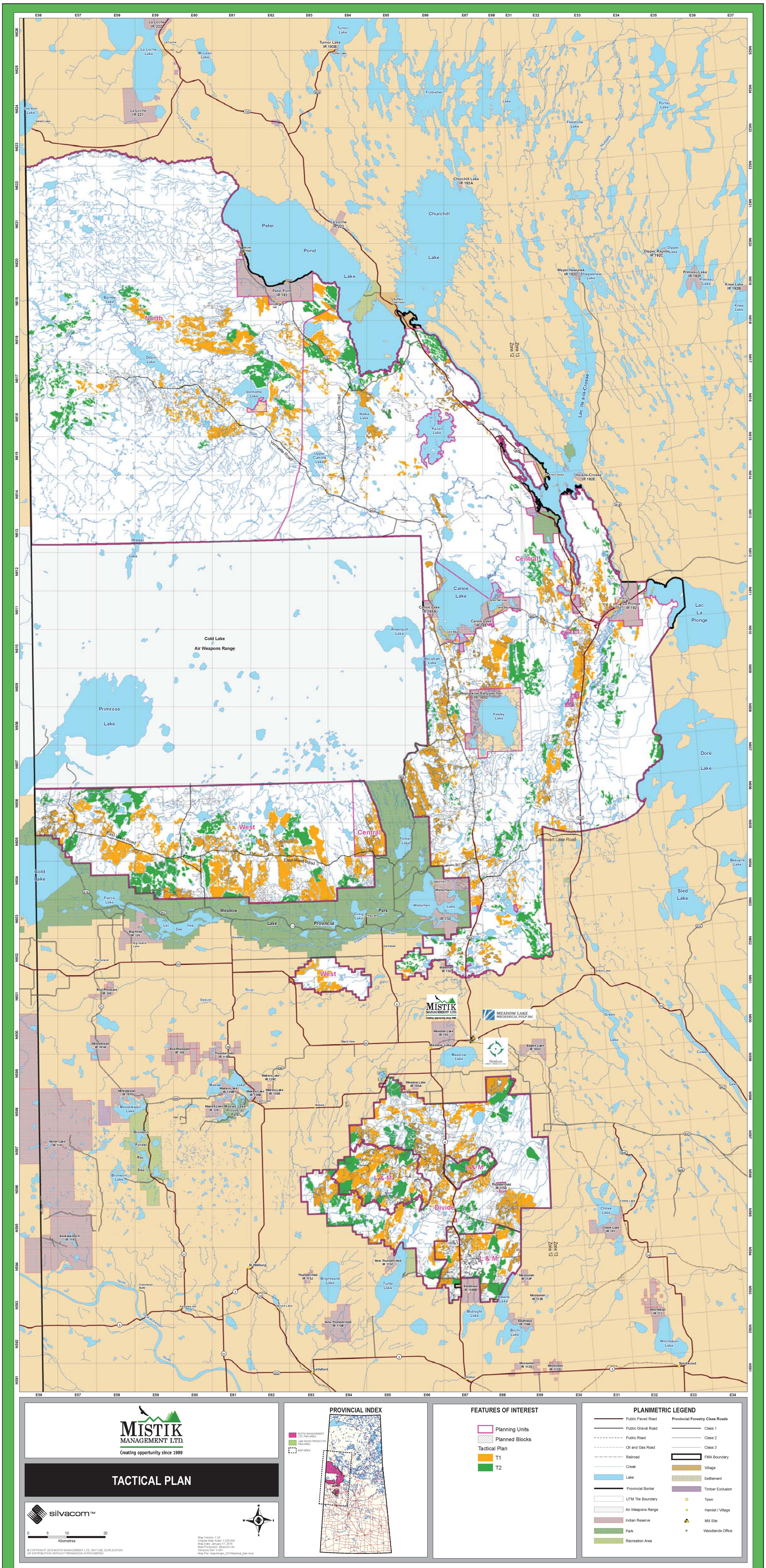


Tactical Plan T1 Initial Age Class Distribution (L&M)



Tactical Plan T2 Initial Age Class Distribution (L&M)





North
Central
West
L & M
Divide
Peter Pond Lake
Churchill Lake
Lac Île-à-la-Crosse
Canoe Lake
Lac La Plonge
Doré Lake
Primrose Lake
Cold Lake Air Weapons Range
Cold Lake
Meadow Lake Provincial Park
Waterhen Lake
Keeley Lake
Sled Lake
Turtle Lake
Witchekan Lake
Brightsand Lake
Midnight Lake
Birch Lake
Meadow Lake
East-West Road
Upper Cummins Road
Vermette Road
Stewart Lake Road
Saskatchewan River
Turtleford
Glaslyn
Spiritwood
Zone 13
Zone 12
MISTIK MANAGEMENT LTD.
Creating opportunity since 1989
MEADOW LAKE MECHANICAL PULP INC.
TACTICAL PLAN
silvacom™
0 5 10 20
Kilometres
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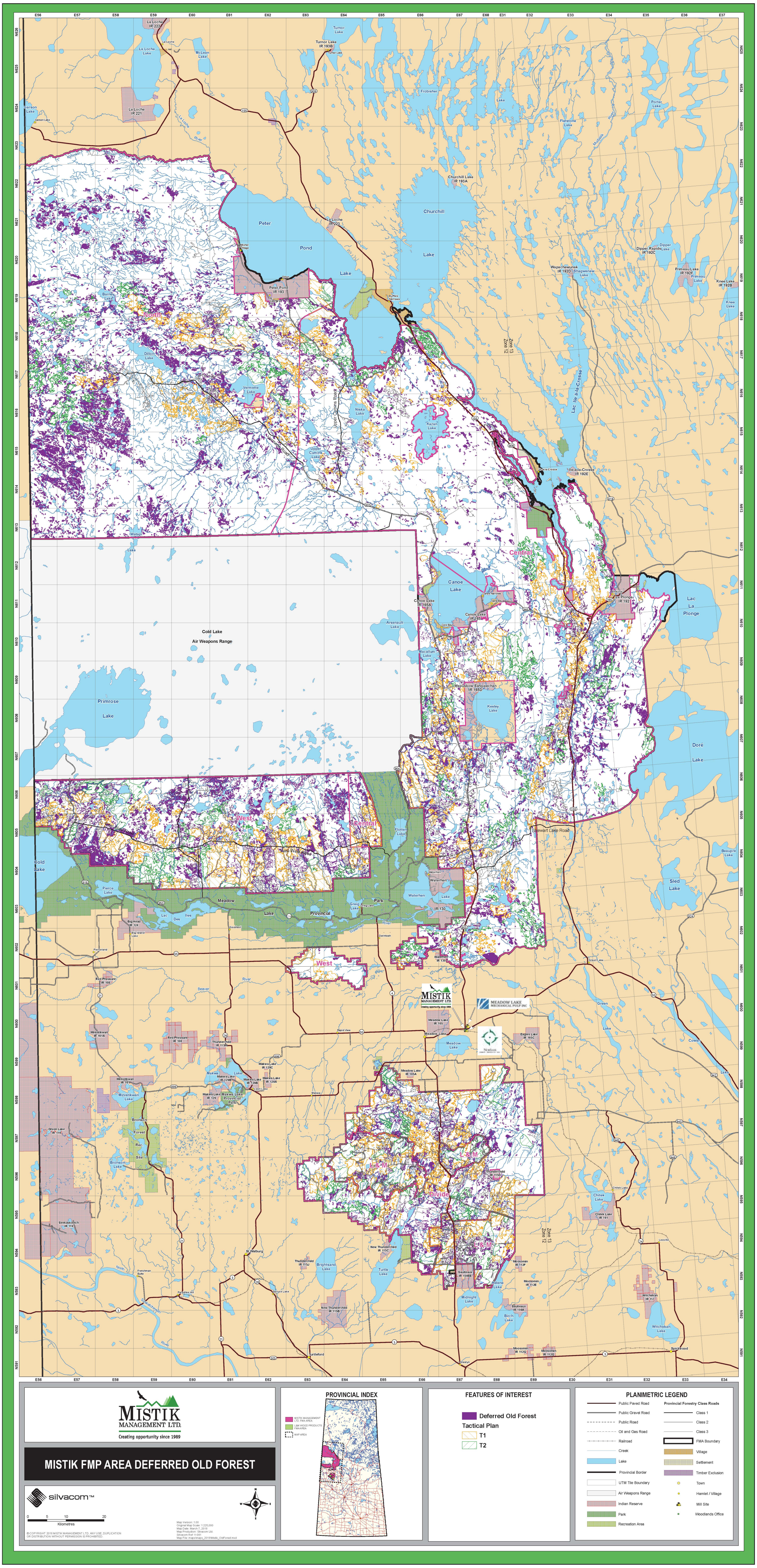
Map Version: 1.00
Original Map Scale: 1:225,000
Map Date: January 17, 2018
Map Production: Silvacom Ltd.
Silvacom Ref: V-081
Map File: maps\maps_2018\tactical_plan.mxd
PROVINCIAL INDEX
MISTIK MANAGEMENT LTD. FMA AREA
L&M WOOD PRODUCTS FMA AREA
MAP AREA
FEATURES OF INTEREST
Planning Units
Planned Blocks
Tactical Plan
T1
T2
PLANIMETRIC LEGEND
Public Paved Road
Public Gravel Road
Public Road
Oil and Gas Road
Railroad
Creek
Lake
Provincial Border
UTM Tile Boundary
Air Weapons Range
Indian Reserve
Park
Recreation Area
Provincial Forestry Class Roads
Class 1
Class 2
Class 3
FMA Boundary
Village
Settlement
Timber Exclusion
Town
Hamlet / Village
Mill Site
Woodlands Office


MISTIK FMP AREA DEFERRED OLD FOREST
MISTIK MANAGEMENT LTD.
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0 5 10 20
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Original Map Scale: 1:225,000
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PROVINCIAL INDEX
MISTIK MANAGEMENT LTD. FMA AREA
L&M WOOD PRODUCTS FMA AREA
MAP AREA
FEATURES OF INTEREST
Deferred Old Forest
Tactical Plan
T1
T2
PLANIMETRIC LEGEND
Public Paved Road
Public Gravel Road
Public Road
Oil and Gas Road
Railroad
Creek
Lake
Provincial Border
UTM Tile Boundary
Air Weapons Range
Indian Reserve
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Recreation Area
Provincial Forestry Class Roads
Class 1
Class 2
Class 3
FMA Boundary
Village
Settlement
Timber Exclusion
Town
Hamlet / Village
Mill Site
Woodlands Office
North
Central
West
L & M
Divide
Cold Lake
Air Weapons Range
Peter Pond Lake
Churchill Lake
Lac Ile-à-la-Crosse
Canoe Lake
Lac La Plonge
Doré Lake
Primrose Lake
Meadow Lake Provincial Park
Meadow Lake
Green Lake
Bronson Forest Rec. Site
Zone 13
Zone 12
MEADOW LAKE MECHANICAL PULP INC

6. SELECTED MANAGEMENT STRATEGY

The Forest Management Scenario (FMS) that has been identified as the Selected Management Strategy (SMS) for the Mistik FMP area was chosen on its ability to achieve specific goals and objectives by the planning team. This section displays how the SMS (FMS 11 **with 10 cm top diameter utilization standards**) harvest sequence and modeled management actions fulfill these goals and objectives as well as the required outputs described in the 2017 Forest Management Planning Standard.

6.1. SPATIAL PARAMETERS

The FMS that was selected as the SMS by the planning team was FMS 11. However, RSPS provides the optimal solution by analyzing a complex set of problems directed towards achieving the desired future forest conditions; RSPS solutions are aspatial. Spatial Optimizer on the other hand, implements RSPS solutions spatially, subject to any additional spatial constraints. As it was necessary for the Natural Forest Patterns to have a spatial assignment of the harvest schedule it was necessary to implement the RSPS solution within Spatial Optimizer.

The harvest sequence was constrained in Spatial Optimizer by several factors outlined in Table 6.1.

TABLE 6.1: SPATIAL RULES FOR SPATIAL OPTIMIZER RUN

HARVEST SEQUENCE ASSUMPTIONS	
Goal:	Assess the spatial harvesting sequence of the timber supply model
SMS Scenario Description	*FMS 11 – Maximize Total Volume, Even flow harvest, Non Declining GS, Force Planned and Tactical Blocks, Seral Stage, Caribou, and Old Forest, and Black Spruce Constraints*
Spatial Simulation length	70 year
Minimum block size	NONE*
Target block size	50 ha
Maximum block size	1,000 ha

*As the tactical plan was already incorporated within the model a minimum block size was not assigned.

Following the assignment of the harvest schedule to polygons using Spatial Optimizer it was necessary to run the results back through RSPS to update the harvest profiles. The following model parameters in Table 6.2 were the settings used in RSPS to produce the final harvest profiles (Figure 6.1, Figure 6.2, and Figure 6.3).

6.2. MODEL PARAMETERS

The parameter settings used in the analysis of this scenario are displayed in Table 6.2.

TABLE 6.2: CONTROL PARAMETERS - SMS TOTAL VOLUME WITH CARIBOU, SERAL STAGE, OLD FOREST CONSTRAINTS AND THE PLANNED/TACTICAL BLOCKS

SMS: MAXIMIZE TOTAL VOLUME WITH CARIBOU, SERAL STAGE, OLD FOREST AND PLANNED/TACTICAL BLOCKS WITH 12.7 CM TOP DIAMETER	
CONTROL PARAMETER	**PARAMETER SETTING**
Objective:	Maximize total volume harvested over the planning horizon
Model constraints:	1) Even flow softwood and hardwood volume harvest for the Mistik FMA area 2) Even flow softwood and hardwood volume harvest for the L&M FMA area 3) Non-declining softwood and hardwood operable growing stock in both the Mistik and L&M FMA areas 4) ≤3% of the 2006 caribou range can be harvested per decade 5) Old and Very old seral stage constraints applied based on targets in VOITs 2a and 2b 6) No identified old forest will be harvested in years 1-20 7) Limit black spruce harvest to ≤ 30,000 m^3/yr in L&M
Effective Date	2015
Harvest unit:	Mistik and L&M FMA areas
Planning horizon:	200 yrs
Minimum harvest age:	100 Years- Black and White Spruce Softwood 70 Years- Jack Pine Softwood 80 Years- Jack Pine Leading Softwood Mixedwood (SH) 90 Years- Spruce Leading Softwood Mixedwood (SH) 80 Years- Jack Pine and Spruce Deciduous Mixedwood (HS) 70 Years- Hardwood
Landbase:	2016 submitted landbase which includes both Mistik and L&M FMA areas
Yield curves:	Yield curves (17 yield curves/development types) based on **10 cm** top diameter utilization standards
Cull deductions:	Applied to yield curves (1.5% Softwood, 7.4% Hardwood)
Regeneration transition:	SGR transition rules
Regeneration lag:	Not applied
Introduce harvest plans:	Planned and tactical blocks applied

6.3. HARVEST PROFILE

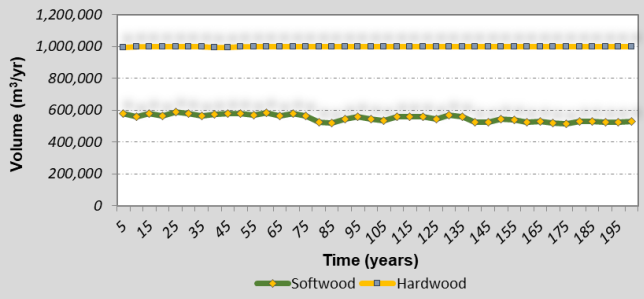
The spatial harvest volume results of the SMS for both Mistik and L&M are displayed in Figure 6.1 below.

FIGURE 6.1: HARVEST VOLUME RESULTS – SELECTED MANAGEMENT STRATEGY

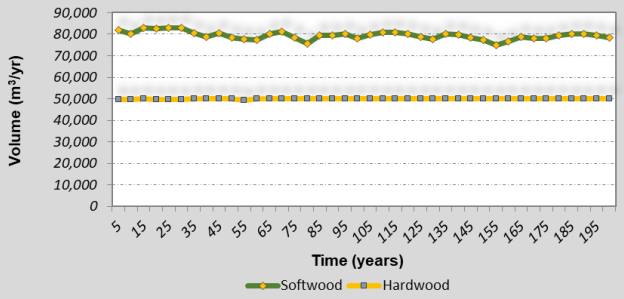
SELECTED MANAGEMENT STRATEGY: HARVEST VOLUME RESULTS

MISTIK		L&M	
SUMMARY TABLE		**SUMMARY TABLE**	
Net Productive Area	817,284 ha	**Net Productive Area**	61,226 ha
Softwood Harvest Level	549,986 m^3/yr	**Softwood Harvest Level**	79,429 m^3/yr
Hardwood Harvest Level	999,753 m^3/yr	**Hardwood Harvest Level**	49,899 m^3/yr

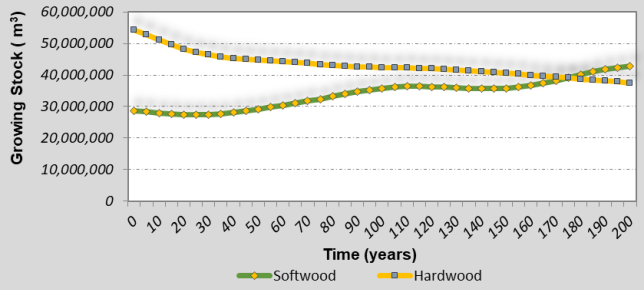
HARVEST FLOWS (M^3/YR)



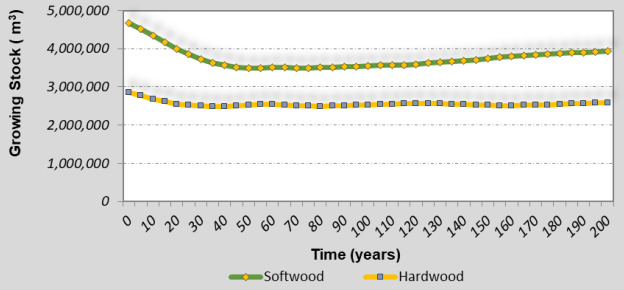
HARVEST FLOWS (M^3/YR)



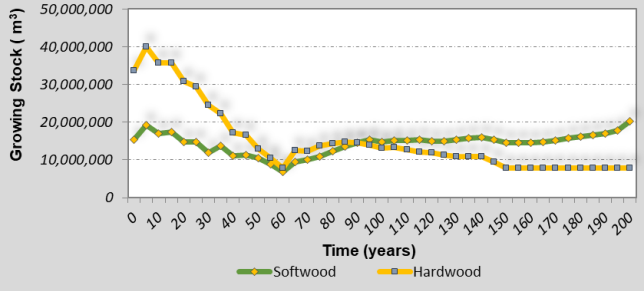
TOTAL GROWING STOCK (M^3)



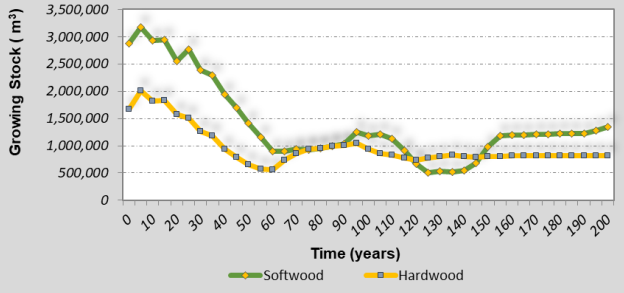
TOTAL GROWING STOCK (M^3)



OPERABLE GROWING STOCK (M^3)



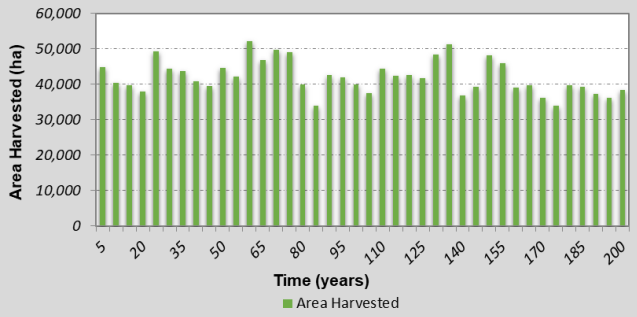
OPERABLE GROWING STOCK (M^3)



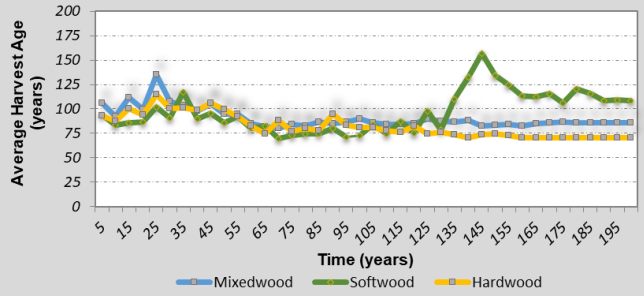
SELECTED MANAGEMENT STRATEGY: HARVEST VOLUME RESULTS

MISTIK

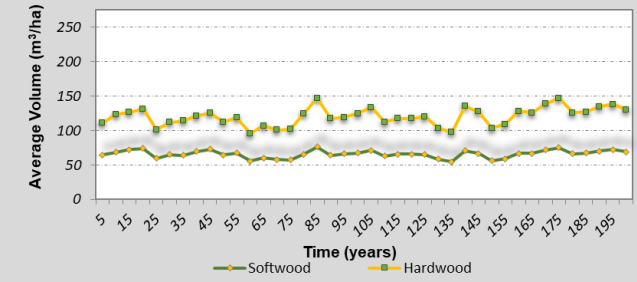
AREA HARVESTED



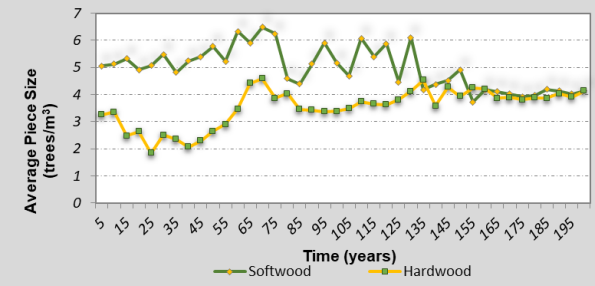
AVERAGE HARVEST AGE



AVERAGE VOLUME (M³/HA)

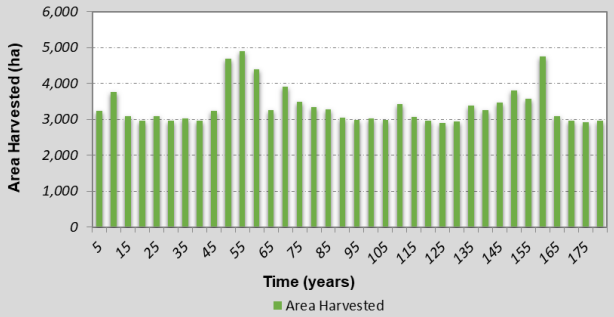


AVERAGE PIECE SIZE (TREES/M³)

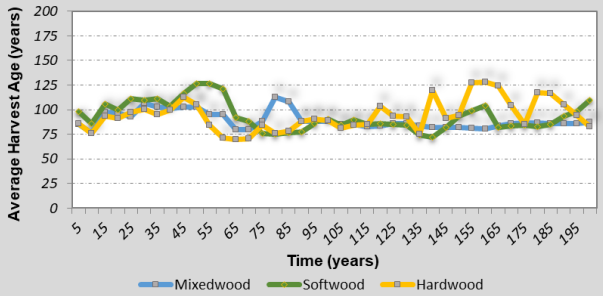


L&M

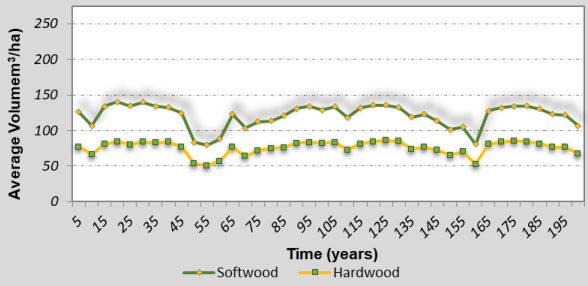
AREA HARVESTED



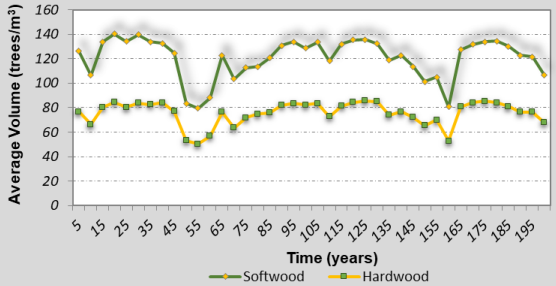
AVERAGE HARVEST AGE



AVERAGE VOLUME (M³/HA)

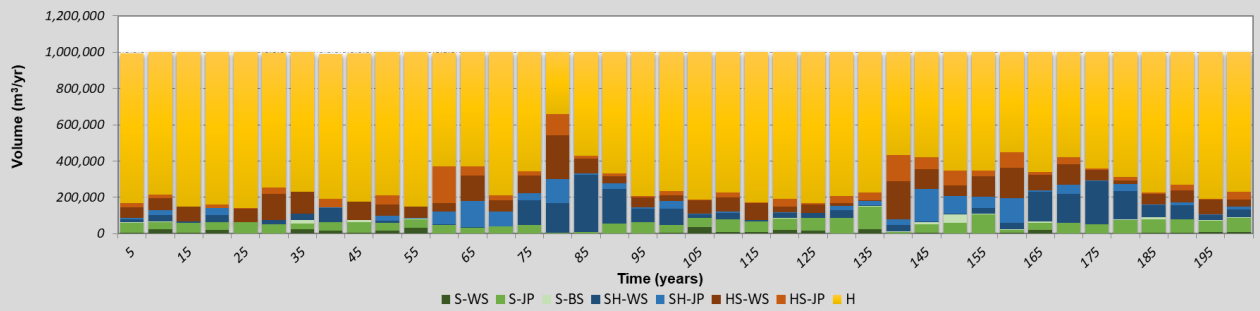


AVERAGE PIECE SIZE (TREES/M³)

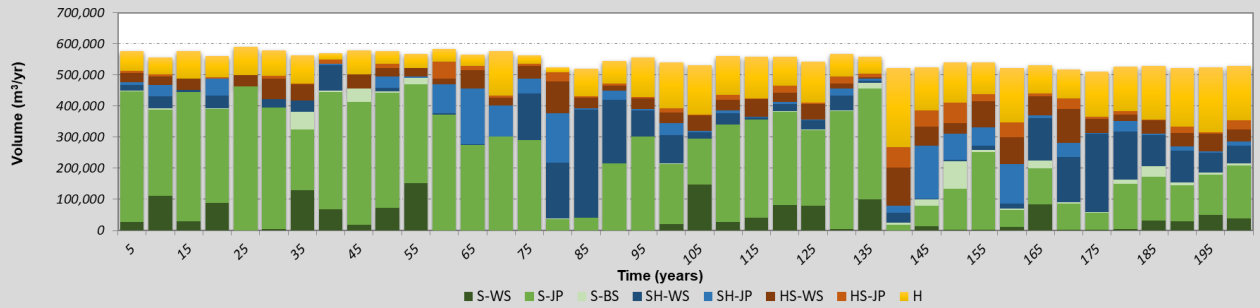


SELECTED MANAGEMENT STRATEGY: HARVEST VOLUME RESULTS Continued

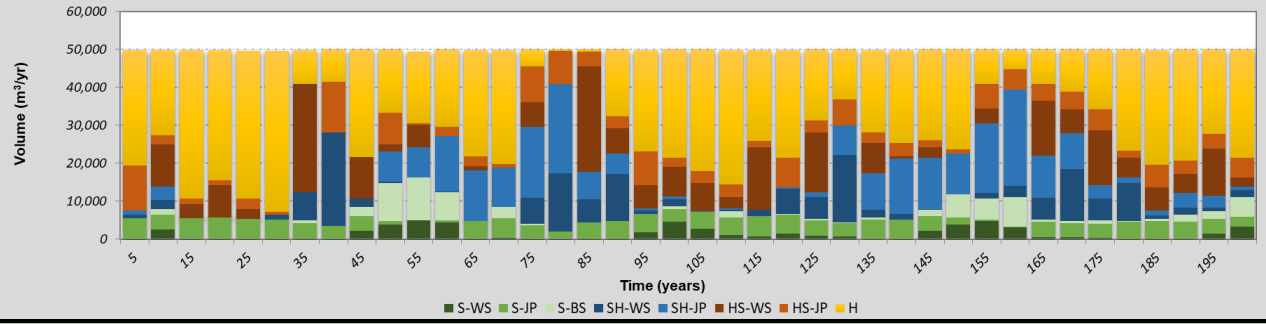
MISTIK HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



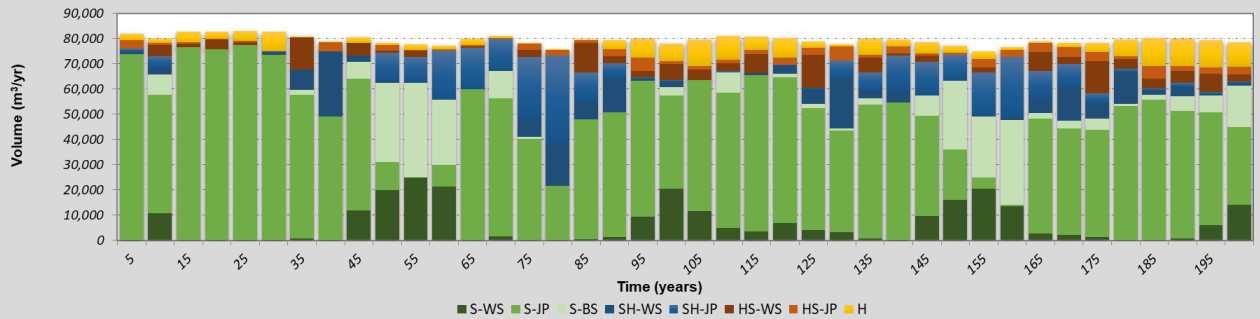
MISTIK SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



L & M SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



6.3.1. HARVEST PROFILE BY PLANNING UNIT

The following figure displays the harvest profile (HVS) for each planning unit within the plan area.

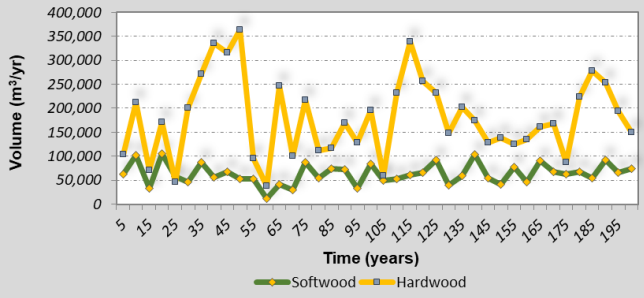
FIGURE 6.2: SMS HARVEST VOLUME RESULTS BY PLANNING UNIT

SELECTED MANAGEMENT STRATEGY

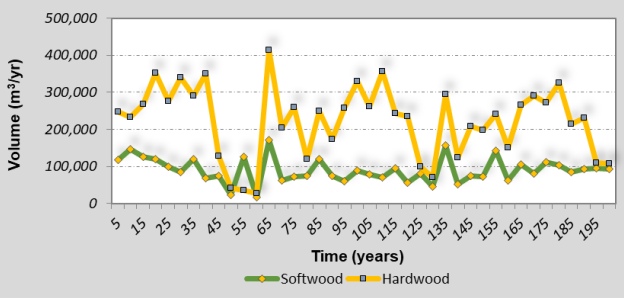
PLANNING UNIT SUMMARY

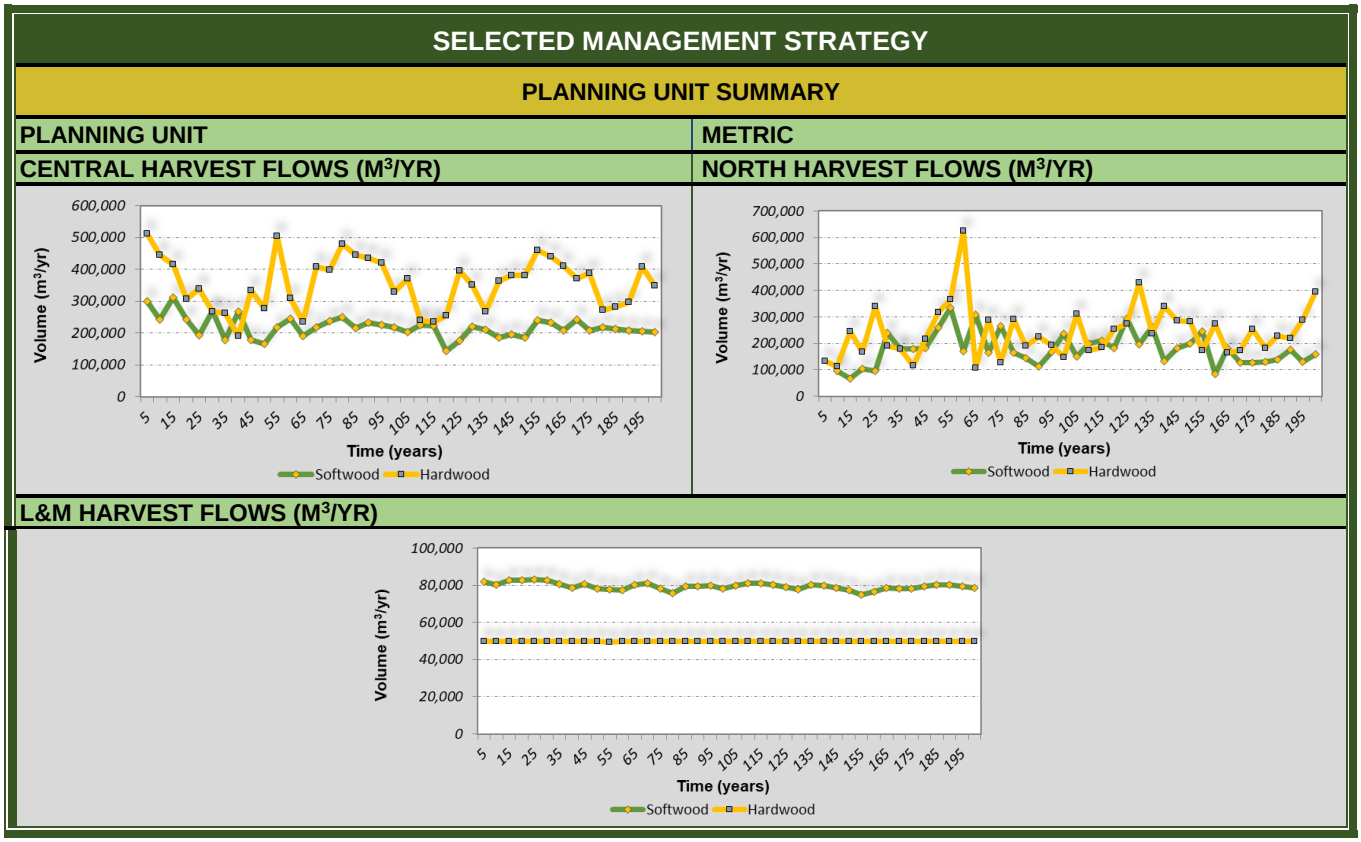
PLANNING UNIT	METRIC	
DIVIDE	Net Productive Area	99,326 ha
	Average SWD HVS Level	63,198 m^3/yr
	Average HWD HVS Level	179,921 m^3/yr
WEST	Net Productive Area	137,558 ha
	Average SWD HVS Level	90,024 m^3/yr
	Average HWD HVS Level	222,096 m^3/yr
CENTRAL	Net Productive Area	305,333 ha
	Average SWD HVS Level	218,605 m^3/yr
	Average HWD HVS Level	355,533 m^3/yr
NORTH	Net Productive Area	275,066 ha
	Average SWD HVS Level	178,141 m^3/yr
	Average HWD HVS Level	242,203 m^3/yr
L & M	Net Productive Area	61,226 ha
	Average SWD HVS Level	79,429 m^3/yr
	Average HWD HVS Level	49,899 m^3/yr

DIVIDE HARVEST FLOWS (M^3/YR)



WEST HARVEST FLOWS (M^3/YR)





6.3.2. RETENTION ADJUSTMENT

As previously mentioned, the retention is being applied as an HVS adjustment. The table below outlines the modeled HVS for softwood and hardwood from the SMS in both the Mistik and L&M FMAs along with the adjusted HVS following retention adjustment. Based on the VOIT[17] there is a minimum of 4% in block retention with proximal retention. The final adjusted HVS is dependent on the amount of in-block versus proximal retention.

TABLE 6.3: MISTIK AND L&M HVS WITH RETENTION

Retention Adjustment	Harvest Volume Schedule (m^3/yr)			
	Mistik		L&M	
	Softwood	Hardwood	Softwood	Hardwood
Modeled HVS	549,986	999,753	79,429	49,899
Modeled HVS with 4% Retention	527,987	959,763	76,252	47,903

[17] *VOIT #4: Tree retention after harvest*. Described in the 2019 Values, Objectives, Indicators, and Targets document.

6.3.3. HVS AND HVS PULP SUMMARY

As requested by the MOE, the following summary outlines the saw log, pulp, and total volumes for both hardwood and softwood for each company based on the selected management strategy. The final softwood saw log HVS is calculated from reducing the retention and then applying the factor for softwood degrade (Table 6.4). The volume-weighted softwood saw log degrade is 12% for Mistik and 9% for L&M (see Volume III, Section 2.3.1, for more details). The final softwood pulp HVS is calculated from the combination of the volume removed from the softwood degrade and tops / additional merchantable trees (Table 6.4). The tops / additional merchantable trees volume was calculated using a ration based on the softwood HVS of Scenario 2 (7.5 cm top) versus the softwood HVS of Scenario 1 (10 cm top). The ratio between the Mistik softwood HVS of the two scenarios is 26.89% and between the L&M softwood HVS is 17.41%.

TABLE 6.4: SAW LOG AND PULP

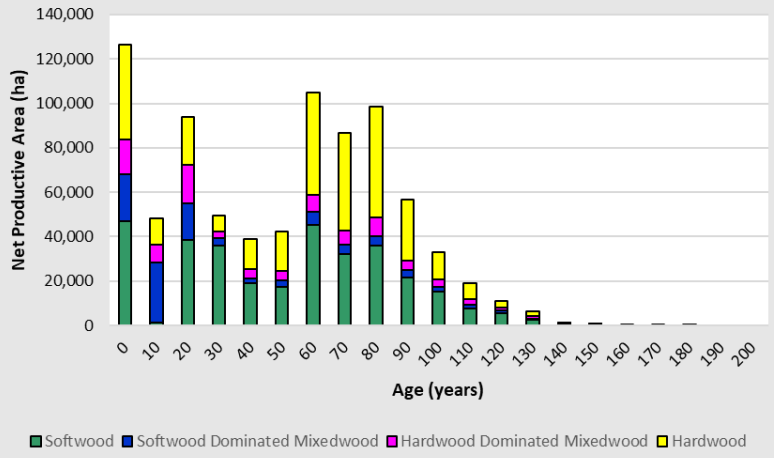
Result	Mistik FMA HVS (m^3/yr)			L&M FMA HVS (m^3/yr)		
	Softwood Sawlog	Softwood Pulp	Hardwood	Softwood Sawlog	Softwood Pulp	Hardwood
SMS Model Result	549,986	N/A	999,753	79,429	N/A	49,899
Reduction for Insular Retention (4%)	-21,999	N/A	-39,990	-3,177	N/A	-1,996
Weighted Average Degrade (Mistik: 12%, L&M 9%)	-63,358	63,358	N/A	-6,863	6,863	N/A
Tops (10cm to 8cm) and additional merch. trees	N/A	124,920	N/A	N/A	12,077	N/A
Final HVS (m^3/yr)	**464,628**	**188,278**	**959,763**	**69,389**	**18,940**	**47,903**

6.4. FUTURE FOREST CONDITION

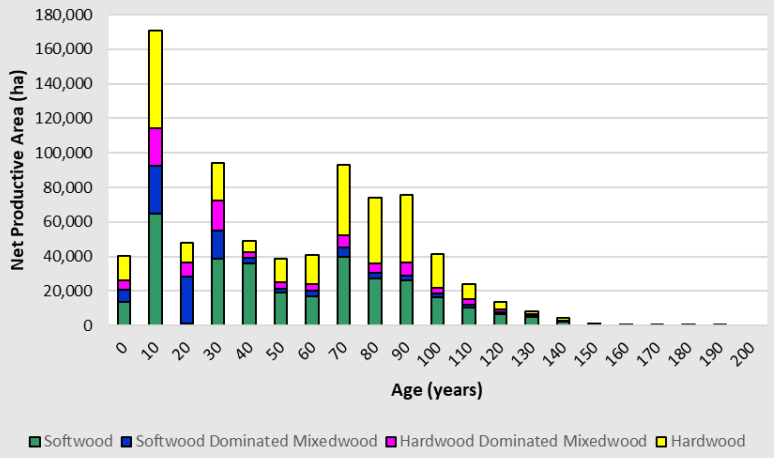
Table 6.3 through Table 6.7 display the species group and age class distribution of the entire Mistik FMA net productive area for the current forest and into the future as modeled in the Selected Management Strategy for years 0 (current), 10, 20, 50, 100, and 200. Table 6.8 displays the operable area for years 0 (current), 10, 20, 50, 100, and 200 in the Mistik FMA. Table 6.9 through Table 6.11 display the species group and age class distribution of the entire L&M FMA net productive area for the current forest and into the future as modeled in the Selected Management Strategy for years 0 (current),10, 20, 50, 100, and 200. Table 6.12 displays the operable area years 0 (current), 10, 20, 50, 100, and 200 in the L&M FMA.

TABLE 6.5: MISTIK AGE CLASS DISTRIBUTION BY SPECIES GROUP FOR THE OPERABLE AREA: CURRENT AND YEAR 10

Current Forest



Year 10



Current Forest Tabular Summary

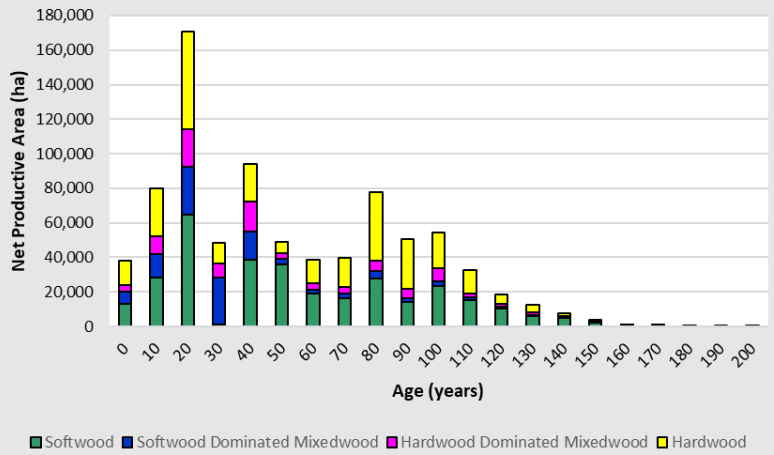
Age (years)	Softwood	Softwood Dominated Mixedwood	Hardwood Dominated Mixedwood	Hardwood	Total Area (ha)
1-40	122,987	67,296	45,116	82,312	**317,711**
41-70	81,541	11,075	15,701	78,021	**186,338**
71-100	89,814	11,660	19,290	121,262	**242,026**
101+	32,626	5,188	8,447	24,949	**71,209**
Total Area (ha)	**326,968**	**95,218**	**88,553**	**306,544**	**817,284**

Year 10 Tabular Summary

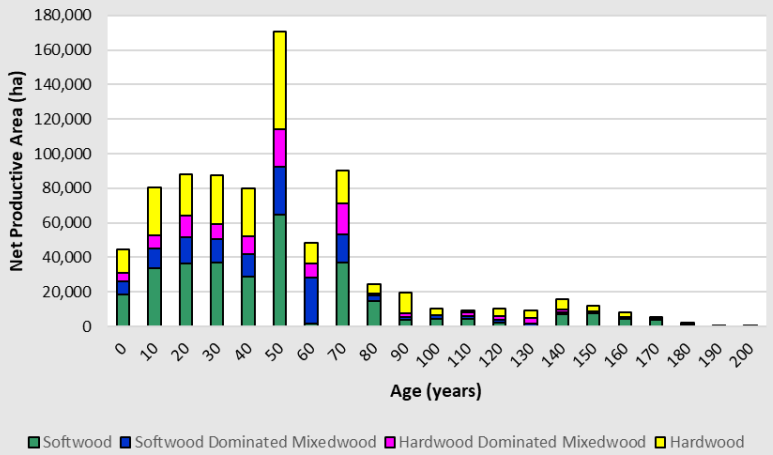
Age (years)	Softwood	Softwood Dominated Mixedwood	Hardwood Dominated Mixedwood	Hardwood	Total Area (ha)
1-40	117,987	78,772	52,324	104,409	**353,491**
41-70	71,765	8,465	11,245	36,882	**128,356**
71-100	92,841	12,254	19,656	118,240	**242,991**
101+	41,600	6049.3	9,321	35,476	**92,446**
Total Area (ha)	**324,192**	**105,540**	**92,546**	**295,006**	**817,284**

TABLE 6.6: MISTIK AGE CLASS DISTRIBUTION BY SPECIES GROUP FOR THE OPERABLE AREA: YEAR 20 AND YEAR 50

Year 20



Year 50



Current Forest Tabular Summary

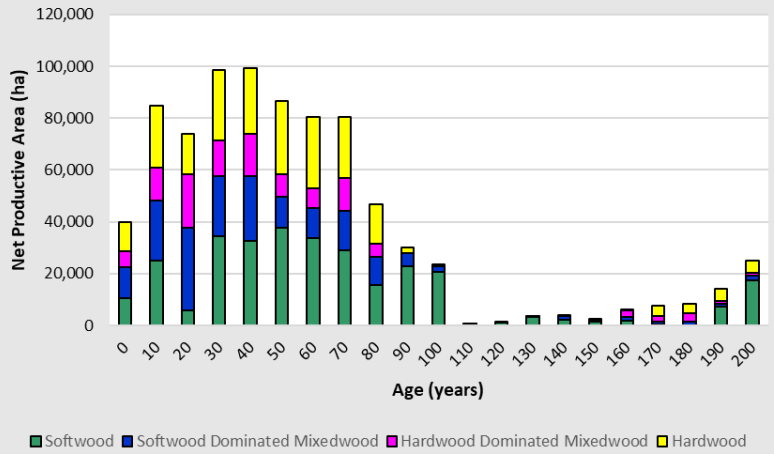
Age (years)	Softwood	Softwood Dominated Mixedwood	Hardwood Dominated Mixedwood	Hardwood	Total Area (ha)
1-40	107,707	75,509	43,376	110,712	**337,304**
41-70	93,356	21,723	24,873	41,526	**181,479**
71-100	57,783	10,143	15,278	85,119	**168,322**
101+	62,730	6,797	13,846	46,806	**130,180**
Total Area (ha)	**321,576**	**114,172**	**97,373**	**284,163**	**817,284**

Year 10 Tabular Summary

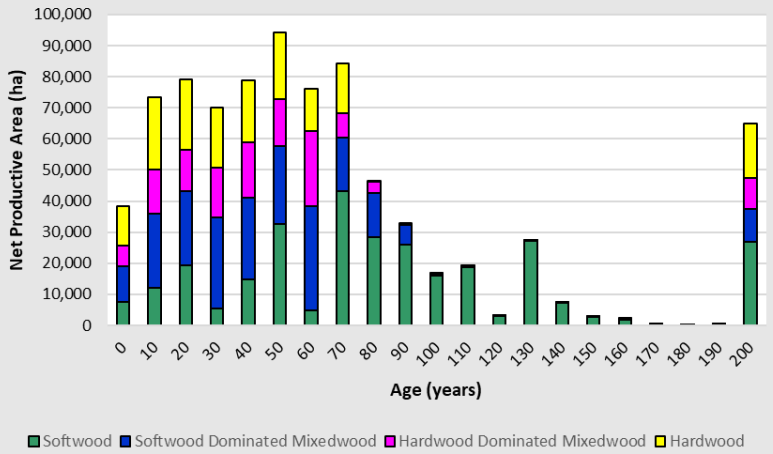
Age (years)	Softwood	Softwood Dominated Mixedwood	Hardwood Dominated Mixedwood	Hardwood	Total Area (ha)
1-40	125,894	47,704	33,650	93,554	**300,801**
41-70	94,474	68,444	39,661	96,675	**299,253**
71-100	55,585	21,291	20,548	36,977	**134,400**
101+	35,470	9503.5	10,029	27,827	**82,829**
Total Area (ha)	**311,422**	**146,942**	**103,887**	**255,032**	**817,284**

TABLE 6.7: MISTIK AGE CLASS DISTRIBUTION BY SPECIES GROUP FOR THE OPERABLE AREA: YEAR 100 AND YEAR 200

Year 100



Year 200



Current Forest Tabular Summary

Age (years)	Softwood	Softwood Dominated Mixedwood	Hardwood Dominated Mixedwood	Hardwood	Total Area (ha)
1-40	75,868	90,165	53,346	78,150	**297,528**
41-70	103,984	48,619	32,592	81,234	**266,428**
71-100	67,357	31,230	17,542	41,239	**157,366**
101+	55,832	12,207	10,104	17,819	**95,962**
Total Area (ha)	**303,040**	**182,220**	**113,583**	**218,441**	**817,284**

Year 10 Tabular Summary

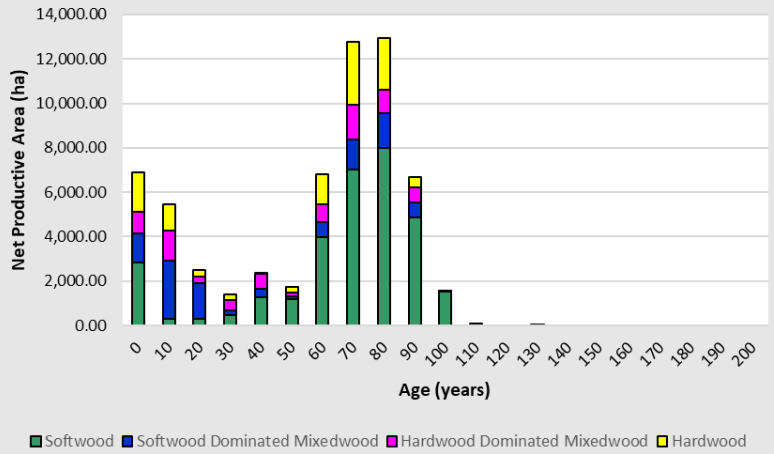
Age (years)	Softwood	Softwood Dominated Mixedwood	Hardwood Dominated Mixedwood	Hardwood	Total Area (ha)
1-40	44,091	88,849	50,044	78,406	**261,390**
41-70	52,281	84,867	57,344	54,793	**249,285**
71-100	97,658	37,865	11,383	16,062	**162,968**
101+	104,448	11380.5	10,148	17,663	**143,639**
Total Area (ha)	**298,477**	**222,962**	**128,919**	**166,925**	**817,284**

TABLE 6.8: MISTIK SMS OPERABLE AREA BY SPECIES GROUP

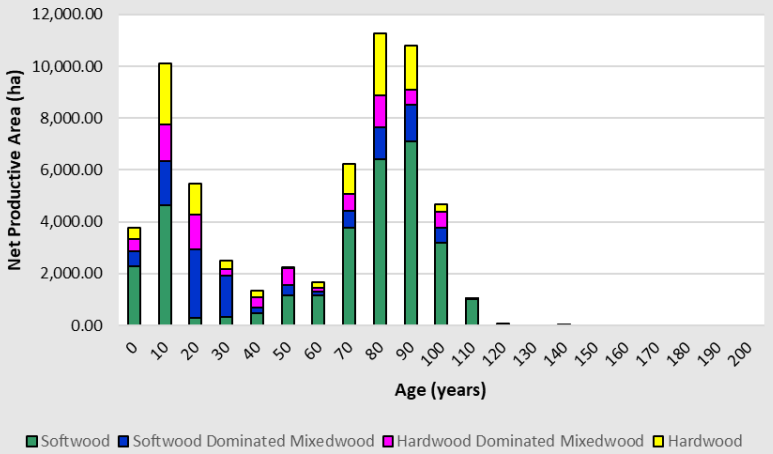
Species Group	Time Period Area (ha)					
	Current Forest	Year 10	Year 20	Year 50	Year 100	Year 200
Softwood	54,651	67,051	103,279	54,925	80,283	112,207
Softwood Dominated Mixedwood	6,045	6,243	16,749	16,086	24,241	22,141
Hardwood Dominated Mixedwood	12,881	11,810	25,087	10,004	4,069	5,420
Hardwood	88,670	109,855	147,797	66,553	45,218	17,219
Total Area (ha)	**162,247**	**194,959**	**292,912**	**147,568**	**153,811**	**156,987**

TABLE 6.9: L&M AGE CLASS DISTRIBUTION BY SPECIES GROUP FOR THE OPERABLE AREA: CURRENT AND YEAR 10

Current Forest



Year 10



Current Forest Tabular Summary

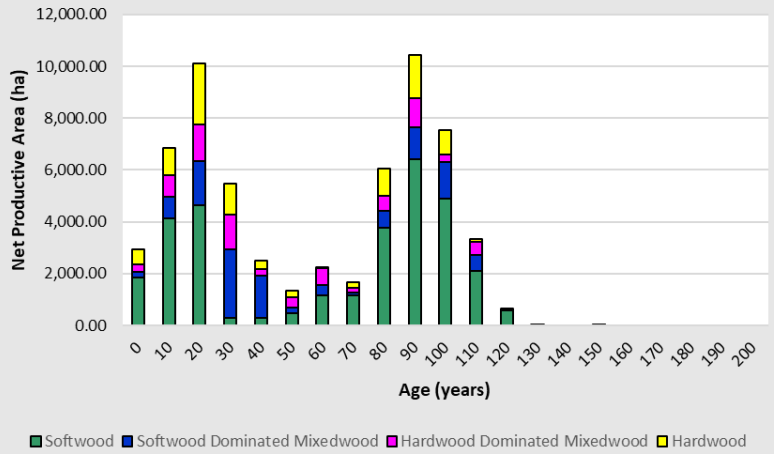
Age (years)	Softwood	Softwood Dominated Mixedwood	Hardwood Dominated Mixedwood	Hardwood	Total Area (ha)
1-40	3,920	5,753	3,028	3,577	**16,277**
41-70	6,405	1,203	1,662	1,627	**10,897**
71-100	19,876	3,618	3,314	5,557	**32,364**
101+	1,635	27	5	21	**1,688**
Total Area (ha)	**31,836**	**10,600**	**8,009**	**10,781**	**61,226**

Year 10 Tabular Summary

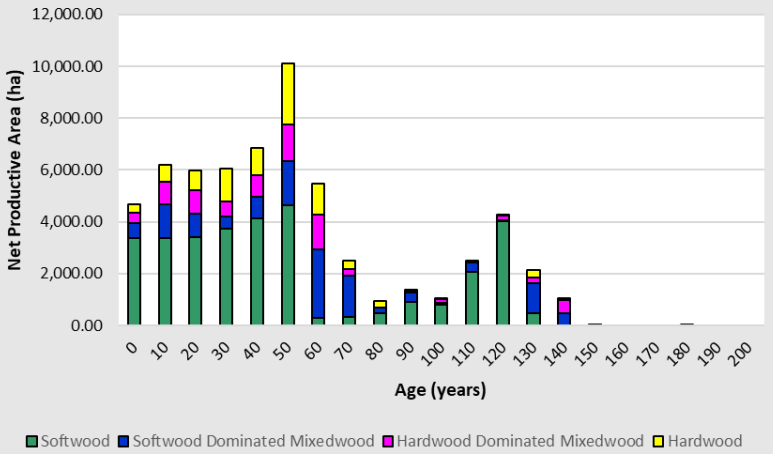
Age (years)	Softwood	Softwood Dominated Mixedwood	Hardwood Dominated Mixedwood	Hardwood	Total Area (ha)
1-40	7,505	6,535	3,506	4,292	**21,838**
41-70	2,804	721	1,231	499	**5,254**
71-100	17,291	3,290	2,433	5,312	**28,326**
101+	4,250	621.4	627	309	**5,807**
Total Area (ha)	**31,849**	**11,168**	**7,797**	**10,412**	**61,226**

TABLE 6.10: L&M AGE CLASS DISTRIBUTION BY SPECIES GROUP FOR THE OPERABLE AREA: YEAR 20 AND YEAR 50

Year 20



Year 50



Current Forest Tabular Summary

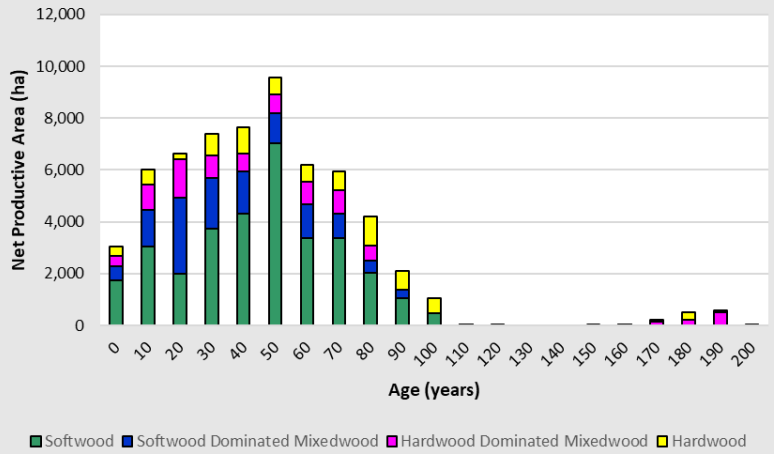
Age (years)	Softwood	Softwood Dominated Mixedwood	Hardwood Dominated Mixedwood	Hardwood	Total Area (ha)
1-40	10,889	5,436	3,853	5,225	**25,403**
41-70	1,953	2,206	1,317	612	**6,088**
71-100	11,364	1,999	1,887	2,907	**18,157**
101+	7,645	2,041	799	1,094	**11,578**
Total Area (ha)	**31,849**	**11,683**	**7,855**	**9,838**	**61,226**

Year 10 Tabular Summary

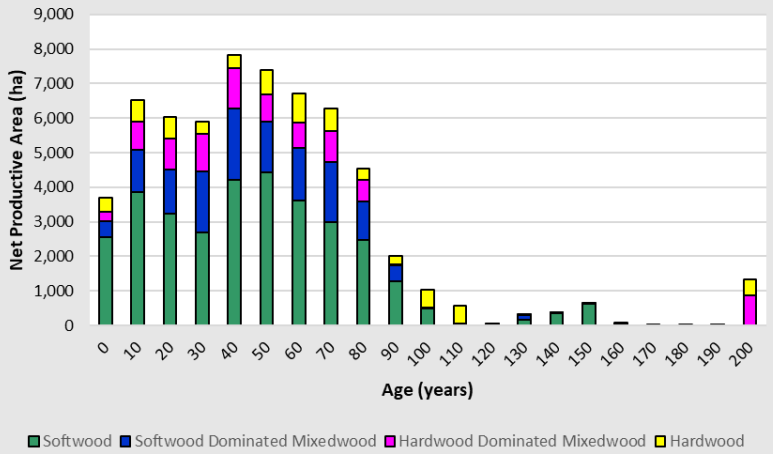
Age (years)	Softwood	Softwood Dominated Mixedwood	Hardwood Dominated Mixedwood	Hardwood	Total Area (ha)
1-40	13,850	3,298	2,764	3,009	**22,920**
41-70	9,054	5,199	3,552	4,645	**22,449**
71-100	1,702	2,187	337	570	**4,796**
101+	7,392	2087.9	1,028	553	**11,061**
Total Area (ha)	**31,997**	**12,772**	**7,680**	**8,777**	**61,226**

TABLE 6.11: L&M AGE CLASS DISTRIBUTION BY SPECIES GROUP FOR THE OPERABLE AREA: YEAR 100 AND YEAR 200

Year 100



Year 200



Current Forest Tabular Summary

Age (years)	Softwood	Softwood Dominated Mixedwood	Hardwood Dominated Mixedwood	Hardwood	Total Area (ha)
1-40	10,549	6,817	3,733	1,985	**23,083**
41-70	14,737	4,076	2,252	2,381	**23,447**
71-100	6,484	1,699	1,512	2,563	**12,258**
101+	459	7	884	1,088	**2,438**
Total Area (ha)	**32,229**	**12,600**	**8,381**	**8,016**	**61,226**

Year 10 Tabular Summary

Age (years)	Softwood	Softwood Dominated Mixedwood	Hardwood Dominated Mixedwood	Hardwood	Total Area (ha)
1-40	12,362	4,726	3,054	2,010	**22,152**
41-70	12,243	5,065	2,680	1,938	**21,926**
71-100	6,732	3,352	1,501	1,260	**12,844**
101+	1,706	201.6	888	1,508	**4,303**
Total Area (ha)	**33,043**	**13,345**	**8,123**	**6,715**	**61,226**

TABLE 6.12: L&M SMS OPERABLE AREA BY SPECIES GROUP

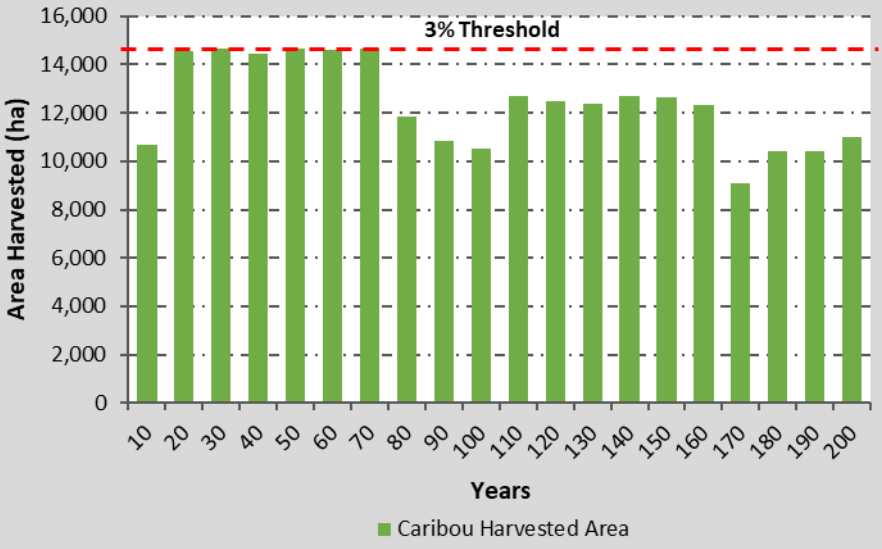
Species Group	Time Period Area (ha)					
	Current Forest	Year 10	Year 20	Year 50	Year 100	Year 200
Softwood	11,795	12,820	13,064	12,144	5,976	7,400
Softwood Dominated Mixedwood	1,970	2,500	3,614	3,171	457	680
Hardwood Dominated Mixedwood	2,081	2,343	2,856	653	690	438
Hardwood	4,255	4,659	4,771	841	3,561	2,424
Total Area (ha)	**20,101**	**22,322**	**24,305**	**16,810**	**10,684**	**10,943**

6.5. WOODLAND CARIBOU ANALYSIS

One of the targets that was utilized within the model is the total harvested area within the 2006 caribou ranges. Within a ten-year period, the total area harvested will not exceed 3% of the total area of all woodland caribou ranges combined. The following figure displays the results of the selected management strategy against the 3% target.

FIGURE 6.3: CARIBOU RANGE HARVEST

Area (ha)		Percent
Caribou Range	Average Harvest per Decade	
486,469	12,372	3%



6.6. PIECE SIZE ANALYSIS

Analysis was completed to identify a piece size profile of the Selected Management Strategy 20-Year harvest sequence. The next four pages display the estimated piece size profile for the 20-year harvest sequence by 5-year period. Appendix D displays the 20-year estimated piece size of the sequence by development type. This analysis was completed using the cruising strata estimates derived from the Mistik Volume Sampling Program. Only plots that contributed to the development of the yield curves were used to determine the strata estimates. To provide better estimates at a development type resolution, some cruise stratums were further refined, including:

- Development productivity class and significant softwood identifiers were added to the hardwood stratums;
- Development productivity class was added to the softwood jack pine development types;
- Mixedwood cruise stratums were redefined as hardwood/softwood or softwood/hardwood;
- Finally, the mixedwood cruise stratums were also assigned a leading conifer of either jack pine or white spruce.

7. NATURAL FOREST PATTERNS

Natural Forest Patterns (NFP) are the natural patterns created across the forest landscape. The NFPs that were analysed within the FMP were based on both processes from the previous FMP developed by David Andison and from the planning standard.

7.1. EVENT SIZE

Harvest event size is the overall disturbance size of harvest events. The purpose of harvest event size targets is to emulate the natural disturbance size distribution across the landscape. The process to determine the range of variation of the natural and anthropogenic disturbance size distribution for the landscape is determined by the process developed by David Andison (Andison 2005, 2006a and 2006b).

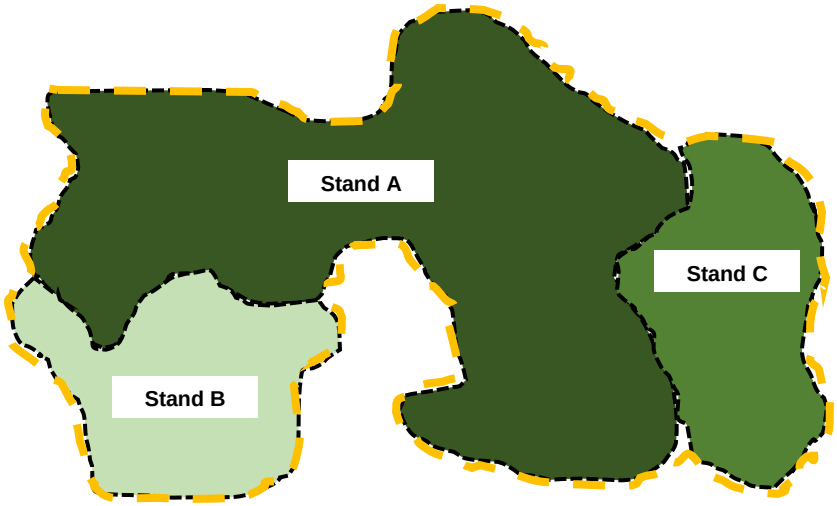


FIGURE 7.1: COMBINING ADJACENT STANDS INTO A SINGLE EVENT PATCH

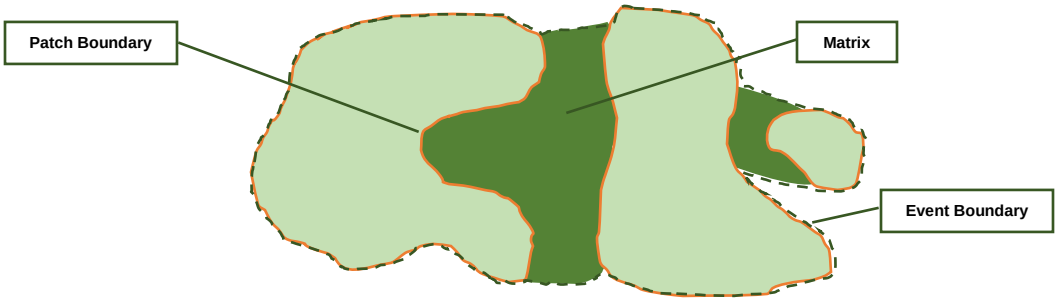


FIGURE 7.2: CLUSTERING OF PATCHES INTO A COMMON EVENT

The event size distribution for the SMS is summarized by the planning standard classes in Table 7.1 and Table 7.2 below.

TABLE 7.1: EVENT SIZE DISTRIBUTION FOR THE SELECTED MANAGEMENT STRATEGY IN YEARS 1-5

Event Size Classes	Size Range (ha)	Events	
		Number	Area (ha)
Small	0-100	1018	20,050
Medium	101-1500	143	40,654
Large	1501-3500	5	9,552
Very Large	3500-8000	2	11,491
Extremely Large	>8000	0	0
Total		***1,168***	***81,747***

Event Size Distribution

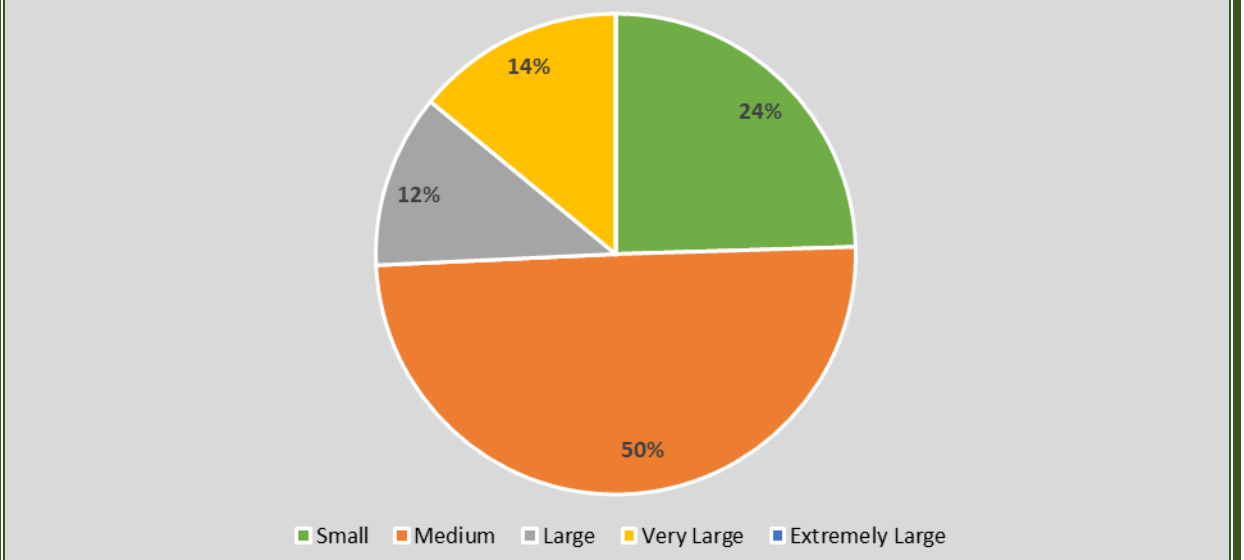
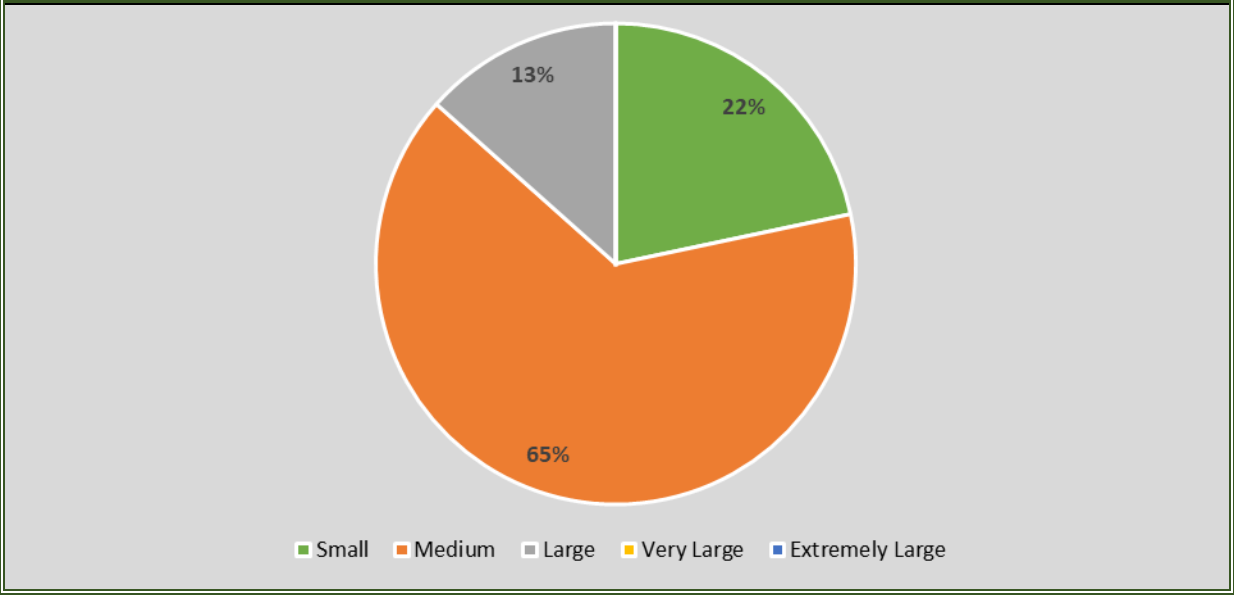


TABLE 7.2: EVENT SIZE DISTRIBUTION FOR THE SELECTED MANAGEMENT STRATEGY IN YEARS 6-10

Event Size Classes	Size Range (ha)	Events	
		Number	Area (ha)
Small	0-100	1047	16,123
Medium	101-1500	130	48,256
Large	1501-3500	5	9,990
Very Large	3500-8000	0	0
Extremely Large	>8000	0	0
Total		***1,182***	***74,369***

Event Size Distribution



As described above in section 3.10.3, the target for event size is that over the next 10 years, at least 25% of all harvested areas will create disturbance events at least 1,000 ha in size. The table below displays the area and percent of event sizes less and greater than 1,000 ha in size.

TABLE 7.3: EVENT SIZE SUMMARY YEARS 1-10

Event Size Classes	Area (ha)	Percent (%)
Under 1,000 ha	50,053	67%
Over 1,000 ha	24,315	33%
Total	**74,369**	**100%**

7.2. SERAL STAGE

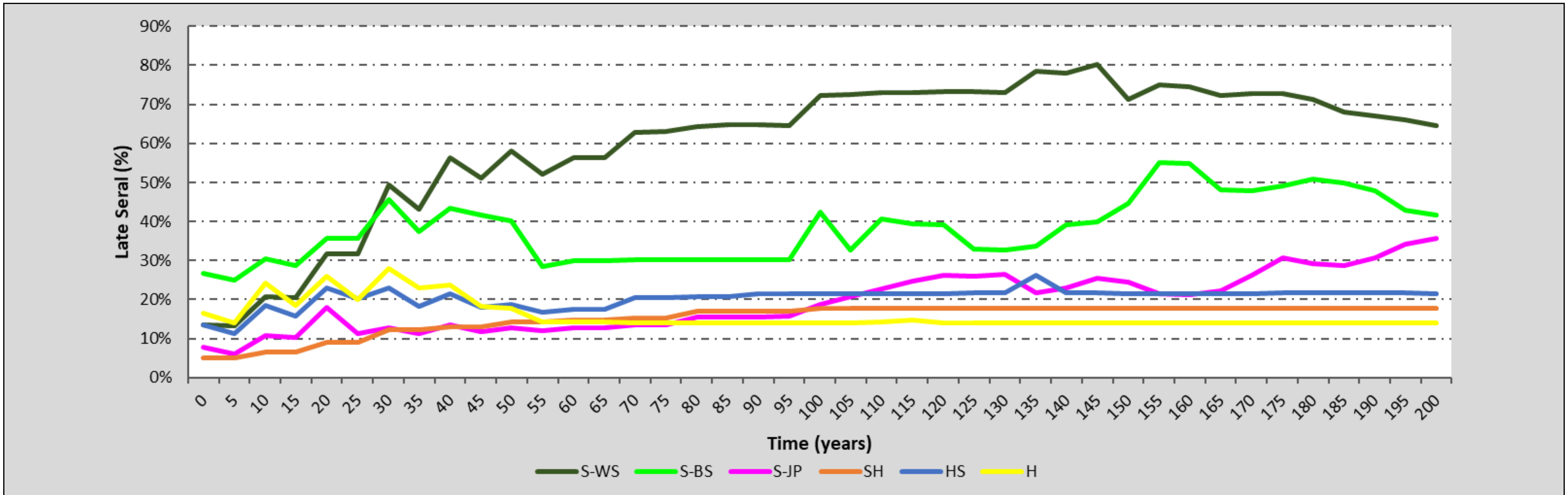
As mentioned above, the seral stage strategy developed for the Mistik FMP area and implemented in the Selected Management Strategy focuses on the retention of sufficient, effective, and high quality late seral stage (old + very old) stands across the entire landbase. The strategy affects two main VOITs (VOITs 1.1.1.1 (2a) and 1.1.1.1 (2b)). These VOITs maintain specific targeted area of old and very old forested area described in section 3.10.1.

Reporting carried out on the Selected Management Strategy late seral stage retention strategy includes:

- The productive area in late seral stage trend over the entire planning horizon for each cover group: Table 7.4;

The operable and eligible non-operable productive late seral stage area by age class and cover group over the entire planning horizon: Table 7.5.

TABLE 7.4: SELECTED MANAGEMENT STRATEGY LATE SERAL STAGE PRODUCTIVE AREA RETENTION AMOUNTS

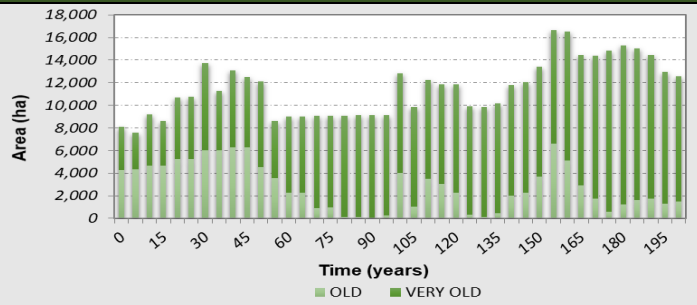


Late Seral Retention Analysis Group	Late Seral Stage (%) in Productive Area by 5 Year Harvest Period																																							
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200
S-WS	14	13	21	21	32	32	49	43	56	51	58	52	56	56	63	63	64	65	65	65	72	73	73	73	73	73	73	78	78	80	71	75	75	72	73	73	71	68	67	66	65
S-BS	27	25	31	29	36	36	46	38	43	42	40	29	30	30	30	30	30	30	30	30	42	33	41	39	39	33	33	34	39	40	45	55	55	48	48	49	51	50	48	43	42
S-JP	8	6	11	10	18	11	13	11	14	12	13	12	13	13	14	14	15	16	16	16	19	21	23	25	26	26	27	22	23	25	24	21	21	22	26	31	29	29	31	34	36
SH	5	5	7	7	9	9	12	12	13	13	14	14	15	15	15	15	17	17	17	17	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
HS	14	11	18	16	23	20	23	18	21	18	19	17	18	18	20	20	21	21	21	21	22	22	22	22	22	22	22	26	22	22	22	22	22	22	22	22	22	22	22	22	22
H	16	14	24	19	26	20	28	23	24	18	18	14	14	14	14	14	14	14	14	14	14	14	14	15	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14

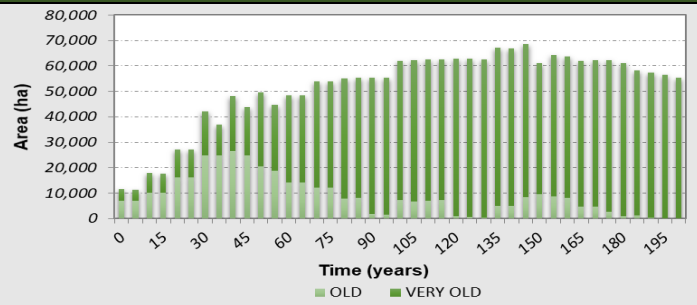
*Note: Green shading indicates that late seral threshold has been met.

TABLE 7.5: SELECTED MANAGEMENT STRATEGY OLD AND VERY OLD AREA RETENTION AMOUNTS

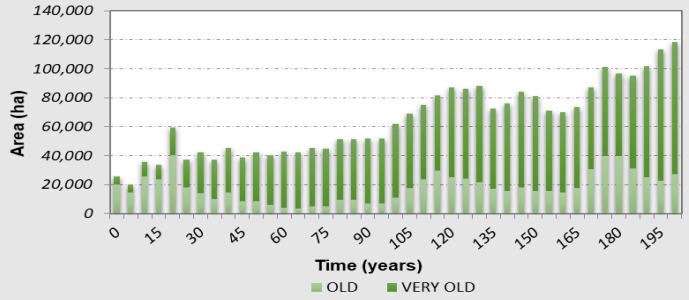
S-WS



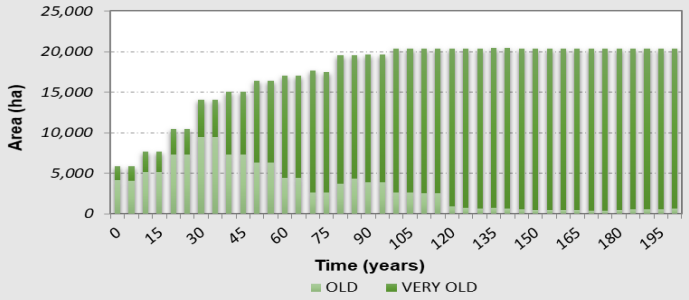
S-BS



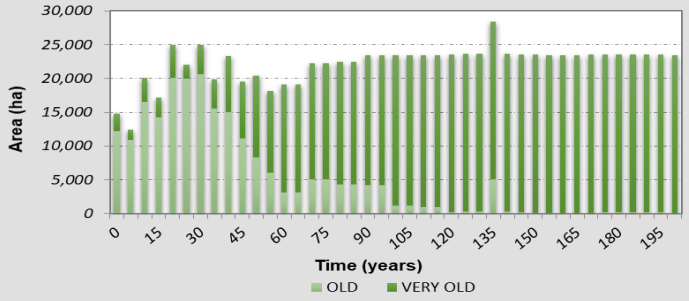
S-JP



SH



HS



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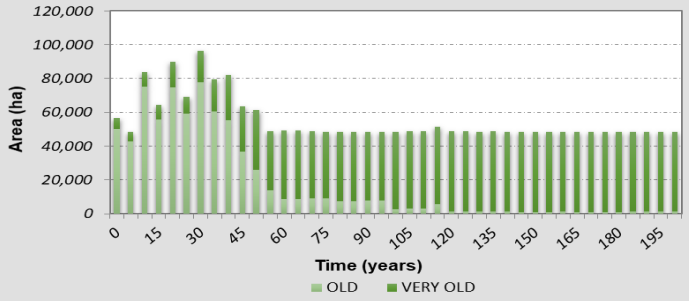


7.3. INTERIOR OLD FOREST

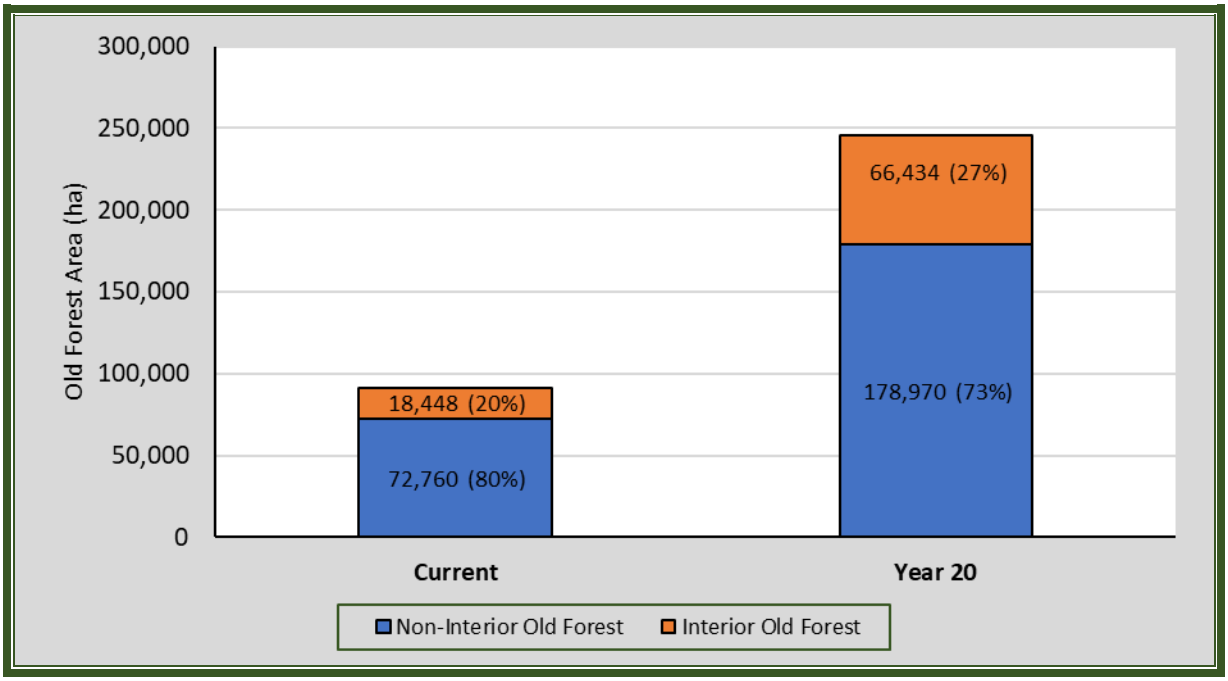
The interior old forest strategy for FMA area ensures that a minimum of 20% of the old and very old forest stands in each species group will be in the interior forest condition.

Interior old forest is determined using the following process:

- Total old + very old stands are dissolved into contiguous polygons;
- "Edge effect buffer zones" for the old + very old stands are calculated:
  - 60 meters, where the adjacent area is non-forested or a forested stand that is less than 40 years old;
  - 30 meters, where the adjacent forest stand is ≥ 40 years and younger than mature forest (described in Table 3.9); and
  - Zero meters where the adjacent stand is mature, old or very old forest;
- The "edge effect buffer zones" are deducted from the old + very old polygons; and
- The species attributes are assigned back to the old + very old polygons with their interior forest attributes.

The figure below displays the current interior old forest and the amount of interior old forest at the end of the plan (year 20). Currently there is 20% interior old forest and by year 20 there is 27% interior old forest (Figure 7.3).

FIGURE 7.3: CURRENT AND YEAR 20 INTERIOR OLD FOREST



7.4. RETENTION

As previously mentioned, the retention is being applied as an HVS adjustment (6-9%, section 3.10.2 and 6.3.2). Table 6.3 outlines the modeled HVS for softwood and hardwood from the SMS in both the Mistik and L&M FMAs along with the adjusted HVS ranges.

7.5. OLD FOREST PATCH SIZE

As previously mentioned, the old forest patch size targets were developed using Dr. David Andison's "Pre-Industrial Forest Condition Analysis" (Andison, 2007). There are three targets for old forest patch size based on the Andison analysis. These targets include:

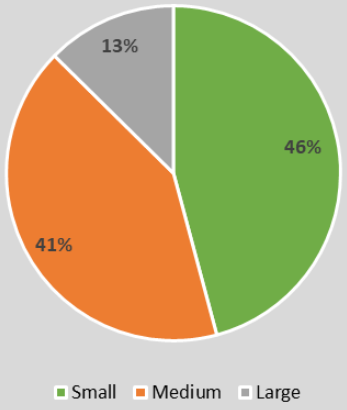
1. Large Old forest Patches:
    a. Maintain the number of old forest patches larger than 500 ha on the Mistik FMA at three or greater over the next 10 years.
2. Small Old forest Patches:
    a. The proportion of old forest area in patches smaller than 50 ha should be between 60-75% over the next ten years.
3. Operable forest in Large Old forest Patches:
    a. For the next 10 years, the proportion of operable forest in each of the five largest old forest patches shall not be less than 20%.

The results of the current old forest patch size and the old forest patch size based on the first 10 years of proposed harvesting are displayed in Table 7.6 below.

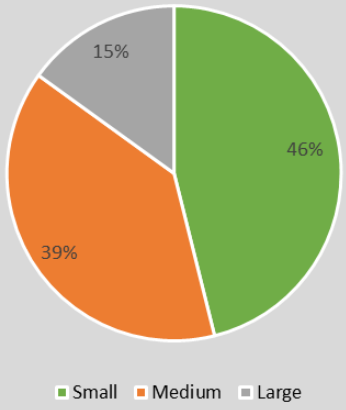
TABLE 7.6: OLD FOREST PATCH SIZE DISTRIBUTION FOR THE SELECTED MANAGEMENT STRATEGY

Current				Year 10			
Patch Size Classes	Size Range (ha)	Number		Patch Size Classes	Size Range (ha)	Number	
		Number	Area			Number	Area
Small	0-50	12,493	56,489	Small	0-50	23,527	80,654
Medium	50-500	424	51,217	Medium	50-500	558	67,961
Large	500+	14	15,556	Large	500+	32	26,326
Total		***12,931***	***123,262***	***Total***		***24,117***	***174,941***

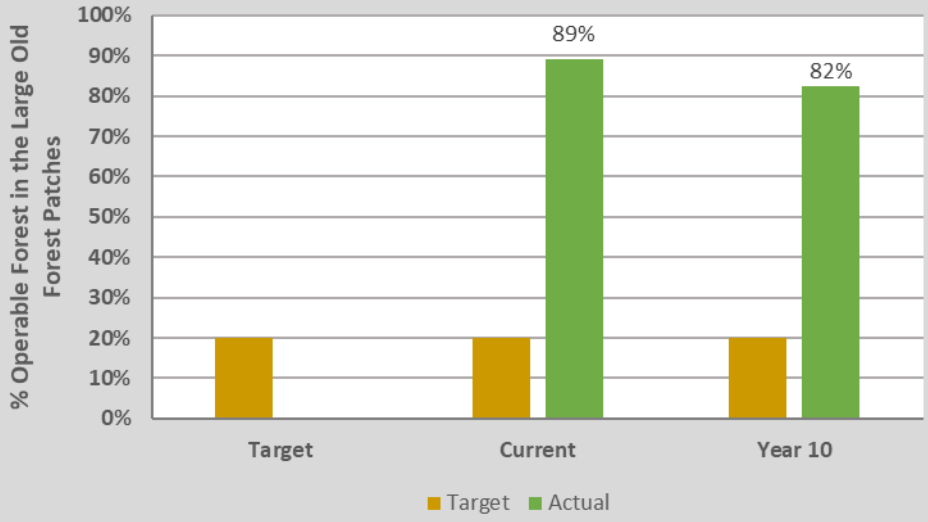
Patch Size Distribution



Patch Size Distribution



Operable Old Forest in Large Patches



8. SALVAGE HARVESTING

If there is a natural disturbance event within either of the FMAs salvage harvest activities will follow the following guidelines to ensure that a portion of the harvested area remains in an unsalvaged state. This section describes Mistik's plans in the potential case of salvage harvesting but it should be noted that salvage harvesting was not included in the model.

8.1. SALVAGE HARVEST TIMING

All salvage harvesting activities will occur within two operating years of the date on which the natural disturbance occurred, unless otherwise approved in an operating plan.

8.2. SALVAGE HARVEST RETENTION CRITERIA

At a minimum, within each salvage harvest event there will be a single contiguous area covering at least 20% of the disturbance area that will be retained from harvesting activities. This retained area will be:

- Free of roads, trails and skid trails; and
- Be composed of tree species representative of the merchantable timber burned or damaged.

8.2.1. RETENTION ARRANGEMENT

For safety concerns, residuals shall be left in clumps, islands and proximal retention. As mentioned above, a single contiguous area covering at least 20% of the disturbance area shall be retained unless an alternate spatial arrangement is approved by the Forest Service Branch. The alternate spatial arrangements may:

- Be comprised of multiple discrete areas adding up to 20% of the disturbance area; and
- Vary from tree residual targets, for reasons of forest health.

8.2.2. LIVE TREE RETENTION

During salvage harvest events there will be efforts to utilize live tree retention criteria to promote the ecological integrity of regenerating stands. If there are not live trees available for retention burned or damaged trees will be used to meet the retention targets.

APPENDIX A: ROTATION AGE ANALYSIS

ROTATION AGE ANALYSIS

Development Type	Strata Area (ha)	Mistik Suggested Rotation Age		Calculated Rotation Age			Literature Suggested Rotation Age								
		Minimum Age	Target Age	Peak MAI Age	Total Area Weighted Rotation Age	Area Weighted by Species Group Rotation Age	Reference 1 Rotation Age	Reference 2 Rotation Age	Reference 3 Rotation Age	Reference 4 Rotation Age	Reference 5 Rotation Age	Reference 6 Rotation Age	Reference 7 Rotation Age	Reference 8 Rotation Age	Reference 9 Rotation Age
1-S-WS-A-A	24,446	100	120	90	70	70	70-110	N/A	N/A	90	70-80	N/A	80	70-80	N/A
2-S-BS-A-A	23,672	100	120	60	70	70	80-130	N/A	N/A	N/A	95-132	60-120	80	75-129	60-80
3-S-JP-LD-A-1	95,057	70	80	80	70	70	50-90	N/A	N/A	N/A	60-80	N/A	80	67-77	N/A
4-S-JP-LD-A-2	30,770	70	80	80	70	70	50-90	N/A	N/A	N/A	60-80	N/A	80	67-77	N/A
5-S-JP-HD-A-1	101,989	70	80	70	70	70	50-90	N/A	N/A	N/A	60-80	N/A	80	67-77	N/A
6-S-JP-HD-A-2	62,570	70	80	70	70	70	50-90	N/A	N/A	N/A	60-80	N/A	80	67-77	N/A
7-S-JP-L&M	17,962	70	80	70	70	70	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8-SH-JP-A-A	41,834	80	90	70	70	70	50-90	N/A	N/A	N/A	60-80	N/A	80	67-77	N/A
9-SH-WS-A-A	28,780	90	100	50	70	70	70-110	N/A	N/A	90	70-80	N/A	80	70-80	N/A
10-HS-WS-A-A	46,271	80	90	60	70	60	50-90	40-60	60	N/A	N/A	45-60	60	65-77	50-65
11-HS-JP-A-A	39,573	80	90	50	70	60	50-90	40-60	60	N/A	N/A	45-60	60	65-77	50-65
12-H-A-LD-A-1	17,845	70	80	70	70	60	50-90	40-60	60	60	N/A	45-60	60	65-77	50-65
13-H-A-LD-A-2	30,323	70	80	70	70	60	50-90	40-60	60	60	N/A	45-60	60	65-77	50-65
14-H-A-HD-A-1	63,166	70	80	70	70	60	50-90	40-60	60	60	N/A	45-60	60	65-77	50-65
15-H-A-HD-A-2	129,451	70	80	60	70	60	50-90	40-60	60	60	N/A	45-60	60	65-77	50-65
16-H(S)-A-LD-A	31,872	70	80	50	70	60	50-90	40-60	60	60	N/A	45-60	60	65-77	50-65
17-H(S)-A-HD-A	50,199	70	80	60	70	60	50-90	40-60	60	60	N/A	45-60	60	65-77	50-65

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APPENDIX B: DEVELOPMENT TYPE TRANSITIONS

SILVICULTURE GROUND RULES

Saskatchewan Provincial Forest Type	Mistik Forest Development Type and Yield Curve[1]	Current Landbase Area (ha)	Minimum Harvest Age (yrs)	Transition Assumptions
WSF *(SGR 1)*	#1 (S-White spruce)	23,016	80	#1 = 100%
BS *(SGR 2)*	#2 (S-Black spruce)	34,594	100	#1 = 10% #2 = 90%
JP *(SGR 3)*	#3 (S-Jack pine) Low Density Low Productivity	94,548	80	#3 = 35% #5 = 55% #8 = 10%
	#4 (S-Jack pine) Low Density High Productivity	29,871	80	#4 = 35% #6 = 55% #8 = 10%
	#5 (S-Jack pine) High Density Low Productivity	101,108	80	#5 = 90% #8 = 10%
	#6 (S-Jack pine) High Density High Productivity	57,705	80	#6 = 90% #8 = 10%
	#7 (S-Jack pine) L&M Jack pine	17,962	80	#7 = 100%
PMW *(SGR 4)*	#8 (SH - Jack pine mixedwood)	54,045	100	#8 = 65% #9 = 10% #11 = 20% #17 = 5%

SILVICULTURE GROUND RULES

Saskatchewan Provincial Forest Type	Mistik Forest Development Type and Yield Curve[1]	Current Landbase Area (ha)	Minimum Harvest Age (yrs)	Transition Assumptions
SMW *(SGR 5)*	#9 (SH - Spruce mixedwood)	51,773	120	#1 = 10% #9 = 70% #10 = 20%
HSM *(SGR 6)*	#10 (HS - Hardwood w/ spruce)	54,377	100	#9 = 40% #10 = 60%
HPM *(SGR 7)*	#11 (HS - Hardwood w/ jack pine)	42,185	100	#8 = 20% #9 = 20% #10 = 20% #11 = 30% #17 = 10%
TAB *(SGR 8)*	#12 (H – Hardwood) Low Density Low Productivity	17,195	80	#9 = 15% #10 = 15% #12 = 5% #14 = 65%
	#13 (H – Hardwood) Low Density High Productivity	28,607	80	#9 = 15% #10 = 15% #13 = 5% #15 = 65%
	#14 (H – Hardwood) High Density Low Productivity	64,239	80	#9 = 15% #10 = 15% #12 = 5% #14 = 65%
	#15 (H – Hardwood) High Density High Productivity	128,017	80	#9 = 5% #10 = 5% #15 = 90%

SILVICULTURE GROUND RULES

Saskatchewan Provincial Forest Type	Mistik Forest Development Type and Yield Curve[1]	Current Landbase Area (ha)	Minimum Harvest Age (yrs)	Transition Assumptions
	#16 (H – Hardwood) Significant Softwood Incidental Low Density	31,104	80	#9 = 35% #10 = 35% #17 = 30%
	#17 (H – Hardwood) Significant Softwood Incidental High Density	48,164	80	#9 = 25% #10 = 25% #17 = 50%

APPENDIX C: SERAL STAGE MAINTENANCE STRATEGY

This appendix describes the strategy, developed in consultation with the FMP planning team, to address the maintenance of late seral stage on the Mistik FMA area.

STRATEGY DETAILS

Four main items form the basis of this strategy:

1. The defining features of a late seral stage stand.

Stand structure is the key indicator that identifies when a stand has progressed into a late seral stage. Late seral stage structure includes both vertical and horizontal characteristics in the stand. Some of the defining structural features include multi-layered canopies, large snags and coarse woody debris, gaps in the canopy and anti-gaps (areas of extreme density), large living trees and thickets of understorey vegetation. Although stand age is an indicator of late seral stage, it functions primarily as a proxy measure of the onset of late seral stage characteristics.

Late Seral Stage is defined in the Mistik FMP using the following age indicators:

- 90 Years - Hardwood
- 90 Years – Mixedwood
- 100 Years - Softwood

2. The defining features of high quality late seral stage.

Key characteristics associated with quality include (ranked in order of priority):

- Size of the stand (larger provides more interior)
- Stand complexity
- Stand height
- Stands in the caribou range, high conservation value forest areas, and intact forest area
- Local knowledge designated

Each of the listed quality indicators have “quality points” attached to them. The “quality points” of all the quality indicators are added up and the stands with the highest score are selected for retention. Example:

- If stand area is greater than 4 ha and less than 64 – score = 1
- If stand area is greater than 64 ha and less than 100 – score = 3
- If stand area is greater than 100 ha and less than 300 – score = 5

3. The portions of the landbase to be included in the strategy.

Late seral stage maintenance is a landscape feature that includes all portions of the forested landbase. As was identified by the FMP planning team, the strategy developed for the wood supply analysis includes the entire forested landbase and has a target for retention for both

productive and eligible non-operable forest types (Figure C.1 Identification of eligible stands for late seral retention

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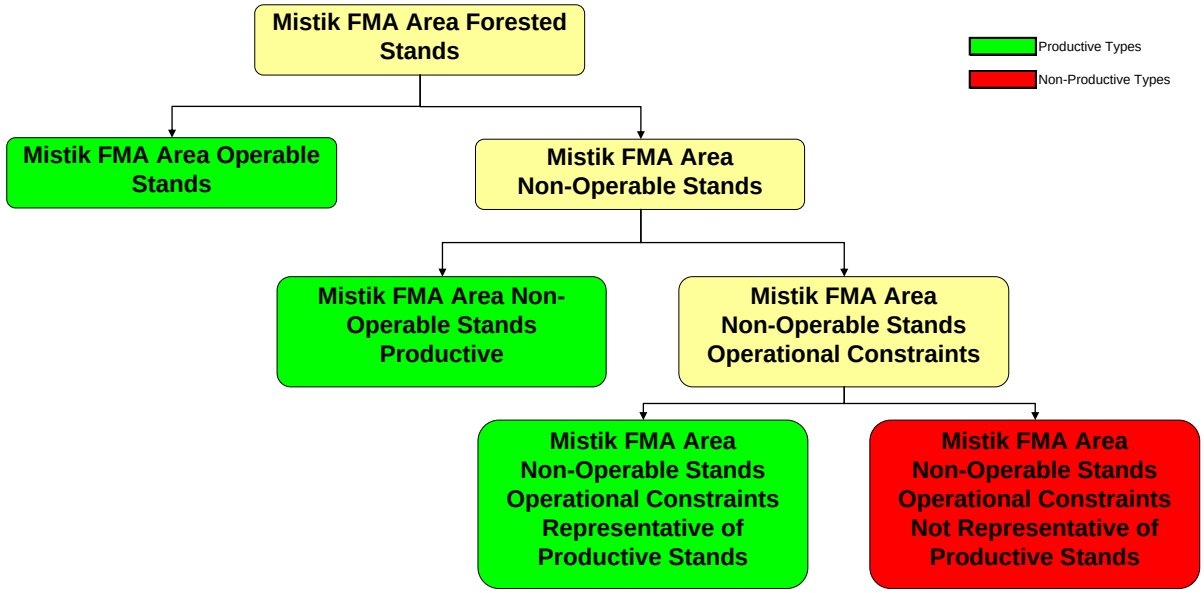

FIGURE C.1 IDENTIFICATION OF ELIGIBLE STANDS FOR LATE SERAL RETENTION

4. What amount of late seral stage should be maintained?

As per David Andison's seral stage analysis[18], the targeted retention of the productive forest areas is as follows:

- 5% - Jack Pine Softwood = 16,565 ha (of which 1,657 ha is very old),
- 5% - Black Spruce Softwood = 4,284 ha (of which 428 ha is very old),
- 9% - White Spruce Softwood = 2,713 ha (of which 271 ha is very old),
- 10% - Softwood Dominated Mixedwood = 11,474 ha (of which 1,147 ha is very old),
- 10% - Hardwood Dominated Mixedwood = 10,894 ha (of which 1,089 ha is very old),
- 14% - Deciduous Types = 48,505 ha (of which 4,850 ha is very old)
- Total targeted late seral stage forest retention in productive forest types is ~94,000 ha.
- ~620,000 ha of late seral stage forest will be produced by the Non-Productive Types.

Combined this accounts at least 714,000 ha of forested land that will be managed for late seral stage.

[18] Andison, D.W. 2006. Natural levels of forest seral-stage variability on the Mistik Management Ltd. FMA Area in Saskatchewan. Bandaloop Landscape-Ecosystem Services. Vancouver, BC.

APPENDIX D: PIECE SIZE ANALYSIS

This appendix displays the 20-year harvest sequence piece size analysis for the Selected Management Strategy by development type.

FIGURE D.1 PIECE SIZE DEVELOPMENT TYPE 1: S-WS-A-A

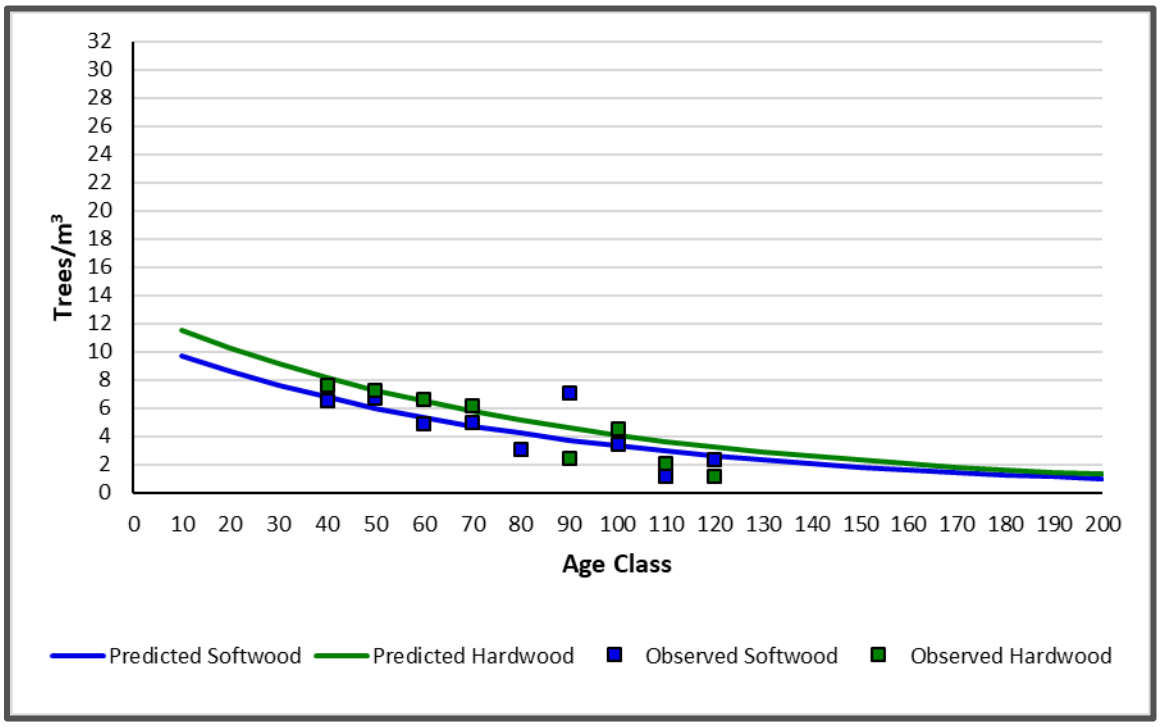

TABLE D.1: PIECE SIZE DEVELOPMENT TYPE 1: S-WS-A-A

Development Type Coefficients	a	b	c	d	t
Softwood	1.090936E+01	1.193618E-02			
Hardwood	1.293250E+01	1.154863E-02			

Age Class (yrs)	Observed Average Piece Size (trees/m³)		Predicted Piece Size (trees/m³)		Predicted Piece Size (m³/tree)	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
10			9.6819	11.5220	0.1033	0.0868
20			8.5926	10.2653	0.1164	0.0974
30			7.6258	9.1457	0.1311	0.1093
40	6.5028	7.6113	6.7678	8.1482	0.1478	0.1227
50	6.6492	7.2667	6.0063	7.2595	0.1665	0.1378
60	4.9088	6.6039	5.3305	6.4677	0.1876	0.1546
70	4.9646	6.1820	4.7308	5.7623	0.2114	0.1735
80	3.0565		4.1985	5.1338	0.2382	0.1948
90	7.0451	2.4225	3.7261	4.5739	0.2684	0.2186
100	3.4554	4.4692	3.3069	4.0750	0.3024	0.2454
110	1.1858	2.0357	2.9348	3.6306	0.3407	0.2754
120	2.3276	1.1445	2.6046	3.2346	0.3839	0.3092
130			2.3115	2.8818	0.4326	0.3470
140			2.0515	2.5675	0.4875	0.3895
150			1.8207	2.2875	0.5493	0.4372
160			1.6158	2.0380	0.6189	0.4907
170			1.4340	1.8157	0.6973	0.5507
180			1.2727	1.6177	0.7858	0.6182
190			1.1295	1.4412	0.8854	0.6938
200			1.0024	1.2840	0.9976	0.7788

FIGURE D.2 PIECE SIZE DEVELOPMENT TYPE 2: S-BS-A-A

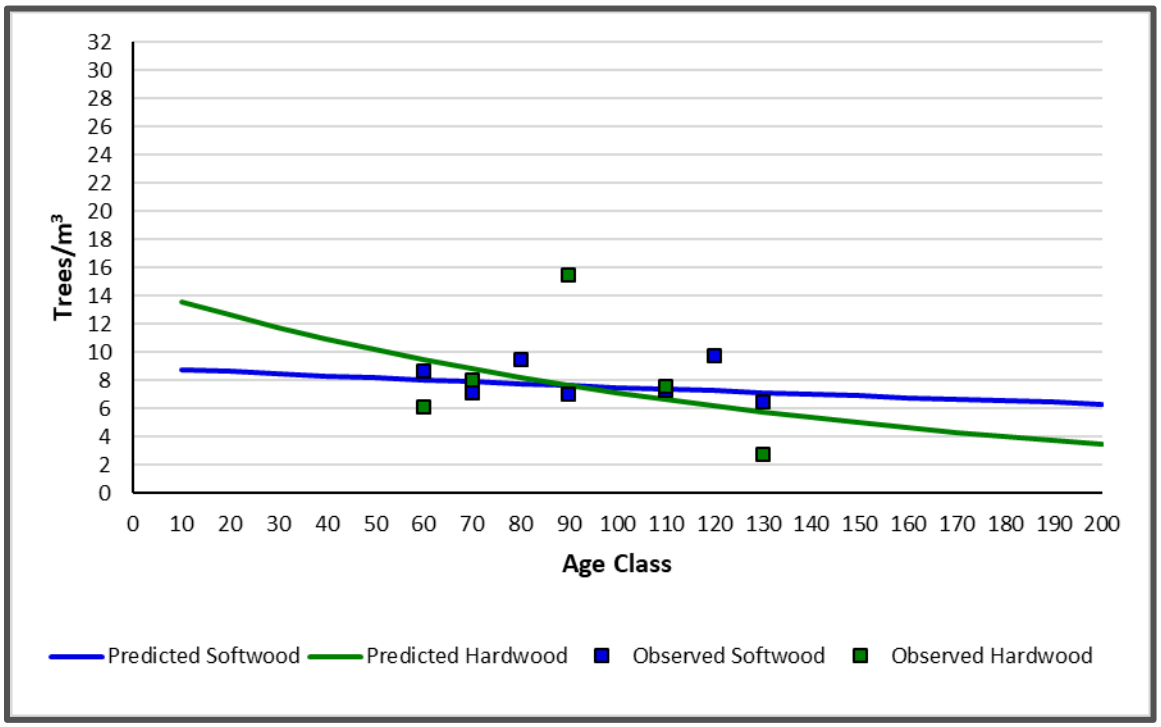

TABLE D.2: PIECE SIZE DEVELOPMENT TYPE 2: S-BS-A-A

Development Type Coefficients	a	b	c	d	t
Softwood	8.923556E+00	1.709487E-03			
Hardwood	1.459727E+01	7.169398E-03			

Age Class (yrs)	Observed Average Piece Size (trees/m³)		Predicted Piece Size (trees/m³)		Predicted Piece Size (m³/tree)	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
10			8.7723	13.5874	0.1140	0.0736
20			8.6236	12.6473	0.1160	0.0791
30			8.4775	11.7723	0.1180	0.0849
40			8.3338	10.9579	0.1200	0.0913
50			8.1925	10.1998	0.1221	0.0980
60	8.7011	6.1372	8.0536	9.4941	0.1242	0.1053
70	7.1516	8.0128	7.9171	8.8373	0.1263	0.1132
80	9.5124		7.7830	8.2259	0.1285	0.1216
90	7.0148	15.5280	7.6510	7.6568	0.1307	0.1306
100			7.5214	7.1270	0.1330	0.1403
110	7.2600	7.6040	7.3939	6.6340	0.1352	0.1507
120	9.7865		7.2685	6.1750	0.1376	0.1619
130	6.4390	2.7917	7.1453	5.7478	0.1400	0.1740
140			7.0242	5.3501	0.1424	0.1869
150			6.9052	4.9800	0.1448	0.2008
160			6.7881	4.6354	0.1473	0.2157
170			6.6731	4.3147	0.1499	0.2318
180			6.5600	4.0162	0.1524	0.2490
190			6.4488	3.7384	0.1551	0.2675
200			6.3395	3.4797	0.1577	0.2874

FIGURE D.3 PIECE SIZE DEVELOPMENT TYPE 3: S-JP-LD-A-1

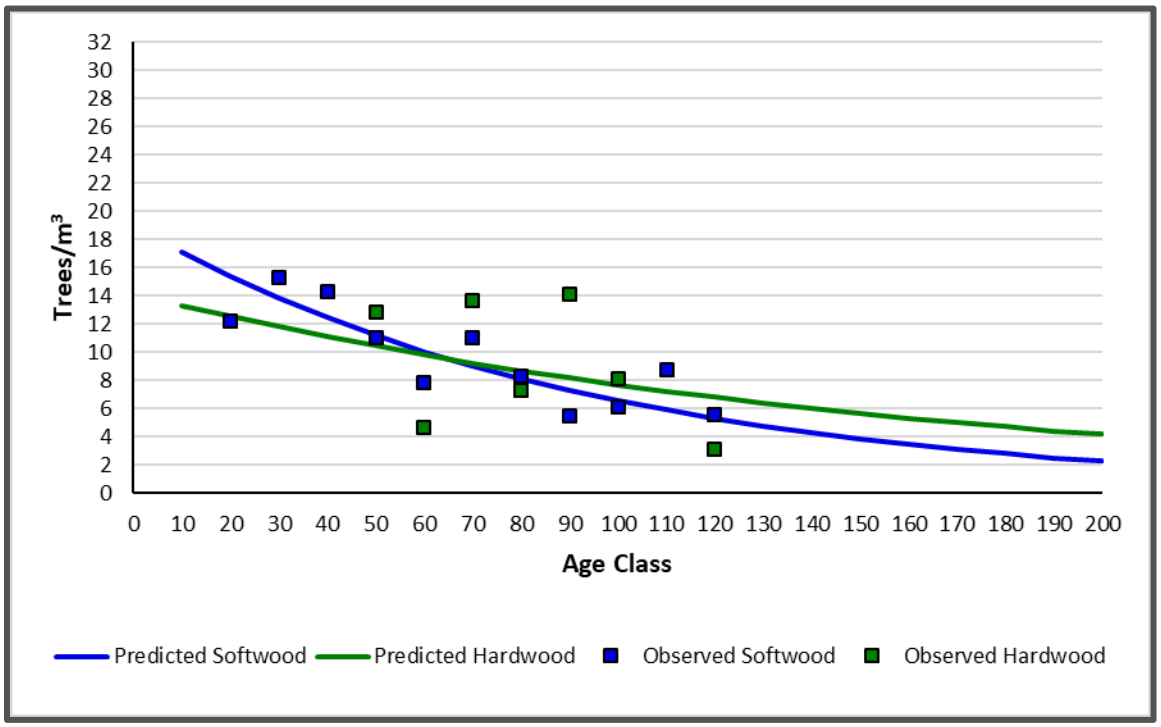

TABLE D.3: PIECE SIZE DEVELOPMENT TYPE 3: S-JP-LD-A-1

Development Type Coefficients	a	b	c	d	t
Softwood	1.906942E+01	1.064310E-02			
Hardwood	1.418362E+01	6.119314E-03			

Age Class (yrs)	Observed Average Piece Size (trees/m³)		Predicted Piece Size (trees/m³)		Predicted Piece Size (m³/tree)	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
10			17.1441	13.3417	0.0583	0.0750
20	12.2249		15.4132	12.5498	0.0649	0.0797
30	15.3139		13.8570	11.8048	0.0722	0.0847
40	14.2814		12.4580	11.1041	0.0803	0.0901
50	11.0365	12.8455	11.2002	10.4450	0.0893	0.0957
60	7.8333	4.6823	10.0694	9.8250	0.0993	0.1018
70	11.0071	13.7063	9.0528	9.2418	0.1105	0.1082
80	8.3069	7.2636	8.1388	8.6932	0.1229	0.1150
90	5.5285	14.1044	7.3171	8.1772	0.1367	0.1223
100	6.0929	8.0794	6.5783	7.6918	0.1520	0.1300
110	8.8021		5.9141	7.2352	0.1691	0.1382
120	5.5383	3.1556	5.3170	6.8058	0.1881	0.1469
130			4.7802	6.4018	0.2092	0.1562
140			4.2976	6.0218	0.2327	0.1661
150			3.8637	5.6643	0.2588	0.1765
160			3.4736	5.3281	0.2879	0.1877
170			3.1229	5.0118	0.3202	0.1995
180			2.8076	4.7143	0.3562	0.2121
190			2.5241	4.4345	0.3962	0.2255
200			2.2693	4.1713	0.4407	0.2397

FIGURE D.4 PIECE SIZE DEVELOPMENT TYPE 4: S-JP-LD-A-2

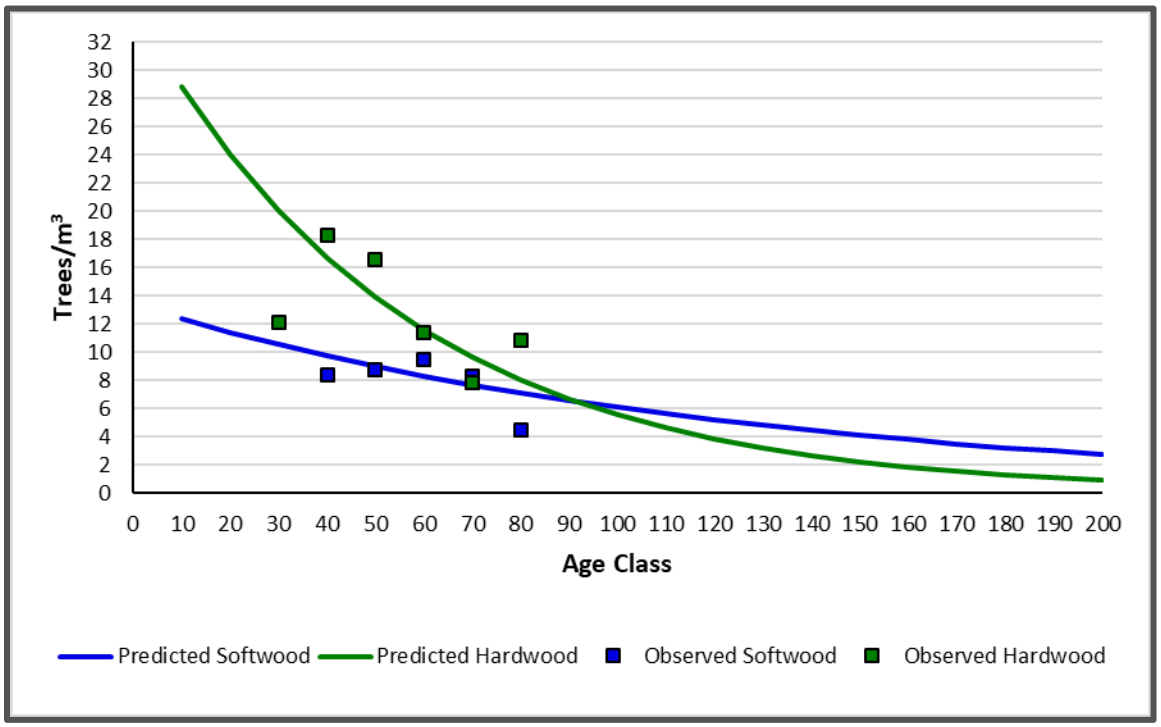

TABLE D.4: PIECE SIZE DEVELOPMENT TYPE 4: S-JP-LD-A-2

Development Type Coefficients	a	b	c	d	t
Softwood	1.336282E+01	7.865057E-03			
Hardwood	3.463192E+01	1.824683E-02			

Age Class (yrs)	Observed Average Piece Size (trees/m³)		Predicted Piece Size (trees/m³)		Predicted Piece Size (m³/tree)	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
10			12.3521	28.8557	0.0810	0.0347
20			11.4178	24.0429	0.0876	0.0416
30		12.0773	10.5542	20.0328	0.0947	0.0499
40	8.3902	18.2944	9.7559	16.6915	0.1025	0.0599
50	8.7856	16.5781	9.0180	13.9076	0.1109	0.0719
60	9.4902	11.3977	8.3359	11.5880	0.1200	0.0863
70	8.2705	7.8291	7.7054	9.6552	0.1298	0.1036
80	4.5047	10.8197	7.1226	8.0448	0.1404	0.1243
90			6.5839	6.7030	0.1519	0.1492
100			6.0859	5.5850	0.1643	0.1790
110			5.6256	4.6535	0.1778	0.2149
120			5.2001	3.8774	0.1923	0.2579
130			4.8067	3.2307	0.2080	0.3095
140			4.4432	2.6918	0.2251	0.3715
150			4.1071	2.2429	0.2435	0.4459
160			3.7965	1.8688	0.2634	0.5351
170			3.5093	1.5571	0.2850	0.6422
180			3.2439	1.2974	0.3083	0.7708
190			2.9985	1.0810	0.3335	0.9251
200			2.7717	0.9007	0.3608	1.1103

FIGURE D.5 PIECE SIZE DEVELOPMENT TYPE 5: S-JP-HD-A-1

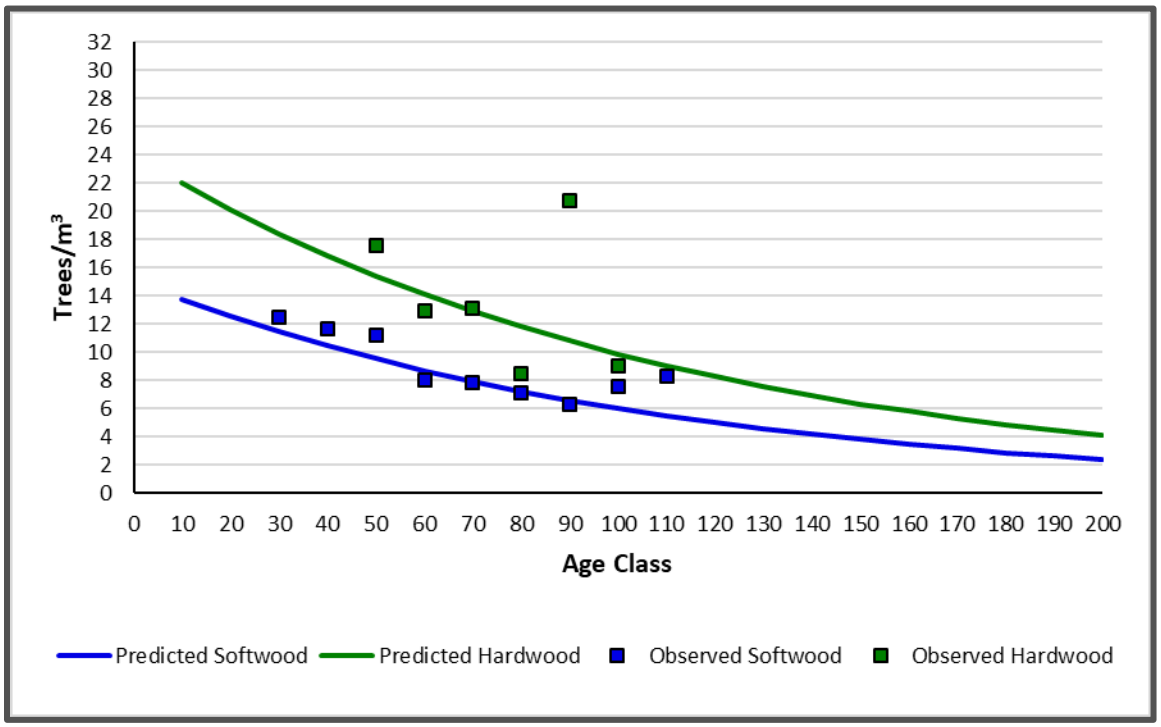

TABLE D.5: PIECE SIZE DEVELOPMENT TYPE 5: S-JP-HD-A-1

Development Type Coefficients	a	b	c	d	t
Softwood	1.509221E+01	9.226411E-03			
Hardwood	2.402961E+01	8.900305E-03			

Age Class (yrs)	Observed Average Piece Size (trees/m³)		Predicted Piece Size (trees/m³)		Predicted Piece Size (m³/tree)	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
10			13.7620	21.9833	0.0727	0.0455
20			12.5491	20.1113	0.0797	0.0497
30	12.4844		11.4431	18.3987	0.0874	0.0544
40	11.6866		10.4345	16.8319	0.0958	0.0594
50	11.1512	17.5292	9.5149	15.3985	0.1051	0.0649
60	8.0248	12.9316	8.6763	14.0872	0.1153	0.0710
70	7.8524	13.0710	7.9116	12.8876	0.1264	0.0776
80	7.1013	8.4822	7.2143	11.7901	0.1386	0.0848
90	6.2334	20.7037	6.5785	10.7861	0.1520	0.0927
100	7.5936	9.0183	5.9987	9.8676	0.1667	0.1013
110	8.2481		5.4700	9.0273	0.1828	0.1108
120			4.9879	8.2586	0.2005	0.1211
130			4.5483	7.5553	0.2199	0.1324
140			4.1474	6.9119	0.2411	0.1447
150			3.7819	6.3233	0.2644	0.1581
160			3.4485	5.7848	0.2900	0.1729
170			3.1446	5.2922	0.3180	0.1890
180			2.8675	4.8415	0.3487	0.2065
190			2.6147	4.4292	0.3824	0.2258
200			2.3843	4.0521	0.4194	0.2468

FIGURE D.6 PIECE SIZE DEVELOPMENT TYPE 6: S-JP-HD-A-2

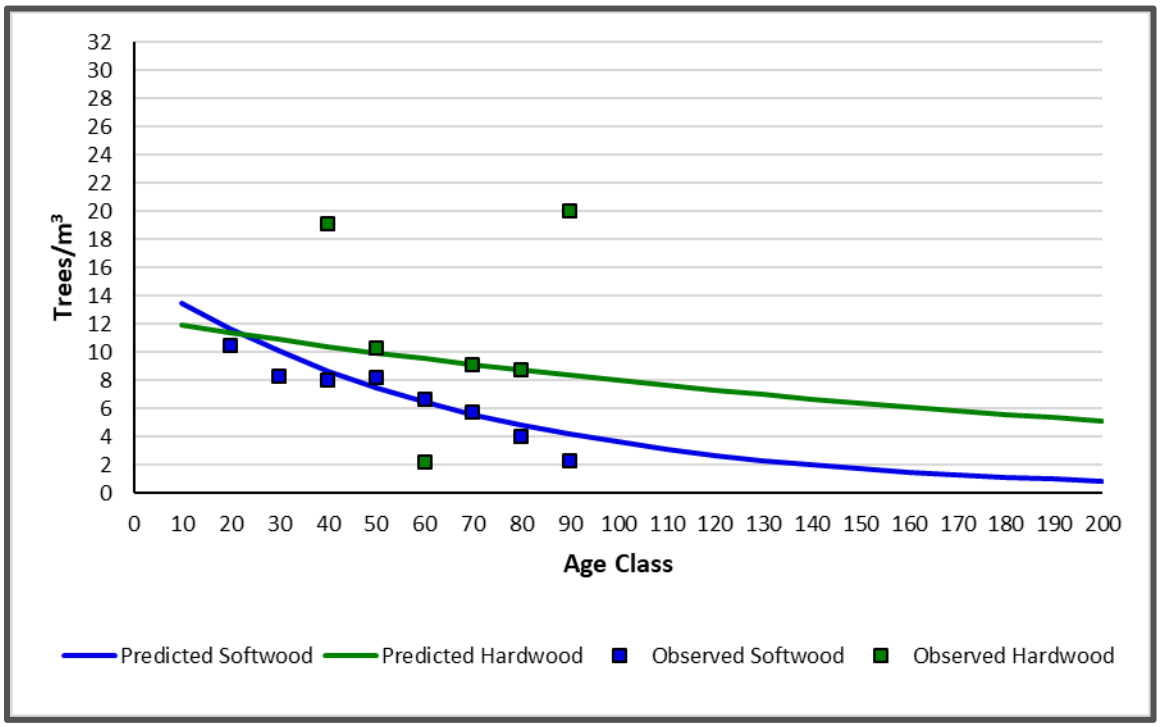

TABLE D.6: PIECE SIZE DEVELOPMENT TYPE 6: S-JP-HD-A-2

Development Type Coefficients	a	b	c	d	t
Softwood	1.561568E+01	1.466984E-02			
Hardwood	1.245177E+01	4.464203E-03			

Age Class (yrs)	Observed Average Piece Size (trees/m³)		Predicted Piece Size (trees/m³)		Predicted Piece Size (m³/tree)	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
10			13.4850	11.9081	0.0742	0.0840
20	10.4767		11.6450	11.3882	0.0859	0.0878
30	8.2869		10.0561	10.8910	0.0994	0.0918
40	8.0260	19.0597	8.6840	10.4155	0.1152	0.0960
50	8.1892	10.3106	7.4991	9.9607	0.1333	0.1004
60	6.6680	2.1915	6.4759	9.5259	0.1544	0.1050
70	5.7169	9.0824	5.5923	9.1100	0.1788	0.1098
80	4.0230	8.6893	4.8292	8.7122	0.2071	0.1148
90	2.2389	20.0401	4.1703	8.3318	0.2398	0.1200
100			3.6013	7.9681	0.2777	0.1255
110			3.1099	7.6202	0.3216	0.1312
120			2.6856	7.2875	0.3724	0.1372
130			2.3191	6.9693	0.4312	0.1435
140			2.0027	6.6650	0.4993	0.1500
150			1.7294	6.3740	0.5782	0.1569
160			1.4935	6.0957	0.6696	0.1640
170			1.2897	5.8296	0.7754	0.1715
180			1.1137	5.5751	0.8979	0.1794
190			0.9618	5.3317	1.0398	0.1876
200			0.8305	5.0989	1.2041	0.1961

FIGURE D.7 PIECE SIZE DEVELOPMENT TYPE 7: S-JP-L&M

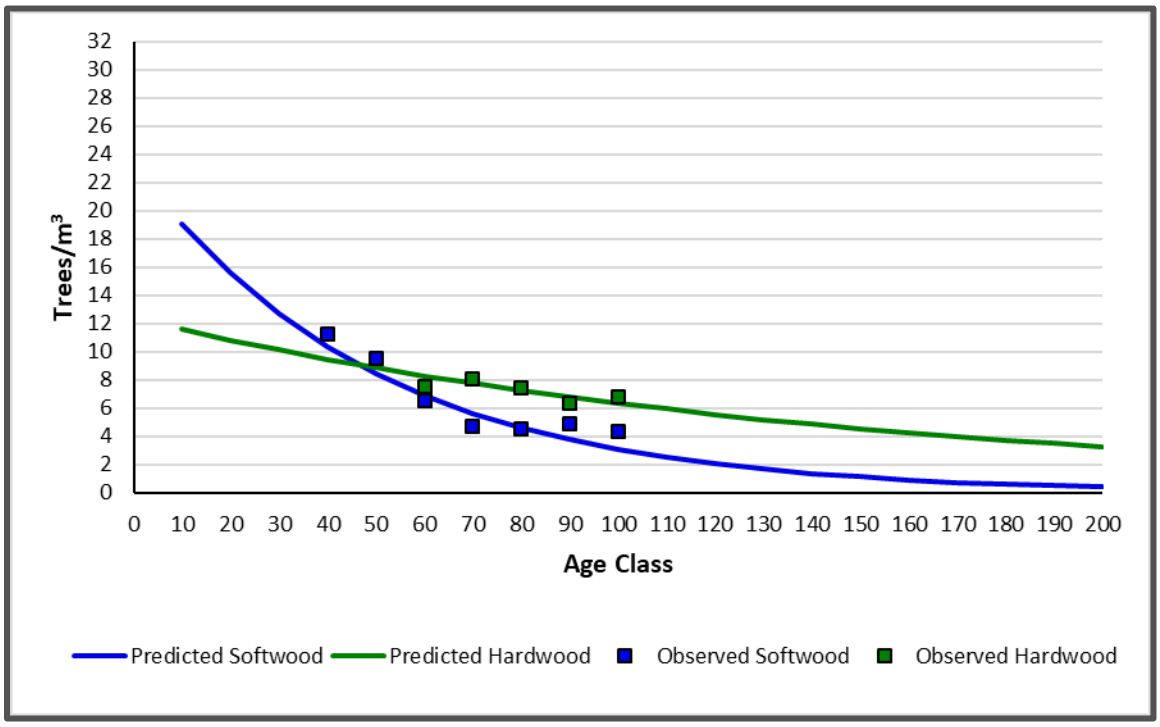

TABLE D.7: PIECE SIZE DEVELOPMENT TYPE 7: S-JP-L&M

Development Type Coefficients	a	b	c	d	t
Softwood	2.341631E+01	2.035329E-02			
Hardwood	1.236110E+01	6.680309E-03			

Age Class (yrs)	Observed Average Piece Size (trees/m³)		Predicted Piece Size (trees/m³)		Predicted Piece Size (m³/tree)	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
10			19.1040	11.5623	0.0523	0.0865
20			15.5859	10.8152	0.0642	0.0925
30			12.7157	10.1163	0.0786	0.0989
40	11.2080		10.3740	9.4626	0.0964	0.1057
50	9.4882		8.4635	8.8511	0.1182	0.1130
60	6.5448	7.5468	6.9049	8.2791	0.1448	0.1208
70	4.7286	8.0717	5.6333	7.7441	0.1775	0.1291
80	4.4938	7.3829	4.5959	7.2437	0.2176	0.1381
90	4.8639	6.3553	3.7496	6.7756	0.2667	0.1476
100	4.3657	6.8266	3.0590	6.3378	0.3269	0.1578
110			2.4957	5.9282	0.4007	0.1687
120			2.0361	5.5451	0.4911	0.1803
130			1.6611	5.1868	0.6020	0.1928
140			1.3552	4.8516	0.7379	0.2061
150			1.1057	4.5381	0.9044	0.2204
160			0.9020	4.2448	1.1086	0.2356
170			0.7359	3.9705	1.3588	0.2519
180			0.6004	3.7140	1.6656	0.2693
190			0.4898	3.4740	2.0415	0.2879
200			0.3996	3.2495	2.5023	0.3077

FIGURE D.8 PIECE SIZE DEVELOPMENT TYPE 8: SH-JP-A-A

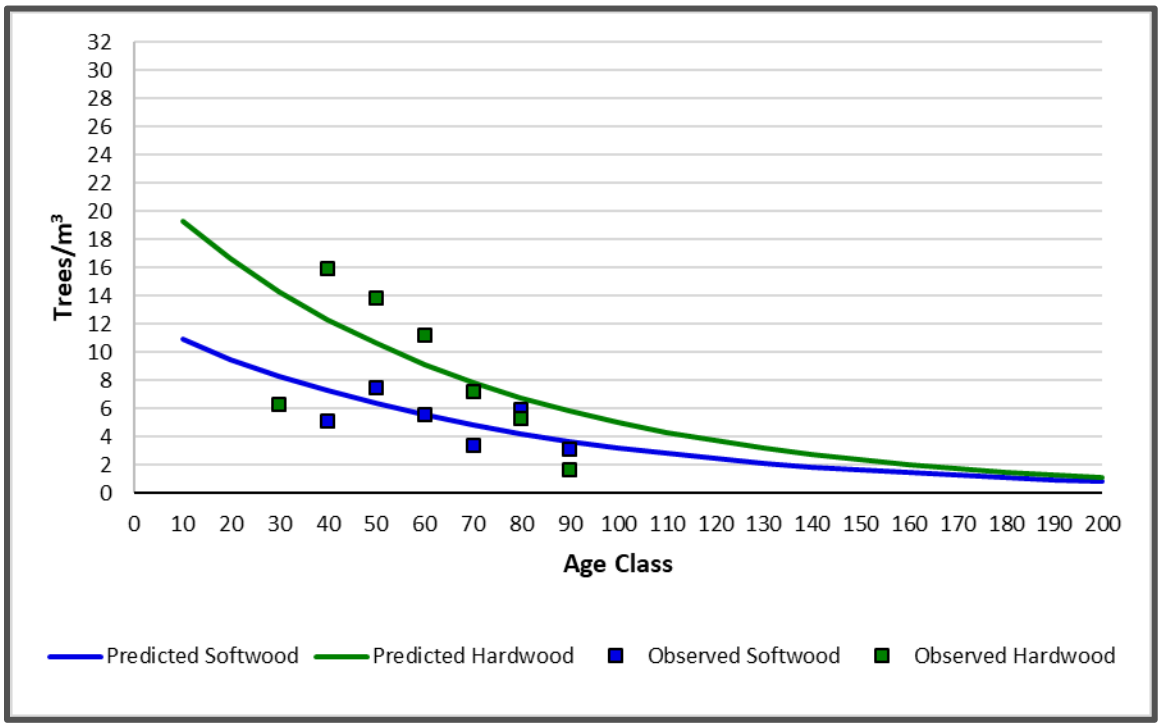

TABLE D.8: PIECE SIZE DEVELOPMENT TYPE 8: SH-JP-A-A

Development Type Coefficients	a	b	c	d	t
Softwood	1.247074E+01	1.350713E-02			
Hardwood	2.247153E+01	1.500171E-02			

Age Class (yrs)	Observed Average Piece Size (trees/m³)		Predicted Piece Size (trees/m³)		Predicted Piece Size (m³/tree)	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
10			10.8951	19.3411	0.0918	0.0517
20			9.5186	16.6467	0.1051	0.0601
30		6.2829	8.3159	14.3277	0.1203	0.0698
40	5.1462	15.9110	7.2652	12.3318	0.1376	0.0811
50	7.4564	13.8725	6.3473	10.6139	0.1575	0.0942
60	5.5651	11.2054	5.5453	9.1353	0.1803	0.1095
70	3.3718	7.1759	4.8447	7.8627	0.2064	0.1272
80	5.9423	5.3061	4.2326	6.7674	0.2363	0.1478
90	3.1535	1.6558	3.6978	5.8246	0.2704	0.1717
100			3.2306	5.0132	0.3095	0.1995
110			2.8224	4.3148	0.3543	0.2318
120			2.4658	3.7138	0.4055	0.2693
130			2.1543	3.1964	0.4642	0.3129
140			1.8821	2.7511	0.5313	0.3635
150			1.6443	2.3679	0.6082	0.4223
160			1.4366	2.0380	0.6961	0.4907
170			1.2550	1.7541	0.7968	0.5701
180			1.0965	1.5097	0.9120	0.6624
190			0.9579	1.2994	1.0439	0.7696
200			0.8369	1.1184	1.1949	0.8941

FIGURE D.9 PIECE SIZE DEVELOPMENT TYPE 9: SH-WS-A-A

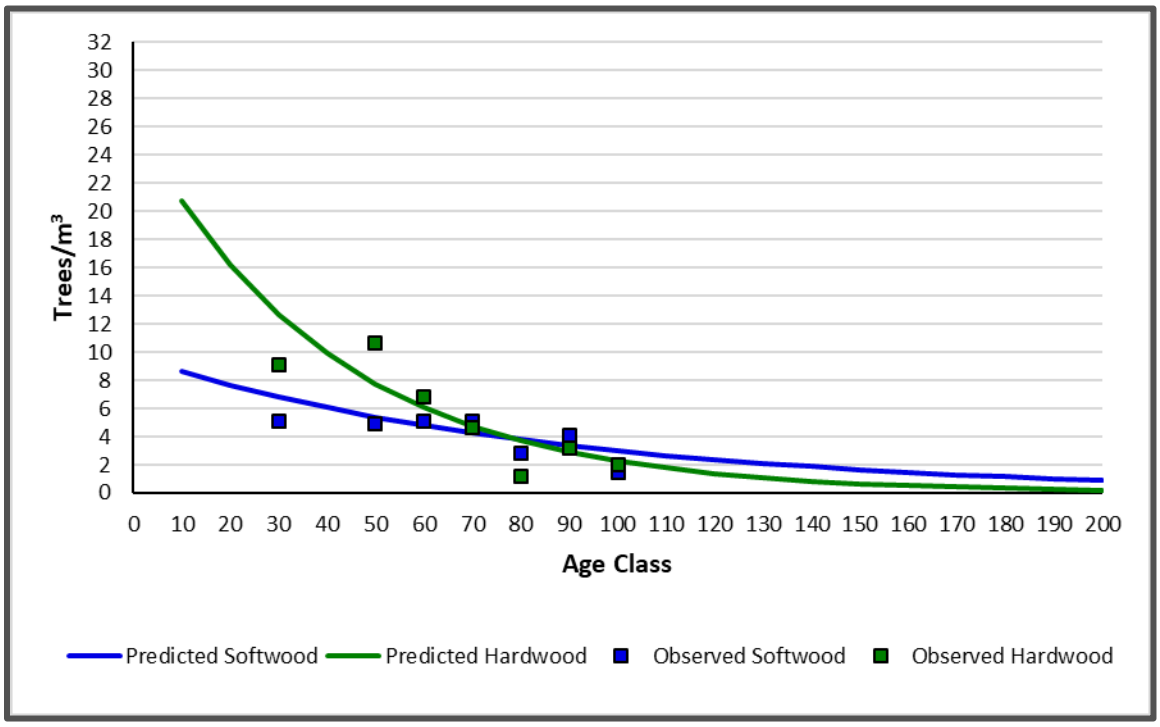

TABLE D.9: PIECE SIZE DEVELOPMENT TYPE 9: SH-WS-A-A

Development Type Coefficients	a	b	c	d	t
Softwood	9.718785E+00	1.179931E-02			
Hardwood	2.642567E+01	2.448865E-02			

Age Class (yrs)	Observed Average Piece Size (trees/m³)		Predicted Piece Size (trees/m³)		Predicted Piece Size (m³/tree)	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
10			8.6371	20.6858	0.1158	0.0483
20			7.6758	16.1927	0.1303	0.0618
30	5.0804	9.0532	6.8215	12.6756	0.1466	0.0789
40			6.0623	9.9224	0.1650	0.1008
50	4.9414	10.6199	5.3876	7.7672	0.1856	0.1287
60	5.0998	6.8232	4.7879	6.0801	0.2089	0.1645
70	5.0897	4.6336	4.2551	4.7594	0.2350	0.2101
80	2.7812	1.1973	3.7815	3.7257	0.2644	0.2684
90	4.0689	3.1830	3.3606	2.9164	0.2976	0.3429
100	1.4714	1.9999	2.9866	2.2830	0.3348	0.4380
110			2.6542	1.7871	0.3768	0.5596
120			2.3588	1.3989	0.4239	0.7148
130			2.0963	1.0951	0.4770	0.9132
140			1.8629	0.8572	0.5368	1.1666
150			1.6556	0.6710	0.6040	1.4903
160			1.4713	0.5253	0.6797	1.9038
170			1.3076	0.4112	0.7648	2.4320
180			1.1620	0.3219	0.8605	3.1069
190			1.0327	0.2520	0.9683	3.9690
200			0.9178	0.1972	1.0896	5.0703

FIGURE D.10 PIECE SIZE DEVELOPMENT TYPE 10: HS-WS-A-A

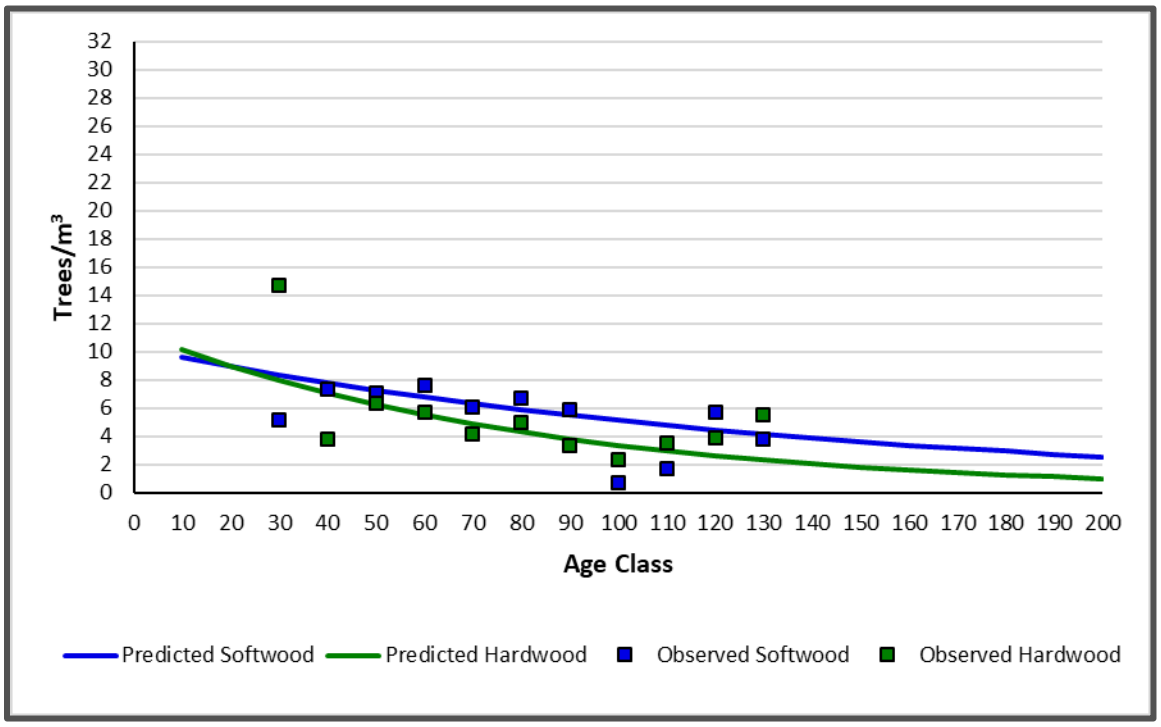

TABLE D.10: PIECE SIZE DEVELOPMENT TYPE 10: HS-WS-A-A

Development Type Coefficients	a	b	c	d	t
Softwood	1.029280E+01	7.000593E-03			
Hardwood	1.145453E+01	1.226536E-02			

Age Class (yrs)	Observed Average Piece Size (trees/m³)		Predicted Piece Size (trees/m³)		Predicted Piece Size (m³/tree)	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
10			9.5969	10.1323	0.1042	0.0987
20			8.9480	8.9628	0.1118	0.1116
30	5.1627	14.6837	8.3430	7.9282	0.1199	0.1261
40	7.2965	3.8058	7.7789	7.0130	0.1286	0.1426
50	7.0931	6.2877	7.2530	6.2035	0.1379	0.1612
60	7.5527	5.6853	6.7626	5.4875	0.1479	0.1822
70	6.0441	4.1817	6.3054	4.8540	0.1586	0.2060
80	6.7079	4.9847	5.8791	4.2937	0.1701	0.2329
90	5.8471	3.3354	5.4816	3.7981	0.1824	0.2633
100	0.6703	2.3575	5.1109	3.3597	0.1957	0.2976
110	1.6642	3.5170	4.7654	2.9719	0.2098	0.3365
120	5.7060	3.8780	4.4432	2.6288	0.2251	0.3804
130	3.7657	5.5170	4.1428	2.3254	0.2414	0.4300
140			3.8627	2.0570	0.2589	0.4862
150			3.6015	1.8195	0.2777	0.5496
160			3.3580	1.6095	0.2978	0.6213
170			3.1310	1.4237	0.3194	0.7024
180			2.9193	1.2594	0.3426	0.7940
190			2.7219	1.1140	0.3674	0.8977
200			2.5379	0.9854	0.3940	1.0148

FIGURE D.11 PIECE SIZE DEVELOPMENT TYPE 11: HS-JP-A-A

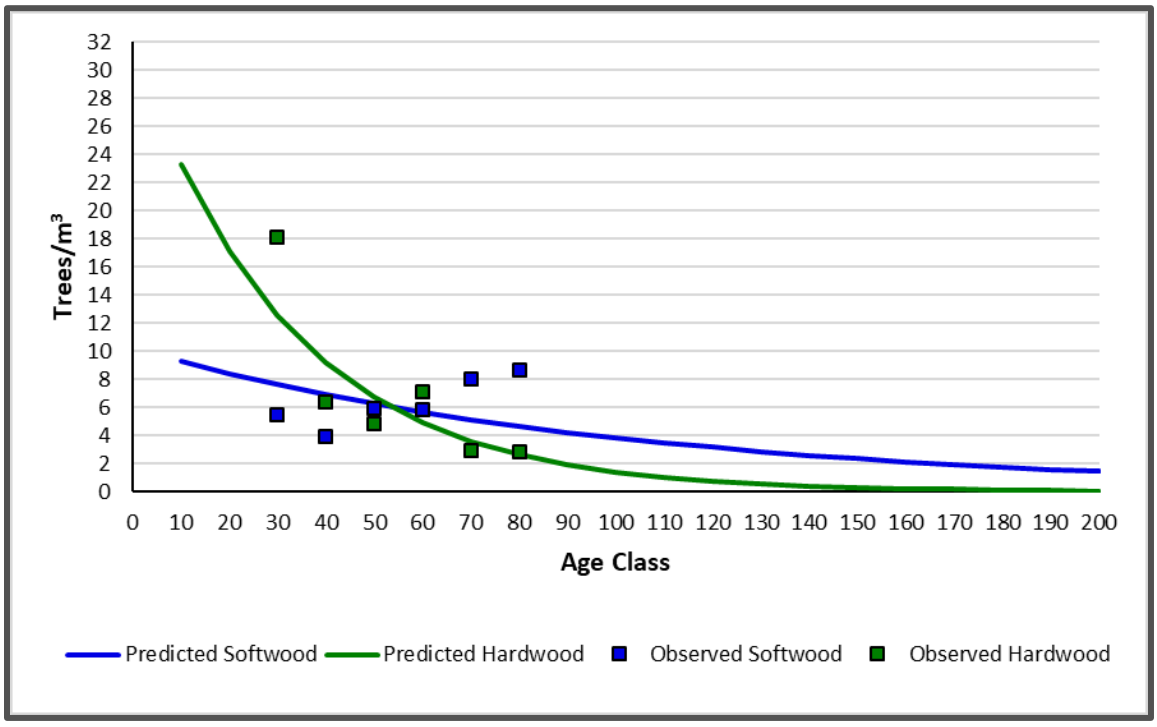

TABLE D.11: PIECE SIZE DEVELOPMENT TYPE 11: HS-JP-A-A

Development Type Coefficients	a	b	c	d[19]	t
Softwood	1.022279E+01	9.769422E-03		4.472449E-01	0
Hardwood	3.185340E+01	3.109161E-02			

Age Class (yrs)	Observed Average Piece Size (trees/m³)		Predicted Piece Size (trees/m³)		Predicted Piece Size (m³/tree)	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
10			9.2713	23.3414	0.1079	0.0428
20			8.4084	17.1040	0.1189	0.0585
30	5.4900	18.0864	7.6258	12.5334	0.1311	0.0798
40	3.9066	6.3876	6.9160	9.1842	0.1446	0.1089
50	5.9775	4.8742	6.2723	6.7299	0.1594	0.1486
60	5.8382	7.0799	5.6885	4.9315	0.1758	0.2028
70	8.0191	2.9267	5.1591	3.6137	0.1938	0.2767
80	8.6239	2.8728	4.6789	2.6480	0.2137	0.3776
90			4.2434	1.9404	0.2357	0.5154
100			3.8485	1.4219	0.2598	0.7033
110			3.4903	1.0419	0.2865	0.9598
120			3.1654	0.7635	0.3159	1.3098
130			2.8708	0.5595	0.3483	1.7874
140			2.6036	0.4100	0.3841	2.4392
150			2.3613	0.3004	0.4235	3.3288
160			2.1415	0.2201	0.4670	4.5427
170			1.9422	0.1613	0.5149	6.1993
180			1.7614	0.1182	0.5677	8.4600
190			1.5975	0.0866	0.6260	11.5451
200			1.4488	0.0635	0.6902	15.7553

[19] The softwood piece data for HS-JP-A-A was guided with data from S-JP-LM and SH-JP-A-A.

FIGURE D.12 PIECE SIZE DEVELOPMENT TYPE 12: H-A-LD-A-1

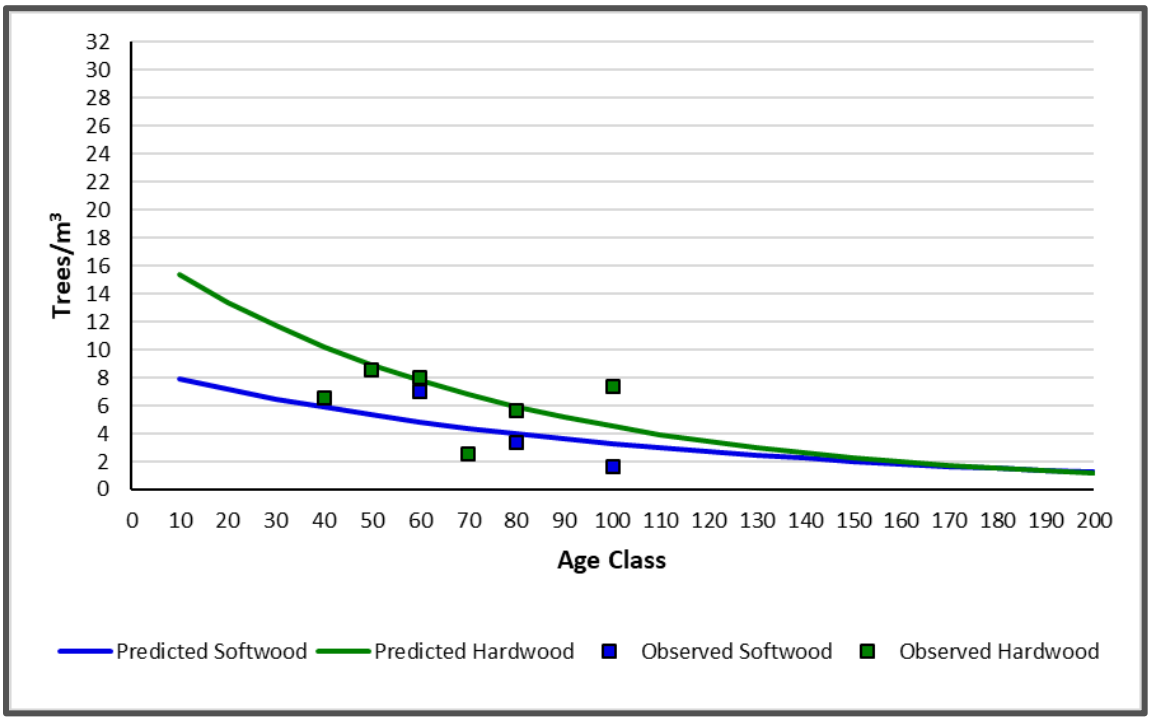

TABLE D.12: PIECE SIZE DEVELOPMENT TYPE 12: H-A-LD-A-1

Development Type Coefficients	a	b	c	d[20]	t
Softwood	8.665846E+00	9.708316E-03		4.677981E+00	0
Hardwood	1.757841E+01	1.357217E-02		5.408412E+00	0

Age Class (yrs)	Observed Average Piece Size (trees/m³)		Predicted Piece Size (trees/m³)		Predicted Piece Size (m³/tree)	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
10			7.8641	15.3475	0.1272	0.0652
20			7.1365	13.3996	0.1401	0.0746
30			6.4762	11.6990	0.1544	0.0855
40		6.5034	5.8771	10.2143	0.1702	0.0979
50		8.5181	5.3333	8.9179	0.1875	0.1121
60	7.0407	7.9555	4.8399	7.7861	0.2066	0.1284
70		2.5269	4.3921	6.7979	0.2277	0.1471
80	3.3236	5.6466	3.9857	5.9352	0.2509	0.1685
90			3.6170	5.1819	0.2765	0.1930
100	1.6163	7.3333	3.2823	4.5243	0.3047	0.2210
110			2.9787	3.9501	0.3357	0.2532
120			2.7031	3.4487	0.3699	0.2900
130			2.4530	3.0111	0.4077	0.3321
140			2.2260	2.6289	0.4492	0.3804
150			2.0201	2.2953	0.4950	0.4357
160			1.8332	2.0040	0.5455	0.4990
170			1.6636	1.7496	0.6011	0.5716
180			1.5097	1.5276	0.6624	0.6546
190			1.3700	1.3337	0.7299	0.7498
200			1.2432	1.1644	0.8043	0.8588

[20] The softwood piece data for H-A-LD-A-1 was guided with data from H-A-HD-A-1 and the hardwood piece size data was guided with H-A-LD-A-2.

FIGURE D.13 PIECE SIZE DEVELOPMENT TYPE 13: H-A-LD-A-2

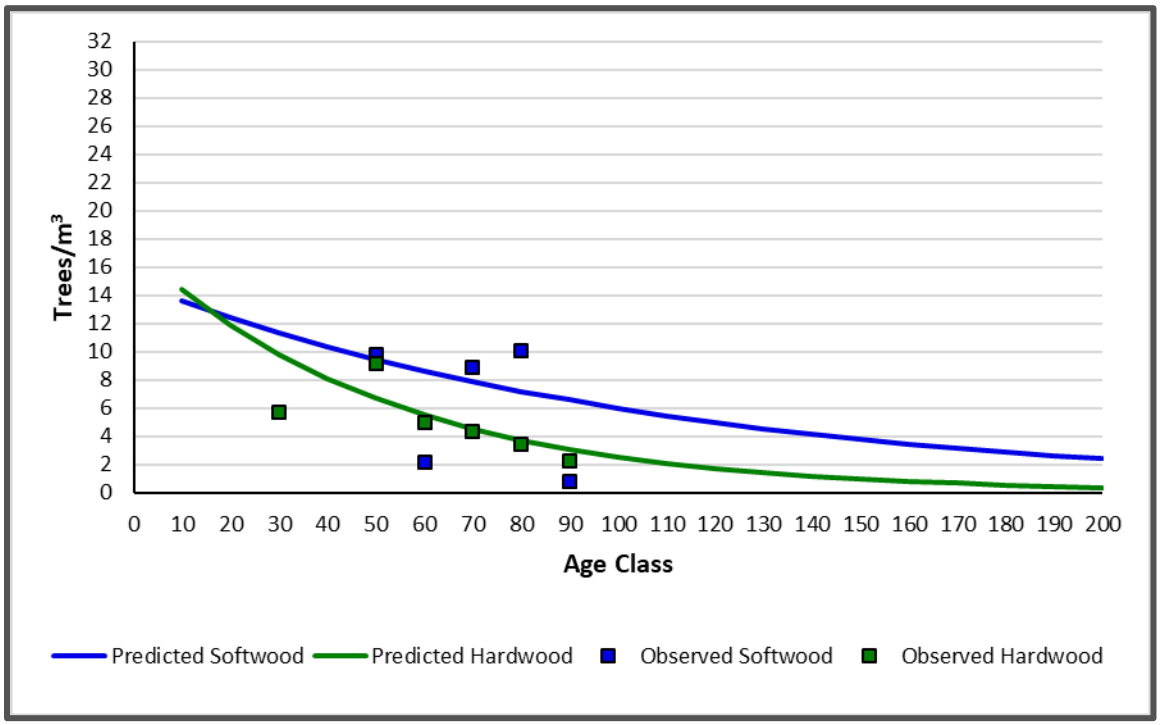

TABLE D.13: PIECE SIZE DEVELOPMENT TYPE 13: H-A-LD-A-2

Development Type Coefficients	a	b	c	d[21]	t
Softwood	1.493007E+01	9.122216E-03		2.797621E+00	0
Hardwood	1.750402E+01	1.928773E-02			

Age Class (yrs)	Observed Average Piece Size (trees/m³)		Predicted Piece Size (trees/m³)		Predicted Piece Size (m³/tree)	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
10			13.6284	14.4335	0.0734	0.0693
20			12.4402	11.9016	0.0804	0.0840
30		5.7183	11.3556	9.8139	0.0881	0.1019
40			10.3656	8.0924	0.0965	0.1236
50	9.8293	9.1622	9.4618	6.6728	0.1057	0.1499
60	2.1501	4.9747	8.6369	5.5023	0.1158	0.1817
70	8.8590	4.3636	7.8839	4.5371	0.1268	0.2204
80	10.0474	3.4582	7.1965	3.7412	0.1390	0.2673
90	0.7712	2.2795	6.5691	3.0849	0.1522	0.3242
100			5.9964	2.5438	0.1668	0.3931
110			5.4736	2.0976	0.1827	0.4767
120			4.9964	1.7296	0.2001	0.5782
130			4.5608	1.4262	0.2193	0.7012
140			4.1631	1.1760	0.2402	0.8503
150			3.8002	0.9697	0.2631	1.0312
160			3.4688	0.7996	0.2883	1.2506
170			3.1664	0.6594	0.3158	1.5166
180			2.8904	0.5437	0.3460	1.8393
190			2.6384	0.4483	0.3790	2.2305
200			2.4083	0.3697	0.4152	2.7050

[21] The softwood piece data for H-A-LD-A-2 was guided with data H-A-HD-A-2.

FIGURE D.14 PIECE SIZE DEVELOPMENT TYPE 14: H-A-HD-A-1

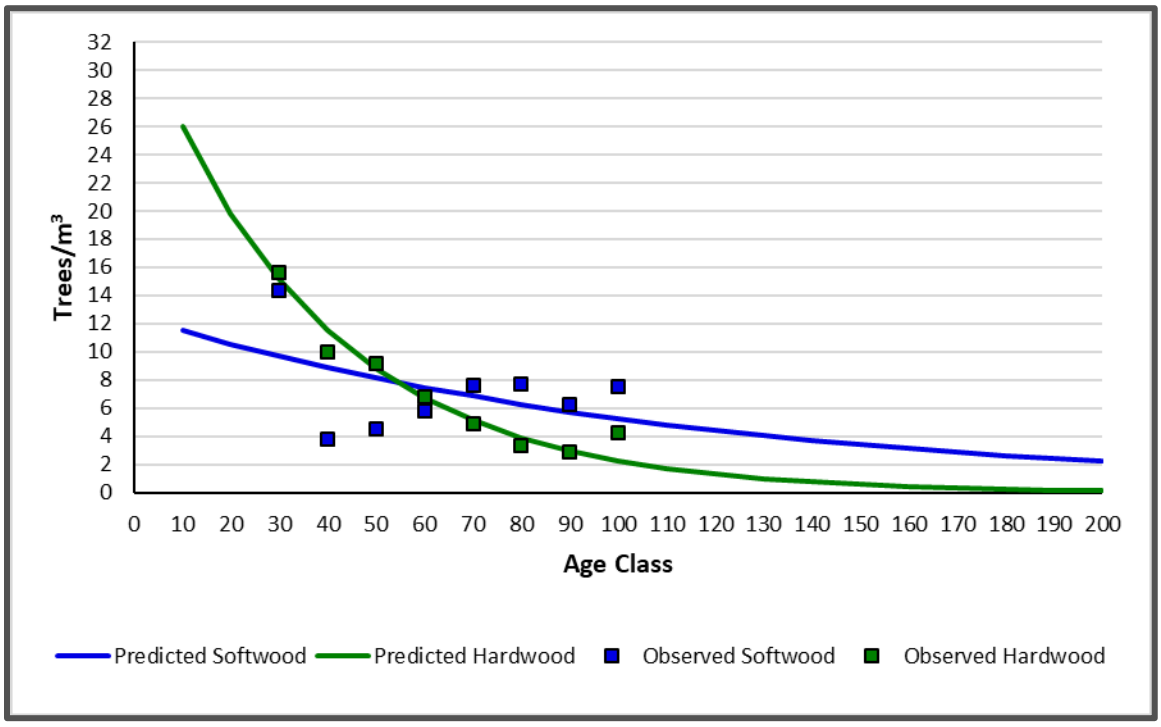

TABLE D.14: PIECE SIZE DEVELOPMENT TYPE 14: H-A-HD-A-1

Development Type Coefficients	a	b	c	d	t
Softwood	1.258294E+01	8.675243E-03			
Hardwood	3.401042E+01	2.699109E-02			

Age Class (yrs)	Observed Average Piece Size (trees/m³)		Predicted Piece Size (trees/m³)		Predicted Piece Size (m³/tree)	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
10			11.5373	25.9652	0.0867	0.0385
20			10.5786	19.8230	0.0945	0.0504
30	14.3387	15.5870	9.6996	15.1339	0.1031	0.0661
40	3.7757	10.0026	8.8936	11.5539	0.1124	0.0866
50	4.5401	9.1950	8.1546	8.8208	0.1226	0.1134
60	5.8213	6.8223	7.4770	6.7342	0.1337	0.1485
70	7.6394	4.9424	6.8557	5.1412	0.1459	0.1945
80	7.6744	3.3786	6.2860	3.9251	0.1591	0.2548
90	6.2291	2.8738	5.7636	2.9966	0.1735	0.3337
100	7.5810	4.3003	5.2847	2.2877	0.1892	0.4371
110			4.8456	1.7466	0.2064	0.5726
120			4.4429	1.3334	0.2251	0.7500
130			4.0737	1.0180	0.2455	0.9823
140			3.7352	0.7772	0.2677	1.2867
150			3.4248	0.5933	0.2920	1.6854
160			3.1403	0.4530	0.3184	2.2076
170			2.8793	0.3458	0.3473	2.8916
180			2.6401	0.2640	0.3788	3.7876
190			2.4207	0.2016	0.4131	4.9612
200			2.2195	0.1539	0.4505	6.4984

FIGURE D.15 PIECE SIZE DEVELOPMENT TYPE 15: H-A-HD-A-2

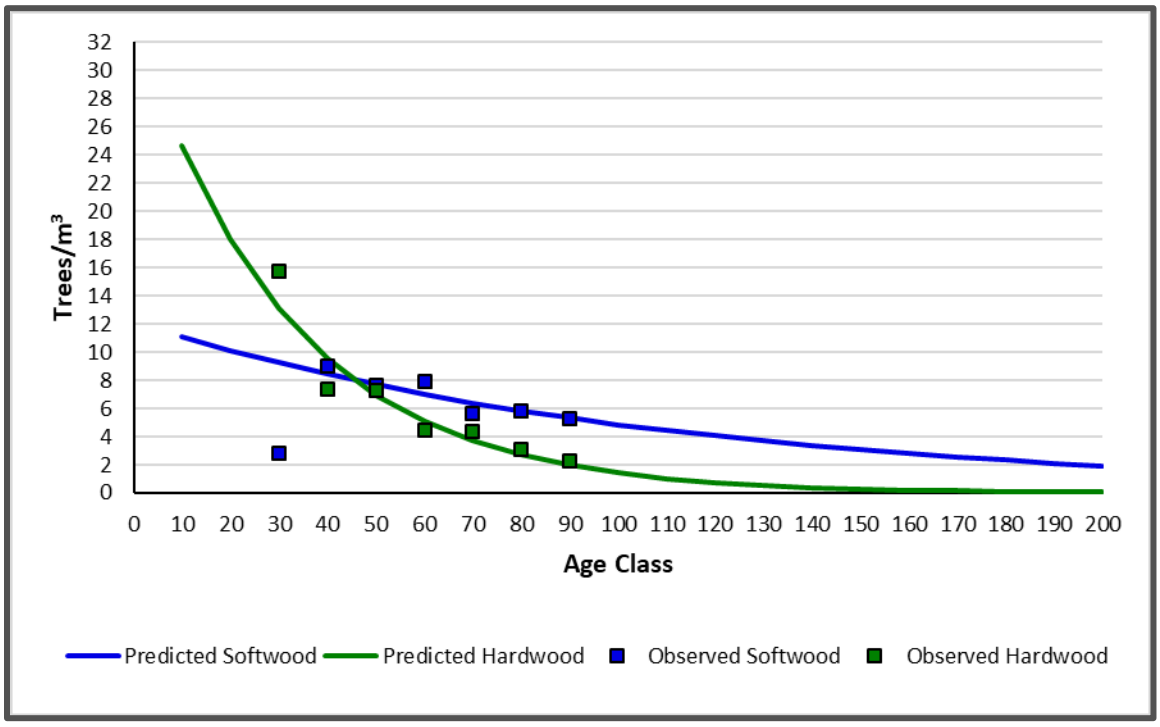

TABLE D.15: PIECE SIZE DEVELOPMENT TYPE 15: H-A-HD-A-2

Development Type Coefficients	a	b	c	d	t
Softwood	1.217425E+01	9.183878E-03			
Hardwood	3.384811E+01	3.170011E-02			

Age Class (yrs)	Observed Average Piece Size (trees/m³)		Predicted Piece Size (trees/m³)		Predicted Piece Size (m³/tree)	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
10			11.1060	24.6526	0.0900	0.0406
20			10.1315	17.9552	0.0987	0.0557
30	2.8457	15.7066	9.2424	13.0773	0.1082	0.0765
40	8.9981	7.3333	8.4314	9.5246	0.1186	0.1050
50	7.6574	7.3060	7.6916	6.9371	0.1300	0.1442
60	7.9102	4.4655	7.0167	5.0525	0.1425	0.1979
70	5.6503	4.3327	6.4010	3.6799	0.1562	0.2717
80	5.7869	3.0781	5.8393	2.6802	0.1713	0.3731
90	5.2810	2.3051	5.3269	1.9520	0.1877	0.5123
100			4.8595	1.4217	0.2058	0.7034
110			4.4331	1.0355	0.2256	0.9657
120			4.0441	0.7542	0.2473	1.3260
130			3.6892	0.5493	0.2711	1.8205
140			3.3655	0.4001	0.2971	2.4996
150			3.0702	0.2914	0.3257	3.4320
160			2.8008	0.2122	0.3570	4.7121
170			2.5550	0.1546	0.3914	6.4697
180			2.3308	0.1126	0.4290	8.8830
190			2.1263	0.0820	0.4703	12.1964
200			1.9397	0.0597	0.5155	16.7456

FIGURE D.16 PIECE SIZE DEVELOPMENT TYPE 16: H(S)-A-LD-A

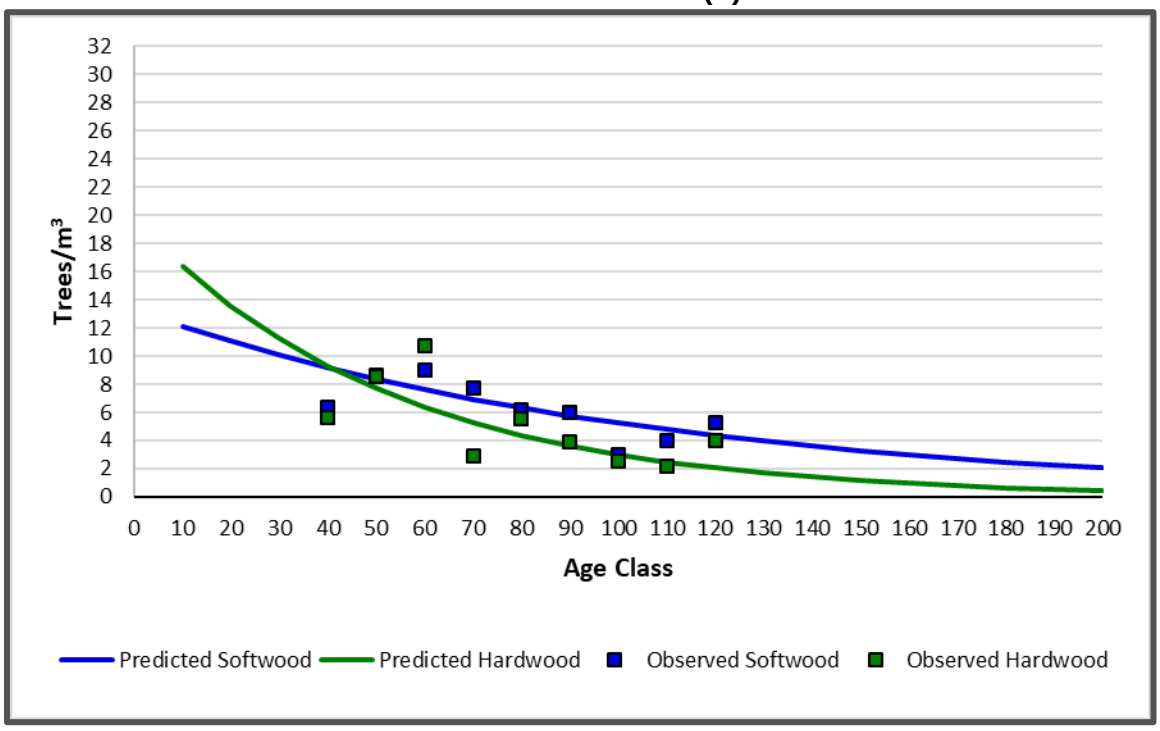

TABLE D.16: PIECE SIZE DEVELOPMENT TYPE 16: H(S)-A-LD-A

Development Type Coefficients	a	b	c	d	t
Softwood	1.331409E+01	9.326052E-03			
Hardwood	1.980868E+01	1.886610E-02			

Age Class (yrs)	Observed Average Piece Size (trees/m³)		Predicted Piece Size (trees/m³)		Predicted Piece Size (m³/tree)	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
10			12.1286	16.4029	0.0825	0.0610
20			11.0486	13.5827	0.0905	0.0736
30			10.0648	11.2474	0.0994	0.0889
40	6.3186	5.5904	9.1686	9.3136	0.1091	0.1074
50	8.6554	8.5743	8.3522	7.7123	0.1197	0.1297
60	8.9647	10.7668	7.6085	6.3863	0.1314	0.1566
70	7.7215	2.8678	6.9310	5.2883	0.1443	0.1891
80	6.1571	5.5140	6.3138	4.3791	0.1584	0.2284
90	5.9770	3.9281	5.7516	3.6261	0.1739	0.2758
100	3.0117	2.5099	5.2395	3.0027	0.1909	0.3330
110	3.9923	2.1594	4.7729	2.4864	0.2095	0.4022
120	5.2228	4.0029	4.3479	2.0589	0.2300	0.4857
130			3.9608	1.7049	0.2525	0.5865
140			3.6081	1.4118	0.2772	0.7083
150			3.2868	1.1691	0.3042	0.8554
160			2.9941	0.9681	0.3340	1.0330
170			2.7275	0.8016	0.3666	1.2475
180			2.4847	0.6638	0.4025	1.5065
190			2.2634	0.5497	0.4418	1.8193
200			2.0619	0.4552	0.4850	2.1970

FIGURE D.17 PIECE SIZE DEVELOPMENT TYPE 17: H(S)-A-HD-A

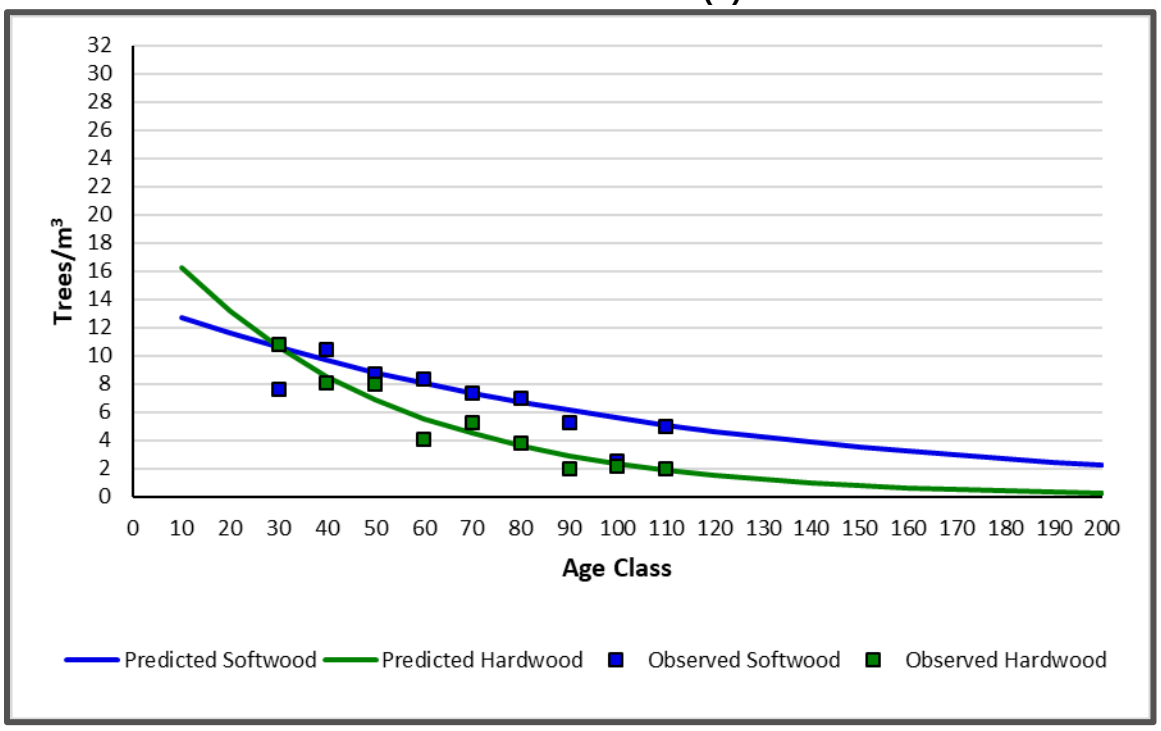

TABLE D.17: PIECE SIZE DEVELOPMENT TYPE 17: H(S)-A-HD-A

Development Type Coefficients	a	b	c	d	t
Softwood	1.397298E+01	9.180973E-03			
Hardwood	2.018677E+01	2.150009E-02			

Age Class (yrs)	Observed Average Piece Size (trees/m³)		Predicted Piece Size (trees/m³)		Predicted Piece Size (m³/tree)	
	Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
10			12.7473	16.2814	0.0784	0.0614
20			11.6290	13.1317	0.0860	0.0762
30	7.5815	10.7932	10.6089	10.5912	0.0943	0.0944
40	10.4582	8.0320	9.6783	8.5422	0.1033	0.1171
50	8.6675	7.9779	8.8293	6.8897	0.1133	0.1451
60	8.3186	4.0416	8.0548	5.5568	0.1241	0.1800
70	7.3718	5.2889	7.3482	4.4818	0.1361	0.2231
80	7.0191	3.7955	6.7036	3.6147	0.1492	0.2766
90	5.2329	1.9621	6.1156	2.9154	0.1635	0.3430
100	2.5557	2.1755	5.5791	2.3514	0.1792	0.4253
110	4.9375	2.0164	5.0897	1.8965	0.1965	0.5273
120			4.6432	1.5296	0.2154	0.6538
130			4.2359	1.2337	0.2361	0.8106
140			3.8643	0.9950	0.2588	1.0050
150			3.5253	0.8025	0.2837	1.2461
160			3.2161	0.6473	0.3109	1.5449
170			2.9340	0.5221	0.3408	1.9155
180			2.6766	0.4211	0.3736	2.3750
190			2.4418	0.3396	0.4095	2.9446
200			2.2276	0.2739	0.4489	3.6510

APPENDIX E: DATA SUBMISSION

This appendix provides dictionaries and description of the digital data submission related to the Wood Supply Model.

The planning inventory layer was updated prior to the wood supply modeling to include the old caribou ranges, the tactical plan blocks, the year of origin (YOO), old forest, planned and harvested blocks, and productive forest identifier (area included within the wood supply model).

The new fields that were added to the original planning inventory are included within the data dictionary (Table E.1). To account for the 2016 harvested blocks, the following fields were utilized:

- AOP_YEAR = 2016
- BLOCSTAT = “CUT”

File: Landbase20160616_Caribou_Tactical

Number of data records: 946,142

TABLE E.1: FOREST COMPOSITE DATABASE STRUCTURE AND DESCRIPTION

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
1.	TIMBER_SUPPLY_AREAS	String	25	0	Timber Supply Areas: L&M Wood Products; Mistik
2.	GL20160616	Numeric	11	2	Unique spatial identifier
3.	MU	String	2	0	Manangement unit number identified as follows: ♦ 01-Divide; ♦ Pierceland; ♦ Big Island Lake; ♦ Waterhen; ♦ 07- Beauval; ♦ 08- Canoe Lake; ♦ 09- Ile-a-la-Crosse; ♦ 10- Buffalo Narrows; ♦ 11- Dillon; ♦ 12- Murray Bay; ♦ 20- Beaver River; ♦ 21- Peter Pond; ♦ 78- Recreation Area; ♦ 79- Timber Reserve; ♦ 85- L&M
4.	MU_NAME	String	40	0	Manangement unit name identified as follows: ♦ Beauval; ♦ Beaver river; ♦ Big island lake; ♦ Buffalo Narrows; ♦ Canoe Lake; ♦ Dillon; ♦ Divide; ♦ Ile-a-la-Crosse; ♦ L & M; ♦ Murray Bay; ♦ Peter Pond; ♦ Pierceland; ♦ Recreation Area; ♦ Timber Reserve; ♦ Waterhen
5.	OP_AREA	String	6	0	Management unit and Operating area code
6.	OP_NAME	String	40	0	Operating area name
7.	OP_NUM	String	3	0	Operating area number
8.	SEASON	String	10	0	Harvest Season: ♦ ALL_SEASON; ♦ WINTER

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
9.	WATERSHED_NUMBER	String	10	0	Watershed: ♦ 5EG; ♦ 5GE; ♦ 5GF; ♦ 6AE; ♦ 6AF; ♦ 6BB; ♦ 6BC; ♦ 6CC
10.	WATERSHED_NUMBER2	String	10	0	Watershed 2: ♦ 5EF; ♦ 5EG; ♦ 6AD; ♦ 6AF; ♦ 6AG; ♦ 6BA; ♦ 6BB; ♦ 6BD
11.	WILDLIFE_ZONE_NUMBER	String	16	0	Wildlife management zone number: ♦ ZONE 47; ♦ ZONE 55; ♦ ZONE 66; ♦ ZONE 67; ♦ ZONE 69; ♦ ZONE 73
12.	DEER_LICNO	String	100	0	White Tailed Deer Outfitting License Number
13.	BEAR_LICNO	String	100	0	Black Bear Outfitting License Number C2005
14.	DMT_HOST	String	2	0	Dwarf mistletoe host: PJ- Jack Pine
15.	DMT_SEVER	String	1	0	Dwarf mistletoe severeity: S- Severe
16.	DMT_DATE	String	9	0	Dwarf mistletoe date:
17.	BUDWORM_YEAR	String	50	0	Budworm defoliation year
18.	BUDWORM_DEFO	String	50	0	Budworm defoliation severeity: ♦ Moderate ♦ Severe
19.	SK_ssi	Numeric	11	2	Stand susceptiability index
20.	ABIOTIC_YEAR	Numeric	11	2	Abiotic year of disturbance
21.	ABIOTIC_TYPE	String	50	0	Abiotic disturbance: What Is the 3? ♦ 3-“Other”; ♦ FLOOD; ♦ WINDTHROW
22.	BIOTIC_YEAR	Numeric	11	2	Biotic year of disturbance:
23.	BIOTIC_TYPE	String	50	0	Biotic disturbance: ♦ EASTERN LARCH BEETLE; ♦ HARDWOOD DEFOLIATION; ♦ SPRUCE NEEDLE RUST

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
24.	SOIL_NAME	String	40	0	♦ BOREAL TRANSITION ♦ MID-BOREAL UPLANDS
25.	DEVEL	String	1	0	Soil development type: ♦ C- Chernozemic; ♦ F- Luvisolic; ♦ M- Eutric Brunisolic; ♦ P- Dystric Brunisolic; ♦ R- Regosolic; ♦ W- Humo-Ferric Podzolic; ♦ X- Fibrisolic; ♦ Y- Mesisolic
26.	PMDEP	String	2	0	Parental mode of desposition types: ♦ B- Organic; ♦ F- Fluvioglacial; ♦ L- Lacustrine; ♦ M- Moranial; ♦ N- Organic; ♦ O- Organic; ♦ U- Undifferentiated; ♦ W- Marine
27.	LOCSF	String	3	0	Local surface form: ♦ B14- Bog; ♦ B16- Bog; ♦ D- Dissected; ♦ F13- Fen; ♦ H- Hummocky; ♦ K- Knoll and Kettle; ♦ M- Rolling; ♦ U- Undulating; ♦ W- Water
28.	FIRE_NO	String	50	0	Fire number
29.	YEAR	Numeric	11	2	Fire year
30.	FIRENAME	String	40	0	Fire name
31.	FCA	String	5	0	Fur Conservation Aea: ♦ M-37; ♦ M-38; ♦ M-38B; ♦ M-53; ♦ M-54; ♦ M-55; ♦ M-56; ♦ M-58; ♦ M-81; ♦ M-94; ♦ N-12; ♦ N-13A; ♦ N-13B; ♦ N-14; ♦ N-15; ♦ N-19; ♦ N-21; ♦ P-88

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
MISTIK FOREST OPERATIONS UPDATE					
32.	BLOCK_ID	Numeric	11	2	FMS block Id
33.	BLOCK_SHAPE_ID	Numeric	15	7	FMA block shape area
34.	SHAPSTAT	String	255	0	Cutblock shape status: ♦ ACTUAL ♦ PLANNED
35.	AOP_YEAR	Numeric	15	7	Annual Operating Plan Year
36.	BLOCSTAT	String	255	0	Cutblock status: ♦ CUT; ♦ PLANNED
37.	OPENTYPE_CODE	String	255	0	Harvest Type: ♦ Burrow pit; ♦ CC: Clearcut; ♦ Clearcut (patch); ♦ Clearcut (strip); ♦ Clearcut w/POR; ♦ High Grade; ♦ Other; ♦ Patch Retention; ♦ PC: Partial Cut; ♦ Salvage; ♦ Salvage – burn; ♦ Salvage - forest health; ♦ Salvage – mistletoe; ♦ Salvage – windthrow; ♦ Seed Tree (single); ♦ ST: Sanitation Cut; ♦ wS undrstry presrvtn
38.	BLOCSPECGROU_CODE	String	255	0	Block Species Group Code: ♦ C- Coniferous; ♦ CD- Conifer leading mixedwood; ♦ D- Deciduous; ♦ DC-Deciduous leading mixedwood
39.	SKID_CLEARANCE_DATE	Date	40	0	Skid Clearance Date (dd-mmm-yyyy)
40.	ESTS_SURVEY_DATE	Date	40	0	Date of establishment survey
41.	Regen_status	String	47	0	Establishment survey regenerated status: ♦ STOCSTAT-NSR- Not satisfactorily regenerated; ♦ STOCSTAT-SR- Satisfactorily regenerated; ♦ STOCSTAT-SRV- Not satisfactorily vegetated
42.	LFN_SP	String	47	0	Leave for Natural Speices: ♦ JP- Jackpine; ♦ TA- Trembling Aspen; ♦ SW- White spruce
43.	LFN_HA	Numeric	16	7	Area left for natural (ha) (dd-mmm-yyyy)
44.	LFN_DATE	Date	40	0	Date of left for natural (dd-mmm-yyyy)

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
45.	PLANT_SP	String	47	0	Planted Species: ♦ SPEC-BS- Black Spruce ♦ SPEC-JP- Jack Pine ♦ SPEC-LP- Lodgepole Pine ♦ SPEC-OTHER-Other ♦ SPEC-RP- Red Pine ♦ SPEC-SP- Scots Pine ♦ SPEC-SW- White Spruce ♦ SPEC-WB –White Birch ♦ SPEC-WS- White Spruce
46.	PLANT_HA	Numeric	16	7	Area Planted (ha)
47.	PLANT_YEAR	Numeric	31	15	Plant date (year)
48.	TEND_TYPE	String	47	0	Stand tend type: ♦ STANTENDTYPE-CL ♦ STANTENDTYPE-DIE ♦ STANTENDTYPE-SPAC ♦ STANTENDTYPE-THIN
49.	TEND_HA	Numeric	31	15	Area tended (ha)
50.	TEND_DATE	Date	40	0	Tending date (dd-mmm-yyyy)
51.	VISUAL_WATER	Numeric	11	2	Visually sensitive area identifier for areas surrounding water: ♦ 0- Not visually sensitive; ♦ 1- visually sensitive
52.	VISUAL_ROADS	Numeric	11	2	Visually sensitive area identifier for areas surrounding roads: ♦ 0- Not visually sensitive; ♦ 1- Visually sensitive
53.	INOPERABLE	Numeric	11	2	Binary identifier of polygons that are inoperable due to slope: ♦ 0- Operable; ♦ 1- Inoperable (slope > 30%)
54.	BUF_90	Numeric	11	2	Binary Identifier of 90 meter riaparian zones: ♦ 0- no 90 metre buffer; ♦ 1- 90 metre buffer zone
55.	BUF_30	Numeric	11	2	Binary Identifier of 30 meter riaparian zones: ♦ 0- no 30 metre buffer; ♦ 1- 30 metre buffer zone
56.	BUF_15	Numeric	11	2	Binary Identifier of 15 meter riaparian zones: ♦ 0- no 15 metre buffer; ♦ 1- 15 metre buffer zone
57.	WAT_ISLAND	Numeric	11	2	Water island identifier: ♦ 0- No Water Island; ♦ 1- Water island
58.	LAC_PLONGE	Numeric	11	2	Lac La Plonge polygon flag: ♦ 0- No flag; ♦ 2- Lac La Plonge
59.	Built_ge_1995	Numeric	11	2	Built greater than 1995 flag: ♦ 0- no flag; ♦ 1995- built greater than 1995

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
60.	ANTH_DISTURB	String	3	0	Anthropogenic Disturbance ♦ AGR- Agriculture; ♦ AIR- Airstrip; ♦ BLT- Bult-up areas; ♦ CMP- Camps and lodges; ♦ FLE- Flowline Easement; ♦ GFT- Government Fire Tower; ♦ IND- Industrial areas; ♦ MIN- Mine Sites; ♦ PIT- Gravel Pits; ♦ PTM- Peat moss; ♦ REC- Recreational; ♦ RES- Rural residential; ♦ RWT- Radio Weather Tower; ♦ WEL- Wells
61.	ANTH_CONFIDENCE	String	1	0	Confidence code: ♦ H- high; ♦ L- low; ♦ M- mid
62.	Road_update	Numeric	11	2	Road presence: ♦ 0; ♦ 2006
SFVI ATTRIBUTES					
63.	ID_TILE	String	11	0	Tile Number made up of zone, easting, and northing.
64.	STAND	Numeric	11	2	SFVI Polygon identification number.
65.	ID_FOR	Numeric	31	15	Identification number made up of ID_TILE and Stand.
66.	CROWN_1	Numeric	11	2	Crown Closure of layer 1 expressed to the nearest 1%.
67.	HEIGHT_1	Numeric	11	2	Average height of layer 1 (m).
68.	COMPLX_1	String	1	0	Canopy structure as follows: ♦ C - Complex; ♦ H - Horizontal.
69.	COMPRG_1	Numeric	11	2	Complex Stand Quantifier ♦ Complex Stand - Describes Height range; ♦ Horizontal Stand - Describes percent of ground area covered by the horizontal component.
70.	SP1_1	String	2	0	Species 1 of layer 1 as follows: ♦ TA - Trembling Aspen; ♦ WB - White Birch; ♦ BP - Balsam Poplar; ♦ BF - Balsam Fir; ♦ TL - Larch; ♦ JP - Jack Pine; ♦ BS - Black Spruce; ♦ WS - White Spruce.
71.	PER1_1	Numeric	11	2	Percent Composition for Species 1 of Layer 1.

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
72.	SP2_1	String	2	0	Species 2 of layer 1 as follows: ♦ TA - Trembling Aspen; ♦ WB - White Birch; ♦ BP - Balsam Poplar; ♦ BF - Balsam Fir; ♦ TL - Larch; ♦ JP - Jack Pine; ♦ BS - Black Spruce; ♦ WS - White Spruce.
73.	PER2_1	Numeric	11	2	Percent Composition for Species 2 of Layer 1.
74.	SP3_1	String	2	0	Species 3 of layer 1 as follows: ♦ TA - Trembling Aspen; ♦ WB - White Birch; ♦ BP - Balsam Poplar; ♦ BF - Balsam Fir; ♦ TL - Larch; ♦ JP - Jack Pine; ♦ BS - Black Spruce; ♦ WS - White Spruce.
75.	PER3_1	Numeric	11	2	Percent Composition for Species 3 of Layer 1.
76.	SP4_1	String	2	0	Species 4 of layer 1 as follows: ♦ TA - Trembling Aspen; ♦ WB - White Birch; ♦ BP - Balsam Poplar; ♦ BF - Balsam Fir; ♦ TL - Larch; ♦ JP - Jack Pine; ♦ BS - Black Spruce; ♦ WS - White Spruce.
77.	PER4_1	Numeric	11	2	Percent Composition for Species 4 of Layer 1.
78.	SP5_1	String	2	0	Species 5 of layer 1 as follows: ♦ TA - Trembling Aspen; ♦ WB - White Birch; ♦ TL - Larch; ♦ JP - Jack Pine; ♦ BS - Black Spruce; ♦ WS - White Spruce.
79.	PER5_1	Numeric	11	2	Percent Composition for Species 5 of Layer 1.
80.	PATTRN_1	String	2	0	Canopy pattern of layer 1 defined as follows: ♦ P0 - Single stems; ♦ P1 - Single patch of stems; ♦ P2 - Few patches of stems; ♦ P3 - Several patches of stems; ♦ P4 - Continuous canopy; openings common; ♦ P5 - Continuous canopy; openings uncommon.
81.	ORIGIN_1	Numeric	11	2	Year of origin of Layer 1.
82.	ORGNINT1	String	1	0	Differentiates between known and estimated year of origin of layer 1 as follows: ♦ A - year of origin is known to the nearest year (annum); ♦ D - year of origin is estimated to the nearest decade.
83.	CROWN_2	Numeric	11	2	Crown Closure of layer 2 expressed to the nearest 1%.
84.	HEIGHT_2	Numeric	11	2	Average height of layer 2 (m).

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
85.	COMPLX_2	String	1	0	Canopy structure as follows: ♦ H - Horizontal.
86.	COMPRG_2	Numeric	11	2	Complex Stand Quantifier Horizontal Stand - Describes percent of ground area covered by the horizontal component.
87.	SP1_2	String	2	0	Species 1 of layer 2 as follows: ♦ TA - Trembling Aspen; ♦ WB - White Birch; ♦ BP - Balsam Poplar; ♦ BF - Balsam Fir; ♦ TL - Larch; ♦ JP - Jack Pine; ♦ BS - Black Spruce; ♦ WS - White Spruce.
88.	PER1_2	Numeric	11	2	Percent Composition for Species 1 of Layer 2.
89.	SP2_2	String	2	0	Species 2 of layer 2 as follows: ♦ TA - Trembling Aspen; ♦ WB - White Birch; ♦ BP - Balsam Poplar; ♦ BF - Balsam Fir; ♦ TL - Larch; ♦ JP - Jack Pine; ♦ BS - Black Spruce; ♦ WS - White Spruce.
90.	PER2_2	Numeric	11	2	Percent Composition for Species 2 of Layer 2.
91.	SP3_2	String	2	0	Species 3 of layer 2 as follows: ♦ TA - Trembling Aspen; ♦ WB - White Birch; ♦ BP - Balsam Poplar; ♦ BF - Balsam Fir; ♦ TL - Larch; ♦ JP - Jack Pine; ♦ BS - Black Spruce; ♦ WS - White Spruce.
92.	PER3_2	Numeric	11	2	Percent Composition for Species 3 of Layer 2.
93.	SP4_2	String	2	0	Species 4 of layer 2 as follows: ♦ TA - Trembling Aspen; ♦ WB - White Birch; ♦ BP - Balsam Poplar; ♦ BF - Balsam Fir; ♦ TL - Larch; ♦ JP - Jack Pine; ♦ BS - Black Spruce; ♦ WS - White Spruce.
94.	PER4_2	Numeric	11	2	Percent Composition for Species 4 of Layer 2.
95.	SP5_2	String	2	0	Species 5 of layer 2 as follows: ♦ TA - Trembling Aspen; ♦ WB - White Birch; ♦ TL - Larch; ♦ JP - Jack Pine; ♦ BS - Black Spruce; ♦ WS - White Spruce.
96.	PER5_2	Numeric	11	2	Percent Composition for Species 5 of Layer 2.

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
97.	PATTRN_2	String	2	0	Canopy pattern of layer 2 defined as follows: ♦ P0 - Single stems; ♦ P1 - Single patch of stems; ♦ P2 - Few patches of stems; ♦ P3 - Several patches of stems; ♦ P4 - Continuous canopy; openings common; ♦ P5 - Continuous canopy; openings uncommon.
98.	ORIGIN_2	Numeric	11	2	Year of origin of layer 2.
99.	ORGNINT2	String	1	0	Differentiates between known and estimated year of origin of layer 2 as follows: ♦ A - year of origin is known to the nearest year (annum); ♦ D - year of origin is estimated to the nearest decade.
100.	CROWN_3	Numeric	11	2	Crown Closure of layer 3 expressed to the nearest 1%.
101.	HEIGHT_3	Numeric	11	2	Average height of layer 3 (m).
102.	COMPLX_3	String	1	0	Canopy structure as follows: ♦ None present.
103.	COMPRG_3	Numeric	11	2	Complex Stand Quantifier ♦ None present.
104.	SP1_3	String	2	0	Species 1 of layer 3 as follows: ♦ TA - Trembling Aspen; ♦ WB - White Birch; ♦ BP - Balsam Poplar; ♦ BF - Balsam Fir; ♦ TL - Larch; ♦ JP - Jack Pine; ♦ BS - Black Spruce; ♦ WS - White Spruce.
105.	PER1_3	Numeric	11	2	Percent Composition for Species 1 of Layer 3.
106.	SP2_3	String	2	0	Species 2 of layer 3 as follows: ♦ TA - Trembling Aspen; ♦ WB - White Birch; ♦ BP - Balsam Poplar; ♦ BF - Balsam Fir; ♦ TL - Larch; ♦ JP - Jack Pine; ♦ BS - Black Spruce; ♦ WS - White Spruce.
107.	PER2_3	Numeric	11	2	Percent Composition for Species 2 of Layer 3.
108.	SP3_3	String	2	0	Species 3 of layer 3 as follows: ♦ TA - Trembling Aspen; ♦ WB - White Birch; ♦ BP - Balsam Poplar; ♦ BF - Balsam Fir; ♦ TL - Larch; ♦ JP - Jack Pine; ♦ BS - Black Spruce; ♦ WS - White Spruce.
109.	PER3_3	Numeric	11	2	Percent Composition for Species 3 of Layer 3.

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
110.	SP4_3	String	2	0	Species 4 of layer 3 as follows: ♦ TA - Trembling Aspen; ♦ WB - White Birch; ♦ BP - Balsam Poplar; ♦ BF - Balsam Fir; ♦ TL - Larch; ♦ JP - Jack Pine; ♦ BS - Black Spruce; ♦ WS - White Spruce.
111.	PER4_3	Numeric	11	2	Percent Composition for Species 4 of Layer 3.
112.	SP5_3	String	2	0	Species 5 of layer 3 as follows: ♦ JP - Jack Pine.
113.	PER5_3	Numeric	11	2	Percent Composition for Species 5 of Layer 3.
114.	PATTRN_3	String	2	0	Canopy pattern of layer 3 defined as follows: ♦ P0 - Single stems; ♦ P1 - Single patch of stems; ♦ P2 - Few patches of stems; ♦ P3 - Several patches of stems; ♦ P4 - Continuous canopy; openings common; ♦ P5 - Continuous canopy; openings uncommon.
115.	ORIGIN_3	Numeric	11	2	Year of origin of layer 3.
116.	ORGNINT3	String	1	0	Differentiates between known and estimated year of origin of layer 3 as follows: ♦ A - year of origin is known to the nearest year (annum); ♦ D - year of origin is estimated to the nearest decade.
117.	CROWN_S	Numeric	11	2	Crown Closure of the shrub layer expressed to the nearest 1%.
118.	COMPLX_S	String	1	0	Canopy structure as follows: ♦ H - Horizontal.
119.	COMPRG_S	Numeric	11	2	Complex Stand Quantifier Horizontal Stand - Describes percent of ground area covered by the horizontal component.
120.	SP1_S	String	2	0	Species 1 of the shrub layer as follows: ♦ Ts - Tall Shrubs; ♦ Al - Alder; ♦ Bh - Beaked Hazel; ♦ Wi - Willow; ♦ Ls - Low Shrub Category; ♦ Bi - Bog Birch; ♦ Bl - Bog Laurel; ♦ La - Labrador tea.
121.	PER1_S	Numeric	11	2	Percent Composition for Species 1 of the Shrub Layer.
122.	SP2_S	String	2	0	Species 2 of the shrub layer as follows: ♦ Ts - Tall Shrubs; ♦ Al - Alder; ♦ Bh - Beaked Hazel; ♦ Cr - High Bush Cranberry; ♦ Wi - Willow; ♦ Ls - Low Shrub Category; ♦ Bu - Buffalo Berry; ♦ Bl - Bog Laurel.
123.	PER2_S	Numeric	11	2	Percent Composition for Species 1 of the Shrub Layer.

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
124.	SP3_S	String	2	0	Species 3 of the shrub layer as follows: ♦ Wi - Willow; ♦ Ls - Low Shrub Category; ♦ Ro - Prickly Rose;
125.	PER3_S	Numeric	11	2	Percent Composition for Species 3 of the Shrub Layer.
126.	SP4_S	String	2	0	Species 4 of the shrub layer as follows: ♦ No species present.
127.	PER4_S	Numeric	11	2	Percent Composition for Species 3 of the Shrub Layer.
128.	CROWN_H	Numeric	11	2	Crown Closure of the herb layer expressed to the nearest 1%
129.	COMPLX_H	String	1	0	Canopy structure as follows: ♦ H - Horizontal
130.	COMPRG_H	Numeric	11	2	Complex Stand Quantifier Horizontal Stand - Describes percent of ground area covered by the horizontal component.
131.	SP1_H	String	2	0	Species 1 of the herb layer as follows: ♦ Gr - Grasses; ♦ Se - Sedges, Rushes, Reeds; ♦ Li - Lichens.
132.	PER1_H	Numeric	11	2	Percent Composition for Species 1 of the Herb Layer.
133.	SP2_H	String	2	0	Species 2 of the herb layer as follows: ♦ He - Herbs (unknown species);
134.	PER2_H	Numeric	11	2	Percent Composition for Species 2 of the Herb Layer.
135.	SP3_H	String	2	0	Species 3 of the herb layer as follows: ♦ No species present.
136.	PER3_H	Numeric	11	2	Percent Composition for Species 3 of the Herb Layer.
137.	SP4_H	String	2	0	Species 4 of the herb layer as follows: ♦ No species present.
138.	PER4_H	Numeric	11	2	Percent Composition for Species 4 of the Herb Layer.
139.	SP5_H	String	2	0	Species 5 of the herb layer as follows: ♦ No species present.
140.	PER5_H	Numeric	11	2	Percent Composition for Species 5 of the Herb Layer.
141.	CROWN_A	Numeric	11	2	Crown Closure of the aquatic layer expressed to the nearest 1%.
142.	COMPLX_A	String	1	0	Canopy structure as follows: ♦ H - Horizontal.
143.	COMPRG_A	Numeric	11	2	Complex Stand Quantifier Horizontal Stand - Describes percent of ground area covered by the horizontal component.
144.	SP1_A	String	2	0	Species 1 of the aquatic layer as follows: ♦ Av - Aquatic Vegetation; ♦ Af - Floating Aquatic Vegetation; ♦ Ae - Emergent Aquatic Vegetation.
145.	PER1_A	Numeric	11	2	Percent Composition for Species 1 of the Aquatic Layer.
146.	SP2_A	String	2	0	Species 2 of the aquatic layer as follows: ♦ No species present.
147.	PER2_A	Numeric	11	2	Percent Composition for Species 2 of the Aquatic Layer.

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
148.	SP3_A	String	2	0	Species 3 of the aquatic layer as follows: ♦ No species present.
149.	PER3_A	Numeric	11	2	Percent Composition for Species 3 of the Aquatic Layer.
150.	COMPLX_N	String	1	0	Canopy structure as follows: ♦ H - Horizontal.
151.	COMPRG_N	Numeric	11	2	Complex Stand Quantifier Horizontal Stand - Describes percent of ground area covered by the horizontal component.
152.	NONFOR	String	3	0	Non-forested features identified as follows: ♦ L - Lakes or Ponds; ♦ R - Rivers; ♦ FL - Floods; ♦ RD - Roads; ♦ TL - Transmission Line; ♦ PL - Oil or Gas Pipeline.
153.	NONFOR_E	Numeric	11	2	Extent; used for roads only as follows: ♦ 1 - Paved, numbered highway; ♦ 2 - Gravel, numbered highway; ♦ 3 - Gravel, access road; ♦ 4 - Local access, dirt/ice road; ♦ 5 - Trail, dirt.
154.	LANDUSE	String	5	0	Non-vegetated land-use clearings identified as follows: ♦ vegu - Vegetation (agriculture); ♦ bugp - Built-up area (settlement); ♦ towu - Tower; generic; ♦ cmty - Cemetery; ♦ dmgu - Campground (recreation); ♦ gsof - Gas and oil facilities; ♦ rwgu - Runway; ♦ muou - Mining area: open pit; ♦ mg - Mining area: generic; ♦ peatc - Peat cutting; ♦ lmby - Lumber yard; ♦ sdgu - Solids depot; ♦ bupo - Built-up area (industrial); ♦ ftow - Fire tower.
155.	MOIST	String	2	0	Soil moisture regime identified as follows: ♦ VD - Very Dry; ♦ D - Dry; ♦ MF - Moderately Fresh; ♦ F - Fresh; ♦ VF - Very Fresh; ♦ MM - Moderately Moist; ♦ M - Moist; ♦ VM - Very Moist; ♦ MW - Moderately Wet; ♦ W - Wet; ♦ VW - Very Wet; ♦ A - Aquatic.

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
156.	MOD1	String	2	0	Stand modifier 1 identified as follows: ♦ CO - Cutover; ♦ BO - Burnover; ♦ WI - Windthrow; ♦ IN - Insect; ♦ DI - Disease; ♦ AK - Animal Kill; ♦ SF - Seasonal Flood; ♦ SL - Slump; ♦ SI - Silviculture; ♦ CW - Abandoned Well Site; ♦ GZ - Grazing; ♦ CL - Clearing; ♦ SN - Snags; ♦ SB - Sand/gravel; ♦ CB - Cutbank.
157.	EXT1	Numeric	11	2	Extent of modification 1 identified as follows: ♦ 'Blank' - No disturbance; ♦ 1 - Light; ♦ 2 - Moderate; ♦ 3 - Heavy; ♦ 4 - Severe; ♦ 5 - Entire.
158.	YEAR1	Numeric	11	2	Year of modification 1.
159.	YR1_INT	String	1	0	Differentiates between known and estimated year of modifier 1 as follows: ♦ a - year of modification is known to the nearest year (annum); ♦ d - year of modification is estimated to the nearest decade.
160.	MOD2	String	2	0	Stand modifier 2 identified as follows: ♦ CO - Cutover; ♦ BO - Burnover; ♦ WI - Windthrow; ♦ DI - Disease; ♦ CL - Clearing; ♦ SF - Seasonal Flood; ♦ SI - Silviculture; ♦ SN - Snags;
161.	EXT2	Numeric	11	2	Extent of modification 2 identified as follows: ♦ 'Blank' - No disturbance; ♦ 1 - Light; ♦ 2 - Moderate; ♦ 3 - Heavy; ♦ 4 - Severe; ♦ 5 - Entire.
162.	YEAR2	Numeric	11	2	Year of modification 2.
163.	YR2_INT	String	1	0	Differentiates between known and estimated year of modifier 2 as follows: ♦ a - year of modification is known to the nearest year (annum).

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
164.	MOD3	String	2	0	Stand modifier 3 identified as follows: ♦ CO - Cutover; ♦ BO - Burnover; ♦ WI - Windthrow; ♦ SF - Seasonal Flood; ♦ SI - Silviculture; ♦ CL - Clearing; ♦ SN - Snags.
165.	EXT3	Numeric	11	2	Extent of modification 3 identified as follows: ♦ 1 - Light; ♦ 2 - Moderate; ♦ 3 - Heavy; ♦ 4 - Severe; ♦ 5 - Entire.
166.	YEAR3	Numeric	11	2	Year of modification 3.
167.	YR3_INT	String	1	0	Differentiates between known and estimated year of modifier 3 as follows: ♦ a - year of modification is known to the nearest year (annum).
168.	MOD4	String	2	0	Stand modifier 4 identified as follows: ♦ SN - Snags;
169.	EXT4	Numeric	11	2	Extent of modification 4 identified as follows: ♦ 1 - Light; ♦ 2 - Moderate.
170.	YEAR4	Numeric	11	2	Year of modification 4.
171.	YR4_INT	String	1	0	Differentiates between known and estimated year of modifier 4 as follows: ♦ Not present.
172.	MOISTH2	String	2	0	Soil moisture regime for the minor horizontal layer identified as follows: ♦ F - Fresh; ♦ VF - Very Fresh; ♦ MM - Moderately Moist; ♦ M - Moist; ♦ VM - Very Moist; ♦ MW - Moderately Wet; ♦ W - Wet; ♦ VW - Very Wet; ♦ A - Aquatic.
173.	MOD1H2	String	2	0	Stand modifier 1 for the minor horizontal layer identified as follows: ♦ BO - Burnover; ♦ SF - Seasonal Flood; ♦ CL - Clearing; ♦ SN - Snags.
174.	EXT1H2	Numeric	11	2	Extent of modification 1 for the minor horizontal layer identified as follows: ♦ 1 - Light; ♦ 2 - Moderate; ♦ 3 - Heavy; ♦ 5 - Entire.
175.	YEAR1H2	Numeric	11	2	Year of modification 1 for the minor horizontal layer.
176.	YR1_INH2	String	1	0	Differentiates between known and estimated year of modifier 1 for the minor horizontal layer as follows: ♦ a - year of modification is known to the nearest year (annum).

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
177.	MOD2H2	String	2	0	Stand modifier 2 for the minor horizontal layer identified as follows: ♦ No modifier present.
178.	EXT2H2	Numeric	11	2	Extent of modification 2 for the minor horizontal layer identified as follows: ♦ No extent present.
179.	YEAR2H2	Numeric	11	2	Year of modification 2 for the minor horizontal layer.
180.	YR2_INH2	String	1	0	Differentiates between known and estimated year of modifier 2 for the minor horizontal layer as follows: ♦ Not present.
181.	MOD3H2	String	2	0	Stand modifier 3 for the minor horizontal layer identified as follows: ♦ No modifier present.
182.	EXT3H2	Numeric	11	2	Extent of modification 3 for the minor horizontal layer identified as follows: ♦ No extent present.
183.	YEAR3H2	Numeric	11	2	Year of modification 3 for the minor horizontal layer.
184.	YR3_INH2	String	1	0	Differentiates between known and estimated year of modifier 3 for the minor horizontal layer as follows: ♦ Not present.
185.	Year_int	Numeric	11	2	Interpretation Year: ♦ 1994; ♦ 1995; ♦ 1996; ♦ 1999; ♦ 2000; ♦ 2001; ♦ 2002; ♦ 2003; ♦ 2005; ♦ 2006; ♦ 2015
186.	SHAPE_LENGTH	Numeric	31	15	Shape length in m
187.	SHAPE_AREA	Numeric	31	15	Shape Area in m^2
CALCULATED FIELDS					
188.	AREAHA	Numeric	8	2	Area in hectares (ha).
189.	HFLAG	Numeric	8	2	Horizontal Identifier as follows: ♦ 0 - Not a horizontal; ♦ 1 - Overstorey is the majority horizontal component; ♦ 2 - Secondary layer is the majority horizontal component; ♦ 4 - Shrub layer is the majority horizontal component; ♦ 5 - Herb layer is the majority horizontal component; ♦ 6 - Aquatic layer is the majority horizontal component; ♦ 7 - Non Forested layer is the majority horizontal component.
190.	SFLAG	Numeric	8	2	Dominant Crown Layer Identifier as follows: ♦ 0 - SFVI Non Forested or a horizontal; ♦ 1 - Overstorey is the dominant crown; ♦ 2 - Secondary layer is the dominant crown; ♦ 3 - Tertiary layer is the dominant crown.

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
191.	DOM_LAYER	Numeric	8	2	Identifies which canopy layer is the dominant layer based on canopy structure as assigned in HFLAG and SFLAG: ♦ 1 - Overstorey layer is the dominant layer; ♦ 2 - Secondary layer is the dominant layer; ♦ 3 - Tertiary layer is the dominant layer.
192.	TOT_CROWN	Numeric	8	2	Sum of the crown closure of all three canopy layers or the dominant crown closure if a forested horizontal.
193.	RENEW_SPECIES	String	3	0	Renewal species
194.	CUTBLOCK	Numeric	8	2	Identifies most recent cutblock from both SFVI cutblocks and FMS cutblocks: ♦ 1 - Cutblocks identified in SFVI MOD3 field; ♦ 2 - Cutblocks identified in SFVI MOD2 field that have not been previously identified; ♦ 3 - Cutblocks identified in SFVI MOD1 field that have not been previously identified; ♦ 4 - Cutblocks indentified in SFVI MOD3 field with no modifier year (YEAR3); ♦ 5 - Cutblocks identified in SFVI MOD2 field not previously identified with no modifier year (YEAR2); ♦ 6 - Cutblocks identified in SFVI MOD1 field not previously identified with no modifier year (YEAR1); ♦ 7 - Override for all FMS cutblocks.
195.	CUTYEAR	Numeric	8	2	Cut Year
196.	PLAN_BLK	Numeric	8	2	Planned Block Flag: ♦ 0; ♦ 1
197.	TACT_BLK	Numeric	8	2	Tactical Block Flag: ♦ 0; ♦ 1
198.	CUTFLAG	Numeric	8	2	Cutflag: ♦ 0; ♦ 1
199.	SFVI_BURN	Numeric	8	2	The most recent burn year identified in SFVI
200.	FIREUPDATE_BURN	Numeric	8	2	Identifies the year burned from the fire update layer
201.	RECENT_BURN	Numeric	8	2	The most recent burn year between the SFVI_BURN and the FIREUPDATE_BURN
202.	BURNFLAG	Numeric	8	2	Burn flag ♦ No burn ♦ 1- Burnt
203.	NEWOCC	String	2	0	Overstorey crown closure class: ♦ A - 1%-25%; ♦ B - 26%-50%; ♦ C - 51%-75%; ♦ D - 76%-100%.
204.	OSGROUP	String	2	0	Overstorey Species Group identified as follows: ♦ S - Softwood; ♦ SH - Softwood dominated mixedwood; ♦ HS - Hardwood dominated mixedwood; ♦ H - Hardwood.

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
205.	OPCTCON	Numeric	8	2	Overstory layer percent Conifer ♦ 0- 0-9; ♦ 1- 10-19; ♦ 2 – 20-29; ♦ 3- 30-39; ♦ 4- 40-49; ♦ 5- 50-59; ♦ 6- 60-69; ♦ 7- 70-79; ♦ 8- 80-89; ♦ 9- 90-99; ♦ 10- 100
206.	OPCTDEC	Numeric	8	2	Overstory layer percent Deciduous ♦ 0- 0-9; ♦ 1- 10-19; ♦ 2 – 20-29; ♦ 3- 30-39; ♦ 4- 40-49; ♦ 5- 50-59; ♦ 6- 60-69; ♦ 7- 70-79; ♦ 8- 80-89; ♦ 9- 90-99; ♦ 10- 100
207.	NEWUCC	String	2	0	Secondary forested layer crown closure class: ♦ A - 1%-25%; ♦ B - 26%-50%; ♦ C - 51%-75%; ♦ D - 76%-100%.
208.	USPGROUP	String	2	0	Secondary layer Species Group identified as follows: ♦ S - Softwood; ♦ SH - Softwood dominated mixedwood; ♦ HS - Hardwood dominated mixedwood; ♦ H - Hardwood.
209.	UPCTCON	Numeric	8	2	Secondary layer percent Conifer ♦ 0- 0-9; ♦ 1- 10-19; ♦ 2 – 20-29; ♦ 3- 30-39; ♦ 4- 40-49; ♦ 5- 50-59; ♦ 6- 60-69; ♦ 7- 70-79; ♦ 8- 80-89; ♦ 9- 90-99; ♦ 10- 100

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
210.	UPCTDEC	Numeric	8	2	Secondary layer percent Deciduous ♦ 0- 0-9; ♦ 1- 10-19; ♦ 2 – 20-29; ♦ 3- 30-39; ♦ 4- 40-49; ♦ 5- 50-59; ♦ 6- 60-69; ♦ 7- 70-79; ♦ 8- 80-89; ♦ 9- 90-99; ♦ 10- 100
211.	NEWTCC	String	2	0	Tertiary layer crown closure class: ♦ A - 1%-25%; ♦ B - 26%-50%; ♦ C - 51%-75%; ♦ D - 76%-100%.
212.	TSPGROUP	String	2	0	Tertiary layer Species Group identified as follows: ♦ S - Softwood; ♦ SH - Softwood dominated mixedwood; ♦ HS - Hardwood dominated mixedwood; ♦ H - Hardwood.
213.	SFVI_SPGP	String	4	0	Dominant layer species group: ♦ S - Softwood; ♦ SH - Softwood dominated mixedwood; ♦ HS - Hardwood dominated mixedwood; ♦ H - Hardwood.
214.	BLOCK_SPGP	String	6	0	Block regen species group ♦ H; ♦ HS; ♦ S; ♦ SH
215.	PREHARVEST_SPGP	String	2	0	Preharvest species group ♦ S - Softwood; ♦ SH - Softwood dominated mixedwood; ♦ HS - Hardwood dominated mixedwood; ♦ H - Hardwood.
216.	POSTHARV_SPGP	String	2	0	Postharvest species group- including NSR/NSV ♦ S - Softwood; ♦ SH - Softwood dominated mixedwood; ♦ HS - Hardwood dominated mixedwood; ♦ H - Hardwood. ♦ NSR- not satisfactory restocked ♦ NSV- Not satisfactory vegetated
217.	POSTHARVEST_SPGP	String	3	0	Postharvest species group- not including NSR/NSV ♦ S - Softwood; ♦ SH - Softwood dominated mixedwood; ♦ HS - Hardwood dominated mixedwood; ♦ H - Hardwood.

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
218.	OLEADSP	String	2	0	Overstorey leading species assigned based on OSPGROUP: ♦ BF - Balsam Fir; ♦ BP - Balsam Poplar; ♦ BS - Black Spruce; ♦ JP - Jack Pine; ♦ TA - Trembling Aspen; ♦ TL - Larch; ♦ WB - White Birch; ♦ WS - White Spruce.
219.	ULEADSP	String	2	0	Secondary layer leading species assigned based on USPGROUP: ♦ BF - Balsam Fir; ♦ BP - Balsam Poplar; ♦ BS - Black Spruce; ♦ JP - Jack Pine; ♦ TA - Trembling Aspen; ♦ TL - Larch; ♦ WB - White Birch; ♦ WS - White Spruce.
220.	TLEADSP	String	2	0	Tertiary layer leading species assigned based on TSPGROUP: ♦ BF - Balsam Fir; ♦ BP - Balsam Poplar; ♦ BS - Black Spruce; ♦ JP - Jack Pine; ♦ TA - Trembling Aspen; ♦ TL - Larch; ♦ WB - White Birch; ♦ WS - White Spruce.
221.	SFVI_LEAD	String	2	0	Dominant layer leading species: ♦ BF - Balsam Fir; ♦ BP - Balsam Poplar; ♦ BS - Black Spruce; ♦ JP - Jack Pine; ♦ TA - Trembling Aspen; ♦ TL - Larch; ♦ WB - White Birch; ♦ WS - White Spruce.
222.	SOFT1	String	2	0	Primary layer softwood
223.	SOFT2	String	2	0	Secondary layer softwood
224.	SOFT3	String	3	0	Tertiary layer softwood
225.	LEAD_SOFT	String	2	0	SFVI lead softwood
226.	SEC_SOFT1	String	2	0	Primary secondary softwood
227.	SEC_SOFT2	String	2	0	Secondary secondary softwood
228.	SEC_SOFT3	String	3	0	Tertiary secondary softwood
229.	MARK1	Numeric	8	2	Primary secondary softwood idenfifer
230.	MARK2	Numeric	8	2	Secondary secondary softwood identifier
231.	MARK3	Numeric	8	2	Tertiary secondary softwood identifier

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
232.	SEC_SOFT	String	2	0	Secondary softwood
233.	SFVI_CRWN	String	1	0	Dominant layer crown closure class: ♦ A - 1%-25%; ♦ B - 26%-50%; ♦ C - 51%-75%; ♦ D - 76%-100%.
234.	BHAGE	Numeric	8	2	Overstory layer age at breast height
235.	P_INDEX1	Numeric	8	3	Overstorey layer Productivity Index calculated using formulas from the AVI 2.1 manual
236.	SPECNUM	Numeric	8	2	Primary layer overstory species
237.	PCLASS1	Numeric	8	2	Overstorey layer productivity index class assigned by SFVI species SP1_1 and P_INDEX1: ♦ 1 - Lowest; ♦ 2 - Low; ♦ 3 - Medium; ♦ 4 - High; ♦ 5 - Highest.
238.	BHAGE2	Numeric	8	2	Secondary layer age at breast height
239.	P_INDEX2	Numeric	8	3	Secondary layer Productivity Index calculated using formulas from the AVI 2.1 manual
240.	SPECNU2	Numeric	8	2	Secondary layer overstory species
241.	PCLASS2	Numeric	8	2	Secondary layer productivity index class assigned by SFVI species SP1_2 and P_INDEX2: ♦ 1 - Lowest; ♦ 2 - Low; ♦ 3 - Medium; ♦ 4 - High; ♦ 5 - Highest.
242.	BHAGE3	Numeric	8	2	Tertiary layer age at breast height
243.	P_INDEX3	Numeric	8	3	Tertiary layer Productivity Index calculated using formulas from the AVI 2.1 manual
244.	SPECNUM3	Numeric	8	2	Tertiary layer overstory species
245.	PCLASS3	Numeric	8	2	Tertiary layer productivity index class assigned by SFVI species SP1_3 and P_INDEX3: ♦ 1 - Lowest; ♦ 2 - Low; ♦ 3 - Medium; ♦ 4 - High; ♦ 5 - Highest.
246.	SFVI_PCLAS	Numeric	8	2	Dominant layer productivity class: ♦ 1 - Lowest; ♦ 2 - Low; ♦ 3 - Medium; ♦ 4 - High; ♦ 5 - Highest.
AERIAL CRUISE DATA					
247.	CRZ_FLAG	Numeric	8	2	Identifies polygons that were surveyed in the aerial cruise program: ♦ 0 - Not Cruised; ♦ 1 - Aerial Cruised.

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
248.	CRZ_SPGP	String	2	0	Aerial Cruise Species Group identified as follows: ♦ S - Softwood; ♦ SH - Softwood dominated mixedwood; ♦ HS - Hardwood dominated mixedwood; ♦ H - Hardwood.
249.	CRZ_OPCTCON	Numeric	8	2	Aerial Cruise percent conifer
250.	CRZ_OPCTDEC	Numeric	8	2	Aerial Cruise percent deciduous
251.	CRZ_CROWN	String	2	0	Aerial Cruise Crown Closure: ♦ D.
252.	CRZ_LEAD	String	2	0	Aerial Cruise Leading Species: ♦ BS - Black Spruce; ♦ JP - Jack Pine; ♦ TA - Trembling Aspen; ♦ WB - White Birch; ♦ WS - White Spruce.
FINAL CALCULATED FIELDS					
253.	WATER	Numeric	8	2	Binary identifier of Water polygons: ♦ 0 - Not Water; ♦ 1 - Water.
254.	DISPO_BIN	Numeric	8	2	Binary identifier of Disposition (Timber Reserve and Recreation Area) polygons: ♦ 0 - Not a Disposition; ♦ 1 - Disposition.
255.	A_NONFOR	Numeric	8	2	Identifies Anthropogenically Non-Forested polygons: ♦ 0 - Not Anthropogenically Non-Forested; ♦ 1 - SFVI LANDUSE Field; ♦ 2 - Landuse update layer, ANTH_DISTURB; ♦ 3 - Mistik update roads identified in RD_UPDATE field.
256.	AGE	Numeric	8	2	Stand Age
257.	AGECLASS5	Numeric	8	2	5-year age class
258.	AGECLASS10	Numeric	8	2	10-year age class
259.	DT_SPGP	String	4	0	Development Type Species Group: ♦ S - Softwood; ♦ SH - Softwood dominated mixedwood; ♦ HS - Hardwood dominated mixedwood; ♦ H - Hardwood.
260.	DT_SP1	String	2	0	Development Type Leading Species: ♦ BF - Balsam Fir; ♦ BP - Balsam Poplar; ♦ BS - Black Spruce; ♦ JP - Jack Pine; ♦ TA - Trembling Aspen; ♦ TL - Larch; ♦ WB - White Birch; ♦ WS - White Spruce.
261.	DT_SOFT	String	2	0	Development Type Leading Softwood: ♦ BF - Balsam Fir ♦ BS - Black Spruce; ♦ JP - Jack Pine; ♦ TL - Larch; ♦ WS - White Spruce.

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
262.	DT_2SOFT	String	2	0	Development Type Secondary Softwood: ♦ BF - Balsam Fir ♦ BS - Black Spruce; ♦ JP - Jack Pine; ♦ TL - Larch; ♦ WS - White Spruce.
263.	SIG_SOFT	Numeric	8	2	Identifies polygons with a hardwood development type species group that contains softwood in one or more layers.
264.	DT_CROWN	String	2	0	Development Type Crown Closure: ♦ HD - High Density; ♦ LD - Low Density.
265.	DT_SOIL	String	1	0	Development Type Soil: ♦ B - Brunisolic; ♦ L - Luvisolic; ♦ O - Organic.
266.	DT_PCLASS	Numeric	8	2	Development Type Productivity Class: ♦ 1 - Lower Productivity; ♦ 2 - Higher Productivity.
267.	DT_SPECIES	String	2	0	Development Type Species: ♦ BS - Black Spruce; ♦ JP - Jack Pine; ♦ TA - Trembling Aspen; ♦ WS - White Spruce.
268.	C_PROD	Numeric	8	2	Binary identifier of stands with low productivity: ♦ 0 - No Productivity Constraint; ♦ 1 - Low Productivity Constraint.
269.	C_LOWCROWN	Numeric	8	2	Binary identifier of stands with low crown closure: ♦ 0 - No Crown Closure Constraint; ♦ 1 - Low Crown Closure Constraint.
270.	C_LARCH	Numeric	8	2	Binary identifier of stands with significant (>40%) larch component: ♦ 0 - No Larch Constraint; ♦ 1 - Significant Larch Composition Constraint.
271.	OLARCHCOMP	Numeric	8	2	Overstorey larch composition
272.	ULARCHCOMP	Numeric	8	2	Second layer larch composition
273.	TLARCHCOMP	Numeric	8	2	Tertiary layer larch composition
274.	C_PINETOE	Numeric	8	2	Binary identifier of stands infested with Mistletoe using SFVI modifiers and FORHEALTH field from NRCAN: ♦ 0 - No Mistletoe Constraint; ♦ 1 - Mistletoe Constraint.
275.	C_BS	Numeric	8	2	Binary identifier of low productivity Black Spruce stands: ♦ 0 - No Black Spruce Constraint; ♦ 1 - Low Productivity Black Spruce Constraint.
276.	TPR	String	1	0	Stand Productivity ♦ F- Fair; ♦ G- Good; ♦ M- Medium; ♦ U- Unproductive

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
277.	NETDOWN	Numeric	8	2	Landbase category numbers identified as follows: ♦ 0 - Netlandbase; ♦ 1 - Water; ♦ 2 - Dispositions; ♦ 3 - Anthropogenically Non-Forested; ♦ 4 - Naturally Non-Forested; ♦ 5 - 90 metre Watercourse Buffer; ♦ 6 - 30 Metre Watercourse Buffer; ♦ 7 - 15 Metre Watercourse Buffer; ♦ 8 - Inoperable; ♦ 9 - Operational Constraints - Low Productivity Class; ♦ 10 - Operational Constraints - Low Crown Cover; ♦ 11 - Operational Constraints - High Larch Component; ♦ 12 - Operational Constraints - Pine Stands with Significant Dwarf Mistletoe; ♦ 13 - Operational Constraints - Low Productivity Black Spruce Stands.
278.	NETDOWN_TYPE	String	50	0	Landbase category names identified as follows: ♦ Netlandbase; ♦ Water; ♦ Dispositions; ♦ Anthropogenically Non-Forested; ♦ Naturally Non-Forested; ♦ 90 metre Watercourse Buffer; ♦ 30 metre Watercourse Buffer; ♦ 15 metre Watercourse Buffer; ♦ Inoperable; ♦ Operational Constraints - Low Productivity Class; ♦ Operational Constraints - Low Crown Cover; ♦ Operational Constraints - High Larch Component; ♦ Operational Constraints - Pine Stands with Significant Dwarf Mistletoe; ♦ Operational Constraints - Low Productivity Black Spruce Stands.
279.	EXCLUSION	String	10	0	Identifies polygons that are not in the netlandbase: ♦ Partial; ♦ Permanent.
280.	DEV_CODE	Numeric	8	2	Development Type Number identified as follows: ♦ 1 - S-WS-A-A; ♦ 2 - S-BS-A-A; ♦ 3 - S-JP-LD-A-1; ♦ 4 - S-JP-LD-A-2; ♦ 5 - S-JP-HD-A-1; ♦ 6 - S-JP-HD-A-2; ♦ 7- S-JP-L&M ♦ 8 - SH-JP-A-A; ♦ 9 - SH-WS-A-A; ♦ 10 - HS-WS-A-A; ♦ 11 - HS-JP-A-A; ♦ 12 - H-A-LD-A-1; ♦ 13 - H-A_LD-A-2; ♦ 14 - H-A-HD-A-1; ♦ 15 - H-A-HD-A-2; ♦ 16 - H(S)-A-LD-A; ♦ 17 - H(S)-A-HD-A.

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
281.	DEVTYPE	String	15	0	Development Type Name identified as follows: ♦ H-A-HD-A-1; ♦ H-A-HD-A-2; ♦ H-A-LD-A; ♦ H(S)-A-HD-A; ♦ H(S)-A-LD-A; ♦ HS-JP-A-A; ♦ HS-WS-A-A; ♦ S-BS-A-A; ♦ S-JP-HD-A-1; ♦ S-JP-HD-A-2; ♦ S-JP-LD-A-1; ♦ S-JP-LD-A-2; ♦ S-JP-L&M ♦ S-WS-A-A; ♦ SH-JP-A-A; ♦ SH-WS-A-A.
282.	SERAL_CLAS	Numeric	8	2	Seral Stage ♦ 1- Young; ♦ 2- Immature; ♦ 3- Mature; ♦ 4- Old; ♦ 5- Older
283.	SGR_CODE	Numeric	8	2	Silviculture Ground Rules Number as follows: ♦ 1 - S-WS; ♦ 2 - S-BS; ♦ 3 - S-JP; ♦ 4 - SH-JP; ♦ 5 - SH-WS; ♦ 6 - HS-WS; ♦ 7 - HS-JP; ♦ 8 - H.
284.	SGR_TYPE	String	15	0	Silviculture Ground Rules identified as follows: ♦ H; ♦ HS-JP; ♦ HS-WS; ♦ S-BS; ♦ S-JP; ♦ S-WS; ♦ SH-JP; ♦ SH-WS.
285.	PFT_TYPE	String	10	0	PFT polygon type identified as follows: ♦ ALA - Agriculture Land; ♦ BSH - Bush; ♦ FOR - Forested; ♦ GRS - Grass; ♦ OMS - Open Muskeg; ♦ OTH - Other; ♦ TMS - Treed Muskeg; ♦ UCL - Unclassified; ♦ WAT - Water.

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
286.	PFT	String	10	0	Provincial Forest Type identified as follows: ♦ AOH - Any other hardwood except TAB; ♦ BSJ - Black Spruce, Jack Pine; ♦ BSL - Black Spruce, Larch; ♦ HPM - Hardwood with Pine Mixedwood; ♦ HSM - Hardwood with Spruce Mixedwood; ♦ JLP - Jack Pine, Lodgepole Pine; ♦ PMW - Pine dominated mixedwood; ♦ SMW - Spruce dominated mixedwood; ♦ TAB - Trembling Aspen, White Birch; ♦ WSF - White Spruce, Balsam Fir.
287.	PFT_SERAL_CLASS	Numeric	8	2	Seral Class identified as follows: ♦ 1 - Young; ♦ 2 - Immature; ♦ 3 - Mature; ♦ 4 - Old; ♦ 5 - Older.
288.	PFT_SERAL_CLASS	Numeric	8	2	Seral Class identified as follows: ♦ 1 - Young; ♦ 2 - Immature; ♦ 3 - Mature; ♦ 4 - Old; ♦ 5 - Older.
289.	UPD_HEIGHT	Numeric	8	2	Updated Height
290.	Range_Id				
291.	Local_pop				
292.	GL20161118	Numeric	11	2	Unique spatial identifier
293.	TACTICAL_C	String			Tactical Plan code identified as follows: ♦ T1; ♦ T2; ♦ OF - old forest; ♦ " " - non tactical plan.
294.	AOP_YEAR	Numeric			Identifies blocks that are planned for harvest by calendar year
295.	BLOCKSTAT	String			Block status code: ♦ CUT - block is cut; ♦ PLANNED - block is planned.
296.	Caribou2006	Numeric			2007 FMP Caribou Range identifier: ♦ 0 - outside the caribou ranges; ♦ 1 - within the caribou ranges.
297.	GL20170913	Numeric	11	2	Unique spatial identifier
298.	OLDFOREST	Numeric			Old forest code identified as follows: ♦ 0 - not identified as old forest; ♦ 1 - identified as "old" forest; ♦ 2 - identified as "very old" forest.
299.	GL20171011	Numeric	11	2	Unique spatial identifier

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
300.	PROD	Numeric			Productive forest code identified as follows: ♦ 0 - not included within the model as productive forest; ♦ 1 - included within the model as productive forest.
301.	AREA_HA	Numeric			Model area field
302.	YOO	Numeric			Year of origin