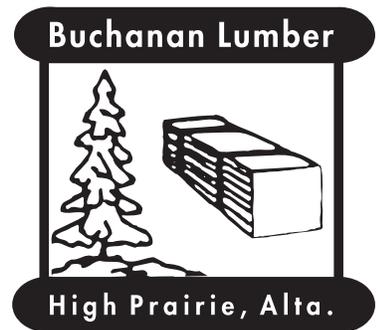


# Integrated Detailed Forest Management Plan

Ref.: J-016



# DFMP

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- Appendix B: Seral Stage Maintenance Strategy
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- Appendix D: Terms of Reference
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- Appendix F: Stake Holder Issues List and Reply
- Appendix G: Watershed Analysis Report
- Appendix H: Full Size Maps (Under Separate Cover)
- Appendix I: Full Size Maps (Under Separate Cover)
- Appendix J: Full Size Maps (Under Separate Cover)



1.0

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# Introduction

DFMP

## 1.0 INTRODUCTION

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### 1.1 PLAN PURPOSE

As defined in the Forests Act, the Minister of Sustainable Resource Development has the right to allocate timber resources through the use of long term tenure arrangements. On March 5, 2002, the Government entered into the first Joint Forest Management Agreement in the Province of Alberta with Gordon Buchanan Enterprises Ltd. (Buchanan Lumber) and Tolko Industries Ltd. High Prairie OSB Division (Tolko).

The Forest Management Agreement 0200039 contains provisions in Section 8(1) for the Companies to "establish, grow, harvest and remove timber on a perpetual sustained yield basis" from approximately 246 243 hectares of Crown Land. In return, the companies have agreed to:

- ◆ Follow sound forestry practices;
- ◆ Develop a Detailed Forest Management Plan;
- ◆ Provide opportunities for public involvement;
- ◆ Integrate operations with other forest industry operators;
- ◆ Create and maintain a forest inventory;
- ◆ Develop a growth and yield program;
- ◆ Develop ground rules to guide harvesting and reforestation operations;
- ◆ Reforest all lands harvested by the Companies.

The Interim Forest Management Planning Guidelines – Version: April 1998 were utilized as a guide to aid in the formation of the Joint Detailed Forest Management Plan. This planning version represents a significant paradigm shift from sustained timber management to sustainable forest management.

### 1.2 CORPORATE PROFILES

#### 1.2.1 BUCHANAN LUMBER A DIVISION OF GORDON BUCHANAN ENTERPRISES LTD.

Arnold Buchanan began the Buchanan Lumber business in 1929 when he purchased and outfitted a small sawmill near McCreary, Manitoba. In 1957 the family operation moved to Alberta. The first sawmill was located in the forest south of Valleyview, Alberta, while the planer was located in High Prairie, Alberta. The family recognized the benefits of moving the sawmill to High Prairie to work in conjunction with the planer. In 1959 the Buchanan family purchased the planer and Buchanan Lumber found a permanent home in High Prairie, Alberta.

#### 1.2.2 TOLKO INDUSTRIES LTD.

Founded in 1961, Tolko Industries Ltd. is a privately owned forest products company employing over 2,400 people across Western Canada. The Company is based in Vernon, British Columbia, and led by sons of the founder, Harold Thorlakson. Tolko's nine manufacturing divisions produce

lumber, specialty kraft paper, and engineered wood products for world markets with sales reaching approximately 899 million dollars in 2003. The Company's Woodlands departments sustainably manage almost 14.8 million hectares of productive forestland in British Columbia, Alberta, Saskatchewan and Manitoba.

### 1.2.3 THE BUCHANAN LUMBER SAWMILL FACILITY

Buchanan Lumber a Division of Gordon Buchanan Enterprises Limited was formed in High Prairie, Alberta in 1961. Buchanan Lumber owns and operates a dimensional stud mill and finger joint plant. Buchanan Lumber employs over 200 people. The annual production of these facilities is 100,000,000 board feet of dimensional studs, 3,000,000 board feet of finger joint products and 50,000 bone dry units of pulp chips. The original mill site has seen continual machinery updates and technological improvements through its 50 plus years of operation.

The Buchanan Lumber mill consumes approximately 350 000 m<sup>3</sup> per year of coniferous fibre from public and private land. The current Annual Allowable Cut for Buchanan Lumber is approximately 258,000 m<sup>3</sup>. Outside of the Forest Management Agreement area there are four quota areas in which Buchanan currently operates. A summary of the existing allocations is provided in the table below.

**TABLE 1-1: BUCHANAN ANNUAL ALLOWABLE CUT SUMMARY**

Allocation	Type	Volume (m <sup>3</sup> )
Joint FMA0200039	Coniferous Annual Allowable Cut	124,427 m <sup>3</sup>
CTQS150004	Coniferous Annual Allowable Cut	20,728 m <sup>3</sup>
CTQP040007	Coniferous Annual Allowable Cut	24,595 m <sup>3</sup>
CTQP030008	Coniferous Annual Allowable Cut	34,028 m <sup>3</sup>
CTQS200003	Coniferous Annual Allowable Cut	54,560 m <sup>3</sup>

Buchanan Lumber recently completed an 11 million-dollar modernization which resulted in increased fibre recovery from its existing wood supply. Through technological advancements the outdated beehive burner has been de-commissioned and a new boiler plant has been constructed. This allows Buchanan to further utilize by-products of their operations and turn these by-products into energy for heating the drying kilns and buildings on the mill site.

### 1.2.4 THE TOLKO INDUSTRIES LTD. OSB FACILITY

Tolko Industries Ltd. - High Prairie OSB Division, Tolko's first oriented strand board (OSB) mill, is a modern manufacturing facility located ten (10) kilometres west of High Prairie, Alberta. The mill has a twelve (12) foot wide forming line feeding a twelve (12) opening, twelve (12) foot by twenty-four (24) foot press, with a rated capacity of 525 million square feet on a 3/8 inch basis. The mill consumes approximately 850 000m<sup>3</sup> per year of deciduous fibre from public and private land.

The High Prairie Woodlands operating area extends in a radius of approximately two hundred fifty (250) kilometres from the mill and provides an annual harvest of up to 850 000 m<sup>3</sup> of Trembling Aspen (*Populus tremuloides* Michx.), Balsam Poplar (*Populus balsamifera* L.) and a small component of White Birch (*Betula papyrifera*).

In addition to the Joint Forest Management Agreement Area, Tolko operates in the Original Forest Management Agreement Area, two quota licences in Canfor's Forest Management Agreement Area,

and a quota licence in a portion of Weyerhaeuser's Forest Management Agreement Area. A summary of the existing allocations is provided in the table below.

**TABLE 1-2: TOLKO ANNUAL ALLOWABLE CUT SUMMARY**

Allocation	Type	Volume (m <sup>3</sup> )
Joint FMA0200039	Deciduous Annual Allowable Cut	167 413
Original FMA9700033	Deciduous Annual Allowable Cut	299 875
DTAG150001	Deciduous Annual Allowable Cut	114 172
DTAG150002	Deciduous Annual Allowable Cut	167 817
DTAG010001	Deciduous Annual Allowable Cut	80 000

### 1.2.5 SUMMARY OF HISTORICAL ANNUAL ALLOWABLE CUT

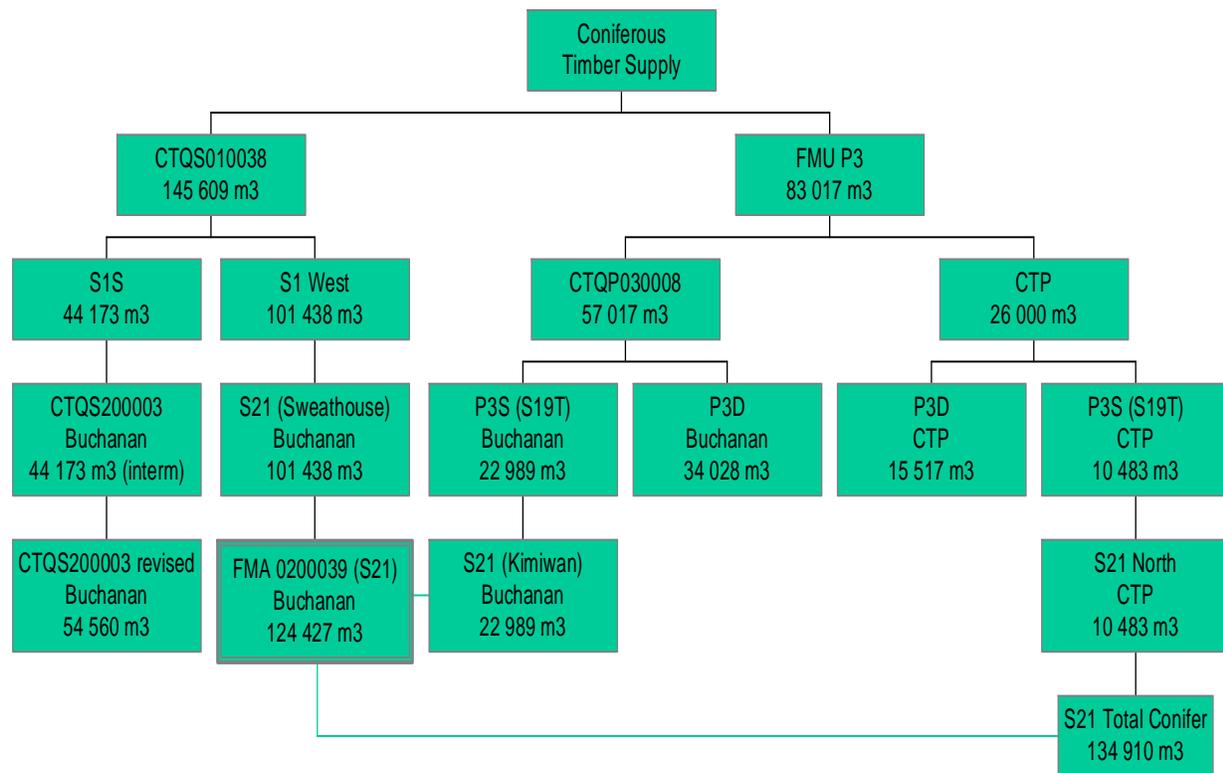
The allocation of deciduous and coniferous timber rights has changed over the years due to the allocation of timber rights to other companies and disposition changes. The coniferous timber supply was initially provided from two areas generally known as the P3 Forest Management Unit and the S1 Forest Management Unit.

The conifer timber rights in the P3 Forest Management Unit, are held by, Buchanan Lumber and the Community Timber Program managed by the Government of Alberta for small loggers and sawmillers. The southern portion of the P3 Forest Management Unit was allocated to Tolko Industries Ltd. in 1995 as part of the High Prairie Timber Supply Area and became part of the Original FMA in 1997. As a result, the Coniferous Quota was split between Tolko's Forest Management Area S19T (P3) and Daishowa's Forest Management Area P3D. In 2002, the southern portion of the P3 Forest Management Area was removed from the Tolko Original Forest Management Area and became part of the Joint Forest Management Area known as S21.

A portion of the conifer timber rights in the S1 Forest Management Unit are held by Buchanan Lumber. The S1 Forest Management Unit was initially all part of the Slave Lake Pulp Reserve Forest Management Area. Eventually it was split into two parts S1S and S1West. In 2002, S1West became part of the Joint Forest Management Area known as S21.

The following flowchart provides a summary of the coniferous annual allowable cut for the Joint Forest Management Agreement area (FMU S21). This flowchart also provides a historical summary of the allocation of the coniferous (Figure 1-1) fibre within the Joint FMA area.

**FIGURE 1-1: SUMMARY OF CONIFEROUS CURRENT AND HISTORICAL ANNUAL ALLOWABLE CUT**



The deciduous timber supply for the Tolko High Prairie OSB facility was initially provided from eight Forest Management Units: S1, G5C, G2C, G2, G10, S3, S9 and P3. The timber supply has changed over the years due to changes in timber allocations and disposition changes.

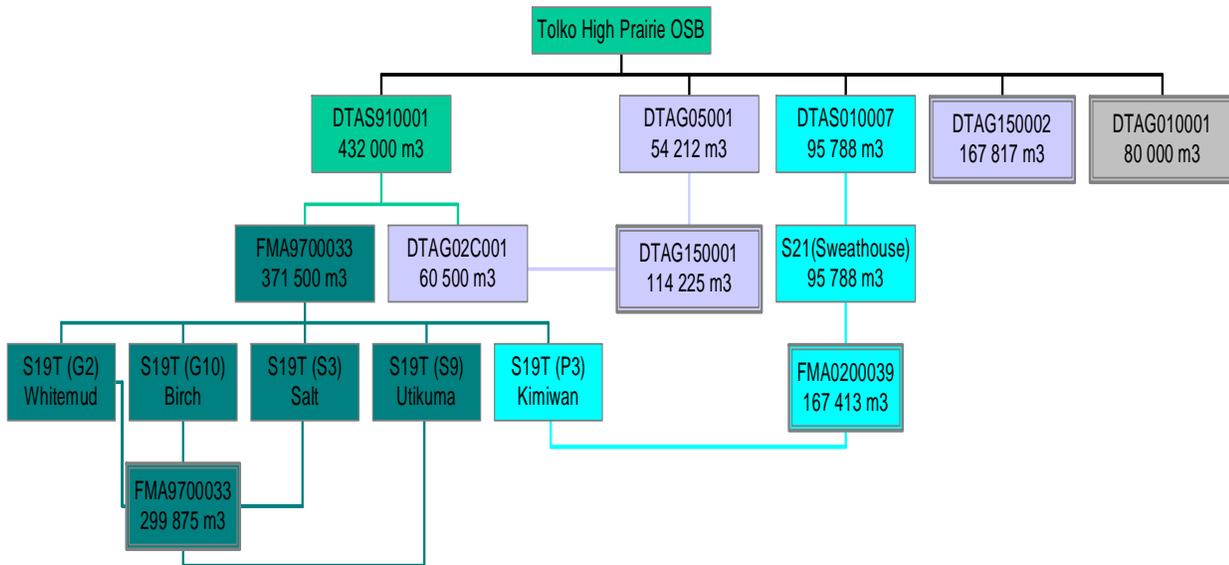
Initially Tolko had a quota allocation known as DTAS910001. In 1997 this allocation was split into the Original Forest Management Area FMA9700033 and the Quota DTAG02C001 located in Canfor's Forest Management Area. In 2002, a portion of the Original Forest Management Area known as S19T (P3) was removed and switched to the Joint Forest Management Area FMA0200039.

The Quota from G5C and G2C located in Canfor's Forest Management Area have recently been amalgamated into a Quota known as DTAG150001.

The Quota from the area known as the S1 Forest Management Area in 2002 became part of the Joint Forest Management Area FMA0200039.

The following flowchart provides a summary of the deciduous annual allowable cut for the Joint Forest Management Agreement area (FMU S21). This flowchart also provides a historical summary of the allocation of the deciduous (Figure 1-2) fibre within the Joint FMA area.

**FIGURE 1-2: SUMMARY OF DECIDUOUS CURRENT AND HISTORICAL ANNUAL ALLOWABLE CUT**



### 1.3 APPROACH TO PLANNING

Buchanan Lumber and Tolko are committed to following the principles of sound, carefully planned, sustainable forest management practices. This will ensure the integrity of all forest resources, the viability of the timber resource-based investments in High Prairie, and the economic well-being of the local communities associated with these investments.

To protect the forests, the interests of Buchanan and Tolko employees, and the local communities, the companies strive to maximize product recoveries and end values, while managing forest lands in a responsible manner.

During negotiations for the Joint Forest Management Area the companies, with approval from the Provincial Government, agreed to forgo the requirement for a Preliminary Forest Management Plan. This agreement was put in place to facilitate the analysis of a single Timber Supply Area through the combination of the Detailed Forest Management Planning processes for the Joint Forest Management Area and the Original Forest Management Area.

Initial work on the timber supply analysis started in 1997 with the collection of data and the creation of the Alberta Vegetation Inventory for the Timber Supply Area. Additional information for the Joint Forest Management Area was purchased from Slave Lake Pulp. The data analysis was followed by the creation of an integrated planning team, which began meeting in September 2002.

Both Buchanan Lumber and Tolko are committed to responsible stewardship of the environment throughout their operations. The FMA holder has tenure rights to harvest and reforest trees on their Forest Management Area. They are also responsible for the mitigation of any adverse impacts of their activities on other forest resource values. They are not responsible for the management of

these other forest resource. This responsibility rests with the crown.<sup>1</sup> Buchanan Lumber and Tolko, pursuant with the above statement taken from the Interim Forest Planning Management Version – 1998, will achieve optimization of the fiber resource within the Forest Management Area while mitigating impacts on other forest resource values. The companies must work towards maintaining a balance between being economically viable and incorporating other non-fiber forest values into the Joint Detailed Forest Management Plan.

## 1.4 PLANNING TEAM DESCRIPTION

The commitment to protect the environment is a shared responsibility, which will be achieved through an open and transparent Joint DFMP process. Local Stakeholders, Provincial and Federal Governments, Metis, Aboriginal, Local Community Timber Program Operators, Local Trappers, Company Contractors and the General Public were all invited to be represented on the Joint DFMP Planning Team. Buchanan Lumber and Tolko assembled a planning team to assist in the development of the Joint Detailed Forest Management Plan. The planning team served as a conduit for information exchange between the companies and the stakeholders.

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<sup>1</sup> *Interim Forest Management Planning Manual – Guidelines to Plan Development – Version: April 1998*

**TABLE 1-3: JOINT DETAILED FOREST MANAGEMENT PLAN PLANNING TEAM MEMBERSHIP**

<b>Planning Team</b>	<b>Affiliation &amp; Position</b>	<b>General Responsibilities</b>
Keith Branting	Buchanan Lumber Woodlands Manager	DFMP development
Rick Alguire	Tolko Industries Ltd. Woodlands Manager	DFMP development
Hilary Wait	Tolko Industries Ltd. Divisional Forester	DFMP development
Bob Morton	President/CEO Silvacom	Preparation and Submission of TSA
Rick Reid	Silvacom	Preparation and Submission of TSA
Robert Stokes	Manager Forest Planning Section Forest Management Branch Edmonton	Forest Management Plan Review Provincial Level
Brad Epp	Forest Management Planning Forester Forest Planning Section Forest Management Branch	Forest Management Plan Review Lead Edmonton Contact
Brad Pinno	Area Forester Alberta Sustainable Resource Development	Forest Management Plan Review Lead Area Contact (High Prairie)
Mike Maximchuk	Forest Health Officer Alberta Sustainable Resource Development Peace River	Advisory regarding Insects & Disease
Andrew Wagner	Water Resource Analyst Alberta Environment High Prairie	Advisory regarding Water Management
Mark Townsend	Alberta Sustainable Resource Development Peace River	TSA Review
Mark Heckbert	Wildlife Biologist Alberta Sustainable Resource Development High Prairie	Advisory regarding Wildlife and Habitat Management
Doug Lowe	Impact Assessment Biologist Federal Department of Fisheries and Oceans (DFO)	Advisory regarding Water Issues and Fisheries Issues
Roger Marcoux	East Peace MTU Representative	MTU Issues
Crosby Rich	Local Contractor Company Owner	Contractor Issues
Gerry Williscroft	Trapper	Trapper Issues
Lorne L'Hirondelle	Métis Representation/Peavine	Métis Issues
J.R. Giroux	Lesser Slave Lake Regional Council	First Nation Issues

The planning team has encountered some challenges since its inception in September 2002. During the life of the team there has been a re-organization of the Alberta Sustainable Resource Department and several departmental name changes. In addition, several of the company and Government staff have left the area for other careers. Other Government personnel involved in the

Joint Detailed Forest Management Plan included: Trisha Stubbings, Kristofer Heemeryck and Theresa Stokes.

Other Company personnel involved in the Joint Detailed Forest Management Plan included: Allan Bell and Kenzie MacDonald. Other stakeholders involved in the Joint Detailed Forest Management Plan included: Mike Aiken and Tom Gogal.

## **1.5 PUBLIC INVOLVEMENT PROCESS**

The aim of Buchanan Lumber and Tolko was to have an open and transparent planning process.

Through the following initiatives, further detailed within the Public Involvement Plan, the companies have achieved a meaningful public involvement process for the Joint Detailed Forest Management Plan development and other associated forest management activities such as the following:

- ◆ Forest Resource Advisory Committee (FRAC);
- ◆ Open House Meetings;
- ◆ Stakeholders representation on the Joint DFMP planning team;
- ◆ Presentations.

This DFMP is an open and transparent process, stakeholders having questions or concerns prior to the submission and approval of these plans were invited to contact company woodlands staff to open a dialogue and communicate their issues, comments, questions or concerns.

Through these processes the companies believe that the framework for public involvement within the Joint Forest Management Area was provided. By providing a meaningful public involvement process with regards to operations the companies hope to aid in the paradigm shift from sustainable timber management towards sustainable forest management.

## **1.6 LIAISON WITH REGULATORY AGENCIES AND QUOTA HOLDERS**

Each year there are a number of different federal, provincial and municipal Government agencies involved in the review of operations on the Joint Forest Management Area.

**TABLE 1-4: SUMMARY OF GOVERNMENT AGENCIES**

<b>Government Agency</b>	<b>Section/Branch</b>	<b>Location</b>
Alberta Sustainable Resource Development	Forest Management Branch	Edmonton
Alberta Sustainable Resource Development	Lesser Slave Forest Area	High Prairie
Alberta Sustainable Resource Development	Lesser Slave Forest Area	Slave Lake
Alberta Sustainable Resource Development	Wapiti Forest Area	Valleyview
Alberta Sustainable Resource Development	Wapiti Forest Area	Grande Prairie
Alberta Sustainable Resource Development	Peace River Forest Area	Peace River
Federal Department of Fisheries and Oceans (DFO)	Impact Assessment	Peace River
Alberta Environment	Water Resources	High Prairie
Alberta Sustainable Resource Development	Fish and Wildlife Division	High Prairie
Alberta Sustainable Resource Development	Fish and Wildlife Division	Slave Lake
Alberta Sustainable Resource Development	Forest Health	Peace River
Alberta Sustainable Resource Development	Forest Protection	Slave Lake
Alberta Sustainable Resource Development	Forest Protection	Grande Prairie
Municipal District of Big Lakes		High Prairie
Municipal District of Greenview		Valleyview
Municipal District of Smoky		Falher
County of Birch Hills		Wanham
Northern Sunrise County		Peace River
Grande Prairie County		Grande Prairie
Saddle Hills County		Spirit River

The Joint Forest Management Area has a Community Timber Program operating in the Kimiwan Operating Area. A summary of the existing allocations is provided in the table below.

**TABLE 1-5: COMMUNITY TIMBER PROGRAM SUMMARY**

<b>Organization</b>	<b>Operating Area</b>	<b>Annual Allowable Cut</b>
East Peace Local Timber Program	Kimiwan (S21 (P3))	10 483 m <sup>3</sup>



# 2.0

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## **Description of the Joint Forest Management Agreement Area (FMA)**

## **2.0 DESCRIPTION OF THE JOINT FOREST MANAGEMENT AGREEMENT AREA (FMA)**

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### **2.1 HISTORY OF THE HIGH PRAIRIE TIMBER DEVELOPMENT AREA**

On March 5th, 2002 Tolko Industries Ltd. and Buchanan Lumber Ltd. entered into an agreement with the Province for the first Joint Forest Management Agreement Area in the province of Alberta. The Forest Management Unit S21 has been divided into two individual operating areas: Kimiwan and Sweathouse (formerly known as S19T (P3) and S1W respectively).

### **2.2 LANDSCAPE AND PLANNING BOUNDARIES**

Tolko and Buchanan Lumber will operate the Forest Management Agreement Area as a single sustained yield unit.

The Joint Forest Management Agreement Area 0200039 is a heterogeneous area consisting of non-contiguous management units dispersed across the boreal mixedwood region of mid-central Alberta.

The Forest Management Unit S21 has been divided into two individual operating areas Kimiwan and Sweathouse (formerly known as S19T (P3), and S1W respectively).

Unlike many other Forest Management Agreement Areas in the Province, the Joint Forest Management Agreement Area is distinguished by the complexity of the landuse and ownership adjacent to its borders and between individual operating areas. In addition there is a complex overlapping tenure structure with multiple forest users.

### **2.3 MANAGEMENT SUBDIVISIONS**

Each of the operating areas (Kimiwan and Sweathouse) has been further divided into compartments. These compartments were developed using geographic features like watercourses, or heights of land and manmade features like main roadways. The intent was to make operational areas that could be easily identified on the ground and appropriate in size for a Compartment Plan or Annual Operating Plan.

In total there are 21 compartments ranging in size from 7,283 hectares to 16,889 hectares with the mean compartment size at approximately 11,726 hectares. The Sweathouse operating area has the largest number of compartments at twelve (12) and Kimiwan has nine (9) compartments. A summary of the compartments and their size in hectares is provided in Table 2-1.

**TABLE 2-1: COMPARTMENT SUMMARY**

<b>FMU</b>	<b>COMPARTMENT NUMBER</b>	<b>GROSS AREA (HA)</b>	<b>NET AREA (HA)</b>
<b>Kimiwan</b>	1	11,679	8,268
	2	16,889	11,553
	3	10,422	4,914
	4	10,994	8,059
	5	9,360	6,937
	6	10,415	7,703
	7	11,868	4,801
	8	11,339	6,269
	9	9,591	4,721
<i>Kimiwan Total</i>		<i>102,557</i>	<i>63,224</i>
<b>Sweathouse</b>	1	14,461	9,256
	2	13,055	8,802
	3	11,739	7,910
	4	15,374	10,503
	5	15,252	9,805
	6	10,407	7,444
	7	14,377	11,586
	8	7,283	5,156
	9	11,569	9,777
	10	9,981	8,104
	11	10,925	9,191
	12	9,263	7,471
<i>Sweathouse Total</i>		<i>143,687</i>	<i>105,005</i>
<b>Joint FMA Total</b>		<b>246,243</b>	<b>168,229</b>

## **2.4 BIOPHYSICAL DESCRIPTION**

### **2.4.1 ECOLOGICAL CLASSIFICATION**

The Boreal Forest Natural Region is the largest natural region in Alberta and encompasses the majority of the Joint FMA area.

This region is characterized by broad lowland plains, discontinuous hill systems and extensive wetlands. The winters are typically long and cold, with short, cool summers. Most of the precipitation falls between May and August. The dominant soils are Luvisols on the well-drained uplands and Organics in the poorly drained lowland areas. Vegetation in this region is aspen dominated forests, with mixedwood or coniferous forests occurring at higher elevation sites or in the wetlands. This natural region is highly diverse and is further divided into six different sub-regions based on differences in vegetation, geology and landforms.

Three sub-regions are represented on the Joint FMA area:

- ◆ Central Mixedwood;
- ◆ Dry Mixedwood; and
- ◆ Lower Foothills.

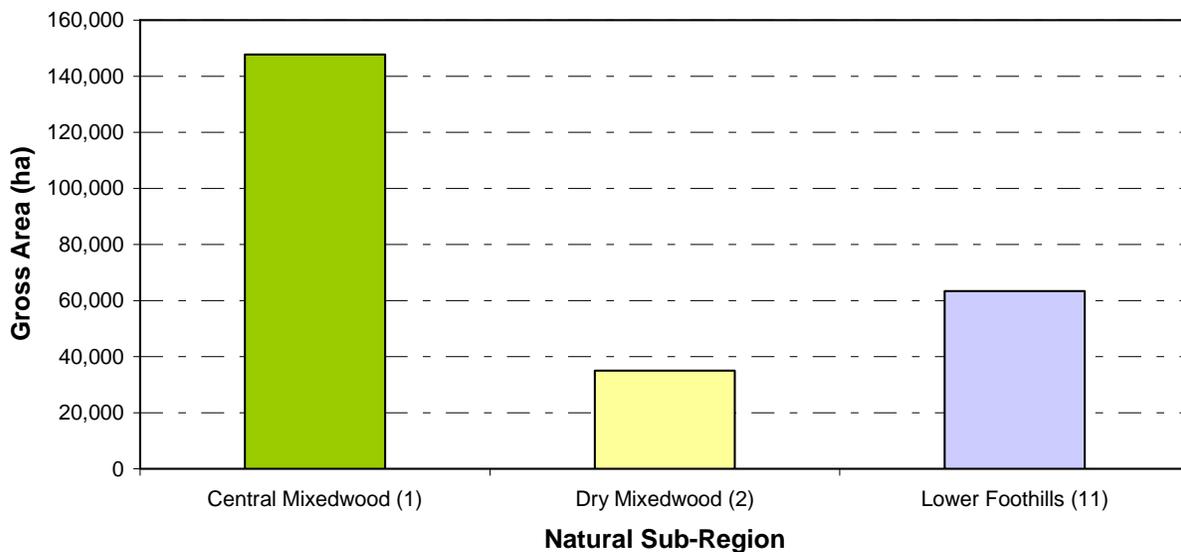
Approximately 60% of the gross area is found in the Central Mixedwood natural sub-region. Smaller portions of the Joint FMA are found in the Dry Mixedwood and Lower Foothills natural sub-regions (14% and 26% respectively). A description of these natural sub-regions can be found in Table 2-3.

An area summary of the natural sub regions across the Joint FMA area can be found in Table 2-2 and Figure 2-1. The distribution of the natural sub-regions across the Joint FMA is illustrated in Map 2-1 (full size maps can be found in Appendix H, Map H-1).

**TABLE 2-2: NATURAL SUB-REGION AREA SUMMARY**

NATURAL SUB-REGION	GROSS AREA (HA)
Central Mixedwood (1)	147,745
Dry Mixedwood (2)	35,060
Lower Foothills (11)	63,438
<b>TOTAL</b>	<b>246,243</b>

**FIGURE 2-1: NATURAL SUB-REGION AREA SUMMARY**



### 2.4.1.1 LOWER FOOTHILLS NATURAL SUB-REGION

The Lower Foothills Natural Sub-region makes up a small portion of the Joint FMA area. This sub-region is found only within the Sweathouse operating area of the Joint FMA.

This sub-region is transitional between the Foothills and Mixedwood Natural Regions. The climate of this sub-region represents a transition between boreal and cordilleran (montane) climatic

conditions and is continental with an average summer temperature of 12.8°C and an average winter of -7.8°C. Total annual precipitation is 465mm a large portion of this falls during the summer about 295mm. Brunisolic and Luvisolic soils are the dominant soil developments on till and glaciofluvial materials. Organic soils are contained to poorly drained, gently sloping, lowland depressions.

Vegetation in the Lower Foothills Natural Sub-region is considered transitional between boreal deciduous and montane coniferous vegetation. Forests are characteristically mixedwood in nature and are composed of aspen, balsam poplar, lodgepole pine, and white spruce with the species composition of the mixedwood determined by the geographical location and disturbance history. For example, pure coniferous components can be found at the upper boundary with the Upper Foothills Natural Sub-region while deciduous can be found at lower elevations and along, dry south-facing slopes. Black spruce and tamarack are found in poorly drained sites. Typically understorey shrubs depend on the drainage of the site and may include, prickly rose, dwarf birch, low-bush cranberry, green alder, bearberry, juniper, low bilberry, Canada buffalo-berry, and Labrador tea. Forbs and grasses would include a selection of hairy wild rye, white meadowsweet, twinflower, marsh reed grass, wild sarsaparilla, bunchberry, dewberry, fireweed, wintergreen, sedges, and mosses.

#### **2.4.1.2 CENTRAL MIXEDWOOD NATURAL SUB-REGION**

This is the largest natural sub-region in Alberta. Summers are typically short and cool while winters are long and cold with average temperatures of 13.8°C and -10.5°C respectively. This sub-region is drier than the Lower Foothills with an average annual precipitation of 380mm. In this sub-region June and July are the wettest months with relatively dry winters being the normal condition. Luvisolic soil developments on morainal and glacial lacustrine materials are the dominant soil types. Organic soils are contained to poorly drained, gently sloping lowland depressions. Some meandering river systems contain large areas of fluvial and colluvial materials.

The dominant tree species in this sub-region is aspen occurring in both pure and mixed stands. Balsam Poplar often occurs with aspen in more moist sites and mixedwood stands of aspen, white spruce, and white birch are also common. Typical shrubby vegetation in deciduous upland sites includes low-bush cranberry, Canada buffalo-berry, twinflower, beaked hazelnut, prickly rose, red-osier dogwood, Saskatoon, and green alder, while common herbs include bunchberry, wild sarsaparilla, dewberry, cream-colored peavine, pink wintergreen, palmate-leaved coltsfoot, hairy wild rye, and marsh reed grass. Feathermosses are the dominant understorey in areas with greater representation of conifers. Mixedwood forests contain a mosaic of these typical deciduous and coniferous understories. Common peatland vegetation within this sub-region includes black spruce, Labrador tea, and various peatmosses in bogs of tamarack, dwarf birches, sedges, and brown mosses.

#### **2.4.1.3 DRY MIXEDWOOD NATURAL SUB-REGION**

The Dry Mixedwood Sub-region is another of the ecological sub-regions found within the Joint FMA area. The climate of this sub-region is continental, similar to that of the Central Mixedwood Sub-region. The average summer temperature is about 13°C and the majority of the average annual precipitation (350mm) arrives during the summer, while the winters are relatively dry with an average of 60mm of precipitation. Within the Joint FMA, Luvisolic soil developments on glacial lacustrine materials are the dominant soil types, although morainal materials are also present. Organic soils are contained to poorly drained, gently sloping, lowland depressions. Some meandering river systems contain large areas of fluvial and colluvial materials with limited, or Regosolic, soil developments.

The dominant tree species in these mixedwood forests tends to be aspen, with a proportion of balsam poplar, white spruce, black spruce, jack pine, and balsam fir determined by the successional stage and moisture regime. Typical understorey vegetation is similar to that found in the Central Mixedwood Natural Sub-region.

**TABLE 2-3: SUB-REGION DESCRIPTIONS<sup>1</sup>**

	PARENT MATERIAL	SOIL TYPES /DRAINAGE	CLIMATE	VEGETATION	UNIQUE CHARACTERISTICS
<b>CENTRAL MIXEDWOOD</b>	Morainal	- Gray Luvisol - Eutric Brunisol - Well Drained	Sub-humid, continental - Cool short summers - Long, cold winters	- Aspen and balsam poplar - White spruce &/or balsam fir successional replace deciduous species	Frequent fires seldom permit conifers to succeed and pure deciduous stands dominate the sub-region.  <b>BOREAL FOREST NATURAL REGION</b>
<b>DRY MIXEDWOOD</b>	Morainal	- Gray Luvisol - Eutric Brunisol - Well drained - Gleysolics and Organics on wet sites	Sub-humid, continental - Cool short summers - Long, cold, relatively dry winters	- Aspen and balsam poplar - White spruce &/or balsam fir successional replace deciduous species	Frequent fires seldom permit conifers to succeed and pure deciduous stands dominate the sub-region.  <b>BOREAL FOREST NATURAL REGION</b>
<b>LOWER FOOTHILLS</b>	Morainal Veneer over Bedrock	- Luvisol - Brunisol - Poorly drained	Continental - Cool in the summer - Relatively warm in the winter	Co-dominant occurrence of - Aspen - Balsam poplar - Lodgepole pine - White spruce	Transitional between aspen – white spruce dominated boreal mixedwood forests and the lodgepole pine dominated upper foothills and sub-alpine forests.  <b>FOOTHILLS NATURAL REGION</b>

<sup>1</sup> Alberta Environment, 2000. *Alberta Natural Region Land Classification System*. On Alberta Natural Heritage Information Centre website. [www.go.ab.ca/env/parks/anhic](http://www.go.ab.ca/env/parks/anhic).

## MAP 2-1: NATURAL SUB-REGIONS OF ALBERTA

## 2.5 OTHER RESOURCE USERS

### 2.5.1 OIL AND GAS INDUSTRY

The non timber resource extraction industries are prevalent on the Joint Forest Management Area. Oil and Gas development is the most frequent activity. There are a number of oil and gas fields located throughout the Joint Forest Management Area. The Sweathouse operating area has the highest amount of activity. The Kimiwan operating area had a significant amount of seismic activity in recent years which is beginning to translate into increased wellsite and roadway development.

Buchanan Lumber and Tolko Industries Ltd. interact with these companies in a number of different capacities. The following are the most active oil and gas companies currently operating in the Forest Management Area:

- ◆ Canadian Natural Resources Limited;
- ◆ Vermilion Resources Ltd.;
- ◆ Conocophilips Canada Resources Corp.;
- ◆ Primewest Energy Inc.;
- ◆ Pengrowth Corporation;
- ◆ Apache Canada Ltd.;
- ◆ Northstar Energy Corporation;
- ◆ Enermark Inc.;
- ◆ Anadarko Canada Corporation;
- ◆ Penn West Petroleum Ltd.;
- ◆ Devon Canada Corporation;
- ◆ Viking Energy Ltd.;
- ◆ Nova Gas Transmission Ltd.;
- ◆ Husky Oil Operations Limited;
- ◆ Vintage Petroleum Canada, Inc.;
- ◆ Pembina Pipeline Corporation;
- ◆ Real Resources Inc.;
- ◆ American Leduc Petroleum Limited;
- ◆ Cal Ven Limited;
- ◆ Paramount Resources Ltd.

## 2.5.2 REGISTERED TRAPPERS ON THE JOINT FMA

The location of Trapline boundaries has been derived from Government LSAS information and summarized in Section 6.4 of the DFMP document. There are a total of twenty-one (21) different traplines located on the Joint Forest Management Area. The table below summarizes the number of traplines located in each operating area.

**TABLE 2-4: TRAPLINE SUMMARY BY OPERATING AREA**

Operating Area	Number of Trapline Licenses
Kimiwan	8
Sweathouse	13
<b>Total</b>	<b>21</b>

It is important to note that for the majority of the Trapline Licenses only a portion of the license area is located within the Joint Forest Management Area.

**TABLE 2-5: PERCENT OF TRAPLINE WITHIN THE JOINT FMA**

% of Trapline in FMA	Count of Trapline Licenses
<10 %	4
11-50	5
51-75	7
76-99	4
100 %	1

## 2.5.3 GUIDE/OUTFITTERS

There are guides and outfitters operating on the Joint Forest Management Area. At the time of submission Tolko and Buchanan had conformation from the following four individuals that operate on or adjacent to the Forest Management Area:

- ◆ Big Lakes Goose Hunting;
- ◆ Alberta Brush Adventures;
- ◆ Smoky River Outfitting Ltd.;
- ◆ South Peace Outfitters.

## 2.5.4 GRAZING LEASES/RESERVATIONS

There is one type of Grazing Disposition located on the Joint Forest Management Area. This is a Grazing Lease (GRL).

**TABLE 2-6: GRAZING LEASE SUMMARY**

FGL/GRL Number	Operating Area
GRL 960001	Kimiwan



3.0

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**Resource  
Management Goals  
and Objectives**

DFMP

## 3.0 RESOURCE MANAGEMENT GOALS AND OBJECTIVES

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### 3.1 SUSTAINABLE FOREST MANAGEMENT PHILOSOPHY

Buchanan Lumber and Tolko Industries Ltd. High Prairie OSB Division are committed to responsible stewardship of the environment throughout their operations. This commitment involves following the principals of sustainable forest management, while mitigating the impacts of forestry operations on other resource values. The companies strive to fully utilize the timber resource to ensure the viability of their timber resource-based investment in High Prairie, and the economic well-being of the local communities associated with these investments. Throughout the development and implementation of the Detailed Forest Management Plan the companies will co-operate with other forest users and involve the public and stakeholders in planning processes.

The companies have adopted a philosophy of adaptive management. Through the process of monitoring the application of the objectives and strategies to the landbase, a feedback loop has been created which will allow for the modification or adjustment of the forest management practices.

The Interim Forest Management Planning Manual Guidelines to Plan Development Version: April 1998 were utilized for the development of this Detailed Forest Management Plan.

### 3.2 GOALS

The government of Alberta has developed and articulated its Commitment to Sustainable Resource Development and Environmental Management (March 1999). This document clearly indicates the vision of Sustainable Resource Development, "Alberta, a member of the global community, is a leader in sustainable development, ensuring a healthy environment, a healthy economy, and a high quality of life in the present and future." Sustainable development means "Renewable resources shall be managed to ensure their long-term viability and future use potential."

A number of goals have been developed for the Detailed Forest Management Plans. These goals have been organized into three broad categories: Ecological (Goals 1-2), Social (Goals 3-4) and Economic (Goals 5-6). The application of these goals on the landbase requires a link between the goals and objectives. In addition, there is also a link to the strategies that are employed and the monitoring and reporting of the results.

- ◆ Goal #1: To Practice Sustainable Forest Management;
- ◆ Goal #2: To Practice Responsible Environmental Stewardship;
- ◆ Goal #3: To support the employment, business and public interests of the local and aboriginal communities;
- ◆ Goal #4: Create and maintain an open consultative environment for the communication of information and the resolution of issues;
- ◆ Goal #5: Ensure the viability of a timber resource based investment and the economic well-being of timber based communities relating to the Forest Management Area;
- ◆ Goal #6: To cooperate with other commercial and non commercial users of the Forest Management Area.

The numbering of Goals, Objectives and Strategies is consistent between the Original Detailed Forest Management Plan and the Joint Detailed Forest Management Plan. There are a small number of strategies that apply specifically to only one of the Forest Management Agreement areas. Those strategies which apply specifically to only one of the Forest Management Agreement areas have been clearly identified throughout Section 3.0 of the document.

### **3.3 SPECIFIC OBJECTIVES**

Each of the goals has objectives and strategies for application to the landbase. The companies are required to demonstrate the progress and achievement of the goals, objectives and strategies. A monitoring and reporting component has been included with each objective to demonstrate how the information will be communicated to the Government and Stakeholders.

Further to the broad division of the goals, the objectives for Goal 1 and Goal 2 have been further organized into the following topics: Timber Management, Water Management, Wildlife Habitat Management, Fisheries Habitat Management, Natural Disturbance and Access Network.

#### **3.3.1 SUSTAINABLE FOREST MANAGEMENT**

**Goal #1:**  
**To Practice Sustainable Forest Management**

##### **3.3.1.1 TIMBER MANAGEMENT OBJECTIVES**

**Objective 1.1:**  
**Maintain an acceptable range of forest ecosystems, tree species, and age class representation across the landscape.**

In order to determine the potential impacts of forestry activities, the current forest composition must be evaluated. A Landscape Assessment which describes the current condition of the forest vegetation, anthropogenic disturbances, and fire history is utilized compare the current forest conditions to the future forest conditions predicted by the preferred forest management strategy.

##### **Strategy 1.1.1:**

Complete a Landscape Assessment of the current Forest Management Agreement Area by submission of the Detailed Forest Management Plan that will be used to evaluate the impacts of planned forest management activities on the future forest condition.

##### **Strategy 1.1.2:**

Develop and implement a twenty year spatial harvest sequence to be followed by all operators on the Forest Management Area. Variance from the twenty year spatial harvest sequence will be monitored, tracked and reported annually. If the variance from the twenty year spatial harvest sequence for the Forest Management Area by compartment, by decade is greater than 20%, the Government may require a compartment assessment, a review of the twenty year spatial harvest sequence or an adjustment to the sustainable harvest level calculation.

To address operational planning concerns, operators are authorized to modify the spatial harvest sequence by deleting no more than 20% of the total sequenced area (hectares) in each compartment within each decade. Operators may harvest no more than 100% of the total area (hectares) in the twenty year spatial harvest sequence by compartment, by decade. Operators may replace stands

equivalent area (hectares) deleted from the twenty year spatial harvest sequence. Preference for replacement stands will be from the second ten year period (years 11 to 20) of the twenty year spatial harvest sequence. Where this is not feasible, replacement of an equivalent area (hectares) may be made from other stands in the approved net landbase of the Forest Management Area. Identified high quality late seral stage stands will not be included in the variance or available for selection as replacements for deleted stands.

**Strategy 1.1.3:**

Complete a comparison of the preferred forest management strategy to the current Landscape Assessment by the submission of the Detailed Forest Management Plan as a measurement of the potential impact of forestry practices on the Forest Management Agreement Area.

**Strategy 1.1.4:**

Implement harvesting patterns which include a range of opening sizes from 1 hectare to 1500 hectares across the Forest Management Agreement Area, to promote the reduction of fragmentation on the landbase created by historical harvesting activities utilizing the cut and leave harvesting pattern.

**Strategy 1.1.5:**

Manage for high quality late seral stage representation on the Forest Management Agreement Area. Both the gross forested and operable landbase contribute to the maintenance of high quality late seral stage for each of the following cover groups: Deciduous, Mixedwood, Conifer Pine Leading, Conifer White Spruce Leading, and Conifer Black Spruce Leading.

Over the entire 160 year planning horizon, representation of late seral stage for the Deciduous, Mixedwood, Conifer Pine Leading, Conifer White Spruce Leading and Conifer Black Spruce Leading on the gross forested landbase for the Joint Forest Management Agreement Area will be on average 6%, 8%, 6%, 8% and 39% respectively.

Over the entire 160 year planning horizon, representation of high quality late seral stage on the operable landbase will be maintained at a minimum of 1% Deciduous, 2% Mixedwood, 1.5% Conifer Pine Leading, 0.5% Conifer White Spruce leading and 0% Conifer Black Spruce Leading.

**Strategy 1.1.6:**

All coniferous and deciduous species identified in the Alberta Vegetation Inventory forest cover types are considered commercial tree species for fibre supply and regeneration. These currently include white spruce (*Picea glauca*), black spruce (*Picea mariana*), lodgepole pine (*Pinus contorta v. latifolia*), jack pine (*Pinus banksiana*), balsam fir (*Abies balsamea*), larch (*Larix laricina*), aspen (*Populus tremuloides*), balsam poplar (*Populus balsamifera*) and paper birch (*Betula papyrifera*).

**Monitoring:**

M1 - Landscape Assessment

M8 - Landscape Structural Summary Table

M11 - Spatial Harvest Sequence Variance Table

**Objective 1.2:**

**Develop and maintain a government approved forest inventory (AVI 2.1) of the Forest Management Agreement Area.**

A key element in the development and planning of forestry activities is maintenance of a current and accurate inventory of the Forest Management Agreement Area.

**Strategy 1.2.1:**

Develop and maintain the currently approved Alberta Vegetation Inventory Version 2.1 for the Forest Management Agreement Area.

**Strategy 1.2.2:**

Implement a maintenance schedule for regular updates of the Alberta Vegetation Inventory (Version 2.1). Complete a re-inventory by operating area for the Joint Forest Management Agreement Area (Sweathouse, Kimiwan) to Alberta Vegetation Inventory Version 2.1 specifications.

**TABLE 3-1: PHOTOGRAPHY UPDATE**

OPERATING AREA	ORIGINAL PHOTOGRAPHY	UPDATE YEAR
Kimiwan	1995/1996	2007
Sweathouse	1997/1998	2010

**Strategy 1.2.3:**

On an annual basis, complete timber harvesting updates to capture timber harvesting activities.

**Strategy 1.2.4:**

On an ongoing basis, capture the landuse activities on the Forest Management Agreement Area by loading planned activities (wellsites, pipelines, roadways) from the Timber Damage Assessment procedure. Verify and update this information during the re-inventory of the operating area as per the Alberta Vegetation Inventory maintenance schedule.

**Strategy 1.2.5:** *(applicable to the Original Forest Management Area)*

**Monitoring:**

M2 - Inventory and Inventory Updates

M17 - Landuse Summary

M29 - Annual Landuse Summary

**Objective 1.3:**

**Monitor spatial diversity and forest fragmentation at the landscape level across the Forest Management Agreement Area.**

Forestry practices and landuse activities on the Forest Management Agreement Area can increase the fragmentation of the forest. The Landscape Assessment will provide data regarding the current level of fragmentation in the operating areas, and allow for a prediction of future forest conditions.

**Strategy 1.3.1:**

Complete a Landscape Assessment of the current Forest Management Agreement Area that will be used to evaluate the impacts of planned forest management activities on the future forest condition.

**Strategy 1.3.2:**

Develop and implement a twenty year spatial harvest sequence to be followed by all operators on the Forest Management Area. Variance from the twenty year spatial harvest sequence will be monitored, tracked and reported annually. If the variance from the twenty year spatial harvest sequence for the Forest Management Area by compartment, by decade is greater than 20%, the Government may require a compartment assessment, a review of the twenty year spatial harvest sequence or an adjustment to the sustainable harvest level calculation.

To address operational planning concerns, operators are authorized to modify the spatial harvest sequence by deleting no more than 20% of the total sequenced area (hectares) in each compartment within each decade. Operators may harvest no more than 100% of the total area (hectares) in the twenty year spatial harvest sequence by compartment, by decade. Operators may replace stands equivalent area (hectares) deleted from the twenty year spatial harvest sequence. Preference for replacement stands will be from the second ten year period (years 11 to 20) of the twenty year spatial harvest sequence. Where this is not feasible, replacement of an equivalent area (hectares) may be made from other stands in the approved net landbase of the Forest Management Area. Identified high quality late seral stage stands will not be included in the variance, or available for selection as replacements for deleted stands.

**Strategy 1.3.3:**

Implement harvesting patterns which include a range of opening sizes from 1 hectare to 1500 hectares across the Forest Management Agreement Area, to promote the reduction of fragmentation on the landbase created by historical harvesting activities utilizing the cut and leave harvesting pattern.

**Strategy 1.3.4:**

On an ongoing basis, work with other forest users to minimize roads and promote utilization of existing disturbances.

**Monitoring**

M1 - Landscape Assessment

M8 - Landscape Structural Summary Table

M11 - Spatial Harvest Sequence Variance Table

M25 - Forest Road Use Agreement Summary

## **Objective 1.4:**

### **Develop stand level management strategies.**

Stand level management strategies have been identified for application at the block or stand level that ensure the key features of stands and biodiversity are maintained throughout time. These strategies also contribute to other values such as wildlife, soil nutrients and carbon cycling.

#### **Strategy 1.4.1:**

Structure containing dead and live trees, representative of the pre-harvest stand condition including species, tree size, condition and distribution, will be retained on the harvest areas. Single tree or patch retention will be applied to a minimum level of 1% of the scheduled harvest area within each compartment up to an average level of 3% of the scheduled harvest area across each operating area over the term of the Detailed Forest Management Plan.

The following techniques will be applied to the landbase alone or in combination to harvest areas to achieve the desired structure retention:

- ◆ Single tree retention will be applied to the landbase by leaving approximately 8 stems per hectare on the harvest area. The technique will be implemented on the landbase via guidance to machine operators during harvest operations.
- ◆ Small clump retention will be applied to the landbase by leaving small groups of trees in conjunction with other operational issues within the harvest area (examples: understory protection or avoidance, wildlife features such as dens, nests and mineral licks, and watercourse or water source area buffers etc), via instructions to machine operators.
- ◆ Green island retention will be applied on harvest areas greater than 100 hectares in size. Green island retention patches will be clearly identified on detailed block plans and in the field prior to harvest operations.

The area retained on the harvest areas will be assessed and tracked on harvest area basis through a post-harvest assessment program utilizing post harvest aerial photography and photo interpretation. The structure that is maintained will be reported by area and category at the end of every cut control period and reconciled each decade.

#### **Strategy 1.4.2:**

Maintain coarse woody debris (CWD) over the short term by leaving standing and downed woody debris on the harvest area during forestry operations.

#### **Strategy 1.4.3:**

Maintain coarse woody debris (CWD) over the long term by leaving live residual trees within the harvest area during forestry operations. Over time these trees will die and contribute to coarse woody debris on the harvest area in the future.

#### **Strategy 1.4.4:**

During the life of the Detailed Forest Management Plan, the primary slash abatement strategy will be to pile and burn. In areas where "pile and burn" is the slash abatement strategy, 1 pile for every 5 hectares of harvested area will be retained over the Operating Area. The retained piles should contain a range of debris piece sizes and a minimum amount of finely packed debris or dirt.

### **Strategy 1.4.5:**

During the life of the Detailed Forest Management Plan the alternate slash abatement strategy that may be employed on harvest areas on a trial or experimental basis is spreading of debris throughout the harvested area.

### **Monitoring**

M3 - Ground Rule Development

M8 - Landscape Structural Summary Table

M14 - Stand Structure Retention Summary

M36 - Annual Harvest Summary

M39 - Annual Research Listing

### **Objective 1.5:**

#### **Develop Landscape level management strategies.**

Landscape strategies which are broader in scope than the stand level strategies are applied at the operating area level to ensure that large scale objectives are achieved on the Forest Management Agreement Area.

A single-pass harvest pattern will provide for the maintenance of the current distribution of patch sizes. This will be achieved by harvesting not only large opening but, by also harvesting the small stands that exist across the landscape. The maintenance of the current mosaic of large and small forest patches will provide for the full range of landscape characteristics both now and in the future. In addition, the single pass will minimize the number of entries for other forest values and reduce or minimize fragmentation.

### **Strategy 1.5.1:**

Design harvest areas following patterns identified in the Landscape Assessment. This design strategy includes incorporating a broad range of stand types, shapes and sizes.

**Strategy 1.5.2:** *(applicable to the Original Forest Management Area)*

**Strategy 1.5.3:** *(applicable to the Joint Forest Management Area)*

Operate the Joint Forest Management Agreement Area as a single sustainable timber supply unit for both the deciduous and coniferous landbase (single landbase). The deciduous and conifer sustainable harvest levels will be calculated and a twenty year spatial harvest sequence developed for the Forest Management Agreement Area as a whole.

**Strategy 1.5.4:** *(applicable to the Original Forest Management Area)*

### **Strategy 1.5.5:**

Manage for high quality late seral stage representation on the Forest Management Agreement Area. Both the gross forested and operable landbase contribute to the maintenance of high quality late seral stage for each of the following cover groups: Deciduous, Mixedwood, Conifer Pine Leading, Conifer White Spruce Leading, and Conifer Black Spruce Leading.

Over the entire 160 year planning horizon, representation of late seral stage for the Deciduous, Mixedwood, Conifer Pine Leading, Conifer White Spruce Leading and Conifer Black Spruce Leading on the gross forested landbase for the Joint Forest Management Agreement Area will be on average 6%, 8%, 6%, 8% and 39% respectively.

Over the entire 160 year planning horizon, representation of high quality late seral stage on the operable landbase will be maintained at a minimum of 1% Deciduous, 2% Mixedwood, 1.5% Conifer Pine Leading, 0.5% Conifer White Spruce leading and 0% Conifer Black Spruce Leading.

**Strategy 1.5.6:**

On an operating area basis, reforest sites with commercial tree species, approximately in proportion to pre-harvest types identified in the Alberta Vegetation Inventory.

**Strategy 1.5.7:**

Implement harvesting patterns which include a range of opening sizes from 1 hectare to 1500 hectares across the Forest Management Agreement Area, to promote the reduction of fragmentation on the landbase created by historical harvesting activities utilizing the cut and leave harvesting pattern.

**Monitoring**

M1 - Landscape Assessment

M8 - Landscape Structural Summary Table

M11 - Spatial Harvest Sequence Variance Table

M36 - Annual Harvest Summary

**Objective 1.6:**

**Develop a pure stand management strategy that is beneficial for all parties.**

The range of pure and mixedwood stand types on the Forest Management Agreement Area contributes to the biodiversity of the landbase.

**Strategy 1.6.1:**

Identify the current extent and distribution of pure and mixedwood stands on the Forest Management Agreement Area.

**Strategy 1.6.2:**

On an operating area basis maintain the same relative proportions of pre-harvest species strata (Deciduous, Coniferous, Deciduous dominated Mixedwood and Coniferous dominated Mixedwood).

**Strategy 1.6.3:**

Validate yield curves for pure deciduous and coniferous strata as per the approved Growth and Yield Plan.

**Strategy 1.6.4:**

Utilizing existing information, and in cooperation with Coniferous Quota Holders, within one year of the Detailed Forest Management Plan approval develop operational procedures for the identification and classification of understories and employ harvesting methods that will minimize damage to those understories.

**Monitoring:**

- M1 - Landscape Assessment
- M8 - Landscape Structural Summary Table
- M10 - Understorey Inventory
- M21 - Growth and Yield Activity Summary
- M36 - Annual Harvest Summary

**Objective 1.7:**

**Develop a mixedwood management strategy that is beneficial for all parties involved while maintaining the objective of balanced overstorey groups.**

The range of pure and mixedwood stand types on the Forest Management Agreement Area contributes to the biodiversity of the landbase.

**Strategy 1.7.1:**

Identify the current extent and distribution of pure and mixedwood stands on the Forest Management Agreement Area.

**Strategy 1.7.2:**

On an operating area basis maintain the same relative proportions of pre-harvest species strata (Deciduous, Coniferous, Deciduous dominated Mixedwood and Coniferous dominated Mixedwood).

**Strategy 1.7.3:**

Validate yield curves for mixedwood strata as per the approved Growth and Yield Plan.

**Strategy 1.7.4:**

Utilizing existing information, and in cooperation with Coniferous Quota Holders, within one year of Detailed Forest Management Plan approval develop operational procedures for the identification and classification of understoreys and employ harvesting methods that will minimize damage to those understoreys.

**Monitoring**

- M1 - Landscape Assessment
- M8 - Landscape Structural Summary Table
- M10 - Understorey Inventory
- M21 - Growth and Yield Activity Summary
- M36 - Annual Harvest Summary

**Objective 1.8:**

**Validate growth information by yield class.**

**Strategy 1.8.1:**

Collect harvested volume information annually to facilitate the comparison of yield curve estimates to actual harvested volumes.

**Strategy 1.8.2:**

Undertake a gap analysis in existing yield curves and develop information collection program to fill existing gaps (if any) during the implementation of the approved Growth and Yield Program.

**Strategy 1.8.3:**

Relate the approved Growth and Yield Program to the yield curves. The current plan, once implemented will have approximately seventy percent of the plots having a re-measurement prior to the next scheduled Timber Supply Analysis.

**Monitoring:**

M21 - Growth and Yield Activity Summary

M36 - Annual Harvest Summary

**Objective 1.9:**

**Conduct research on yield information on harvest treatments for multi-tiered stands.**

The concept of a multi-tiered stand is a difficult concept to communicate. Basically, a multi-tiered stand would be described as a stand with an overstorey canopy with multiple understorey layers. These stands may require operations to be completed utilizing some type of modified harvesting system. This modified harvesting system would remove all or a portion of the overstorey, and protect the understorey. This would allow the understorey layer additional growing time.

**Strategy 1.9.1:**

Within one year of Detailed Forest Management Plan approval, identify existing multi-tiered stands on the Forest Management Agreement Area.

**Strategy 1.9.2:**

Throughout the life of the Detailed Forest Management Plan develop and implement on an experimental or operational trial basis, harvesting prescriptions for multi tiered stands.

**Strategy 1.9.3:**

Continue to participate in mixedwood management organizations.

**Monitoring:**

M21 – Growth and Yield Activity Summary

M31 – Membership Listing

M36 - Annual Harvest Summary

M39 - Annual Research Listing

**Objective 1.10:**

**Implement regeneration standards which reflect yield class assumptions.**

**Strategy 1.10.1:**

Utilize pre-harvest information from Alberta Vegetation Inventory or pre-harvest assessments conducted on proposed harvest areas to determine the appropriate reforestation strategy.

**Strategy 1.10.2:**

Survey all harvest areas according to the Alberta Regeneration Manual and develop an action plan for "Not Satisfactorily Restocked" (NSR) areas within one year of the survey.

**Strategy 1.10.3:**

Promote the natural reforestation of deciduous tree species via suckering, vegetation propagation and natural seeding.

**Strategy 1.10.4:**

Promote the reforestation of conifer species using seedlings grown from seed collected from within the same general geographic region, in accordance with the Seed Zone Guidelines for the Province of Alberta.

**Strategy 1.10.5:**

Follow Provincial Legislation regarding genetically modified stock or exotic species on the Forest Management Agreement Area.

**Strategy 1.10.6:**

On an operating area basis maintain the same relative proportions of pre-harvest species strata (Deciduous, Coniferous, Deciduous dominated Mixedwood and Coniferous dominated Mixedwood).

**Strategy 1.10.7:**

Complete initial reforestation treatment on harvest areas within two years of harvest.

**Strategy 1.10.8:**

All coniferous and deciduous species identified in the Alberta Vegetation Inventory forest cover types are considered commercial tree species for fibre supply and regeneration. These currently include white spruce (*Picea glauca*), black spruce (*Picea mariana*), lodgepole pine (*Pinus contorta v. latifolia*), jack pine (*Pinus banksiana*), balsam fir (*Abies balsamea*), larch (*Larix laricina*), aspen (*Populus tremuloides*), balsam poplar (*Populus balsamifera*) and paper birch (*Betula papyrifera*).

**Strategy 1.10.9:**

Collect information on regenerating stands via implementation of the approved Growth and Yield Program and regeneration surveys to develop regenerating stand yield curves for the next timber supply Analysis.

**Monitoring:**

M1 - Landscape Assessment

M21 - Growth and Yield Activity Summary

M37 - Annual Silviculture Summary

**Objective 1.11:**

**Maintain or enhance the deciduous and coniferous Annual Allowable Cut.**

Responsible stewardship and professional forest management of the Forest Management Agreement Area requires credible and accurate information to substantiate the Annual Allowable Cut and the sustainability of the fibre supply.

**Strategy 1.11.1:**

Determine the Net Landbase available for production of timber by submission of the Detailed Forest Management Plan.

**Strategy 1.11.2:**

Harvest according to the calculated deciduous and coniferous sustainable harvest level.

**Strategy 1.11.3:**

Implement Timber Supply Analysis assumptions regarding transition of low (AB) density stands to full (CD) stocking throughout the life of the Detailed Forest Management Plan.

The range of treatments that could be utilized for original stand composition are summarized in Table 3-2. It is important to understand that this table is a snapshot in time and changes are an integral component of the philosophy of continuous improvement and site-specific silviculture. Prescriptions are adjusted as required on a site-specific basis. Deviations in treatment could result from the following factors: ecosite, regeneration standards, strata balancing, re-classification, understory protection, slash loading, terrain, residual overstorey, season of harvest, cone crops, seed availability, seedling availability, season of access, adjacency, available microsites, weather, climatic factors, disease, and insect, other resource values, drainage, new tools and technology, seed zone limitations, survey results, etc.

**TABLE 3-2: SILVICULTURE ASSUMPTIONS**

YIELD STRATUM	TRANSITION ASSUMPTIONS	SITE PREP*	ESTABLISHMENT TYPE		COMPETITION CONTROL *
			DECIDUOUS COMPONENT <sup>†</sup>	CONIFER COMPONENT	
1 (D)	100% to Yield Curve 5	NIL,M,CH	LFN/PLANT	Replacement of conifer understorey protection or plant	NIL,M,CH
2 (D)	100% to Yield Curve 6	NIL,M,CH	LFN/PLANT	Replacement of conifer understorey protection or plant	NIL,M,CH
3 (D)	100% to Yield Curve 7	NIL,M,CH	LFN/PLANT	Replacement of conifer understorey protection or plant	NIL,M,CH
4 (D)	100% to Yield Curve 8	NIL,M,CH	LFN/PLANT	Replacement of conifer understorey protection or plant	NIL,M,CH
5 (D)	Status Quo	NIL,M,CH	LFN	Replacement of conifer understorey protection or plant	NIL,M,CH
6 (D)	Status Quo	NIL,M,CH	LFN	Replacement of conifer understorey protection or plant	NIL,M,CH
7 (D)	Status Quo	NIL,M,CH	LFN	Replacement of conifer understorey protection or plant	NIL,M,CH
8 (D)	Status Quo	NIL,M,CH	LFN	Replacement of conifer understorey protection or plant	NIL,M,CH
9 (DC)	100% to Yield Curve 10	M,CH,NIL	LFN	Plant 800-1200 stems/ha	M,CH,NIL
10 (DC)	Status Quo	M,CH,NIL	LFN	Plant 800-1200 stems/ha	M,CH,NIL
11 (CD)	100% to Yield Curve 12	M,CH,NIL	LFN	Plant 1100-1600 stems/ha	M,CH,NIL
12 (CD)	Status Quo	M,CH,NIL	LFN	Plant 1100-1600 stems/ha	M,CH,NIL
13 (C-Sw/Fb)	100% to Yield Curve 16	M,CH,NIL	LFN	Plant 1400-1600 stems/ha	M,CH,NIL
14 (C-PI)	100% to Yield Curve 17	M,DC,CH,NIL	LFN	Plant 1400-1600 stems/ha	M,CH,NIL
15 (C-Sb)	100% to Yield Curve 18	M	LFN	Plant 1400-1600 stems/ha	M,CH,NIL
16 (C-Sw/Fb)	Status Quo	M,CH,NIL	LFN	Plant 1400-1600 stems/ha	M,CH,NIL
17 (C-PI)	Status Quo	M,DC,CH,NIL	LFN	Plant 1400-1600 stems/ha	M,CH,NIL
18 (C-Sb)	Status Quo	M	LFN	Plant 1400-1600 stems/ha	M,CH,NIL

\*     NIL     No Site Preparation  
        M     Mechanical  
        DC     Drag Chain  
        CH     Chemical

†     LFN     Leave for Natural Regeneration

**Strategy 1.11.4:**

Work with Government and other forest users to review reclamation standards and promote the re-establishment of commercial tree species on reclaimed landuse dispositions.

**Strategy 1.11.5:**

Encourage Alberta Sustainable Resource Development to create and manage forest Community Timber Programs within the vicinity of the Forest Management Agreement Area.

**Strategy 1.11.6:**

Ensure both conifer and deciduous Timber Damages Assessment (TDA) dollars are collected from the Joint Forest Management Agreement Area. Apply Timber Damages Assessment money collected to offset damage to improvements, to replace timber resource or to re-establish commercial tree species.

**Strategy 1.11.7:**

The amount of wet low (AB) density deciduous stands has been limited through the net landbase determination. A total of 66 hectares of low density deciduous wet site area has been included in the 20 year spatial harvest sequence. As these stands are identified there will be a pre harvest assessment to determine the appropriate silviculture treatment. A post harvest assessment to ensure the stocking is adequate. The following tables summarize the amount of area:

**TABLE 3-3: SUMMARY OF LOW DENSITY DECIDUOUS AREAS LOCATED ON WET SITES IN THE NET LANDBASE**

DENSITY	SITE	AREA (ha)
A	Wet	832
B	Wet	192
<b>Total</b>		<b>1,024</b>

**TABLE 3-4: SUMMARY OF LOW DENSITY DECIDUOUS AREAS LOCATED ON WET SITES SCHEDULED FOR HARVEST IN THE TWENTY YEAR SPATIAL HARVEST SEQUENCE**

DENSITY	SITE	AREA (ha)
A	Wet	63
B	Wet	3
<b>Total</b>		<b>66</b>

**Strategy 1.11.8:**

Both coniferous and deciduous secondary species volumes are to be sustainable on the landbase. The estimated timber volume from a hectare of landbase was determined by utilizing volume information from the approved yield curves. A summary is presented in Table 3-5 and Table 3-6.

**TABLE 3-5: TARGET FOR REPLACEMENT OF CONIFER FROM PURE DECIDUOUS STRATA**

YIELD CURVE	STRATUM	TOTAL STRATA NET LANDBASE (ha)	AVERAGE TARGET HARVEST AGE (20 YEAR SPATIAL HARVEST SEQUENCE)	INCIDENTAL CONIFER VOLUME* (m <sup>3</sup> /ha)	TOTAL VOLUME* (m <sup>3</sup> )
1	MX-AB-D-A-G	14,057	80	26	365,482
2	MX-AB-D-A-MF	30,330	100	22	667,260
5	MX-CD-D-A-G	45,325	70	25	1,133,125
6	MX-CD-D-A-MF	77,283	80	25	1,932,075
3	FH-AB-D-A-G	1,709	80	18	30,762
4	FH-AB-D-A-MF	2,189	100	12	26,268
7	FH-CD-D-A-G	9,117	70	16	145,872
8	FH-CD-D-A-MF	5,033	90	34	171,122
<b>Total Hectares</b>		<b>185,043</b>	<b>Total Volume</b>		<b>4,471,966</b>
<b>Target Volume per hectare (m<sup>3</sup>/ha) for conifer replacement in pure D stands</b>					<b>24.17</b>

\*Cull deduction of 2% applied to volumes.

**TABLE 3-6: TARGET FOR REPLACEMENT OF DECIDUOUS FROM PURE CONIFER STRATA**

YIELD CURVE	STRATUM	TOTAL STRATA NET LANDBASE (ha)	AVERAGE TARGET HARVEST AGE (20 YEAR SPATIAL HARVEST SEQUENCE)	INCIDENTAL CONIFER VOLUME* (m <sup>3</sup> /ha)	TOTAL VOLUME* (m <sup>3</sup> )
13	A-AB-C-SW-A	17,100	130	57	974,700
16	A-CD-C-SW-A	19,228	130	74	1,422,872
14	A-AB-C-P-A	11,486	130	2	22,972
17	A-CD-C-P-A	16,174	130	24	388,176
15	A-AB-C-SB-A	8,619	140	0	0
18	A-CD-C-SB-A	6,760	130	0	0
<b>Total Hectares</b>		<b>79,367</b>	<b>Total Volume</b>		<b>2,808,720</b>
<b>Target Volume per hectare for deciduous replacement in pure C stands</b>					<b>35.39</b>

\*Cull deduction of 10% applied to volumes.

The delivery of conifer and deciduous species from the forest management area will be tracked and reported. The replacement of secondary species on the landbase will be geared to the target volumes from the Spatial Harvest Sequence and reconciled to the actual volumes in the Stewardship Report. The harvest areas will be assessed and tracked through a post-harvest assessment program utilizing

post harvest aerial photography, photo interpretation, site visits (as required) and reforestation surveys. The primary method for replacement of incidental conifer will be to protect or avoid any existing understorey conifer. If adequate healthy stems to achieve conifer replacement are not available, the following areas could be utilized for planting of conifer seedlings: low wet areas, roads and landings from harvest operations or low density deciduous stands. If the opportunities listed above do not apply, then the companies will jointly determine where conifer will be replaced in the harvest areas.

The strategy to be utilized for accounting of the replacement volumes will be linked to the regenerated yields from fully stocked curves within each stratum. These are summarized in Table 3-7 and Table 3-8.

**TABLE 3-7: CONIFER TARGET REPLACEMENT VOLUMES AND STEM DENSITIES**

REPLACEMENT STRATUM	TARGET AGE (years)	CONIFER VOLUME FULLY STOCKED (m3/ha)	ESTABLISHMENT TARGET (stems/ha)
C (White Spruce)	80	238	1400 - 1600
C (Pine)	80	196	1400 - 1600
C (Black Spruce)	80	33	1400 - 1600
CD	80	162	1100 - 1600
DC	80	116	800 - 1200
D (Mixedwood Natural Subregion) TPR G	80	35	200 - 300
D (Mixedwood Natural Subregion) TPR MF	80	25	200 - 300
D (Foothills Natural Subregion) TPR G	80	19	100 - 200
D (Foothills Natural Subregion) TPR MF	80	34	100 - 200

**TABLE 3-8: DECIDUOUS TARGET REPLACEMENT VOLUMES AND STEM DENSITIES**

REPLACEMENT STRATUM	TARGET AGE (years)	DECIDUOUS VOLUME FULLY STOCKED (m3/ha)	ESTABLISHMENT TARGET (stems/ha)
C (White Spruce)	80	58	*
C (Pine)	80	33	*
C (Black Spruce)	80	3	*
CD	80	72	*
DC	80	168	*
D (Mixedwood Natural Subregion) TPR G	80	226	*
D (Mixedwood Natural Subregion) TPR MF	80	179	*
D (Foothills Natural Subregion) TPR G	80	315	*
D (Foothills Natural Subregion) TPR MF	80	260	*

\* Monitor and report actual results to determine the range of variability.

**Monitoring:**

M1 - Landscape Assessment

M9 - Reclamation Listing

M17 - Landuse Summary

M28 - Fibre Supply Table

M29 - Annual Landuse Summary

M36 - Annual Harvest Summary

M37 - Annual Silviculture Summary

**Objective 1.12:**

**Develop and maintain a growth and yield program.**

The intent of the approved Growth and Yield Program is to collect information that will be utilized to verify:

- ◆ Natural stand yield as predicted by the yield curves developed in the Detailed Forest Management Plan process,
- ◆ Regeneration on harvest openings as assumed in AAC calculations, and
- ◆ Overall forest level growth is sustainable when considered in conjunction with other timber and non timber related activities.

**Strategy 1.12.1:**

Implement the approved Growth and Yield program by establishing permanent and temporary sample plots over a ten year period.

**Strategy 1.12.2:**

As part of the approved Growth and Yield Program implementation, conduct a gap analysis and implement a strategy for collecting information for the next Timber Supply Analysis.

**Monitoring:**

M21 - Growth and Yield Activity Summary

**Objective 1.13:**

**Minimize the effects of forestry practices on the productive capacity of the forest.**

**Strategy 1.13.1:**

Operate in compliance with the Soil Conservation Guidelines and ground rules.

**Strategy 1.13.2:**

Within six months of the approval of the Detailed Forest Management Plan develop Forest Management Agreement Area specific ground rules that mitigate the potential effects of forestry practices on the productive capacity of the forest.

**Strategy 1.13.3:**

Conduct harvest operations during frozen or dry ground conditions to minimize damage to the productive capacity of the Operating Areas.

**Strategy 1.13.4:**

Roads will be kept to a minimum while still maintaining safe and efficient harvesting and log haul operations. The temporary in-block roads will be limited to less than or equal to 5% of the gross harvest area.

**Strategy 1.13.5:**

Reduce the amount of area lost to the productive landbase due to slash accumulation. The tactic employed will be to "pile and burn" slash accumulations, leaving a maximum of one pile for every five hectares.

**Strategy 1.13.6:**

Utilize existing access, where feasible, on the Forest Management Agreement Area to minimize roading. Currently, access to the Operating Areas within the Joint Forest Management Agreement Area is available using a number of existing routes. These routes include primary and secondary paved Highways, Municipal District or County gravel roads, oilfield road networks and LOC roads. The following is a summary of the primary access to each of the operating areas and the within operating area access. See the compartment access plan on Map 3-1 (full size maps can be found in Appendix H, Map H-2).

- Primary Access to the Kimiwan operating area is provided via paved primary (Hwy #2 or #2A) and paved secondary (Hwy #749). Within the Kimiwan Operating Area Access is provided via the Reno Oilfield Road Network, the Harmon Valley Road and the Buchanan North Haul Road. Table 3-9 outlines Buchanan held LOC roads in the area.

**TABLE 3-9: KIMIWAN - BUCHANAN LOC ROADS**

DISPOSITION TYPE	DISPOSITION NUMBER	LEGAL LOCATION (MERIDIAN-RANGE-TOWNSHIP-SECTION-QUARTER)	OWNERSHIP
LOC	4017	5-17-078-16-NW	Buchanan
LOC	4403	5-17-075-26-SW	Buchanan
LOC	4521	5-16-084-30-NW	Buchanan
LOC	5490	5-17-078-32-SW	Buchanan
LOC	5607	5-17-078-22-SE	Buchanan
LOC	800492	5-17-080-03-SE	Buchanan
LOC	801255	5-17-077-03-NW	Buchanan
LOC	870853	5-17-077-28-SE	Buchanan
LOC	911019	5-16-081-06-NW	Buchanan
LOC	910736	5-17-081-03-SE	Buchanan

- Primary Access to the Sweathouse Operating Area is provided via paved secondary (Hwy #747), paved secondary (Hwy (749) and the Snipe Lake Resource Road. Within Sweathouse Operating Area Access is provided via the Snipe Oilfield Road Network, the Goose Oilfield Road Network, the Blue Lake LOC, the Goose Tower LOC, and the Sweathouse Tower LOC. In addition, Buchanan Lumber and Tolko hold the following LOC roads in the area (Table 3-10):

**TABLE 3-10: SWEATHOUSE – BUCHANAN/TOLKO LOC ROADS**

DISPOSITION TYPE	DISPOSITION NUMBER	LEGAL LOCATION (MERIDIAN-RANGE-TOWNSHIP-SECTION-QUARTER)	OWNERSHIP
LOC	3635	5-19-066-02-SW	Buchanan
LOC	831050	5-19-066-23-NW	Buchanan
LOC	840310	5-18-066-30-SW	Buchanan
LOC	841035	5-19-067-05-SW	Buchanan
LOC	850796	5-16-068-21-SE	Buchanan
LOC	861225	5-16-069-30-NW	Buchanan
LOC	870799	5-15-067-29-NW	Buchanan
LOC	871024	5-15-067-16-NW	Buchanan
LOC	910034	5-17-077-16-SE	Buchanan
LOC	920597	5-16-081-14-SW	Buchanan
LOC	931149	5-17-065-33-SE	Buchanan
LOC	961511	5-16-068-20-SE	Buchanan
LOC	972096	5-19-067-33-SE	Buchanan
LOC	972097	5-19-068-02-SW	Buchanan
LOC	950666	5-18-069-18-NW	Tolko
LOC	951233	5-20-066-07-NE	Tolko

**Monitoring:**

- M3 - Ground Rule Development
- M6 - Access Corridor Identification Map
- M23- Detailed Road Inventory Map
- M36 - Annual Harvest Summary
- M37 - Annual Silviculture Summary

## **MAP 3-1: COMPARTMENT ACCESS PLAN**

**Objective 1.14:**

**Mitigate the impacts of forestry practices on forest soils.**

Forest harvesting and reforestation operations have the potential to disturb forest soils. Maintaining the productive capacity of forest soils and mitigating the impact of detrimental effects is important to sustaining the supply of timber from the Forest Management Agreement Area.

**Strategy 1.14.1:**

Operate in compliance with Soil Conservation Guidelines and Ground Rules.

**Strategy 1.14.2:**

Conduct harvest operations during frozen or dry ground conditions to minimize damage to the forest soils on the Operating Areas.

**Strategy 1.14.3:**

Roads will be kept to a minimum while still maintaining safe and efficient harvesting and log haul operations. The temporary in-block roads will be limited to less than or equal to 5% of the gross harvest area.

**Strategy 1.14.4:**

Reclaim temporary in-block roads constructed during non-frozen conditions by decompacting and rolling back any debris and topsoil.

**Strategy 1.14.5:**

Reclaim temporary in-block roads constructed during frozen ground conditions by rolling back any debris and topsoil.

**Strategy 1.14.6:**

Maintain coarse woody debris (CWD) over the short term by leaving standing and downed woody debris on the harvest area during forestry operations. Coarse woody debris contributes to the maintenance of nutrients and carbon cycling.

**Strategy 1.14.7:**

Maintain coarse woody debris (CWD) over the long term by leaving live residual trees within the harvest area during forestry operations. Over time these trees will die and contribute to coarse woody debris on the harvest area in the future.

**Strategy 1.14.8:**

Through the life of the Detailed Forest Management plan investigate site preparation methods and their effects on forest soils.

**Monitoring:**

M3 - Ground Rule Development

M36 - Annual Harvest Summary

M37 - Annual Silviculture Summary

**Objective 1.15:**

**Ensure that company personnel are aware of and current with all applicable laws, regulations and policies affecting forest practices.**

The policies, laws and regulations governing the forest industry change as a result of new information and trends in public opinion. Company staff are committed to remain current with the science and art of forestry practices and the current policies, laws and regulations.

**Strategy 1.15.1:**

Provide opportunity for company staff to maintain professional development through structured and non-structured training activities.

**Strategy 1.15.2:**

Maintain subscription to a program which provides regular updates to forest related legislation (i.e. Forest Views or Natural Resource).

**Monitoring:**

M20 - Training and Employment Listing

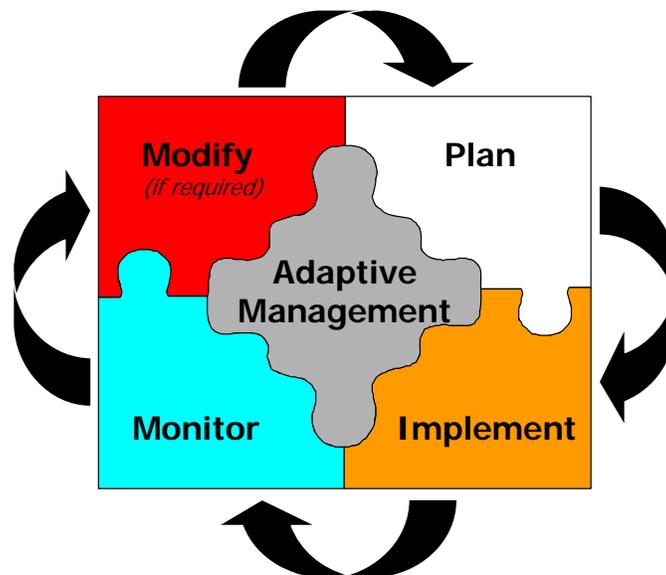
M24 - Forest Legislation

M31 – Membership Listing

**Objective 1.16:**

**Ensure implemented management strategies are achieving desired results by adopting the philosophy of adaptive management.**

**FIGURE 3-1: ADAPTIVE MANAGEMENT FLOW CHART**



**Strategy 1.16.1:**

Report on the harvesting operations and reforestation efforts in the Five Year Stewardship Report to ensure that commitments outlined in the Detailed Forest Management Plan are being achieved or changed as a result of new information or knowledge.

**Monitoring:**

M8 - Landscape Structural Summary Table

M11 - Spatial Harvest Sequence Variance Table

M36 - Annual Harvest Summary

M37 - Annual Silviculture Summary

**Objective 1.17:**

**Ensure appropriate stand utilization by implementation of the twenty year spatial harvest sequence.**

**Strategy 1.17.1:**

Ensure that all forestry operators on the Forest Management Agreement Area follow the twenty year spatial harvest sequence and the harvest profile as it is outlined in the Detailed Forest Management Plan within the allowable variance range of 20%.

**Monitoring:**

M11 - Spatial Harvest Sequence Variance Table

M36 - Annual Harvest Summary

**3.3.2 ENVIRONMENTAL STEWARDSHIP**

**Goal #2:**

**To Practice Responsible Environmental Stewardship**

**3.3.2.1 WATER MANAGEMENT OBJECTIVES**

The watersheds on the Forest Management area have been identified on the landbase to facilitate the evaluation of the preferred forest management strategy and twenty year spatial harvest sequence.

The interface between waterbodies, watercourses and the upland area, known as riparian areas, are important areas. They are usually very rich, productive sites important for forestry, wildlife, water quality and biodiversity.

**Objective 2.1:**

**Mitigate the impacts of forestry practices on riparian areas, water bodies, watersheds and hydrological cycles.**

**Strategy 2.1.1:**

Operate in compliance with Provincial and Federal Legislation.

**Strategy 2.1.2:**

Identify major watersheds on Forest Management Agreement Area, to improve the understanding of the impacts of forestry practices on hydrological cycles. Through the use of computer simulation models (e.g. Cumulative Watershed Disturbance and Hydrologic Recovery Simulator (ECA- Alberta)) evaluate the potential impacts of forestry practices on water flows.

**Strategy 2.1.3:**

Analyze watersheds using the Age Threshold Analysis to determine the percentages of area affected by harvesting activities. Plan harvest operations to ensure that a minimum of 50% of the watershed will be older than the specified threshold ages for species cover types.

**Strategy 2.1.4:**

Identify waterbody and watercourse areas, apply the appropriate buffer depending on classification and remove the area from the net landbase.

**Strategy 2.1.5:**

Design forestry activities in the vicinity of riparian areas in a manner that will not compromise the objectives of the area.

**Monitoring:**

M1 - Landscape Assessment

M3 - Ground Rule Development

M4 - Watershed Assessment

M18 - Watershed Analyses Summary

M36 - Annual Harvest Summary

**Objective 2.2:**

**Minimize the effects of roadway development on watercourses within the Forest Management Agreement Area**

Roadway development on the Forest Management Agreement Area can impact watercourses through the creation of crossings. Crossings create the opportunity for increased sedimentation and restriction of water flow.

**Strategy 2.2.1:**

Plan access routes to minimize the number of stream crossings and reduce the potential for runoff from the road to enter waterways.

**Strategy 2.2.2:**

Install watercourse crossing structures that are appropriate for the watercourse being crossed, the season of use, and in compliance with the Provincial and Federal Legislation.

**Strategy 2.2.3:**

Develop a watercourse crossing database for the tracking of crossing installation, removal and re-vegetation efforts within one year of Detailed Forest Management Plan approval.

**Strategy 2.2.4:**

Operate cooperatively with other forest industry stakeholders in the Forest Management Agreement Area to develop integrated forest harvest plans and coordinate (where possible) the number and timing of entries into operating areas.

**Strategy 2.2.5:**

Reduce the amount of new road being developed on the Forest Management Agreement Area. Where possible, enter into commercial road use agreements with companies that operate on the Forest Management Agreement Area.

**Strategy 2.2.6:**

Conduct harvest operations during frozen or dry ground conditions. Watercourse crossing construction techniques such as snow fills, ice bridges or the use of log fills, with removal prior to spring melt will be used to minimize effects of roadway development on watercourses.

**Monitoring:**

- M3 - Ground Rule Development
- M6 - Access Corridor Identification Map
- M17 - Landuse Summary
- M23- Detailed Road Inventory Map
- M25 - Forest Road Use Agreement Summary
- M26 - Integrated Harvest Summary
- M27 - Road Maintenance and Abandonment Summary
- M36 - Annual Harvest Summary

**3.3.2.2 WILDLIFE HABITAT MANAGEMENT OBJECTIVES**

The management of wildlife populations is the mandate of the Alberta Government. The involvement of forest companies is limited to minimization of potential impacts and mitigation of the detrimental effects of forestry practices on the wildlife habitat. A number of coarse filter and fine filter approaches to wildlife habitat management will be employed to maintain features of wildlife habitat.

**Objective 2.3:**

**Manage forestry operations to provide wildlife habitat features.**

**Strategy 2.3.1:**

Minimize fragmentation of the landscape with the single pass harvest system. The intent of the harvest system is to create a range of opening sizes from 1 hectare to 1500 hectares. This distribution of opening sizes will sustain the larger tracts of contiguous habitat required by some species while providing for species that require multiple habitat types.

**Strategy 2.3.2:**

In conjunction with the wildlife life requisites assessment of the Forest Management Area, analyze the Preferred Forest Management strategy for connectivity and compare to the current landbase.

**Strategy 2.3.3:**

Recognize and implement appropriate protection of existing identified unique or rare habitat.

**Strategy 2.3.4:**

Structure containing dead and live trees, representative of the pre-harvest stand condition including species, tree size, condition and distribution, will be retained on the harvest areas. Single tree or patch retention will be applied to a minimum level of 1% of the scheduled harvest area within each compartment up to an average level of 3% of the scheduled harvest area across each operating area over the term of the Detailed Forest Management Plan.

The following techniques will be applied to the landbase alone or in combination to harvest areas to achieve the desired structure retention:

- ◆ Single tree retention will be applied to the landbase by leaving approximately 8 stems per hectare on the harvest area. The technique will be implemented on the landbase via guidance to machine operators during harvest operations.
- ◆ Small clump retention will be applied to the landbase by leaving small groups of trees in conjunction with other operational issues within the harvest area (examples: understory protection or avoidance, wildlife features such as dens, nests and mineral licks, and watercourse or water source area buffers etc), via instructions to machine operators.
- ◆ Green island retention will be applied on harvest areas greater than 100 hectares in size. Green island retention patches will be clearly identified on detailed block plans and in the field prior to harvest operations.

The area retained on the harvest areas will be assessed and tracked on harvest area basis through a post-harvest assessment program utilizing post harvest aerial photography and photo interpretation. The structure that is maintained will be reported by area and category at the end of every cut control period and reconciled each decade.

**Strategy 2.3.5:**

Leave coarse woody debris to provide wildlife habitat and stand structure in balance with tree utilization standards. Maintain coarse woody debris (CWD) over the short term by leaving standing and downed woody debris on the site during forestry operations.

**Strategy 2.3.6:**

Leave coarse woody debris to provide wildlife habitat and stand structure in balance with tree utilization standards. Maintain coarse woody debris (CWD) over the long term by leaving live residual trees within the harvest area during forestry operations over time these trees will die and contribute to coarse woody debris on the site in the future.

**Strategy 2.3.7:**

During the life of the Detailed Forest Management Plan, retain 1 pile for every 5 hectares of harvested area, in areas where "pile and burn" is the slash abatement strategy. The retained piles

should contain a range of debris piece sizes with a minimum amount of finely packed debris or dirt and will contribute to the habitat of some species.

**Strategy 2.3.8:**

Manage for high quality late seral stage representation on the Forest Management Agreement Area. Both the gross forested and operable landbase contribute to the maintenance of high quality late seral stage for each of the following cover groups: Deciduous, Mixedwood, Conifer Pine Leading, Conifer White Spruce Leading, and Conifer Black Spruce Leading

Over the entire 160 year planning horizon, representation of late seral stage for the Deciduous, Mixedwood, Conifer Pine Leading, Conifer White Spruce Leading and Conifer Black Spruce Leading on the gross forested landbase for the Joint Forest Management Agreement Area will be on average 6%, 8%, 6%, 8% and 39% respectively.

Over the entire 160 year planning horizon, representation of high quality late seral stage on the operable landbase will be maintained at a minimum of 1% Deciduous, 2% Mixedwood, 1.5% Conifer Pine Leading, 0.5% Conifer White Spruce leading and 0% Conifer Black Spruce Leading.

**Strategy 2.3.9:**

Utilizing available Alberta Vegetation Inventory and Wildlife Species Life Requisite information complete an assessment to forecast the habitat availability throughout the life of the plan for the following Moose (*Alces alces andersoni*), American Marten (*Martes americana actuosa*), Northern Goshawk (*Accipiter gentilis atricapillus*), Pileated Woodpecker (*Dryocopus pileatus abieticola*), and Grizzly Bear (*Ursus arctos*), wildlife species using the Alberta Vegetation Inventory the preferred forest management strategy and its associated twenty year spatial harvest sequence.

**Monitoring:**

M1 - Landscape Assessment

M8 - Landscape Structural Summary Table

M12 - Wildlife Species Life Requisite Information

M14 - Stand Structure Retention Summary

M36 - Annual Harvest Summary

**Objective 2.4:**

**Manage forestry operations to maintain habitat features of specific wildlife areas identified by Sustainable Resource Development - Fish and Wildlife Division.**

**Strategy 2.4.1:**

Minimize fragmentation of the landscape with the single pass harvest system. The intent of the harvest system is to create a range of opening sizes from 1 to 1500 hectares. This distribution of opening sizes will sustain the larger tracts of contiguous habitat required by some species while providing for species that require multiple habitat types.

**Strategy 2.4.2:**

In conjunction with the wildlife life requisites assessment of the Forest Management Area. Analyse the Preferred Forest Management strategy for connectivity and compare to the current landbase.

**Strategy 2.4.3:**

Manage for high quality late seral stage representation on the Forest Management Agreement Area. Both the gross forested and operable landbase contribute to the maintenance of high quality late seral stage for each of the following cover groups: Deciduous, Mixedwood, Conifer Pine Leading, Conifer White Spruce Leading, and Conifer Black Spruce Leading

Over the entire 160 year planning horizon, representation of late seral stage for the Deciduous, Mixedwood, Conifer Pine Leading, Conifer White Spruce leading and Conifer Black Spruce Leading on the gross forested landbase for the Joint Forest Management Agreement Area will be on average 6%, 8%, 6%, 8% and 39% respectively.

Over the entire 160 year planning horizon, representation of high quality late seral stage on the operable landbase will be maintained at a minimum of 1% Deciduous, 2% Mixedwood, 1.5% Conifer Pine Leading, 0.5% Conifer White Spruce leading and 0% Conifer Black Spruce Leading.

**Strategy 2.4.4:** *(applicable to the Joint Forest Management Area)*

A river corridor has been identified along the Goose River. Manage harvesting operations within the river corridor to provide high quality ungulate habitat and maintain the integrity of the travel corridor.

**Strategy 2.4.5:** *(applicable to the Original Forest Management Area)*

**Strategy 2.4.6:** *(applicable to the Original Forest Management Area)*

**Strategy 2.4.7:** *(applicable to the Joint Forest Management Area)*

The land referral map (Version October 2003) has identified special access management areas in the Sweathouse and Kimiwan Operating Areas. In the Sweathouse and Kimiwan Operating Areas work with Government staff to implement operational controls to limit access during harvesting operations. The Preferred Forest Management Strategy for a single landbase, single pass will limit the amount and duration of access into the operating areas.

**Monitoring:**

M1 - Landscape Assessment

M8 - Landscape Structural Summary Table

M11 - Spatial Harvest Sequence Variance Table

**Objective 2.5:**

**Manage forestry operations to maintain habitat features for species of concern.**

**Strategy 2.5.1:**

Obtain the Federal and Provincial listing of forest dependant wildlife species. Within two years of Detailed Forest Management Plan approval, identify the known occurrences (if any) of these forest dependant species on the Forest Management Areas.

**Strategy 2.5.2:**

Utilizing existing information, complete an assessment within two years of Detailed Forest Management Plan approval, to determine if the habitat features for the listed forest dependant wildlife species are located on the Forest Management Agreement Area.

**Strategy 2.5.3:**

On an ongoing basis and in conjunction with Alberta Sustainable Resource Development investigate whether the species is utilizing the identified habitat.

**Strategy 2.5.4:**

Implement specified buffer zone strategy around identified trumpeter swan nesting lakes. Identified trumpeter swan nesting lakes will be verified within active operating area compartments. Any "new" identified trumpeter swan nesting lakes will be incorporated into the plans (Detailed Forest Management Plans, Compartment Plans, General Development Plan and Annual Operating Plans).

**Strategy 2.5.5:**

Manage timing of forestry operations to minimize potential for disturbance to raptor species and colonial nesting birds during the breeding season.

**Strategy 2.5.6:**

Plan operations in accordance with the Boreal Caribou Committee Guidelines in any known Caribou Zone.

**Monitoring:**

M3 - Ground Rule Development

M13 - Species of Concern Listing

**Objective 2.6:**

**Operate in compliance with legislation aimed at maintaining unique or rare flora and fauna.**

**Strategy 2.6.1:**

Utilizing existing information sources (Committee on the Status of Endangered Wildlife in Canada COSEWIC, Alberta Natural History Information Centre ANHIC) obtain a listing of the Federally and Provincially endangered species. Within two years of Detailed Forest Management Plan approval, locate information identifying the known occurrences (if any) of these species on the Forest Management Areas.

**Strategy 2.6.2:**

Utilizing existing information in order to determine if the habitat features for these species are located on the Forest Management Agreement Area within two years of Detailed Forest Management Plan approval.

**Strategy 2.6.3:**

On an ongoing basis and in conjunction with Alberta Sustainable Resource Development investigate whether the species is utilizing the habitat.

**Monitoring:**

M3 - Ground Rule Development

M13 - Species of Concern Listing

**3.3.2.3 FISH HABITAT MANAGEMENT OBJECTIVES**

The management of fish populations and fish habitat is the mandate of the Federal and Provincial Governments. The involvement of forest companies is the minimization of potential impacts and the mitigation of the detrimental effects of forestry operations on the fish habitat.

**Objective 2.7:**

**Mitigate the impacts of forestry practices on fish and fish habitat.**

**Strategy 2.7.1:**

Meet or exceed government riparian management requirements.

**Strategy 2.7.2:**

Meet or exceed government watercourse crossing requirements.

**Strategy 2.7.3:**

Analyze watersheds using the Age Threshold Analysis to determine the percentages of area affected by harvesting activities. Plan harvest operations to ensure that a minimum of 50% of the watershed will be older than the specified threshold ages for species cover types.

**Monitoring:**

M3 - Ground Rule Development

M18 - Watershed Analyses Summary

M27 - Road Maintenance and Abandonment Summary

M36 - Annual Harvest Summary

**3.3.2.4 NATURAL DISTURBANCE OBJECTIVES**

**Objective 2.8:**

**Develop proactive strategies to minimize the loss of fiber due to fire, insects and disease on the Forest Management Agreement Area.**

**Strategy 2.8.1:**

Monitor and update the Alberta Vegetation Inventory changes due to occurrence of forest fires.

**Strategy 2.8.2:**

Promote the utilization of fire killed deciduous and coniferous timber where feasible as per Alberta Sustainable Resource Development Fire Salvage Guidelines.

**Strategy 2.8.3:**

Maintain forest fire protection equipment and training of Woodlands staff as per Provincial Legislation.

**Strategy 2.8.4:**

In the event of a large scale fire or insect or disease outbreak greater than 2.5 percent of the Forest Management Agreement Area net landbase the sustainable harvest level will be recalculated and submitted to Sustainable Resource Development for approval.

**Strategy 2.8.5:**

Maintain active membership within the Northwest Boreal Integrated Pest Management Working Group.

**Strategy 2.8.6:**

Maintain a library of forest health, insect and disease publications including identification information, annual reports, and research papers. Provide training opportunities for Woodlands staff. In the event of an outbreak Industry staff will work in conjunction with Public Lands and Forest Division staff in managing the pest or disease.

**Monitoring:**

M2 - Inventory and Inventory Updates

M15 - Insect and Disease Summary

M16 - Forest Fire Summary

M20 - Training and Employment Listing

M28 - Fibre Supply Table

M38 - Forest Control Plan

**Objective 2.9:**

**Reduce the susceptibility for forest fires on the Forest Management Agreement Area**

**Strategy 2.9.1:**

Compare twenty year spatial harvest sequence to areas identified with high fuel loading potential. These stands are to be targeted for harvest early in the twenty year spatial harvest sequence Design harvest plans in areas identified with high fuel loading potential which are the oldest and most susceptible to fire, insects and disease.

**Strategy 2.9.2:**

Within five years of Detailed Forest Management Plan approval, in conjunctions with Forest Protection Division participate in the development of a wildfire urban interface initiative.

**Strategy 2.9.3:**

Reduce the susceptibility of forest fire and fire spread potential due to slash accumulation. The tactic employed will be to "pile and burn" slash accumulations, leaving a maximum of one pile for every five hectares.

**Strategy 2.9.4:**

Participate in the public education forums or seminars related to fire awareness in conjunction with the Forest Protection Division.

**Strategy 2.9.5:**

Maintain forest fire protection equipment and training of Woodlands staff per the Forest and Prairie Protection Act and associated Regulations.

**Monitoring:**

M1 - Landscape Assessment

M16 – Forest Fire Summary

M30 - Public Involvement, Education and Safety Summary

M36 - Annual Harvest Summary

M38 - Forest Control Plan

**Objective 2.10:**

**Operate in compliance with legislation aimed at limiting the introduction and spread of noxious and restricted weeds on the Forest Management Agreement Area.**

The Public Lands Act indicates that disposition holders must prevent the spread of nuisance weeds, control identified patches of noxious weeds and destroy restricted weeds.

**Strategy 2.10.1:**

Maintain a current library of weed information. Train company staff and summer students to identify weeds.

**Strategy 2.10.2:**

Develop a Weed Management Plan within one year of Detailed Forest Management Plan approval which will include education, prevention, detection, monitoring and control strategies.

**Strategy 2.10.3:**

Continue to participate in the Weed Management Co-operatives that have been initiated by the Provincial and Municipal Governments.

**Monitoring:**

M20 - Training and Employment Listing

M22 - Weed Management Plan

M31 – Membership Listing

**Objective 2.11:**

**Protect sensitive sites.**

The forest companies operating in the Forest Management Agreement Area recognize the importance of protecting sites within the Forest Management Agreement Area, which may be sensitive to commercial operations, human disturbance or unnecessary exposure to increased activity.

**Strategy 2.11.1:**

Work with Alberta Sustainable Resource Development to identify the location of mineral licks on the Forest Management Agreement Area.

**Strategy 2.11.2:**

Develop and maintain a listing of trapper cabin locations on the Forest Management Agreement Area. This layer of information will be maintained as confidential information by the companies and will not be released to the public.

**Strategy 2.11.3:**

Identify major waterbodies and watercourses within the Forest Management Agreement Area and coordinate harvest operations to mitigate impacts on those sites

**Strategy 2.11.4:**

Provide staff training for identifying sensitive sites and create operating procedures to ensure that all levels of operations recognize the need to mitigate impacts on these sites.

**Monitoring:**

M1 - Landscape Assessment

M7 - Stakeholder Information Listing

M20 - Training and Employment Listing

M36 - Annual Harvest Summary

**3.3.2.5 ACCESS NETWORK OBJECTIVES**

The creation of access networks in the Forest Management Agreement Area have the potential to remove productive land from the net landbase, create linear disturbances that fragment the forest and increase the activity by other forest users. In addition, increased activity may create effects on wildlife species movement, habitat selection and habitat use.

**Objective 2.12:**

**Work cooperatively with other forest users to manage the quality, and quantity of access within the Forest Management Agreement Area.**

**Strategy 2.12.1:**

Utilize existing access during field operations where practical.

**Strategy 2.12.2:**

Minimize the number of entries into a harvest plan area and co-ordinate annual harvesting operations through a single pass harvest system.

**Strategy 2.12.3:**

During the twenty year spatial harvest sequence implementation identify compartments with low harvest volumes and postpone harvest until later in the planning horizon to group proposed harvest areas and limit the access.

**Strategy 2.12.4:**

Reclaim all temporary roads following completion of harvesting and silviculture operations to prevent highway vehicle use.

**Strategy 2.12.5:**

Reduce access opportunities, maintain the productive landbase and limit wildlife harassment potential by rolling back in-block roads.

**Strategy 2.12.6:**

Identify the access corridors accessing different Operating Areas in the Detailed Forest Management Plan.

**Strategy 2.12.7:**

Develop a road inventory within one year of Detailed Forest Management Plan approval. This will include an inventory of the current roads by classification on the Forest Management Agreement Area.

**Strategy 2.12.8:**

Continue to work with Alberta Sustainable Resource Development - Public Lands and Forests Division and stakeholders through the Annual Operating Plan referral process to identify access routes and landuse requests.

**Monitoring:**

M6 - Access Corridor Identification Map

M23- Detailed Road Inventory Map

M25 - Forest Road Use Agreement Summary

M27 - Road Maintenance and Abandonment Summary

**3.3.3 SOCIAL OBJECTIVES**

**Goal #3:**

**To support the employment, business and public interests of the local and aboriginal communities.**

**Objective 3.1:**

**Develop strategies for the identification and protection of unique social and cultural areas.**

A historical resources potential model has been developed for the Forest Management Agreement area. The model identifies areas where proposed forestry operations coincide with sites that have the potential to have significant historical value.

**Strategy 3.1.1:**

Utilize the existing South Peace Heritage Model to identify the areas with high potential for heritage resources and develop appropriate management strategies for locating any existing heritage resources within these areas during the Preliminary Annual Operating Plan stage.

**Strategy 3.1.2:**

Utilize the existing South Peace Heritage Model to identify existing heritage resource sites and develop appropriate management strategies for protection of heritage resources during forestry operations and road building operations during the Final Annual Operating Plan stage and field operations.

**Strategy 3.1.3:**

Operate in compliance with the Alberta Historical Heritage Act and associated regulations.

**Strategy 3.1.4:**

Work with Local Aboriginal Groups to identify Traditional Landuse Areas and mitigate impacts from forestry operations in these areas.

**Monitoring:**

M19 - Historical Resources Summary

M30 - Public Involvement, Education and Safety Summary

**Objective 3.2**

**Provide opportunities to involve stakeholders in forest management of the Forest Management Agreement Area.**

The companies are committed to soliciting input from the public regarding the management of the Forest Management Agreement Area. The input will be obtained through formal regular meetings with interested stakeholders and upon request, through informal meetings with individuals.

**Strategy 3.2.1:**

Continue to implement the Public Involvement Plan. Activities include: Forest Resources Advisory Committee, Detailed Forest Management Planning Team, open houses, public meetings, tours, and National Forestry Week Activities

**Strategy 3.2.2:**

Continue to maintain a corporate presence in local communities.

**Monitoring:**

M30 - Public Involvement, Education and Safety Summary

**Objective 3.3:**

**Promote reasonable economic opportunities with businesses within the region.**

The communities adjacent to the Forest Management Agreement Area and located near the mill facilities of the Companies are the direct beneficiaries of the economic activity created by the forest resource. Maintenance of existing jobs and creation of new opportunities for the local population is the mechanism for sustainable communities and growth.

**Strategy 3.3.1:**

Ensure local businesses, contractors and stakeholders are given reasonable consideration when relevant opportunities arise.

**Monitoring:**

M35 – Contractor Summary

**Objective 3.4:**

**Recognize public interests within the Forest Management Agreement Area.**

The companies are committed to soliciting input from the public regarding their interests within the Forest Management Agreement Area. These inputs will be considered in the forest management activities.

**Strategy 3.4.1:**

Continue to implement the Public Involvement Plan. Activities include: Forest Resources Advisory Committee, Detailed Forest Management Planning Team, open houses, public meetings, tours, and National Forestry Week Activities

**Monitoring:**

M30 - Public Involvement, Education and Safety Summary

**Objective 3.5:**

**Explore research opportunities with industry partners, education institutions, government departments and independent research organizations.**

The companies recognize the need to identify gaps in the scientific knowledge base, which would permit informed decision making regarding the management of the forest resource. The acquisition of this information is the basis for adaptive forest management.

**Strategy 3.5.1:**

Continue to maintain memberships in organizations representing the forest industry and conducting research activities.

**Strategy 3.5.2:** *(applicable to the Original Forest Management Area)*

**Strategy 3.5.3:** *(applicable to the Joint Forest Management Area)*

Maintain a fund of \$0.25 per cubic meter, as per section 33(1) of the Joint Forest Management Agreement and "to enhance the management activities and level of understanding of the forest resources and forest products within the forest management area."

**Monitoring:**

M31 – Membership Listing

M34 – Research and Education Fund Summary

**3.3.4 PUBLIC INVOLVEMENT OBJECTIVES**

**Goal #4:**

**Create and maintain an open consultative environment for the communication of information and the resolution of issues.**

The Companies have committed to an open and consultative planning process in the development and implementation of the Detailed Forest Management Plan. This continual commitment extends to

inclusion of other forest resource users in both the short and long term planning horizon. The companies will communicate openly with the public, using local public advisory committees and other forums, regarding the management of the Forest Management Agreement Area.

**Objective 4.1:**

**Encourage public and aboriginal involvement during the development of strategic directions and site specific forest management initiatives.**

The companies are committed to soliciting input from the public regarding the management of the Forest Management Agreement Area. The input will be obtained through formal regular meetings with interested stakeholders and upon request, through informal meeting with individuals.

**Strategy 4.1.1:**

Continue to implement the Public Involvement Plan. Activities include: Forest Resources Advisory Committee, Detailed Forest Management Planning Team, Open houses, public meetings, tours, and National Forestry Week Activities

**Strategy 4.1.2:**

Continue to support the Lesser Slave and Mackenzie Forest Education Societies.

**Monitoring:**

M30 - Public Involvement, Education and Safety Summary

M31 – Membership Listing

**Objective 4.2:**

**Provide opportunities to increase public knowledge and awareness of forestry.**

The Companies are committed to educating the public in the field of forestry to promote informed discussion.

**Strategy 4.2.1:**

Continue to implement the Public Involvement Plan. Activities include: Forest Resources Advisory Committee, Detailed Forest Management Planning Team, Open houses, public meetings, tours, and National Forestry Week Activities

**Strategy 4.2.2:**

Continue to support the Lesser Slave and Mackenzie Forest Education Societies.

**Monitoring**

M30 - Public Involvement, Education and Safety Summary

M31 – Membership Listing

### 3.3.5 ECONOMIC OBJECTIVES

**Goal #5:**

**Ensure the viability of a timber resource based investment and the economic well-being of timber based communities relating to the Forest Management Area.**

The companies operating in the Forest Management Agreement Area contribute a significant portion of the economic base for the communities in and around the Forest Management Agreement Area. These local communities have strong ties to the forest resource and the economics generated from the forest landbase. Economic stability of these communities is important to the Companies and is considered in the Detailed Forest Management Plan process.

**Objective 5.1:**

**Maintain or enhance the currently allocated timber resource for tenure holders.**

The Tolko and Buchanan Lumber Joint Forest Management Agreement states that the Detailed Forest Management Plan shall "provide for the maintenance of the annual allowable cut for both the coniferous and deciduous tree species subject to the occurrence of natural disasters" Section 10(7a).

The strategies employed in the timber supply analysis provided in the Joint Detailed Forest Management Plan is consistent with the intent of the Forest Management Agreement document.

**Strategy 5.1.1:**

Maintain or enhance coniferous and deciduous sustainable harvest level. By conversion of low (AB) density stands to full stocking during the life of the plan.

**Strategy 5.1.2:**

Harvest according to the calculated deciduous and coniferous sustainable harvest level.

**Strategy 5.1.3:**

Track and report fibre drain from the Forest Management Agreement Area annually.

**Strategy 5.1.4:**

Collect information and report on the harvested yields for conifer and deciduous harvest areas to validate yield curves. Report of the information to be summarized in the five year stewardship report.

**Strategy 5.1.5:**

Apply information collected from implementation of the approved Growth and Yield Program to validate the yield curves.

**Strategy 5.1.6:** *(applicable to the Original Forest Management Area)*

**Strategy 5.1.7:** *(applicable to the Joint Forest Management Area)*

Ensure both conifer and deciduous Timber Damages Assessment (TDA) dollars are collected from the Joint Forest Management Agreement Area. Apply Timber Damages Assessment money collected to offset damage to improvements, to replace timber resource and to re-establish commercial tree species.

**Strategy 5.1.8:** *(applicable to the Original Forest Management Area)*

**Strategy 5.1.9:** *(applicable to the Joint Forest Management Area)*

There has been a small amount of area designated as potentially productive on the landbase. Approximately 40 hectares on the Joint Forest Management Agreement Area. The main category of potential productive land has been defined in the Net Landbase document as a polygon which has been burned since the AVI, and is not already identified in the netdown field or has not already been identified as an update harvest area. These areas will be evaluated to determine the opportunity of returning the area to the net productive landbase via afforestation.

**Strategy 5.1.10:**

Work with the local MTU program and Sustainable Resource Development to maintain their traditional areas as much as possible.

**Monitoring:**

M17 - Landuse Summary

M21 - Growth and Yield Activity Summary

M28 - Fibre Supply Table

M29 - Annual Landuse Summary

M30 - Public Involvement, Education and Safety Summary

M36 - Annual Harvest Summary

M37 - Annual Silviculture Summary

**Objective 5.2:**

**Develop an optimal balance of logging and hauling operations throughout the Forest Management Agreement Area to minimize delivered wood costs.**

The companies strive to be the low cost producers in oriented strand board, veneer and dimension lumber production to maintain or enhance their long-term competitiveness. This ability to remain competitive provides long-term stability for the local and regional economies. Efficiency in all phases of operation is crucial in the industry's desire to be cost competitive. The forest companies have committed to integrated planning. These initiatives will provide greater flexibility in all phases of operations.

**Strategy 5.2.1:**

Develop a twenty year spatial harvest sequence that allows for flexibility in forest planning, production and delivery schedules between deciduous and coniferous tenure holders by submission of the plan.

**Strategy 5.2.2:**

Allow for the switching of areas between the 1-10 year portion and the 11-20 year portions of the twenty year spatial harvest sequence through flexibility built into the twenty year spatial harvest sequence. The stands must be from the same strata (Deciduous, Conifer, and Mixedwood) and equivalent size (hectares).

**Strategy 5.2.3:** *(applicable to the Joint Forest Management Area)*

Implementation of single pass harvest system based on a single timber supply unit for both the deciduous and coniferous landbase (single landbase) has been identified as the preferred forest management strategy to facilitate the consolidation of harvest operations and realize significant cost efficiencies.

**Strategy 5.2.4:** *(applicable to the Original Forest Management Area)*

**Strategy 5.2.5:**

Forest companies will submit integrated annual operating plans.

**Monitoring:**

M11 - Spatial Harvest Sequence Variance Table

M26 - Integrated Harvest Summary

**Objective 5.3:**

**Harvest under sustainable forest management principles.**

By the companies harvesting at sustainable harvest levels they ensure the security of their fibre supply which is paramount to the mills existence and its contribution to the communities.

**Strategy 5.3.1:**

Harvest according to the calculated deciduous and coniferous sustainable harvest level.

**Monitoring:**

M28 – Fibre Supply Table

**Objective 5.4:**

**Investigate opportunities to utilize wood from agricultural clearing activities.**

The companies realize that by utilizing the timber from agriculture activity they are benefiting from an alternate fibre supply as well as providing an economic benefit to the communities.

**Strategy 5.4.1:**

Continue to maintain a fair and equitable purchase wood program to fully utilize the timber that is available on the open market, private land or agricultural clearing.

**Strategy 5.4.2:**

Develop and maintain a list of potential land clearing opportunities throughout the life of the plan.

**Monitoring:**

M28 – Fibre Supply Table

**Objective 5.5**

**Develop a Deciduous private land woodlot program.**

The companies realize that by utilizing the timber from agriculture activity they are benefiting from an alternate fibre supply as well as providing an economic benefit to the communities. Land owners are receiving economic benefit from a resource that was previously under utilized or destroyed.

**Strategy 5.5.1:**

Identify a woodlands person to be a liaison officer.

**Strategy 5.5.2:**

Develop and maintain a list of potentially interested parties throughout the life of the plan.

**Strategy 5.5.3:**

Develop a woodlot program as suitable opportunities are available.

**Strategy 5.5.4:**

Continue to promote the creation of forest woodlots within the vicinity of the Forest Management Agreement Area and participate in the development of white area forest development strategies.

**Monitoring:**

M33 - Woodlot Summary

**Objective 5.6:**

**Continue integration of Company and Quota holder planning and operations with a spirit of trust, cooperation and open communication.**

**Strategy 5.6.1:**

Develop a twenty year spatial harvest sequence that allows for flexibility in forest planning, production and delivery schedules between deciduous and coniferous tenure holders. Efficiency dictates that the twenty year spatial harvest sequence allows some degree of variability.

**Strategy 5.6.2:**

Allow for flow of information between companies.

**Strategy 5.6.3:** *(applicable to the Joint Forest Management Area)*

Operate the Joint Forest Management Agreement Area as a single sustainable timber supply unit for both the deciduous and coniferous landbase (single landbase). The deciduous and conifer harvest levels will be calculated and a twenty year spatial harvest sequence developed for the Forest Management Agreement Area as a whole.

**Strategy 5.6.4:** *(applicable to the Original Forest Management Area)*

**Monitoring:**

M5 - Information Exchange

M11 - Spatial Harvest Sequence Variance Table

M26 - Integrated Harvest Summary

**3.3.6 OTHER RESOURCE USER OBJECTIVES**

**Goal #6:**

**To cooperate with other commercial and non commercial users of the Forest Management Area.**

Forestry operations can and will have varying impacts on the other users of the Forest Management Agreement Area. Tolko and Buchanan Lumber together with the forest industry recognize the need to develop objectives and strategies to identify and work together with other forest users to mitigate the impact of forestry operations and the cumulative effects.

**Objective 6.1:**

**Plan and operate in co-existence with hunting, fishing, guiding, trapping and where appropriate grazing.**

**Strategy 6.1.1:**

Develop and maintain a listing of Trapping License holders on the Forest Management Agreement Area to be completed by submission of the Detailed Forest Management Plan.

**Strategy 6.1.2:**

Develop and maintain a listing of Trapper Cabin Locations on the Forest Management Agreement Area to be completed by submission of the Detailed Forest Management Plan. This layer of information will be maintained as confidential information by the companies and will not be released to the public.

**Strategy 6.1.3:**

Complete analysis of the impacts to trapping licenses from a single pass, single landbase harvest system by submission of the Detailed Forest Management Plan.

**Strategy 6.1.4:**

Develop and maintain a listing of Active Guide Outfitters on the Forest Management Agreement Area to be completed by submission of the Detailed Forest Management Plan.

**Strategy 6.1.5:**

Develop and maintain a listing of Grazing Lease and License holders on the Forest Management Agreement Area to be completed by submission of the Detailed Forest Management Plan.

**Strategy 6.1.6:**

Continue to participate in the Northwest Boreal Grazing group to facilitate cooperation between forest company and grazing lease holders.

**Strategy 6.1.7:**

Provide notifications regarding harvesting and silviculture operations to appropriate stakeholders annually.

**Strategy 6.1.8:**

Address any concerns or comments raised by stakeholders and maintain record of communications as they occur.

**Monitoring:**

M7 - Stakeholder Information Listing

M30 - Public Involvement, Education and Safety Summary

M31 – Membership Listing

**Objective 6.2:**

**Promote the integration of utility companies, oil and gas industry and forest industry activities on the Forest Management Agreement Area.**

Forestry industry, utility companies and oil and gas activities on the Forest Management Agreement Area have resulted in fragmentation becoming more prevalent on the landscape. The intent of promoting the integration of industry activities is to reduce the occurrence of forest fragmentation. Forest fragmentation also occurs naturally as a result of disturbances or by permanent landscape features.

**Strategy 6.2.1:**

Utilize the current request for withdrawal notification process for landuse dispositions to promote use of common corridors, existing access and salvage of merchantable timber.

**Strategy 6.2.2:**

Update Forest Inventory Layer for tracking of disturbances from the utility companies and the oil and gas sector. The planned activities are loaded spatially through the Timber Damages Assessment process. Annually these planned activities are incorporated into the Annual Operating Plans. Confirmation of these planned activities is confirmed through the AVI inventory Update process.

**Strategy 6.2.3:**

Notify Quota holders of salvage opportunities as they are identified through the request for withdrawal notification process.

**Strategy 6.2.4:**

Create and maintain a listing of oil and gas companies on the Forest Management Agreement Area to be completed by submission of the Detailed Forest Management Plan.

**Strategy 6.2.5:**

Work with utility companies to identify their hazard-tree reduction requirements. Wherever feasible, integrate hazard-tree reduction procedures in conjunction with forest harvest plans.

**Monitoring:**

M2 - Inventory and Inventory Updates

M5 - Information Exchange

M7 - Stakeholder Information Listing

M29 - Annual Landuse Summary

**Objective 6.3:**

**Plan and operate in co-existence with non commercial stakeholders.**

Forestry operations can and will have varying impacts on the other users of the Forest Management Agreement Area. Tolko and Buchanan Lumber and the forest industry recognize the need to develop strategies to mitigate the impact of forestry operations on those forest users.

**Strategy 6.3.1:**

Develop and maintain a listing of non commercial stakeholders on the Forest Management Agreement Area by submission of the Detailed Forest Management Plan.

**Strategy 6.3.2:**

Continue to provide notifications regarding harvesting and silviculture operations to appropriate stakeholders.

**Strategy 6.3.3:**

Address any concerns or comments raised by stakeholders and maintain record of communications.

**Strategy 6.3.4:**

Identify any current or pending recreation opportunities within the Forest Management Agreement Area within one year of Detailed Forest Management Plan approval.

**Monitoring:**

M7 - Stakeholder Information Listing

M30 - Public Involvement, Education and Safety Summary

**Objective 6.4:**

**Work with stakeholders and Government to enhance public safety.**

The companies recognize the need for a public safety program, especially during the intensive winter log haul program when there is the potential for interaction between the log haul fleet and public users of the road network.

**Strategy 6.4.1:**

Continue to participate in AFPA Log haul sub committee

**Strategy 6.4.2:**

Continue a Log Haul Weight and Safety monitoring program. Including log haul commencement notification, incident investigations and corrective action recommendations.

**Strategy 6.4.3:**

Continue to work with local school boards on school bus safety during log haul.

**Strategy 6.4.4:**

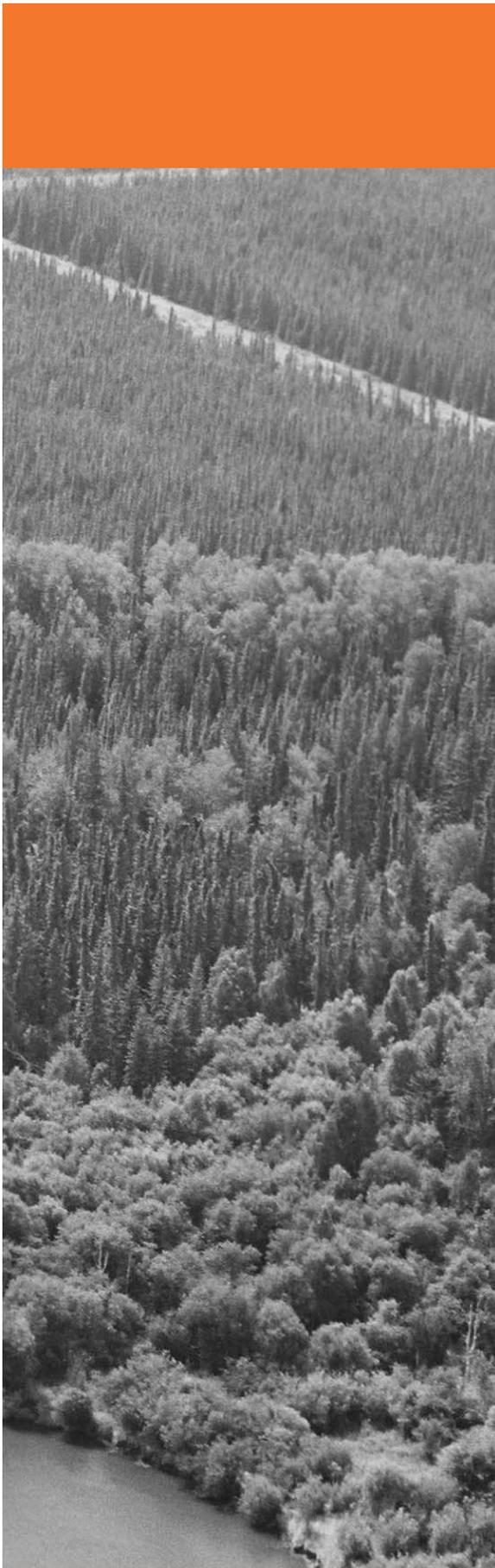
Place signage in areas with active operations.

**Monitoring:**

M30 - Public Involvement, Education and Safety Summary

M31 – Membership Listing

M32 – Log Haul Summary



4.0

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**Fibre Supply  
Analysis**

DFMP

## **4.0 FIBRE SUPPLY ANALYSIS**

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### **4.1 SOURCE INFORMATION**

#### **4.1.1 ALBERTA VEGETATION INVENTORY**

Medium scale (1:15,000) “leaf-on”, black and white air photos were obtained for the entire Joint FMA between 1995 and 1998. Additional photography for the Sweathouse Operating Area was acquired in 1997 and 1998 to address the impacts of the Virginia Hills burn. The stratification of forested and non-forested lands was completed in accordance with AVI standards version 2.1 for the Kimiwan Operating Area and AVI standards version 2.2 for the Sweathouse Operating Area. The data has since been standardized to AVI 2.1 to match the Kimiwan Operating Area.

Small scale (1:60,000) “leaf-on”, black and white panchromatic air photo coverage was obtained for the entire Joint FMA in 1996 and 1997. Digital orthophotos were produced by the Orthoshop Ltd. (Calgary) from the 1:60,000 photos (in combination with 50 metre digital elevation model data). 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.

#### **4.1.2 INVENTORY UPDATES**

Cutblock update boundaries were acquired to reflect harvesting activities in the Joint FMA as follows:

- ◆ Kimiwan Operating Area cutblock updates were captured from Tolko photography updates which have been completed since the time of the inventory to the 2001/2002 timber year;
- ◆ Sweathouse Operating Area cutblock updates were captured from a data purchase from Slave Lake Pulp and recent Buchanan photography updates to bring the harvesting history to the 2001/2002 timber year.

Boundaries of recent fires (post-inventory), up to the end of the 2001/2002 fire year, were also acquired from the Land and Forest Division of Alberta Sustainable Resource Development (SRD) and incorporated into the analysis.

The Timber Damage Assessment area coverage was also updated to reflect the landuse disturbance as of October 2002.

### **4.2 NET LANDBASE DETERMINATION**

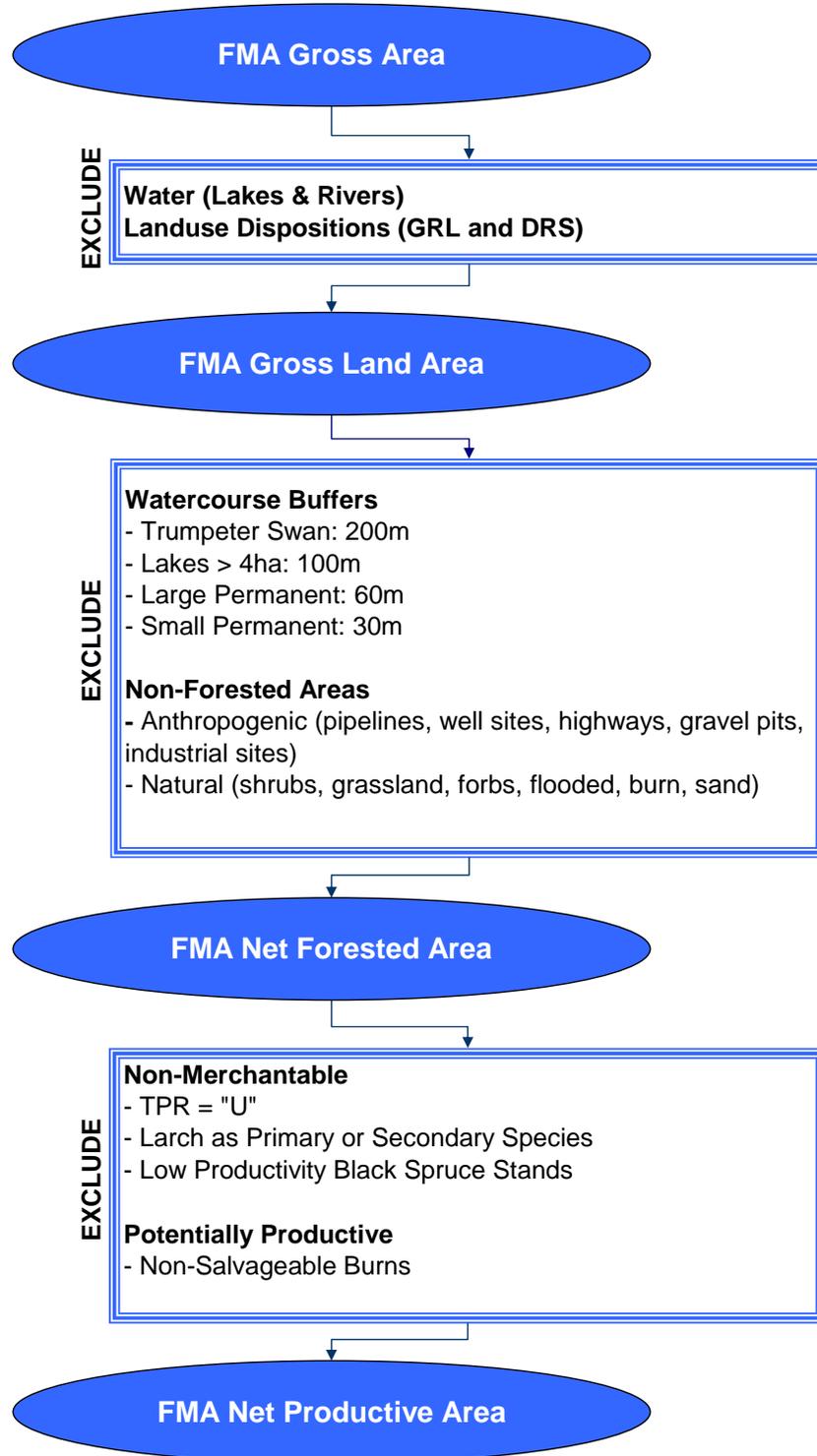
This section briefly describes the process used to netdown the Joint FMA area. A more detailed description of the netdown process can be found in the “Net Landbase Determination” (April 30, 2003) document.

#### **4.2.1 GROSS LANDBASE**

The extent of the landbase under consideration for Buchanan and Tolko includes FMU S21 with a gross area of 246,243 ha. Figure 4-1 outlines the approach taken to determine the net productive landbase. The Joint FMA map illustrating the landbase categories derived from the netdown procedures is presented on Map 4-1 (full size maps can be found in Appendix H, Map H-3). The

Joint FMA species group and age class distribution within net productive area map is presented on Map 4-2 of this document (full size maps can be found in Appendix H, Map H-4).

**FIGURE 4-1: PRODUCTIVE FOREST CLASSIFICATION PROCEDURES**



## MAP 4-1: LANDBASE CATEGORIES

## **MAP 4-2: SPECIES GROUP AND AGE CLASS DISTRIBUTION WITHIN NET PRODUCTIVE AREA**

## **4.2.2 COMPARTMENTALIZATION**

The Joint FMA area is organized into two operating areas: Kimiwan and Sweathouse. Each operating area is further divided into various compartments. Map 4-3 illustrates the FMA's compartmentalization (full size maps can be found in Appendix H, Map H-5).

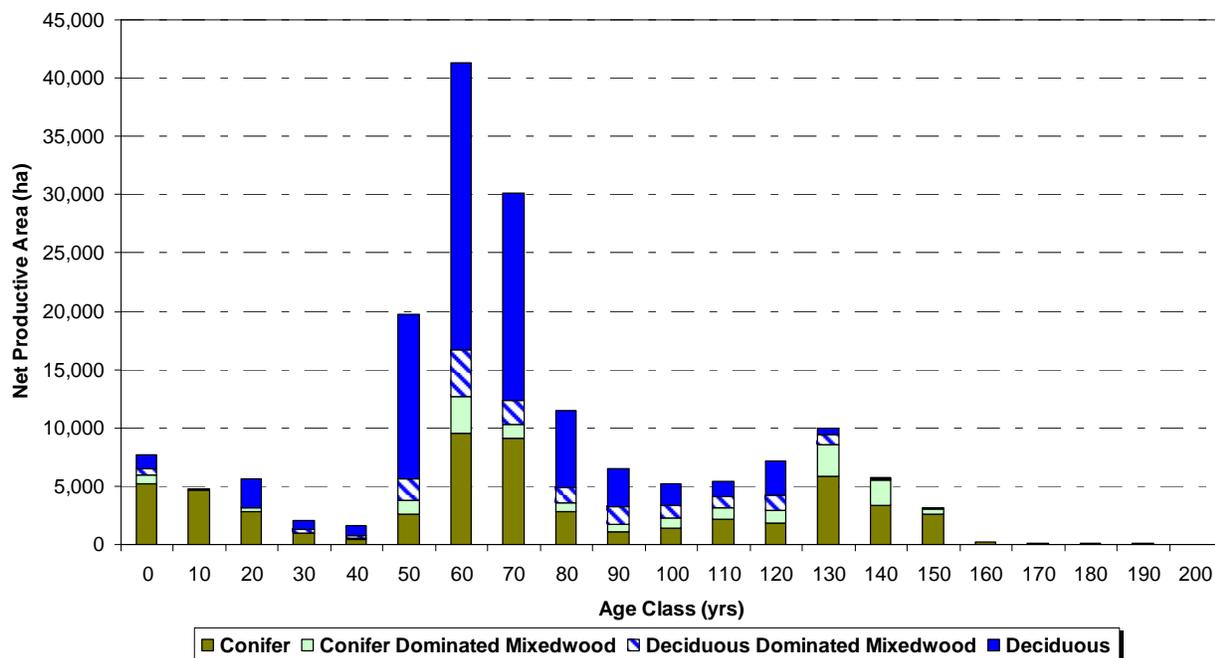
The area for each landbase category is presented for the entire Joint FMA and for each operating area in Table 4-1 to Table 4-3. The net landbase age class distribution by overstorey species group is presented in Figure 4-2 to Figure 4-4.

## **MAP 4-3: COMPARTMENT AND OPERATING AREA BOUNDARIES**

**TABLE 4-1: LANDBASE SUMMARY: ENTIRE FMA**

Landbase Category	Area (ha)	Percent of Gross Area
<b>Gross Area</b>	<b>246,243</b>	<b>100.0</b>
♦ Water	1,823	0.7
♦ Landuse Dispositions (GRL and DRS)	479	0.2
<b>Gross FMA Land Area</b>	<b>243,941</b>	<b>99.1</b>
Watercourse Buffers		
♦ Trumpeter Swan Lake Buffers (200m)	145	0.1
♦ Lake Buffers (100m)	1,631	0.7
♦ Large Permanent Buffers (60m)	5,642	2.3
♦ Small Permanent Buffers (30m)	5,484	2.2
<i>Sub-Total</i>	<i>12,902</i>	<i>5.2</i>
Non-Forested		
♦ Anthropogenic	2,041	0.8
♦ Natural	14,149	5.7
<i>Sub-Total</i>	<i>16,190</i>	<i>6.6</i>
<b>Net Forested Area</b>	<b>214,849</b>	<b>87.3</b>
Non-Merchantable		
♦ TPR = "U"	24,187	9.8
♦ Larch SP1 or SP2	7,926	3.2
♦ Low Productivity SB Stands	14,467	5.9
<i>Sub-Total</i>	<i>46,580</i>	<i>18.9</i>
Potentially Productive		
♦ Non-Salvageable Burns	40	0.0
<i>Sub-Total</i>	<i>40</i>	<i>0.0</i>
<b>Net Productive Area</b>	<b>168,229</b>	<b>68.3</b>

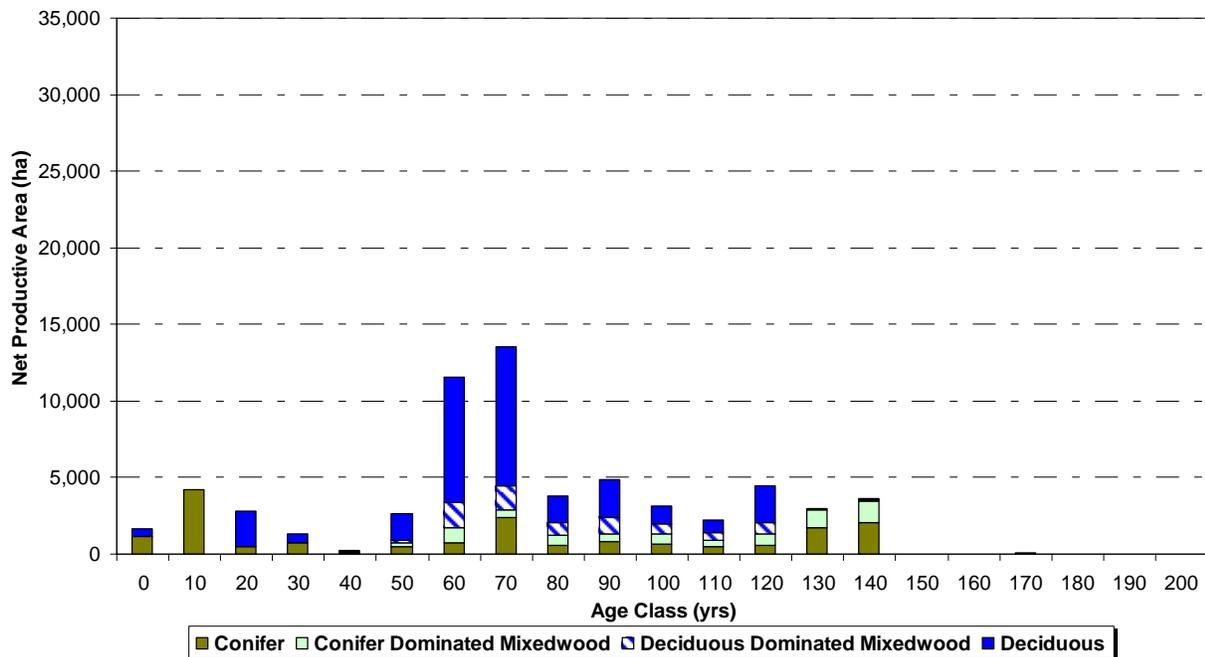
**FIGURE 4-2: NET LANDBASE AGE CLASS DISTRIBUTION BY LEADING SPECIES GROUP: ENTIRE FMA**



**TABLE 4-2: LANDBASE SUMMARY: KIMIWAN OPERATING AREA**

Landbase Category	Area (ha)	Percent of Gross Area
<b>Gross Area</b>	<b>102,557</b>	<b>100.0</b>
♦ Water	1,388	1.4
♦ Landuse Dispositions (GRL and DRS)	471	0.5
<b>Gross FMA Land Area</b>	<b>100,698</b>	<b>98.2</b>
Watercourse Buffers		
♦ Trumpeter Swan Lake Buffers (200m)	145	0.1
♦ Lake Buffers (100m)	1,287	1.3
♦ Large Permanent Buffers (60m)	2,100	2.0
♦ Small Permanent Buffers (30m)	2,394	2.3
<i>Sub-Total</i>	5,926	5.8
Non-Forested		
♦ Anthropogenic	1,034	1.0
♦ Natural	7,288	7.1
<i>Sub-Total</i>	8,322	8.1
<b>Net Forested Area</b>	<b>86,449</b>	<b>84.3</b>
Non-Merchantable		
♦ TPR = "U"	15,356	15.0
♦ Larch SP1 or SP2	4,002	3.9
♦ Low Productivity SB Stands	3,834	3.7
<i>Sub-Total</i>	23,192	22.6
Potentially Productive		
♦ Non-Salvageable Burns	33	0.0
<i>Sub-Total</i>	33	0.0
<b>Net Productive Area</b>	<b>63,224</b>	<b>61.6</b>

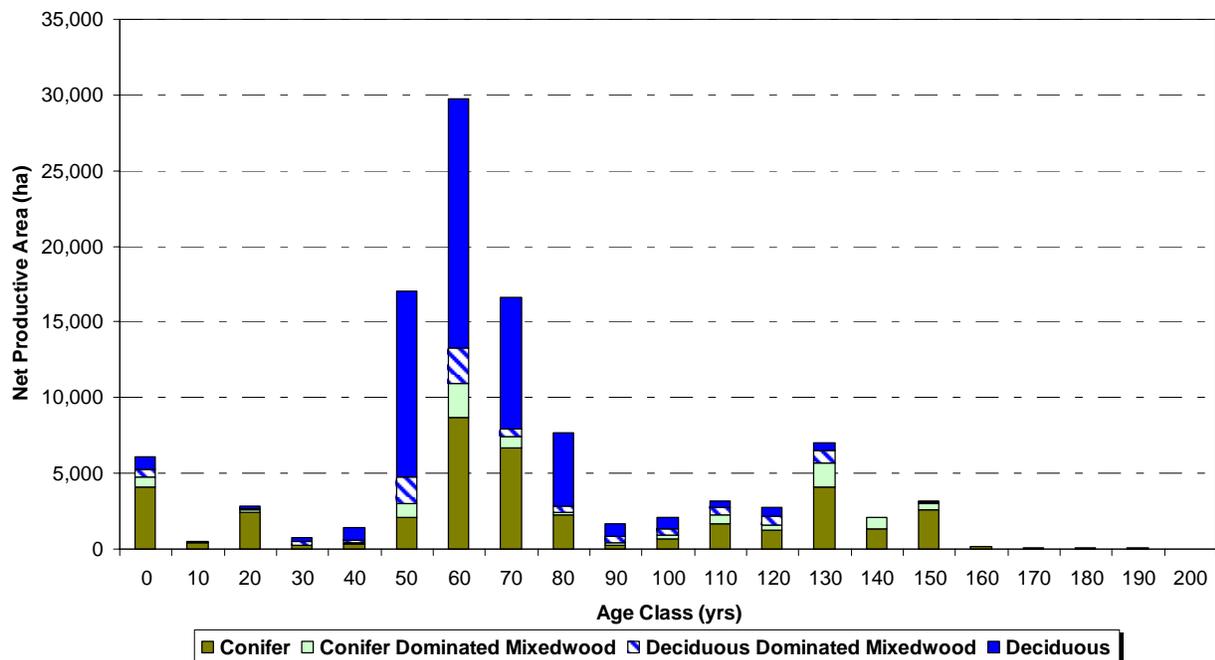
**FIGURE 4-3: NET LANDBASE AGE CLASS DISTRIBUTION BY LEADING SPECIES GROUP: KIMIWAN OPERATING AREA**



**TABLE 4-3: LANDBASE SUMMARY: SWEATHOUSE OPERATING AREA**

Landbase Category	Area (ha)	Percent of Gross Area
<b>Gross Area</b>	<b>143,687</b>	<b>100.0</b>
♦ Water	436	0.3
♦ Landuse Dispositions (GRL and DRS)	8	0.0
<b>Gross FMA Land Area</b>	<b>143,243</b>	<b>99.7</b>
Watercourse Buffers		
♦ Trumpeter Swan Lake Buffers (200m)	0	0.0
♦ Lake Buffers (100m)	344	0.2
♦ Large Permanent Buffers (60m)	3,542	2.5
♦ Small Permanent Buffers (30m)	3,090	2.2
<i>Sub-Total</i>	6,976	4.9
Non-Forested		
♦ Anthropogenic	1,007	0.7
♦ Natural	6,861	4.8
<i>Sub-Total</i>	7,868	5.5
<b>Net Forested Area</b>	<b>128,399</b>	<b>89.4</b>
Non-Merchantable		
♦ TPR = "U"	8,831	6.1
♦ Larch SP1 or SP2	3,924	2.7
♦ Low Productivity SB Stands	10,633	7.4
<i>Sub-Total</i>	23,388	16.3
Potentially Productive		
♦ Non-Salvageable Burns	7	0.0
<i>Sub-Total</i>	7	0.0
<b>Net Productive Area</b>	<b>105,005</b>	<b>73.1</b>

**FIGURE 4-4: NET LANDBASE AGE CLASS DISTRIBUTION BY LEADING SPECIES GROUP: SWEATHOUSE OPERATING AREA**



## 4.3 GROWTH AND YIELD

The following section provides an overview of the growth and yield analysis for the Tolko FMA area and the Tolko and Buchanan Joint FMA area. A more detailed description of the methods used in predicting volume estimates can be found in the “Yield Curve Development” (August 30, 2003) document.

### 4.3.1 YIELD CURVE STRATIFICATION

The following predictors of yields were examined as possible classes for yield curve stratification:

- ◆ Natural sub-region (NSR, NSR\_NAME);
- ◆ Species group (SPGRP);
- ◆ Crown closure (CROWN);
- ◆ Leading species (SP1);
- ◆ Timber Productivity Rating (TPR).

These predictors were examined in age ranges where the most plot data was available so that the greatest amount of supporting evidence was available for stratifying or not stratifying by the examined property. These age classes would also have the most influence on the resulting yield curves because of the plot-based methodology that would be used to fit the yield curves. If statistical differences were exhibited in these age classes statistical differences would also most likely be evident in the resulting yield curves.

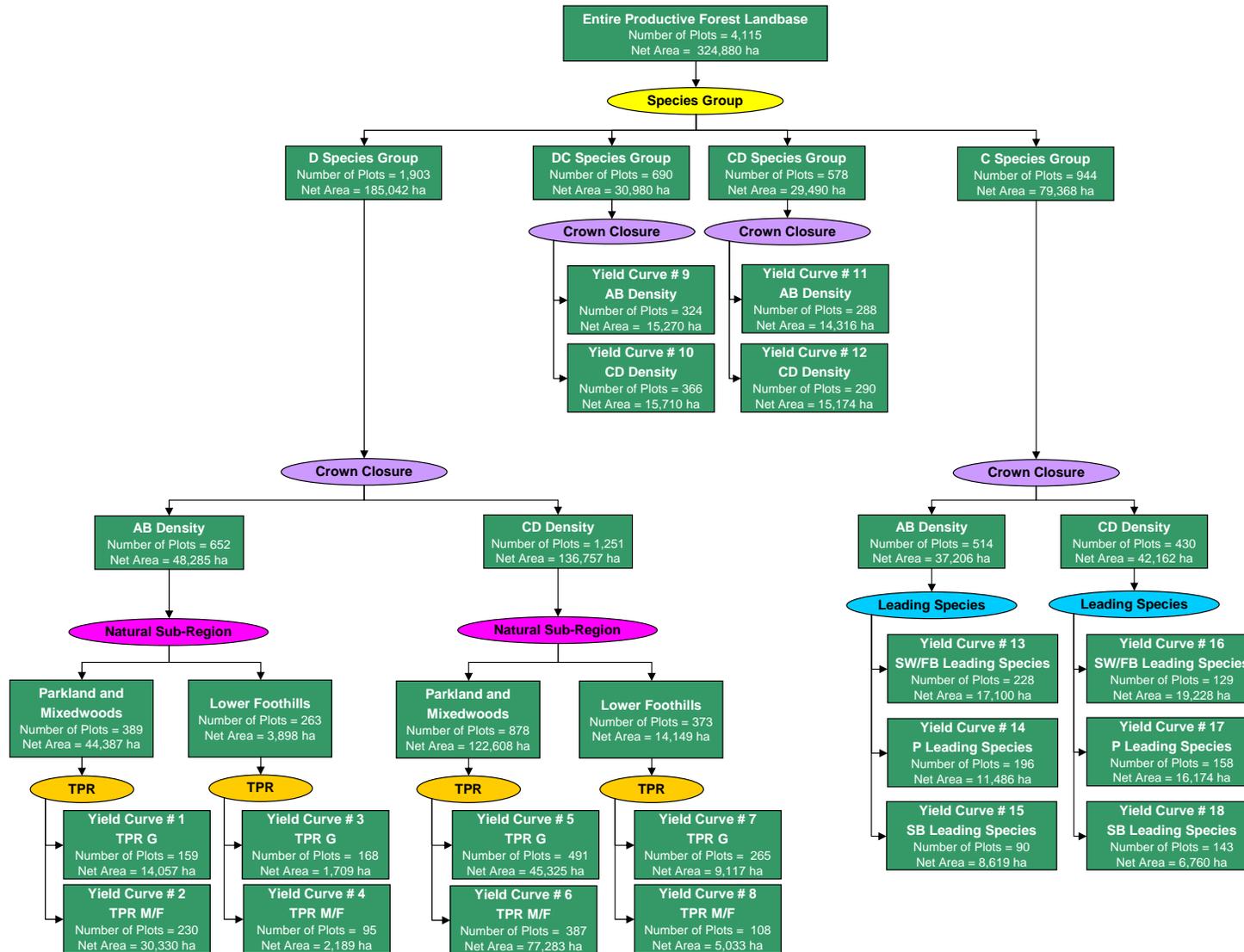
These predictors were also examined by holding all other variables constant. For example when testing for significant differences in volume between crown closure classes, the species group, leading species, natural sub-region and TPR were held constant.

Although management objectives do play a certain role in yield curve stratification, significance testing was used for determining yield curve stratification because it would predict yield curve volumes that would be closer to the actual volumes harvested.

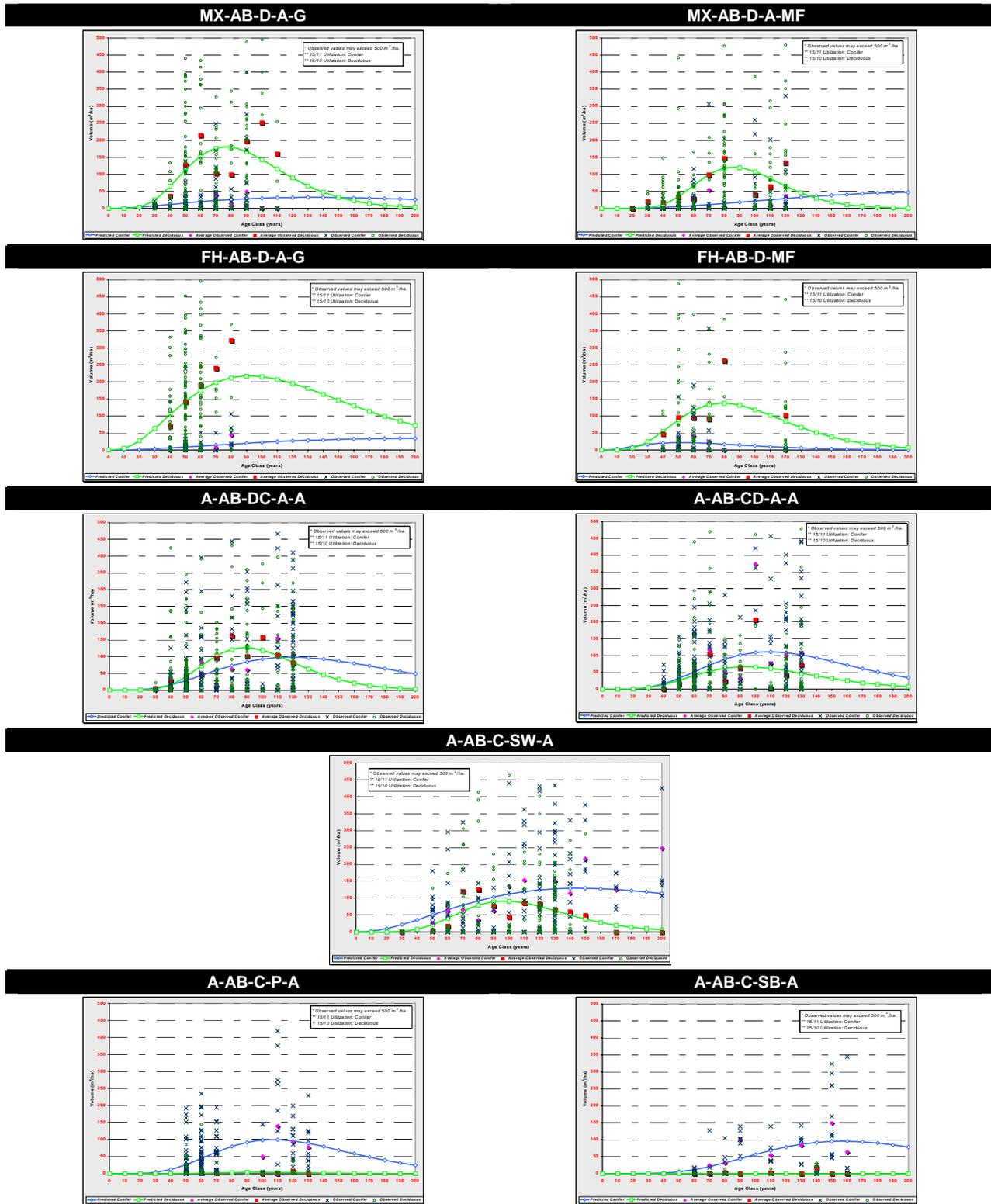
Figure 4-5 provides a detailed description of the yield strata assignments showing the number of plots and net landbase area for each yield stratum class.

Figure 4-6 and Figure 4-7 contain the final proposed yield curves for the conifer and deciduous strata.

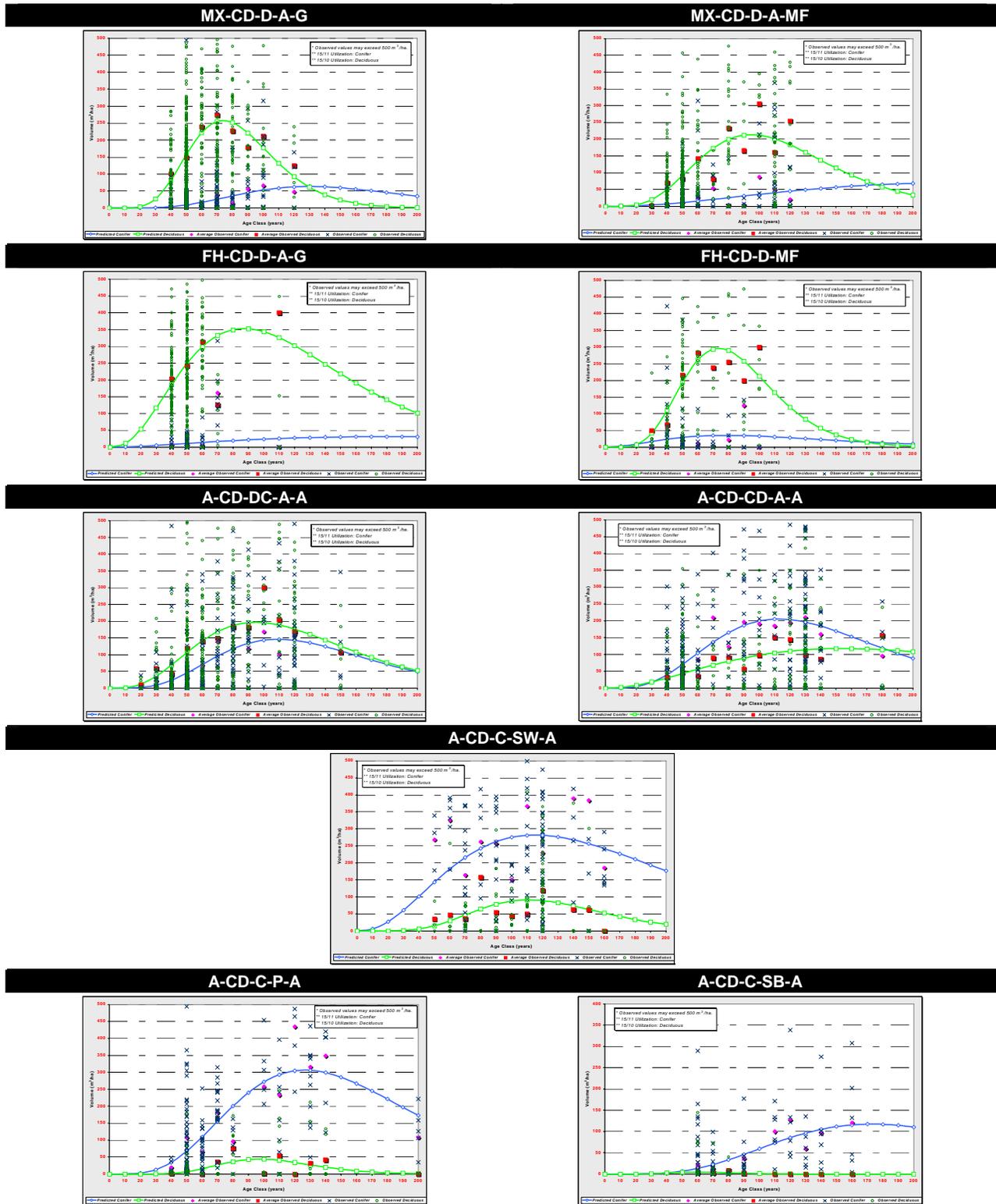
**FIGURE 4-5: YIELD CURVE DEVELOPMENT**



**FIGURE 4-6: YIELD CURVES – AB CROWN CLOSURE**



**FIGURE 4-7: YIELD CURVES – CD CROWN CLOSURE**



### 4.3.2 CULL DEDUCTIONS

Cull deductions were not applied during the yield curve development. The following cull deductions were applied to the yield curves during the timber supply analysis:

- ◆ 2% conifer cull deduction (derived from the provincial average);
- ◆ 10% deciduous cull deduction (derived from Tolko's historical scale data).

### 4.3.3 YIELD STRATA TRANSITION

Stands were assumed to regenerate on the fully stocked yield curve (i.e. AB density regenerates to CD density) with the same species composition and TPR. The yield curve transition is demonstrated in Table 4-4.

**TABLE 4-4: YIELD CURVE TRANSITION**

NATURAL SUBREGION	CROWN CLOSURE	SPECIES GROUP	LEADING SPECIES	TPR	YIELD CURVE STRATA	TRANSITION CURVE STRATA
1 or 2 or 15	A or B	D	ALL	G	MX-AB-D-A-G	MX-CD-D-A-G
1 or 2 or 15	A or B	D	ALL	M or F	MX-AB-D-A-MF	MX-CD-D-A-MF
11	A or B	D	ALL	G	FH-AB-D-A-G	FH-CD-D-A-G
11	A or B	D	ALL	M or F	FH-AB-D-A-MF	FH-CD-D-A-MF
1 or 2 or 15	C or D	D	ALL	G	MX-CD-D-A-G	MX-CD-D-A-G
1 or 2 or 15	C or D	D	ALL	M or F	MX-CD-D-A-MF	MX-CD-D-A-MF
11	C or D	D	ALL	G	FH-CD-D-A-G	FH-CD-D-A-G
11	C or D	D	ALL	M or F	FH-CD-D-A-MF	FH-CD-D-A-MF
ALL	A or B	DC	ALL	ALL	A-AB-DC-A-A	A-CD-DC-A-A
ALL	C or D	DC	ALL	ALL	A-CD-DC-A-A	A-CD-DC-A-A
ALL	A or B	CD	ALL	ALL	A-AB-CD-A-A	A-CD-CD-A-A
ALL	C or D	CD	ALL	ALL	A-CD-CD-A-A	A-CD-CD-A-A
ALL	A or B	C	SW or FB	ALL	A-AB-C-SW-A	A-CD-C-SW-A
ALL	A or B	C	PL, P or PJ	ALL	A-AB-C-P-A	A-CD-C-P-A
ALL	A or B	C	SB	ALL	A-AB-C-SB-A	A-CD-C-SB-A
ALL	C or D	C	SW or FB	ALL	A-CD-C-SW-A	A-CD-C-SW-A
ALL	C or D	C	PL, P or PJ	ALL	A-CD-C-P-A	A-CD-C-P-A
ALL	C or D	C	SB	ALL	A-CD-C-SB-A	A-CD-C-SB-A

## 4.4 TIMBER SUPPLY ANALYSIS

This section summarizes the procedures, results and assumptions applied in determining the annual allowable harvest level for the Joint FMA area.

### 4.4.1 MODELS

#### 4.4.1.1 LRSYA

Long-run sustained-yield average (LRSYA) is a measure of forest productivity that 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 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 the annual growth in the oldest age class. LRSYA is calculated using the following formula:

$$LRSYA = \sum_i MAI_i \cdot A_i$$

Where:

LRSYA = long-run sustained-yield average (m<sup>3</sup>/yr)

MAI<sub>i</sub> = mean annual increment (m<sup>3</sup>/ha/yr) for yield class “i”

A<sub>i</sub> = net area (ha) for yield class “i”

The LRSYA estimates are provided in Table 4-5 through Table 4-10.

**TABLE 4-5: LRSYA ESTIMATES: “STATUS QUO” REGENERATION TRANSITION – JOINT FMA**

Yield Curve	Net Area (ha)	MAI (m <sup>3</sup> /ha/yr) @ 80 Years		LRSYA (m <sup>3</sup> /yr)	
		Conifer	Deciduous	Conifer	Deciduous
MX-AB-D-A-G	5,573	0.32	2.02	1,783	11,258
MX-AB-D-A-MF	14,343	0.18	1.33	2,582	19,076
FH-AB-D-A-G	1,709	0.22	2.39	376	4,084
FH-AB-D-A-MF	2,189	0.22	1.55	482	3,393
MX-CD-D-A-G	11,705	0.44	2.83	5,150	33,124
MX-CD-D-A-MF	28,998	0.31	2.24	8,989	64,956
FH-CD-D-A-G	9,117	0.24	3.93	2,188	35,828
FH-CD-D-A-MF	5,033	0.43	3.26	2,164	16,406
A-AB-DC-A-A	7,651	0.90	1.37	6,886	10,482
A-CD-DC-A-A	8,499	1.44	2.10	12,239	17,848
A-AB-CD-A-A	8,194	1.09	0.70	8,931	5,736
A-CD-CD-A-A	8,207	2.02	0.90	16,578	7,386
A-AB-C-SW-A	9,257	1.13	0.89	10,461	8,239
A-AB-C-PL-A	9,703	0.97	0.04	9,412	388
A-AB-C-SB-A	5,313	0.39	0.00	2,072	0
A-CD-C-SW-A	12,302	2.97	0.72	36,536	8,857
A-CD-C-PL-A	14,557	2.45	0.41	35,665	5,968
A-CD-C-SB-A	5,880	0.41	0.03	2,411	176
<b>Total</b>	<b>168,229</b>			<b>164,904</b>	<b>253,206</b>

**TABLE 4-6: LRSYA ESTIMATES: “FULLY STOCKED” REGENERATION TRANSITION – JOINT FMA**

Yield Curve	Net Area (ha)	MAI (m <sup>3</sup> /ha/yr) @ 80 Years		LRSYA (m <sup>3</sup> /yr)	
		Conifer	Deciduous	Conifer	Deciduous
MX-AB-D-A-G	5,573	0.44	2.83	2,452	15,773
MX-AB-D-A-MF	14,343	0.31	2.24	4,446	32,128
FH-AB-D-A-G	1,709	0.24	3.93	410	6,715
FH-AB-D-A-MF	2,189	0.43	3.26	941	7,137
MX-CD-D-A-G	11,705	0.44	2.83	5,150	33,124
MX-CD-D-A-MF	28,998	0.31	2.24	8,989	64,956
FH-CD-D-A-G	9,117	0.24	3.93	2,188	35,828
FH-CD-D-A-MF	5,033	0.43	3.26	2,164	16,406
A-AB-DC-A-A	7,651	1.44	2.10	11,017	16,067
A-CD-DC-A-A	8,499	1.44	2.10	12,239	17,848
A-AB-CD-A-A	8,194	2.02	0.90	16,552	7,375
A-CD-CD-A-A	8,207	2.02	0.90	16,578	7,386
A-AB-C-SW-A	9,257	2.97	0.72	27,495	6,665
A-AB-C-PL-A	9,703	2.45	0.41	23,772	3,978
A-AB-C-SB-A	5,313	0.41	0.03	2,179	159
A-CD-C-SW-A	12,302	2.97	0.72	36,536	8,857
A-CD-C-PL-A	14,557	2.45	0.41	35,665	5,968
A-CD-C-SB-A	5,880	0.41	0.03	2,411	176
<b>Total</b>	<b>168,229</b>			<b>211,183</b>	<b>286,546</b>

**TABLE 4-7: LRSYA ESTIMATES: "STATUS QUO" REGENERATION TRANSITION – KIMIWAN OPERATING AREA**

Yield Curve	Net Area (ha)	MAI (m <sup>3</sup> /ha/yr) @ 80 Years		LRSYA (m <sup>3</sup> /yr)	
		Conifer	Deciduous	Conifer	Deciduous
MX-AB-D-A-G	1,467	0.32	2.02	470	2,964
MX-AB-D-A-MF	8,163	0.18	1.33	1,469	10,857
FH-AB-D-A-G	0	0.22	2.39	0	0
FH-AB-D-A-MF	0	0.22	1.55	0	0
MX-CD-D-A-G	2,940	0.44	2.83	1,294	8,320
MX-CD-D-A-MF	18,571	0.31	2.24	5,757	41,598
FH-CD-D-A-G	0	0.24	3.93	0	0
FH-CD-D-A-MF	0	0.43	3.26	0	0
A-AB-DC-A-A	4,136	0.90	1.37	3,722	5,666
A-CD-DC-A-A	3,363	1.44	2.10	4,843	7,063
A-AB-CD-A-A	4,172	1.09	0.70	4,547	2,920
A-CD-CD-A-A	2,937	2.02	0.90	5,933	2,643
A-AB-C-SW-A	5,073	1.13	0.89	5,732	4,515
A-AB-C-PL-A	516	0.97	0.04	500	21
A-AB-C-SB-A	2,215	0.39	0.00	864	0
A-CD-C-SW-A	8,571	2.97	0.72	25,457	6,171
A-CD-C-PL-A	316	2.45	0.41	774	130
A-CD-C-SB-A	784	0.41	0.03	321	24
<b>Total</b>	<b>63,224</b>			<b>61,685</b>	<b>92,893</b>

**TABLE 4-8: LRSYA ESTIMATES: "FULLY STOCKED" REGENERATION TRANSITION – KIMIWAN OPERATING AREA**

Yield Curve	Net Area (ha)	MAI (m <sup>3</sup> /ha/yr) @ 80 Years		LRSYA (m <sup>3</sup> /yr)	
		Conifer	Deciduous	Conifer	Deciduous
MX-AB-D-A-G	1,467	0.44	2.83	646	4,153
MX-AB-D-A-MF	8,163	0.31	2.24	2,531	18,286
FH-AB-D-A-G	0	0.24	3.93	0	0
FH-AB-D-A-MF	0	0.43	3.26	0	0
MX-CD-D-A-G	2,940	0.44	2.83	1,294	8,320
MX-CD-D-A-MF	18,571	0.31	2.24	5,757	41,598
FH-CD-D-A-G	0	0.24	3.93	0	0
FH-CD-D-A-MF	0	0.43	3.26	0	0
A-AB-DC-A-A	4,136	1.44	2.10	5,956	8,686
A-CD-DC-A-A	3,363	1.44	2.10	4,843	7,063
A-AB-CD-A-A	4,172	2.02	0.90	8,427	3,755
A-CD-CD-A-A	2,937	2.02	0.90	5,933	2,643
A-AB-C-SW-A	5,073	2.97	0.72	15,067	3,652
A-AB-C-PL-A	516	2.45	0.41	1,264	211
A-AB-C-SB-A	2,215	0.41	0.03	908	66
A-CD-C-SW-A	8,571	2.97	0.72	25,457	6,171
A-CD-C-PL-A	316	2.45	0.41	774	130
A-CD-C-SB-A	784	0.41	0.03	321	24
<b>Total</b>	<b>63,224</b>			<b>79,177</b>	<b>104,759</b>

**TABLE 4-9: LRSYA ESTIMATES: “STATUS QUO” REGENERATION TRANSITION – SWEATHOUSE OPERATING AREA**

Yield Curve	Net Area (ha)	MAI (m <sup>3</sup> /ha/yr) @ 100 Years		LRSYA (m <sup>3</sup> /yr)	
		Conifer	Deciduous	Conifer	Deciduous
MX-AB-D-A-G	4,106	0.32	2.02	1,330	8,294
MX-AB-D-A-MF	6,179	0.18	1.33	1,141	8,218
FH-AB-D-A-G	1,709	0.22	2.39	377	4,084
FH-AB-D-A-MF	2,189	0.22	1.55	480	3,393
MX-CD-D-A-G	8,765	0.44	2.83	3,813	24,804
MX-CD-D-A-MF	10,428	0.31	2.24	3,250	23,358
FH-CD-D-A-G	9,117	0.24	3.93	2,155	35,828
FH-CD-D-A-MF	5,033	0.43	3.26	2,158	16,406
A-AB-DC-A-A	3,515	0.90	1.37	3,151	4,815
A-CD-DC-A-A	5,136	1.44	2.10	7,416	10,785
A-AB-CD-A-A	4,022	1.09	0.70	4,389	2,816
A-CD-CD-A-A	5,270	2.02	0.90	10,638	4,743
A-AB-C-SW-A	4,185	1.13	0.89	4,726	3,724
A-AB-C-PL-A	9,187	0.97	0.04	8,922	367
A-AB-C-SB-A	3,099	0.39	0.00	1,198	0
A-CD-C-SW-A	3,730	2.97	0.72	11,091	2,686
A-CD-C-PL-A	14,241	2.45	0.41	34,914	5,839
A-CD-C-SB-A	5,097	0.41	0.03	2,072	153
<b>Total</b>	<b>105,005</b>			<b>103,219</b>	<b>160,313</b>

**TABLE 4-10: LRSYA ESTIMATES: “FULLY STOCKED” REGENERATION TRANSITION – SWEATHOUSE OPERATING AREA**

Yield Curve	Net Area (ha)	MAI (m <sup>3</sup> /ha/yr) @ 100 Years		LRSYA (m <sup>3</sup> /yr)	
		Conifer	Deciduous	Conifer	Deciduous
MX-AB-D-A-G	4,106	0.44	2.83	1,807	11,620
MX-AB-D-A-MF	6,179	0.31	2.24	1,916	13,841
FH-AB-D-A-G	1,709	0.24	3.93	410	6,715
FH-AB-D-A-MF	2,189	0.43	3.26	941	7,137
MX-CD-D-A-G	8,765	0.44	2.83	3,856	24,804
MX-CD-D-A-MF	10,428	0.31	2.24	3,233	23,358
FH-CD-D-A-G	9,117	0.24	3.93	2,188	35,828
FH-CD-D-A-MF	5,033	0.43	3.26	2,164	16,406
A-AB-DC-A-A	3,515	1.44	2.10	5,061	7,381
A-CD-DC-A-A	5,136	1.44	2.10	7,395	10,785
A-AB-CD-A-A	4,022	2.02	0.90	8,125	3,620
A-CD-CD-A-A	5,270	2.02	0.90	10,645	4,743
A-AB-C-SW-A	4,185	2.97	0.72	12,428	3,013
A-AB-C-PL-A	9,187	2.45	0.41	22,509	3,767
A-AB-C-SB-A	3,099	0.41	0.03	1,270	93
A-CD-C-SW-A	3,730	2.97	0.72	11,079	2,686
A-CD-C-PL-A	14,241	2.45	0.41	34,890	5,839
A-CD-C-SB-A	5,097	0.41	0.03	2,090	153
<b>Total</b>	<b>105,005</b>			<b>132,007</b>	<b>181,788</b>

#### 4.4.1.2 HARVEST SIMULATION

SILVASYM is Silvacom’s proprietary timber supply simulation model. The model simulates the effect of management strategies on sustainable harvest levels over a specified planning horizon. In its most basic form, SILVASYM is a model that cuts and grows each stand in the forest according to user-defined yield functions and forest policy constraints. SILVASYM maintains a full spatial link to the net landbase GIS coverage and attribute file over the entire planning horizon. Compartment sequencing can also be introduced to reflect “real-world” limitations, such as accessibility and multi-pass harvesting rules. Adjacency constraints can be applied on a stand-by-stand basis to control the distribution (or concentration) of the harvest and mimic operational planning strategies.

A number of sorting rules are available that define the harvest priorities assigned to each stand. The simulation model uses binary search methods to assess harvest levels. Average harvest age and post-harvest forest conditions are evaluated at the end of each simulation to determine whether the even-flow harvest levels are too low or too high. Reports and GIS map products can be produced for each scenario to evaluate the condition of the forest throughout, and also at the end of the planning horizon. Table 4-11 provides a definition of the harvest simulation control parameters used in the analysis.

**TABLE 4-11: HARVEST SIMULATION CONTROL PARAMETER DEFINITIONS USED IN ANALYSIS**

PARAMETER	DEFINITION
FMA/FMU	Description of the administrative area under analysis
Planning horizon	Total time period for the analysis scenario (years)
Targeted average harvest age at the end of the planning horizon	Average age (years) of stands scheduled for harvest in the last twenty years of the planning horizon, typically with a specified tolerance
Minimum harvest age	Minimum age of stands that are eligible for harvest scheduling; may vary by yield stratum (years)
Landbase	Landbase available for analysis (e.g., discrete, single)
Sorting rules	Factors used to prioritize stands for harvest sequencing
Harvest flow constraint	Scheduled harvest level of the primary species between harvest periods (may have tolerances applied)
Yield curve sets	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
Introduce harvest plans	Incorporation of existing harvest plans into the harvest sequence
Spatial stand adjacency	The process of protecting other resource values by spatially identifying and scheduling inventory polygons (stands) that share a boundary, or are within a specified distance to that polygon
Adjacency: Time horizon	Total time period that stand adjacency is incorporated into the analysis (years)
Adjacency: Green-up	The time period applied restricting the harvest of adjacent polygons (years)
Adjacency: Accumulate adjacent stands	Maximum total area of adjacent stands scheduled for harvest in the same harvest period
Modulation	Reduces the annual variability in the harvest of the secondary species by distributing the "peaks" in secondary harvest flow to periods with little or no secondary harvest
Compartment sequencing	Prioritization of administrative planning units for harvest scheduling
Number of compartments open simultaneously	Number of compartments available for harvest scheduling at any given time

## 4.4.2 TIMBER SUPPLY ASSUMPTIONS

The following assumptions were used to formulate the preferred management strategy.

### 4.4.2.1 LANDBASE AGGREGATIONS

The Joint FMA area is organized into two operating areas: Kimiwan and Sweathouse. The two operating areas have been aggregated into one unit to determine the timber supply for the primary species (deciduous).

### 4.4.2.2 PLANNING HORIZON

The planning horizon used for the Joint FMA area is 160 years.

### 4.4.2.3 YIELD CURVE TRANSITIONS (REGENERATION, MULTIPLE ENTRY)

Two yield strata transitions are typically applied to timber supply analysis:

- ◆ The status quo transition assumes all stands regenerate to the same yield strata;
- ◆ The fully stocked transition assumes all stands regenerate to the fully stocked density of the existing yield strata.

### 4.4.2.4 INCORPORATION OF HARVEST PLANS

Existing planned blocks from Annual Operating Plans (AOPs) were introduced into the timber supply analysis to:

- ◆ Maintain consistency between the harvest simulation and currently planned operations;
- ◆ Bridge the transition from current operational practices to future management strategies that use the spatial harvest sequence.

**TABLE 4-12: PLANNED BLOCK SUMMARY TABLE**

Operating Area	Conifer Blocks		Deciduous Blocks	
	Area (ha)	Count	Area (ha)	Count
Kimiwan	1,129	45	1,994	52
Sweathouse	753	56	1,529	61
<b>Total</b>	<b>1,883</b>	<b>101</b>	<b>3,523</b>	<b>113</b>

### 4.4.2.5 ADJACENCY / GREEN-UP / ACCUMULATE ADJACENT STANDS

Adjacency is the process of spatially identifying and scheduling inventory polygons (stands) that share a boundary or are within a specified distance. Thus “real-world” decision rules can be introduced into the TSA. The following decision rules are typically analysed:

- ◆ Allowing the accumulation of adjacent stands into larger harvest units (cutblocks) to restrict the total area harvested in adjacent stands;
- ◆ Applying a delay factor (green-up) that restricts the harvest of adjacent polygons.
- ◆ Compartment Sequences

#### **4.4.2.6 PATCH SIZE MITIGATION STRATEGY**

The PFMS includes a harvest patch size mitigation strategy for the first 20 years. This strategy was applied to planned blocks/existing blocks. The result of incorporating this strategy is:

- ◆ The reduction of large contiguous harvest patches created, while maintaining a wide range of block sizes across the landscape;
- ◆ The distribution of sequenced stands in areas with a high concentration of older age class stands. For an example see township 80-17-5 on Map 4-4 versus Map 5-1.

#### **4.4.2.7 COMPARTMENT SEQUENCES**

Compartments have been defined for the Joint FMA area. However, since access is not a limiting factor compartment sequencing was not used in the timber supply analysis.

#### **4.4.2.8 MERCHANTABILITY / ECONOMIC LIMITATIONS**

The current utilization standard for the Joint FMA is 15/11 conifer and 15/10 deciduous utilization.

#### **4.4.3 HARVEST SCHEDULING RESULTS**

Throughout the DFMP process many forest management strategies are produced and assessed to aid in the development of the preferred forest management strategy. In this section a summary of the required timber supply analysis is presented in the following tables, which includes the harvest simulation control parameters, detailed profiles showing outputs from the timber supply model used to assess each management strategy, and 20 year harvest sequence maps (full size maps can be found in Appendix H, Map H-6 to H-9). The required runs include:

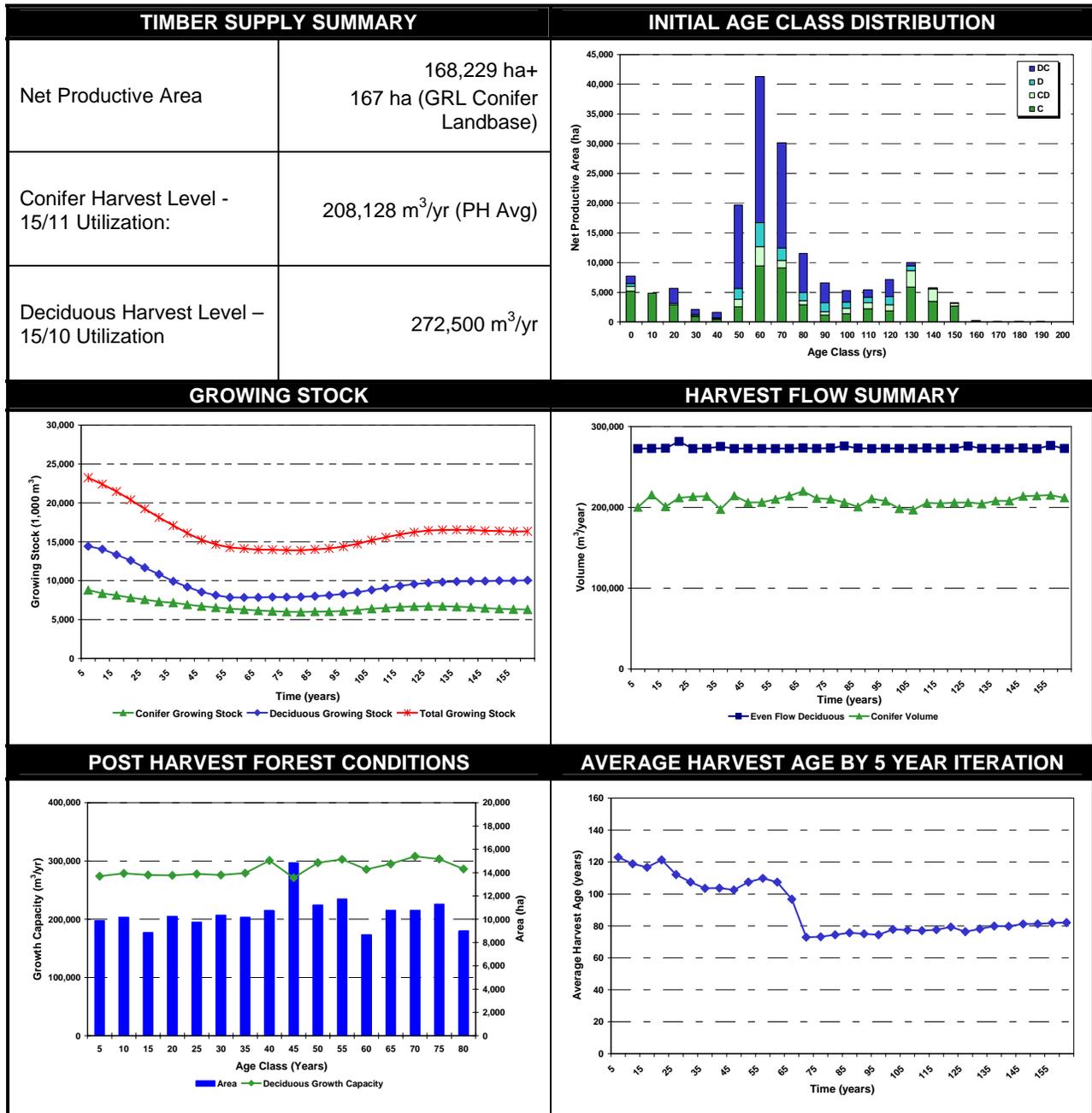
- ◆ Single pass even flow over two rotations, with “fully stocked” regeneration strategy – (FMS no. 57);
- ◆ Two pass, even flow, over two rotations (fully stocked regeneration strategy) – (FMS no. 55);
- ◆ Two pass, even flow, for one rotation, step-up / down to LRSYA (fully stocked regeneration strategy) – (FMS no. 58);
- ◆ Single pass, even flow over two rotations with harvest constraints (fully stocked regeneration strategy) (PFMS – No carry over volume) – (FMS no. 90).

**4.4.3.1 SINGLE PASS EVEN FLOW OVER TWO ROTATIONS (FULLY STOCKED REGENERATION STRATEGY) – FMS NO. 57**

**TABLE 4-13: HARVEST SIMULATION CONTROL PARAMETERS – FMS NO. 57**

<b>BUCHANAN AND TOLKO JOINT FMA HARVEST SIMULATION CONTROL PARAMETERS – FMS: 57</b>	
<b>Control Parameter</b>	<b>Parameter Setting</b>
Harvest unit:	FMA
Planning horizon:	160 years
Targeted average harvest age at the end of the planning horizon:	80 ± 5
Minimum harvest age:	70 yrs (Conifer) 50 yrs (Deciduous)
Landbase:	Single
Sorting rules:	1) Modulate conifer flow 2) Maximize deciduous and conifer harvest
Modulation:	Applied
Harvest flow constraint:	Dual even flow
Yield curves:	Net yield curves
Cull Deductions:	Applied (2% Conifer, 10% Deciduous)
Regeneration transition:	Fully Stocked
Regeneration lag:	Non-Constraining
Introduce harvest plans:	Non-Constraining
Spatial stand adjacency:	Non-Constraining
Adjacency - Green-up:	Non-Constraining
Adjacency - Accumulate adjacent stands:	Non-Constraining
Age Normalization Factor:	Non-Constraining
Compartment sequencing:	Non-Constraining
Number of compartments open simultaneously:	Non-Constraining

**FIGURE 4-8: HARVEST SIMULATION RESULTS – FMS NO. 57**



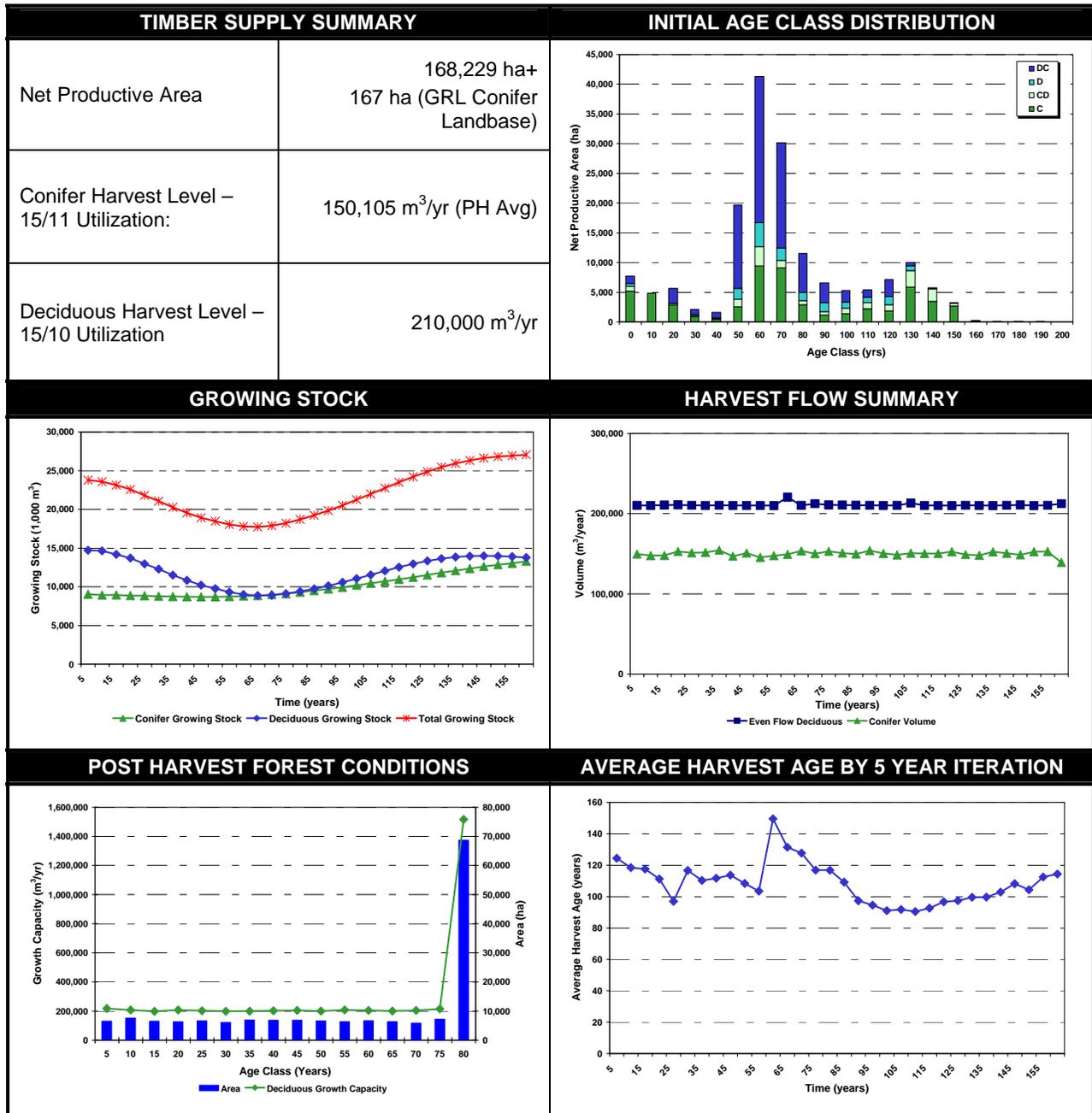
## **MAP 4-4: 20 YEAR HARVEST SEQUENCE – FMS NO. 57**

**4.4.3.2 TWO PASS EVEN FLOW OVER TWO ROTATIONS (FULLY STOCKED REGENERATION STRATEGY) – FMS NO. 55**

**TABLE 4-14: HARVEST SIMULATION CONTROL PARAMETERS – FMS NO. 55**

<b>BUCHANAN AND TOLKO JOINT FMA HARVEST SIMULATION CONTROL PARAMETERS – FMS: 55</b>	
<b>Control Parameter</b>	<b>Parameter Setting</b>
Harvest unit:	FMA
Planning horizon:	160 years
Targeted average harvest age at the end of the planning horizon:	80 ± 5
Minimum harvest age:	70 yrs (Conifer) 50 yrs (Deciduous)
Landbase:	Single
Sorting rules:	1) Modulate conifer flow 2) Maximize deciduous and conifer harvest
Modulation:	Applied
Harvest flow constraint:	Dual even flow
Yield curves:	Net yield curves
Cull Deductions:	Applied (2% Conifer, 10% Deciduous)
Regeneration transition:	Fully Stocked
Regeneration lag:	Non-Constraining
Introduce harvest plans:	Non-Constraining
Spatial stand adjacency:	Applied – 55 years
Adjacency - Green-up:	Applied – 20 years
Adjacency - Accumulate adjacent stands:	Applied – max 200 ha
Age Normalization Factor:	Non-Constraining
Compartment sequencing:	Non-Constraining
Number of compartments open simultaneously:	Non-Constraining

**FIGURE 4-9: HARVEST SIMULATION RESULTS – FMS NO. 55**



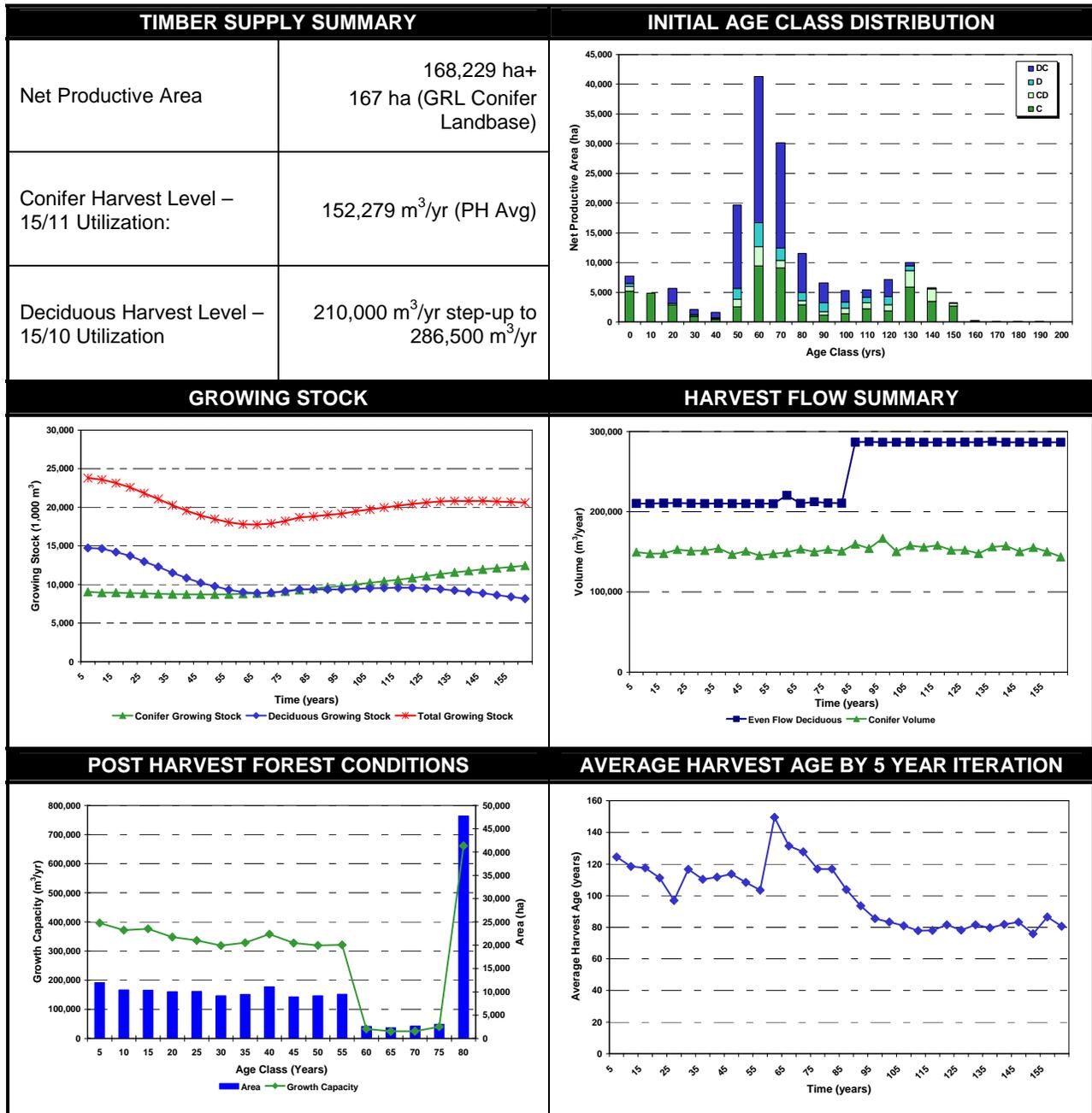
## **MAP 4-5: 20 YEAR HARVEST SEQUENCE – FMS NO. 55**

**4.4.3.3 TWO PASS EVEN FLOW FOR ONE ROTATION; STEP-UP / DOWN TO LRSYA (FULLY STOCKED REGENERATION STRATEGY) – FMS NO. 58**

**TABLE 4-15: HARVEST SIMULATION CONTROL PARAMETERS – FMS NO. 58**

<b>BUCHANAN AND TOLKO JOINT FMA HARVEST SIMULATION CONTROL PARAMETERS – FMS: 58</b>	
<b>Control Parameter</b>	<b>Parameter Setting</b>
Harvest unit:	FMA
Planning horizon:	160 years
Targeted average harvest age at the end of the planning horizon:	80 ± 5
Minimum harvest age:	70 yrs (Conifer) 50 yrs (Deciduous)
Landbase:	Single
Sorting rules:	1) Modulate conifer flow 2) Maximize deciduous and conifer harvest
Modulation:	Applied
Harvest flow constraint:	1) Dual even flow 2) Step up to LRSYA after 80 years
Yield curves:	<u>Net</u> yield curves
Cull Deductions:	Applied (2% Conifer, 10% Deciduous)
Regeneration transition:	Fully Stocked
Regeneration lag:	Non-Constraining
Introduce harvest plans:	Non-Constraining
Spatial stand adjacency:	Applied – 55 years
Adjacency - Green-up:	Applied – 20 years
Adjacency - Accumulate adjacent stands:	Applied – max 200 ha
Age Normalization Factor:	Non-Constraining
Compartment sequencing:	Non-Constraining
Number of compartments open simultaneously:	Non-Constraining

**FIGURE 4-10: HARVEST SIMULATION RESULTS – FMS NO. 58**



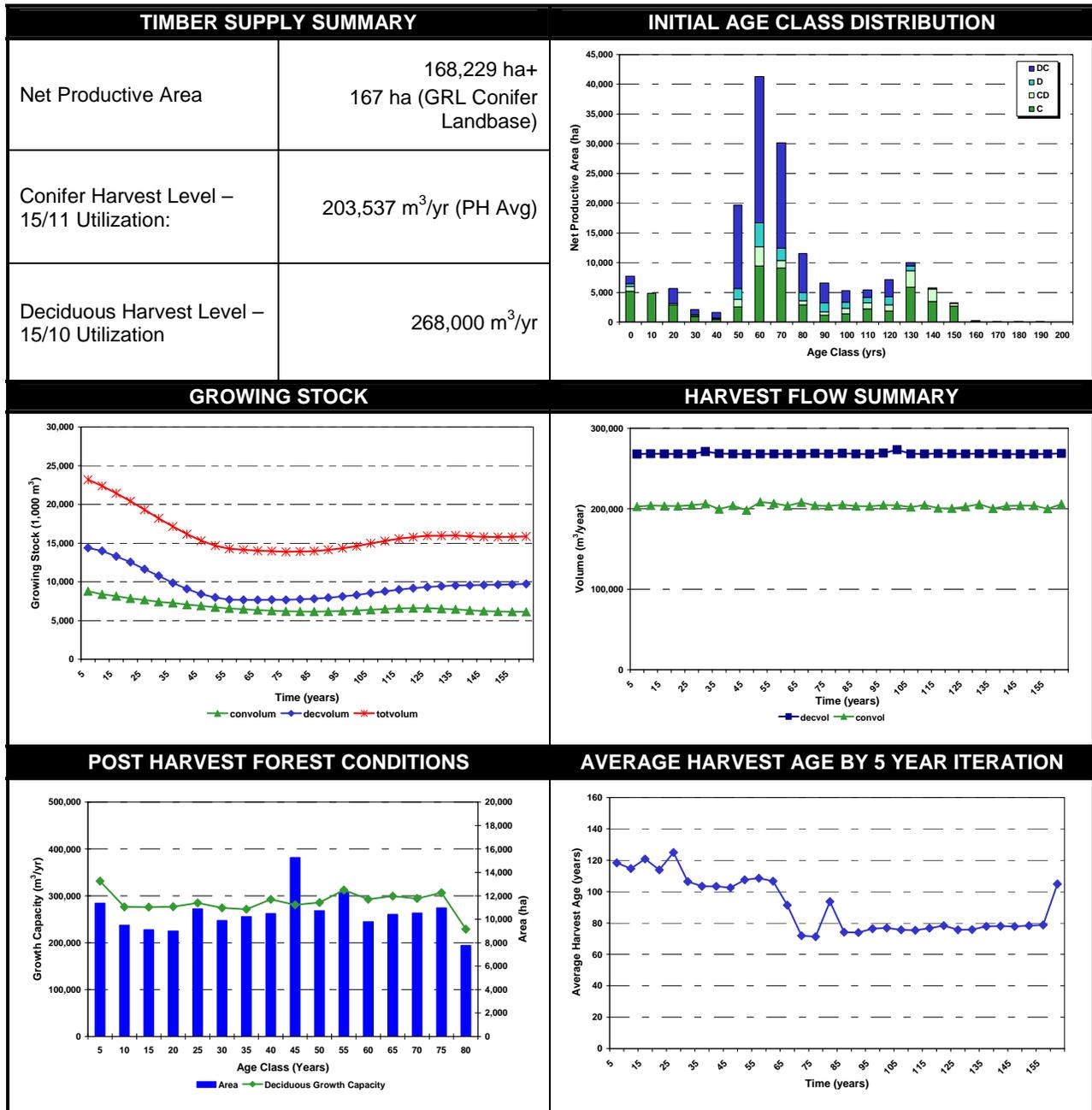
## **MAP 4-6: 20 YEAR HARVEST SEQUENCE – FMS NO. 58**

**4.4.3.4 SINGLE PASS EVEN FLOW OVER TWO ROTATIONS WITH HARVEST CONSTRAINTS (FULLY STOCKED REGENERATION STRATEGY) (PFMS – NO CARRY OVER VOLUME) – FMS NO. 90**

**TABLE 4-16: HARVEST SIMULATION CONTROL PARAMETERS – FMS NO. 90**

<b>BUCHANAN AND TOLKO JOINT FMA HARVEST SIMULATION CONTROL PARAMETERS – FMS: 90</b>	
<b>Control Parameter</b>	<b>Parameter Setting</b>
Harvest unit:	FMA
Planning horizon:	160 years
Targeted average harvest age at the end of the planning horizon:	80 ± 5
Minimum harvest age:	70 yrs (Conifer) 50 yrs (Deciduous)
Landbase:	Single
Sorting rules:	1) Modulate conifer flow 2) Maximize deciduous and conifer harvest
Modulation:	Applied
Harvest flow constraint:	Dual even flow
Yield curves:	<u>Net</u> yield curves
Cull Deductions:	Applied (2% Conifer, 10% Deciduous)
Regeneration transition:	Fully Stocked
Regeneration lag:	Non-Constraining
Introduce harvest plans:	Applied
Patch Size Mitigation Strategy:	Applied - 20 years
Adjacency - Green-up:	Non-Constraining
Adjacency - Accumulate adjacent stands:	Non-Constraining
Age Normalization Factor:	Non-Constraining
Compartment sequencing:	Non-Constraining
Number of compartments open simultaneously:	Non-Constraining

**FIGURE 4-11: HARVEST SIMULATION RESULTS – FMS NO. 90**



## **MAP 4-7: 20 YEAR HARVEST SEQUENCE – FMS NO. 90**



5.0

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**Preferred Forest  
Management  
Strategy**

DFMP

## 5.0 PREFERRED FOREST MANAGEMENT STRATEGY

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During the development of the Detailed Forest Management Plan over the past two and half years Buchanan and Tolko have completed approximately 100 different timber supply model runs utilizing an iterative process to determine the preferred forest management strategy that achieves a balance between environmental, social and economic values. The different model runs were used to evaluate the following topics: Government required baseline runs, single timber supply unit verses multiple timber supply units, status quo regeneration transition verses transition to full stocking, single landbase verses discrete landbase, patch size mitigation, and seral stage age class distribution. The companies have selected forest management strategy number 92 as the preferred forest management strategy (PFMS). The following discussion provides a summary of how the goals, objectives and strategies outlined in Section 3 of the Detailed Forest Management Plan are achieved by the selected preferred forest management strategy.

### 5.1 TIMBER MANAGEMENT OBJECTIVES

This preferred forest management strategy achieves the allocation requirements by incorporating:

- ◆ A sustainable even flow deciduous harvest level for the Joint FMA;
- ◆ A sustainable even flow conifer harvest level for the Joint FMA;
- ◆ Utilization of the deciduous carry over for the first twenty years of the planning horizon.

At the beginning of the Detailed Forest Management Planning process a determination of the landbase available for timber operations was completed. This process started with the gross landbase and through a systematic process excluded from the gross area the following areas: water (lakes and rivers), landuse dispositions (GRL and DRS), watercourse buffers, waterbody buffers, non forested areas, non merchantable areas and potentially productive areas to determine the net landbase. The result for the Joint Forest Management Agreement Area is that approximately 68% percent of the landbase is available for forestry operations. This represents the productive operational forest landbase that forest management activities like harvesting and silviculture can occur.

The preferred forest management strategy (PFMS) selected by Buchanan and Tolko provides for the achievement of the goals and objectives outlined in section 3 and is summarized as follows.

- ◆ The preferred forest management strategy provides a sustainable deciduous annual allowable cut for Tolko Industries Ltd. from the Joint Forest Management Area (*refer to Figure 5-1*);
- ◆ The preferred forest management strategy allows for the utilization of the undercut volume over a twenty year period. Tolko Industries Ltd. as part of their agreement with the Province of Alberta has been receiving a large component of 'incidental' (deciduous timber production from coniferous harvest areas) wood deliveries since production started at the High Prairie facility. As a result the Company has been placed in an undercut situation on the Joint Forest Management Area (previously DTAS010007). Tolko, with the co-operation of the Alberta Government has proposed that the undercut volume be harvested over a twenty year period. The undercut volume of approximately 243 612 m<sup>3</sup> has been incorporated into the preferred forest management strategy at a level of approximately 12 000 m<sup>3</sup> per year for the first twenty years of the planning horizon (*refer to Figure 5-1*);

- ◆ The preferred forest management strategy provides a sustainable coniferous annual allowable cut for Buchanan Lumber from the Joint Forest Management Area (*refer to Figure 5-1*);
- ◆ The preferred forest management strategy provides a sustainable coniferous annual allowable cut for the Community Timber Program in the Kimiwan operating area (*refer to Figure 5-1*);
- ◆ The single pass harvest system reduces fragmentation and amount of edge as compared to two pass harvest system (*refer to Table 5-5, Strategy 1.3.3*);
- ◆ Fragmentation is reduced by providing for a range of block sizes between 1 and 1500 hectares. (*refer to Figure 5-2, Objective 1.3, Strategy 1.1.4*);
- ◆ A patch size mitigation strategy has been applied for a twenty year period on existing and planned harvest areas to reduce the number of patches greater than 400 hectares in size. The twenty year spatial harvest sequence with patch size mitigation applied resulted in a more desirable range of harvest area sizes and mitigated potential impacts to a number of individual traplines and watersheds;
- ◆ The preferred forest management strategy allows for the maintenance of high quality late seral stage Deciduous, Mixedwood, Conifer - White Spruce Leading, Conifer - Pine Leading and Conifer - Black Spruce Leading strata over the 160 year planning horizon (*refer to Strategy 1.1.5, Appendix B*);
- ◆ The preferred forest management strategy provides for stand structure retention over the short and long term. Methods for stand structure retention include single tree retention, small clump retention and green island retention (*refer to Strategy 1.4.1*);
- ◆ The preferred forest management strategy provides a more balanced range of patch sizes than the traditional two pass harvest system (*refer to Figure 5-2, Objective 1.5*);
- ◆ The forest on the timber supply area currently is dominated by the immature age class due to fire history dating back to the 1940's. Approximately forty eight percent of the E class fires occurred in the decade 1941 to 1950. The preferred forest management strategy strives to create a more even distribution of seral stages on the landbase (*refer to Section 6.2, Strategy 1.5.5*);
- ◆ The preferred forest management strategy and the traditional two pass harvest system both provide for maintenance of a range of seral stages (*refer to Section 6.2, Strategy 1.5.5*);
- ◆ Through reforestation and silvicultural treatments, harvest areas will transition to fully stocked (*refer to Table 3-2, Strategy 1.11.3*);
- ◆ Deciduous 'A' density wet areas have been limited through the net landbase determination. There is a small amount of 'A' density wet stands which will be transitioned to fully stocked. A summary of the low density deciduous harvest areas on wet sites indicated a small amount of area is located in the net landbase and only a portion of that is scheduled for harvest in the twenty year spatial harvest sequence (*refer to Strategy 1.11.3*);

**TABLE 5-1: SUMMARY OF LOW DENSITY DECIDUOUS AREAS LOCATED ON WET SITES IN THE NET LANDBASE: JOINT FMA**

Net Landbase Summary		
Density	Site	Area (ha)
A	Wet	832
B	Wet	192
<b>Total</b>		<b>1,024</b>

**TABLE 5-2: SUMMARY OF LOW DENSITY DECIDUOUS AREAS LOCATED ON WET SITES SCHEDULED FOR HARVEST IN THE TWENTY YEAR SPATIAL HARVEST SEQUENCE: JOINT FMA**

20 Year Harvest Period		
Density	Site	Area (ha)
A	Wet	63
B	Wet	3
<b>Total</b>		<b>66</b>

- ◆ A schedule for forest inventory update has been included in the plan (*refer to Objective 1.2, Strategy 1.2.1, Strategy 1.2.2, Table 3-1*);
- ◆ Annual updates of the harvested areas will allow for tracking of harvest areas and within block roads (*refer to Strategy 1.2.3*);
- ◆ Regularly account for landuse withdrawals from the landbase via the Timber Damages Assessment process and verify the location of these activities during the inventory updates (*refer to Strategy 6.2.2*);
- ◆ By utilizing a single pass harvesting system verses the traditional two pass harvest system, the number of entries and amount of roading will be minimized to protect the productive capacity of the forest and forest soils (*refer to Objective 1.13, Objective 1.14*);
- ◆ Identification of the Forest Management Area as a single landbase will facilitate the integration planning processes and the co-operation between conifer and deciduous operations (*refer to Objective 5.6, Strategy 5.2.3*);
- ◆ It is assumed that biodiversity is being maintained on the landbase through the maintenance of a range of patch sizes, a range of seral stages and the regeneration of native tree species (*refer to Strategy 1.10.6*);

## 5.2 WATER MANAGEMENT OBJECTIVES

The management of water is the mandate of the Provincial and Federal Governments. The involvement of forest companies is to: provide protection to the structure and function of the interface between the watercourse or water body and the upland area, minimize the potential impacts to the watercourse or water body, and mitigation of the detrimental effects of forestry practices on water features.

- ◆ By utilizing a single pass harvesting system, versus the traditional two pass harvest system, the number of entries and amount of roading will be minimized resulting in a reduction of the number of crossings (*refer to Objective 2.2*);
- ◆ Buffers have been applied to identified watercourses and waterbodies on the gross landbase and the area was removed from the net landbase (*refer to Strategy 2.1.4*);
- ◆ The plan provides for protection of unidentified watercourses or water source areas (*refer to Strategy 2.1.4*);
- ◆ Watersheds or portions of have been identified on the Forest Management Area (*refer to Strategy 2.1.2*);
- ◆ Summarize the potential impact of harvest activities on watersheds or portions of watersheds over time (*refer to Figure 6-25 to Figure 6-31, Appendix G*).

### 5.3 WILDLIFE HABITAT MANAGEMENT OBJECTIVES

The management of wildlife populations is the mandate of the Alberta Government. The involvement of forest companies is limited to minimization of potential impacts and mitigation of the detrimental effects of forestry practices on the wildlife habitat. A number of coarse filter and fine filter approaches to wildlife habitat management will be employed to maintain features of wildlife habitat.

- ◆ The preferred forest management strategy provides for stand structure retention over the short and long term. Methods for stand structure retention include single tree retention, small clump retention and green island retention (*refer to Strategy 2.3.4*);
- ◆ The preferred forest management strategy provides for maintenance of coarse woody debris (*refer to Strategy 2.3.5, Strategy 2.3.6*);
- ◆ The single pass harvest system maintains ungulate habitat on a landscape basis (*refer to Strategy 2.3.1*);
- ◆ The preferred forest management strategy has been reviewed to forecast the habitat availability throughout the life of the plan for the following species Moose (*Alces alces andersoni*), American Marten (*Martes americana actuosa*), Northern Goshawk (*Accipiter gentilis atricapillus*), Pileated Woodpecker (*Dryocopus pileatus abieticola*), and Grizzly Bear (*Ursus arctos*) (*refer to Section 6.6*);
- ◆ By utilizing a single pass harvesting system, versus the traditional two pass harvest system, the number of entries and amount of roading will be minimized resulting in reduction in disturbance to wildlife (*refer to Strategy 2.4.7, Strategy 2.12.4, Strategy 2.12.5*);
- ◆ Road inventory and corridor identification provides opportunity for implementation of access controls (*refer to Strategy 2.4.7*);
- ◆ The preferred forest management strategy provides for identification and protection of sensitive sites (*refer to Objective 2.6, Strategy 2.4.4*);
- ◆ The single pass harvest system with no block size restriction, versus the traditional two pass harvest system, results in a range of patch sizes with harvesting as well as a range of patch sizes with no disturbance (*refer to Strategy 2.4.1*);

- ◆ It is assumed that biodiversity is being maintained on the landbase through the maintenance of a range of patch sizes, a range of seral stages and the regeneration of native tree species (*refer to Strategy 2.3.8*);
- ◆ The single pass harvest system provides for the maintenance of cover types (*refer to Figure 6-2, Figure 6-3*).
- ◆ The preferred forest management strategy allows for the maintenance of high quality late seral stage Deciduous, Mixedwood, Conifer - White Spruce Leading, Conifer - Pine Leading and Conifer - Black Spruce Leading strata over the 160 year planning horizon (*Objective 2.4.3, Objective 2.3.8, Appendix B*).

## 5.4 FISH HABITAT MANAGEMENT OBJECTIVES

The management of fish populations and fish habitat is the mandate of the Federal and Provincial Governments. The involvement of forest companies is limited to the minimization of potential impacts and the mitigation of the detrimental effects of forestry operations on fish habitat.

- ◆ Utilizing a single pass harvesting system, versus the traditional two pass harvest system, minimizes the number of entries and amount of roading resulting in a reduction of the number of crossings and potential for siltation (*refer to Objective 2.2*);
- ◆ Buffers have been applied to identified watercourses and waterbodies on the gross landbase and the area was removed from the net landbase (*refer to Strategy 2.1.4*);
- ◆ The plan provides for protection of unidentified watercourses or water source areas (*Strategy 2.1.4*).

## 5.5 NATURAL DISTURBANCE OBJECTIVES

The preferred forest management strategy, utilizing a single pass harvest system by prioritizing more mature stands, reduces the susceptibility of the future forest to catastrophic events such as fire, insect or disease outbreaks. The traditional two pass harvest system does not address the probability of fuel loading within stand types.

- ◆ By prioritizing more mature stands in the twenty year spatial harvest sequence, the stands susceptible to insect and disease attack or with high fuel loading are removed early in the harvest sequence thereby reducing the risk of loss (*refer to Strategy 2.9.1*);
- ◆ The Companies have committed to work with Alberta Sustainable Resource Development to develop a forest/urban interface fire protection plan (*refer to Strategy 2.9.2*);
- ◆ The preferred forest management strategy provides a range of harvest opening sizes between 1 and 1500 hectares. This range of sizes allows for entire polygons to be removed and limit the susceptibility of stands to natural disturbance.

## 5.6 ACCESS NETWORK OBJECTIVES

In comparison to the traditional two pass harvest system, the single pass harvest system concentrates the harvest in fewer compartments, results in a reduction of long term roading, reduces the number of entries and overall creates a more efficient harvesting operation. The development of permanent roads in the Forest Management Agreement Area has the potential to remove productive land from

the net landbase, create linear disturbances that fragment the forest and increase the activity of other forest users. This increased activity may have effects on wildlife species movement, habitat selection and habitat use. By identifying a road corridor plan the Companies are promoting integrated use of roadways by other industrial forest users.

- ◆ Utilizing a single pass harvesting system, the number of entries and amount of roading will be minimized (*refer to Strategy 2.12.2*);
- ◆ Road inventory and corridor identification provides opportunity for implementation of access controls (*refer to Strategy 2.12.6*);
- ◆ Identification of the FMA as a single landbase will facilitate the integration planning processes and the cooperation between conifer and deciduous operations (*refer to Strategy 2.12.2*);
- ◆ Integrated use by other industrial users is promoted (*refer to Strategy 2.12.8, Strategy 6.2.1*).

## 5.7 SOCIAL AND PUBLIC INVOLVEMENT OBJECTIVES

Tolko and Buchanan Lumber recognise that there are social values associated with the Forest Management Area. The public of Alberta are considered the owner of the crown forested land and as a result their issues must be addressed in Forest Management Activities and the planning process.

- ◆ The Detailed Forest Management Plan has provided for the identification of historical resources (*refer to Objective 3.1, Objective 3.4*);
- ◆ An ongoing opportunity for public awareness, education and input via the Forest Resources Advisory Committee, Open Houses and ongoing stakeholder communication has been outlined in the DFMP (*refer to Objective 4.2, Strategy 3.2.1, Strategy 3.5.3*);
- ◆ Within the Detailed Forest Management Plan an analysis of impacts of harvest patterns on other values has been conducted (*refer to Strategy 2.1.3, Strategy 6.1.3*);

## 5.8 ECONOMIC OBJECTIVES

The forest companies operating in the Forest Management Agreement Area contribute a significant portion of the economic base for the communities in and around the Forest Management Agreement Area. These local communities have strong ties to the forest resource and the economics generated from the forest landbase. Economic stability of these communities is important to Buchanan Lumber Ltd. and Tolko Industries Ltd. and is considered in the Detailed Forest Management Plan process.

- ◆ The local communities realize economic benefits via the employment and business opportunities created through the utilization of the forest resources (*refer to Objective 3.3*).
- ◆ A single pass harvest system on a single landbase provides economic benefit to companies as compared to a traditional two pass harvest system, by consolidating harvest operations and realising significant cost efficiencies (*refer to Strategy 5.2.3, Strategy 5.6.3*);
- ◆ The preferred Forest Management Strategy allows for the sustainable harvest of timber over the long term which creates stable forest related businesses over the long term that contributes to the stability of communities (*refer to Strategy 5.1.1, Strategy 5.1.2*);

- ◆ Utilizing fibre from agricultural lands provides economic benefits to individuals of the local communities (*refer to Objective 5.4, Objective 5.5*).

## 5.9 OTHER RESOURCE USER OBJECTIVES

- The Detailed Forest Management Plan has been designed for other forest users and the companies to co-exist on the landbase. (*refer to Objective 6.1, Objective 6.3*)
- The Detailed Forest Management Plan promotes integration between the forest companies and other commercial users. (*refer to Objective 6.2*)

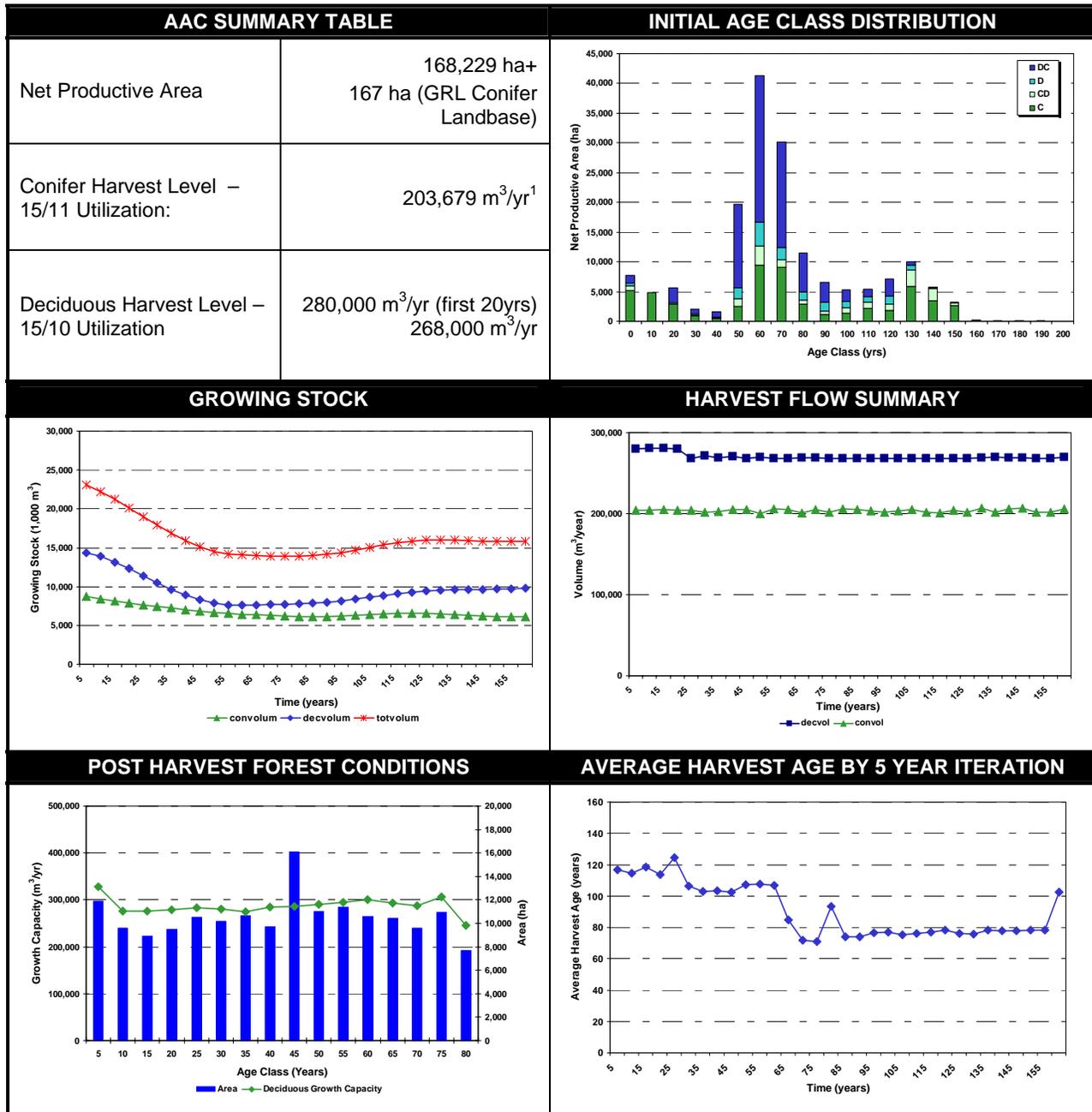
A summary of the PFMS timber supply analysis is provided in the following tables, which includes the harvest simulation control parameters, detailed profiles showing outputs from the timber supply model used to assess the PFMS and the 20 year harvest sequence map (full size maps can be found in Appendix H, Map H-10).

## 5.10 SINGLE PASS SINGLE LANDBASE EVEN FLOW WITH HARVEST CONSTRAINTS AND CARRY OVER (FULLY STOCKED REGENERATION STRATEGY) – FMS NO. 92

**TABLE 5-3: HARVEST SIMULATION CONTROL PARAMETERS – FMS NO. 92**

<b>BUCHANAN AND TOLKO JOINT FMA HARVEST SIMULATION CONTROL PARAMETERS – FMS: 92</b>	
<b>Control Parameter</b>	<b>Parameter Setting</b>
Harvest unit:	FMA
Planning horizon:	160 years
Targeted average harvest age at the end of the planning horizon:	80 ± 5
Minimum harvest age:	70 yrs (Conifer) 50 yrs (Deciduous)
Landbase:	Single
Sorting rules:	1) Modulate conifer flow 2) Maximize deciduous and conifer harvest
Modulation:	Applied
Harvest flow constraint:	Dual even flow
Yield curves:	<u>Net</u> yield curves
Cull Deductions:	Applied (2% Conifer, 10% Deciduous)
Regeneration transition:	Fully Stocked
Regeneration lag:	Non-Constraining
Introduce harvest plans:	Applied
Patch Size Mitigation Strategy	Applied - 20 years
Adjacency - Green-up:	Non-Constraining
Adjacency - Accumulate adjacent stands:	Non-Constraining
Age Normalization Factor:	Non-Constraining
Compartment sequencing:	Non-Constraining
Number of compartments open simultaneously:	Non-Constraining

**FIGURE 5-1: HARVEST SIMULATION RESULTS – FMS NO. 92**



<sup>1</sup> The represented AAC value is the planning horizon averages.

**TABLE 5-4: PFMS HARVEST FLOW SUMMARY TABLE**

Harvest Period	Deciduous Harvest Flow (m <sup>3</sup> /yr)	Conifer Harvest Flow (m <sup>3</sup> /yr)
5	280,000	203,679
10	280,000	203,679
15	280,000	203,679
20	280,000	203,679
25	268,000	203,679
30	268,000	203,679
35	268,000	203,679
40	268,000	203,679
45	268,000	203,679
50	268,000	203,679
55	268,000	203,679
60	268,000	203,679
65	268,000	203,679
70	268,000	203,679
75	268,000	203,679
80	268,000	203,679
85	268,000	203,679
90	268,000	203,679
95	268,000	203,679
100	268,000	203,679
105	268,000	203,679
110	268,000	203,679
115	268,000	203,679
120	268,000	203,679
125	268,000	203,679
130	268,000	203,679
135	268,000	203,679
140	268,000	203,679
145	268,000	203,679
150	268,000	203,679
155	268,000	203,679
160	268,000	203,679
<b>Planning Horizon Average</b>	<b>280,000/ 268,000</b>	<b>203,679</b>

## **MAP 5-1: 20 YEAR HARVEST SEQUENCE – FMS 92**

Figure 5-2 provides a comparison between harvest patches currently on the landscape versus harvest patches generated by the PFMS (FMS 92) and an alternative two pass harvest system (FMS 55). These patches were produced for the first 20 years of the harvest sequence (1-10 years and 11-20 years) to show the percent area harvested and the frequency of patches by patch class (0-25 ha, 25.1-50 ha, 50.1-100 ha, 100.1-200 ha, 200.1-400 ha and 400 ha+).

**FIGURE 5-2: PFMS VS. TWO PASS – HARVEST SEQUENCE PATCH SIZE ANALYSIS**

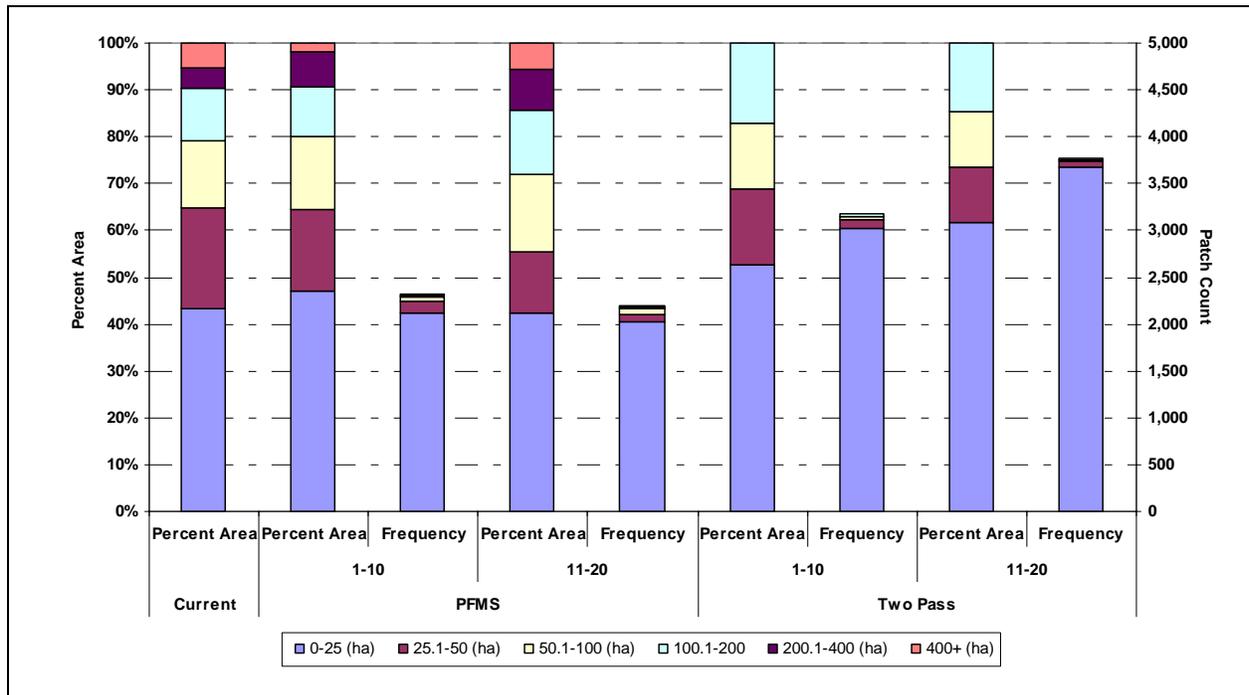


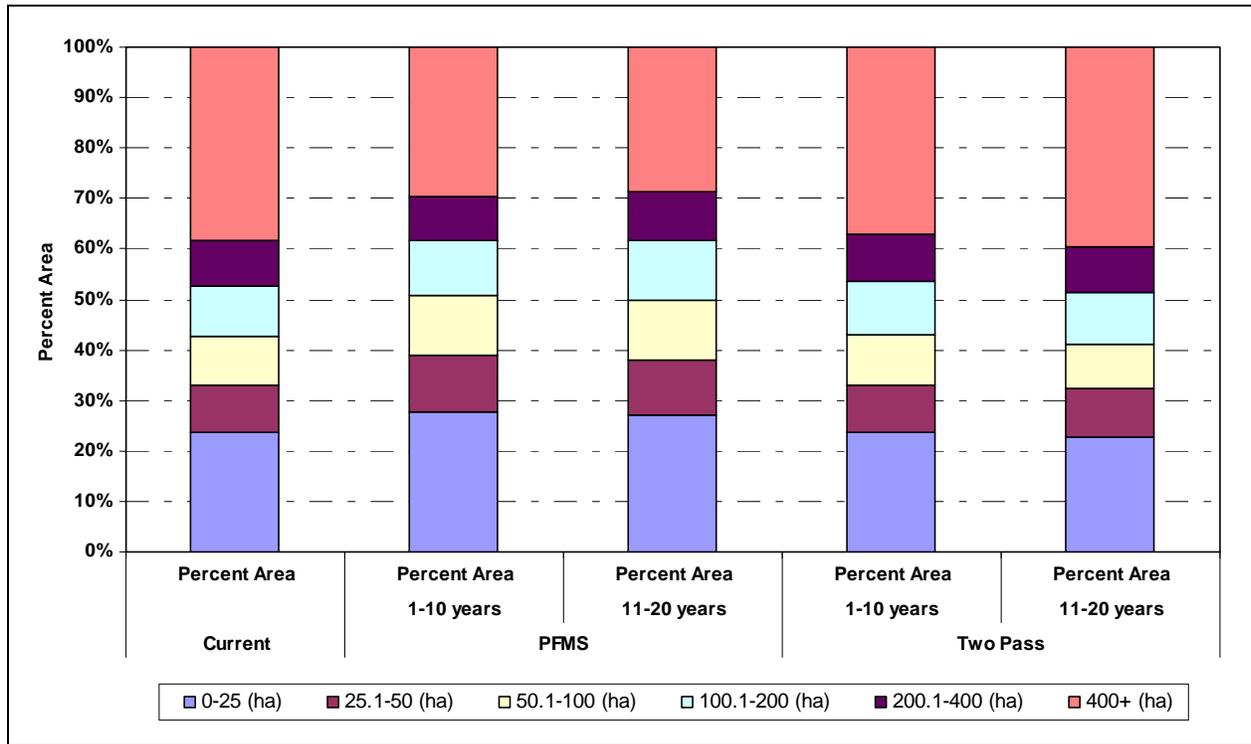
Table 5-5 provides a comparison between the amount of edge created in the PFMS (FMS 92) and an alternative two pass harvest system (FMS 55).

**TABLE 5-5: PFMS VS. TWO PASS - EDGE ANALYSIS**

Harvest Period (yrs)	PFMS			TWO PASS		
	Area Harvested (ha)	Edge (m)	Metres of Edge per Hectare Harvested (m/ha)	Area Harvested (ha)	Edge (m)	Metres of Edge per Hectare Harvested (m/ha)
1-10	22,884	4,383,659	192	19,018	4,088,430	215
11-20	23,202	4,592,756	198	15,789	3,909,625	248
<b>Total</b>	<b>46,087</b>	<b>8,976,415</b>	<b>195</b>	<b>34,807</b>	<b>7,998,055</b>	<b>230</b>

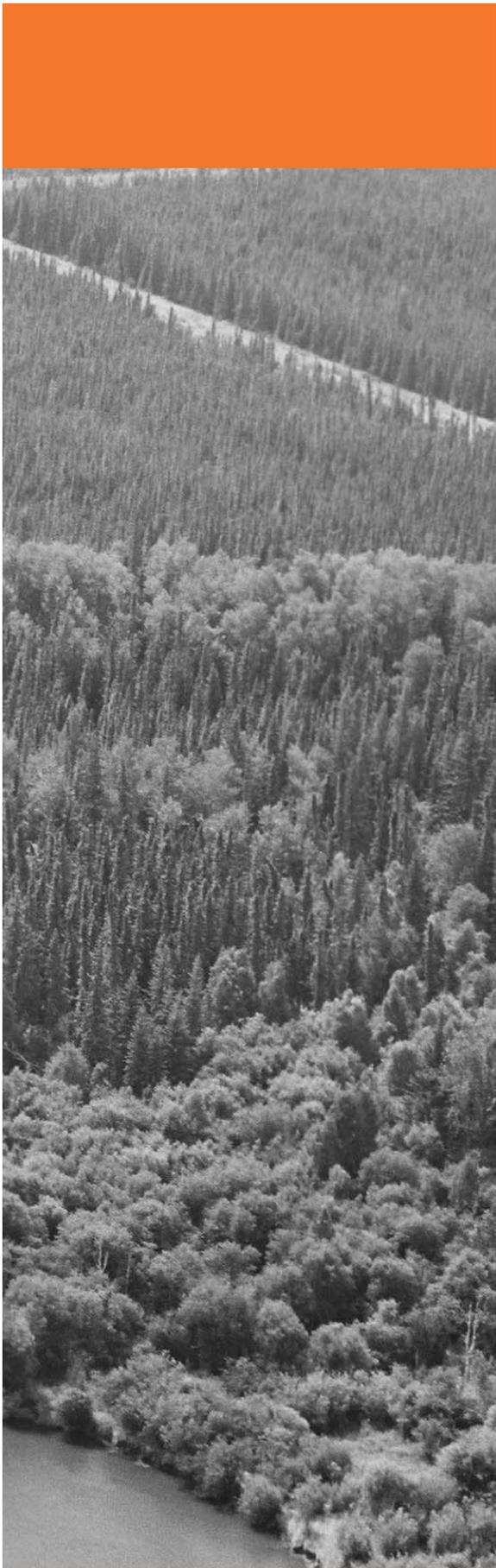
Figure 5-3 provides a comparison between the seral stage patches generated by the PFMS (FMS 92) and an alternative two pass harvest system (FMS 55) in relation to the patches currently found on the landscape. Patches are defined as contiguous areas of forest within the same seral stage class not split by delineated linear features.

**FIGURE 5-3: PFMS VS. TWO PASS - SERAL STAGE PATCH ANALYSIS**



### 5.10.1 GIS COVERAGE DATA AND HARVEST SEQUENCE AND NET LANDBASE DATABASE

The enclosed DVD contains the ArcInfo net landbase coverage and the associated harvest sequence and net landbase database. The link between the coverage and the net landbase is GIS\_LINK. The harvest sequence and net landbase database structure and description can be found in Appendix A.



6.0

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**PFMS Additional  
Analysis**

DFMP

## 6.0 PFMS ADDITIONAL ANALYSIS<sup>1</sup>

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Buchanan and Tolko's PFMS was selected on its ability to achieve specific goals and objectives. Several aspects of the goals and objectives required incorporation into the PFMS modelling and reporting. This section will highlight the following items:

- 6.1 Future Forest Condition (6-1)
- 6.2 Seral Stage Strategy Implementation and Analysis (6-20)
- 6.3 Harvest Area Patch Size Analysis (6-50)
- 6.4 Piece Size Analysis (6-51)
- 6.5 Trapline Analysis (6-52)
- 6.6 Wildlife Habitat Distribution Analysis (6-54)
- 6.7 Watershed Analysis (6-79)

### 6.1 FUTURE FOREST CONDITION

Future forest condition based on the PFMS is presented in Figure 6-1 through Figure 6-8. The harvest summary tables indicate a relatively even amount of volume being harvested over the entire 160 year planning horizon for both conifer and deciduous, with an average harvest age levelling out at approximately 80 years near the end of the planning horizon.

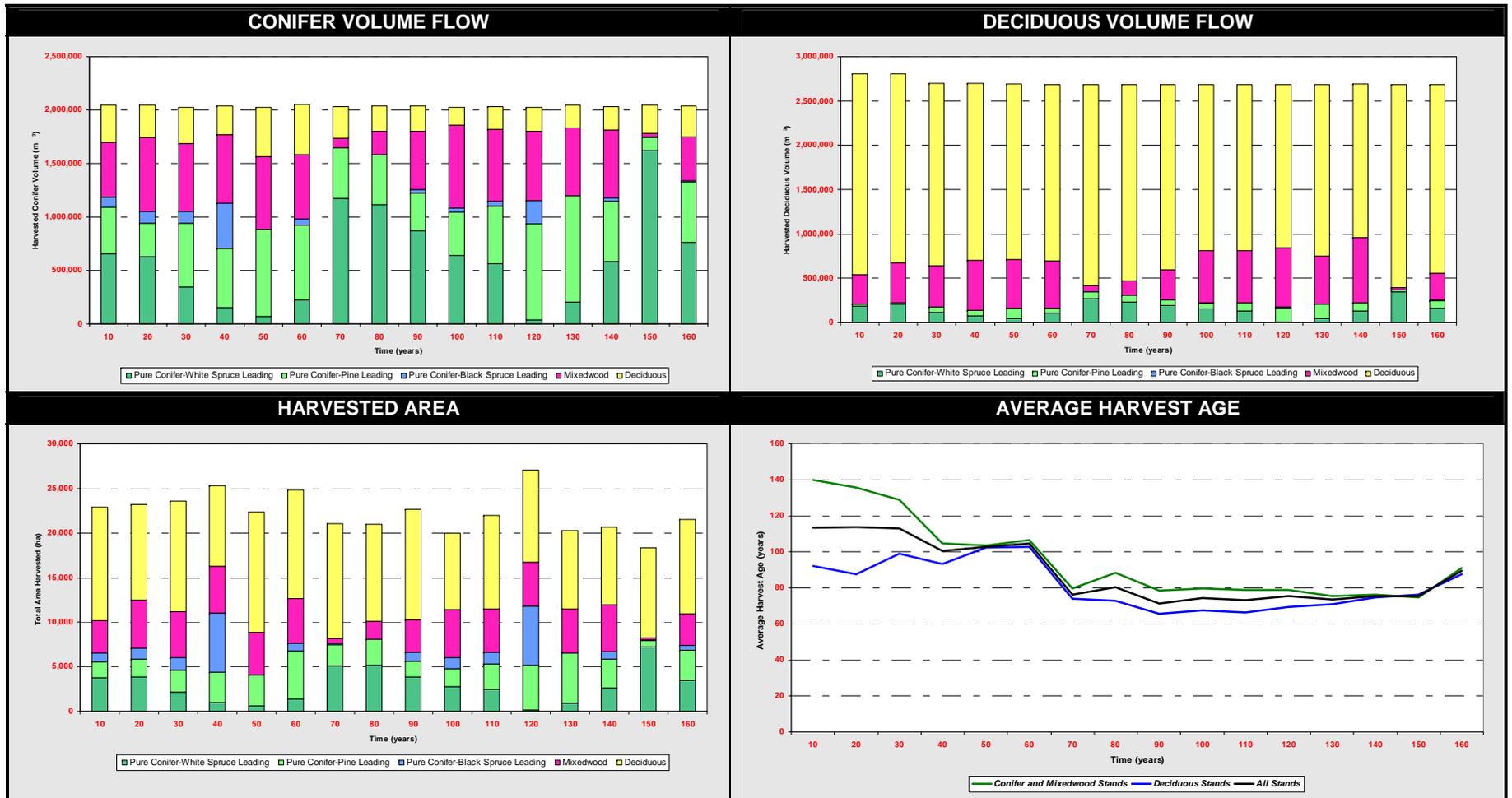
The future forest summary in Figure 6-2 demonstrates how the cover type distribution of the forest changes over time. It identifies there is no change in cover type distribution over the entire planning horizon (as expected from the yield curve transition used, once a stand is harvested it will regenerate on the same yield strata with a fully stocked density class).

The cover type age class summaries in Figure 6-3 through Figure 6-7 show how the age class distribution of the forest changes over time and Figure 6-8 illustrates how the seral stage distribution of the forest changes over time. To approximate natural stand dynamics, non-operable stands that are assumed to have no anthropogenic disturbance in this plan, will have their age cycled from 200 years to the beginning age of their respective cover group late seral stage threshold. This assumption captures the fact that trees and stands will not get indefinitely old through the planning horizon and that the stand will not revert to an earlier seral stage as a result of the structure and other characteristics that define late seral stage still being intact throughout the 160 year planning horizon. The future forest analysis does not account for area left behind as structure retention, which would also contribute to area in future old age classes. The age class graphs for the net productive landbase show how the forest moves towards a "regulated forest state". Map 6-1 through Map 6-5 depicts the current forest, 10 year, 40 year, 80 year and 160 year projection of age class by cover type distribution for the gross landbase (full size maps can be found in Appendix H, Map H-11 to H-15). The net landbase is depicted in Map 6-6 through Map 6-10 (full size maps can be found in Appendix I, Map I-1 to I-5).

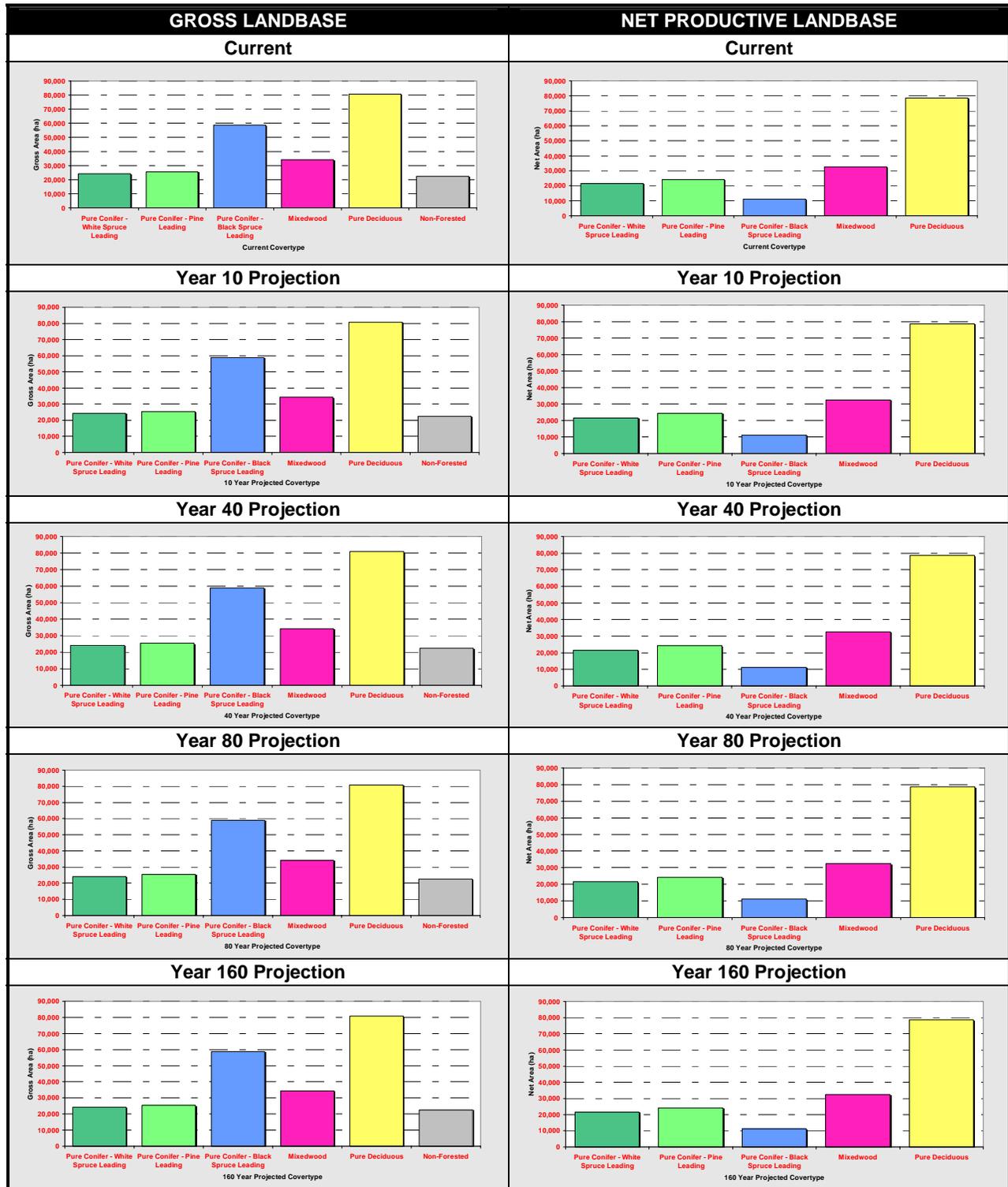
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<sup>1</sup> The additional analysis presented does not account for harvesting activity on the deciduous landbase within grazing lease areas.

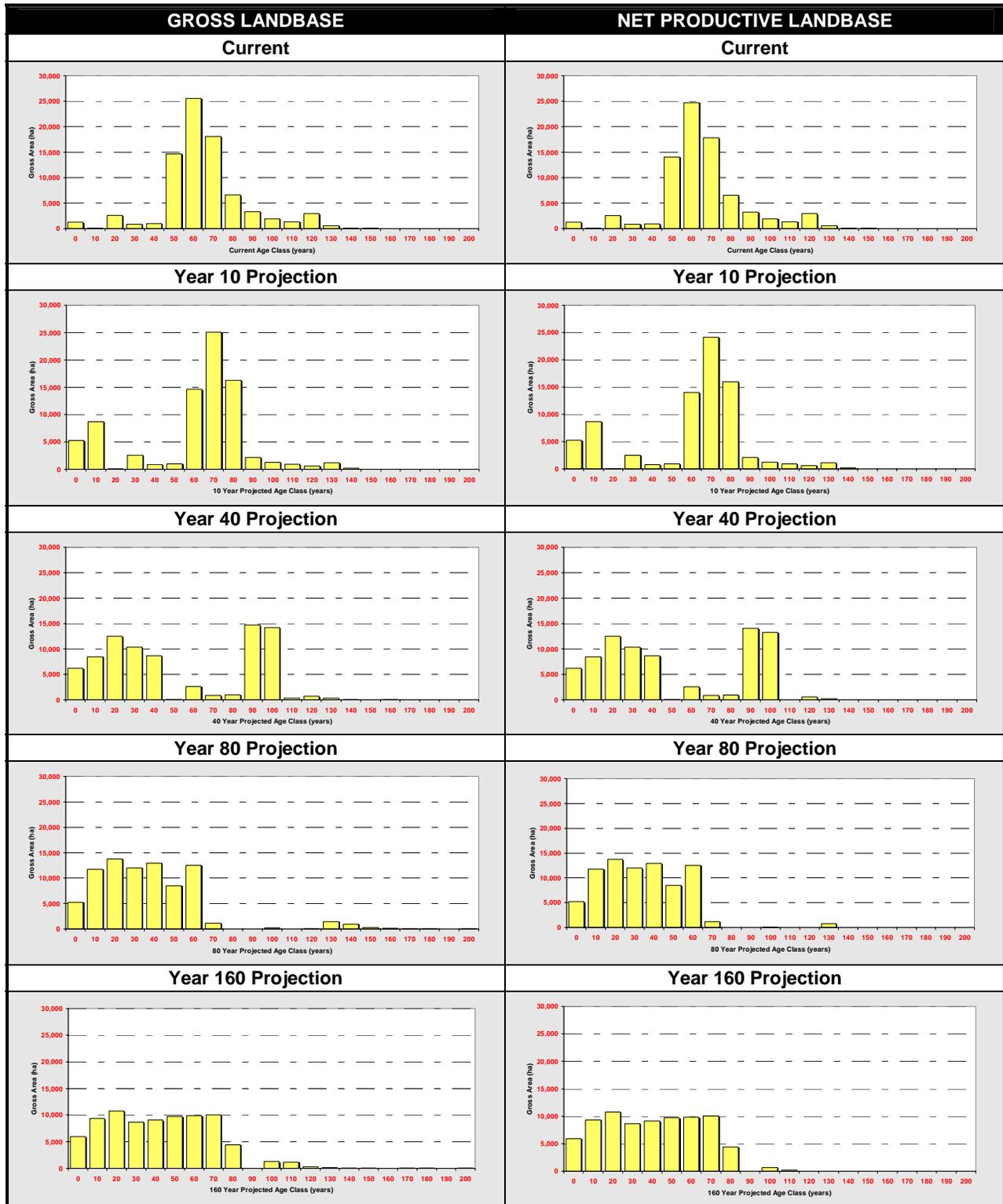
**FIGURE 6-1: FUTURE FOREST HARVEST SUMMARIES**



**FIGURE 6-2: FUTURE FOREST SUMMARY: COVER TYPE**

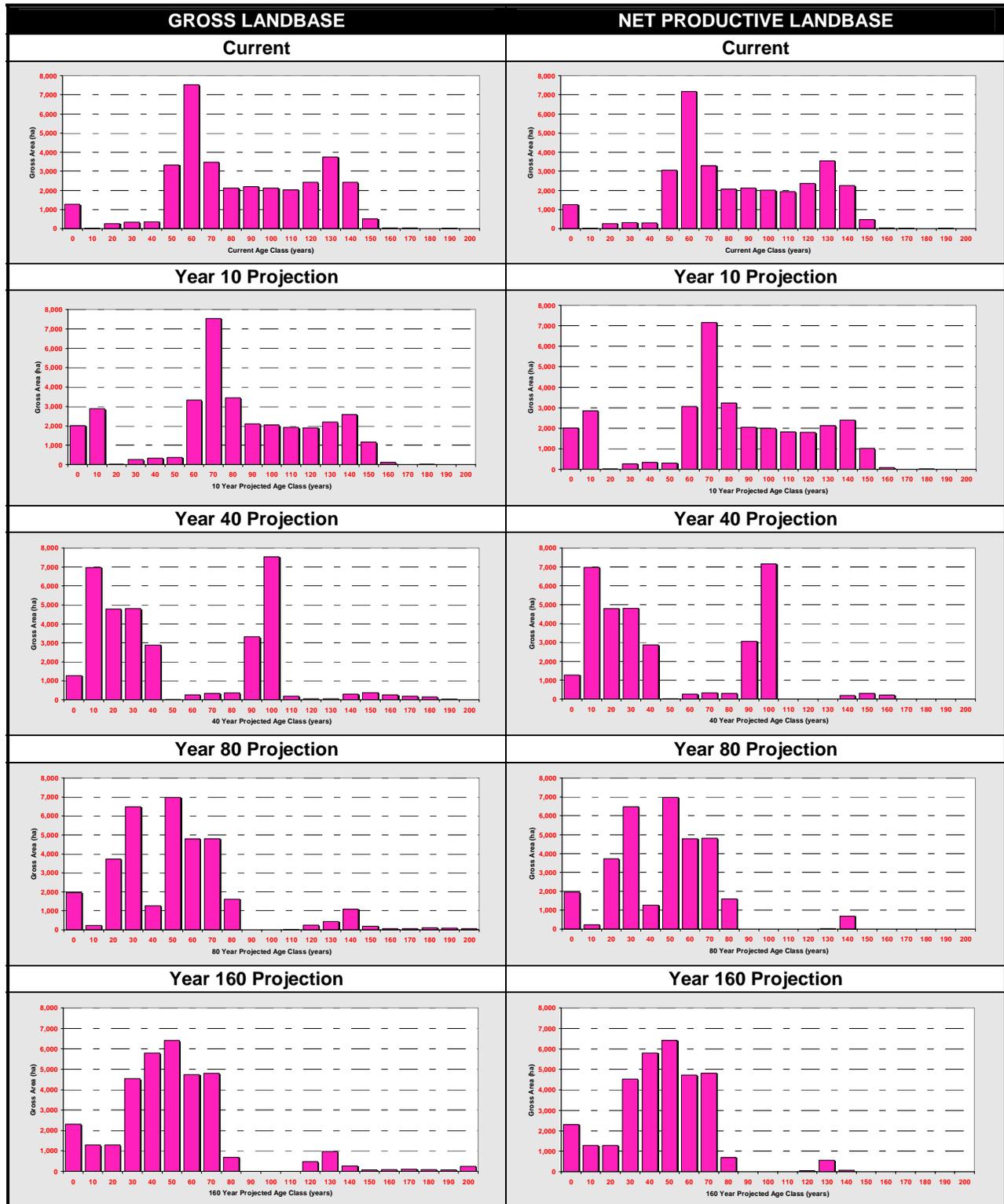


**FIGURE 6-3: FUTURE FOREST SUMMARY<sup>2</sup>: PURE DECIDUOUS AGE CLASS**



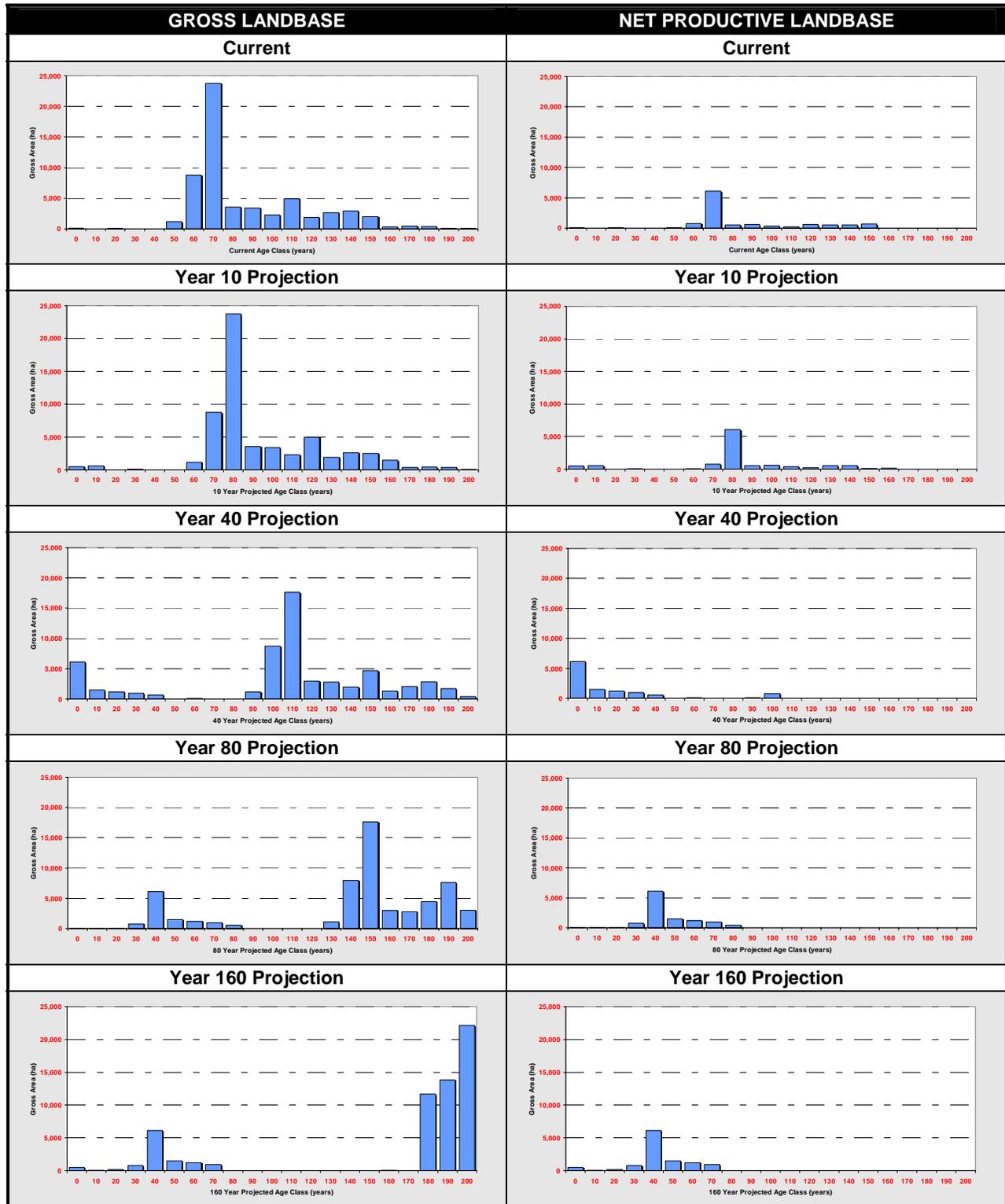
<sup>2</sup> Future forest analysis does not account for structure retention left after harvesting.

**FIGURE 6-4: FUTURE FOREST SUMMARY<sup>3</sup>: MIXEDWOOD AGE CLASS**



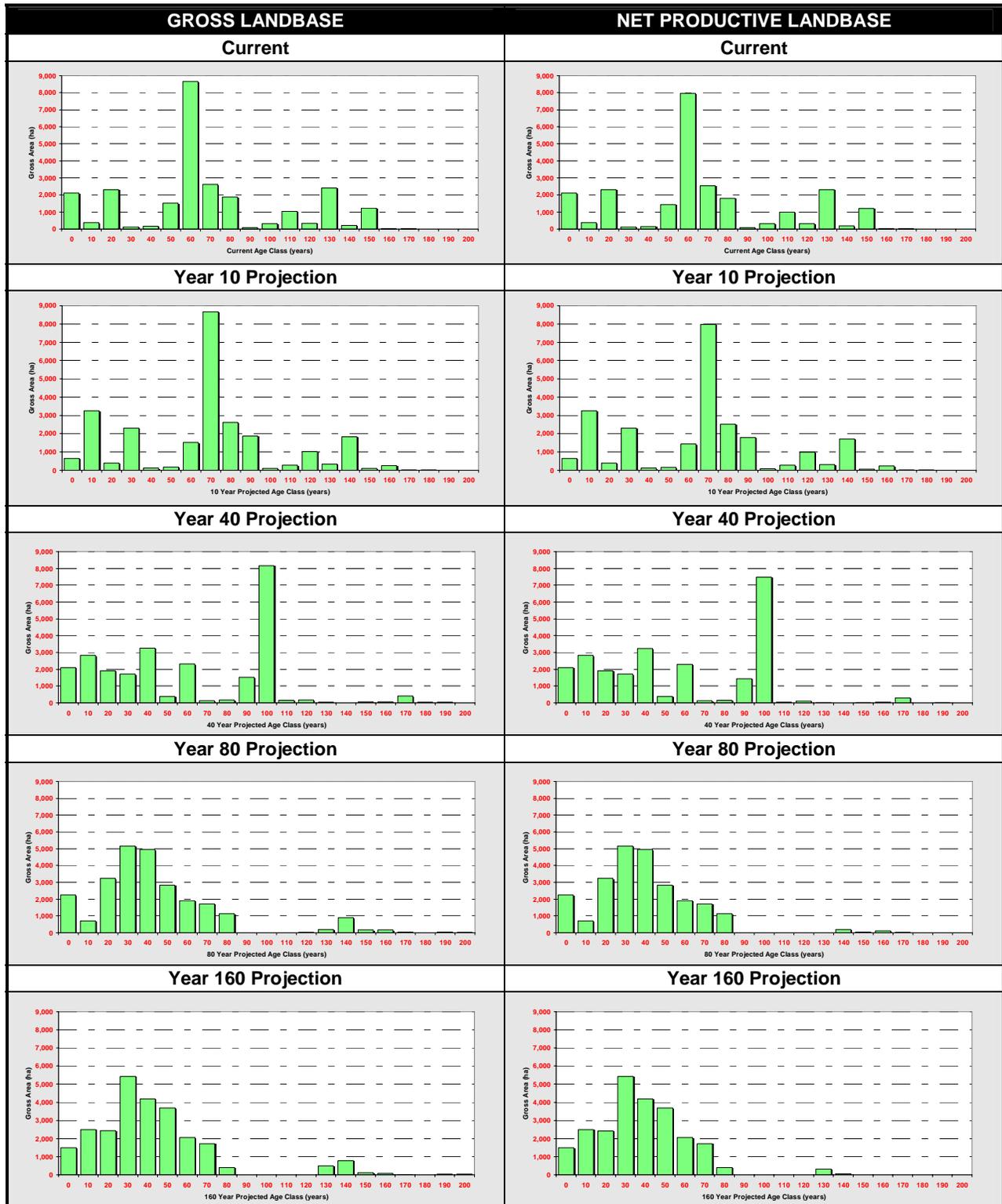
<sup>3</sup> Future forest analysis does not account for structure retention left after harvesting.

**FIGURE 6-5: FUTURE FOREST SUMMARY<sup>4</sup>: PURE CONIFER - SB AGE CLASS**



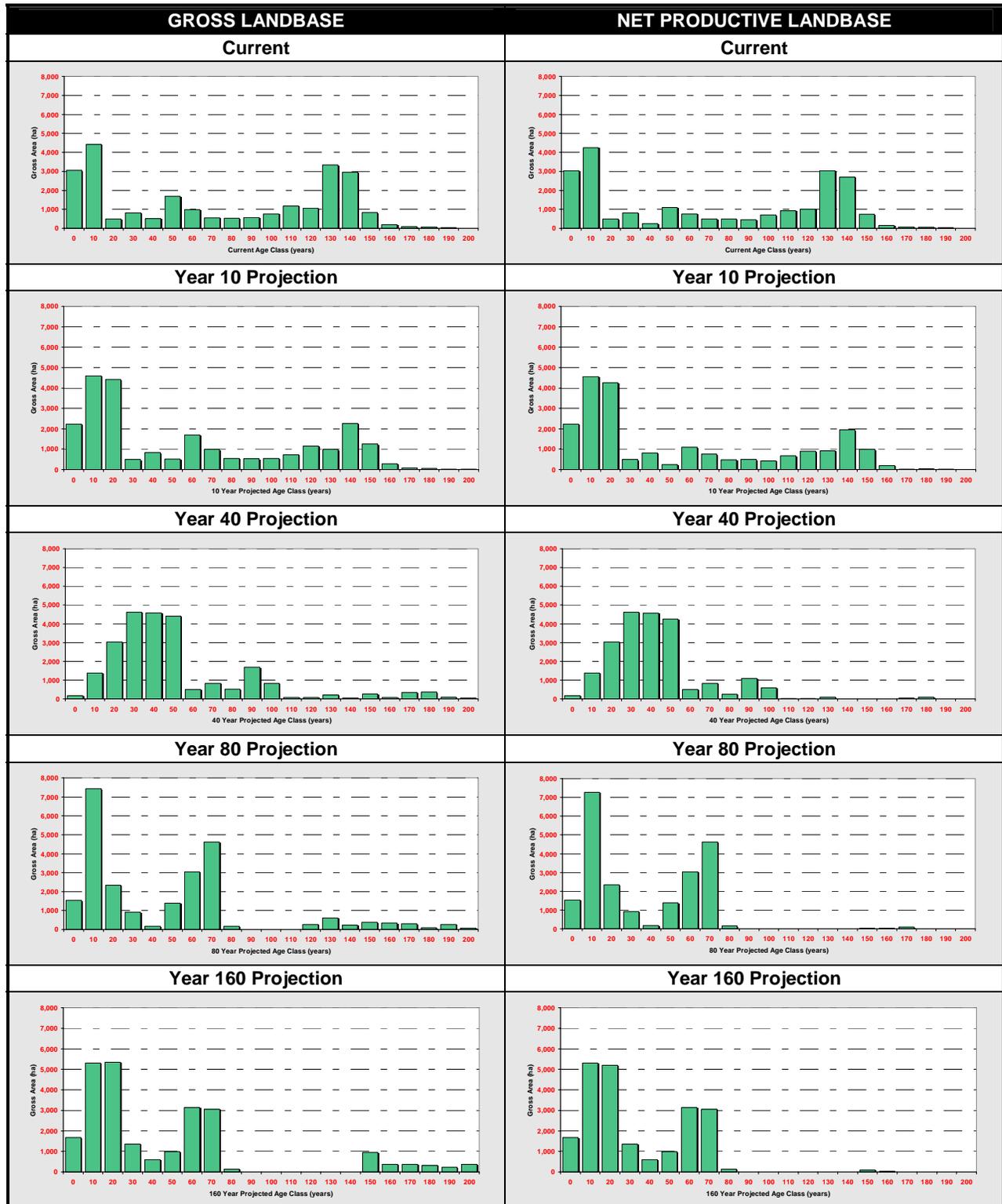
<sup>4</sup> Future forest analysis does not account for structure retention left after harvesting.

**FIGURE 6-6: FUTURE FOREST SUMMARY<sup>5</sup>: PURE CONIFER - PINE AGE CLASS**



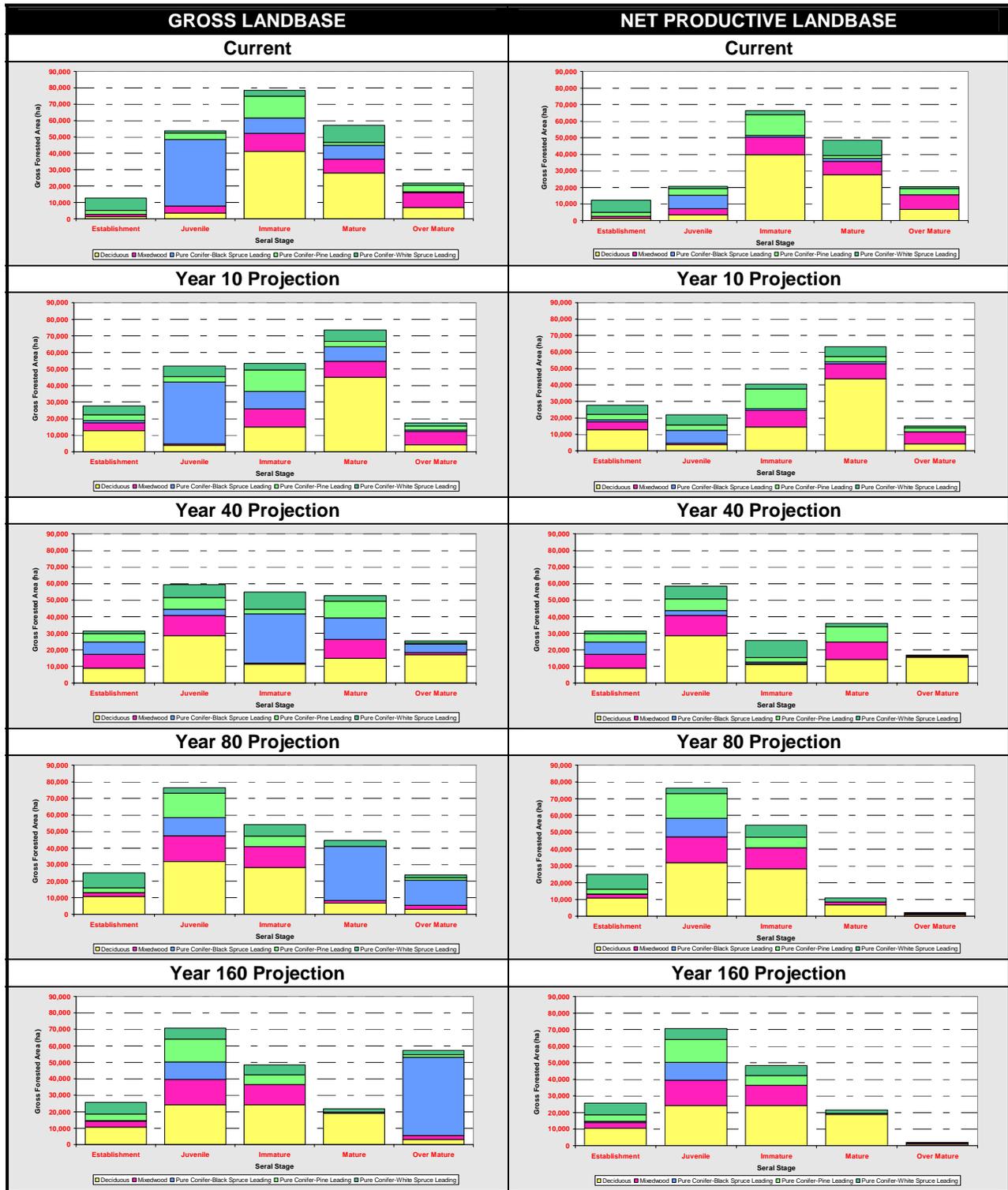
<sup>5</sup> Future forest analysis does not account for structure retention left after harvesting.

**FIGURE 6-7: FUTURE FOREST SUMMARY<sup>6</sup>: PURE CONIFER - SW AGE CLASS**



<sup>6</sup> Future forest analysis does not account for structure retention left after harvesting.

**FIGURE 6-8: FUTURE FOREST SUMMARY: COVER TYPE AND SERAL STAGE**



<sup>7</sup> Future forest analysis does not account for structure retention left after harvesting

## **MAP 6-1: CURRENT – GROSS AGE CLASS DISTRIBUTION**

## **MAP 6-2: 10 YEAR PROJECTION – GROSS AGE CLASS DISTRIBUTION**

## **MAP 6-3: 40 YEAR PROJECTION – GROSS AGE CLASS DISTRIBUTION**

## **MAP 6-4: 80 YEAR PROJECTION – GROSS AGE CLASS DISTRIBUTION**

## **MAP 6-5: 160 YEAR PROJECTION – GROSS AGE CLASS DISTRIBUTION**

## **MAP 6-6: CURRENT – NET AGE CLASS DISTRIBUTION**

## **MAP 6-7: 10 YEAR PROJECTION – NET AGE CLASS DISTRIBUTION**

## **MAP 6-8: 40 YEAR PROJECTION – NET AGE CLASS DISTRIBUTION**

## **MAP 6-9: 80 YEAR PROJECTION – NET AGE CLASS DISTRIBUTION**

## **MAP 6-10: 160 YEAR PROJECTION – NET AGE CLASS DISTRIBUTION**

## 6.2 SERAL STAGE STRATEGY IMPLEMENTATION AND ANALYSIS

Appendix B details the seral stage strategy developed specifically for this FMA Area. The strategy focuses on the retention of effective, high quality late seral stage stands across the entire landbase. The minimum percentage of high quality, late seral stage stands retained on the net operable landbase (as a percentage of the gross forested area) are as follows:

- 2% for the mixedwood cover group by operating area;
- 1.5% for the pine leading conifer cover group by operating area;
- 1.0% for the deciduous cover group by operating area;
- 0.5% for the white spruce leading conifer cover group by operating area.

Significant effort was placed on the selection and spatial identification of the highest quality stands throughout the planning horizon, these stands are illustrated on Map 6-11.

Reporting carried out on the PFMS late seral stage strategy includes:

- The operable and non-operable area by age class, cover group and seral stage at different points in time: Table 6-1 through Table 6-7;
- The seral stage trend over the entire planning horizon for each seral stage and cover group by FMA and operating area: Figure 6-9 through Figure 6-11;
- The seral stage distribution over time are illustrated in Map 6-12 through Map 6-16 (full size maps can be found in Appendix I, Map I-6 to I-10);
- Forest class patches based on five seral stage groupings (establishment, juvenile, immature, mature, over-mature) and six patch size classes (0 – 25 ha, 25.1 – 50 ha, 50.1 – 100 ha, 100.1 – 200 ha, 200.1 – 400 ha, >400 ha). Patch sizes of these groups were determined for the current forest, 10, 40, 80 and 160 years into the future. The FMA wide seral stage patch size summary is presented in Table 6-8;
- Summaries of the late seral stage present over the planning horizon: Section 6.2.1.

Note:

- All high quality operable late seral stage stands are harvested during the planning horizon.
- When a stand was identified as a candidate for high quality late seral stage retention and was also identified as a planned cutblock, the stand was retained for late seral stage and removed from the planned cutblock layer.
- At the end of the planning horizon, for the Joint and Tolko FMAs combined, the total gross forested area in late seral stage is 124,200 ha.
- The seral stage analysis in this section does not include operable deciduous stands within grazing lease areas.

## **MAP 6-11: HIGH QUALITY LATE SERAL STAGE STANDS IDENTIFIED FOR RETENTION**

**TABLE 6-1: COVER GROUP AGECLASS AND SERAL STAGE SUMMARY –  
 CURRENT (FMA)**

Age Class <sup>8</sup>	Yield Curve Group										Total	
	C-SW		C-PL		C-SB		MIX		DEC		Operable	Non-Operable
	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable		
0	3,028	22	2,110	7	70	67	1,262	24	1,246	3	7,715	123
10	4,325	3	377	0	0	0	21	0	71	0	4,794	3
15	81	0	8	0	0	0	0	0	0	0	90	0
20	489	0	2,304	0	82	0	269	0	2,525	62	5,670	63
30	818	4	124	0	0	0	326	13	816	31	2,084	48
40	256	258	153	23	15	1	305	60	908	49	1,637	391
50	1,080	604	1,320	66	56	759	2,944	270	12,587	586	17,987	2,285
55	10	0	122	7	0	351	115	1	1,449	33	1,697	391
60	760	229	7,972	687	759	7,980	7,167	369	24,684	912	41,341	10,177
65	0	0	0	0	0	0	0	0	0	0	0	0
70	488	68	2,526	96	6,102	17,640	3,283	191	17,796	290	30,194	18,285
75	0	0	0	0	0	0	0	0	0	0	0	0
80	496	42	1,801	69	557	2,996	2,067	61	6,548	107	11,468	3,275
90	454	121	77	13	587	2,793	2,131	58	3,269	41	6,518	3,026
95	0	0	0	0	0	0	0	0	0	0	0	0
100	705	53	315	5	361	1,956	2,007	108	1,867	35	5,254	2,159
110	923	246	1,002	36	235	4,717	1,940	92	1,308	8	5,408	5,099
120	1,004	64	313	20	574	1,327	2,361	65	2,925	44	7,178	1,520
125	0	0	0	0	0	0	0	0	0	0	0	0
130	3,039	303	2,293	113	542	2,101	3,546	186	546	25	9,966	2,728
140	2,686	274	184	37	526	2,403	2,263	151	48	0	5,706	2,865
150	742	97	1,212	23	687	1,324	479	33	61	5	3,179	1,482
160	144	51	27	0	2	379	29	1	0	0	201	431
170	80	16	24	0	25	421	25	3	3	4	158	444
175	0	0	0	0	0	0	0	0	0	0	0	0
180	56	14	0	0	13	389	0	0	0	0	70	403
190	45	2	6	0	0	40	16	0	0	4	67	46
200	5	0	0	0	0	38	0	0	9	0	14	38
<b>EST</b>	7,353	25	2,487	7	70	67	1,283	24	1,246	3	12,438	126
<b>JUV</b>	1,389	4	3,909	89	8,158	32,520	3,844	343	3,411	93	20,712	33,049
<b>IMM</b>	2,594	1,158	12,421	859	1,171	8,001	10,564	560	39,629	1,580	66,378	12,158
<b>MAT</b>	9,307	1,103	1,707	74	1,782	6,628	8,144	320	27,613	438	48,552	8,563
<b>OMAT</b>	1,072	181	3,745	173	13	467	8,718	438	6,767	126	20,316	1,385
<b>Subtotal</b>	<b>21,714</b>	<b>2,471</b>	<b>24,270</b>	<b>1,202</b>	<b>11,194</b>	<b>47,682</b>	<b>32,553</b>	<b>1,686</b>	<b>78,666</b>	<b>2,241</b>	<b>168,397</b>	<b>55,282</b>

<sup>8</sup> Age classes 0 and 10 for the deciduous cover group were altered to coincide with the seral stage classes. Age class 0 = 0 to 10 years and age class 10 = 11 to 15. For Deciduous, the EST (establishment) seral stage includes year 0 to 10 and JUV (juvenile) starts at 11. For all cover groups, age class 15 includes ages 16 through 19 to coincide with the seral stage classification.

**TABLE 6-2: COVER GROUP AGECLASS AND SERAL STAGE SUMMARY –  
 CURRENT (KIMIWAN)**

Age Class <sup>9</sup>	Yield Curve Group										Total	
	C-SW		C-PL		C-SB		MIX		DEC		Operable	Non-Operable
	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable		
0	1,114	15	0	7	4	67	69	24	443	3	1,629	116
10	4,293	3	0	0	0	0	0	0	0	0	4,293	3
15	81	0	0	0	0	0	0	0	0	0	81	0
20	460	0	10	0	0	0	6	0	2,362	62	2,839	62
30	720	3	0	0	0	0	46	4	557	4	1,322	10
40	114	240	0	0	1	1	46	1	61	5	223	247
50	363	147	4	0	3	57	267	12	344	25	981	241
55	10	0	122	7	0	351	115	1	1,449	33	1,697	391
60	419	89	322	12	39	4,328	2,627	91	8,175	131	11,581	4,651
65	0	0	0	0	0	0	0	0	0	0	0	0
70	330	25	222	4	1,844	9,457	2,050	96	9,097	183	13,543	9,765
75	0	0	0	0	0	0	0	0	0	0	0	0
80	378	24	28	0	192	2,073	1,448	41	1,744	41	3,791	2,179
90	303	77	4	0	524	1,937	1,567	45	2,475	37	4,873	2,096
95	0	0	0	0	0	0	0	0	0	0	0	0
100	507	29	70	3	115	876	1,323	21	1,121	7	3,135	936
110	384	14	0	0	123	3,919	871	14	872	6	2,250	3,952
120	518	40	14	1	82	871	1,480	39	2,366	16	4,461	967
125	0	0	0	0	0	0	0	0	0	0	0	0
130	1,681	52	0	0	69	328	1,187	19	43	4	2,981	403
140	2,058	131	39	1	2	182	1,488	51	32	0	3,619	365
150	12	0	7	1	0	64	0	0	0	0	19	65
160	5	0	0	0	0	2	0	0	0	0	5	2
170	44	0	0	0	0	0	15	0	0	4	59	4
175	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0
190	0	0	0	0	0	0	5	0	0	4	5	4
200	5	0	0	0	0	0	0	0	0	0	5	0
<b>EST</b>	5,407	18	0	7	4	67	69	24	443	3	5,922	119
<b>JUV</b>	1,262	3	14	0	2,604	18,204	365	17	2,919	66	7,163	18,289
<b>IMM</b>	1,237	501	694	23	320	5,666	4,791	188	10,029	194	17,072	6,572
<b>MAT</b>	5,828	366	88	4	72	575	5,209	121	13,316	260	24,513	1,327
<b>OMAT</b>	66	0	46	3	0	0	4,176	109	4,435	42	8,722	154
<b>Subtotal</b>	<b>13,800</b>	<b>889</b>	<b>841</b>	<b>36</b>	<b>2,999</b>	<b>24,511</b>	<b>14,611</b>	<b>459</b>	<b>31,141</b>	<b>566</b>	<b>63,392</b>	<b>26,461</b>

<sup>9</sup> Age classes 0 and 10 for the deciduous cover group were altered to coincide with the seral stage classes. Age class 0 = 0 to 10 years and age class 10 = 11 to 15. For Deciduous, the EST (establishment) seral stage includes year 0 to 10 and JUV (juvenile) starts at 11. For all cover groups, age class 15 includes ages 16 through 19 to coincide with the seral stage classification.

**TABLE 6-3: COVER GROUP AGECLASS AND SERAL STAGE SUMMARY – CURRENT (SWEATHOUSE)**

Age Class <sup>10</sup>	Yield Curve Group										Total	
	C-SW		C-PL		C-SB		MIX		DEC		Operable	Non-Operable
	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable
0	1,914	7	2,110	0	66	0	1,192	0	803	0	6,086	7
10	32	0	377	0	0	0	21	0	71	0	501	0
15	0	0	8	0	0	0	0	0	0	0	8	0
20	29	0	2,295	0	82	0	263	0	163	0	2,832	0
30	98	2	124	0	0	0	281	9	259	27	762	38
40	141	17	153	23	14	0	259	60	847	44	1,414	144
50	717	457	1,316	66	53	702	2,677	258	12,244	561	17,006	2,044
55	0	0	0	0	0	0	0	0	0	0	0	0
60	341	139	7,650	675	719	3,653	4,540	278	16,509	781	29,759	5,526
65	0	0	0	0	0	0	0	0	0	0	0	0
70	158	43	2,304	92	4,258	8,183	1,233	94	8,700	107	16,652	8,520
75	0	0	0	0	0	0	0	0	0	0	0	0
80	118	17	1,772	69	365	922	618	21	4,803	66	7,678	1,096
90	151	45	74	13	63	856	564	13	794	4	1,645	931
95	0	0	0	0	0	0	0	0	0	0	0	0
100	198	25	245	3	247	1,081	684	87	746	28	2,119	1,222
110	539	232	1,002	36	112	798	1,069	79	436	2	3,157	1,147
120	486	24	299	19	492	456	881	26	560	29	2,717	553
125	0	0	0	0	0	0	0	0	0	0	0	0
130	1,358	250	2,293	113	473	1,774	2,358	166	503	21	6,985	2,324
140	627	143	146	36	523	2,221	775	100	15	0	2,087	2,500
150	730	97	1,204	22	687	1,261	479	33	61	5	3,160	1,417
160	139	51	27	0	2	377	29	1	0	0	196	429
170	37	16	24	0	25	421	10	3	3	0	99	440
175	0	0	0	0	0	0	0	0	0	0	0	0
180	56	14	0	0	13	389	0	0	0	0	70	403
190	45	2	6	0	0	40	11	0	0	0	62	42
200	0	0	0	0	0	38	0	0	9	0	9	38
<b>EST</b>	1,946	7	2,487	0	66	0	1,214	0	803	0	6,516	7
<b>JUV</b>	127	2	3,896	89	5,555	14,316	3,479	326	493	27	13,549	14,760
<b>IMM</b>	1,357	657	11,726	837	851	2,335	5,773	372	29,600	1,386	49,307	5,586
<b>MAT</b>	3,478	737	1,619	70	1,710	6,053	2,935	199	14,297	178	24,039	7,237
<b>OMAT</b>	1,007	181	3,700	170	13	467	4,542	329	2,332	84	11,594	1,231
<b>Subtotal</b>	<b>7,915</b>	<b>1,582</b>	<b>23,428</b>	<b>1,166</b>	<b>8,195</b>	<b>23,171</b>	<b>17,942</b>	<b>1,226</b>	<b>47,524</b>	<b>1,675</b>	<b>105,005</b>	<b>28,820</b>

<sup>10</sup> Age classes 0 and 10 for the deciduous cover group were altered to coincide with the seral stage classes. Age class 0 = 0 to 10 years and age class 10 = 11 to 15. For Deciduous, the EST (establishment) seral stage includes year 0 to 10 and JUV (juvenile) starts at 11. For all cover groups, age class 15 includes ages 16 through 19 to coincide with the seral stage classification.

**TABLE 6-4: COVER GROUP AGECLASS AND SERAL STAGE SUMMARY –  
10 YEAR PROJECTION (FMA)**

Age Class <sup>11</sup>	Yield Curve Group										Total	
	C-SW		C-PL		C-SB		MIX		DEC		Operable	Non-Operable
	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable
0	2,231	0	652	0	518	0	2,006	0	12,777	0	18,184	0
10	3,127	7	2,835	7	558	67	2,858	24	1,193	3	10,572	107
15	1,436	15	405	0	0	0	2	0	0	0	1,843	15
20	4,406	3	386	0	0	0	21	0	71	0	4,884	3
30	489	0	2,304	0	82	0	269	0	2,525	62	5,670	63
40	818	4	124	0	0	0	326	13	816	31	2,084	48
50	256	258	153	23	15	1	305	60	908	49	1,637	391
55	0	0	0	0	0	0	0	0	0	0	0	0
60	1,080	604	1,320	66	56	759	2,944	270	12,582	586	17,982	2,285
65	10	0	122	7	0	351	115	1	1,449	33	1,696	391
70	760	229	7,972	687	759	7,980	7,167	369	24,155	912	40,812	10,177
75	0	0	0	0	0	0	0	0	0	0	0	0
80	481	68	2,525	96	6,098	17,640	3,243	191	16,014	290	28,360	18,285
90	495	42	1,792	69	551	2,996	2,047	61	2,081	107	6,966	3,275
95	0	0	0	0	0	0	0	0	0	0	0	0
100	427	121	77	13	587	2,793	1,992	58	1,243	41	4,326	3,026
110	675	53	268	5	360	1,956	1,815	108	889	35	4,008	2,159
120	901	246	987	36	235	4,717	1,801	92	607	8	4,532	5,099
125	0	0	0	0	0	0	0	0	0	0	0	0
130	918	64	313	20	569	1,327	2,129	65	1,131	44	5,061	1,520
140	1,951	303	1,713	113	542	2,101	2,404	186	190	25	6,799	2,728
150	983	274	54	37	119	2,403	1,010	151	21	0	2,187	2,865
160	192	97	229	23	144	1,324	88	33	15	5	668	1,482
170	24	51	11	0	0	379	0	1	0	0	35	431
175	0	0	0	0	0	0	0	0	0	0	0	0
180	35	16	24	0	0	454	10	3	0	4	69	477
190	11	14	0	0	0	395	0	0	0	0	11	409
200	9	2	2	0	0	40	0	0	0	4	11	46
<b>EST</b>	5,358	7	3,487	7	1,076	67	4,865	24	12,777	0	27,563	104
<b>JUV</b>	6,332	18	3,372	23	7,561	29,727	924	73	3,788	66	21,977	29,907
<b>IMM</b>	2,924	1,095	11,939	856	1,183	9,466	10,225	640	14,306	666	40,577	12,723
<b>MAT</b>	5,847	897	3,125	123	1,374	7,534	9,096	419	43,699	1,342	63,141	10,315
<b>OMAT</b>	1,254	455	2,347	193	0	888	7,443	530	4,096	167	15,139	2,233
<b>Subtotal</b>	<b>21,714</b>	<b>2,471</b>	<b>24,270</b>	<b>1,202</b>	<b>11,194</b>	<b>47,682</b>	<b>32,553</b>	<b>1,686</b>	<b>78,666</b>	<b>2,241</b>	<b>168,397</b>	<b>55,282</b>

<sup>11</sup> Age classes 0 and 10 for the deciduous cover group were altered to coincide with the seral stage classes. Age class 0 = 0 to 10 years and age class 10 = 11 to 15. For Deciduous, the EST (establishment) seral stage includes year 0 to 10 and JUV (juvenile) starts at 11. For all cover groups, age class 15 includes ages 16 through 19 to coincide with the seral stage classification.

**TABLE 6-5: COVER GROUP AGECLASS AND SERAL STAGE SUMMARY –  
40 YEAR PROJECTION (FMA)**

Age Class <sup>12</sup>	Yield Curve Group										Total	
	C-SW		C-PL		C-SB		MIX		DEC		Operable	Non-Operable
	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable
0	165	0	2,095	0	6,098	0	1,264	0	9,054	0	18,675	0
10	1,389	0	2,825	0	1,498	0	6,978	0	5,619	0	18,309	0
15	0	0	0	0	0	0	0	0	0	0	0	0
20	3,033	0	1,913	0	1,186	0	4,797	0	12,467	0	23,397	0
30	4,623	0	1,724	0	941	0	4,811	0	10,354	0	22,454	0
40	4,563	22	3,240	7	558	67	2,860	24	8,699	3	19,921	123
50	4,239	3	162	0	0	0	0	0	45	0	4,446	3
55	167	0	224	0	0	0	21	0	26	0	438	0
60	364	0	2,304	0	82	0	269	0	2,525	62	5,545	63
65	125	0	0	0	0	0	0	0	0	0	125	0
70	818	4	124	0	0	0	326	13	816	31	2,084	48
75	0	0	0	0	0	0	0	0	0	0	0	0
80	256	258	153	23	15	1	305	60	908	49	1,637	391
90	1,080	604	1,320	66	56	759	2,944	270	12,582	586	17,982	2,285
95	10	0	122	7	0	351	115	1	1,449	33	1,696	391
100	595	229	7,483	687	759	7,980	7,167	369	13,287	916	29,290	10,181
110	13	68	52	96	0	17,640	0	191	0	290	65	18,285
120	28	42	110	69	0	2,996	0	64	599	111	737	3,282
125	0	0	0	0	0	0	0	0	0	0	0	0
130	95	121	28	13	0	2,793	0	58	237	41	360	3,026
140	0	53	0	5	0	1,956	196	108	0	35	196	2,159
150	0	262	23	36	0	4,717	296	92	0	8	319	5,116
160	0	78	37	20	0	1,327	203	65	0	44	240	1,534
170	49	305	304	113	0	2,101	0	186	0	25	353	2,730
175	0	0	0	0	0	0	0	0	0	0	0	0
180	95	274	0	37	0	2,856	0	151	0	0	95	3,319
190	6	97	25	23	0	1,719	0	33	0	5	31	1,877
200	0	51	0	0	0	418	0	1	0	0	0	470
<b>EST</b>	1,554	0	4,919	0	7,596	0	8,242	0	9,054	0	31,366	0
<b>JUV</b>	7,657	0	7,040	7	2,839	827	12,469	24	28,441	0	58,445	858
<b>IMM</b>	10,277	29	2,806	23	759	28,967	617	13	11,294	66	25,753	29,097
<b>MAT</b>	2,077	1,374	9,087	925	0	12,895	10,530	891	14,306	666	35,999	16,751
<b>OMAT</b>	150	1,067	418	247	0	4,994	695	758	15,572	1,509	16,834	8,575
<b>Subtotal</b>	<b>21,714</b>	<b>2,471</b>	<b>24,270</b>	<b>1,202</b>	<b>11,194</b>	<b>47,682</b>	<b>32,553</b>	<b>1,686</b>	<b>78,666</b>	<b>2,241</b>	<b>168,397</b>	<b>55,282</b>

<sup>12</sup> Age classes 0 and 10 for the deciduous cover group were altered to coincide with the seral stage classes. Age class 0 = 0 to 10 years and age class 10 = 11 to 15. For Deciduous, the EST (establishment) seral stage includes year 0 to 10 and JUV (juvenile) starts at 11. For all cover groups, age class 15 includes ages 16 through 19 to coincide with the seral stage classification.

**TABLE 6-6: COVER GROUP AGECLASS AND SERAL STAGE SUMMARY –  
 80 YEAR PROJECTION (FMA)**

Age Class <sup>13</sup>	Yield Curve Group										Total	
	C-SW		C-PL		C-SB		MIX		DEC		Operable	Non-Operable
	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable
0	1,538	0	2,241	0	70	0	1,956	0	10,828	0	16,633	0
10	7,435	0	712	0	82	0	234	0	6,168	0	14,631	0
15	0	0	0	0	0	0	0	0	0	0	0	0
20	2,332	0	3,241	0	71	0	3,723	0	13,754	0	23,121	0
30	915	0	5,156	0	759	0	6,476	0	12,010	0	25,316	0
40	165	0	4,942	0	6,098	0	1,264	0	12,934	0	25,404	0
50	822	0	1,304	0	551	0	3,968	0	2,866	0	9,511	0
55	567	0	1,521	0	947	0	3,010	0	5,619	0	11,664	0
60	1,607	0	950	0	389	0	2,202	0	6,823	0	11,971	0
65	1,427	0	963	0	797	0	2,595	0	5,644	0	11,426	0
70	2,393	0	1,073	0	423	0	2,805	0	1,153	0	7,846	0
75	2,231	0	652	0	518	0	2,006	0	0	0	5,407	0
80	147	22	1,130	7	489	67	1,599	24	0	3	3,365	123
90	0	3	0	0	0	0	0	0	0	0	0	3
95	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	101	88	101	88
110	0	4	0	0	0	0	0	13	0	31	0	48
120	0	258	0	23	0	1	0	246	0	54	0	581
125	0	0	0	0	0	0	0	0	0	0	0	0
130	0	604	9	185	0	1,110	24	422	765	619	798	2,940
140	0	229	185	724	0	7,980	690	401	0	916	876	10,250
150	13	373	52	120	0	17,640	0	191	0	290	65	18,614
160	28	315	110	69	0	2,996	0	64	0	111	138	3,556
170	95	219	28	13	0	2,793	0	58	0	41	123	3,123
175	0	0	0	0	0	0	0	0	0	0	0	0
180	0	104	0	5	0	4,476	0	108	0	35	0	4,729
190	0	262	0	36	0	7,573	0	92	0	8	0	7,972
200	0	78	0	20	0	3,046	0	65	0	44	0	3,253
<b>EST</b>	8,974	0	2,953	0	152	0	2,190	0	10,828	0	25,097	0
<b>JUV</b>	3,247	0	14,643	0	11,042	67	15,432	0	31,932	0	76,297	67
<b>IMM</b>	6,980	0	6,289	7	0	1	12,618	0	28,242	0	54,129	8
<b>MAT</b>	2,377	1,120	0	23	0	32,519	1,599	36	6,797	3	10,773	33,701
<b>OMAT</b>	136	1,351	385	1,172	0	15,096	714	1,649	866	2,237	2,101	21,506
<b>Subtotal</b>	<b>21,714</b>	<b>2,471</b>	<b>24,270</b>	<b>1,202</b>	<b>11,194</b>	<b>47,682</b>	<b>32,553</b>	<b>1,686</b>	<b>78,666</b>	<b>2,241</b>	<b>168,397</b>	<b>55,282</b>

<sup>13</sup> Age classes 0 and 10 for the deciduous cover group were altered to coincide with the seral stage classes. Age class 0 = 0 to 10 years and age class 10 = 11 to 15. For Deciduous, the EST (establishment) seral stage includes year 0 to 10 and JUV (juvenile) starts at 11. For all cover groups, age class 15 includes ages 16 through 19 to coincide with the seral stage classification.

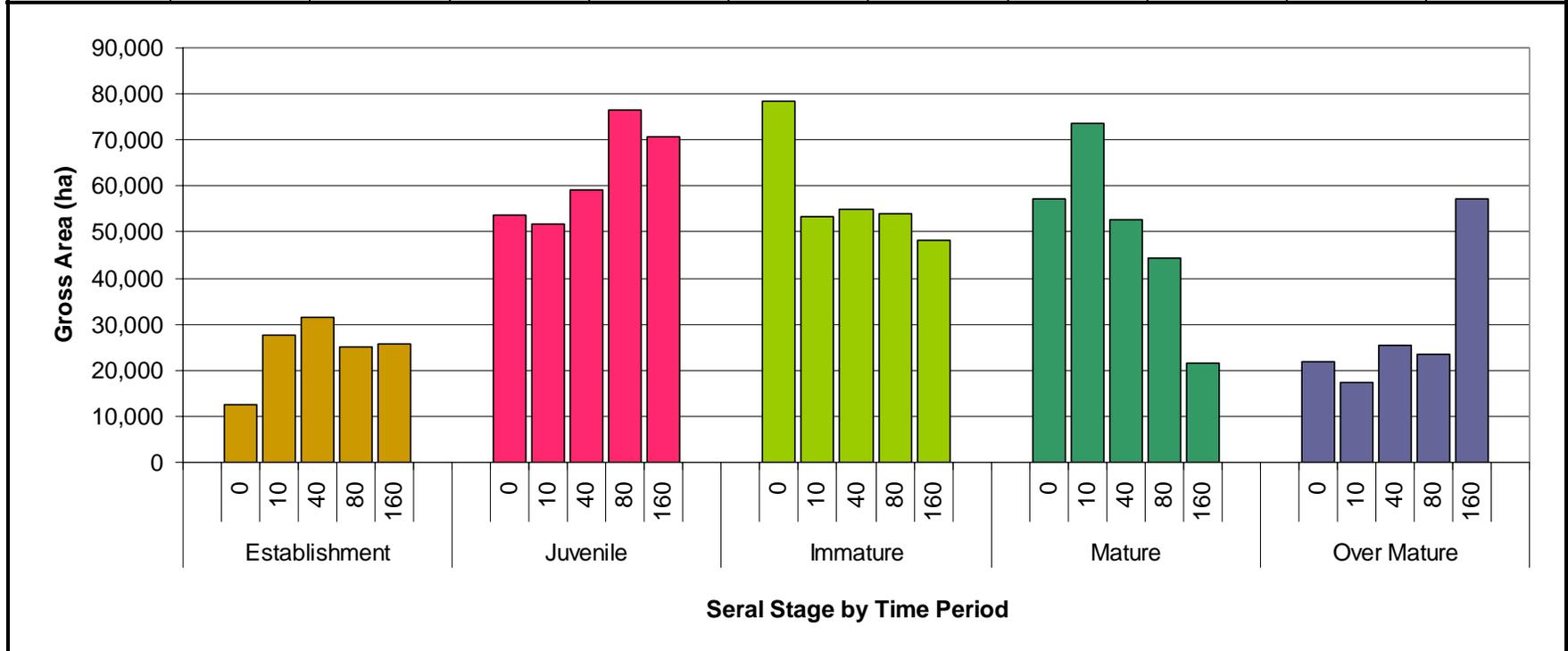
**TABLE 6-7: COVER GROUP AGECLASS AND SERAL STAGE SUMMARY –  
160 YEAR PROJECTION (FMA)**

Age Class <sup>14</sup>	Yield Curve Group										Total	
	C-SW		C-PL		C-SB		MIX		DEC		Operable	Non-Operable
	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable	Operable	Non-Operable
0	1,667	0	1,506	0	489	0	2,313	0	10,507	0	16,482	0
10	5,300	0	2,496	0	70	0	1,283	0	4,742	0	13,890	0
15	0	0	0	0	0	0	0	0	0	0	0	0
20	5,346	0	2,428	0	154	0	1,288	0	10,776	0	19,992	0
30	1,360	0	5,428	0	759	0	4,537	0	8,696	0	20,779	0
40	595	0	4,181	0	6,098	0	5,794	0	9,096	0	25,765	0
50	165	0	1,930	0	551	0	3,698	0	4,616	0	10,959	0
55	822	0	1,757	0	947	0	2,718	0	5,124	0	11,370	0
60	1,626	0	1,087	0	389	0	2,133	0	5,338	0	10,573	0
65	1,507	0	959	0	797	0	2,595	0	4,519	0	10,377	0
70	1,253	0	1,073	0	423	0	2,805	0	4,054	0	9,607	0
75	1,798	0	652	0	518	0	2,006	0	5,958	0	10,932	0
80	150	0	390	0	0	0	695	0	4,393	0	5,627	0
90	0	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	644	619	644	619
110	0	0	0	0	0	0	0	0	202	916	202	916
120	0	0	0	0	0	0	0	421	0	290	0	711
125	0	0	0	0	0	0	57	1	0	0	57	1
130	0	0	320	185	0	0	562	401	0	111	882	698
140	0	0	55	724	0	0	69	191	0	41	124	957
150	91	866	0	120	0	0	0	64	0	35	91	1,085
160	35	329	9	76	0	67	0	82	0	12	44	565
170	0	376	0	13	0	0	0	108	0	44	0	541
175	0	0	0	0	0	0	0	0	0	0	0	0
180	0	315	0	6	0	11,679	0	92	0	88	0	12,180
190	0	223	0	36	0	13,820	0	77	0	31	0	14,187
200	0	362	0	43	0	22,117	0	246	0	54	0	22,822
<b>EST</b>	6,967	0	4,002	0	558	0	3,596	0	10,507	0	25,631	0
<b>JUV</b>	6,706	0	13,967	0	10,635	0	15,317	0	24,213	0	70,839	0
<b>IMM</b>	5,967	0	5,917	0	0	0	12,258	0	24,175	0	48,317	0
<b>MAT</b>	1,948	0	0	0	0	67	695	0	18,924	0	21,567	67
<b>OMAT</b>	126	2,471	383	1,202	0	47,615	688	1,686	846	2,241	2,044	55,215
<b>Subtotal</b>	<b>21,714</b>	<b>2,471</b>	<b>24,270</b>	<b>1,202</b>	<b>11,194</b>	<b>47,682</b>	<b>32,553</b>	<b>1,686</b>	<b>78,666</b>	<b>2,241</b>	<b>168,397</b>	<b>55,282</b>

<sup>14</sup> Age classes 0 and 10 for the deciduous cover group were altered to coincide with the seral stage classes. Age class 0 = 0 to 10 years and age class 10 = 11 to 15. For Deciduous, the EST (establishment) seral stage includes year 0 to 10 and JUV (juvenile) starts at 11. For all cover groups, age class 15 includes ages 16 through 19 to coincide with the seral stage classification.

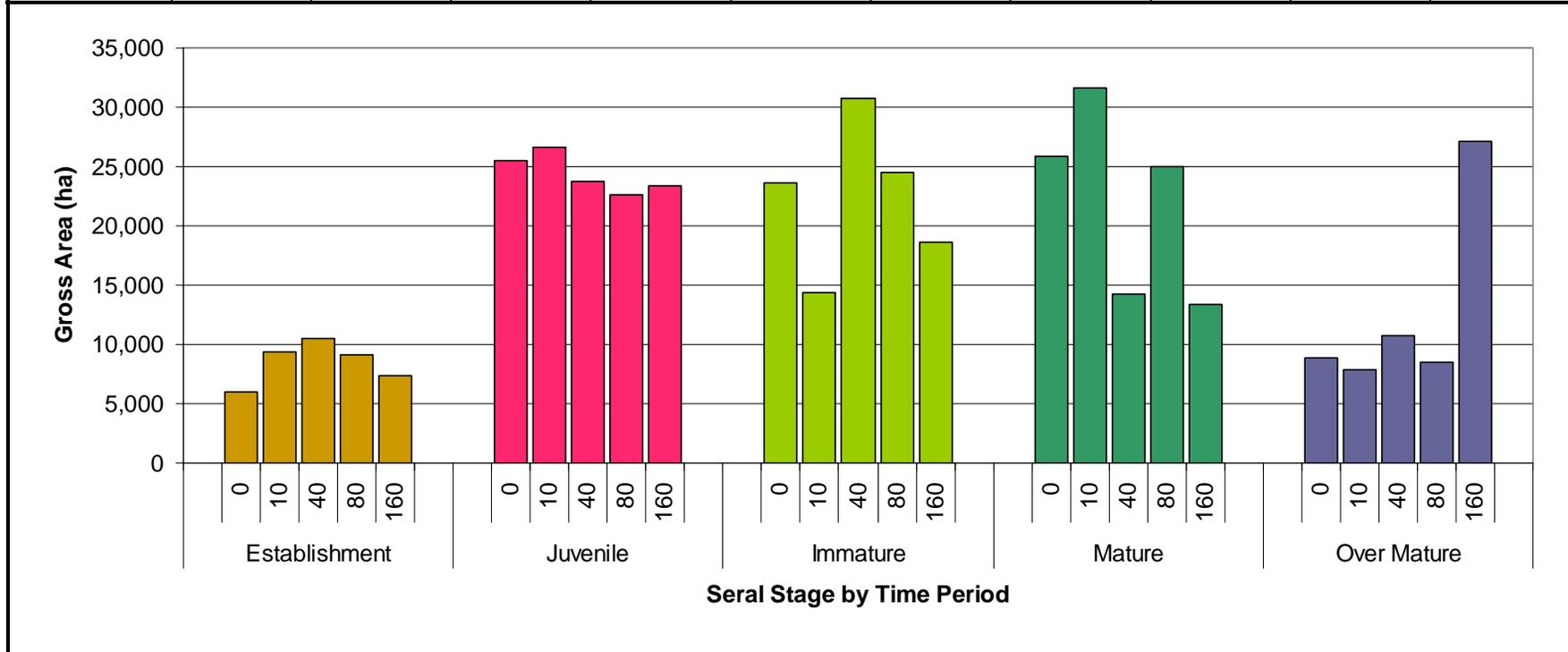
**FIGURE 6-9: SERAL STAGE AREA SUMMARY – FMA**

Seral Stage	Current Forest		Future Forest Year 10		Future Forest Year 40		Future Forest Year 80		Future Forest Year 160	
	Gross Area (ha)	% of Gross Area	Gross Area (ha)	% of Gross Area	Gross Area (ha)	% of Gross Area	Gross Area (ha)	% of Gross Area	Gross Area (ha)	% of Gross Area
Establishment	12,564	5%	27,667	11%	31,366	13%	25,097	10%	25,631	10%
Juvenile	53,762	22%	51,884	21%	59,302	24%	76,363	31%	70,839	29%
Immature	78,537	32%	53,300	22%	54,850	22%	54,137	22%	48,317	20%
Mature	57,115	23%	73,455	30%	52,751	21%	44,474	18%	21,633	9%
Over Mature	21,701	9%	17,372	7%	25,409	10%	23,606	10%	57,259	23%
Non-Forested	22,473	9%	22,473	9%	22,473	9%	22,473	9%	22,473	9%
<b>Total</b>	<b>246,152</b>	<b>100%</b>	<b>246,152</b>	<b>100%</b>	<b>246,152</b>	<b>100%</b>	<b>246,152</b>	<b>100%</b>	<b>246,152</b>	<b>100%</b>



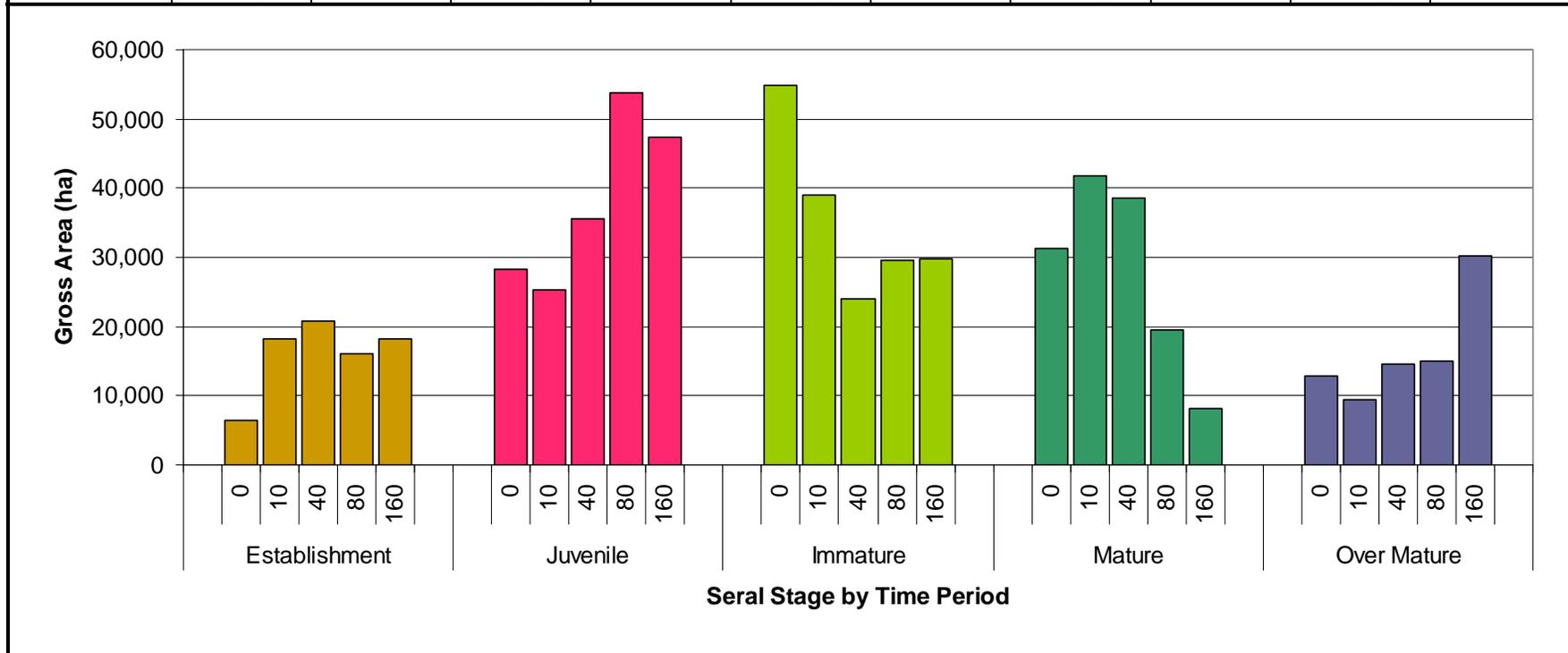
**FIGURE 6-10: SERAL STAGE AREA SUMMARY – KIMIWAN OPERATING AREA**

Seral Stage	Current Forest		Future Forest Year 10		Future Forest Year 40		Future Forest Year 80		Future Forest Year 160	
	Gross Area (ha)	% of Gross Area	Gross Area (ha)	% of Gross Area	Gross Area (ha)	% of Gross Area	Gross Area (ha)	% of Gross Area	Gross Area (ha)	% of Gross Area
Establishment	6,041	6%	9,359	9%	10,477	10%	9,102	9%	7,319	7%
Juvenile	25,452	25%	26,602	26%	23,700	23%	22,667	22%	23,421	23%
Immature	23,644	23%	14,396	14%	30,752	30%	24,513	24%	18,588	18%
Mature	25,840	25%	31,630	31%	14,191	14%	25,058	24%	13,395	13%
Over Mature	8,876	9%	7,867	8%	10,734	10%	8,512	8%	27,130	26%
Non-Forested	12,612	12%	12,612	12%	12,612	12%	12,612	12%	12,612	12%
<b>Total</b>	<b>102,465</b>	<b>100%</b>	<b>102,465</b>	<b>100%</b>	<b>102,465</b>	<b>100%</b>	<b>102,465</b>	<b>100%</b>	<b>102,465</b>	<b>100%</b>



**FIGURE 6-11: SERAL STAGE AREA SUMMARY – SWEATHOUSE OPERATING AREA**

Seral Stage	Current Forest		Future Forest Year 10		Future Forest Year 40		Future Forest Year 80		Future Forest Year 160	
	Gross Area (ha)	% of Gross Area	Gross Area (ha)	% of Gross Area	Gross Area (ha)	% of Gross Area	Gross Area (ha)	% of Gross Area	Gross Area (ha)	% of Gross Area
Establishment	6,523	5%	18,308	13%	20,889	15%	15,995	11%	18,311	13%
Juvenile	28,309	20%	25,283	18%	35,603	25%	53,696	37%	47,418	33%
Immature	54,893	38%	38,904	27%	24,098	17%	29,624	21%	29,729	21%
Mature	31,275	22%	41,825	29%	38,560	27%	19,416	14%	8,239	6%
Over Mature	12,825	9%	9,505	7%	14,676	10%	15,095	11%	30,128	21%
Non-Forested	9,861	7%	9,861	7%	9,861	7%	9,861	7%	9,861	7%
<b>Total</b>	<b>143,687</b>	<b>100%</b>	<b>143,687</b>	<b>100%</b>	<b>143,687</b>	<b>100%</b>	<b>143,687</b>	<b>100%</b>	<b>143,687</b>	<b>100%</b>



**MAP 6-12: CURRENT - SERAL STAGE**

## **MAP 6-13: 10 YEAR PROJECTION - SERAL STAGE**

## **MAP 6-14: 40 YEAR PROJECTION - SERAL STAGE**

## **MAP 6-15: 80 YEAR PROJECTION - SERAL STAGE**

## **MAP 6-16: 160 YEAR PROJECTION - SERAL STAGE**

**TABLE 6-8: SERAL STAGE PATCH SIZE SUMMARY**

Seral Stage	Patch Size (ha)	Current Forest					Future Forest 10 Years					Future Forest 40 Years					Future Forest 80 Years					Future Forest 160 Years				
		Max (ha)	Mean (ha)	Min (ha)	Count	Gross Area (ha)	Max (ha)	Mean (ha)	Min (ha)	Count	Gross Area (ha)	Max (ha)	Mean (ha)	Min (ha)	Count	Gross Area (ha)	Max (ha)	Mean (ha)	Min (ha)	Count	Gross Area (ha)	Max (ha)	Mean (ha)	Min (ha)	Count	Gross Area (ha)
Establishment	0-25	25	7	0	878	5,774	25	5	0	2,387	12,678	25	4	0	3,316	12,178	25	5	0	1,988	10,768	25	5	0	2,254	11,239
	25.1-50	49	33	25	92	3,017	50	34	25	154	5,303	50	35	25	108	3,734	50	35	25	141	4,870	50	34	25	121	4,159
	50.1-100	96	67	50	31	2,069	99	70	50	58	4,059	98	73	50	63	4,589	97	68	50	58	3,954	97	68	50	45	3,042
	100.1-200	158	124	102	12	1,488	188	134	102	23	3,089	181	130	101	27	3,498	192	129	102	30	3,877	187	124	100	27	3,337
	200.1-400	215	215	215	1	215	335	260	215	6	1,563	298	244	201	6	1,464	301	252	215	3	755	323	256	207	6	1,534
	>400						539	487	435	2	974	2,258	1,180	485	5	5,902	458	437	416	2	874	1,293	773	506	3	2,319
Juvenile	0-25	25	4	0	3,074	13,181	25	4	0	3,408	14,890	25	3	0	5,066	15,927	25	3	0	5,019	16,281	25	3	0	5,087	15,856
	25.1-50	50	34	25	159	5,467	50	34	25	195	6,675	50	34	25	157	5,351	50	35	25	186	6,449	50	34	25	205	5,854
	50.1-100	99	68	50	96	6,574	98	69	50	94	6,452	99	73	50	110	7,999	100	74	50	106	7,841	100	70	50	116	5,898
	100.1-200	199	138	100	47	6,480	199	136	100	50	6,804	198	143	101	48	6,852	195	138	100	63	8,670	197	135	100	71	9,819
	200.1-400	380	275	210	26	7,155	378	305	206	12	3,655	380	262	203	27	7,080	369	265	200	39	10,340	392	263	206	36	7,937
	>400	1,787	745	417	20	14,904	1,680	670	405	20	13,409	1,522	766	401	21	16,094	6,602	1,116	412	24	26,781	3,927	832	402	24	34,183
Immature	0-25	25	4	0	2,818	11,398	25	5	0	2,273	10,230	25	4	0	4,466	17,569	25	3	0	6,139	16,731	25	3	0	5,800	16,089
	25.1-50	50	35	25	115	4,038	49	34	25	119	4,034	50	34	25	216	7,430	50	36	25	182	6,589	50	35	25	174	6,136
	50.1-100	99	71	51	60	4,289	99	71	50	72	5,139	99	68	50	112	7,660	99	72	50	109	7,876	100	72	50	97	6,937
	100.1-200	199	147	100	39	5,719	197	135	101	30	4,036	184	128	100	51	6,524	186	131	100	50	6,530	197	135	101	50	6,747
	200.1-400	385	287	204	18	5,164	389	271	201	21	5,699	389	279	204	12	3,346	393	286	204	15	4,290	333	247	200	22	5,425
	>400	12,672	1,598	404	30	47,927	3,718	1,342	436	18	24,161	1,750	770	400	16	12,321	2,927	1,010	439	12	12,121	1,122	698	403	10	6,982
Mature	0-25	25	4	0	4,155	16,165	25	4	0	4,832	17,393	25	4	0	2,861	10,605	25	4	0	4,077	14,699	25	3	0	3,103	9,384
	25.1-50	49	35	25	157	5,425	50	36	25	171	6,102	50	34	25	121	4,102	50	34	25	129	4,374	49	35	25	80	2,765
	50.1-100	99	71	51	87	6,184	100	69	50	119	8,238	98	71	50	86	6,116	99	69	50	87	6,040	98	68	50	52	3,561
	100.1-200	197	141	103	30	4,233	198	134	100	51	6,813	199	134	100	30	4,007	197	133	101	36	4,787	193	141	104	13	1,832
	200.1-400	384	272	212	25	6,801	360	266	204	28	7,453	398	273	201	17	4,648	374	285	212	17	4,848	392	279	206	8	2,231
	>400	4,732	1,144	543	16	18,307	3,853	1,098	417	25	27,457	4,000	1,225	436	19	23,272	1,604	748	406	13	9,727	507	465	412	4	1,860
Over Mature	0-25	25	4	0	1,740	6,419	25	2	0	2,895	7,011	25	3	0	3,836	9,646	25	2	0	4,500	7,671	25	2	0	4,782	11,178
	25.1-50	49	33	25	86	2,855	49	34	25	83	2,819	50	35	25	115	4,002	50	35	25	76	2,623	48	35	25	107	3,696
	50.1-100	100	69	51	39	2,677	97	68	51	39	2,654	98	70	50	43	3,008	97	70	51	40	2,809	99	72	50	65	4,698
	100.1-200	191	142	102	28	3,964	195	146	103	24	3,506	199	136	102	19	2,593	168	134	102	22	2,948	195	141	101	28	3,948
	200.1-400	339	258	217	4	1,033	398	274	205	3	823	314	260	216	9	2,342	382	295	202	7	2,066	385	274	214	22	6,030
	>400	1,542	950	431	5	4,752	560	560	560	1	560	961	637	433	6	3,819	1,177	686	438	8	5,488	5,541	1,539	404	18	27,709

### 6.2.1 LATE SERAL STAGE ANALYSIS

Figure 6-12 shows the percent of late seral stage present for the C-SW, C-PL, MIX, and DEC cover groups throughout the 160 year planning horizon for the Tolko and Joint FMA combined.

**FIGURE 6-12: LATE SERAL STAGE AREA BY COVER GROUP RETAINED ON THE GROSS LANDBASE FOR THE 160 YEAR PLANNING HORIZON – BOTH FMAs**

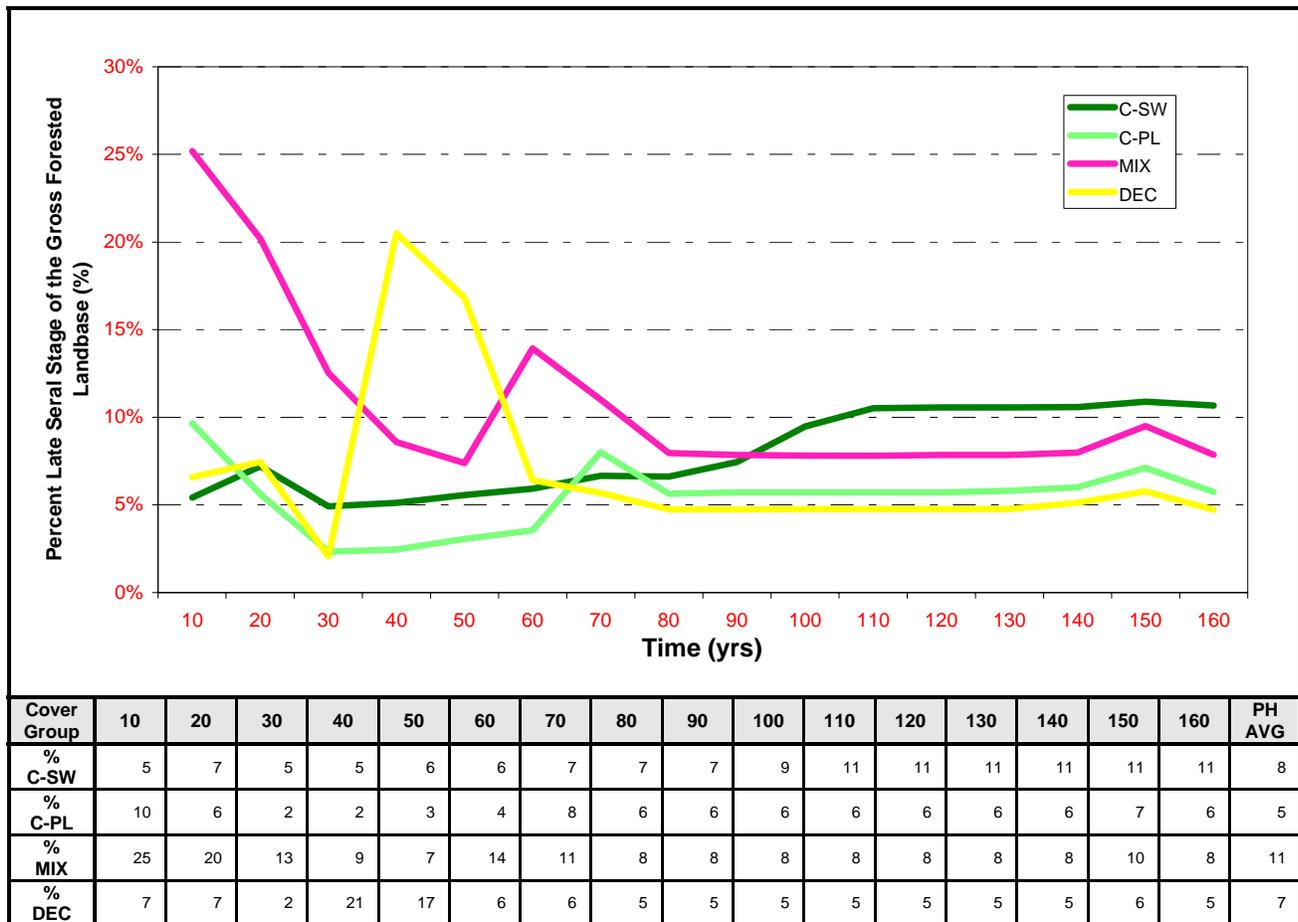
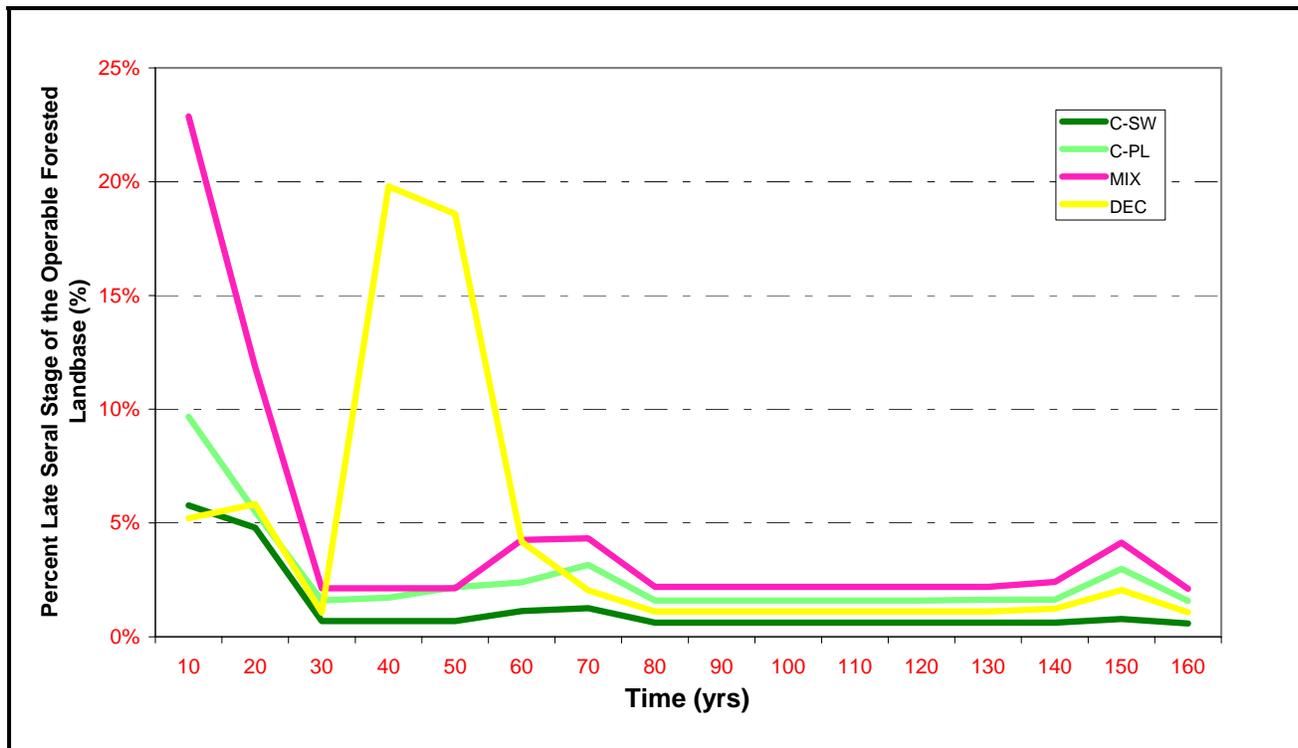


Figure 6-13 displays the amount of late seral stage present on the operable landbase throughout the 160 year planning horizon for the joint FMA, and Figure 6-14 and Figure 6-15 display the same information by Operating Area. The amount of late seral stage area to be retained is at or above the targets for all points in time. A drop in the total amount of area in late seral stage is observed on the operable landbase but this decrease is offset by the amount of area on the non-operable area that becomes late seral stage during the planning horizon. Figure 6-16 through to Figure 6-22 displays the amount of area in late seral stage for the gross and operable landbase for the entire FMA, and further breaks it down by cover type.

The structure retention component of this DFMP compliments the strategy of retaining late seral stage on the landbase. The structure left after harvesting should contribute late seral stage characteristics at an earlier age than would be expected if no structure is left following harvest. This will result in more area in the late seral stage class than is predicted and reported.

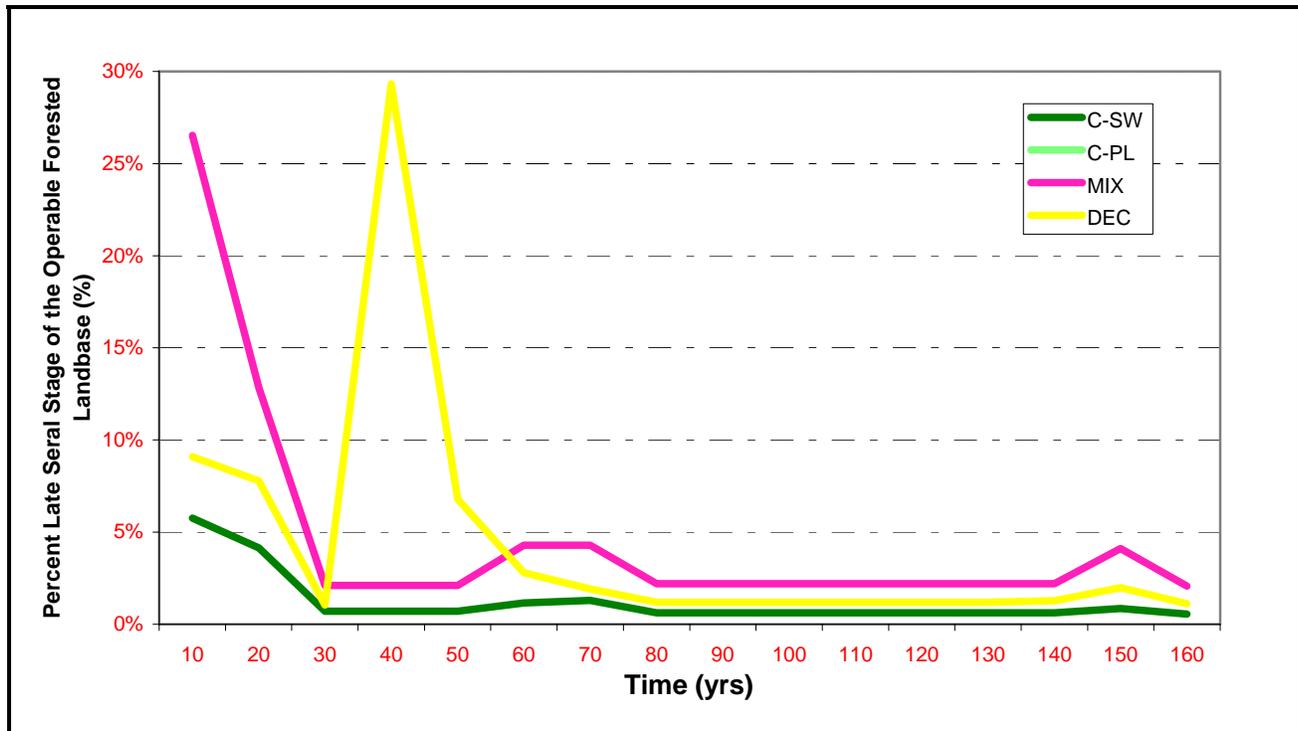
**FIGURE 6-13: LATE SERAL STAGE AREA BY COVER GROUP RETAINED ON THE OPERABLE LANDBASE FOR THE 160 YEAR PLANNING HORIZON - FMA**



Cover Group	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	PH AVG
% C-SW	5.8	4.8	0.7	0.7	0.7	1.1	1.3	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.6	1.3
% C-PL	9.7	5.5	1.6	1.7	2.2	2.4	3.2	1.6	1.6	1.6	1.6	1.6	1.6	1.6	3.0	1.6	2.6
% MIX	22.9	11.9	2.1	2.1	2.1	4.3	4.3	2.2	2.2	2.2	2.2	2.2	2.2	2.4	4.1	2.1	4.5
% DEC	5.2	5.8	1.1	19.8	18.6	4.2	2.0	1.1	1.1	1.1	1.1	1.1	1.1	1.2	2.1	1.1	4.2

\* Note: This figure only depicts the late seral stage on the operable portion of the landbase. Figure 6-12 depicts the entire amount of late seral stage on the forested landbase over time.

**FIGURE 6-14: LATE SERAL STAGE AREA BY COVER GROUP RETAINED ON THE OPERABLE LANDBASE FOR THE 160 YEAR PLANNING HORIZON – KIMIWAN**

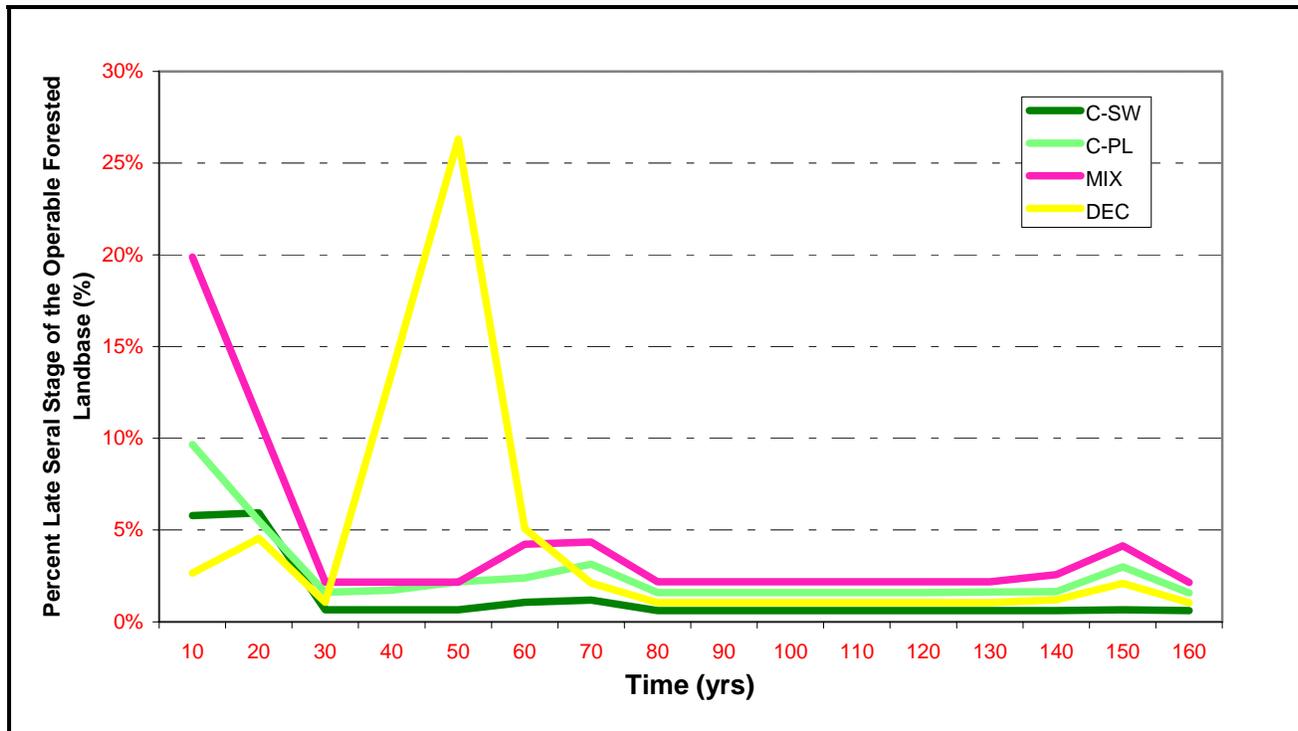


Cover Group	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	PH AVG
% C-SW	5.8	4.1	0.7	0.7	0.7	1.2	1.3	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.9	0.6	1.3
% C-PL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
% MIX	26.5	12.8	2.1	2.1	2.1	4.3	4.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	4.1	2.1	4.7
% DEC	9.1	7.8	1.0	29.3	6.8	2.8	1.9	1.2	1.2	1.2	1.2	1.2	1.2	1.3	2.0	1.1	4.4

\* Note: This figure only depicts the late seral stage on the operable portion of the landbase. Figure 6-12 depicts the entire amount of late seral stage on the forested landbase over time.

\*\* Note: C-PL cover group has been joined with Sweathouse.

**FIGURE 6-15: LATE SERAL STAGE AREA BY COVER GROUP RETAINED ON THE OPERABLE LANDBASE FOR THE 160 YEAR PLANNING HORIZON – SWEATHOUSE**

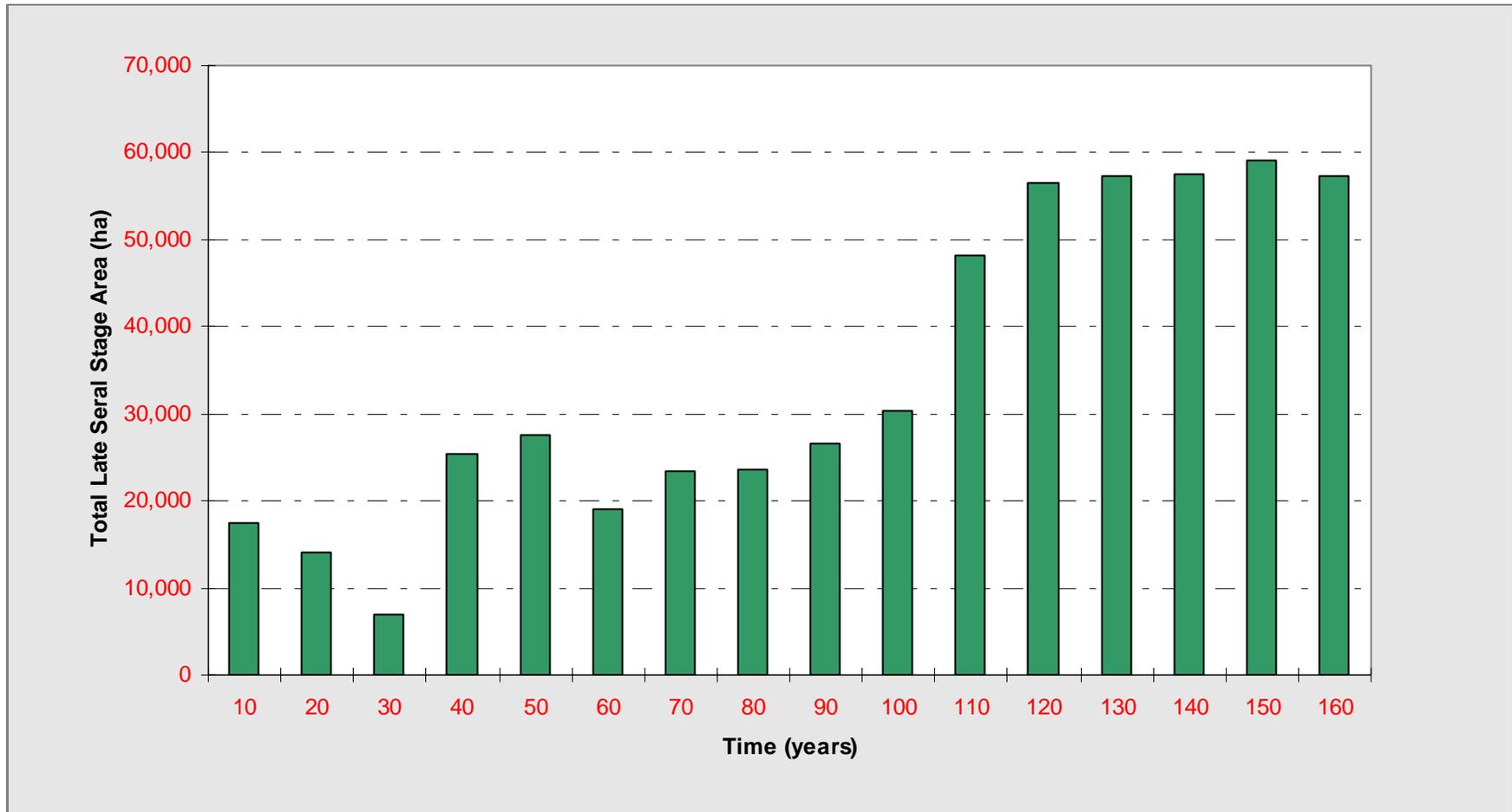


Cover Group	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	PH AVG
% C-SW	5.8	5.9	0.7	0.7	0.7	1.1	1.2	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	1.3
% C-PL	9.7	5.5	1.6	1.7	2.2	2.4	3.2	1.6	1.6	1.6	1.6	1.6	1.6	1.6	3.0	1.6	2.6
% MIX	19.9	11.1	2.2	2.2	2.2	4.2	4.3	2.2	2.2	2.2	2.2	2.2	2.2	2.6	4.1	2.1	4.2
% DEC	2.7	4.6	1.1	13.5	26.3	5.1	2.1	1.0	1.0	1.0	1.0	1.0	1.0	1.2	2.1	1.1	4.1

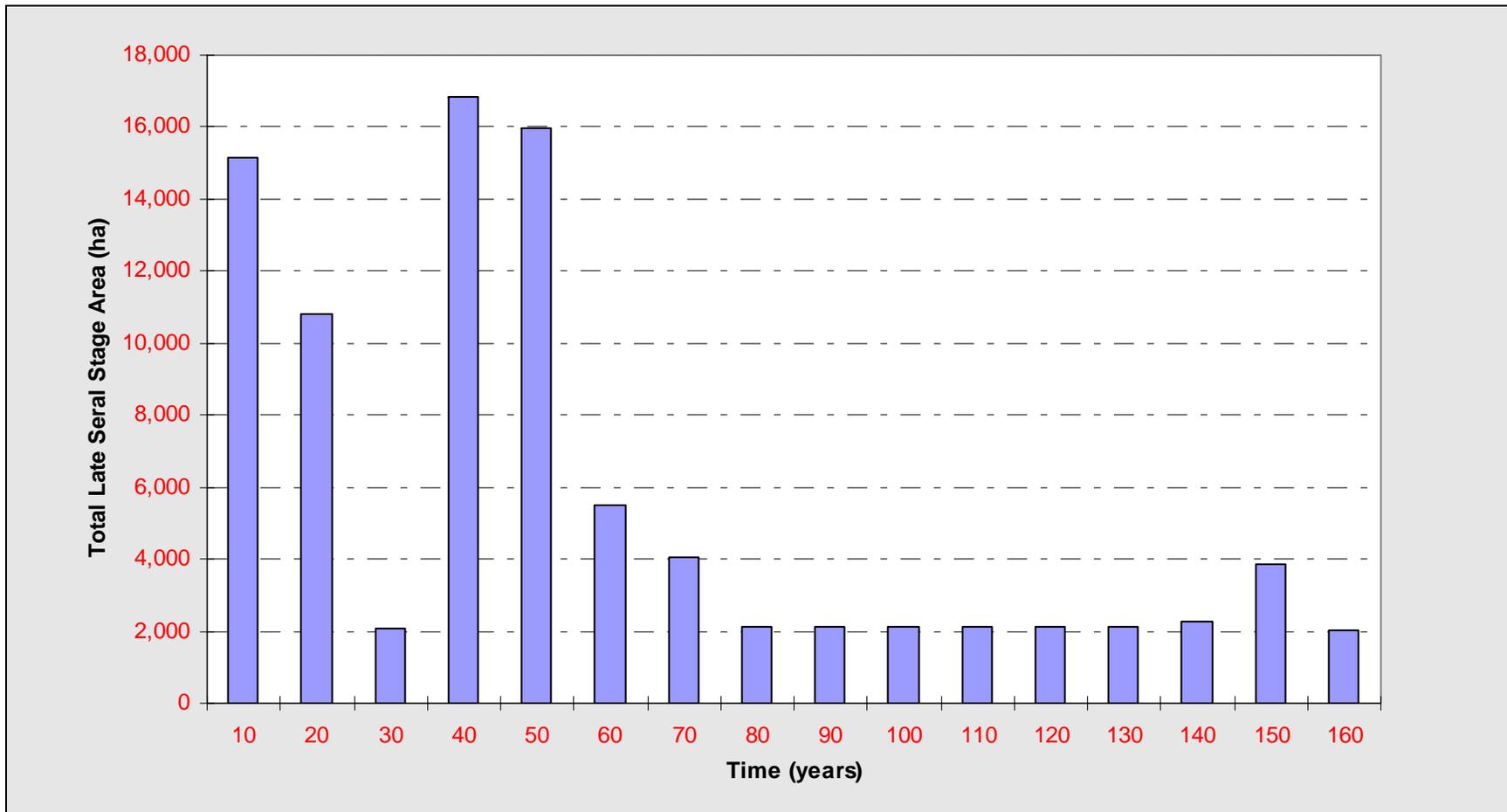
\* Note: This figure only depicts the late seral stage on the operable portion of the landbase. Figure 6-12 depicts the entire amount of late seral stage on the forested landbase over time.

\*\* Note: C-PL cover group includes the C-PL from Kimiwan.

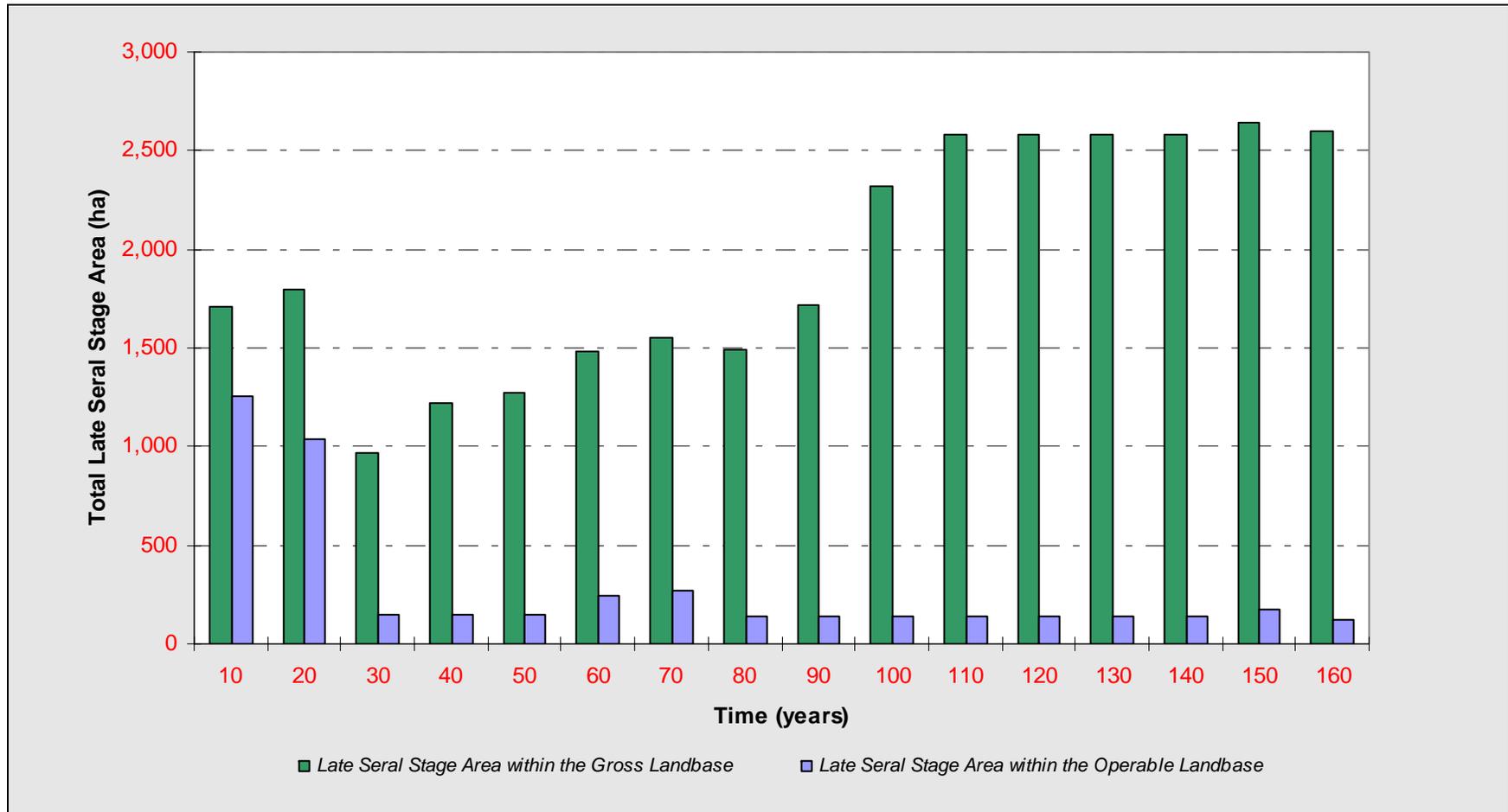
**FIGURE 6-16: AMOUNT OF LATE SERAL STAGE PRESENT ON THE GROSS FORESTED LANDBASE OVER TIME – ALL COVERTYPES**



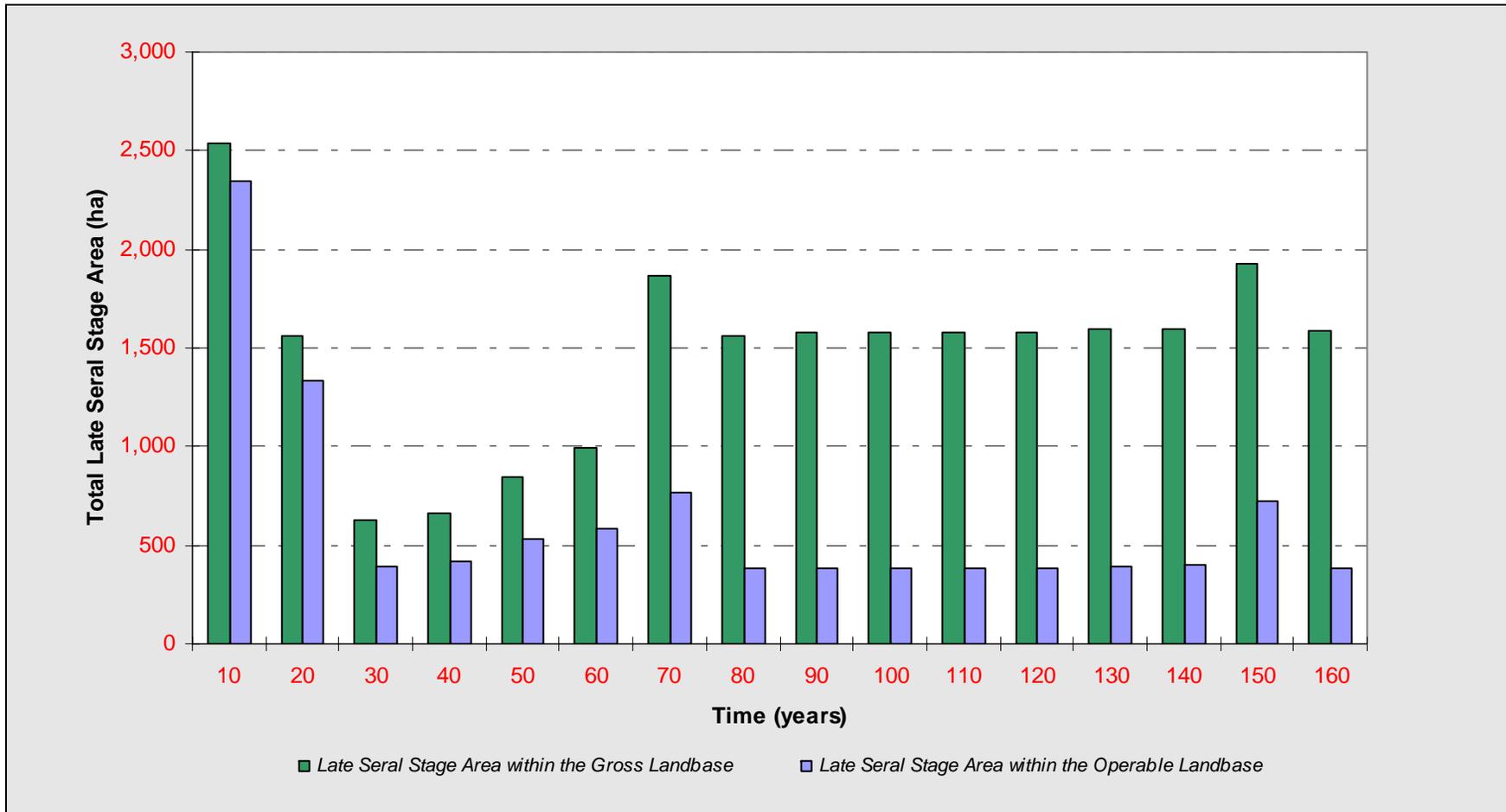
**FIGURE 6-17: AMOUNT OF LATE SERAL STAGE PRESENT ON THE OPERABLE FORESTED LANDBASE OVER TIME – ALL COVERTYPES**



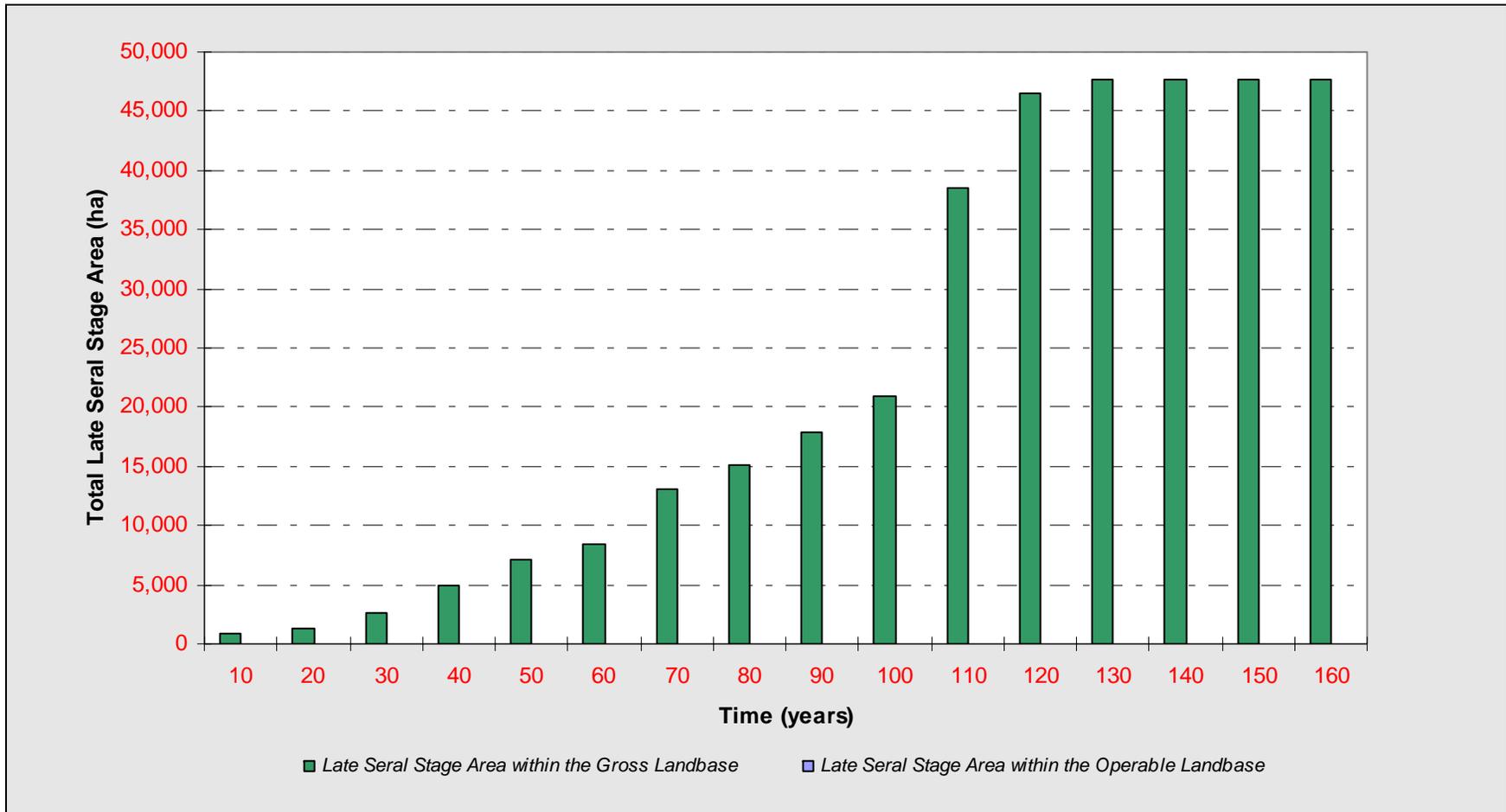
**FIGURE 6-18: AMOUNT OF LATE SERAL STAGE PRESENT ON THE FORESTED LANDBASE OVER TIME – CONIFER WHITE SPRUCE**



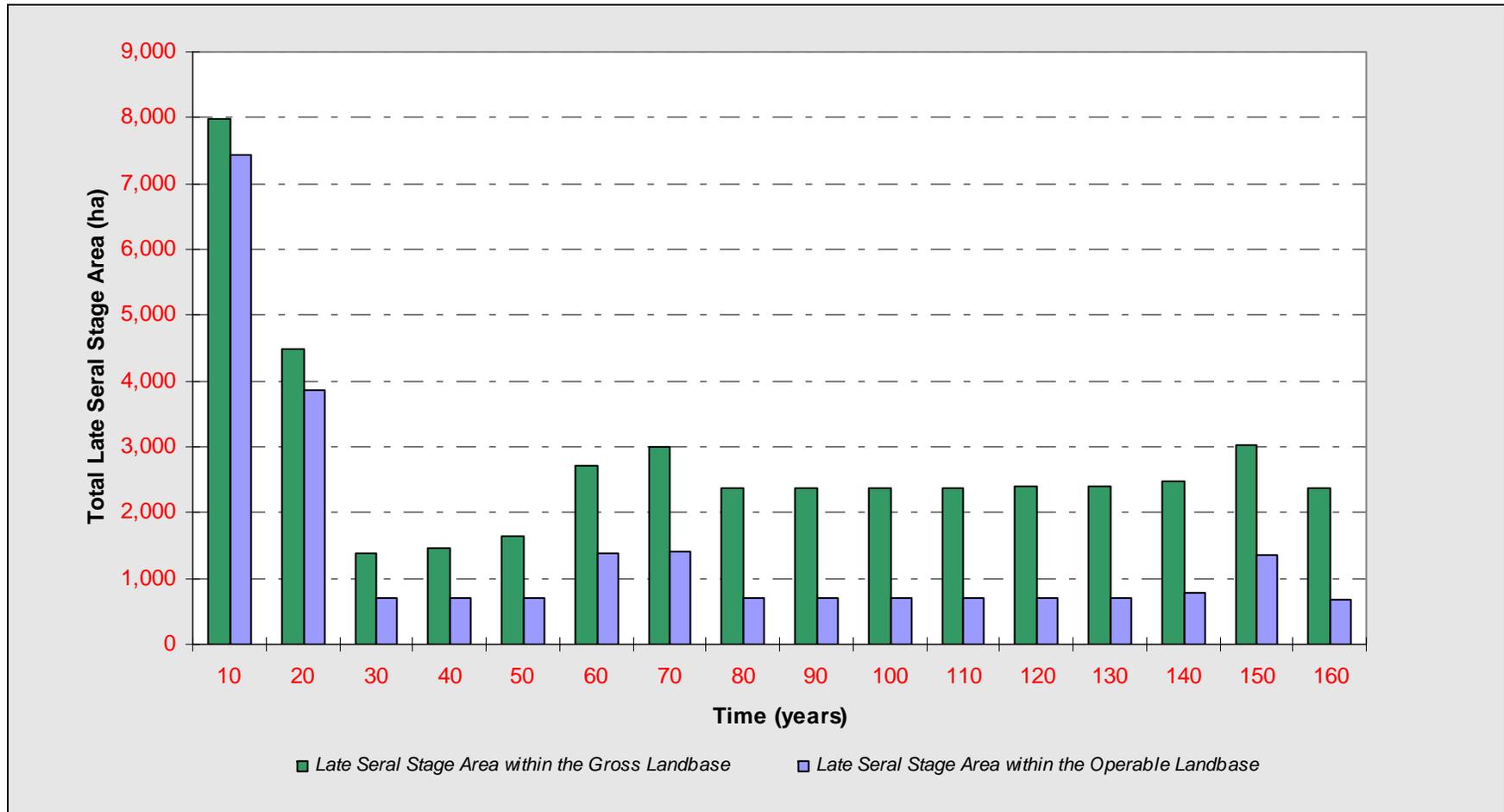
**FIGURE 6-19: AMOUNT OF LATE SERAL STAGE PRESENT ON THE FORESTED LANDBASE OVER TIME – CONIFER PINE**



**FIGURE 6-20: AMOUNT OF LATE SERAL STAGE PRESENT ON THE FORESTED LANDBASE OVER TIME – CONIFER BLACK SPRUCE**



**FIGURE 6-21: AMOUNT OF LATE SERAL STAGE PRESENT ON THE FORESTED LANDBASE OVER TIME – MIXEDWOOD**



**FIGURE 6-22: AMOUNT OF LATE SERAL STAGE PRESENT ON THE FORESTED LANDBASE OVER TIME – DECIDUOUS**

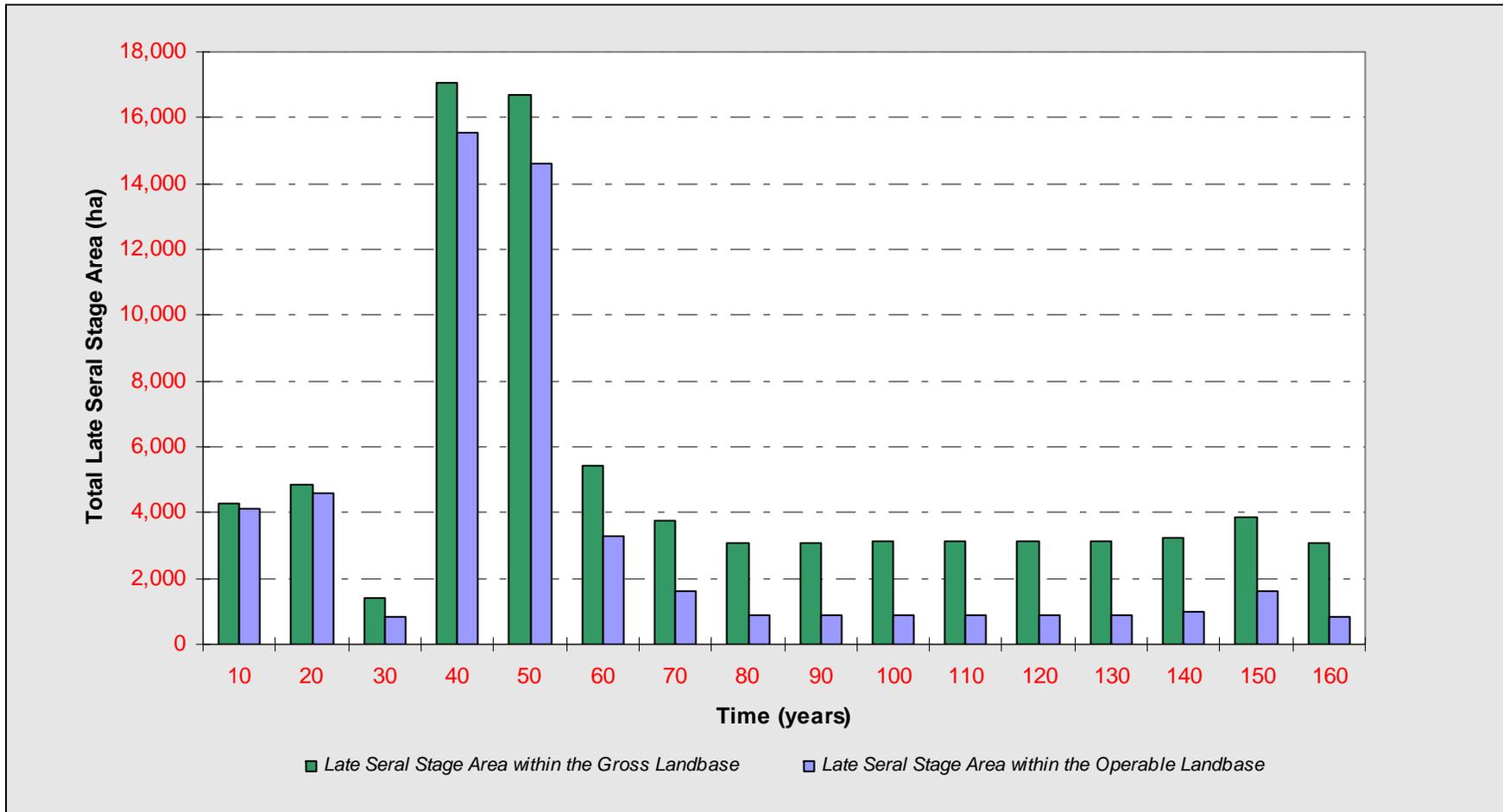
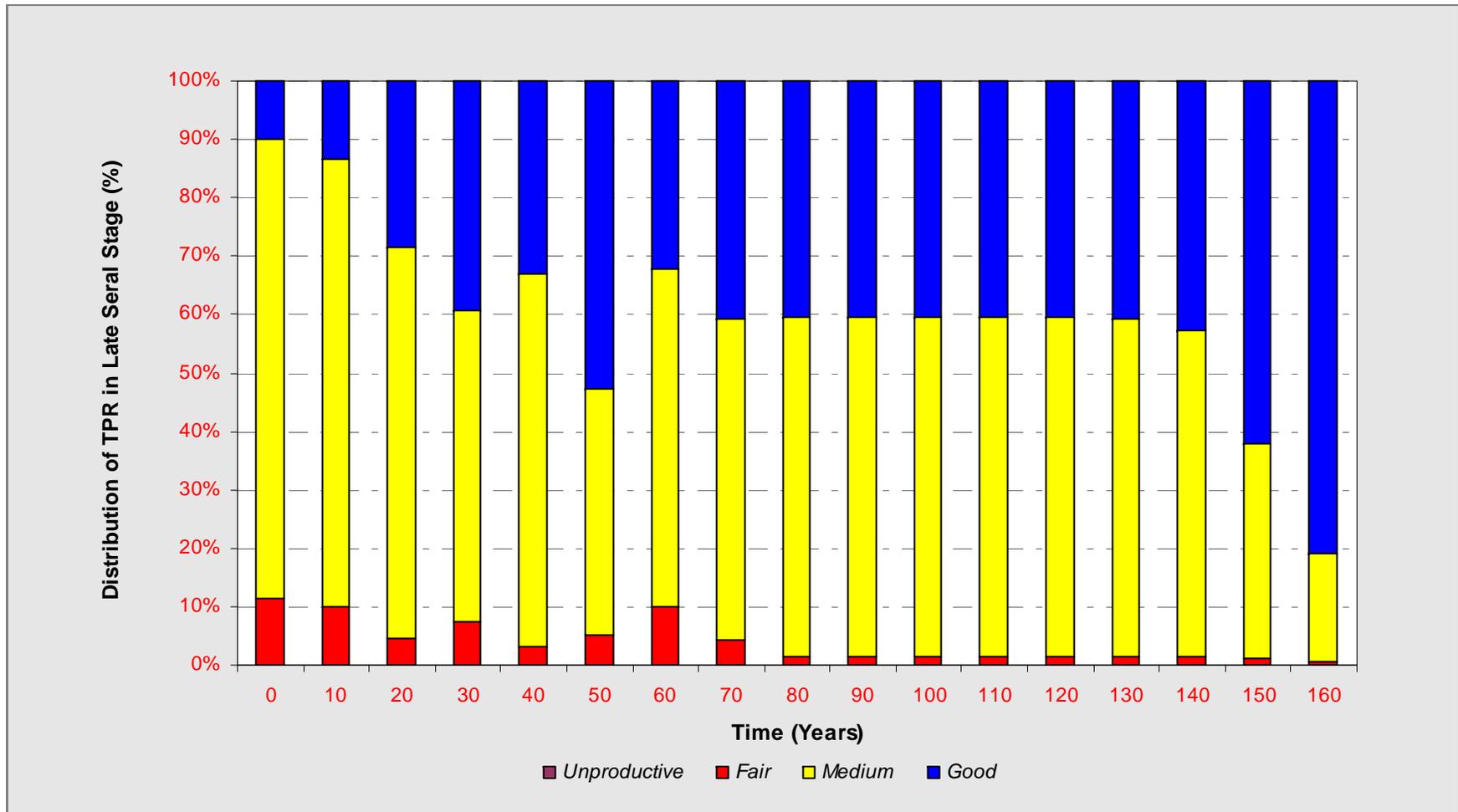


Figure 6-23 displays that late seral stage area retained on the operable landbase are comprised of a representative distribution of Timber Productivity Rating. In the later part of the planning horizon, more of the retained area is has a good Timber Productivity Rating.

**FIGURE 6-23: DISTRIBUTION OF THE TIMBER PRODUCTIVITY RATING OF LATE SERAL STAGE STANDS THROUGH TIME ON THE OPERABLE LANDBASE**



### 6.3 HARVEST AREA PATCH SIZE ANALYSIS

The contiguous harvest area patch size analysis is presented in Table 6-9. Based on the PFMS harvest sequence, harvest patches were developed by dissolving boundaries of polygons that were sequenced adjacent to another harvested polygon within a designated time period. These harvest patches were then classified into six patch size classes (0 – 25 ha, 25.1 – 50 ha, 50.1 – 100 ha, 100.1 – 200 ha, 200.1 – 400 ha, >400 ha) and three time periods (1 – 10 Years, 11 – 20 Years, 1 – 20 Years).

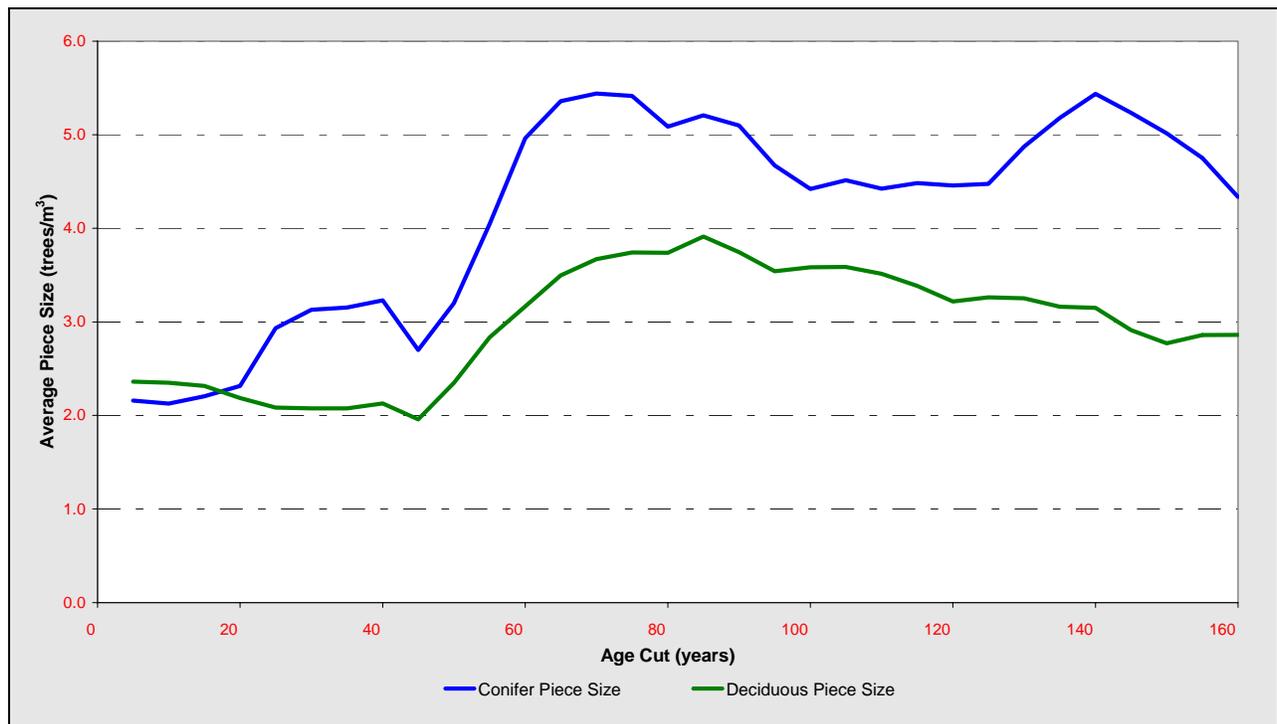
**TABLE 6-9: CONTIGUOUS HARVEST AREA PATCH SIZE ANALYSIS**

Patch Size	1 - 10 Years					11 – 20 Years					1 – 20 Years				
	Max. (ha)	Mean (ha)	Min. (ha)	Count	Sum (ha)	Max. (ha)	Mean (ha)	Min. (ha)	Count	Sum (ha)	Max. (ha)	Mean (ha)	Min. (ha)	Count	Sum (ha)
0 – 25 ha	25	5	0	2,125	10,780	25	5	0	2,020	9,807	25	5	0	3,027	15,604
25.1 – 50 ha	50	35	25	115	3,980	50	36	25	86	3,069	50	35	25	176	6,161
50.1 – 100 ha	99	71	50	50	3,565	96	69	51	56	3,839	97	71	51	107	7,595
100.1 – 200 ha	188	135	104	18	2,434	188	130	103	24	3,127	188	131	102	46	6,046
200.1 – 400 ha	343	282	218	6	1,690	316	258	218	8	2,067	389	289	214	22	6,352
> 400 ha	435	435	435	1	435	1,293	1,293	1,293	1	1,293	1,305	618	409	7	4,328

## 6.4 PIECE SIZE ANALYSIS

The PFMS piece size trends are presented in Figure 6-24 for both conifer and deciduous species. Piece size summaries were determined using a projected height for each time period that was calculated using projected stand age of the period and the Provincial site index equation given in the Alberta Vegetation Inventory Standards Manual Version 2.2 (ASRD 1997). This projected height was then used to assign a sampling stratum for each stand in each period. Stratum volume and density tables were matched to the sampling strata to determine an average piece size in each time period. Note that because heights were projected into the future in order to determine sampling strata, piece size calculations beyond 20 years may not be very reliable.

**FIGURE 6-24: PIECE SIZE TRENDS OVER TIME (20 YEAR MOVING AVERAGE)**



## 6.5 TRAPLINE ANALYSIS

Based on the PFMS, a seral stage analysis was done for each trapline area on the FMA to determine how the PFMS harvest sequence will effect the seral stage distribution of each trapline over time. The analysis assesses the total gross area with the gross forested area broken out by five seral stage groupings (establishment, juvenile, immature, mature, over-mature) and five future forest projections (current, 10 year, 40 year, 80 year, 160 year). The seral stage summary by trapline showing the percent of gross area within each seral stage by trapline is given in Table 6-10.

**TABLE 6-10: SERAL STAGE SUMMARY BY TRAPLINE<sup>15</sup>**

Trapline Number	Gross Trapline Area Within FMA (ha)	Total Trapline Area (ha)	% of Trapline Within FMA	Non-Forested (% Gross Area)	Current Forest (% of Gross Area)					Future Forest 10 Years Current Forest (% of Gross Area)					Future Forest 40 Years Current Forest (% of Gross Area)					Future Forest 80 Years Current Forest (% of Gross Area)					Future Forest 160 Years Current Forest (% of Gross Area)				
					EST	JUV	IMM	MAT	OMAT	EST	JUV	IMM	MAT	OMAT	EST	JUV	IMM	MAT	OMAT	EST	JUV	IMM	MAT	OMAT	EST	JUV	IMM	MAT	OMAT
101	1,318	15,750	8	1	14	14	35	24	12	13	23	23	28	12	7	46	13	25	8	18	37	24	11	9	20	36	16	11	15
151	8,332	14,315	58	6	0	33	46	11	3	4	27	42	19	1	4	6	23	44	17	2	46	4	25	17	6	35	12	1	40
332	10,302	17,558	59	28	20	16	5	11	20	26	15	6	10	15	1	35	22	9	4	23	21	17	4	8	21	22	16	1	11
335	2,584	1,078	12	5	0	30	44	9	13	11	21	43	12	7	20	21	21	29	4	7	51	10	21	7	9	51	12	0	24
1331	1,578	32,165	5	14	0	19	43	23	0	18	14	11	43	1	11	17	7	12	38	17	30	30	5	4	17	19	39	2	9
1445	4,739	7,497	63	23	22	24	10	10	11	12	39	4	11	10	3	17	46	6	5	24	25	18	6	3	11	36	18	4	8
1530	22,120	25,185	88	7	5	31	25	17	14	11	32	17	22	10	9	25	34	17	7	9	16	23	30	14	12	13	16	13	39
1700	18,962	37,815	50	13	2	20	28	35	2	3	21	17	44	3	9	30	20	21	6	4	15	17	33	16	3	14	13	23	34
1760	855	10,105	8	9	0	22	58	10	0	0	21	34	34	2	3	0	19	34	35	0	50	1	19	21	0	30	20	0	40
1941	11,767	14,022	84	5	1	24	51	14	4	6	21	28	37	3	18	7	19	28	23	5	35	22	16	16	6	26	31	1	31
2002	6,862	43,430	16	16	8	16	18	27	15	19	18	10	25	12	5	38	18	16	7	15	22	20	9	17	14	25	13	8	24
2048	3,699	12,102	31	8	0	12	72	4	4	5	5	69	12	2	4	7	5	69	7	1	76	7	7	1	4	59	23	1	6
2321	1,830	11,441	16	5	0	20	64	10	1	3	11	58	22	0	4	8	11	59	13	1	69	10	12	3	3	43	31	5	13
2387	31,902	46,479	69	4	2	21	45	28	1	10	20	31	33	2	23	22	15	27	10	14	41	16	16	9	13	39	18	5	22
2389	1,045	20,875	5	7	0	40	38	15	0	1	25	25	41	2	35	10	23	24	1	0	23	28	41	1	4	21	25	4	38
2427	5,729	9,421	61	23	5	41	10	20	1	5	44	6	21	1	16	5	45	4	7	7	22	10	35	2	1	27	10	0	39
2535	42,732	42,732	100	12	7	23	21	28	8	10	23	14	31	9	10	22	31	12	13	10	26	28	20	4	6	29	21	13	19
2585	5,560	8,663	64	8	1	15	27	27	22	16	12	8	42	13	14	24	23	7	23	4	34	32	15	7	9	31	23	12	16
2714	21,363	27,976	76	6	5	14	41	21	13	10	13	32	29	10	15	27	13	31	8	10	41	24	12	7	15	32	28	6	13
2819	4,361	21,143	21	6	0	33	38	22	0	0	28	28	36	2	19	19	14	29	14	2	41	9	30	12	15	32	14	4	29
2941	38,513	47,724	81	4	4	18	33	27	14	19	16	20	33	9	15	33	18	21	8	12	31	31	10	12	14	30	22	11	20

<sup>15</sup> Total Trapline areas were derived from 1:1,000,000 provincial data. If discrepancies were noted between the trapline areas derived for net landbase purposes and the provincial data, the areas used for the net landbase were used.

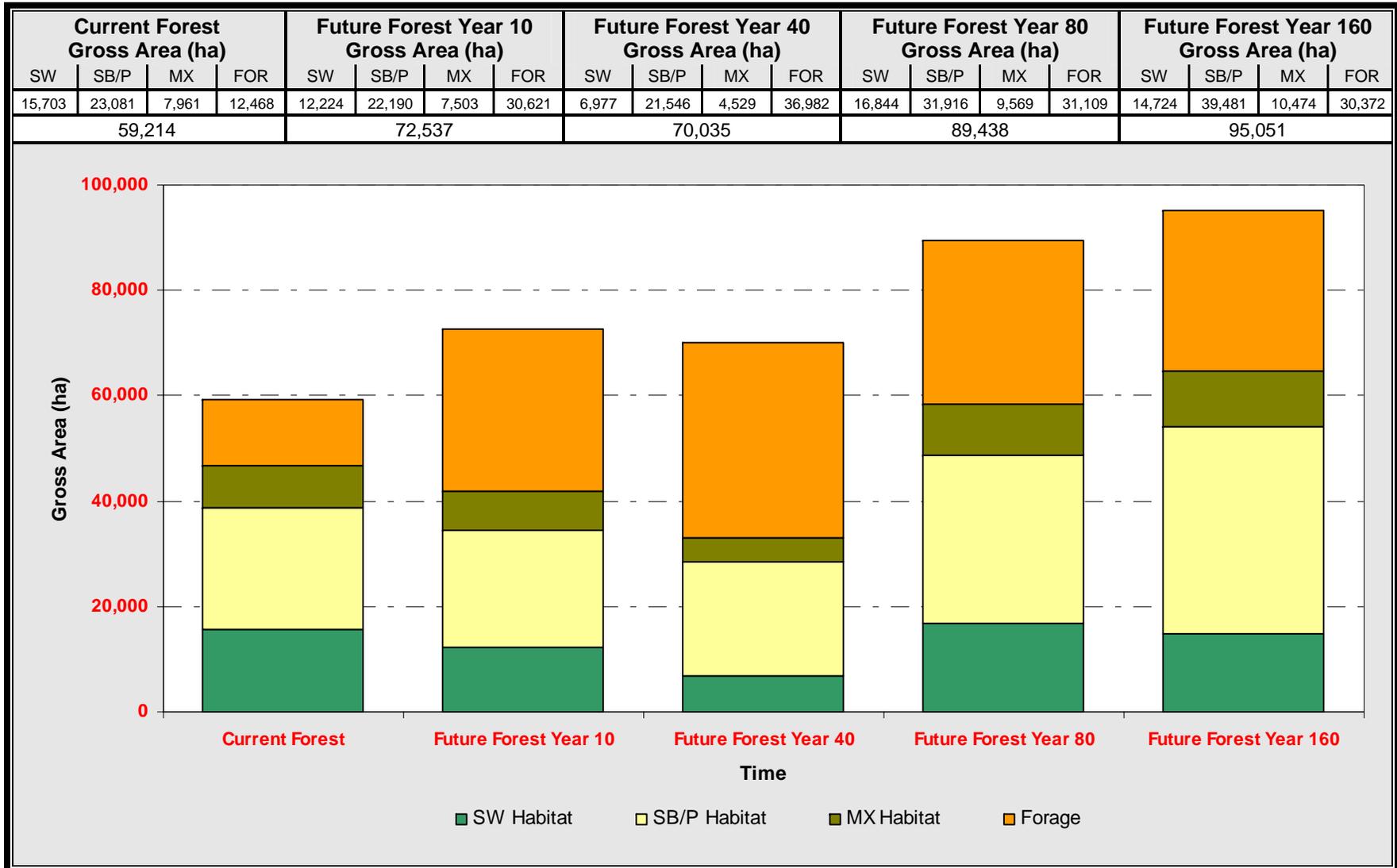
## 6.6 WILDLIFE HABITAT DISTRIBUTION ANALYSIS

In order to predict the effect that the PFMS will have on wildlife habitat within the FMA area, an analysis of the amount of habitat of four key wildlife species was undertaken. The species included, American Marten (*Martes americana*), Moose (*Alces alces*), Pileated Woodpecker (*Dryocopus pileatus*), and Northern Goshawk (*Accipiter gentilis*). The analysis compared data from the current forest and the future forest at projections of 10 years, 40 years, 80 years, and 160 years. For each of the time periods, a set of criteria (Table 6-11) was used to determine which stands qualified as habitat for each of the species. These stands are illustrated in Map 6-17 through Map 6-36 (full size maps can be found in Appendix I, Map I-12 to I-16 and Appendix J, Map J-1 to Map J-15). Figure 6-25 through Figure 6-28 summarize the total habitat area for each species at the current and future states of the forest. It is important to note that the late seral strategy contributed directly to the habitat of each of these four key wildlife species. In this analysis, the grazing lease areas were not included.

**TABLE 6-11: HABITAT DISTRIBUTION ANALYSIS CRITERIA**

SPECIES	HABITAT CRITERIA
<b>Moose</b> <i>(Alces alces)</i>	<ul style="list-style-type: none"> <li>◆ Crown closure between 31% and 100% (B,C, or D density).</li> <li>◆ Leading species of White Spruce, Black Spruce, Jack Pine or Lodgepole Pine.</li> <li>◆ Tree height greater than 10m</li> </ul> <p style="text-align: center;"><b>OR</b></p> <ul style="list-style-type: none"> <li>◆ Deciduous overstorey with an understorey meeting the same specifications listed above</li> </ul> <p style="text-align: center;"><b>OR</b></p> <ul style="list-style-type: none"> <li>◆ Mixedwood stand with a closure between 51% and 100% (C or D density) and a tree height greater than 10m</li> </ul> <p style="text-align: center;"><b>◆ Forage criteria:</b> cutblocks less than 20 years old</p>
<b>American Marten</b> <i>(Martes americana)</i>	<ul style="list-style-type: none"> <li>◆ Crown closure between 51% and 100% (C or D density).</li> <li>◆ Canopy composition of Black Spruce, White Spruce, and/or Balsam Fir greater than 50%</li> <li>◆ Tree height greater than 15m</li> <li>◆ Stand age greater than 90 years</li> </ul> <p style="text-align: center;"><b>OR</b></p> <ul style="list-style-type: none"> <li>◆ Deciduous overstorey with an understorey meeting the same specifications listed above</li> </ul> <p style="text-align: center;"><b>◆ Forage criteria:</b> cutblocks greater than or equal to 30 years and less than or equal to 90 years old adjacent to stands meeting the above habitat criteria</p>
<b>Northern Goshawk</b> <i>(Accipiter gentilis)</i>	<ul style="list-style-type: none"> <li>◆ Crown closure between 51% and 100% (C or D density).</li> <li>◆ Mixedwood or deciduous dominated stand</li> <li>◆ Tree height greater than 10m</li> </ul>
<b>Pileated Woodpecker</b> <i>(Dryocopus pileatus)</i>	<ul style="list-style-type: none"> <li>◆ Crown closure between 51% and 100% (C or D density).</li> <li>◆ Canopy composition of Aspen and/or Balsam Poplar greater than 50%</li> <li>◆ Stand age greater than 40 years</li> </ul>

**FIGURE 6-25: MOOSE HABITAT SUMMARY**



## **MAP 6-17: CURRENT MOOSE HABITAT DISTRIBUTION ANALYSIS**

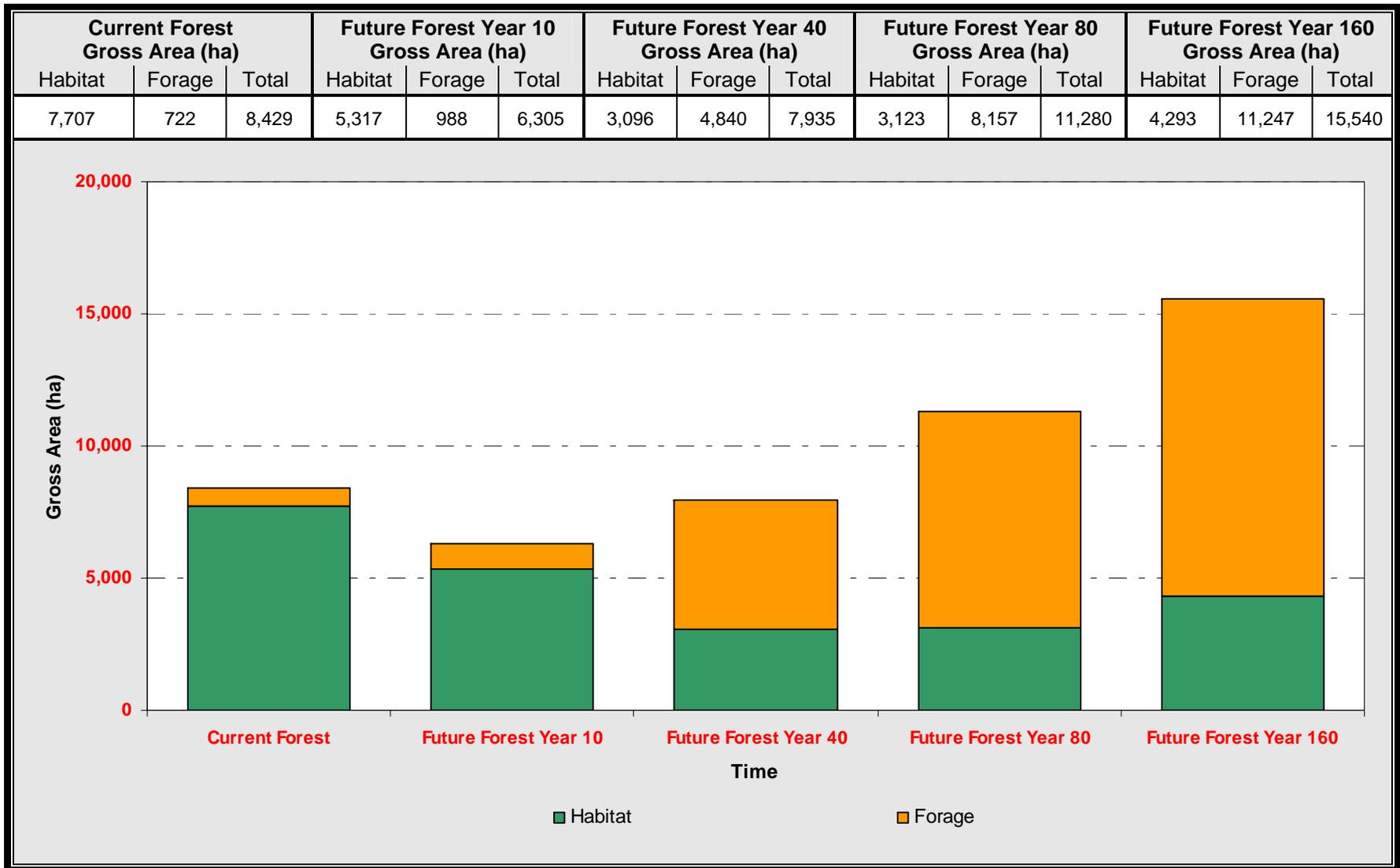
## **MAP 6-18: YEAR 10 MOOSE HABITAT DISTRIBUTION ANALYSIS**

## **MAP 6-19: YEAR 40 MOOSE HABITAT DISTRIBUTION ANALYSIS**

## **MAP 6-20: YEAR 80 MOOSE HABITAT DISTRIBUTION ANALYSIS**

## **MAP 6-21: YEAR 160 MOOSE HABITAT DISTRIBUTION ANALYSIS**

**FIGURE 6-26: AMERICAN MARTEN HABITAT SUMMARY**



## **MAP 6-22: CURRENT AMERICAN MARTEN HABITAT DISTRIBUTION ANALYSIS**

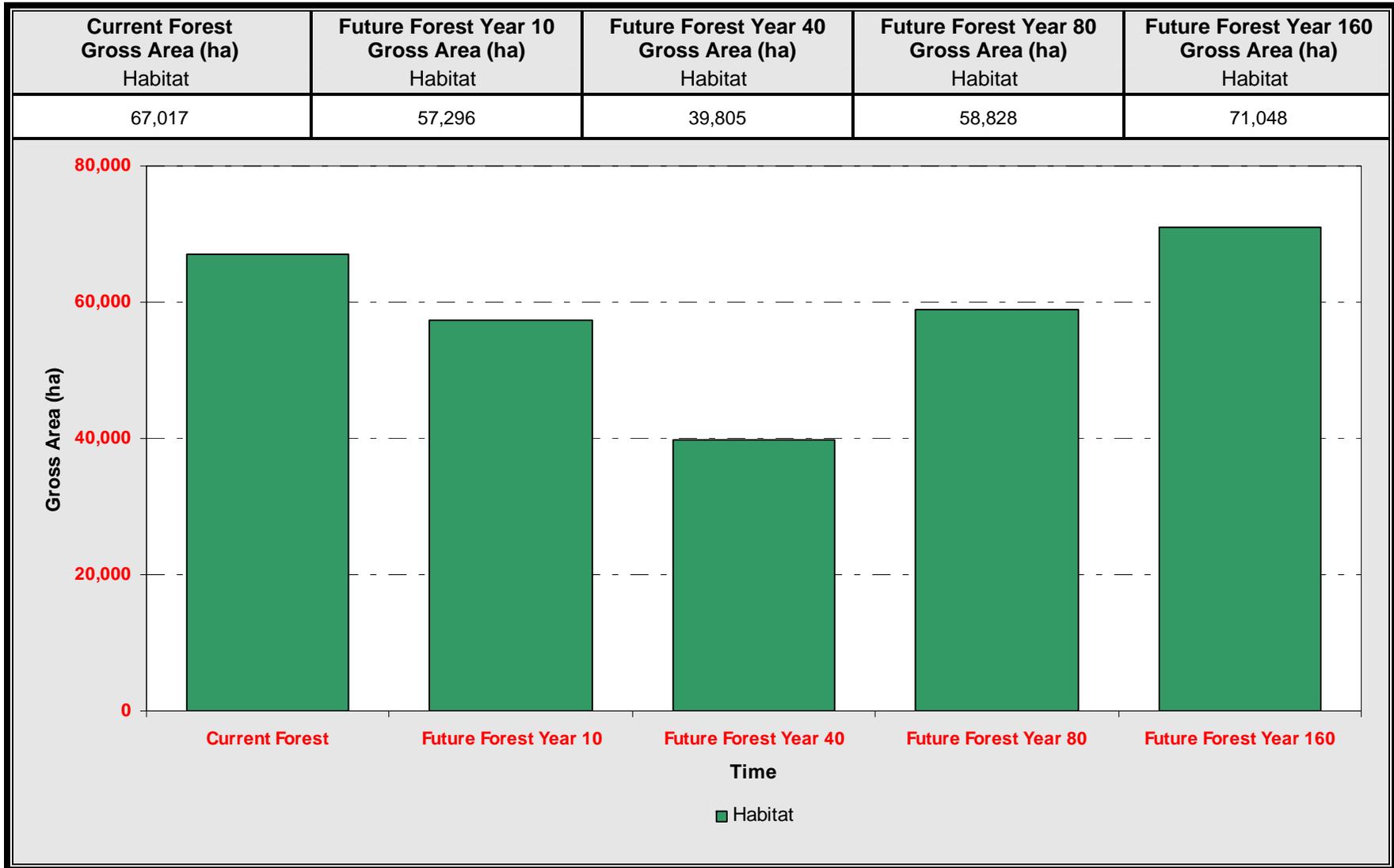
## **MAP 6-23: YEAR 10 AMERICAN MARTEN HABITAT DISTRIBUTION ANALYSIS**

## **MAP 6-24: YEAR 40 AMERICAN MARTEN HABITAT DISTRIBUTION ANALYSIS**

## **MAP 6-25: YEAR 80 AMERICAN MARTEN HABITAT DISTRIBUTION ANALYSIS**

## **MAP 6-26: YEAR 160 AMERICAN MARTEN HABITAT DISTRIBUTION ANALYSIS**

**FIGURE 6-27: NORTHERN GOSHAWK HABITAT SUMMARY**



## **MAP 6-27: CURRENT NORTHERN GOSHAWK HABITAT DISTRIBUTION ANALYSIS MAP**

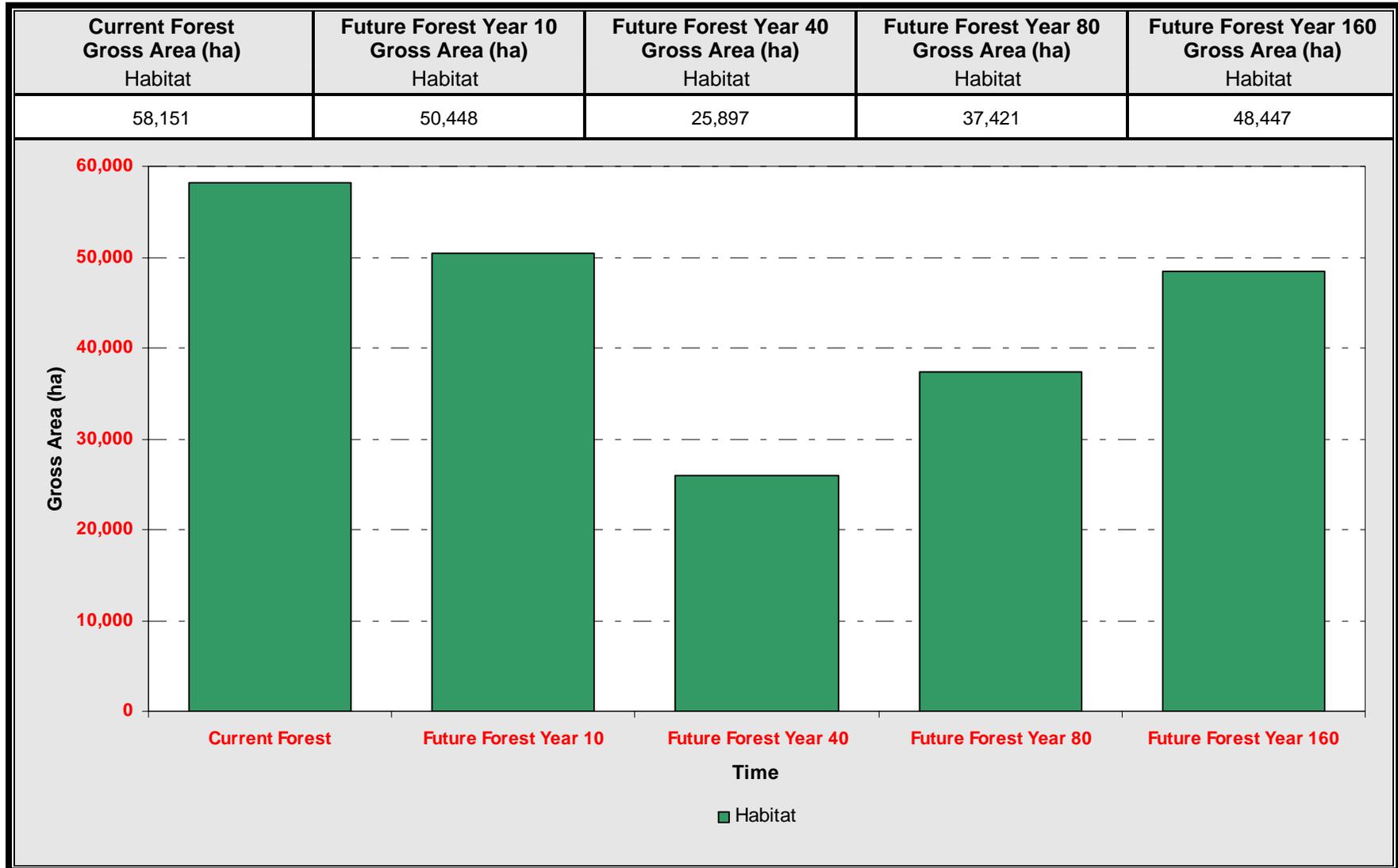
## **MAP 6-28: YEAR 10 NORTHERN GOSHAWK HABITAT DISTRIBUTION ANALYSIS**

## **MAP 6-29: YEAR 40 NORTHERN GOSHAWK HABITAT DISTRIBUTION ANALYSIS**

## **MAP 6-30: YEAR 80 NORTHERN GOSHAWK HABITAT DISTRIBUTION ANALYSIS**

## **MAP 6-31: YEAR 160 NORTHERN GOSHAWK HABITAT DISTRIBUTION ANALYSIS**

**FIGURE 6-28: PILEATED WOODPECKER HABITAT SUMMARY**



## **MAP 6-32: CURRENT PILEATED WOODPECKER HABITAT DISTRIBUTION ANALYSIS**

## **MAP 6-33: YEAR 10 PILEATED WOODPECKER HABITAT DISTRIBUTION ANALYSIS**

## **MAP 6-34: YEAR 40 PILEATED WOODPECKER HABITAT DISTRIBUTION ANALYSIS**

## **MAP 6-35: YEAR 80 PILEATED WOODPECKER HABITAT DISTRIBUTION ANALYSIS**

## **MAP 6-36: YEAR 160 PILEATED WOODPECKER HABITAT DISTRIBUTION ANALYSIS**

## 6.7 WATERSHED ANALYSIS

Watersheds were assessed using two methods of analysis to determine what effect the PFMS harvest sequence would have on each watershed.

The first analysis presented in Table 6-12 shows how much of the gross forested area within each watershed is below certain age thresholds. The age threshold is the age at which the leaf area index of a disturbed stand recovers to pre-harvest conditions (D-10 years, DC-15 years, CD-40 years, C-Pine-25 years, C-White Spruce-40 years, C-Black Spruce-40 years).

The second analysis uses the Cumulative Watershed Disturbance and Hydrologic Recovery Simulator (ECA-Alberta), to determine what effect the PFMS harvest sequence would have on each of the 28 watersheds. ECA stands for “equivalent clearcut area” which describes the “effective” area that a recovering historic disturbance currently represents in terms of its ecological effects. The model was used to evaluate the cumulative effect of proposed forest harvesting on streamflow in a watershed.

To accomplish this, the model requires a data set of future areas disturbed by species and timber productivity rating. Using this information, along with regional long term average precipitation and streamflow data and provincial average growth/yield data (to predict rate of hydrologic recovery), the model will calculate the equivalent clearcut area and resulting change in annual streamflow. Separate long term streamflow and precipitation averages were derived for each operating area.

The results of the watershed analysis showing percent of gross watershed area harvested, percent equivalent clearcut area, and percent change in long term average annual yield over time, for each watershed, are presented in Figure 6-29 through Figure 6-35. The relationship between percent change in long term average annual yield and equivalent clearcut area differs greatly depending on the initial streamflow and precipitation model inputs (Table 6-13). Table 6-14 summarizes this relationship between equivalent clearcut area and percent change in long term average annual yield realized in this analysis. For maps showing the percent equivalent clearcut area by watershed at 10 and 20 years in the future, refer to Map 6-37 and Map 6-38 (full size maps can be found in Appendix J, Map J-16 to J-17). Much of the material in this section is referenced from the ECA-Alberta Model. An additional external review, assessment and analysis of risk of the Cumulative Watershed Disturbance and Hydrologic Recovery Simulator (ECA-Alberta) results presented here can be found in Appendix G.

### NOTE:

- ◆ Streamflow gauging station(s), with at least 5 years of data, representing a watershed with like topography and vegetation to those of a given operating area were used to derive the long term streamflow averages, Table 6-13 displays these averages.
- ◆ Precipitation station(s) within close proximity to a given operating area were used to derive the long term precipitation averages; Table 6-13 displays these averages.
- ◆ Most streamflow gauging stations are shut down during certain times of the year and therefore, the gaps in data must be estimated to determine a year round average;
- ◆ Model accuracy depends primarily on accurate hydrologic recovery information of forest stands after disturbance, as well as representative regional streamflow and precipitation data;
- ◆ Hydrologic recovery of mixedwood stands is not simulated by this model;
- ◆ Model assumes that maximum volume growth rate represents the age at which full hydrologic recovery is obtained.

- ◆ Model calculations reflect provincial averages for unmanaged (primarily fire origin) stands;
- ◆ Deviation of regional forest growth from provincial averages may produce unreliable results for some regions;
- ◆ This analysis only represents the incremental cumulative effect of harvesting;
- ◆ The objective of this model is not to produce a detailed, highly accurate simulation of streamflow, but rather a projection of streamflow changes over time assuming average climatic conditions in the region;
- ◆ ECA-Alberta describes how disturbance will affect streamflow based on long-term climatic conditions and may not represent actual changes in any given year.

**TABLE 6-12: PERCENT OF GROSS FORESTED AREA BELOW AGE THRESHOLD<sup>16</sup>  
 BY WATERSHED**

WATERSHED #	GROSS FORESTED AREA (ha)	% OF GROSS FORESTED AREA BELOW THRESHOLD <sup>3</sup>		
		CURRENT	10 YEARS	20 YEARS
1-Sweathouse	3,298	27	28	50
2-Sweathouse	5,806	42	37	33
3-Sweathouse	12,023	1	14	12
4-Sweathouse	11,414	21	30	35
5-Sweathouse	5,357	5	19	16
6-Sweathouse	17,751	4	20	21
7-Sweathouse	4,393	11	21	30
8-Sweathouse	15,726	4	12	13
9-Sweathouse	9,465	3	13	7
10-Sweathouse	4,054	2	9	5
11-Sweathouse	1,209	0	5	4
12-Sweathouse	25,508	0	5	6
13-Sweathouse	5,139	0	2	21
14-Sweathouse	9,623	5	13	23
15-Sweathouse	3,058	15	10	13
16-Kimiwan	8,501	9	12	25
17-Kimiwan	4,131	16	21	48
18-Kimiwan	2,810	17	24	31
19-Kimiwan	4,357	30	33	35
20-Kimiwan	7,617	10	18	23
21-Kimiwan	7,327	7	14	8
22-Kimiwan	7,885	4	23	18
23-Kimiwan	8,549	6	20	13
24-Kimiwan	7,146	13	18	20
25-Kimiwan	6,487	6	29	19
26-Kimiwan	10,113	4	8	17
27-Kimiwan	9,078	3	6	29
28-Kimiwan	5,941	0	2	18

**TABLE 6-13: CUMULATIVE WATERSHED DISTURBANCE AND HYDROLOGICAL RECOVERY ANALYSIS: MODEL INPUT STREAMFLOW AND PRECIPITATION PARAMETERS**

OPERATING AREA	LONG TERM STREAMFLOW AVERAGE (MM/YR)	LONG TERM PRECIPITATION AVERAGE (MM/YR)
Kimiwan	43	457
Sweathouse	147	491

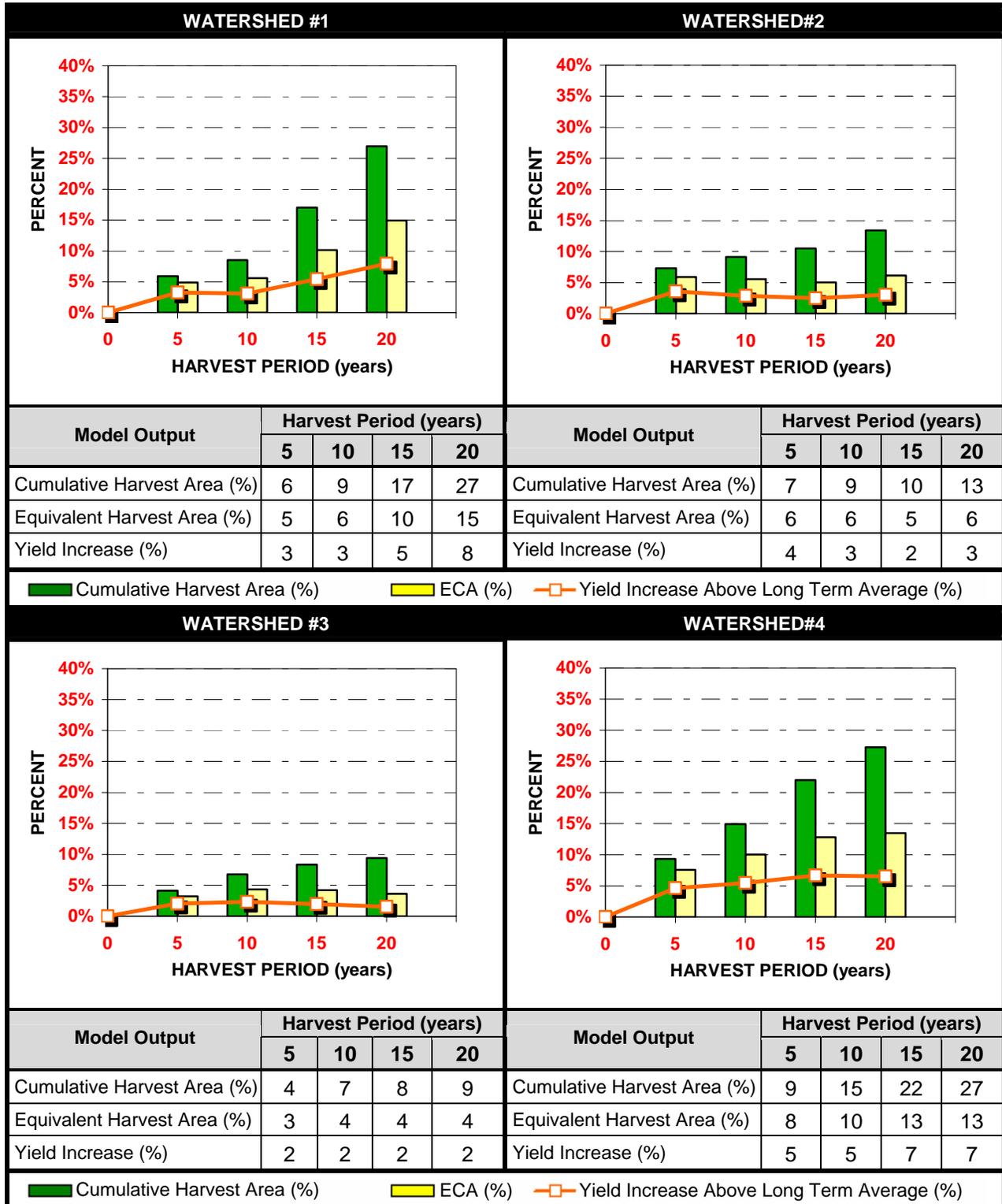
<sup>16</sup>Age Threshold; The age that leaf area index (LAI) recovers to pre-harvest conditions.  
 D-10 years, DC-15 years, CD-40 years, C-Pine-25 years, C-White Spruce-40 years, C-Black Spruce-40 years

**TABLE 6-14: CUMULATIVE WATERSHED DISTURBANCE AND HYDROLOGICAL RECOVERY ANALYSIS: 20 YEAR PEAK YIELD SUMMARY**

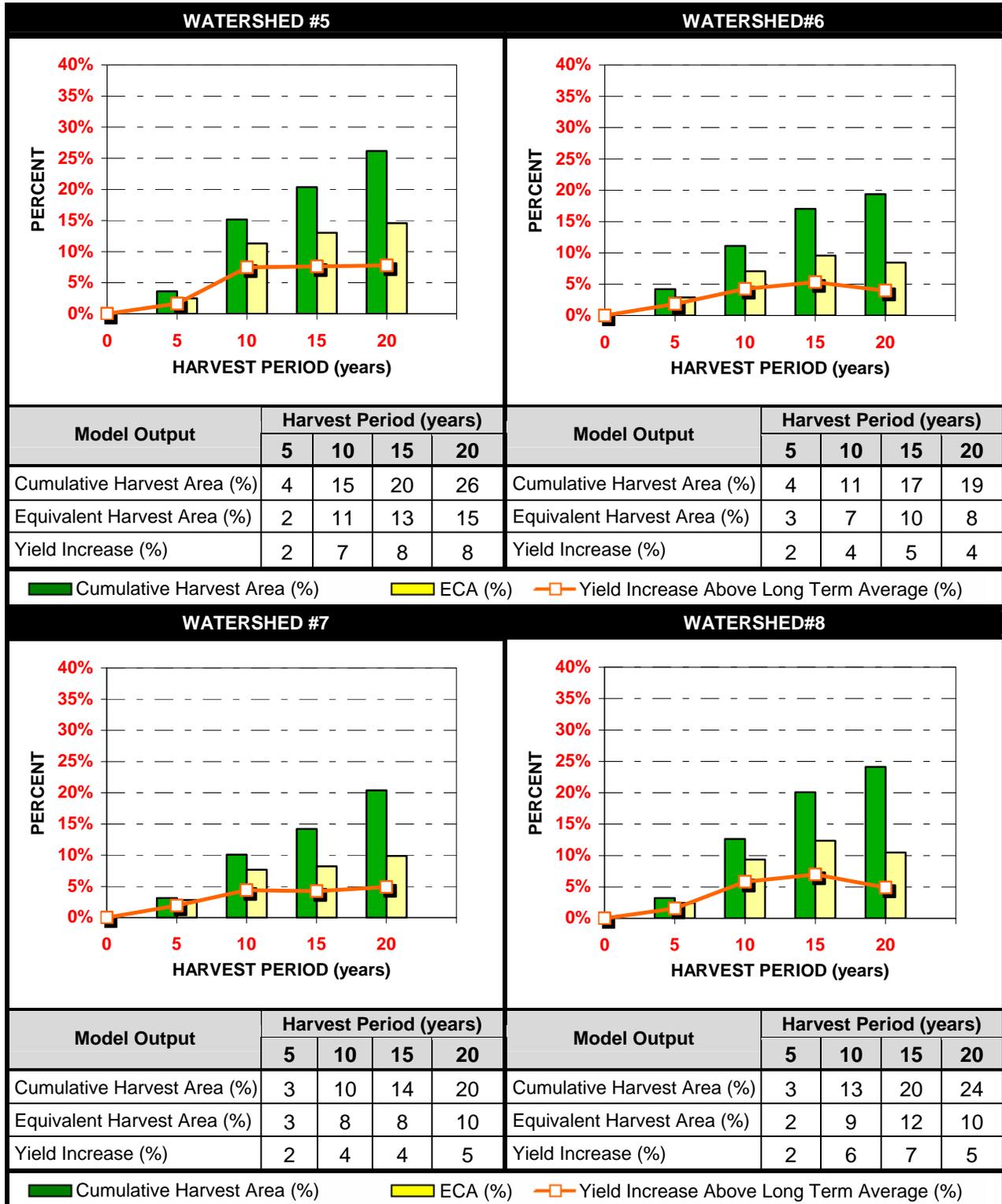
WATERSHED #	20 YEAR PEAK YIELD INCREASE ABOVE LONG TERM AVERAGE (%)	EQUIVALENT CLEARCUT AREA* <sup>17</sup>		GROSS WATERSHED AREA (ha) WITHIN FMA
		PERCENT (%)	AREA (ha)	
1 - Sweathouse	8	15	543	3,631
2 - Sweathouse	4	6	537	9,124
3 - Sweathouse	2	4	550	12,736
4 - Sweathouse	7	13	1,533	11,968
5 - Sweathouse	8	15	799	5,481
6 - Sweathouse	5	10	1,783	18,613
7 - Sweathouse	5	10	446	4,506
8 - Sweathouse	7	12	1,972	15,974
9 - Sweathouse	2	3	348	10,109
10 - Sweathouse	2	3	125	4,305
11 - Sweathouse	2	3	39	1,285
12 - Sweathouse	2	3	764	27,161
13 - Sweathouse	11	17	906	5,365
14 - Sweathouse	6	11	1,095	10,196
15 - Sweathouse	2	3	102	3,234
16 - Kimiwan	13	5	475	9,130
17 - Kimiwan	36	14	607	4,374
18 - Kimiwan	20	8	262	3,335
19 - Kimiwan	5	2	156	6,660
20 - Kimiwan	10	4	360	8,408
21 - Kimiwan	10	3	307	9,167
22 - Kimiwan	32	11	959	8,578
23 - Kimiwan	11	4	394	9,735
24 - Kimiwan	18	8	654	7,891
25 - Kimiwan	23	9	647	7,006
26 - Kimiwan	12	5	555	10,828
27 - Kimiwan	34	12	1,267	10,435
28 - Kimiwan	15	5	378	7,010

<sup>17</sup> Equivalent Clearcut Area describes the "effective" area that a recovering historic disturbance currently represents in terms of its ecological effects.

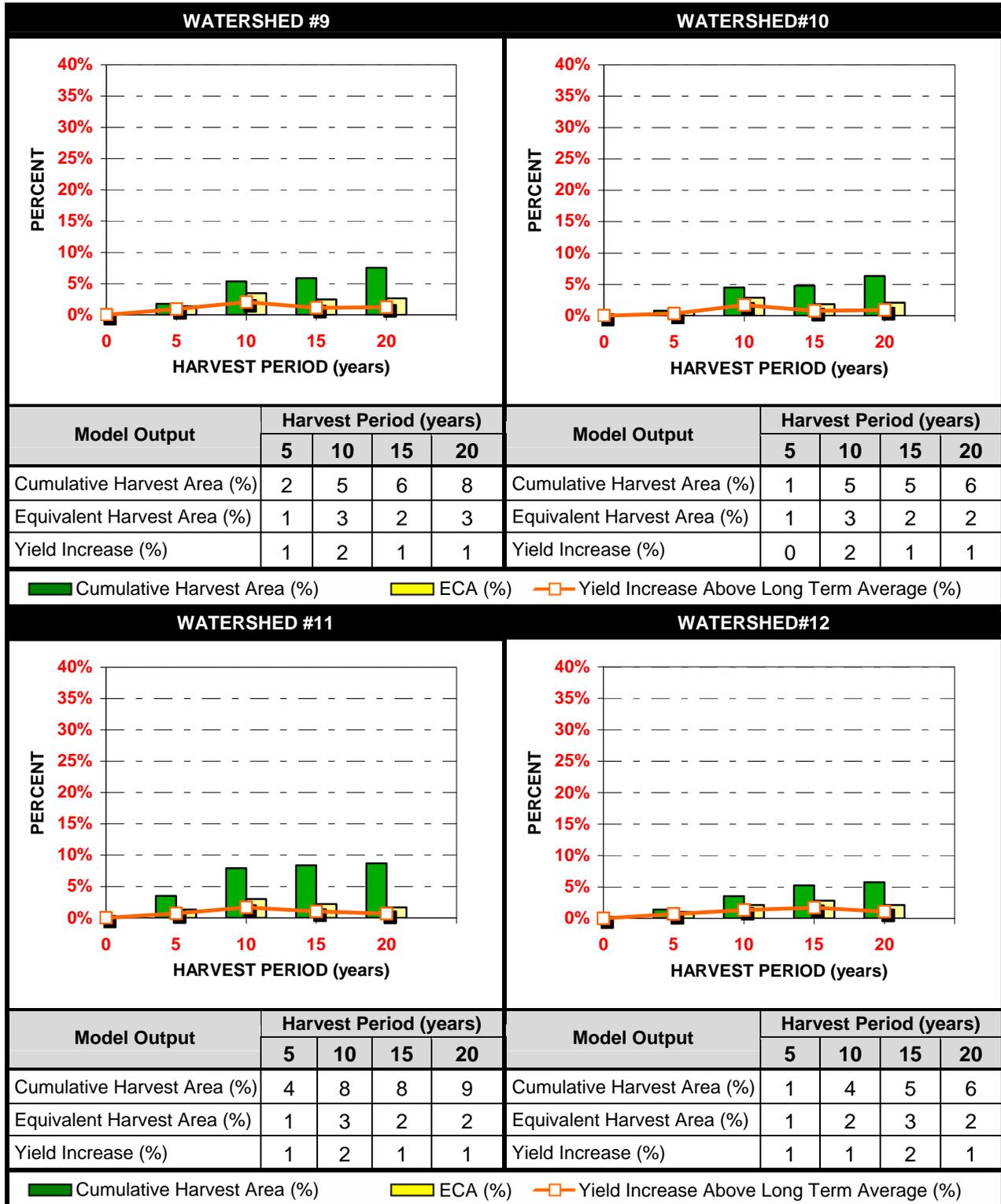
**FIGURE 6-29: CUMULATIVE WATERSHED DISTURBANCE AND HYDROLOGICAL RECOVERY ANALYSIS: SWEATHOUSE WATERSHEDS #1 - #4**



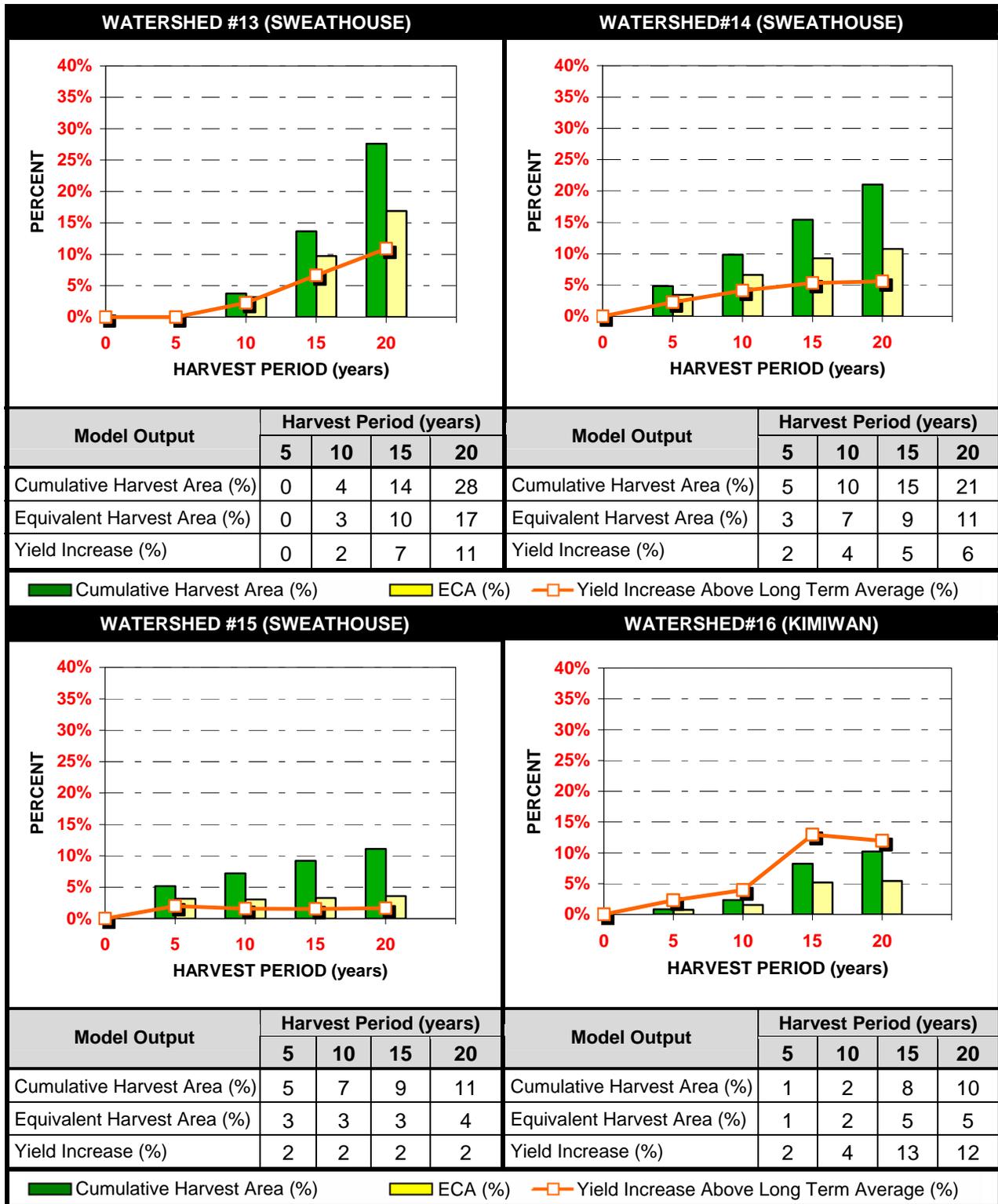
**FIGURE 6-30: CUMULATIVE WATERSHED DISTURBANCE AND HYDROLOGICAL RECOVERY ANALYSIS: SWEATHOUSE WATERSHEDS #5 - #8**



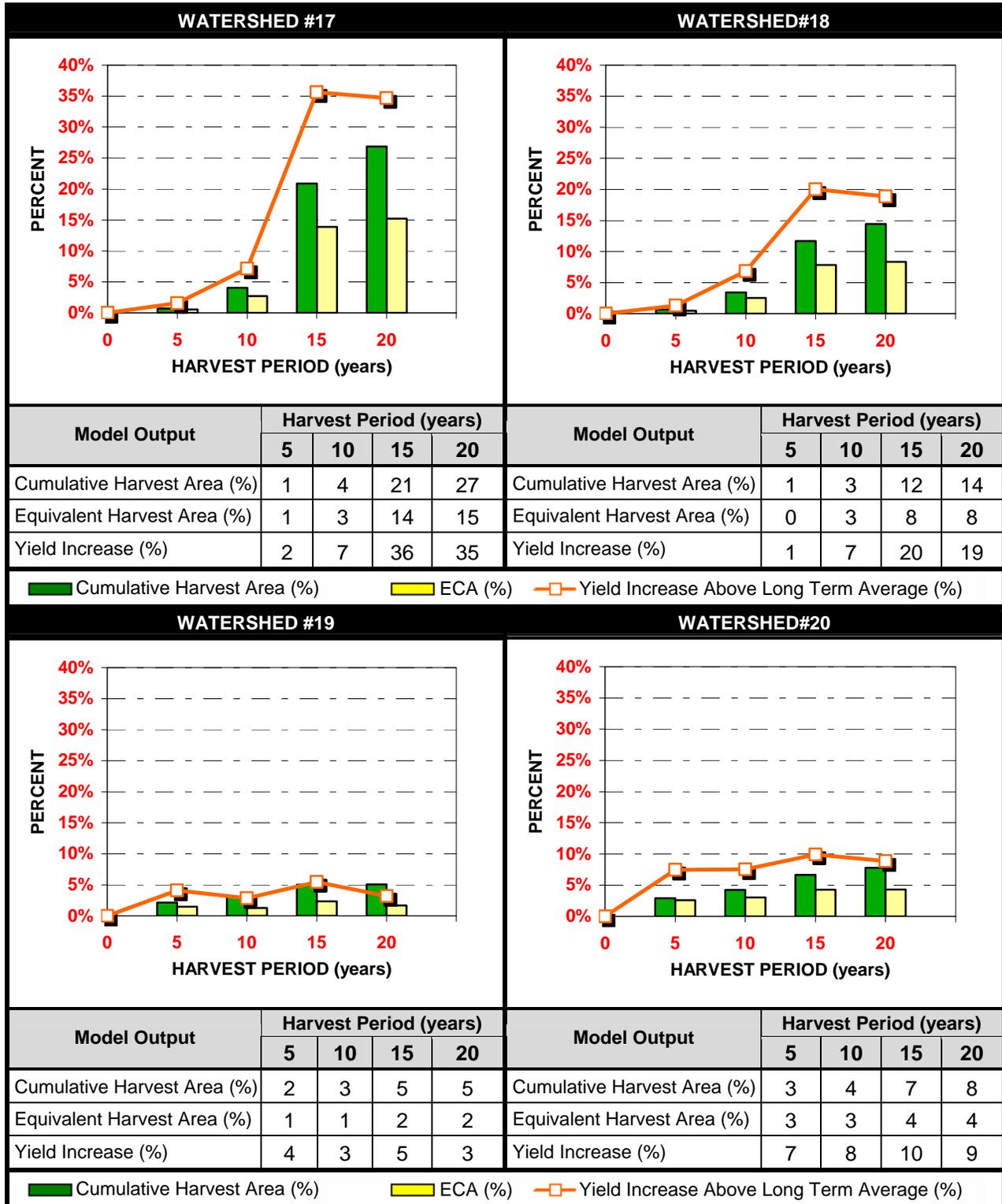
**FIGURE 6-31: CUMULATIVE WATERSHED DISTURBANCE AND HYDROLOGICAL RECOVERY ANALYSIS: SWEATHOUSE WATERSHEDS #9 - #12**



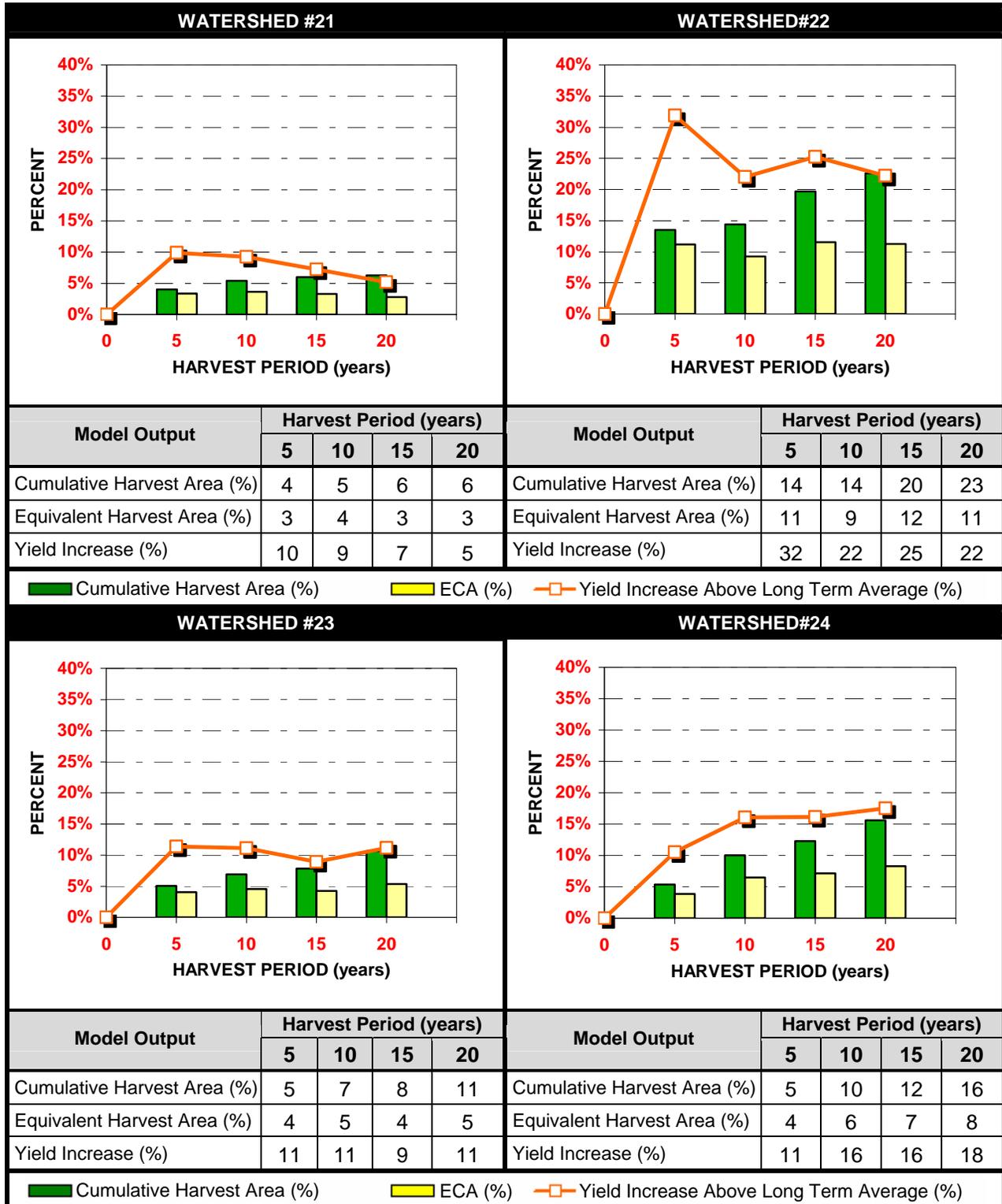
**FIGURE 6-32: CUMULATIVE WATERSHED DISTURBANCE AND HYDROLOGICAL RECOVERY ANALYSIS: SWEATHOUSE/KIMIWAN WATERSHEDS #13 - #16**



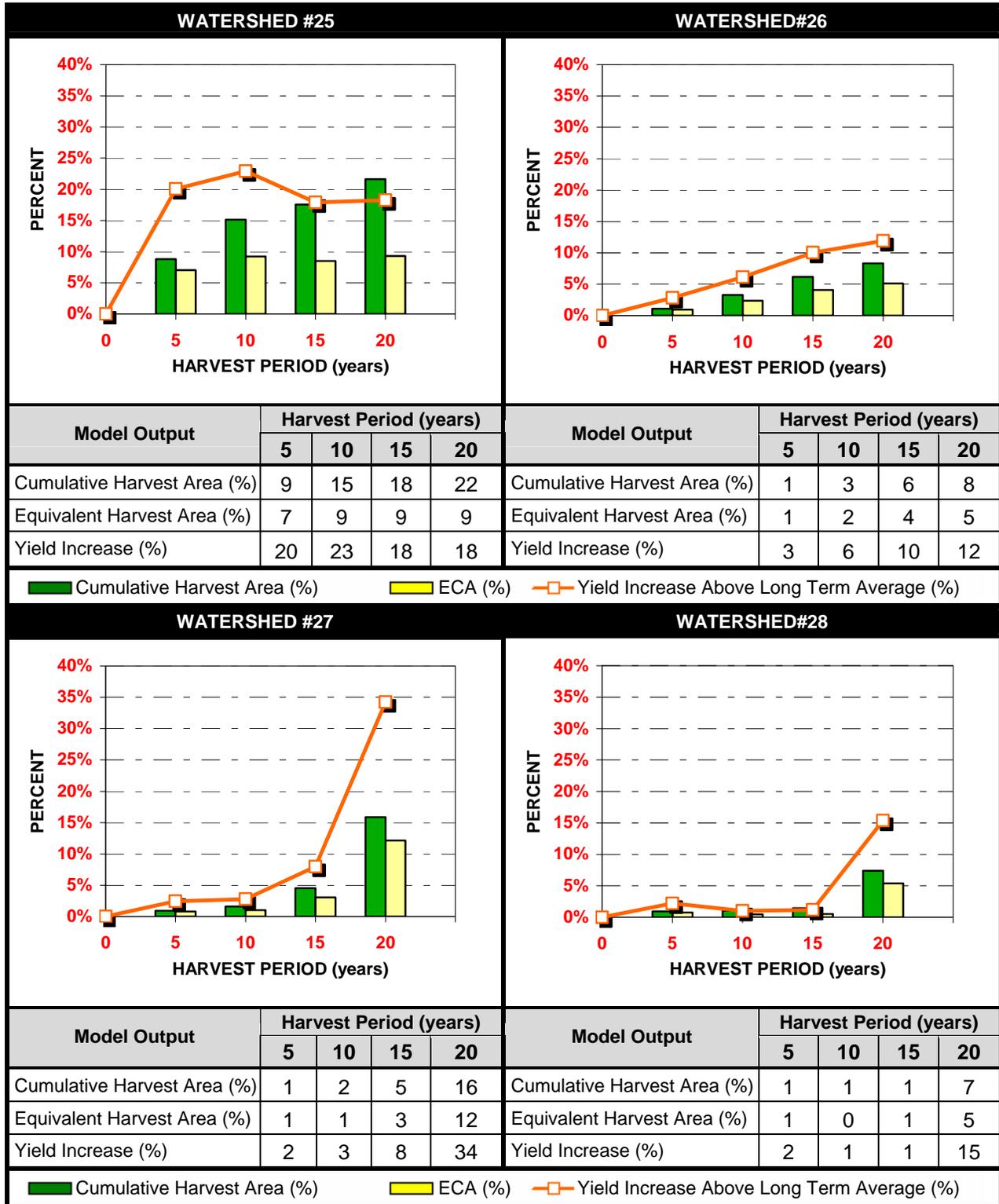
**FIGURE 6-33: CUMULATIVE WATERSHED DISTURBANCE AND HYDROLOGICAL RECOVERY ANALYSIS: KIMIWAN WATERSHEDS #17 - #20**



**FIGURE 6-34: CUMULATIVE WATERSHED DISTURBANCE AND HYDROLOGICAL RECOVERY ANALYSIS: KIMIWAN WATERSHEDS #21 - #24**



**FIGURE 6-35: CUMULATIVE WATERSHED DISTURBANCE AND HYDROLOGICAL RECOVERY ANALYSIS: KIMIWAN WATERSHEDS #25 - #28**



## **MAP 6-37: 10 YEAR PROJECTION – CUMULATIVE WATERSHED DISTURBANCE AND HYDROLOGIC RECOVERY ANALYSIS**

## **MAP 6-38: 20 YEAR PROJECTION – CUMULATIVE WATERSHED DISTURBANCE AND HYDROLOGIC RECOVERY ANALYSIS**

## 6.7.1 DISCUSSION OF RESULTS

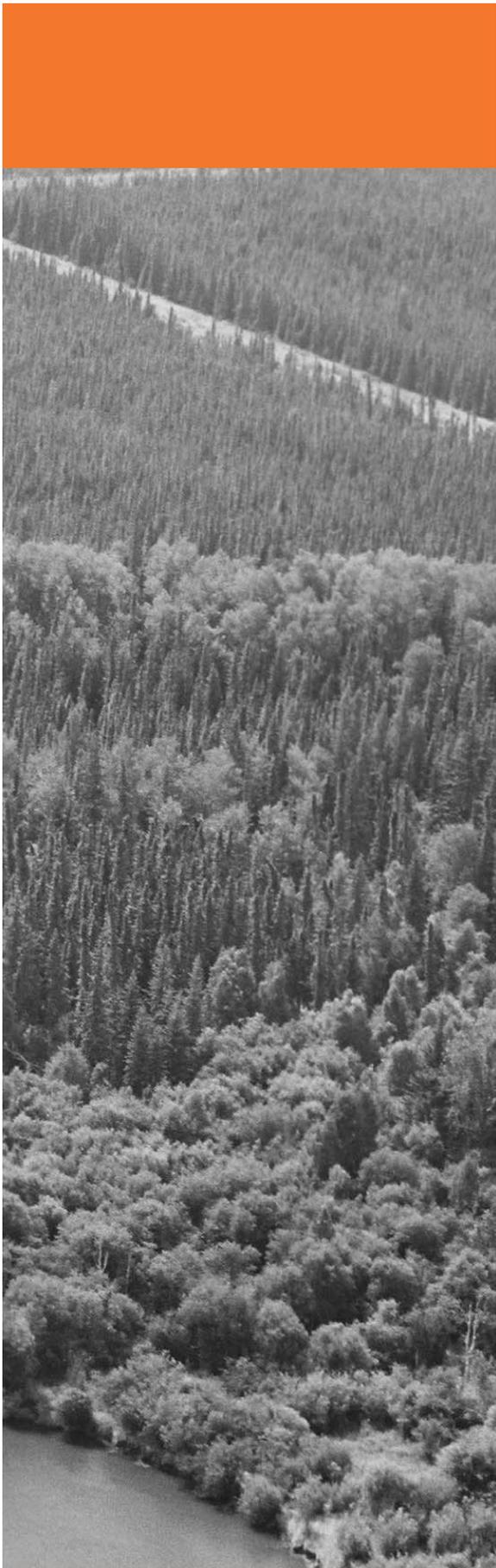
After comparing the projected increase in stream flow against the natural variability around the long term average, it was found that only three of the 28 watersheds yield an increase that is significantly different than the average yield. (See Appendix G for details).

Further review of the three watersheds was done to understand why they are outside the natural range of variability. After analyzing the data and discussing the results with the hydrologists Buchanan and Tolko adopted the PFMS for the following reasons:

1. The watershed that projects the highest increase in water yield is 35.7% above the long term average stream flow. This represents an increase of only 15.4mm/yr in comparison to a rainfall event of 62.5mm that occurred in Slave Lake on September 2, 2004. (i.e. this appears to be only a minor deviation in streamflow).
2. If the increase in water yield seen in watershed 17 (35.7%) is translated to the amount of area harvested at that time, the equivalent clear cut area only represents 13.9% of the gross watershed area within the FMA (the entire watershed does not fall within the FMA), which is only 607ha out of 4,374ha.
3. As indicated in the supporting documentation, the watersheds used in the analysis are actually only small sub-catchments of larger watersheds. With larger watersheds, the projected yield increases are probably very small and likely below the measurement detection limit using standard hydrometric techniques.
4. The model assumes un-routed flow. However, in the areas the analysis was completed, the topographic relief would suggest the probable outcome would be soil and ground water recharge versus direct flow into the surrounding streams.
5. The input values that identify the streamflow for the Kimiwan operating area are very low. Therefore, only a small amount of activity in the defined watersheds will result in a large increase in streamflow. For example, a 10mm increase in Kimiwan (43mm/yr) would show a 19% increase in streamflow, where as a 10mm increase in Sweathouse (147mm/yr) would reflect a 6% increase in streamflow. From this example we see that it is important to consider the absolute projected change when analyzing the results of the analysis.

## 6.7.2 CONCLUSION

Upon completion of the detailed watershed analysis, Buchanan and Tolko engaged qualified hydrologists to complete an external review (Appendix G) and interpret the results of the PFMSs effect on stream flow. Professional opinion concluded that the PFMS does not significantly alter natural stream flow patterns.



# 7.0

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## Implementation Strategy

DFMP

## 7.0 IMPLEMENTATION STRATEGY

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### 7.1 PERFORMANCE MONITORING

The performance monitoring program and stewardship reporting have been designed to provide the objectives outlined in the Interim Forest Management Planning Manual - Guidelines to Plan Development (April 1998):

- Track actual activities in comparison to forecast activities;
- Track actual responses to management activities and compare to forecasted responses;
- Provide the ability or opportunity to assess impacts arising from change;
- Trigger appropriate actions to correct or mitigate any negative impacts of the change.

The Detailed Forest Management Plan has been structured in a manner that the Goals, Objectives, and Strategies are linked throughout the plan. This linkage is further enhanced with a link to a monitoring or reporting strategy that identifies the specific measures with which the outcome of implementation of the Detailed Forest Management Plan will be measured.

This monitoring program has been referenced throughout Section 3 of the document by listing the monitoring and reporting strategy by number and title following the objectives and strategies.

The intent of the following discussion is to:

- Fully describe each monitoring or reporting mechanism;
- Indicate the timing and frequency of each measure; and
- Assemble the complete monitoring and reporting strategy into larger and recognizable reports or existing reports and processes.

The main reporting mechanisms will include the Detailed Forest Management Plan, The Five-year Stewardship Report, and the Annual Performance Monitoring Summary. In addition some aspects of the performance monitoring may be incorporated into existing plans like the General Development Plan and Annual Operating Plans.



## 7.1.1 DETAILED FOREST MANAGEMENT PLAN

Several of the objectives listed in Section 3 have been implemented on the entire Forest Management Area and will be summarized or updated periodically throughout the 160 year planning horizon. Monitoring and Reporting items M1 through M7 have been incorporated into the text of the Detailed Forest Management Plan submission, or previously submitted to Alberta Sustainable Resource Development under separate cover.

### 7.1.1.1 M1 - LANDSCAPE ASSESSMENT

A Landscape Assessment was completed in April 2003 and submitted to Alberta Sustainable Resource Development for the combined Timber Supply Area of the Joint and Original Forest Management Areas. This report provides a point in time description of the current landscape conditions. The Landscape Assessment and analysis summaries were utilized to compare the current forest conditions to the future forest conditions predicted by the preferred forest management strategy on the landbase. The sections of the report are as follows:

General Description:

- General Area Description;
- Natural Sub-Regions;
- Protected and Special Management Areas;
- Watersheds.

Landscape Disturbance:

- Forest Productivity and Operational Categories;
- Historical Harvest Patterns;
- Non-Timber Resource Extraction Industries.

Landscape Pattern and Structure:

- Age Class Distribution;
- Cover Type Distribution;
- Seral Stage Distribution;
- Cover Type Age Class Distribution.

Landscape Fire Assessment:

- Fire Occurrence Risk;
- Fire Behaviour Prediction;
- Crowning Susceptibility;
- Historic Fire Occurrence;
- Values at Risk;
- Barriers to Fire Spread.

### 7.1.1.2 M2 - INVENTORY AND INVENTORY UPDATES

The companies have a complete approved Alberta Vegetation Inventory version 2.1 for both the Original and Joint Forest Management Agreement Areas.

The Original Forest Management Agreement Area inventory was completed in accordance with Alberta Vegetation Inventory standards version 2.1 using medium scale (1:15 000) leaf on, black and white air photo coverage obtained between 1995 and 1998. The Birch, Whitemud, Salt, Utikuma and Kimiwan operating areas were included.

Information for the Sweathouse Operating Area of the Joint Forest Management Agreement Area was purchased from Slave Lake Pulp. The Alberta Vegetation Inventory for the Sweathouse operating area was completed in accordance with Alberta Vegetation Inventory standards version 2.2 using medium scale (1:15,000) leaf on, black and white air photo coverage obtained between 1997 and 1998. The Sweathouse Operating Area data has been standardized to Alberta Vegetation Inventory 2.1 to match the Original Forest Management Agreement Area data.

For the Detailed Forest Management Plan process, updated harvest opening boundaries reflecting harvesting activities for both the Original and Joint Forest Management Areas were completed to bring the harvest history current to the timber year ending April 30, 2002.

The companies will implement a maintenance schedule for regular updates of the Alberta Vegetation Inventory (Version 2.1) and submit for approval, for complete operating areas according to the following table.

**TABLE 7-2: PHOTOGRAPHY UPDATE**

FMA	OPERATING AREA	ORIGINAL PHOTOGRAPHY	UPDATE YEAR
Original FMA	Birch	1996	2008
	Whitemud	1995/1996	2008
	Salt	1995/1996	2006
	Utikuma	1995/1996/1997	2009
Joint FMA	Kimiwan	1995/1996	2007
	Sweathouse	1997/1998	2010

### 7.1.1.3 M3 - GROUND RULE DEVELOPMENT

The Joint Forest Management Agreement between Buchanan Lumber, Tolko Industries Ltd. and the Province of Alberta in section 16(2) states that "Within six months following the approval of the detailed management plan under 10(4), the Minister and the Companies shall jointly develop a new set of ground rules consistent with the management plan objectives, for the preparation of operating plans and to guide harvesting and reforestation operations". The forestry companies and Alberta Sustainable Resource Development will jointly develop the operating ground rules for the Forest Management Agreement Area within six months of plan approval. These guidelines will apply to all forestry operations on the Forest Management Agreement Area and operations may only deviate from them under authority of the Area Manager.

#### **7.1.1.4 M4 - WATERSHED ASSESSMENT**

During the Detailed Forest Management Plan process, the watersheds or portions of watersheds on the landbase were identified. A total of eighty-six (86) watersheds were identified in the Timber Supply Area (Joint and Original Forest Management Agreement Areas). Twenty-eight (28) of the watersheds or portions of watersheds are located on the Joint Forest Management Agreement Area and fifty-eight (58) of the watersheds or portions of watershed are located on the Original Forest Management Agreement Area. These watershed or portions of watershed have been identified to provide a vehicle for evaluating the preferred forest management strategy and predicting the potential impacts of forest harvesting operations on these watersheds. These summaries and analysis information have been included in the Detailed Forest Management Plan.

#### **7.1.1.5 M5 - INFORMATION EXCHANGE**

Successful implementation of the Detailed Forest Management Plan is dependant on effective communication and the exchange of information between forest companies, the government and the public. A summary of the process the companies utilizes to facilitate information exchange will be included in the Five-year Stewardship Report.

#### **7.1.1.6 M6 - ACCESS CORRIDOR IDENTIFICATION MAP**

A map identifying the access corridors has been developed and included in the Detailed Forest Management Plan. This map at a coarse filter level identifies the existing and planned access corridors to each of the operating areas.

#### **7.1.1.7 M7 -STAKEHOLDER INFORMATION LISTING**

A listing of the commercial stakeholders (trappers, outfitters, grazing lease or licences, utility companies, and oil and gas industry) has been included in the Detailed Forest Management Plan. This information will be utilized internally by Tolko Industries Ltd. and Buchanan Lumber planning staff during the implementation of the twenty-year spatial harvest sequence and the development of Annual Operating Plans.

## **7.1.2 FIVE-YEAR STEWARDSHIP REPORT**

The Five-year Stewardship Report is designed as a mid-term report on the implementation of the Detailed Forest Management Plan. A number of the monitoring protocols and commitments detailed within the strategies fall within the time frame of the Five-year Stewardship Report. This report will be submitted at the end of each five year period after the approval of the Detailed Forest Management Plan. In general, monitoring and reporting items M8 through M25, and item M39 will be incorporated into the Five-year Stewardship Report.

### **7.1.2.1 M8 - LANDSCAPE STRUCTURAL SUMMARY TABLE**

- Seral Stage Summary Table.

Seral stage reporting is necessary in a number of the strategies, especially those pertaining to biodiversity and wildlife habitat. The Five-year Stewardship Report will provide a summary on the relative proportion of each seral stage (as defined in the landscape assessment) after five years of harvest. The measurable criteria for this monitoring protocol will be the presence or absence of seral stages across the landscape and their relative proportions. The information will be summarized by Operating Area. The plan recognizes that natural disturbances may completely eliminate one or more seral stages from any particular unit. The seral stage section of the Five-year Stewardship Report will highlight shifts in seral stages and identify areas which may become a concern for other forest values and which may have to be addressed within the context of the next Detailed Forest Management Plan.

- Patch Size and Fragmentation Summary Table.

Integral to the landscape structure is the fragmentation and patch size summaries. Patch size and fragmentation have been summarized in the landscape assessment. Within the Five-year Stewardship Report, this analysis will be compiled to determine if the size and distribution of patches have changed due to harvest activities. Fragmentation, the artificial breaking up of natural stand boundaries, has been viewed as undesirable. Fragmentation will be assessed through the patch size distribution statistics.

### **7.1.2.2 M9 - RECLAMATION LISTING**

A need to maintain or increase the productive forest landbase was identified in the Detailed Forest Management Plan. One method of accomplishing this is to return reclaimed land use dispositions to a productive capacity. On the anniversary date of the Forest Management Agreement, Alberta Sustainable Resource Development sends a listing of the cancelled dispositions to the companies. This information will be summarized within the Five-year Stewardship Report. In addition, a summary of efforts by the forest companies to reforest abandoned or cancelled dispositions and return the areas to a productive capacity will be included.

### **7.1.2.3 M10 - UNDERSTOREY INVENTORY**

The forest companies have completed an understorey inventory. The primary objective is to identify understories of conifer and deciduous species. This inventory was completed to be utilized as a tool during the implementation of the mixedwood strategies and to support the conifer and deciduous allowable cuts.

#### **7.1.2.4 M11 - SPATIAL HARVEST SEQUENCE VARIANCE TABLE**

The Detailed Forest Management Plan submission includes a twenty-year spatial harvest sequence. It is recognized that the twenty-year spatial harvest sequence is intended to be operational however, the Alberta Vegetation Inventory and volume sampling were undertaken at a broad landscape level. The transition to operational level planning may result in some variance from the twenty-year spatial harvest sequence for a variety of reasons. It is the intent of the forest companies to annually monitor the variance from the twenty-year spatial harvest sequence and summarize these variances in the five-year stewardship report.

#### **7.1.2.5 M12 - WILDLIFE SPECIES LIFE REQUISITE INFORMATION**

Utilizing the approved Alberta Vegetation Inventory and Wildlife Species Life Requisite information an assessment has been completed, and the results summarized within the Detailed Forest Management Plan. This information forecasts the habitat availability at points in time throughout the planning horizon for the following wildlife species: Moose (*Alces alces andersoni*), American Marten (*Martes americana actiosa*), Northern Goshawk (*Accipiter gentilis atricapillus*), Pileated Woodpecker (*Dryocopus pileatus abieticola*), and Grizzly Bear (*Ursus arctos*).

#### **7.1.2.6 M13 - SPECIES OF CONCERN LISTING**

The list of Species of Concern is to be completed within one year of the Detailed Forest Management Plan approval with a summary of known presence on the Forest Management Area for the Five-year Stewardship Report.

#### **7.1.2.7 M14 - STAND STRUCTURE RETENTION SUMMARY**

Structure containing dead and live trees, representative of the pre-harvest stand condition including species, tree size, condition and distribution, will be retained on the harvest areas. Single tree or patch retention will be applied to a minimum level of 1% of the scheduled harvest area within each compartment up to an average level of 3% of the scheduled harvest area across each operating area over the term of the Detailed Forest Management Plan.

The following techniques will be applied to the landbase alone or in combination to harvest areas to achieve the desired structure retention:

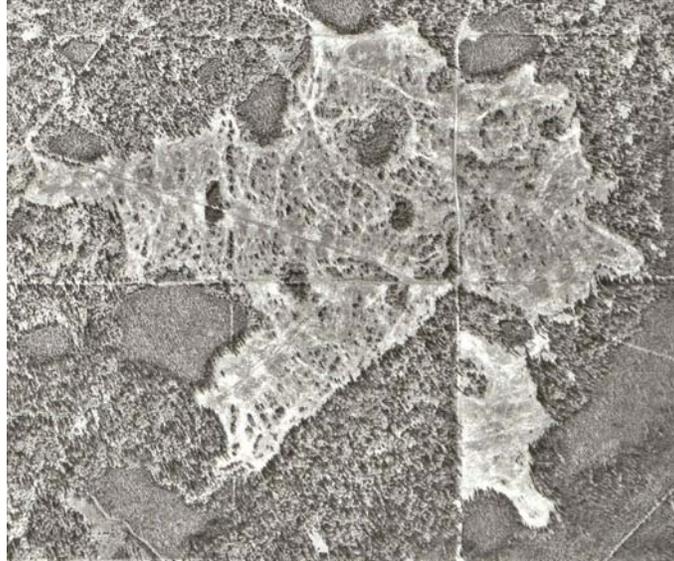
- Single tree retention will be applied to the landbase by leaving approximately 8 stems per hectare on the harvest area. The technique will be implemented on the landbase via guidance to machine operators during harvest operations.
- Small clump retention will be applied to the landbase by leaving small groups of trees in conjunction with other operational issues within the harvest area (examples: understory protection or avoidance, wildlife features such as dens, nests and mineral licks, and watercourse or water source area buffers etc), via instructions to machine operators.
- Green island retention will be applied on harvest areas greater than 100 hectares in size. Green island retention patches will be clearly identified on detailed block plans and in the field prior to harvest operations.

The area retained on the harvest areas will be assessed and tracked on harvest area basis through a post-harvest assessment program utilizing post harvest aerial photography and photo interpretation.

The structure that is maintained will be reported by area and category at the end of every cut control period and reconciled each decade.

Figure 7-1 and Figure 7-2 are examples of the harvest area aerial photography update. Through instructions to the photo interpreters, areas of retention down to tenths of hectares can be identified and a summary of the Alberta Vegetation Inventory cover types can be produced.

**FIGURE 7-1: DECIDUOUS HARVEST AREA UPDATE AERIAL PHOTOGRAPHY**



**FIGURE 7-2: CONIFEROUS HARVEST AREA UPDATE AERIAL PHOTOGRAPHY**



### **7.1.2.8 M15 - INSECT AND DISEASE SUMMARY**

Insect and disease outbreaks are reported annually by the Government. These annual Government reports will be reviewed for references to insect or disease infestations or outbreaks affecting the Forest Management Agreement Area. These references will be summarized in the Five-year Stewardship Report. Forest companies participate in the operational monitoring of insects and diseases outbreaks and provides this information to the Government for inclusion in their reports.

### **7.1.2.9 M16 - FOREST FIRE SUMMARY**

The Alberta Government tracks the number and size of forest fires in the Province of Alberta. A summary of this information for the Forest Management Agreement Area will be requested by the company and the number, size (hectares) and effect of fires on the net landbase will be summarized in the Five-year Stewardship Report.

### **7.1.2.10 M17 - LANDUSE SUMMARY**

This report will be a compilation of the Annual Landuse Summaries with an evaluation of the effect on the net landbase summarized in the Five-year Stewardship Report.

### **7.1.2.11 M18 - WATERSHED ANALYSES SUMMARY**

It is perceived that forest harvesting operations may have effects on water quantity and timing of flows. The companies have undertaken an Age Threshold Analysis on the watersheds within the Forest Management Agreement Area. Watersheds or partial watersheds were identified on the Forest Management Agreement Area, this information was input into computer simulation models (e.g. Cumulative Watershed Disturbance and Hydrologic Recovery Simulator (ECA- Alberta)) and the results summarized in the Detailed Forest Management Plan.

### **7.1.2.12 M19 - HISTORICAL RESOURCES SUMMARY**

The Forest Management Agreement Area is covered by the South Peace Heritage Historical Resources Potential Model. This model is utilized to predict the effect forestry operations may have on the below ground historical resources as defined by Alberta Community Development. The areas identified for harvest operations in the twenty-year spatial harvest sequence will be input into the model and a summary of the findings or areas identified for further information collection will be included in the Five-year Stewardship Report.

### **7.1.2.13 M20 - TRAINING AND EMPLOYMENT LISTING**

This part of the Five-year Stewardship Report will list the training programs employed by the forest companies for the purposes of health, safety, environmental awareness, legislation, and awareness of the planning hierarchy.

### **7.1.2.14 M21 - GROWTH AND YIELD ACTIVITY SUMMARY**

The forest companies are implementing an approved Growth and Yield Program which will provide stand and tree level information aimed at better understanding the growth dynamics of the forests within the Forest Management Agreement Areas. This program will include both Permanent and Temporary Sample Plots. A summary of the activities will be included in the Five-year Stewardship Report.

### **7.1.2.15 M22 - WEED MANAGEMENT PLAN**

The development of the Weed Management Plan will be completed within one year of approval of the Detailed Forest Management Plan. The plan will include education, prevention, detection, monitoring, and control strategies pertaining to restricted and noxious weeds on the Forest Management Agreement Area. The plan will contain the following sections:

- Education and prevention will describe awareness training requirements for company staff and contractors. Training will include prevention methods including cleaning equipment and reclamation procedures;
- The approach to for detection and monitoring will be described;
- Strategies for weed control will be outlined. The treatments may include mowing, cutting, hand pulling, or herbicide use.

### **7.1.2.16 M23- DETAILED ROAD INVENTORY MAP**

The companies recognize the importance of minimizing access within the Forest Management Agreement Areas to protect a number of other values such as wildlife, water quality and soil disturbance. Within one year of approval of this plan the companies will complete a detailed road inventory for the Forest Management Agreement Areas and work with Alberta Sustainable Resource Development on identifying access control requirements and implementation processes.

### **7.1.2.17 M24 - FOREST LEGISLATION**

The company will provide a description of the process forest companies employ to ensure that company staff have access to current forest legislation.

### **7.1.2.18 M25 - FOREST ROAD USE AGREEMENT SUMMARY**

A large number of road use agreements are issued within the Forest Management Agreement Area each year. This summary will be provided to demonstrate the level of commitment to working cooperatively with other industry users while minimizing the development of duplicate access routes on the Forest Management Agreement Area.

### **7.1.3 ANNUAL PERFORMANCE MONITORING SUMMARY**

The Annual Performance Monitoring Summary is designed as an annual report on the implementation of the Detailed Forest Management Plan. A number of the monitoring protocols and commitments detailed within the strategies have an annual monitoring and reporting component. This report will be submitted on an annual basis after the approval of the Detailed Forest Management Plan. Monitoring and Reporting items M26 through M39 will be incorporated into the Annual Performance Monitoring Summary. Some components of the monitoring and reporting protocols may also be incorporated into existing plans like the General Development Plan or Annual Operating Plans.

#### **7.1.3.1 M26 - INTEGRATED HARVEST SUMMARY**

The main purpose of the Integrated Harvest Summary is to integrate the activities of several forestry companies to ensure a smooth flow of fibre to the various mills, reduce the costs of operations and maintain and mitigate the effect on other forest values. The annual integration of operations through General Development Plan process, permits individual companies to assess their yearly operations and mesh the activities of their operations on the Forest Management Area with their operations outside the Forest Management Area. The integrated harvest schedule reported annually in the General Development Plan indicates the level of integration on the Annual Operating Plans.

#### **7.1.3.2 M27 - ROAD MAINTENANCE AND ABANDONMENT SUMMARY**

The Road Maintenance and Abandonment summary included in the General Development Plan indicates the degree of integration required to access the fibre supply. Included in this report is the status and condition of all Licenses of Occupation within the Forest Management Agreement Area under company ownership.

#### **7.1.3.3 M28 – FIBRE SUPPLY SUMMARY**

The fibre supply table summarizes the drain of conifer and deciduous timber from the Forest Management Area.

#### **7.1.3.4 M29 - ANNUAL LANDUSE SUMMARY**

The annual landuse summary will provide a description of withdrawals from the Forest Management Agreement Area due to other landuse dispositions.

#### **7.1.3.5 M30 - PUBLIC INVOLVEMENT, EDUCATION AND SAFETY SUMMARY**

A summary of company efforts to provide opportunities for education, exchange of information and feedback regarding the forest management planning process and the practice of forestry will be provided annually. An assessment of the level of public involvement in the development of annual forest industry plans will provide the opportunity to gauge public perceptions and values over the long term. The summary will include a description of how feedback received from members of the public was addressed in the forest management planning process.

#### **7.1.3.6 M31 – MEMBERSHIP LISTING**

A list summarizing the companies' memberships will be provided annually.

#### **7.1.3.7 M32 – LOG HAUL SUMMARY**

A summary of the past seasons log haul will be provided annually.

#### **7.1.3.8 M33 - WOODLOT SUMMARY**

A summary of the status of the Woodlot Program will be provided annually.

#### **7.1.3.9 M34 – RESEARCH AND EDUCATION FUND SUMMARY**

As per section 33(1) of the Joint Forest Management Agreement and \$0.25 per cubic meter will be used “to enhance the management activities and level of understanding of the forest resources and forest products within the forest management area.” A summary of these activities will be provided annually.

#### **7.1.3.10 M35 – CONTRACTOR SUMMARY**

A summary of contractors and local businesses utilized by the companies will be provided annually.

#### **7.1.3.11 M36 - ANNUAL HARVEST SUMMARY**

The annual harvest reports indicate the post harvest results from the previous timber year (May 1 to April 30). The indicators include: area and volume summaries, a summary of variance from the harvest design, stand structure retention results, a summary of coarse woody debris descriptions, and a summary of slash disposal activities.

#### **7.1.3.12 M37 - ANNUAL SILVICULTURE SUMMARY**

- Silviculture Activity Summary.

The information in this summary will include the silvicultural activity, area treated, and type of treatment.

- Harvest Opening Declarations Table.

The single landbase concept allows flexibility in the declarations of target strata group assignments. Each block will be assigned a strata group to balance the requirements for maintenance of the Annual Allowable Cut and Detailed Forest Management Plan objectives.

- Annual Silvicultural Activity Schedule.

Areas proposed for treatments for the next year will be described.

- Afforestation Summary.

The potentially productive ground within the Forest Management Area may be reforested to a productive capacity at any time during the plan. Any work done towards inclusion of these areas into the productive landbase will be reported annually.

#### **7.1.3.13 M38 - FIRE CONTROL PLAN**

A company specific Fire Control Plan is submitted annually at the start of the fire season (April 1st to October 30th). Portions of the plan are included in Annual Operating Plans with operations being conducted during the fire season. The contents of the Fire Control Plan reflect the

requirements stipulated under the ground rules and legislation and detail the company action plan with regards to forest protection and fire prevention.

The company will work with the Forest Protection Division to develop prevention programs, which are intended to reduce the risk of fire. The programs may include hazard tree reduction, corridor development, conversion of stands and training programs.

To mitigate the potential negative effects of fire, certain areas of high-risk timber were allowed to be sequenced in the harvest plan. The change of these stands to less dangerous fuel types will be a significant measure of the plan's success. The change in fuel types over the five years will be analyzed to evaluate the effectiveness of the strategy.

#### **7.1.3.14 M39 - ANNUAL RESEARCH LISTING**

A complete listing of the research being conducted by the forest company or the forest company is participating in will be provided annually.

## 7.2 ADAPTIVE MANAGEMENT

The companies have adopted a philosophy of adaptive management. Through the process of monitoring the application of the objectives and strategies to the landbase, a feedback loop has been created which will allow for the modification or adjustment of the forest management practices.

## 7.3 PUBLIC INVOLVEMENT

The purpose of the Public Involvement process is to exchange information and promote dialogue between Tolko Industries Ltd., Buchanan Lumber and the stakeholders within the communities in which the companies operate. The Public Involvement Process was initiated 1999 with the development of a Public Involvement Plan (refer to Appendix E). The plan outlined the approach to public involvement utilizing the following five mechanisms:

- 1) Forest Advisory Committee (FRAC),
- 2) Public Information Meeting,
- 3) Resource User Consultations,
- 4) Public Awareness Campaign,
- 5) Documentation and Monitoring.

The aim of this process was to provide an opportunity for stakeholders with an interest in the outcome of a decision to influence that decision. This process is founded through the sharing and transferring of relevant information. Through these mechanisms, individuals are given an opportunity to communicate their concerns and discuss relevant issues with Tolko and Buchanan representatives.

Early in 2000 the Forest Resources Advisory Committee (FRAC) was formed by inviting groups, organizations and the public to identify a representative and participate on the committee.

Tolko Industries Ltd. and Buchanan Lumber annually hold Open House meetings for review of the General Development Plan and present the plan at the Municipal District and County council meetings.

During the summer of 2004 Tolko Industries Ltd. High Prairie OSB Division and Buchanan Lumber expanded the Public Involvement initiatives presently in place in accordance with requests made by Alberta Sustainable Resource Development regarding the re-submission of the Detailed Forest Management Plans. Tolko and Buchanan Lumber provided open house opportunities for the following communities: High Prairie, Falher, Girouxville, Wanham, McLennan, Sucker Creek, Gift Lake, Atikameg, East Prairie, Peavine, Grouard, Driftpile, DeBolt, Valleyview, and Sturgeon Lake. The goal of the expansion and development was to ensure that the Public Involvement process allow for the inclusion of stakeholders interested in forest management into forest planning processes. Such participation of public stakeholders ensured that due consideration, in reference to stakeholder views, influence, and advice, is considered within Tolko Industries Ltd. and Buchanan Lumber Ltd. forest management planning processes. Notification for these open houses was completed utilizing local newspaper advertisements, posters, radio advertisements and a website ([www.highprairiecsa.com](http://www.highprairiecsa.com)). Posters were put up in all communities in which the Open Houses occurred. The posters were located in local businesses, community offices and community bulletin boards. A summary of the open house and meeting dates since 1999 is provided in Table 7-3. A summary of the questions, topics or issues expressed at the meetings is provided in Appendix F.

In addition to the open house meetings, a Trapline Licence Holder Stakeholder communication process was conducted the week of August 23<sup>rd</sup> to 27<sup>th</sup>, 2004. A total of sixty one trapline licence holders were sent an invitation via Canada Post to attend an Open House Meeting to review the Detailed Forest Management Plan and identify any issues or concerns. A summary of the questions, issues, or topics expressed at the Trapline Licence Holder communication process in Appendix F.

**TABLE 7-3: MEETING LIST**

<b>Meeting Type</b>	<b>Year</b>	<b>Date</b>
GDP Open House - High Prairie	1999	July 6, 1999
GDP Open House - Valleyview	1999	July 7, 1999
FRAC Meeting	2000	January 18, 2000
FRAC Meeting	2000	March 13, 2000
FRAC Meeting	2000	May 8, 2000
GDP Open House - High Prairie	2000	June 20, 2000
GDP Open House - Atikameg	2000	June 21, 2000
GDP Open House - Valleyview	2000	June 22, 2000
FRAC Meeting	2000	June 26, 2000
FRAC Meeting	2000	September 11, 2000
FRAC Meeting	2000	November 6, 2000
FRAC Meeting	2001	February 12, 2001
Original DFMP Planning Team Meeting	2001	February 26, 2001
Original DFMP Planning Team Meeting	2001	March 28, 2001
Original DFMP Planning Team Meeting	2001	April 25, 2001
FRAC Meeting	2001	June 4, 2001
GDP Open House - High Prairie	2001	June 19, 2001
GDP Open House - Atikameg	2001	June 21, 2001
Original DFMP Planning Team Meeting	2001	June 27, 2001
Original DFMP Planning Team Meeting	2001	July 25, 2001
Original DFMP Planning Team Meeting	2001	August 29, 2001
Original DFMP Planning Team Meeting	2001	September 26, 2001
FRAC Meeting	2001	October 22, 2001
Original DFMP Planning Team Meeting	2001	October 31, 2001
Original DFMP Planning Team Meeting	2001	November 28, 2001
FRAC Meeting	2001	December 10, 2001
Original DFMP Planning Team Meeting	2001	December 19, 2001
FRAC Meeting	2002	January 14, 2002
Original DFMP Planning Team Meeting	2002	January 30, 2002
FRAC Meeting	2002	February 11, 2002
Original DFMP Planning Team Meeting	2002	February 27, 2002
FRAC Meeting	2002	April 8, 2002
Original DFMP Planning Team Meeting	2002	May 29, 2002
FRAC Meeting	2002	June 10, 2002
Original DFMP Planning Team Meeting	2002	June 26, 2002
GDP Open House - High Prairie	2002	July 30, 2002
GDP Open House - Valleyview	2002	July 31, 2002
Joint DFMP Planning Team Meeting	2002	September 24, 2002
FRAC Meeting	2002	October 21, 2002
Joint DFMP Planning Team Meeting	2002	October 29, 2002
Joint DFMP Planning Team Meeting	2002	November 26, 2002
Original DFMP Planning Team Meeting	2002	November 27, 2002
FRAC Meeting	2002	December 9, 2002
Joint DFMP Planning Team Meeting	2003	January 28, 2003

<b>Meeting Type</b>	<b>Year</b>	<b>Date</b>
Original DFMP Planning Team Meeting	2003	January 29, 2003
Joint DFMP Planning Team Meeting	2003	February 25, 2003
Original DFMP Planning Team Meeting	2003	February 26, 2003
Joint & Original DFMP Planning Team Meeting	2003	March 25, 2003
FRAC Meeting	2003	April 14, 2003
Joint & Original DFMP Planning Team Meeting	2003	April 29, 2003
Joint DFMP Planning Team Meeting	2003	May 27, 2003
Original DFMP Planning Team Meeting	2003	May 28, 2003
FRAC Meeting	2003	June 9, 2003
Joint & Original DFMP Planning Team Meeting	2003	June 24, 2003
GDP/DFMP Open House - Valleyview	2003	June 26, 2003
GDP/DFMP Open House - High Prairie	2003	June 27, 2003
Joint & Original DFMP Planning Team Meeting	2003	July 29, 2003
Joint & Original DFMP Planning Team Meeting	2003	August 26, 2003
Joint & Original DFMP Planning Team Meeting	2003	September 30, 2003
FRAC Meeting	2003	October 20, 2003
Joint & Original DFMP Planning Team Meeting	2003	October 28, 2003
Joint & Original DFMP Planning Team Meeting	2003	November 12, 2003
Joint & Original DFMP Planning Team Meeting	2003	November 25, 2003
Lesser Slave Indian Regional Council Presentation	2003	November 27, 2003
FRAC Meeting	2003	December 8, 2003
Open House	2003	December 10, 2003
Joint & Original DFMP Planning Team Meeting	2004	January 15, 2004
Municipal District of Smoky	2004	July 7, 2004
Northern Sunrise County	2004	July 8, 2004
Open House - Valleyview	2004	July 14, 2004
Municipal District of Greenview	2004	July 14, 2004
Open House - Wanham	2004	July 15, 2004
Open House - High Prairie	2004	July 19, 2004
Open House - McLennan	2004	July 19, 2004
Open House - Falher	2004	July 20, 2004
Open House - Girouxville	2004	July 20, 2004
Open House - Sucker Creek	2004	July 21, 2004
Open House - Grouard	2004	July 23, 2004
Municipal District of Big Lakes	2004	July 28, 2004
Open House - Peavine	2004	August 11, 2004
Open House - Gift Lake	2004	August 17, 2004
Open House - East Prairie	2004	August 18, 2004
Open House - DeBolt	2004	August 19, 2004
Open House - Driftpile	2004	August 25, 2004
Open House - Atikameg	2004	September 2, 2004
Open House - Sturgeon Lake	2004	September 9, 2004



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**Appendix A**  
*Harvest Sequence  
and Net Landbase  
Database Structure  
and Description*

DFMP

## APPENDIX A HARVEST SEQUENCE AND NET LANDBASE DATABASE STRUCTURE & DESCRIPTION

The following data has been prepared and is included on the enclosed DVD:

- ◆ Tolko FMA PFMS Sequence and Landbase (Harvest\_LB\_Joint.dbf) – see Table A-1 for the data structure document.

**TABLE A-1: HARVEST SEQUENCE AND NET LANDBASE DATABASE STRUCTURE & DESCRIPTION – JOINT FMA**

Number of data records: 87,167

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
1.	AREA	Numeric	20	5	Area in square metres
2.	PERIMETE	Numeric	20	5	Perimeter in metres
3.	GIS_LINK	Numeric	20	0	Unique link to spatial coverage
4.	TILE_NAM	Character	32		Name assigned to tile, made up of twp, rge and mer
5.	FMA	Numeric	2	0	Forest Management Agreement area
6.	OLD_FMU	Character	3		Old Forest Management Unit identified as follows: ◆ S1 – Portion of FMU S21 that previously was S1; ◆ P3 – Portion of FMU S21 that previously was P3.
7.	BUF30	Numeric	2	0	30 metre stream buffer identifier
8.	BUF60	Numeric	2	0	60 metre large permanent stream buffer identifier
9.	BUF60R	Numeric	2	0	60 metre river buffer identifier
10.	BUF100	Numeric	2	0	100 metre lake buffer identifier
11.	BUFTRUMP	Numeric	2	0	200 metre trumpeter swan nesting site buffer identifier
12.	CUT_LINK	Numeric	11	0	Unique cutblock identifier
13.	BLOCKNUM	Numeric	3	0	Cutblock number
14.	ALPHA	Character	1		Cutblock suffix
15.	HARV_YR	Character	5		Year cutblock was harvested
16.	CUT_SPP	Character	5		Species group cutblock assignment (Assigned by Tolko and Buchanan): ◆ C – Pure conifer; ◆ CD – Conifer dominated mixedwood; ◆ DC – Deciduous dominated mixedwood; ◆ D – Pure deciduous; ◆ PR91 – Harvested before 1991.
17.	BLK_SPP	Character	2		Leading species cutblock assignment (Assigned by Tolko and Buchanan): ◆ AW – Trembling Aspen; ◆ PL – Lodgepole Pine; ◆ SB – Black Spruce; ◆ SW – White Spruce.
18.	CUT_PASS	Numeric	2	0	Pass that the cutblock was harvested in
19.	SOURCE	Character	3		Cutblock source of reference: ◆ FI – Forest Inventory; ◆ UPD – Cutblock updates; ◆ UP2 – Cutblock orthophoto updates from 1999-2000; ◆ DFM – DFMP Cutblock updates.

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
20.	OWNER	Character	7		Organization that harvested the cutblock: ♦ APL – Alberta Plywood Ltd.; ♦ AUDY – Audy; ♦ BUCH – Buchanan Lumber Ltd.; ♦ MOF – Alberta Ministry of Forests; ♦ MTU – Miscellaneous Timber Use program; ♦ TOLKO – Tolko Industries Ltd.; ♦ PRE 91 – Pre 1991 cutblocks.
21.	LICENSE	Character	15		Permit that the cutblock was harvested under
22.	OPENNUM	Character	13		Cutblock opening number
23.	TDA	Numeric	2	0	Timber Damage Assessment identifier
24.	FIRENUMB	Character	12		Fire identifying number
25.	FIREYEAR	Numeric	6	0	Year of burn
26.	NR_NAME	Character	20		Name of Natural Region
27.	NSR_NAME	Character	25		Name of Natural Sub-Region
28.	TPA	Character	7		Trapper boundaries
29.	WSHD_NUM	Numeric	3	0	Watershed boundary number
30.	DRS	Numeric	2	0	Disposition reservation identifier
31.	GRL	Numeric	2	0	Grazing lease identifier
32.	BUCKWILD	Numeric	2	0	Buck-for-wildlife special management area identifier
33.	OP_NAME	Character	15		Operating area name
34.	COMP_NUM	Numeric	2	0	Compartment number identifier
35.	MER	Numeric	2	0	Meridian
36.	TWP	Numeric	3	0	Township
37.	RGE	Numeric	2	0	Range
38.	PID	Numeric	4	0	Polygon identifier (stand number)
<b>AVI Overstorey Attributes</b>					
39.	MOIST	Character	1		Moisture regime identified as follows: ♦ A – Aquatic; ♦ D – Dry; ♦ M – Mesic; ♦ W – Wet.
40.	CROWN	Character	1		Crown closure identified as follows: ♦ A – 6 – 30% crown closure; ♦ B – 31 – 50% crown closure; ♦ C – 51 – 70% crown closure; ♦ D – 71 – 100% crown closure.
41.	HEIGHT	Numeric	2	0	Height (m)
42.	SP1	Character	2		Species 1 identified as follows: ♦ AW – Trembling Aspen; ♦ PB – Balsam Poplar; ♦ BW – White Birch; ♦ LT – Larch; ♦ P – Pine; ♦ PL – Lodgepole Pine; ♦ SB – Black Spruce; ♦ SW – White Spruce.
43.	PER1	Numeric	2	0	Species 1 percent

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
44.	SP2	Character	2		Species 2 identified as follows: ♦ AW – Trembling Aspen; ♦ PB – Balsam Poplar; ♦ BW – White Birch; ♦ FB – Balsam Fir; ♦ LT – Larch; ♦ P – Pine; ♦ PL – Lodgepole Pine; ♦ SB – Black Spruce; ♦ SW – White Spruce.
45.	PER2	Numeric	2	0	Species 2 percent
46.	SP3	Character	2		Species 3 identified as follows: ♦ AW – Trembling Aspen; ♦ PB – Balsam Poplar; ♦ BW – White Birch; ♦ FB – Balsam Fir; ♦ LT – Larch; ♦ P – Pine; ♦ PL – Lodgepole Pine; ♦ SB – Black Spruce; ♦ SW – White Spruce.
47.	PER3	Numeric	2	0	Species 3 percent
48.	SP4	Character	2		Species 4 identified as follows: ♦ AW – Trembling Aspen; ♦ PB – Balsam Poplar; ♦ BW – White Birch; ♦ FB – Balsam Fir; ♦ LT – Larch; ♦ PL – Lodgepole Pine; ♦ SB – Black Spruce; ♦ SW – White Spruce.
49.	PER4	Numeric	2	0	Species 4 percent
50.	SP5	Character	2		Species 5 identified as follows: ♦ AW – Trembling Aspen; ♦ LT – Larch.
51.	PER5	Numeric	2	0	Species 5 percent
52.	STR	Character	1		Stand structure identified as follows: ♦ C – Complex; ♦ H – Horizontal;
53.	STRVAL	Numeric	2	0	Stand structure value
54.	ORIGIN	Numeric	4	0	Origin
55.	TPR	Character	1		Timber Productivity Rating identified as follows: ♦ G – Good; ♦ M – Medium; ♦ F – Fair; ♦ U – Unproductive.

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
56.	MOD1	Character	2		Stand modifier 1 identified as follows: ♦ BU – Burn; ♦ CC – Clearcut; ♦ CL – Clearing; ♦ CW – Abandoned wellsite; ♦ FL – Flooded; ♦ FT – Fire tower; ♦ PI – Pipeline; ♦ SN – Snags; ♦ ST – Scattered timber; ♦ TH – Thinned; ♦ TL – Transmission line.
57.	EXT1	Numeric	2	0	Extent of modification 1
58.	YEAR1	Numeric	4	0	Year of modification 1
59.	MOD2	Character	2		Stand modifier 2 identified as follows: ♦ BU – Burn; ♦ CC – Clearcut; ♦ CL – Clearing; ♦ CW – Abandoned wellsite; ♦ PI – Pipeline; ♦ PL – Planted; ♦ SC – Scarified; ♦ SN – Snags; ♦ ST – Scattered timber.
60.	EXT2	Numeric	2	0	Extent of modification 2
61.	YEAR2	Numeric	4	0	Year of modification 2
62.	MOD3	Character	2		Stand modifier 3 identified as follows: ♦ BU – Burn; ♦ PL – Planted; ♦ SC – Scarified; ♦ SN – Snags; ♦ ST – Scattered timber.
63.	EXT3	Numeric	2	0	Extent of modification 3
64.	YEAR3	Numeric	4	0	Year of modification 3
65.	MOD4	Character	2		Stand modifier 4 identified as follows: ♦ BU – Burn.
66.	EXT4	Numeric	2	0	Extent of modification 4
67.	YEAR4	Numeric	4	0	Year of modification 4
68.	NAT_V	Character	2		Naturally non-forested vegetated land identified as follows: ♦ HF – Herbaceous forbs; ♦ HG – Herbaceous grassland; ♦ SC – Closed shrubs; ♦ SO – Open shrubs.
69.	NAT_CL	Numeric	2	0	Non-forested natural vegetated land shrub closure
70.	ANTH_V	Character	3		Anthropogenic vegetated land identified as follows: ♦ CIP – Pipeline; ♦ CIW – Geophysical activity (wellsite); ♦ CP – Cropland (perennial).
71.	ANTH_N	Character	3		Anthropogenic non-vegetated land identified as follows: ♦ AIG – Gravel or borrow pit; ♦ AIH – Permanent right-of-way; ♦ All – Industrial sites.

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
72.	NAT_N	Character	3		Naturally non-vegetated land identified as follows: ♦ NMB – Recent burn; ♦ NMC – Cutbank; ♦ NMS – Sand; ♦ NWF – Flooded; ♦ NWL – Lake or pond; ♦ NWR – River.
73.	REF_SC	Character	1		Reference source identified as follows: ♦ A – Air call; ♦ F – Field plot; ♦ I – Interpreted TPR.
74.	REF_YR	Numeric	4	0	Reference year
<b>AVI Understorey Attributes</b>					
75.	U_MOIST	Character	1		Moisture regime identified as follows: ♦ A – Aquatic; ♦ D – Dry; ♦ M – Mesic; ♦ W – Wet.
76.	U_CROWN	Character	1		Crown closure identified as follows: ♦ A – 6 – 30% crown closure; ♦ B – 31 – 50% crown closure; ♦ C – 51 – 70% crown closure; ♦ D – 71 – 100% crown closure.
77.	U_HEIGHT	Numeric	2	0	Height (m)
78.	U_SP1	Character	2		Species 1 identified as follows: ♦ AW – Trembling Aspen; ♦ BW – White Birch; ♦ FB – Balsam Fir; ♦ PB – Balsam Poplar; ♦ LT – Larch; ♦ PL – Lodgepole Pine; ♦ SB – Black Spruce; ♦ SW – White Spruce.
79.	U_PER1	Numeric	2	0	Species 1 percent
80.	U_SP2	Character	2		Species 2 identified as follows: ♦ AW – Trembling Aspen; ♦ BW – White Birch; ♦ FB – Balsam Fir; ♦ PB – Balsam Poplar; ♦ LT – Larch; ♦ PL – Lodgepole Pine; ♦ SB – Black Spruce; ♦ SW – White Spruce.
81.	U_PER2	Numeric	2	0	Species 2 percent
82.	U_SP3	Character	2		Species 3 identified as follows: ♦ AW – Trembling Aspen; ♦ BW – White Birch; ♦ FB – Balsam Fir; ♦ PB – Balsam Poplar; ♦ LT – Larch; ♦ PL – Lodgepole Pine; ♦ SB – Black Spruce; ♦ SW – White Spruce.

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
83.	U_PER3	Numeric	2	0	Species 3 percent
84.	U_SP4	Character	2		Species 4 identified as follows: <ul style="list-style-type: none"> <li>◆ AW – Trembling Aspen;</li> <li>◆ BW – White Birch;</li> <li>◆ PB – Balsam Poplar;</li> <li>◆ PL – Lodgepole Pine;</li> <li>◆ SB – Black Spruce;</li> <li>◆ SW – White Spruce.</li> </ul>
85.	U_PER4	Numeric	2	0	Species 4 percent
86.	U_SP5	Character	2		Species 5
87.	U_PER5	Numeric	2	0	Species 5 percent
88.	U_STR	Character	1		Stand structure identified as follows: <ul style="list-style-type: none"> <li>◆ H – Horizontal.</li> </ul>
89.	U_STRVAL	Numeric	2	0	Stand structure value
90.	U_ORIGIN	Numeric	4	0	Origin
91.	U_TPR	Character	1		Timber productivity rating identified as follows: <ul style="list-style-type: none"> <li>◆ G – Good;</li> <li>◆ M – Medium;</li> <li>◆ F – Fair;</li> <li>◆ U – Unproductive.</li> </ul>
92.	U_MOD1	Character	2		Stand modifier 1 identified as follows: <ul style="list-style-type: none"> <li>◆ BU – Burn;</li> <li>◆ CC – Clearcut;</li> <li>◆ CL – Clearing;</li> <li>◆ CW – Abandoned wellsite;</li> <li>◆ FL – Flooded;</li> <li>◆ PI – Pipeline;</li> <li>◆ SN – Snags;</li> <li>◆ ST – Scattered timber;</li> <li>◆ TH – Thinned.</li> </ul>
93.	U_EXT1	Numeric	2	0	Extent of modification 1
94.	U_YEAR1	Numeric	4	0	Year of modification 1
95.	U_MOD2	Character	2		Stand modifier 2 identified as follows: <ul style="list-style-type: none"> <li>◆ CC – Clearcut;</li> <li>◆ CL – Clearing;</li> <li>◆ CW – Abandoned wellsite;</li> <li>◆ PL – Planted;</li> <li>◆ SC – Scarified;</li> <li>◆ SN – Snags;</li> <li>◆ ST – Scattered timber;</li> <li>◆ TL – Transmission line.</li> </ul>
96.	U_EXT2	Numeric	2	0	Extent of modification 2
97.	U_YEAR2	Numeric	4	0	Year of modification 2
98.	U_MOD3	Character	2		Stand modifier 3 identified as follows: <ul style="list-style-type: none"> <li>◆ PL – Planted;</li> <li>◆ SN – Snags;</li> <li>◆ ST – Scattered timber.</li> </ul>
99.	U_EXT3	Numeric	2	0	Extent of modification 3
100.	U_YEAR3	Numeric	4	0	Year of modification 3
101.	U_NAT_V	Character	2		Non-forested natural vegetated land type identified as follows: <ul style="list-style-type: none"> <li>◆ HF – Herbaceous forbs;</li> <li>◆ HG – Herbaceous grass;</li> <li>◆ SC – Closed shrubs;</li> <li>◆ SO – Open shrubs.</li> </ul>

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
102.	U_NAT_CL	Numeric	2	0	Non-forested natural vegetated land shrub closure
103.	U_ANTH_V	Character	3		Anthropogenic vegetated land identified as follows: ♦ CIP – Pipeline; ♦ CIW – Wellsite.
104.	U_ANTH_N	Character	3		Anthropogenic non-vegetated land identified as follows: ♦ AIG – Gravel pit; ♦ AIH – Highway; ♦ All – Industrial sites.
105.	U_NAT_N	Character	3		Naturally non-vegetated land identified as follows: ♦ NMB – Sand; ♦ NWF – Flooded land; ♦ NWL – Lake.
106.	U_REF_SC	Character	1		Reference source identified as follows: ♦ A – Air call; ♦ F – Field plot; ♦ I – Interpreted TPR.
107.	U_REF_YR	Numeric	4	0	Reference year
<b>Calculated Fields</b>					
108.	AREAHA	Numeric	8	2	Area (hectares)
109.	HFLAG	Numeric	4	0	Horizontal component identifier ♦ Use overstorey component (HFLAG = 1); ♦ Use understorey component (HFLAG = 2).
110.	SPGP	Character	4		Overstorey species group
111.	USPGROUP	Character	4		Understorey species group
112.	NONFOR	Numeric	4	0	Non-forested polygon identifier: ♦ Timber Damage Assessment area (NONFOR = 1); ♦ Natural vegetated (NONFOR = 2); ♦ Natural non-vegetated (NONFOR = 3); ♦ Anthropogenic vegetated (NONFOR = 4); ♦ Anthropogenic non-vegetated (NONFOR = 5); ♦ Forested (NONFOR = 0).
113.	NONFSPGP	Character	2		Cutblock species group derived from largest component of update cutblock
114.	CUTFLAG	Numeric	6	2	Cutblock identifier – identifies all cutblocks including: ♦ Non-vegetated islands within cutblocks (CUTFLAG = 0.5); ♦ Cutblock updates (CUTFLAG = 1); ♦ Buchanan Cutblock updates (CUTFLAG = 2); ♦ DFMP Cutblock updates (CUTFLAG = 3); ♦ Forest inventory cutblocks (CUTFLAG = 4).
115.	CUT_SPGP	Character	2		Cutblock species group
116.	MERCH	Numeric	1	0	Non-merchantable polygon identifier: ♦ Unproductive timber productivity rating (MERCH = 1); ♦ Larch as primary or secondary species (MERCH = 2); ♦ Low productivity black spruce stands (MERCH = 3).
117.	CUT_YEAR	Numeric	4	0	Year cutblock was harvested
118.	AGE	Numeric	4	0	Stand age
119.	AGECLASS	Numeric	4	0	10 year age class
120.	YC_SPGP	Character	2		Yield curve species group
121.	YC_CRWN	Character	1		Yield curve crown class

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	NO. OF DECIMALS	FIELD DESCRIPTION
122.	YC_SP	Character	2		Yield curve species
123.	NATREG	Numeric	4	0	Natural Sub-Region Identifier: <ul style="list-style-type: none"> <li>◆ Central Mixedwood (NATREG = 1);</li> <li>◆ Dry Mixedwood (NATREG = 2);</li> <li>◆ Lower Foothills (NATREG = 11).</li> </ul>
124.	YC_STRAT	Character	12		Yield curve strata developed from volume sampling
125.	YC_NUM	Numeric	4	0	Yield curve number developed from volume sampling and assigned as follows: <ul style="list-style-type: none"> <li>◆ MX-AB-D-A-G (YCNUM = 1);</li> <li>◆ MX-AB-D-A-MF (YCNUM = 2);</li> <li>◆ FH-AB-D-A-G (YCNUM = 3);</li> <li>◆ FH-AB-D-A-MF (YCNUM = 4);</li> <li>◆ MX-CD-D-A-G (YCNUM = 5);</li> <li>◆ MX-CD-D-A-MF (YCNUM = 6);</li> <li>◆ FH-CD-D-A-G (YCNUM = 7);</li> <li>◆ FH-CD-D-A-MF (YCNUM = 8);</li> <li>◆ A-AB-DC-A-A (YCNUM = 9);</li> <li>◆ A-CD-DC-A-A (YCNUM = 10);</li> <li>◆ A-AB-CD-A-A (YCNUM = 11);</li> <li>◆ A-CD-CD-A-A (YCNUM = 12);</li> <li>◆ A-AB-C-SW-A (YCNUM = 13);</li> <li>◆ A-AB-C-PL-A (YCNUM = 14);</li> <li>◆ A-AB-C-SB-A (YCNUM = 15);</li> <li>◆ A-CD-C-SW-A (YCNUM = 16);</li> <li>◆ A-CD-C-PL-A (YCNUM = 17);</li> <li>◆ A-CD-C-SB-A (YCNUM = 18).</li> </ul>
126.	DISP	Numeric	6	2	Disposition identifier: <ul style="list-style-type: none"> <li>◆ Special management area, buck-for-wildlife disposition (DISP = 0.75);</li> <li>◆ Grazing leases (DISP = 1);</li> <li>◆ Disposition Reservation (DISP = 4).</li> </ul>
<b>Net Landbase Determination Field</b>					
127.	NETDOWN	Numeric	6	2	Net down items – identifies all landbase categories: <ul style="list-style-type: none"> <li>◆ Net landbase (NETDOWN = 0);</li> <li>◆ Water (NETDOWN = 1);</li> <li>◆ Disposition (NETDOWN = 2);</li> <li>◆ Trumpeter swan nesting site buffer – 200m (NETDOWN = 4);</li> <li>◆ Lake buffer – 100m (NETDOWN = 5);</li> <li>◆ River and large permanent stream buffer – 60m (NETDOWN = 6);</li> <li>◆ Stream buffer – 30m (NETDOWN = 7);</li> <li>◆ Anthropogenic vegetated, anthropogenic non-vegetated and TDA areas (NETDOWN = 8);</li> <li>◆ Naturally vegetated and naturally non-vegetated (NETDOWN = 9);</li> <li>◆ Merchantability deletions (NETDOWN = 10);</li> <li>◆ Recent burns – since 1997 AVI (NETDOWN = 11).</li> </ul>
<b>Harvest Sequence</b>					
128.	AOP	Numeric	8	2	Planned block identifier
129.	CUTYEAR1	Numeric	8	2	First entry harvest
130.	CUTYEAR2	Numeric	8	2	Second entry harvest
131.	CUTYEAR3	Numeric	8	2	Third entry harvest



B.

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**Appendix B**  
*Seral Stage*  
*Maintenance Strategy*

DFMP

## APPENDIX B LATE SERAL STAGE MAINTENANCE STRATEGY

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### B.1 INTRODUCTION

This appendix describes the strategy, developed in consultation with SRD, to address the maintenance of biodiversity and species habitat. A coarse filter approach was taken as an initial step. In this approach, management objectives have been formulated to maintain the distribution of late seral stages across the FMA landbase. This initial strategy will be refined as more science becomes available.

Guiding principles for developing this strategy were that it had to be:

- Scientifically defensible, given the current knowledge base, and recognize the unique nature of the FMAs (i.e. geographically dispersed, fragmented and surrounded by agricultural land);
- Empirically measurable and auditable by regulatory agencies;
- Operationally feasible.

### B.2 BACKGROUND

A review of the literature and consultations with SRD staff revealed that:

- Both quality and quantity of late seral stage area are key components in a management strategy;
- Retention targets should be specific to a defined forest area.

Four main questions form the basis of this strategy:

#### 1. What are 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 for the species and site 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.

#### 2. What portions of the landbase should be included in the strategy?

Late seral stage maintenance is a landscape issue that includes all portions of the forested landbase. The strategy must consider the landscape in its entirety (both operable and non-operable areas).

#### 3. How can high quality late seral stage be defined and how much high quality late seral stage currently exists on the landscape?

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

- Distance to a riparian buffer (closer is better);
- Distance to roads (further away is better; the edge effect created by a road decreases the effective interior forest of the late seral stage stand; as well, road corridors allow easy access by predators);
- Distance to other reserve areas (connectivity to these areas is desired);
- Size of the stand (a larger stand provides more interior forest);
- Stands in the “Whitemud Bottle Neck” (sufficient cover in this area is important since it is a wildlife corridor);
- Stand complexity (complex stands provide more structure);

- Stand height (taller stands typically have more vertical structure);
- Diversity of stand cover types (late seral stage should represent all stand cover types);
- Stand Shape (less edge results in more interior forest).

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

A unifying approach to selecting late seral stage maintenance targets does not exist. Alternatives include prescribing “set” percentages or approximating the natural range of variability that has been observed. Targets selected should be specific to the defined forest area.

### B.3 PROBLEM STATEMENT

The primary question is, how should Tolko Industries Ltd. and Buchanan Lumber retain late seral stages in an effort to maintain biodiversity and wildlife habitat within their forest management areas?

### B.4 METHODS

To address the problem, the following four questions were investigated:

#### 1. What are the defining features of a late seral stage stand?

The identification of seral stages is a complex issue that often relies on stand attributes which are not easily modelled (i.e. stand structure and complexity). Age is typically used to define seral stages since it can be classified in an inventory and is usually an indicator for the onset of late seral stage characteristics.<sup>1</sup>

#### 2. What portions of the landbase should be included in the strategy, i.e. does it include both the operable and non-operable areas?

Operable and non-operable areas are defined as follows:

- Operable areas: All stands that were included in the Annual Allowable Cut calculation. This includes all stands in the net landbase as well as the productive conifer stands in the grazing leases. Table B-1 shows the breakdown of the operable landbase for the two FMAs.

**TABLE B-1: OPERABLE LANDBASE SUMMARY**

FORESTED LANDBASE CATEGORY	JOINT FMA		TOLKO FMA	
	AREA (HA)	PERCENT OF OPERABLE AREA	AREA (HA)	PERCENT OF OPERABLE AREA
NET PRODUCTIVE AREA	168,229	99.9	156,651	98.5
GRL CONIFER LANDBASE	168	0.1	2,450	1.5
<b>TOTAL OPERABLE AREA (HA)</b>	<b>168,397</b>	<b>100.0</b>	<b>159,101</b>	<b>100.0</b>

- Non-Operable areas: Stands that were not included in the Annual Allowable Cut calculation except for the productive deciduous stands in the grazing lease areas. The productive deciduous stands in the grazing lease areas are not included in this strategy because they are not sequenced for harvest in this plan, but they will be harvested under a separate management plan. Therefore, their seral stage status

<sup>1</sup> A process for identifying seral stages was carried out in the landscape assessment document for the two FMAs. This process was empirical in nature and used available growth and yield data as the basis for the seral stage definitions. These seral stage definitions were compared to the literature reviewed and were not deemed to be significantly different.

through time is uncertain and cannot be assumed to be late seral stage in the future. Table B-2 provides a breakdown of the operable landbase for the two FMAs.

**TABLE B-2: NON-OPERABLE LANDBASE SUMMARY**

FORESTED LANDBASE CATEGORY	JOINT FMA		TOLKO FMA	
	AREA (HA)	PERCENT OF NON-OPERABLE AREA	AREA (HA)	PERCENT OF NON-OPERABLE AREA
<b>LANDUSE DISPOSITIONS</b>	74	0.1	1,466	2.2
<b>RECREATIONAL LAKE BUFFERS (400M)</b>	0	0.0	65	0.1
<b>TRUMPETER SWAN LAKE BUFFERS (200M)</b>	79	0.1	294	0.4
<b>MEDIUM RECREATIONAL LAKE BUFFER (200M)</b>	0	0.0	863	1.3
<b>LAKE BUFFERS (100M)</b>	990	1.8	3,178	4.8
<b>LARGE PERMANENT BUFFERS (60M)</b>	4,014	7.3	2,399	3.6
<b>SMALL PERMANENT BUFFERS (30M)</b>	3,504	6.3	2,988	4.5
<b>NON-MERCHANTABLE</b>	46,580	84.3	54,661	82.9
<b>POTENTIALLY PRODUCTIVE</b>	40	0.1	33	0.1
<b>TOTAL NON-OPERABLE FORESTED AREA (HA)</b>	55,282	100.0	65,948	100.0

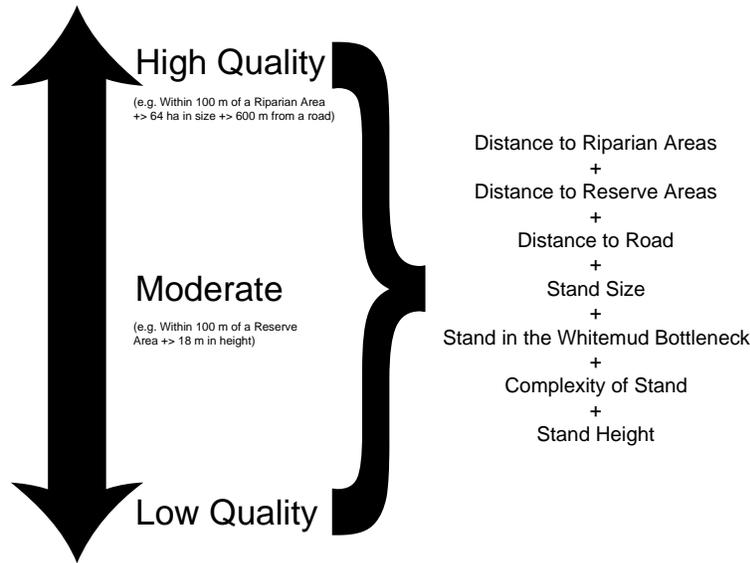
The literature review emphasized that seral stage maintenance is a landscape issue and that all portions of the forested landbase should contribute to late seral stage retention. To determine whether stands on the non-operable landbase are representative of the entire landbase, a comparison was done<sup>2</sup>.

**3. How can high quality late seral stage be defined and how much high quality late seral stage currently exists on the landscape?**

A process for identifying high quality late seral stage was required in order to compare the amount of “high quality” late seral stage that currently exists to what will be retained in the future. Quality indicators identified in the literature and through the DFMP planning process were used to define “high quality” late seral stage. Each of the quality indicators were assigned “quality points” and these points were summed up in order to determine the amount of “high quality” late seral stage for each cover group/operating area strata identified. Figure B-1 illustrates the process used.

<sup>2</sup> The data used in this analysis was sourced from the April 30, 2003 Net Landbase Determination

**FIGURE B-1: QUALITY POINT EXAMPLE**



The identification of these high quality stands was then used for both the definition of targets and the implementation of the strategy.

**4. What is the amount of late seral stage that should be maintained?**

Within the two FMA areas there are six operating areas that are geographically separated. Using the April 30, 2003 net landbase, the current amount of late seral stage for each cover group/operating area strata was calculated. The variable amounts of late seral stage in each of the six operating areas provided a way to determine an approximation of the natural range of variability for the amount of late seral stage present over time in any given area within the FMA.

Within each operating area stands representing each cover group exist in the non-operable landbase. These non-operable stands will become late seral stage in the future since they are unavailable for harvest<sup>3</sup>. A comparison between the approximate natural range of variability of late seral stage for each cover group and the area that will be retained in the non-operable landbase will help determine if the total non-operable landbase late seral stage is within the approximate natural range of variability.

Late seral stage maintenance is an issue of quality as well as quantity. Since non-operable areas are primarily riparian buffers (i.e. high quality late seral stage stands), a comparison was made to analyze the difference between the current amount of the gross forested landbase in high quality late seral stage and the amount of non-operable area that will be late seral stage. The difference between the two values identified the amount of high quality late seral stage required on the operable landbase in order to retain the current amount of high quality late seral stage existing on the FMAs.

**B.5 RESULTS**

**1. What are the defining features of a late seral stage stand?**

The seral stage definitions determined in the landscape assessment are summarized in Table B-3. The overmature seral stage is equivalent to late seral stage.

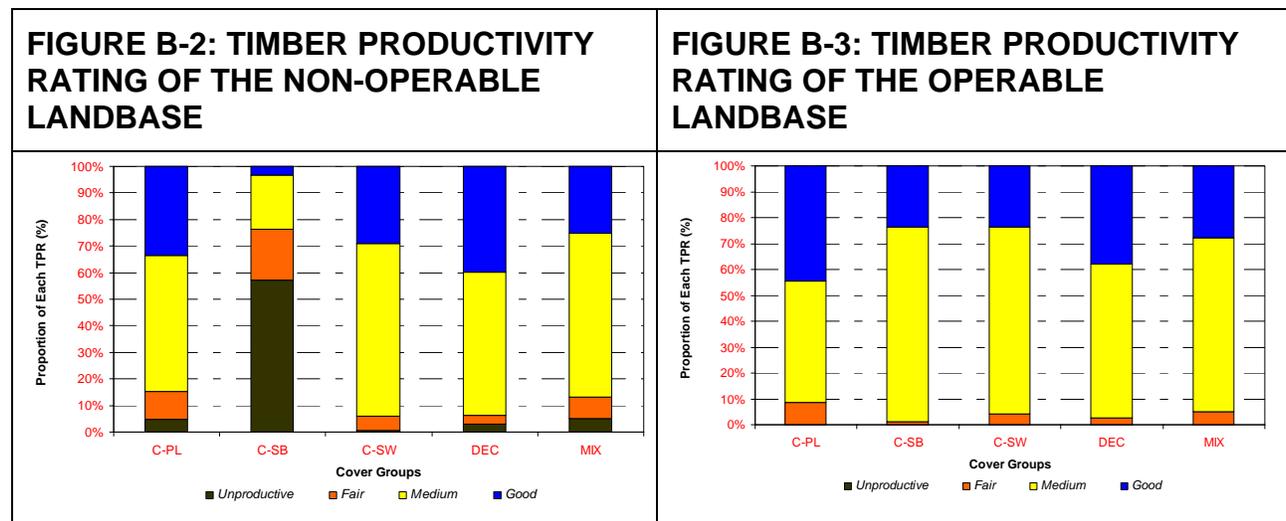
<sup>3</sup> This analysis does not incorporate random disturbance events (fire, insects and disease, etc)

**TABLE B-3: DEFINITION OF SERAL STAGES**

SERAL STAGE	COVER GROUP				
	PURE CONIFER WHITE SPRUCE LEADING	PURE CONIFER PINE LEADING	PURE CONIFER BLACK SPRUCE LEADING	MIXEDWOOD	PURE DECIDUOUS
	AGE RANGE (YEARS)	AGE RANGE (YEARS)	AGE RANGE (YEARS)	AGE RANGE (YEARS)	AGE RANGE (YEARS)
ESTABLISHMENT	0 – 15	0 – 15	0 – 15	0 – 15	0 – 10
JUVENILE	16 – 39	16 – 54	16 – 94	16 – 54	11 – 39
IMMATURE	40 – 74	55 – 89	95 – 129	55 – 79	40 – 64
MATURE	75 – 149	90 – 124	130 – 174	80 – 119	65 – 94
OVERMATURE	150 +	125 +	175 +	120 +	95 +

**2. What portions of the landbase should be included in the strategy?**

Figure B-2 presents the timber productivity rating (TPR) of the non-operable landbase stands by cover group and Figure B-3 presents the TPR of the operable stands by cover group. This analysis shows that for all cover groups, with the exception of Black Spruce leading conifer<sup>4</sup>, the non-operable stands are representative of the operable landbase.



**3. How can quality late seral stage be defined and how much high quality late seral stage currently exists on the landscape?**

Stands were assigned a quality rating in order to identify high quality seral stage areas. The current amount of high quality late seral stage across both FMAs is provided in Table B-4.

<sup>4</sup> The Black Spruce leading Conifer has ~90% of the area removed from the net landbase for each of the six operating areas, resulting in proportionally very little area in the operable landbase. The amount of the Black Spruce cover group that will be retained in late seral stage as a result of the non-operable area far exceeds the proxy natural range and therefore no strategy is warranted for the operable landbase.

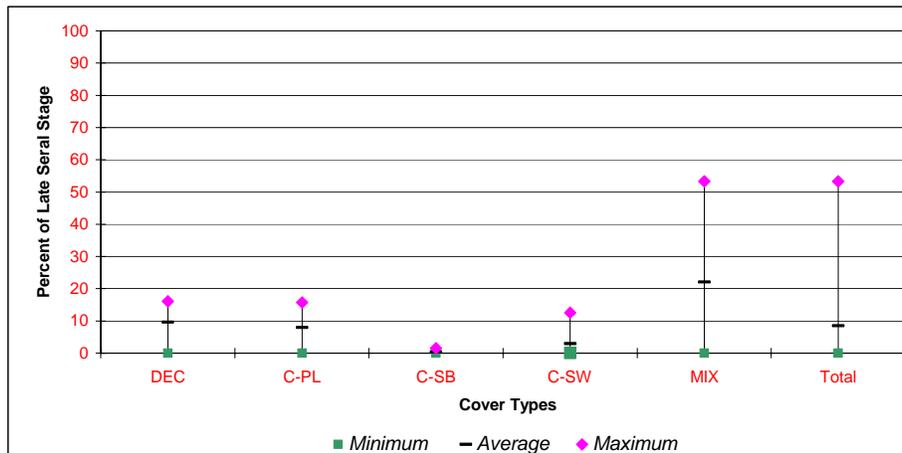
**TABLE B-4: CURRENT AMOUNT OF HIGH QUALITY LATE SERAL STAGE**

	COVER GROUP				
	DEC	C-PL	C-SB	C-SW	MIX
CURRENT AVERAGE AMOUNT OF HIGH QUALITY LATE SERAL STAGE (%)	3%	2%	0%	1%	8%
CURRENT TOTAL AMOUNT OF HIGH QUALITY LATE SERAL STAGE (%)	3%	5%	0%	1%	8%

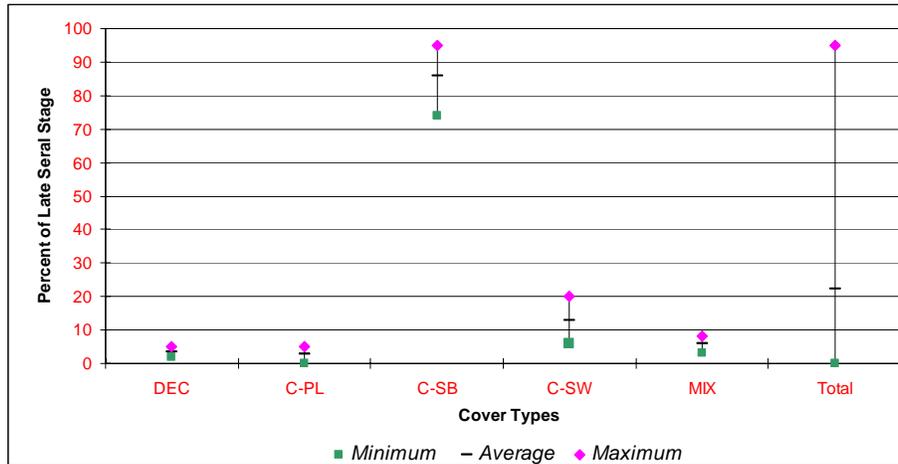
**4. What is the amount of late seral stage that should be maintained?**

The area of late seral stage existing in each of the six operating areas is provided in Figure B-4. The area that will be retained in late seral stage in the non-operable landbase is provided in Figure B-5. By comparing the approximate natural range of variability of late seral stage for each cover group to the area that will be retained in the non-operable landbase, it appears that the late seral stage areas that will be contributed by the non-operable landbase are well within or above the natural range of variability. This analysis is seen in Figure B-6.

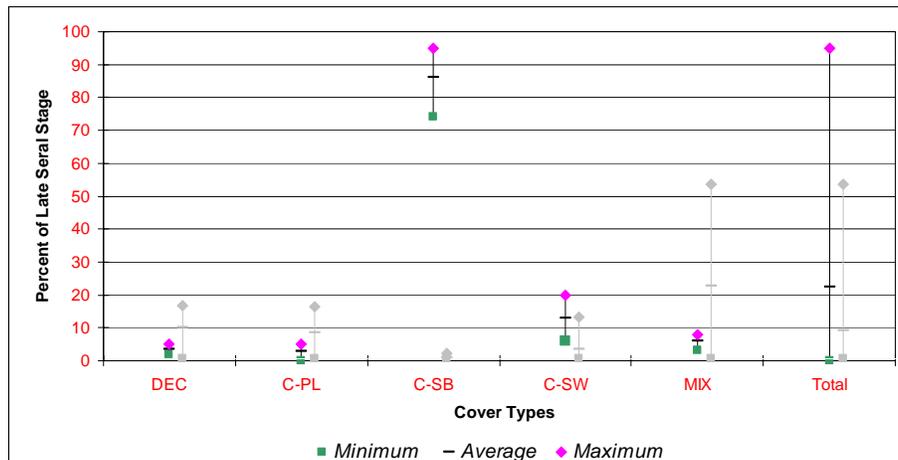
**FIGURE B-4: CURRENT AMOUNT OF LATE SERAL STAGE PRESENT IN THE SIX OPERATING AREAS**



**FIGURE B-5: AMOUNT OF AREA IN THE NON-OPERABLE LANDBASE IN THE SIX OPERATING AREAS<sup>5</sup>**



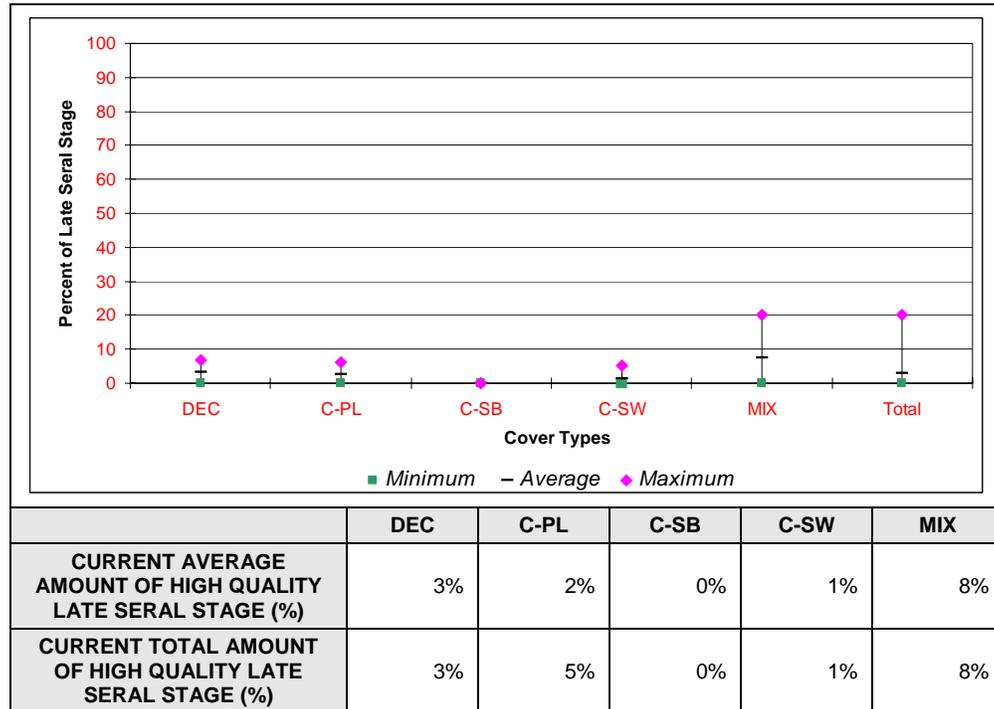
**FIGURE B-6: AMOUNT OF AREA IN THE NON-OPERABLE LANDBASE COMPARED TO THE APPROXIMATE NATURAL RANGE OF VARIABILITY (APPROXIMATE NRV IS IN GREY)**



Next, a comparison between the amount of high quality late seral stage that currently exists and what will be present in the non-operable landbase was required. The current amount of high quality is seen in Figure B-7.

<sup>5</sup> Due to the overall size of the Birch operating area and its proximity to the Whitemud operating area, the two operating areas will be combined.

**FIGURE B-7: CURRENT AMOUNT OF HIGH QUALITY LATE SERAL STAGE PRESENT IN THE SIX OPERATING AREAS**



**TABLE B-5: CURRENT AMOUNT OF AREA IN HIGH QUALITY LATE SERAL STAGE COMPARED TO THE AVERAGE AMOUNT OF AREA IN THE NON-OPERABLE LANDBASE IN THE SIX OPERATING AREAS**

COVER GROUP	CURRENT TOTAL AMOUNT OF HIGH QUALITY LATE SERAL STAGE (%)	AVERAGE FUTURE AMOUNT OF LATE SERAL STAGE IN NON-OPERABLE LANDBASE(%)	DIFFERENCE (%)
MIX	8%	6%	2%
C-PL	5%	3%	2%
DEC	3%	4%	-1%
C-SW	1%	13%	-12%
C-SB	0%	86%	-86%

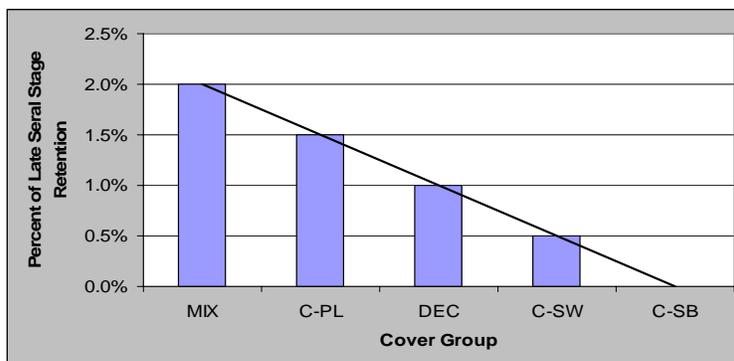
As seen in Table B-5 the Mixedwood cover group has an average of 6% of non-operable area. Other than the Black Spruce leading conifer cover group, the non-operable areas are primarily riparian buffers, which are high quality late seral stage stands. There is currently 8% of the gross forested landbase in the Mixedwood cover type in high quality late seral stage. In order to retain a similar amount of high quality late seral stage, an additional 2% of the gross forested landbase area will be required on the operable landbase for the Mixedwood cover group.

When comparing the difference between the average future amount of late seral stage in non-operable landbase and the current amount of high quality late seral stage for the Deciduous and White Spruce leading conifer cover groups, it appears that no further retention on the operable landbase is required. But as a result of the majority of the non-operable area being comprised of riparian buffers, the stand shape of the retention

areas may not produce enough interior forest as riparian areas are typically narrow, so it was determined that area should be retained on the operable landbase in these cover groups as well. The Pine Leading Conifer and Mixedwood both have a 2% difference, but when comparing the average of non-operable area to the current total amount of late seral stage, there is a greater difference in the Mixedwood cover group. Therefore the higher percentage will be maintained for Mixedwood. The cover types will be assigned target retention percents linearly between the Mixedwood minimum target of 2% and the Black Spruce leading Conifer minimum of 0%, based on their ranking identified by the % difference.

Figure B-8 graphically represents the minimum retention targets for the five various cover groups.

**FIGURE B-8: MINIMUM PERCENT RETENTION ON THE OPERABLE LANDBASE**



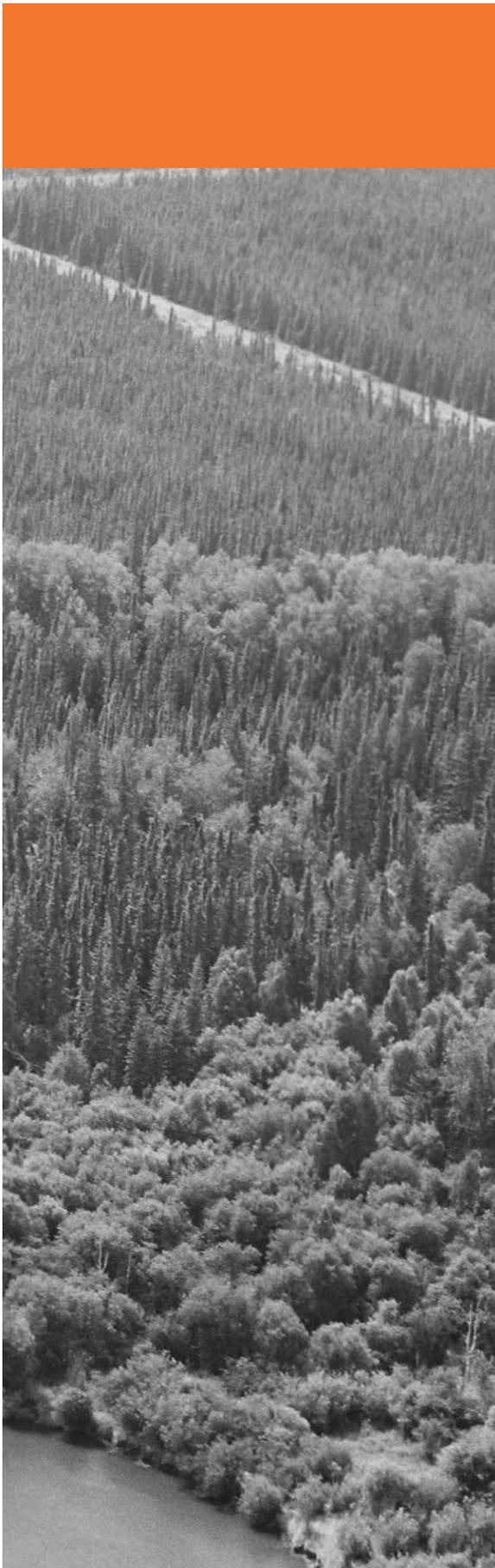
## B.6 CONCLUSION

Tolko Industries Ltd. and Buchanan Lumber will initially address the maintenance of wildlife habitat and biodiversity within their forest management area by managing late seral stage as follows:

- 1) using the overmature definition as identified in the Landscape Assessment;
- 2) considering both the operable and non-operable landbase in the strategy;
- 3) focusing on the retention of high quality, effective late seral stage by using the identified quality indicators and;
- 4) retaining the non-operable landbase area, plus an additional 2% minimum of the gross forested landbase area on the operable landbase for the Mixedwood cover group, 1.5% for the Pine Leading Conifer cover group, 1.0% Deciduous cover group, and 0.5% White Spruce Leading Conifer cover group, for each operating area cover group strata.<sup>6</sup>

Implementation of this strategy will be spatially explicit for the full 160 year planning horizon with each high quality stand identified and managed operationally. Details regarding the implementation are discussed in Section 6.2.

<sup>6</sup> Due to the overall size of the Birch operating area and its proximity to the Whitemud operating area, the two operating areas have been combined. Some of the other cover group/operating area strata do not have enough area to require an individual targeted strategy and are combined with other similar strata.



C.

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**Appendix C**  
*Joint Forest  
Management Agreement*

DFMP

GOVERNMENT OF THE PROVINCE OF ALBERTA

FORESTS ACT

FOREST MANAGEMENT AGREEMENT

(O.C. 29/2002)

Approved and Ordered

Lois Hole  
Lieutenant Governor

Edmonton, February 6, 2002

Upon the recommendation of the Honourable Minister of Sustainable Resource Development, the Lieutenant Governor in Council, pursuant to section 16 of the Forests Act, approves the entry by the Minister of Sustainable Resource Development into a forest management agreement with Gordon Buchanan Enterprises Ltd. and Tolko Industries Ltd. in accordance with the attached Appendix.

Shirley McClellan (Acting Chair)

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**MEMORANDUM OF AGREEMENT**

**BETWEEN:**

**HER MAJESTY THE QUEEN** in the right of the Province of Alberta, as represented by the Minister of Sustainable Resource Development, (hereinafter referred to as "the Minister"),

OF THE FIRST PART

and

**GORDON BUCHANAN ENTERPRISES LTD.** a body corporate, registered under the laws of Alberta, with a business office in High Prairie, Alberta ("Buchanan")

OF THE SECOND PART

and

**TOLKO INDUSTRIES LTD.**, a body corporate, registered under the laws of Alberta, with a business office in High Prairie, Alberta ("Tolko")

OF THE THIRD PART

(hereinafter referred to as the Companies)

**WHEREAS** Buchanan owns and operates a sawmill complex ("the "Sawmill") located in the Town of High Prairie, Alberta with an annual production capacity of 100,000,000 board feet of lumber; and

**WHEREAS** Tolko owns and operates a major oriented strandboard production facility (the "Plant") located near the Town of High Prairie, Alberta for the manufacture of oriented

strandboard with a rated annual capacity of 525,000,000 square feet of oriented strand board measured on a 3/8 inch basis; and

**WHEREAS** the Minister, recognizing the Companies' needs for a forest management agreement to warrant the continued operations of their respective facilities, desires to provide for a perpetual sustained yield of timber for each of the Companies' respective operations; and

**WHEREAS** it has been mutually agreed by all of the parties hereto that it is a convenient time to enter into a forest management agreement that will supply a portion of both Tolko's and Buchanan's respective timber needs for the Plant and the Sawmill, and

**WHEREAS** the Minister desires to provide for sustainable development of all resources and to provide for the fullest possible economic utilization of timber from the forest management area and stable employment in local communities by maximizing the value of the timber resource base while maintaining a forest environment of high quality.

**NOW THEREFORE THIS AGREEMENT WITNESSETH** that in consideration of the premises, terms, conditions, covenants, stipulations, agreements and provisions herein contained, the Minister, Buchanan and Tolko hereby agree as follows:

### **DEFINITIONS**

1. (1) In this Agreement
  - (a) "Agreement" means this Forest Management Agreement including all appendices or schedules attached hereto, and any written amendments made hereto from time to time by agreement of all of the parties;
  - (b) "annual allowable cut" is the amount of timber that may be harvested in any one year as stipulated in the pertinent forest management plan approved by the Minister;
  - (c) "Buchanan" means Gordon Buchanan Enterprises Ltd.
  - (d) "commencement date" has that meaning provided for in paragraph 2.(1) of this Agreement;
  - (e) "Companies" means, collectively, Tolko and Buchanan and "Company" means either of them;
  - (f) "coniferous stand" means pure coniferous and mixed wood stands (C, C(D), CD and DC) and pure deciduous stands with mapped coniferous understory identified on timber type maps referenced in Appendix "B" attached hereto;
  - (g) "coniferous timber" means all coniferous species of trees growing on the forest management area, including, but not limited to, all species of pine, spruce, fir and larch;
  - (h) "Crown" means Her Majesty the Queen in right of Alberta;
  - (i) "cubic metre" shall have the same meaning as that prescribed by the Timber Management Regulation;
  - (j) "cut control period" means a period of five consecutive forest management operating years;

- (k) “deciduous timber” means all deciduous species of trees growing on the forest management area, including, but not limited to, all species of poplar, aspen and birch;
  - (l) “deciduous stand” means stands which have 80% to 100% deciduous crown cover. These pure deciduous stands are D and D(C) stands that do not contain an established coniferous understory as designated on timber type maps produced by the Department and referenced in Appendix “E” attached hereto;
  - (m) "Department" means the Department of Sustainable Resource Development;
  - (n) “designate” has that meaning provided for in paragraph 6(4);
  - (o) "dollar" means Canadian currency of the value of one Canadian dollar, or the equivalent value in any other currency;
  - (p) "forest management area" refers to the tract of forest land as specifically defined in paragraph 3, over which the Companies are hereby given rights (as herein detailed) for establishing, growing and harvesting timber on a perpetual sustained yield basis for a defined period of time;
  - (q) "periodic allowable cut" is the total of the annual allowable cuts approved for a five-year cut control period;
  - (r) “Plant” has that meaning provided for in the recitals to this Agreement;
  - (s) “Sawmill” has that meaning provided for in the recitals to this Agreement;
  - (t) "Scaling Regulation" means Alberta Regulation 336/79 authorized by Ministerial Order 40/79;
  - (u) "Surface Materials Regulation" means Alberta Regulation 11/78;
  - (v) "Timber Management Regulation" means Alberta Regulation 60/73 authorized under Order-in-Council 309/73;
  - (w) "Timber Regulation" means Alberta Regulation 404/92 and any amendments thereto or substitutions therefor; and
  - (x) “Tolko” means Tolko Industries Ltd.
- (2) The *Forests Act*, the *Public Lands Act*, and the regulations made thereunder shall mean for the purposes of this Agreement, those Alberta Statutes and the regulations as each may from time to time be amended respectively or such Acts or regulations as may from time to time be substituted therefor, and terms defined by the *Forests Act*, the *Public Lands Act*, and the regulations made thereunder shall for the purpose of this Agreement, have the meaning given to them by those Acts and regulations as each may be amended or substituted from time to time.

2. (1) This Agreement shall commence on the 5<sup>th</sup> day of March, 2002, (hereinafter referred to as the “commencement date”), and shall expire on the 4<sup>th</sup> day of March, 2022, unless renewed under the provisions of subparagraph (3).
- (2) It is the intention of the parties hereto to continue the respective rights of the Companies under paragraph 7 to establish, grow harvest and remove timber on the forest management area for terms of twenty years if, pursuant to subparagraph (3), mutual agreement thereon can be reached by the Minister and the Companies and such agreement is approved by the Lieutenant Governor in Council.
- (3) Subject to the approval of the Lieutenant Governor in Council and provided that the Companies are not in default as to any of the terms, conditions, stipulations, covenants, agreements and provisions of this Agreement, the Companies, or Company who is not then in default of any of the provisions of this Agreement, shall be entitled to a renewal of this Agreement whereby its rights under paragraph 7 to establish, grow harvest and remove timber are continued on condition that:
  - (a) the Companies, or Company who is not then in default of any of the terms, conditions, stipulations, covenants, agreements and provisions of this Agreement, gives notice to the Minister within nine years following the commencement date of this Agreement of its desire to renew this Agreement; and
  - (b) mutually acceptable terms, conditions, stipulations, covenants, agreements and provisions including further renewal provisions or other requirements can be renegotiated at the time of renewal.
- (4) Where the Companies or Company gives a notice under subparagraph (3)(a), the Companies or Company, as the case may be, and the Minister shall carry out good faith negotiations in an attempt to agree on a renewal Agreement with a term of twenty years and have it approved by the Lieutenant Governor in Council prior to the tenth anniversary of this Agreement.
- (5) The parties may agree to commence negotiations earlier than provided for in subparagraph (3)(a).

#### **FOREST MANAGEMENT AREA**

3. The Minister and the Companies hereby enter into this forest management agreement in respect of the forest management area comprising, subject to paragraphs 4, 5, and 6, public lands within the boundaries shown outlined on a map registered in the Department, a copy of which is annexed hereto as Appendix "A".
4. Out of the forest management area the following are excepted:
  - (a) areas which are the subject of any existing timber dispositions issued pursuant to the *Forests Act*, to parties other than the Companies, prior to the date of this Agreement;
  - (b) lands which are the subject of a disposition issued pursuant to the *Public Lands Act* prior to the date of this Agreement or lands in respect of which a disposition under the *Public Lands Act* has been approved but which issuance is pending prior to the date of this Agreement;

- (c) lands which have been reserved under section 18(c) of the *Public Lands Act* or in respect of which a reservation has been approved but which has not been granted prior to the date of this Agreement;
  - (d) the beds and shores of all permanent and naturally occurring bodies of water and all naturally occurring rivers, streams, watercourses and lakes; and
  - (e) lands contained within any Provincial Park, Forest Recreation area, Natural Area or Ecological Reserve prior to the date of this Agreement;
5. Whenever any of the productive or potentially productive land excepted under paragraph 4.(a), (b), (c) or subsequently withdrawn from the forest management area becomes available for disposition and where such land is intended to be returned to timber production by the Minister, the Minister shall notify the Companies when such land becomes available and where the Companies request that such land be returned to timber production by the Minister, the Minister shall return these lands back to the forest management area in a productive or potentially productive state.

### **WITHDRAWALS**

6. (1) The Minister may, at any time in his discretion, after consultation with the Companies with respect to the effect any such withdrawal may have on the forest management area, either permanently or for a specified term, withdraw from the forest management area:
- (a) any land which cannot be logged without causing substantial harm to the water table or to lakes, rivers, streams or other bodies of water, to the margins of water courses or to roads;
  - (b) any lands required for rights-of-way, water resource and agricultural development or for any other purposes deemed by the Minister to be required for the human or physical resource development of the Province;
  - (c) any lands required for commercial and industrial purposes; and
  - (d) any lands which are not capable of producing timber.
- (2) A withdrawal shall take effect
- (a) on the date that a joint notice of withdrawal is given by the Minister to the Companies, or
  - (b) where the joint notice given states that the withdrawal shall take effect at a future date, on the date stated in the joint notice.
- (3) In the event from time to time, after consultation with the Companies, of any withdrawal or withdrawals of land from the forest management area by the Minister under subparagraph (1):
- (a) for disposition to users other than the Crown, the Companies shall be entitled to reasonable compensation from the users of the area withdrawn for any loss of profit or other damage or loss suffered by the Companies, including by way of example, but without limitation, damage to timber, improvements, regeneration, forest growth or to

their operations on the forest management area resulting from such withdrawals;

- (b) for use by the Crown wherein the cumulative net aggregate productive area withdrawn does not exceed 2% of the net productive area of the forest management area, the Minister shall determine the compensation and arrange for reimbursement to the Companies for the actual loss or damage resulting from such withdrawal to any improvements created by the Companies' efforts, but not for any loss of profit, inconvenience nor increased costs reasonably incurred by the Companies in harvesting an equivalent volume of timber elsewhere;
  - (c) for use by the Crown wherein the cumulative net aggregate productive area withdrawn does exceed 2% of the net productive area of the forest management area, the Minister shall determine the compensation in respect of such excess and arrange for reimbursement to the Companies for any increased costs reasonably incurred by the Companies in replacing the lost volume of timber and for any loss or damage suffered by the Companies including damage to timber, improvements, regeneration, forest growth, or to its operations on the forest management area;
  - (d) In the event that any or all of subparagraphs (a), (b) or (c) should apply, only the Company which has actually suffered the loss or damage shall be entitled to the prescribed compensation as set forth in this subparagraph (3).
- (4) (a) The Companies appoint Buchanan as a designate ("designate") who will represent the Companies with respect to matters involving
- (i) disposition holders other than the Crown;
  - (ii) forest management planning;
  - (iii) fire control plans;
  - (iv) provision of consent to the activities of disposition holders on the forest management area;
  - (v) withdrawal of productive lands;
  - (vi) collection of compensation from disposition holders; and
  - (vii) other matters related to this Agreement.
- (b) The Companies may, from time to time, on 30 days written notice to the Minister, appoint a replacement designate for the matters set out in subparagraph (4)(a).
- (5) The Minister may, from time to time add available public land to the forest management area as full or partial compensation to the Company or Companies, as the case may be, under subparagraph (3)(b) or (c).
- (6) If the administration and control of any of the lands comprising the forest management area is transferred to the Crown in right of Canada, the Company or Companies, as the case may be, shall be entitled to compensation under subparagraph (3) as if the lands were withdrawn for use by the Crown.

- (7) For the purposes of applying subparagraphs (3)(b) and (c),
  - (a) the net productive area for the initial forest management area shall be established and agreed upon by all of the parties to be effective on the commencement date of this Agreement, and
  - (b) the cumulative net aggregate productive area withdrawn shall be calculated taking into consideration all exceptions and additions to the forest management area under subparagraph (5) and paragraphs 4 and 5 and all withdrawals under subparagraph (1) for use by the Crown.
- (8) Monetary compensation received by the Companies under subparagraph (3)(a) and paragraph 8(1)(b) shall only be used to offset damage to improvements such as plantations, roads, bridges or other facilities and to replace timber resources.
- (9) The Companies shall maintain complete and accurate records of the receipt and use of all compensation funds received under this paragraph and paragraph 8(1)(b).
- (10) The Minister may from time to time at his discretion request verifiable documentation of the use of compensation funds received under this paragraph and paragraph 8(1)(b) and the Companies shall comply with any such request.

#### **RIGHTS OVER THE LAND**

- 7. (1) Subject to all the terms and conditions of this Agreement the Minister grants:
  - (a) to Buchanan, the right, during the term of this Agreement, to enter upon the forest management area to:
    - (i) establish, grow, harvest and remove coniferous timber thereon from coniferous stands on a perpetual sustained yield basis; and
    - (ii) harvest and remove deciduous timber from coniferous stands on behalf of Tolko where such deciduous timber has been approved for harvest under the approved annual operating plan; and
  - (b) to Tolko, the right during the term of this Agreement, to enter upon the forest management area to:
    - (i) establish, grow, harvest and remove deciduous timber thereon from deciduous stands on a perpetual sustained yield basis; and
    - (ii) harvest and remove coniferous timber from deciduous stands on behalf of Buchanan where such coniferous timber has been approved for harvest under the approved annual operating plan.
  - (c) to the Companies, the right to enter upon the forest management area for the purposes of the construction, operation and maintenance of camps, roads, wood concentration yards and other installations necessary and incidental to the Companies respective logging and silvicultural operations.
- (2) For the purpose of interpreting the *Surface Rights Act*, as amended, the

Companies are each an occupant of the public lands comprising the forest management area.

- (3) The Minister shall cause land dispositions required within the forest management area for work such as roads, bridges, camps, timber processing operations and other necessary works incidental to the Companies' respective harvesting and silvicultural operations to be issued to the Companies, or either of them, without any dues, fees or rental charges under the *Public Lands Act* being paid but such dispositions shall otherwise be subject to any pertinent regulations.
  - (4) Notwithstanding subparagraph (3), the Companies may each obtain sand and gravel needed for their respective operations under this Agreement from any vacant public land on the forest management area pursuant to the Surface Materials Regulation, subject to the payment by the Companies, or either of them, as the case may be, of all required fees and royalties. In no case, however, shall the Companies have to pay fees or royalties for in situ right-of-way material located and used where it is found within the right-of-way.
8. (1) It is recognized by the Minister that the Companies use of the forest management area for establishing, growing, harvesting and removing timber is to be the primary use thereof and that it is to be protected therein in keeping with the principles of sustainable forest management. In keeping with public values and recognizing that certain portions of the forest management area may have other resource values, the Minister reserves all land rights on the forest management area not specifically given hereby, including by way of example, but without limiting the generality of the foregoing:
- (a) the right of others to travel, hunt, fish and otherwise use the said lands for recreational purposes, subject only to any necessary restrictions approved by the Minister for the purpose of prevention of accidents, fire control, protection of wildlife and seasonal protection of roads;
  - (b) the right to authorize any person to conduct any work in connection with or incidental to geological or geophysical exploration pursuant to the *Mines and Minerals Act*, or the Exploration Regulations; provided that the Companies or either of them shall be entitled to receive reasonable compensation from the person or company which holds the authorization to conduct the exploration, for any loss or damage suffered by the Companies or either of them and resulting from such exploration including by way of example but without limitation, for any damage to timber, forest growth, regeneration, improvements or to any of their operations on the forest management area; and provided further that the Companies or either of them shall not be entitled to compensation for damage to timber or forest growth caused by any such geological or geophysical exploration where the right to cut such timber has been granted to a third party under timber permit;
  - (c) the right to maintain and enhance forest resources, including fish and wildlife resources; and

- (d) the right to authorize trapping and, after consultation with the Companies, to authorize domestic stock grazing provided, however, that the growth performance of the managed timber species is not impaired and the regeneration will not be damaged by domestic stock grazing to the point where the overall stocking is reduced below the reforestation standard as set out in the Timber Management Regulation and provided the Companies' right to establish, grow, harvest and remove timber is not significantly impaired.
- (2) The Minister also reserves the following rights to the timber on the forest management area:
- (a) the right, after consulting with the Companies, to issue timber permits from within the forest management area to provide timber
    - (i) for local use in construction and maintenance of public works by any local authority, municipality, county, the Crown in right of Alberta or Canada, and
    - (ii) for a Community Timber Use program

provided that the total combined volume for these dispositions does not exceed 67,500 cubic metres of coniferous timber and 2,500 cubic metres of deciduous timber in each five-year cut control period;
  - (b) the right, after consulting with Buchanan, to issue coniferous timber permits for the removal of smallwood coniferous timber from mature and over mature coniferous stands, when such coniferous timber is not scheduled to be harvested by Buchanan in the approved annual operating plan submitted under paragraph 18;
- (3) The Minister and the Companies shall provide each other such available information as the Minister and the Companies may reasonably request concerning the operations authorized under permit and licence. The Minister shall consult with the Companies on an ongoing basis as may be required to minimize any conflict between the operations authorized under the permits and licences issued pursuant to subparagraph (2) and the respective operations of the Companies.

## **FOREST MANAGEMENT**

### **A. GENERAL PROVISIONS**

9. On the forest management area, the Companies shall, in accordance with the approved forest management plan follow sound forestry practices including landscape management based on ecological principles in managing the land base for the purpose of achieving and maintaining a perpetual sustained yield of timber from the productive forest land, while not reducing the productivity of the land.
10. (1) Before the Companies submit a plan referred to in subparagraphs (3), (4) and (5) to the Minister for his review and approval, the Companies shall
- (a) develop the requisite forest management plan so as to ensure that the objectives and principles of sustainable forest management are maintained in keeping with the requirements as specified in the forest management planning manual and as set forth in Appendix "B",

- (b) make reasonable arrangements required for and shall conduct public presentations and reviews of the proposed forest management plans; and
  - (c) provide the opportunity for third parties holding timber dispositions on the forest management area to participate in the formulation of the Companies' detailed forest management plans to ensure that the long term sustainable objectives and principles of forest management are maintained.
- (2) After these public presentations and reviews, the Companies shall incorporate in the forest management plan their response to the concerns raised by the public respecting the proposed forest management plan and shall submit this plan to the Minister within the time specified in subparagraphs (3), (4) or (5), as the case may be, for the Minister's review and approval.
- (3) No later than December 31, 2003, the designate shall submit for the Minister's approval a single preliminary forest management plan. Prior to approval of the preliminary forest management plan, the Companies shall continue their respective timber harvesting operations in accordance with the Crown's approved forest management unit plans and the terms of the Companies' approved annual operating plans.
- (4) Not later than the fifth anniversary of the commencement date of this Agreement, the designate shall submit for the Minister's approval a single detailed forest management plan, and this plan when approved will replace that plan approved under subparagraph (3).
- (5) Not later than the fifteenth anniversary of the commencement date of this Agreement, the designate shall submit for the Minister's approval, a single revised detailed forest management plan, and this revised plan when approved will replace that plan approved under subparagraph (4).
- (6) The Companies shall prepare the forest management plans referred to in subparagraphs (3), (4) and (5) in accordance with the forest management planning manual prepared by the Minister, as amended from time to time, and having regard to the management, harvesting and reforestation requirements set forth in Appendix "B".
- (7) The management strategies in the detailed forest management plan under subparagraphs (4) and (5) shall:
  - (a) provide for the maintenance of the annual allowable cut for both the coniferous and deciduous tree species, subject only to the occurrence of natural disasters; and
  - (b) account for both the coniferous and deciduous growing stock in the forest management area, and shall ensure that these components are being replaced through strategies outlined in the approved forest management plans and annual operating plans.
- (8) The Minister may require the Companies, after discussing any proposed changes with the Companies, to alter any of the methods described in the forest management plans before approving such plans. Without limiting the generality of the foregoing, if there is any dispute as between the Companies concerning finalization of the detailed forest management plans required to be submitted in accordance with this paragraph 10, the Minister may, in his sole

discretion, direct that the Companies proceed to binding arbitration to resolve such dispute, which arbitration, if so directed by the Minister, shall occur in accordance with the provisions set forth in paragraph 44.

- (9) The Minister agrees that so long as a plan, required under this paragraph 10 has been submitted by the Companies, within the time periods herein specified and provided such plan complies with the requirements of this Agreement, unless the Minister has sent a notice under paragraph 12, the Companies are hereby authorized to continue to carry on their respective operations pursuant to the existing approved plan, pending approval being granted by the Minister to the newly submitted plan.
11. Subject to paragraphs 10(3) and 10(9) the Companies may not commence or carry on any construction project or any operation on the forest management area until the relevant plans which are required to be submitted pursuant to this Agreement have been submitted by the Companies and approved in writing by the Minister. The Companies may not digress from the approved plans without the Minister's consent in writing, with the understanding that the Minister shall provide a full explanation whenever consent is withheld.
12. When, in the opinion of the Minister, any plan approved by him becomes obsolete or inadequate, he may, by reasonable notice in writing, require the Companies to submit a revised plan for his approval within a specified time, or within any extended time he may subsequently allow.
13.
  - (1) The Minister shall consult with the Companies concerning proposed areas and methods of harvesting by timber licensees and permittees in the forest management area before designating the areas in which timber licensee and permittee operations may be carried on.
  - (2) The Companies shall, through sustainable forest management planning, integrate and coordinate the management of the forest resources with all timber licensees and permittees operating within the forest management area.
14.
  - (1) The Minister shall require timber licensees and permittees operating within the forest management area to conduct all harvesting operations in accordance with the approved plans submitted hereunder and to refrain from hindering or obstructing the lawful operations of the Companies.
  - (2) Buchanan shall have the right to negotiate the purchase of timber quota certificates or negotiate other arrangements with holders of coniferous certificates, licences and permits in order to combine coniferous timber harvesting operations from coniferous stands for maximum utilization of coniferous timber resources.
  - (3) Tolko shall have the right to negotiate the purchase of deciduous timber dispositions or negotiate other arrangements with holders of deciduous timber dispositions in order to combine deciduous timber harvesting operations for maximum utilization of deciduous timber resources.
15.
  - (1) The Companies shall conduct such forest inventories of the forest management area as are necessary to prepare the plans required by this Agreement.
  - (2) The Companies shall maintain a reasonably complete and accurate forest inventory of the forest management area collected to Alberta Vegetation Inventory Standards version 2.1, or as otherwise mutually agreed to by the Companies and the Minister, and shall update all depletions and reforestation.

- (3) By December 31, 2002, the Companies shall establish and implement a growth and yield program consistent with prevailing standards and policies and acceptable to the Minister on lands within the forest management area.
  - (4) The growth and yield program will include the establishment of a system of permanent sample plots which will be used to monitor the results of different silvicultural systems during the term of this Agreement so as to provide accurate information for the preparation of reliable yield tables.
  - (5) All information and data related to the forest management area that has been or will be collected by the Companies or the Minister relating to forest inventory, other resource uses, the inventory referred to in subparagraph (2), growth and yield data, reforestation results, and operational and detailed planning maps shall be made available from the Companies to the Minister, or from the Minister to the Companies, whichever is the case, free of charge upon request and on a timely and confidential basis.
16.
  - (1) The Companies shall conduct their timber harvesting and reforestation operations in accordance with the approved "Alberta Timber Harvest Planning and Operating Ground Rules" until such time as they are replaced by the established set of ground rules under subparagraphs (2) or (3).
  - (2) Within six (6) months following the approval of the detailed management plan under paragraph 10(4), the Minister and the Companies shall jointly develop a new set of ground rules consistent with the detailed forest management plan, for the preparation of operating plans and to guide harvesting and reforestation operations.
  - (3) If a set of ground rules cannot be established by mutual agreement of the Minister and the Companies, the Minister may establish new ground rules which are consistent with the approved detailed forest management plan, but only with the approval of the Lieutenant Governor in Council.
  - (4) At the initiative of any party to this Agreement, the ground rules shall be reviewed jointly by the Minister and the Companies. These ground rules may be altered by mutual agreement of the Minister and the Companies.
17.
  - (1) The term of this Agreement shall be divided into four cut control periods each with a duration of five years or as otherwise agreed to by the Minister.
  - (2) If either of the Companies over cuts the periodic allowable cut the Minister shall reduce the annual allowable cut for the coniferous or deciduous, as the case may be, during the subsequent cut control period by an amount equivalent to the entire overcut volume, except to the extent that the overcut results from the salvage of dead, damaged, endangered, diseased, decadent or fire killed timber.
  - (3) Where production is lower than the periodic allowable cut, the Company responsible for any reduced production may submit a program satisfactory to the Minister making up the undercut volume in the subsequent cut control period, or such other period as may be approved by the Minister.

18.
  - (1) The Companies shall forthwith upon the commencement of this Agreement establish a forest management operating year that shall commence and end on dates approved by the Minister.
  - (2) Subject to paragraph 10(3), the Companies shall annually submit to the Minister a single integrated annual operating plan in accordance with the ground rules referred to in paragraph 16.
  - (3) Each annual operating plan shall be prepared in accordance with the approved forest management plan and shall provide for the establishment, growing, harvesting and removal of timber in the forest management area in accordance with the guidelines set forth in Appendix "B" and shall include an operating projection showing the proposed harvesting operation intended by each of the Companies. Such operating projection shall be in accordance with the standards and shall cover the period of time specified in the ground rules referred to in paragraph 16.
  - (4) The Minister may approve such plan as submitted, or may require the Companies, after discussing any proposed changes with the Companies, to alter any harvesting operations described in the plans, provided that the Minister shall not thereby alter the ground rules and acts promptly so as to avoid delay in the Companies' respective operations.
  - (5) When the annual operating plan does not provide for the salvage of dead, damaged, endangered, diseased or decadent or fire killed timber, the Minister may give notice to the Companies that he requires provision for its salvage in such plan. The Companies shall have thirty (30) days from the date on which such notice is given to them by the Minister within which to amend the plan, or to justify the exclusion of such timber from the plan, but if they fail or elect not to do either within such period, they shall not be deemed to be in default and the Minister may dispose of such timber to any person by license or permit not exceeding one year in duration without compensating the Companies and the volume of timber so disposed will be charged by the Minister as production against the annual volume of either deciduous production or coniferous production, as the case may be, in the forest management area.
19.
  - (1) Buchanan shall use reasonable effort to purchase coniferous roundwood if required by Buchanan and if offered to Buchanan at prevailing market prices, provided that the coniferous roundwood possesses a standard of quality suitable in the opinion of Buchanan for use in its Sawmill.
  - (2) Tolko shall use reasonable effort to purchase deciduous roundwood if required by Tolko and if offered to Tolko at prevailing market prices, provided that the deciduous roundwood possesses a standard of quality suitable in the opinion of Tolko for use in its Plant.
20.
  - (1) Buchanan shall utilize all merchantable coniferous timber cut in road construction and other incidental operations of the Companies unless otherwise permitted in writing by the Minister.
  - (2) Tolko shall utilize all merchantable deciduous timber cut in road construction and other incidental operations of the Companies unless otherwise permitted in writing by the Minister.
21. The Companies shall not hinder or obstruct the lawful timber operations of licensees and permittees.

22. (1) It is recognized that during their operations, licensees and permittees may cause some incidental damage to timber. No claim shall be made by either of the Companies against any licensee, permittee or the Minister for reasonably unavoidable incidental damage to timber.
- (2) The Minister shall ensure that all timber licences and permits issued on the forest management area after the commencement date of this Agreement shall include a provision preventing a claim against either of the Companies for reasonably unavoidable incidental damage to timber.

## **B. REFORESTATION**

23. (1) Buchanan shall reforest at its own expense
    - (a) all lands cut over by or on behalf of Buchanan under this Agreement to the required reforestation standard and shall describe its reforestation program in its forest management plans and annual operating plans; and
    - (b) those lands cut over by Buchanan prior to the commencement date of this Agreement that comprise part of the forest management area, the reforestation of which was the responsibility of Buchanan and that have not been recognized by the Minister as being satisfactorily regenerated and shall reforest those lands to the required reforestation standard and shall describe its reforestation program in its forest management plans and annual operating plans.
  - (2) Tolko shall reforest at its own expense
    - (a) all lands cut over by or on behalf of Tolko under this Agreement to the required reforestation standard and shall describe its reforestation program in its forest management plans and annual operating plans; and
    - (b) those lands cut over by Tolko prior to the commencement date of this Agreement that comprise part of the forest management area, the reforestation of which was the responsibility of Tolko and that have not been recognized by the Minister as being satisfactorily regenerated and shall reforest those lands to the required reforestation standard and shall describe its reforestation program in its forest management plans and annual operating plans.
  - (3) In this Agreement the required reforestation standard means the reforestation standard under the Timber Management Regulation as amended from time to time or in any regulation passed in substitution thereof.
24. As part of its operations under this Agreement the Companies shall, at their own expense, furnish all of the seedling trees and propagules required for their respective reforestation needs.
  25. Seed, seedling trees and propagules used for reforestation programs under this Agreement shall be produced in accordance with the rules established by the Minister governing the source and type of tree seed and species used to reforest public land.
  26. Each Company shall be solely responsible for reforesting to the required reforestation standard all productive and potentially productive lands burned by fire within the forest management area, when the fire has been caused by the Company, its

employees, agents or contractors. For the purposes of the foregoing, it is agreed by all of the parties to this Agreement that neither Tolko nor Buchanan is the agent of the other.

27. (1) The Companies, or either of them may devise and implement enhanced forest management practices beyond those required under this Agreement. The Companies and the Minister may enter into an agreement which will define the programs and conditions that, in the Minister's opinion, will establish a sustainable increase in the allowable cut approved by the Minister in the management plans submitted under paragraph 10.
- (2) Where the Companies, or either of them, implements enhanced forest management practices under the terms of such an agreement, and where the Minister and the Companies agree on the amount of additional allowable cut which will result from the enhanced forest management practices over and above those required under this Agreement and the *Forests Act*, then such additional allowable cut shall be offered by the Minister to the Companies, or Company, as the case may be, that is undertaking the approved enhanced forest management practices free of timber dues provided the Minister has been duly authorized to do so by a regulation passed under section 4 of the *Forests Act*.
- (3) The additional allowable cut resulting from the enhanced forest management practices will only be offered free of timber dues after the Companies or Company, as the case may be, has fully utilized the unenhanced annual allowable cut approved in the management plans.

#### **C. FOREST PROTECTION**

28. (1) The Minister agrees to provide and maintain an organization of people and equipment necessary for the protection of the forest from and suppression of forest fires on the forest management area and, except as herein otherwise provided, to pay the cost of fighting any forest fire that originates on the forest management area on the understanding that the Minister will not be liable for damages to the Companies resulting from a failure to prevent, control or suppress any fire.
- (2) Notwithstanding subparagraph (1), each Company shall pay the cost of suppressing any forest fire that originates on the forest management area if the fire is caused by or arises out of any of the operations or activities conducted on the forest management area by the Company, their employees, agents or contractors; provided, however, that in no event shall the liability of a Company exceed the liability provided for in a separate Fire Control Agreement which may be negotiated and entered into by the Minister and the Companies. Until such time as a Fire Control Agreement has been entered into, each Company agrees to have on hand in good working order such fire fighting equipment as specified in The Forest and Prairie Protection Regulations and shall train such employees in fire suppression as specified by the Minister. If the cause of any fire is disputed by the Companies, the dispute shall be resolved by means of civil suit in the Courts of Alberta.
- (3) Notwithstanding anything contained in this Agreement, the Companies shall not be liable to the Crown for loss of or damage to Crown timber by fire that is caused by or arises out of any of the operations or activities conducted on the forest management area by the Companies or their respective employees, agents or contractors.

- (4) In the event of an occurrence of insect damage of epidemic nature to forest growth or a disease epidemic affecting forest growth on the forest management area the parties hereto will co-operate in suppressing the epidemic.

### **RECORDS AND SCALING**

29. (1) All scaling and measuring of timber weights and volumes shall be conducted in accordance with the Timber Regulation, the Scaling Regulation and the published instructions of the Department.
- (2) The Companies shall each maintain in the form and in the manner approved by the Minister complete and accurate records of their respective operations conducted on the forest management area.
- (3) The Minister, or any person authorized by the Minister, may inspect the records maintained by the Companies pursuant to subparagraph (2).
30. (1) Unless otherwise prescribed in the Timber Management Regulation, within thirty (30) days of the termination of every calendar quarter, the Companies shall each submit, separately and in confidence to the Minister in writing, on a form prescribed by the Minister, a return reporting:
- (a) the volume of timber cut by and for the Company;
- (b) the volume of timber cut or destroyed by others for which the Company is entitled to compensation under this Agreement; and
- (c) the volume of timber and primary timber products purchased for use in its mills and timber and primary timber products sold by the Company, from their operations in Alberta and the land from which the timber was cut.
- (2) The Companies shall each remit to the Minister with their respective returns the amount of all dues payable for the volume of timber shown on such returns.

### **CHARGES AND DUES**

31. (1) Once a year during the term of this Agreement, the Companies shall pay to the Minister on or before a date specified by the Minister a holding and forest protection charge.
- (2) Initially, the charge in subparagraph (1) will be \$100,000.00 in total.
- (3) Subsequent holding and forest protection charges shall be adjusted annually on the anniversary of the commencement date of this Agreement using the Annual Implicit Price Index for government current expenditure in goods and service, as published by Statistics Canada, in the following formula:

$$\text{Charge for Year of Payment} = \text{Charge for Previous Year} \times \frac{\text{Index for Year Prior to Year of Payment}}{\text{Index for Second Year Prior to Year of Payment}}$$

Example:

$$2003 \text{ Holding and Protection Charge} = \$100,000 \quad X \quad \frac{2002 \text{ Index}}{2001 \text{ Index}}$$

In the event that the Annual Implicit Price Index is no longer published or in the event of a change in the method used to calculate the Index, the Minister and the Companies shall mutually and reasonably agree on a comparable published index to be used in the above formula.

- (4) Notwithstanding the foregoing provisions of this paragraph:
    - (a) the holding and forest protection charges otherwise payable by the Companies shall be reduced by the eligible expenditures actually made by the Companies in carrying out approved forest protection plans submitted by the Companies under subparagraph (6); and
    - (b) eligible expenditures can only be used to reduce the holding and protection charges otherwise payable in the year following the year the expenditures were made and then only to the limit of those charges.
  - (5) For the purposes of subparagraph (4), eligible expenditures shall not include costs of suppressing forest fires or epidemics of insects or disease.
  - (6) The designate shall submit annually on behalf of the Companies, a forest protection plan for the Minister's approval.
  - (7) The forest protection plan shall include a description and an estimated cost for those proposed expenditures the Companies' wish to claim under subparagraph (4). Within thirty (30) days of submission of the forest protection plan, the Minister shall indicate those proposed expenditures that are eligible to reduce the holding and forest protection charges otherwise payable by the Companies.
  - (8) The Companies shall annually submit a joint audited financial report detailing how much monies were spent by the Companies in implementing the plans referred to in subparagraph (6). The audited financial report shall be prepared by an independent, qualified auditor and shall be prepared in accordance with the Canadian Institute of Chartered Accountants handbook.
  - (9) The Companies shall maintain and retain for three (3) years, such records of the expenditures claimed under subparagraph (4) as would allow a proper audit of these expenditures and shall, during normal business hours, make available to the Crown, including, but not limited to, Crown appointed auditors, the existing records in whatever form as relate to such eligible expenditures.
- 32.
- (1) For all coniferous timber harvested by or for Buchanan, Buchanan shall pay to the Minister timber dues at the rates established under the Timber Management Regulation.
  - (2) For all deciduous timber harvested by or for Tolko, Tolko shall pay to the Minister timber dues at the rates established under the Timber Management Regulation.
  - (3) For all timber for which a Company is entitled to compensation, the Company shall pay to the Minister timber dues in accordance with the Timber Management Regulation.

33. (1) The Companies shall establish and fund a program on the commencement date of this Agreement to enhance the management activities and level of understanding of the forest resources and forest products within the forest management area. The minimum annual funding for this program, will be \$0.25 per cubic metre based on all timber cut by or for the Companies from the forest management area.
- (2) The Companies shall, as requested by the Minister, provide a report that details the activities of the program referred to in subparagraph (1).

#### **FACILITY OPERATION**

34. (1) If, at any time the Sawmill ceases to be in production and operation for a period of twelve (12) consecutive months, Buchanan shall have no right to and shall not harvest coniferous timber on the forest management area, until such time as Buchanan advises the Minister in writing of its intentions to resume production and operation of the Sawmill.
- (2) If, at any time, the Plant ceases to be in production and operation for a period of twelve (12) consecutive months, Tolko shall have no right to and shall not harvest deciduous timber on the forest management area until such time as Tolko advises the Minister in writing of its intentions to resume production and operation of the Plant.
- (3) Notwithstanding subparagraphs (1) and (2), where either Company fails to recommence production and operation of its facility after such period of twelve (12) consecutive months, the Minister shall have the right to cancel all rights and entitlements arising under this Agreement of the Company in default.
- (4) If either Company submits a proposal for a forest industry project (the "project"), including an implementation timetable, as a replacement for the Sawmill (in the case of Buchanan) or the Plant (in the case of Tolko), which project is acceptable to the Minister, the Minister shall delay exercising his right under subparagraph (3) to cancel all rights and entitlements arising under this Agreement of the Company in default.
- (5) If either Company has submitted a proposal acceptable to the Minister under subparagraph (4) and, in the opinion of the Minister, the Company is not carrying out the proposal in accordance with its terms, the Minister may cancel all rights and entitlements of the Company arising under this Agreement.
- (6) Buchanan will notify the Minister, in writing, of any intended major reduction in production levels of the Sawmill, and such notification will be submitted to the Minister at least six (6) weeks prior to the intended reduction taking effect.
- (7) Tolko will notify the Minister, in writing, of any intended major reduction in production levels of the Plant, and such notification will be submitted to the Minister at least six (6) weeks prior to the intended reduction taking effect.
- (8) If there is a closure of either the Plant or the Sawmill as contemplated in subparagraph (1) or (2), the Company that is continuing on with its operations shall carry on harvesting operations in such a manner so as to minimize secondary timber production. Any secondary timber production that is necessarily produced by virtue of the Company's ongoing harvesting operation will be charged by the Minister as either deciduous production or coniferous production, as the case may be, against the forest management area.

## GENERAL PROVISIONS

35. (1) If either Company at any time is in default under any of the covenants, terms, conditions, provisions, agreements and stipulations in this Agreement, the Minister may give notice to the Company in default setting out the default complained of and requiring that Company to remedy the default within six (6) months of the giving of notice.
- (2) The Lieutenant Governor in Council may from time to time extend the period during which the Company is required to remedy any default complained of in a notice given pursuant to subparagraph (1).
36. The Minister shall have the right to have the Companies perform all of their respective covenants, terms, conditions, stipulations, provisions and agreements and obligations as contained in this Agreement or to sue the defaulting Company for damages for any breach or breaches thereof and the Minister shall also have the right to cancel this Agreement as it pertains to the defaulting Company as set forth in paragraph 38 provided the remedies available to the Minister for default by a Company under paragraph 34 shall be limited to those set out in paragraph 34.
37. When any default or delay by a Company in the performance or observance of any of the terms, conditions, provisions, agreements, covenants and stipulations of this Agreement is occasioned in whole or in part through:
- (a) industrial disputes,
  - (b) governmental review or judicial proceedings respecting forest management impact of woodlands operations or the possible environmental impact of the mill facilities, or
  - (c) interruption which is not the result of any wilful or negligent act or omission by the Company, such as power failure, fire, sabotage, tempest, war or acts of God

and not avoidable by reasonable effort or foresight, that Company shall not be deemed in default under this Agreement and the time for performance or observance of such term, condition, provision, agreement, covenant or stipulation shall be extended by such reasonable period of time as the Minister may specify in writing to that Company.

38. (1) Except as otherwise provided in paragraph 34 the Minister may, by giving a defaulting Company ninety (90) days notice in writing, cancel this Agreement as it relates to the defaulting Company when:
- (a) any goods or chattels of the defaulting Company which are located in or about the Town of High Prairie, Alberta and which constitute a material part of that Company's assets located thereat, are lawfully seized or taken in execution by a creditor of that Company, and that Company has failed to take any legal action to contest the same within ninety (90) days after such seizure or taking, or
  - (b) the defaulting Company makes any general assignment for the benefit of its creditors or an assignment in bankruptcy or takes the benefit of any Act in force for bankrupt or insolvent debtors, or
  - (c) the defaulting Company fails from time to time to observe or perform any of the covenants, stipulations, terms, conditions, provisions and

agreements required to be observed or performed by the Company under this Agreement, and having been given notice of such failure under paragraph 35 of this Agreement, fails to remedy such failure within the time allowed by the said paragraph for so doing, or any extension thereof given by the Lieutenant Governor in Council.

- (2) Subparagraphs (1) (a) and (b) do not apply if a trustee for the holders or receiver managers or the holders themselves of bonds, debentures, or other securities of the defaulting Company exercises any rights or remedies contained in any deed of trust or mortgage or other agreement under which such bonds, debentures or other securities are issued or secured, including but without restricting the generality of the foregoing, the taking of possession by the trustee, receiver managers or the holders themselves of the Company's properties and assets and the operation or disposition thereof for the benefit of the holders of the Company's bonds, debentures or other securities.
39. The Minister does not guarantee any quality or quantity of timber on the forest management area.
  40. No implied contract of any kind by or on behalf of the Minister shall arise or be construed from anything contained in this Agreement and the only rights, powers and privileges granted to the Companies are those contained in this Agreement.
  41. The Minister and the Companies agree that the lines on the map shown in Appendix "A" hereunto annexed are intended, where those lines outline areas that are yet unsurveyed, to be the survey lines of the townships, sections, or half sections, as the case may be, that would exist if such areas were surveyed under the system of township surveys prescribed by the *Surveys Act* (Alberta) and any amendments or substitutions thereto.
  42. The Companies shall comply with and observe all the provisions and requirements of all Acts of the Province of Alberta and the regulations thereunder in force from time to time that apply to the Companies or to this Agreement either specially or generally by express wording or by implication.
  43. The Companies shall each during the term of this Agreement, maintain an office in the Province of Alberta or obtain and maintain a registration under the *Business Corporations Act* (Alberta), its regulations or as each may be amended from time to time.
  44.
    - (1) Where any dispute arises between all of the parties to this Agreement or between one of the Companies and the Minister concerning the application or interpretation of this Agreement the dispute may be referred to arbitration pursuant to the *Arbitration Act* (Alberta) as may be amended from time to time, but only upon the mutual agreement of the parties to the dispute.
    - (2) Where the parties to a dispute do not agree to refer a dispute concerning this Agreement to arbitration as provided in subparagraph (1), the dispute shall be resolved by means of civil action before the Courts of the Province of Alberta.
    - (3) Where any dispute arises between Tolko and Buchanan, they shall attempt to settle the dispute by good faith negotiations, mediation or both.
    - (4) If a dispute between the Companies cannot be settled within six (6) months of the commencement of good faith negotiations, mediation or both, or if the Companies are directed to arbitration pursuant to paragraph 10(8), then the dispute shall be referred to binding arbitration by a single arbitrator in

accordance with the *Arbitration Act*. Either Company may initiate the arbitration process by serving the other with notice of an intention to proceed to arbitration, unless otherwise directed by the Minister.

- (5) With respect to any dispute that is to be resolved by arbitration in accordance with subparagraph (4), the arbitrator used to resolve such dispute shall be determined from the list of arbitrators described in subparagraph (6).
  - (6) Within six (6) months after the commencement date, the Companies shall prepare a list of arbitrators qualified to decide forestry matters acceptable to each Company. The list of arbitrators shall be reviewed and updated from time to time as required, but no later than five (5) years after the commencement date and every five (5) years thereafter.
45. (1) Neither of the Companies shall assign this Agreement or any of their respective rights granted to them by this Agreement without the consent of the Minister in writing and such consent may in his sole discretion be withheld. Where the Minister refuses consent to an assignment, he shall advise the Company in writing of his reasons for so refusing.
- (2) Subparagraph (1) does not apply to:
- (a) the employment of one or more contractors in the normal conduct of its operations; or
  - (b) an assignment or transfer of this Agreement by way of mortgage or charge or the grant of a security interest in this Agreement to lenders to or trustees for lenders to either of the Companies.
46. Any waiver by the Minister of the strict performance by the Companies or either of them of their covenants or of any term, condition, stipulation, agreement or provision under this Agreement is not binding upon the Minister unless such waiver is expressed in writing under the authority of the Minister, and any such waiver or any extension of time granted by the Lieutenant Governor in Council hereunder shall not abrogate such or any covenant, term, condition, stipulation, agreement or provision herein or constitute a waiver or extension of time as to any subsequent breach of the same or any other covenant, term, condition, stipulation, agreement or provision herein.
47. Each Company covenants and agrees to observe, perform and keep all covenants, terms, conditions, stipulations, agreements and provisions herein on its part to be observed, performed and kept, and time shall be and remain of the essence thereof and notwithstanding any binding waiver given by the Minister as referred to in paragraph 46 or any extensions of time given by the Lieutenant Governor in Council under this Agreement that thereby may affect the time for performing any particular act, covenant, term, condition, stipulation, agreement or provision of this Agreement herein, time shall remain of the essence pertaining to all subsequent performance by that Company of any and all acts, covenants, terms, conditions, stipulations, agreements and provisions herein contained and to this entire Agreement.
48. (1) Each Company assumes liability for and shall pay all claims of the Minister for all damages to any real or personal property other than timber of the Crown caused by that Company, its servants, agents, workmen and contractors in the course of the exercise or purported exercise of its rights, powers and privileges under this Agreement, whether or not the damage so caused is due to the negligence of that Company, its servants, agents, workmen and contractors, as the case may be; provided however, neither of the Companies assumes liability under this subparagraph for economic loss or incidental and consequential loss

and damage.

- (2) Subparagraph (1) shall not restrict, in any manner, the ability of the Minister to pursue the Company under the common law for economic loss or incidental and consequential loss and damage, which liability may be resolved by means of arbitration pursuant to the *Arbitration Act* with the mutual agreement of both parties, or failing such agreement, by civil action before the courts of the Province of Alberta.
49. The Companies agree to hold the Minister harmless against any and all third party claims, demands or action for which the Companies are legally responsible, including those arising out of negligence, wilful harm, or crimes by the Companies or their employees or agents.
50. The Companies shall submit to the Minister when required, any information or documents the Minister may reasonably request in respect of matters relating to this Agreement for the purpose of verifying the Company's continued compliance of the Companies with the terms of this Agreement.
51. Any notice required to be given under this Agreement shall be deemed to be well and sufficiently given if delivered to the address set out below or if mailed at any government post office in the Province of Alberta by prepaid registered mail addressed as follows:
- |     |  |   |
|-----|--|---|
| (a) | to Buchanan:<br>Bag 38<br>High Prairie, Alberta<br>T0G 1E0   | to Tolko:<br>Bag 3000<br>High Prairie, Alberta<br>T0G 1E0 |
| (b) | to the Minister:<br>Minister of Sustainable Resource Development<br>Legislature Building<br>Edmonton, Alberta<br>T5K 2B7 |   |
- or to such other address any party may from time to time inform the other party in writing, and any such notice shall be deemed to have been received on the fourth business day after the mailing thereof, or if delivered, when delivered; provided that if mailed should there be between the time of mailing and the actual receipt of the notice a mail strike, slow down or other labour dispute which might affect the delivery of such notice then such notice shall only be effective if and when actually delivered.
52. This Agreement is made subject to its approval by the Lieutenant Governor in Council.
53. (1) Buchanan agrees that upon the execution of this Agreement by the parties, the Minister shall cancel Coniferous Timber Quota CTQS010038 and shall amend Coniferous Timber Quota Certificate P030008 upon approval of and in a manner consistent with the preliminary forest management plan under paragraph 10.

- (2) In the event that this Agreement is cancelled for any reason, the Minister shall
    - (a) grant to Buchanan for the sum of \$1.00 each, coniferous timber quotas for the volume of coniferous timber, including incidental coniferous timber, that becomes available as a result of the cancellation of this Agreement, and
    - (b) grant to Tolko for the sum of \$1.00 each, deciduous timber allocations for the volume of deciduous timber, including incidental deciduous timber, that becomes available as a result of the cancellation of this Agreement.
  - (3) The obligation of the Minister to grant coniferous timber quota(s) and deciduous timber allocations under subparagraph (2) shall survive the cancellation of this Agreement.
  - (4) If this Agreement is cancelled against one of the Companies, this Agreement shall not be cancelled against the other party unless for cause and then only in the manner herein provided.
54. This Agreement inures to the benefit of and is binding upon the Crown and Her assigns, and each of Tolko and Buchanan and their respective successors and assigns if approved by the Minister in accordance with the provisions of this Agreement.
55.
  - (1) Notwithstanding anything to the contrary in this Agreement, whether express or implied, each of Tolko and Buchanan shall be separately responsible for the performance of their respective obligations under this Agreement and no obligations under this Agreement shall be construed or deemed to be joint and several obligations.
  - (2) The parties acknowledge that no partnership is created by this Agreement and that nothing contained in this Agreement shall or shall be deemed to constitute the Companies as partners nor agents of the other nor any other relationship whereby either of the Companies could be held liable for any act or omission of the other nor shall either Company have any authority to act for the other or to incur any obligation on behalf of the other save as specifically provided by this Agreement.
56. Where any information, data or documents are provided to the Crown in confidence under this Agreement, that confidentiality is subject to any restriction on disclosure or obligation to disclose imposed on the Crown by law.

57. This Agreement shall be construed as having been made in the Province of Alberta and the laws of the Province of Alberta shall be applied in the event of any action or arbitration mutually agreed to, respecting any dispute arising from this Agreement, its formulation, interpretation, and each and every other aspect pertaining to or resulting from its entire contents.

**IN WITNESS WHEREOF** the party of the first part executes this Agreement under the hand of the Minister subscribed hereunder and the party of the second part executes this Agreement by subscribing hereunder the signatures of its duly authorized corporate officers and the party of the third part executes this Agreement by subscribing hereunder the signatures of its duly authorized corporate officers at Edmonton, Alberta this \_\_\_\_ day of \_\_\_\_\_, 2002.

Her Majesty the Queen  
in Right of Alberta

\_\_\_\_\_  
Witness

\_\_\_\_\_  
Minister of Sustainable Resource  
Development

**Gordon Buchanan Enterprises Ltd.**

\_\_\_\_\_  
Witness

Per: \_\_\_\_\_

**Tolko Industries Ltd.**

\_\_\_\_\_  
Witness

Per: \_\_\_\_\_

**APPENDIX "A"**

Forest Management Area

**GORDON BUCHANAN ENTERPRISES LTD.  
AND  
TOLKO INDUSTRIES LTD.**

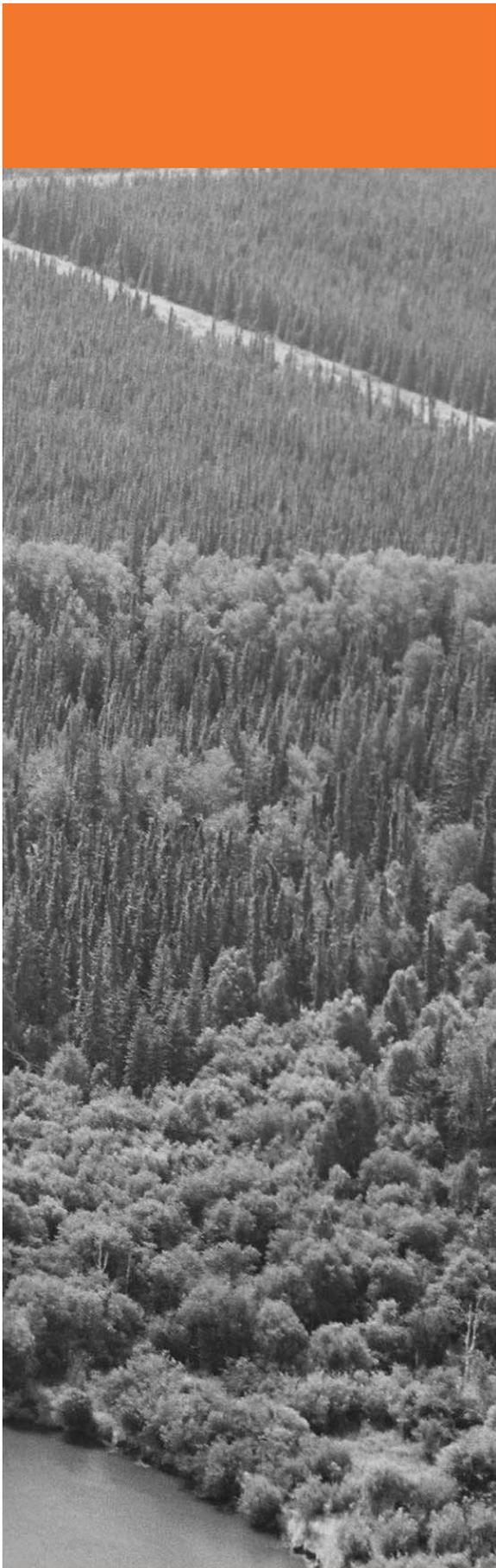
**APPENDIX "B"**

**PLANNING CRITERIA**

The coniferous timber and deciduous timber on the forest management area shall be managed, harvested and reforested on a perpetual sustained yield basis in accordance with the provisions of this Agreement including the following guidelines:

1. Timber stands in the forest management area shall be classified in accordance with the forest timber type classification as designated on maps produced using Alberta Vegetation Inventory Standards version 2.1 or such other criteria as may be mutually agreed to by all of the parties.
2. All stands in the forest management area will be managed and harvested in accordance with the following provisions:
  - (a) All pure coniferous and mixedwood stands (C, CD, and DC) shall be managed primarily for coniferous production. The detailed forest management plan shall provide for the sustainability of deciduous timber harvested from those coniferous stands managed primarily for coniferous production.
  - (b) All pure deciduous stands (D) shall be managed primarily for deciduous production. The detailed forest management plan shall provide for the sustainability of coniferous timber harvested from those deciduous stands managed primarily for deciduous production.
  - (c) In reference to subparagraphs (a) and (b) above, the detailed forest management plan will provide for the maintenance of mixedwood stand structures within the forest management area in a manner that recognizes and protects biological diversity. The detailed forest management plan will provide for the monitoring of stand composition changes over time and for the implementation of adaptive management strategies to ensure sustainability of supply of both deciduous timber and coniferous timber.
3. So as to accommodate the full utilization of the timber resource growing on the forest management area and the integration of deciduous and coniferous harvesting
  - (a) Buchanan and Tolko shall be required to make prior arrangements with each other for the harvest and removal of coniferous and deciduous timber.
  - (b) harvesting and removal of deciduous timber by Buchanan shall be subject to the terms of the approved annual operating plan submitted pursuant to this Agreement. The deciduous timber cut by Buchanan from coniferous stands, will be made available to Tolko; and
  - (c) harvesting and removal of coniferous timber by Tolko shall be subject to the terms of the approved annual operating plan submitted pursuant to this Agreement. The coniferous timber cut by Tolko from deciduous stands will be made available to Buchanan.

4. All secondary species of coniferous and deciduous timber shall be felled, skidded and decked and made available at cost to the party entitled thereto, as indicated above, and the party receiving such timber shall pay to the harvesting party, the actual cost for felling, skidding and decking such timber in accordance with a mutually acceptable business arrangement determined between the harvesting party and the receiving party.
5. Unless otherwise agreed by Buchanan, Tolko shall have no rights to any coniferous timber harvested by either Company on the forest management area.
6. Unless otherwise agreed by Tolko, Buchanan shall have no rights to any deciduous timber harvested by either Company on the forest management area.
7. All coniferous and deciduous timber cut by and for the Companies on the forest management area shall be considered as production against the forest management area.



D.

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**Appendix D**  
*Terms of Reference*

DFMP

**TOLKO INDUSTRIES LTD.**  
High Prairie OSB Division

**BUCHANAN LUMBER LTD.**  
A Division of Gordon Buchanan Enterprises Ltd.

***FOREST RESOURCE ADVISORY COMMITTEE***  
***(FRAC)***

***TERMS OF REFERENCE***

**Ratified May 3, 2004**

Amended April 20, 2004

October 21, 2002

## **A. BACKGROUND**

The Forest Resource Advisory Committee was developed as part of the commitment to public involvement made by Tolko Industries Ltd. - High Prairie OSB Division in the Detailed Forest Management Planning process for the Original Forest Management Area and the Public Involvement Plan. During the early development of the committee it was recognized that there was value in operating the committee jointly with Buchanan Lumber. The committee was initiated January 18, 2000 and has been operating as a joint committee with both Tolko Industries Ltd. and Buchanan Lumber since March 13, 2000. In addition to its function as a forum for information exchange between the companies and stakeholders, the committee will be involved in the public review process of the Original Detailed Forest Management Plan, Joint Detailed Forest Management Plan, and Certification Processes.

## **B. PURPOSE AND OBJECTIVES**

- To identify community concerns and issues for consideration in resource management planning.
- To obtain constructive community input, advice and recommendations to ensure all local interests are effectively involved in business and resource management planning.
- To ensure effective ongoing communication on company operating strategies between key stakeholders and the companies (Tolko Industries Ltd. – High Prairie OSB Division and Buchanan Lumber Ltd.).
- To ensure resources are being managed in the best possible interest of present and future generations.
- To identify local level values, objectives, indicators and targets in the development of a Sustainable Forest Management (SFM) plan for the Defined Forest Area (DFA) according to Canadian Standards Association (CSA) guidelines.
- To develop procedures for monitoring the effectiveness of the Sustainable Forest Management (SFM) plan and provide ongoing public input into the implementation, monitoring and continual improvement of the SFM plan.

## **C. OPERATING RULES**

### **Name**

- The name of the Committee is the Forest Resource Advisory Committee (FRAC).

### **Ground Rules/Conduct**

- The FRAC and its committee members agree to work by the following ground rules:
  - a) All members will be given the opportunity to voice their perspectives;
  - b) All members will listen to the range of perspectives;
  - c) Meetings will be well-structured and facilitated to enable efficient progress;
  - d) Refreshments and food will be provided for the meetings.

### **Meeting Agenda & Dates**

#### **Meeting Agendas**

- Meeting agenda will address where possible both the needs of the Detailed Forest Management Plan and CSA certification as well as any topics of interest or issues of concern to the committee members and/or companies.
- Input for future meeting agendas will be obtained during each meeting.
- Round table discussions will be held at the end of the meeting to develop an issues list and brainstorm possible solutions.

**Meeting Dates**

- Meeting dates will be the second Monday of the following months: February, April, June, October, and December. The meeting frequency may be increased as necessary.

**Meeting Notices**

- Meeting notices will be sent at least two weeks in advance, and generally the next meeting date will be confirmed at each FRAC meeting.
- Material, if available, will be provided for review in advance of meetings.

**Meeting Locations**

- Meetings will be held at a time and place most suitable to the members of the group, and may vary occasionally to satisfy members requirements.

**D. TIMELINES**

- The target date for the completion of the Sustainable Forest Management (SFM) Plan will be August 31, 2004. Following completion of the SFM Plan, the Forest Resource Advisory Committee (FRAC) will be engaged to review annual progress on performance measures with the goal being continual improvement.

**E. COMMITTEE MEMBERSHIP, ROLES and RESPONSIBILITIES**

- There will be two types of committee members:
  - a) participating members; and
  - b) advisory members.
- The following Organizations/Groups have been asked to provide a participating committee member and an alternate:
  - Alberta Guide Outfitters Association
  - Alberta Trappers Association
  - County of Birch Hills
  - East Prairie Metis Settlement
  - Gift Lake Metis Settlement
  - Local Advisory Committee – High Prairie
  - Local Advisory Committee – Valleyview
  - Municipal District of Big Lakes
  - Municipal District of Greenview
  - Municipal District of Smoky River
  - Northern Sunrise County
  - Peavine Metis Settlement
  - Public Members at Large (two positions)
  - Tolko Mill Employees
  - Buchanan Mill Employees
  - Town of High Prairie
  - Whitefish First Nations
  - Alberta Conservation Association

- The Committee may select additional committee members from stakeholders or interest groups. (Refer to Section E Suggested Selection Criteria For FRAC Members.)
- Other groups may approach the committee for membership. Upon expression of interest and acceptance by other members of the FRAC. Designation of member status will be determined on a case-by-case basis. Membership may be granted if the group/individual meets the selection criteria.
- The following Organizations/Groups have been asked to provide an advisory committee member and an alternate:
  - Alberta Plywood Ltd.
  - Alberta Sustainable Resource Development – Public Lands and Forests Division
  - Buchanan Lumber
  - Tolko Industries Ltd. – High Prairie Division

#### FRAC Committee Member's Role

- Members will be appointed by each of the member organizations.
- To provide input as related to the objectives outlined in Section B of the Terms of Reference including the Detailed Forest Management and CSA Planning Processes.
- To identify local-level values that are consistent with the Canadian Council of Forest Ministers (CCFM) criteria and identify goals, objectives, indicators, and targets with respect to each value.
- To develop procedures for monitoring the effectiveness of the SFM plan including annual meetings of the SFM group to review results of performance measures and the outcomes of any CSA audits.
- The participating committee members are responsible for consensus reaching and decision making for the FRAC.
- To act as a liaison between FRAC and the organization they are representing.
- To attend meetings regularly.
- Members will be appointed by each of the member organizations.
- Members can be replaced if more than three (3) consecutive meetings are missed without a valid reason. The member organization they represent may be asked either to reconsider its membership, or to replace the member with someone more able to participate. A member at large may be replaced by open invitation with the approval of the committee.
- Existing members, who no longer represent their original organization, may choose to remain on as Members-at-Large as this will provide ongoing continuity.

#### FRAC Member Organization Role

- Members Organizations will appoint a committee member.
- An organization may appoint an alternate to act as an interim replacement for the member. Alternates are also guided by the Terms of Reference.
- To replace a member, the member organization will be asked by either the current member or by the Tolko/Buchanan representative to reappoint a new member.
- Tolko and Buchanan will confirm member appointments.

#### Observers Role

- Public members are welcome to observe the FRAC meetings.
- Observers may participate in discussions or make presentations only with agreement by the group, chair or facilitator; and
- Will not take part in reaching consensus or decision-making of the FRAC.

#### Tolko's and Buchanan Lumber's Role

- Develop meeting agenda with input from Company, Government, and Committee Membership.
- Record meeting minutes, and distribute the minutes following each meeting.
- Provide a Meeting Chairperson or facilitator for each meeting.
- Tolko and Buchanan will address input, advice, and recommendations put forward by the committee.
- To make decisions regarding sustainable forest management and certification.
- Develop action plan track progress – form a sub-committee as needed to address issues or concerns.

#### Advisor's Role

- Advisory members will participate in all discussions, and will serve as information resources to the Committee, but will not be included when seeking consensus.
- Participating members will keep their organization informed of developments in meetings and solicit their opinions.

#### Facilitator's Role

- To provide support in summarizing and clarifying issues and recommendations for the Sustainable Forest Management (SFM) plan.
- To aid in the preparation of a work plan and timetable for the process.
- To aid in the preparation of agendas and summaries for meetings.

## **F. SUGGESTED SELECTION CRITERIA FOR FRAC MEMBERS**

- Members should be stakeholders.
- Members should represent a wide range of views and should be regionally based:
  - Public representatives from local municipalities or communities.
  - Local Aboriginal Communities.
  - Government and technical representatives (Alberta Sustainable Resource Development - Land and Forest Division, Alberta Sustainable Resource Development - Fish and Wildlife, Canadian Forest Service, Post Secondary Educational Institutions, General Public, and the Forest Products Industry).
  - Company representatives involved with management plans should be on committee as non-voting members.
  - Community interest representatives (recreation, other commercial users, trappers, logging contractors, environmental groups, landowners, etc.).
- Generally, members should be regional in nature.
- Committee members should have an alternative representative to represent their group in the event the primary representative is unable to make it to a meeting.

## **G. COMMUNICATION AND INFORMATION**

### Internal Communication to FRAC

- Meeting Agendas will be developed in consultation with Buchanan Lumber and review of previous meeting minutes for potential agenda items. Tolko will ensure draft agendas are distributed approximately two (2) weeks prior to meetings.
- Tolko will ensure meeting minutes are distributed following each meeting.
- Tolko and Buchanan Lumber will provide the FRAC with information as it applies to the function and business of the FRAC. Confidential business information such as financial or human resource information may be deemed to be sensitive and proprietary and may not be released.
- A list of issues will be developed from round table discussion and agenda topics.
- People who want to bring forward agenda items can notify one of the Tolko or Buchanan representatives.
- The SFM plan and Annual Monitoring Reports.

### External Communication

- Only authorized members of the advisory committee are to speak on behalf of the committee as agreed by the group, Tolko Industries Ltd. and Buchanan Lumber.
- When communicating with the media, interest groups or the public at large, specific comments will not be attributed to any individual committee member without his/her prior consent.
- If a committee member wishes to respond to media, they are to speak on behalf of the interest group they represent only. Members will be respectful of other members and other interest groups. Members will not characterize the suggestions or positions of other members or interest groups in their discussions with the public or media.
- The committee may direct that a specific meeting open to the public and media be held to discuss issues of interest or concern.
- The SFM Plan and Annual Monitoring Reports will be made available to members of the public, which will include Aboriginal communities in the region.
- A website offering general information on the SFM process and information specific to Tolko's SFM Plan will be maintained.

### Internal to Tolko and Buchanan Lumber

- Recommendations or questions from the FRAC will be reported at Woodlands Communications Meetings.

### Information

- Any documentation required to enhance the process may be provided to each of the participants of the FRAC by the Companies this will include (but is not limited to) the following:
  - Canadian Standards Association (CSA) certification guidelines and other background information.
  - SFM Plans from other Tolko Divisions and/or companies for their Defined Forest Areas (DFA's)
- Where desired by the FRAC the Companies will seek to provide internal or external experts to provide a better understanding a particular issue.

## **H. DECISION MAKING AND METHODOLOGY**

- Every effort shall be made to develop decisions and recommendations through consensus building. If consensus is not reached then there are three alternatives:
  - a) Defer issue to next meeting
  - b) Refer issue to an independent body for recommendations
  - c) Use majority vote of members present
- Consensus is defined as no member having substantial disagreement with a decision, recommendation or issue.
- All decisions and recommendations will require involvement of at least fifty (50%) of the active membership.
- Quorum is defined as having greater than fifty percent (50%) of the active participating members in attendance at meetings
- Active committee members are defined as those committee members who have attended fifty percent (50%) of the FRAC meetings during the last calendar year.

## **I. CONFLICTS OF INTERESTS**

- Forest Resource Advisory Committee Members will declare any possible or perceived conflict of interest pertaining to a specific discussion topic, should the situation arise. In such cases, the FRAC will decide on the conflicting members' level of involvement relative to the specific topic matter.

## **J. DISPUTE RESOLUTION MECHANISM**

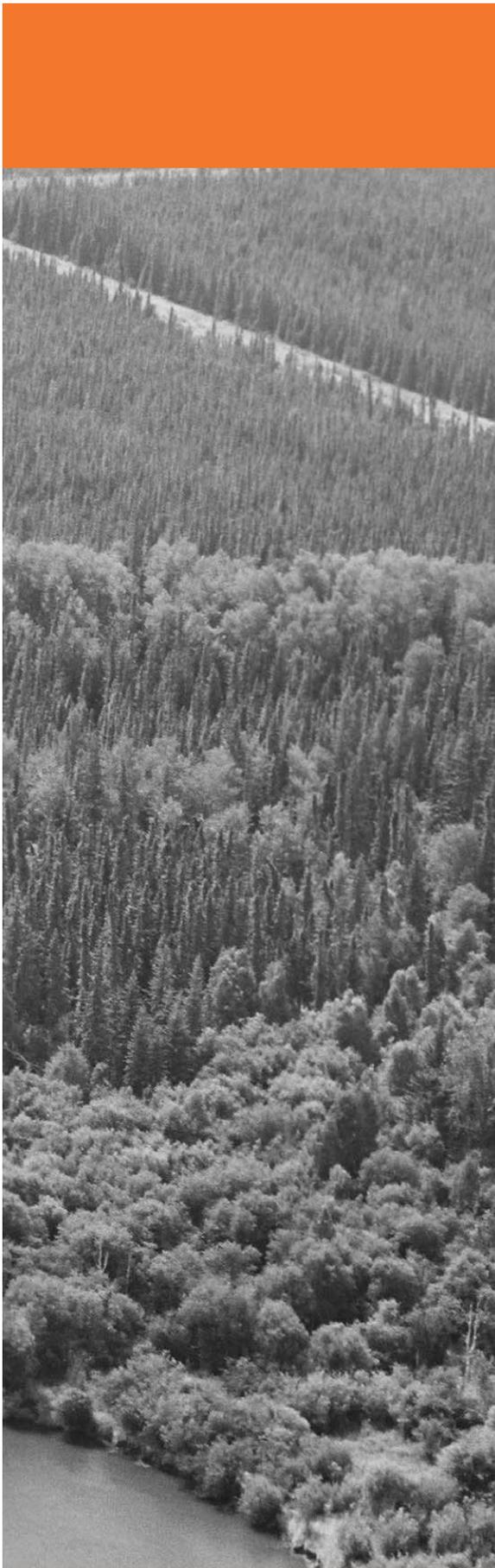
### Process Issues

- The meeting chairperson or facilitator will resolve process issues.
- Technical Issues The members will work to identify the underlying issues and work toward a solution in a positive friendly environment.
- The members will seek compromise, alternatives and clarification of information needed.
- The members will commit to arriving at the best solution possible.
- If no consensus solution can be reached, then the outstanding issues will be summarized and forwarded to Tolko and Buchanan for their consideration. The company will be informed of the level of support and dissent with the issue.

In instances where the companies do not accept a consensus recommendation of the FRAC, a written explanation of the decision will be included in the SFM Plan process documents.

## **K. REVIEW OF AND REVISIONS TO TERMS OF REFERENCE**

- The FRAC Terms of Reference will be reviewed every second year after adoption or earlier based on consensus of the group to review.
- The approval and revision of the FRAC Terms of Reference requires the approval of the FRAC, Tolko Industries Ltd. and Buchanan Lumber.



E.

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**Appendix E**  
*Public Involvement Plan*

DFMP

**TOLKO INDUSTRIES LTD.  
High Prairie OSB Division**

&

**BUCHANAN LUMBER LTD.  
A Division of  
Gordon Buchanan Enterprises Ltd.**

***Public Involvement Plan***

*Forest Management Agreement 0200039  
Forest Management Agreement 9700033*

*(Resubmission)* **April 4, 2003**

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## **1.0 INTRODUCTION**

### **1.1 Plan Purpose and Objectives**

The Alberta Forest Conservation Strategy outlines a new way of viewing and caring for forests in the Province. It outlines five strategic directions for ensuring the long-term sustainability of ecosystems and economic benefits of the forest. These strategic directions are:

1. Ecological Management;
2. Sustainable Forest Economy;
3. Protected Areas;
4. Range of Management Intensities; and
5. Participation and Partnerships.

The essence of Participation and Partnerships is towards a more effective involvement of forest-based communities in the process of decision making and identification of objectives to ensure that all forest users assume greater responsibility for their actions.

Open Communication is a core company value for both Tolko Industries Ltd. and Buchanan Lumber. We believe that open, constructive, communication will lead to a shared commitment by all parties to achieve the goals of Tolko Industries Ltd., Buchanan Lumber, and the Alberta Forest Conservation Strategy. With participation in the formulation of objectives, stakeholders have the opportunity to work together to accomplish these common goals.

In addition to the corporate commitment to a public involvement process, the Forest Management Agreement mandates a public presentation, participation and review process for proposed forest management activities prior to submission. The companies are required to incorporate their response to concerns raised by the public, quota holders, and permittees. All plans are subject to the review and approval of the Minister of Sustainable Resource Development who may also require the companies to further modify its plans prior to approval.

Public involvement is the process through which people affected by the execution of a plan, and those who have an interest in the outcome, have a chance to influence the decision before it is made. The primary objective of the joint public involvement process is to maintain and enhance the ongoing public communication processes by providing the public with an opportunity to participate in the forest management planning for FMA9700033 and FMA0200039. The process, outlined within this document, will complement the existing decision-making processes. It is primarily a forum for education, communication, and information exchange. Resolution of specific issues will be achieved through an ongoing process of open dialogue and the exchange of relevant information.

This document summarizes the process by which the companies propose to meet its public involvement obligation under the Forest Management Agreements for FMA9700033 and FMA0200039.

## 1.2 Tolko Industries Ltd.: Corporate Profile

### The Company

Tolko Industries Ltd. is a privately owned company founded in 1961 by Mr. Harold Thorlakson. The company has nine manufacturing divisions, four marketing and sales divisions and employs over 2 300 people throughout British Columbia, Alberta and Manitoba. In addition, the company has recently initiated a joint venture in Meadow Lake, Saskatchewan. The Company's Woodlands departments manage approximately 6.8 million hectares of productive forest in Western Canada.

### The High Prairie Division OSB Processing Facility

High Prairie Division, Tolko's first OSB (oriented strand board) mill, is a modern manufacturing facility located near High Prairie, Alberta. The mill has a twelve foot wide forming line feeding a 12 opening 12' by 24' press, with a rated capacity of 525 million square feet on a 3/8 inch basis. The mill consumes approximately 850 000 m<sup>3</sup> per year of deciduous fibre from public and private land.

The High Prairie Woodlands operating area extends in a radius of approximately 250 kilometres from the mill and provides an annual harvest of up to 850 000 m<sup>3</sup> of Trembling Aspen (*Populus tremuloides* Michx.), Balsam Poplar (*Populus balsamifera* L.) and a small component of White Birch (*Betula papyrifera*).

## 1.3 Buchanan Lumber Ltd.: Corporate Profile

### The Company

Arnold Buchanan began the Buchanan Lumber business in 1929 when he purchased and outfitted a small sawmill near McCreary, Manitoba. In 1957 they moved the family operation to Alberta. The first sawmill was located in the forest in an area south of Valleyview, Alberta, while the planer was located in High Prairie. The family recognized the benefits in moving the sawmill to High Prairie to work in conjunction with the planer. In 1959 the Buchanan family purchased the planer and Buchanan Lumber found a permanent home in High Prairie, Alberta.

Buchanan Lumber a Division of Gordon Buchanan Enterprises Limited was formed in High Prairie, Alberta in 1961. Buchanan Lumber owns and operates a dimensional stud mill and finger joint plant. Buchanan Lumber has over 200 employees. The annual production of these facilities is 100,000,000 board feet of dimensional studs, 3,000,000 board feet of finger joint products and 50,000 bone dry unit of pulp chips. The original mill site has seen continual machinery and technological improvements and updates through its 50 plus years of operations.

The Buchanan mill consumes approximately 350 000 m<sup>3</sup> per year of coniferous fibre from public and private land. The Annual Allowable Cut for Buchanan Lumber is 250,000 m<sup>3</sup>. Outside of the Forest Management Agreement area there are four quota areas in which Buchanan currently operates.

At present Buchanan Lumber is completing an 11 million-dollar modernization which will allow for an anticipated 15 percent increase in fiber recovery from its existing wood supply. Through technological advancements the outdated beehive burner has been de-commissioned and a new boiler plant has been constructed. This allows Buchanan to further utilize byproducts of our operations and turn these byproducts into energy for heating our drying kilns as well as certain buildings on the mill site.

## 2.0 APPROACH TO PUBLIC INVOLVEMENT

Provincial Legislation or policy, the terms and conditions of FMA9700033 and FMA020039, and the associated Terms of Reference or Preliminary Forest Management Plan guide the public involvement process. To ensure that this public involvement plan is an effective tool for communication, Tolko Industries Ltd. and Buchanan Lumber will consult periodically with the Alberta Sustainable Resource Development, Land and Forest Division to clarify:

- Issues of concern and boundaries on the scope of discussion;
- Expectations, measures of performance and feedback procedures;
- Rights and Responsibilities;
- Authority for approval.

An effective Public Involvement program has many elements including communication mechanisms for information dissemination and feedback, indicators of success, methods of resolving disputes and knowledge of the identity of the stakeholders. The companies recognize that public involvement is a dynamic and evolutionary process. It is understood that no single means will suffice for the dissemination of information and the collection of relevant feedback to the process. Tolko Industries Ltd. and Buchanan Lumber therefore, proposes to garner public opinion through several initiatives:

### 1. Forest Resource Advisory Committee

One of the primary mechanisms for effective implementation of a public involvement program has been the Forest Resource Advisory Committee (FRAC). The FRAC provides a regularly scheduled forum for public education and dialogue. In addition, it also provides guidance on the specification of issues, priorities and scope of discussion.

### 2. Public Information Meeting

A broad cross-section of the public will be invited to attend periodic information session designed to explain and discuss significant milestones which the Companies have and will achieve, in the information gathering and planning process.

### 3. Resource User Consultations

Informal, one-on-one meeting with individual stakeholders will be conducted to discuss and resolve unique, site-specific issues of local concern.

### 4. Public Awareness Campaign

Tolko Industries Ltd. and Buchanan Lumber Ltd. will conduct an ongoing program to promote public awareness of the Companies forest management planning process. Activities will include forestry displays during provincial and civic functions, presentations to specific user groups, public schools, colleges etc. and woodland/mill tours to interested parties.

### 5. Documentation

Efficacy of the public involvement process, will be determined through continuous monitoring and an annual review of the program.

### 3.0 FOREST RESOURCE ADVISORY COMMITTEE

A joint Forest Resource Advisory Committee (FRAC) has been established to serve as an ongoing forum where representatives from across the Forest Management Agreement (FMA) areas can share knowledge, interests, views, values and concerns with respect to forest management activities. The FRAC is expected to be a long-term public involvement process. Tolko Industries Ltd. and Buchanan Lumber are firmly committed to effective interaction with the committee.

The FRAC was designed as a consultative forum, which meets five times a year. Meetings will be agenda driven with opportunity for input from all members of the committee. Additional information regarding the operation of the committee is provided in the FRAC Terms of Reference (Appendix I).

The objectives of the FRAC are to:

- Provide committee representatives and members of the public with information on the companies business plans, forest management activities and environmental practices;
- Provide an opportunity for the companies to learn about the diverse interests, values and concerns of committee members and the public as they pertain to forest management activities on the Forest Management Agreement areas;
- Provide an opportunity for the committee to discuss and comment on the diverse interests, values, issues and concerns of the committee members and the general public as they pertain to forest management activities on the Forest Management Agreement areas;
- Provide a forum where the public, via the committee members, can comment on and contribute to the Companies forest management plans and environmental practices;
- Provide a working forum for public participation in the Companies forest management planning and operations consistent with the public involvement obligations under the FMA agreements.

Further guidance to the Forest Resource Advisory Committee, including access to specific expertise, is provided under sections 5 and 9 of the Original FMA9700033 Terms of Reference, and sections 4 and 7 of the Joint FMA0200039 Terms of Reference.

The FRAC was initiated in January 2000. The first two years of the committees operation were dedicated to the following activities:

- Development of a terms of reference to guide the Committee's deliberations;
- Exchange of information concerning the forest management process;
- Development of a process for issue identification and resolution.

Tolko Industries Ltd. and Buchanan Lumber will prepare an annual report of FRAC proceedings to demonstrate a measurable level of activity and performance. The annual FRAC report will describe meeting location, participation and content.

**JOINT PUBLIC INVOLVEMENT PLAN**

REVISION DATE: APRIL 4, 2003

The following organizations have a delegate to represent each organization’s interests and values concerning planned forest management activities on FMA9700033 and FMA0200039:

1. Representative from County of Birch Hills (1)
2. Representative from Municipal District 130 (Smoky River) (1)
3. Representative from Municipal District 136 (Big Lakes) (1)
4. Representative from Municipal District 16 (Greenview) (1)
5. Representative from Northern Sunrise County (1)
6. Representative from the Alberta Sustainable Resource Development, Land and Forest Division (1)
7. Representative from the Alberta Trappers Association (1)
8. Representative from the employees of the Buchanan Lumber Mill (1)
9. Representative from the employees of the High Prairie OSB Mill (1)
10. Representative from the Lesser Slave Lake Indian Regional Council (1)
11. Representatives from the Metis Settlements (Gift Lake, Peavine, East Prairie) (3)
12. Representative from the Town of High Prairie (1)
13. Representative from the Whitefish Band (1)
14. Representative from Alberta Plywood Ltd. (coniferous Quota Holder) (1)
15. Representatives from Local Advisory Committees located in Valleyview and High Prairie (2)
16. Representatives from the General Public Member – at – Large (2)

As the process evolves, additional members of the community-at-large, as well as representatives from other commercial sectors, may be invited to join the Committee if a need is identified, or if significant changes in the industrial or community landscape warrant their participation.

**Table #1. Forest Resource Advisory Committee (FRAC) Membership** *(as of Jan 2003).*

<b>Name</b>	<b>Affiliation</b>	<b>Responsibilities</b>
Trevor Barnes	Alberta Trappers Association	Trapper Representative
Albert Quinn	East Prairie Metis Settlement	Metis Representative
Glady Anderson	Gift Lake Metis Settlement	Metis Representative
Iner Gauchier	Peavine Metis Settlement	Metis Representative
Doug Gladue	Whitefish First Nation	First Nation Representative
Laurence Strebchuk	LAC High Prairie	LAC Representative
Florence Niemi	LAC Valleyview	LAC Representative
David Marx	MD of Big Lakes	MD Representative
Charlie Cramer	MD of Greenview	MD Representative
Louis Tokarz	MD of Smoky River	MD Representative
Ed Dziengielewski	Northern Sunrise County	County Representative
Ben Boettcher	County of Birch Hills	County Representative
Leonard Olson	Town of High Prairie	Town Representative
Vacant	Public Member #1	Member at Large
Vacant	Public Member #2	Member at Large
Tom Barrons	Tolko Industries Ltd.	Tolko Mill Employee Representative
Vacant	Buchanan Lumber	Buchanan Mill Employee Representative
Terry Kristoff	Alberta Plywood Ltd.	Alberta Plywood Representative
Kristofer Heemeryck	Alberta Sustainable Resource Development	ASRD Representative
Hilary Wait / Lindsay Banks	Tolko Industries Ltd.	Tolko Representative Meeting Facilitation
Keith Branting/ Kenzie MacDonald	Buchanan Lumber	Buchanan Representative Meeting Facilitation

#### 4.0 PUBLIC INFORMATION MEETINGS

As an element of the forest management planning process, Tolko Industries Ltd. and Buchanan Lumber will periodically hold public information meetings in communities such as High Prairie, Valleyview, and Atikameg<sup>1</sup>.

A broad cross-section of the public will be invited to attend, by way of a public notice. Generally, an open house meeting of this type is held in the spring of each year to view the General Development Plan.

The purpose of these meetings is to:

- Inform the public about the specific forest management activities that are planned, by Tolko Industries Ltd., Buchanan Lumber, coniferous quota holders, and permittees on the Forest Management Agreement areas.
- Present results of the companies information gathering and planning activities at significant milestones in the forest inventory and management process.
- Solicit the public's views on the values and objectives for forest management over the Forest Management Agreement areas. Concerns and suggestions will be noted and used as feedback in the management planning process.
- Discuss additional interests and concerns that resource users and the general public may have about these proposed activities.
- Take into consideration stakeholder concerns.

The information brought forward during these meetings will be documented, incorporated to the extent possible, and will form the basis for the companies Detailed Forest Management Plan submission to the Government for both the original and joint Forest Management Areas.

#### 5.0 RESOURCE USER CONSULTATIONS

Throughout the year, Tolko Industries Ltd. and Buchanan Lumber woodlands staff meet informally with special interest groups and individual stakeholders to discuss specific issues of concern. These less formal meetings are viewed as being of key importance since they bring forward specific local knowledge and expertise, and assist in identifying specific areas of concern.

Specific to individual stakeholders, such as trappers, site specific meetings are often accompanied by field trips. These one-on-one meetings are particularly important in developing mitigation methods, which address and resolve specific areas of concern. Information gathered during these meetings and field trips are documented and utilized in the development of site specific plans.

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<sup>1</sup> Other communities, may be considered as venues for public meetings should events and interest warrant it.

## 6.0 PUBLIC AWARENESS

Throughout each year, company woodlands staff have attended a variety of functions to promote public awareness of forestry, forest management and the companies. Tolko Industries Ltd. and Buchanan Lumber are committed to an ongoing program of public awareness, through participation in activities such as the following:

- Forestry displays during:
  - National Forestry Week;
  - Community trade shows;
  - Local civic functions.
- Formal and informal presentations, displays and discussions with:
  - Local primary, junior high and high school groups;
  - Surrounding aboriginal communities;
  - Community college classes.
- On-site tours and presentations, to interested groups, of:
  - Forestry planning and woodlands operations;
  - OSB mill and Sawmill.
- Distribution of corporate newsletters and information bulletins (internally and externally) such as:
  - The Tolko “Circular” & The “OSB Press”;
  - Tolko’ s Corporate “annual report”
  - Tolko’s Sustainability Reports
- Copies of management plans will be made available to the stakeholders at local libraries.
- Support and maintenance of Tolko’s internet web site ([www.tolko.com](http://www.tolko.com)).
- Support and maintenance of Buchanan Lumber’s internet web site ([www.telusplanet.net/public/blumber/noframes.htm](http://www.telusplanet.net/public/blumber/noframes.htm) ).

Tolko Industries Ltd. and Buchanan Lumber are also committed to supporting forestry education and public awareness initiatives sponsored by the professional forestry community. Company staff have, and will continue to, participate in a variety of public institutions, forums and advisory committees such as the:

- Alberta Forest Products Association;
- Alberta Research Council (ARC);
- College of Alberta Professional Foresters;
- College of Alberta Professional Forest Technologists;
- Canadian Institute of Forestry;
- Forest Engineering Research Institute of Canada (FERIC);
- Canfor Forest Management Advisory Committee;
- Tolko Industries Ltd./Buchanan Forest Resource Advisory Committee;
- Whitefish First Nation Cooperative Management Committee;
- Lesser Slave Forest Education Society;
- MacKenzie Forest Education Society.

## 7.0 COMMUNICATIONS WITH GENERAL PUBLIC

Members of the public are invited to contact Tolko Industries Ltd. High Prairie Division directly via the phone (780) 523-2101, fax (780) 523-2204 or Postal Bag 3000, High Prairie, AB, T0G 1E0. Additional information regarding Tolko Industries Ltd. divisions located throughout Western Canada is available on an internet web page (<http://www.tolko.com>) which is maintained by the Corporate office.

Members of the public are invited to contact Buchanan Lumber directly via the phone (780) 523-4544, fax (780) 523-5422 or Postal Box 38, High Prairie, AB, T0G 1E0. Additional information regarding Buchanan Lumber is available on an internet web page ([www.telusplanet.net/public/blumber/noframes.htm](http://www.telusplanet.net/public/blumber/noframes.htm)).

## 8.0 DISPUTE RESOLUTION PROCESS

For the purpose of this Public Involvement Plan, the term “conflict” shall be defined as opposing viewpoints or opinions of two or more parties involved. When a dispute arises with a member of the public or another land user, Tolko Industries Ltd. and Buchanan Lumber staff will attempt to resolve the concern through the following sequential process:

Step 1) Upon initial contact with the individual or group voicing the issue, specific details regarding the request or concern are identified. The appropriate person within Tolko Industries Ltd. or Buchanan Lumber will be identified and the call or information then transferred to the designated employee. Proceed to step 2 in the process.

Step 2) The designated employee will attempt to respond verbally to the request or concern. If the individual voicing the issue is not satisfied or requires additional information, proceed to step 3 in the process.

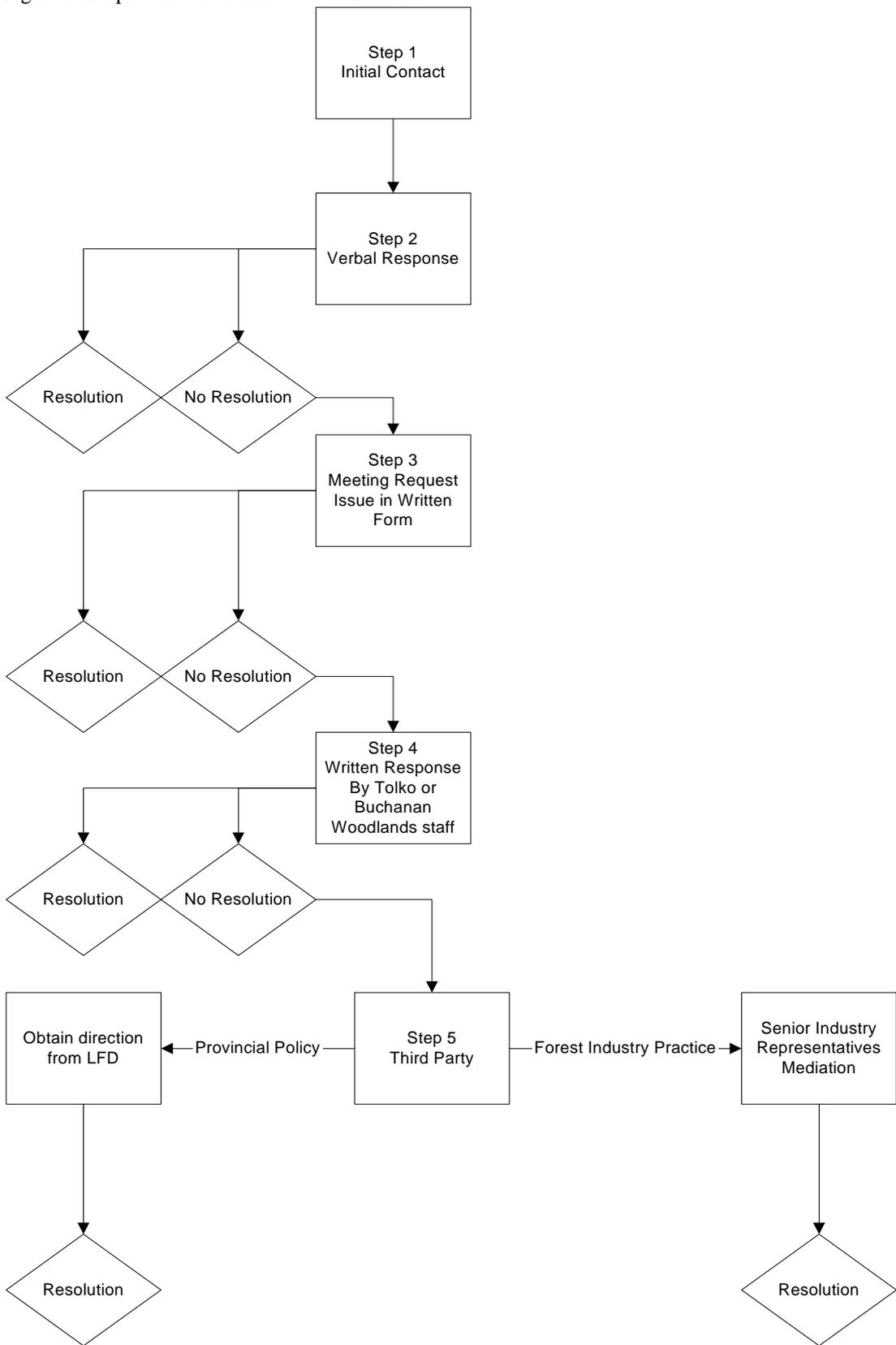
Step 3) An offer is made to meet the person at a convenient location (field or office) to further discuss the issue or obtain additional information. If the individual voicing the issue is not satisfied or requires additional information, the individual is requested to outline their issue in writing. Proceed to step 4 in the process.

Step 4) The designated employee will respond to the individuals request or concern in writing. If the individual voicing the issue is not satisfied or additional information is required, proceed to step 5 in the process.

Step 5) If additional actions are required, the appropriate third party (depending on nature of issue) will be contacted to review the information and assist in working towards a solution of the issue or conclude the dispute. For example the appropriate third party could be one of the following: a senior industry representative, a Government official, an independent mediator, an independent arbitrator, or legal process.

Throughout this process, it must be recognized, that not all disputes can be resolved to the mutual satisfaction of both parties.

Figure 1. Dispute Resolution Process Schematic.



## 9.0 AUDITING AND PERFORMANCE MEASURES

Both Buchanan Lumber and Tolko Industries Ltd. are committed to responsible stewardship of the environment throughout our operations.

- Due Diligence (i.e. reasonable investigation and review consistent with normal business practice and industry standards) - All of our business activities take into account relevant laws and the legal and moral consequences of our actions. Changes in Provincial policy and legislation will be closely monitored by the companies with a view to a) protecting the Company's and local communities' interests and b) ensuring that forest management activities are consistent with Provincial expectations.
- Internal Woodlands Auditing - Tolko Industries Ltd. has institutionalized an annual woodlands audit process using audit methodology developed jointly with Price Waterhouse. This process includes employee and public involvement. A report is produced for distribution.
- External Woodlands Auditing - Tolko Industries Ltd. and Buchanan plan to participate in the AFPA "ForestCare" process and will cooperate with the Alberta Sustainable Resource Development - Land and Forest Division in regularly scheduled compliance audits.
- Communication - Several publications are prepared on an annual and periodic basis, including "Circular", "Tolko Forest Management Audit Report", and "Tolko Woodlands Annual Report". In addition, our employees are surveyed on a periodic basis to determine their perception of various forest management issues and a summary report is prepared.
- Communication - Companies will solicit comments and questions from the general public through the public awareness campaign, formal public information meetings and through representation by the Forest Resource Advisory Committee.

These processes will continue to be an integral part of the feedback and monitoring element of our public involvement process.

To demonstrate a measurable level of performance concerning public awareness, Tolko Industries Ltd. and Buchanan Lumber will submit an annual report card describing public education activities. The annual report will provide a concise description of location, date, type of event and level of public participation.

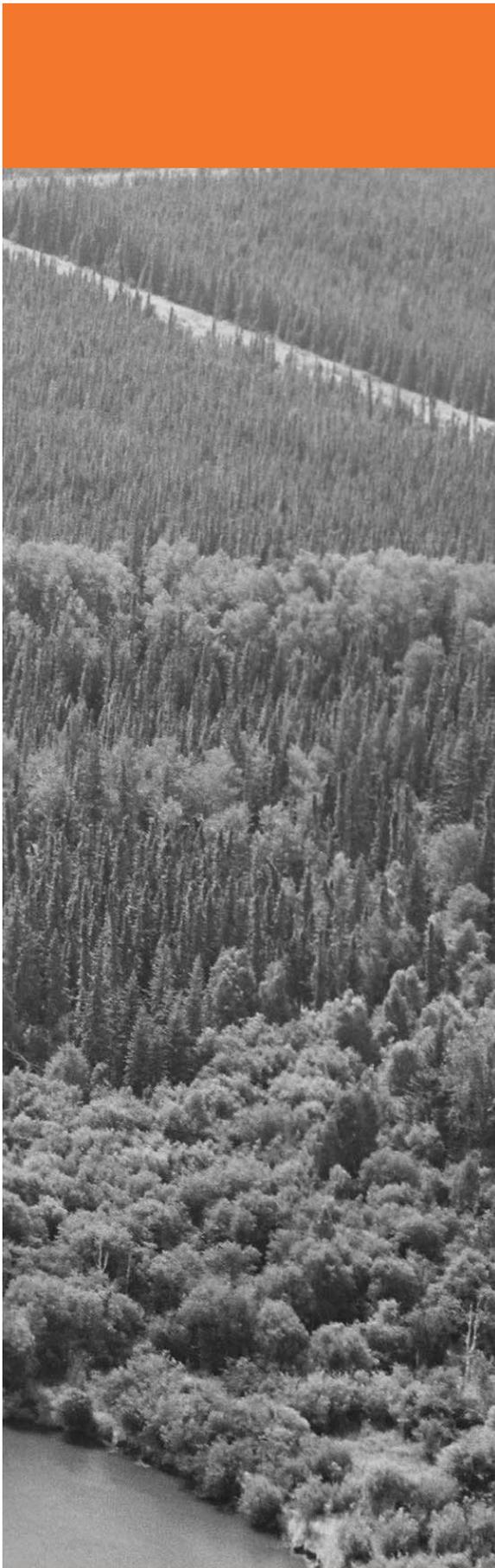
In addition, the Annual Operating Plan process demonstrates public involvement via the stakeholder notifications and other resource users consultations.

## 10.0 CLOSURE

Information obtained during the above public involvement processes will be summarized and brought forward to the planning teams. Upon submission of the Detailed Forest Management Plans to Government, ongoing performance monitoring and communication will be primarily achieved through the auditing and performance measures outlined above and through the Forest Resource Advisory Committee process.

## **APPENDIX I**

### **Forest Resource Advisory Committee Terms of Reference**



F.

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**Appendix F**  
*Stakeholder Issues List  
and Reply*

DFMP

At the start of the Joint Detailed Forest Management Planning process in January 2003, the following groups or organizations were asked to provide issues lists: Sucker Creek, Lesser Slave Indian Regional Council, Peavine Metis Settlement, Local Contractors, Local Trappers, East Peace MTU Program, Sustainable Resource Development - Fish and Wildlife Division, Department of Fisheries and Oceans, and the Forest Resources Advisory Committee

The following is a summary of the actual text in *blue italics* of the issues lists provided by the group or organization to the companies. The text following each issue outline how the question, concern or issue is addressed in the Detailed Forest Management Plan.

***East Peace Miscellaneous Timber Use (MTU) Issues***  
***Sustainability of program***

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 5.1, Objective 1.11.

***Proximity to residence of blocks – With small volumes distance to block becomes a concern as well as length of bush road to open up.***

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Strategy 5.1.8, Strategy 5.2.1

***Quality of timber – As some loggers still do hand work tree size might become an issue for them.***

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Strategy 1.17.1

***Size of blocks (volumes) – As each logger attempts to cut an average of 1500m<sup>3</sup>/year, some years there are over/under cuts, balancing is required for each logger. Therefore, blocks may have to be individually tailored for each logger.***

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Strategy 5.1.2

***MTU Areas – Is there a mechanism in place to maintain traditional MTU areas or will all operations be operated jointly within one area?***

The above listed question is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Strategy 5.1.8

***Aspen Volume – The traditional cut for P03 aspen for area loggers has been 1% of the AAC but has never been realized by area loggers. Now that detailed planning is in the works it must be made available to the loggers.***

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Strategy 1.5.3

***Contract work – Is there a mechanism in place for area loggers to obtain contract work within company operations i.e. - small logger programs?***

The above listed question is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Strategy 3.3.1

***Better pre-harvest information – More detailed block information such as species composition is required.***

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Strategy 1.2.1

***Department of Fisheries and Oceans Issues***

*Maintaining the productive capability of fish habitat. No net loss policy for fish habitat.*

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 2.7, Objective 2.2, Strategy 2.7.2

*Preventing sedimentation and siltation that are the results of human activity on the landscape.*

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 2.2, Strategy 2.7.2

*Maintaining natural flow regimes in watersheds. This is really focusing on maximum amounts of deforestation in watershed buffers, rutting that may disturb surface flows (etc.).*

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 2.1, Strategy 2.7.3, Strategy 2.1.5

### ***Trappers Issues***

*Prior to any activity by timber companies consultation should occur with trap line owners and if possible timber companies provide trappers with a three to five year operations and cut plan to allow trappers to adjust their operations accordingly.*

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Strategy 6.1.7, Strategy 6.1.8

*All water bodies that have potential for or evidence of beaver or other fur bearing species populations activities should have a one hundred meter buffer left on all sides of the main water source as well as a fifty meter buffer on each side of the feeder creeks leading into the main water body. Lakes should have no less than a five hundred meter buffer left around the entire perimeter.*

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Strategy 2.1.4. Ground Rule Buffers have been implemented according to watercourse class. Large Permanent watercourses have a sixty (60m) buffer, Small Permanent watercourses have a thirty meter (30m) buffer and Lakes greater than four (4) hectares in size have a one hundred (100) meter buffer.

*Cut plans should be done in a co-operative fashion by the timber industry whereby one cut takes both deciduous and coniferous timber thereby reducing the impact to the fur bearing species environment by reducing interference due to repeated logging and traffic.*

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 1.5, Strategy 6.1.3

*A quarter mile buffer should be left around all trapper's cabins in consideration that the trapper carefully selects cabin locations with fur potential and trapping operations in mind.*

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Strategy 2.11.2

*Accesses opened by industry that are beneficial to the trapper should be left in a usable form for trapper's future use (eg.: in the case of a timber bridge, if the trapper so desires it could be reduced to a size usable by all terrain vehicles when road decommissioning is in progress.)*

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Strategy 6.1.8

*In cases where damage occurs to trappers property including cabins, traps, bridges, etc., compensation values should be decided upon using an independent third party chosen and agreed upon using an independent third party chosen and agreed upon by both the trapper and the timber industry representative.*

The above listed issue is outside the scope of the Detailed Forest Management Plan.

## *Wildlife Issues List*

### ***Tolko /Buchanan Lumber DFMP 2002-03 FMA 0200039 August 2002***

*The following issue list is intended to outline basic wildlife issues to be addressed in the forthcoming DFMP. This list should not be considered as a final document. Additional issues may arise that will have to be addressed in the DFMP.*

#### ***Habitat Management***

##### ***Coarse Filter***

- *Landscape Scale;*
- *Maintenance of Biodiversity;*
- *Maintain Range of Size/ Distribution of Forest Age Classes over two rotations;*
- *Any AAC retention should be planned and mapped over the course of two rotations;*
- *Block size;*
- *Adjacency;*
- *Green-up.*
- *Natural Disturbance Regime on FMA;*
- *Key Wildlife Areas;*
- *River valleys.*
- *Habitat types by natural sub-region need to be quantified (data on area, volume);*
- *When should timber type be considered seral? (i.e. Yield curve decline or other?);*
- *Conifer seral should be further defined by species i.e. pine, white spruce, black spruce;*
- *Intensive single pass harvesting, if proposed, must account for dramatic habitat change in a short time frame and provide for habitat types required by species in that area immediately following harvesting. (i.e. % retention will have to be higher in oversize blocks - what about other landscape concerns like aesthetics, trapping issues?)*

##### ***Fine Filter***

- *Stand Level Objectives;*
- *Block size;*
- *Adjacency;*
- *Green-up;*
- *In-block structure;*
- *Strategies for oversize blocks.*
- *Species at Risk/ Sensitive Species;*
- *Unique/ Rare Habitats;*
- *River valleys;*
- *Mineral licks;*
- *Rare plants;*
- *Denning sites.*

The above issues are addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 1.1, Strategy 1.1.2, Strategy 1.1.4, Objective 1.4, Strategy 1.4.1, Strategy 1.4.2, Strategy 1.4.3, Objective 1.5, Objective 2.3, Strategy 2.3.1, Strategy 2.3.2, Strategy 2.3.4, Strategy 2.3.5, Strategy 2.3.6, Strategy 2.3.7, Strategy 2.3.8, Strategy 2.3.9, Objective 2.4, Strategy 2.4.1, Strategy 2.4.2, Strategy 2.4.3, Strategy 2.4.4, Strategy 2.4.5, Strategy 2.4.5, Strategy 2.4.6, Strategy 2.4.7, Objective 2.5, Strategy 2.5.1, Strategy 2.5.2, Strategy 2.5.3, Strategy 2.5.4, Strategy 2.5.5, Strategy 2.5.6, Objective 2.6, Strategy 2.6.1, Strategy 2.6.2, and Strategy 2.6.3.

### **Silviculture**

- *Links to planning and harvesting phases;*
- *Importance of maintaining values retained during harvesting;*
- *Clear linkages of herbicide use to initial site prep is required;*
- *Disposal methods for slash piles, downed woody debris retention, carbon cycling.*

The above issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 1.6, Objective 1.7

### **Enhanced Forest Management**

- *Herbicide;*
- *Hybrid stock;*
- *Fertilizer;*
- *Access and site disturbance;*
- *Rotation time;*
- *% FMA planned for EFM;*
- *Deadwood resources over time and nutrient cycling;*
- *Site fertility;*
- *Effect on regional biodiversity;*
- *% landbase by habitat type and EFM intensity defined and projected impacts must be clearly laid out- tie to access management.*

The topic of Enhanced Forest Management has not been included in the selected preferred forest management strategy.

### **Riparian Areas:**

- *Strategies to maintain values;*
- *Flooded areas;*
- *Lotic sites;*
- *Lentic sites;*
- *Beaver ponds.*

The above listed issues are addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 2.3, Strategy 2.3.1, Strategy 2.3.2, Strategy 2.3.3, Strategy 2.3.3, Strategy 2.3.4, Strategy 2.3.6, Strategy 2.3.7, Strategy 2.3.8, Strategy 2.3.9, Objective 2.4, Strategy 2.4.1, Strategy 2.4.2, Strategy 2.4.3, Strategy 2.4.4, Strategy 2.4.5, Strategy 2.4.6, Strategy 2.4.7, Objective 2.5, Strategy 2.5.1, Strategy 2.5.2, Strategy 2.5.3, Strategy 2.5.4, Strategy 2.5.5, Strategy 2.5.6, Objective 2.6, Strategy 2.6.1, Strategy 2.6.2, Strategy 2.6.3.

### ***Access Management***

- *Intensity;*
- *Duration;*
- *Abandonment;*
- *Coordination of industrial access;*
- *Communication with publics;*
- *Key wildlife areas;*
- *Any company can close access through a variety of means - the best access management is the access management done without the public knowing access management has been done or combined with site reclamation i.e. Dog legs, rollback, re-planting of in-block roads, landings, pulling of watercourse crossing;*
- *Measures taken to reclaim existing disturbances i.e. planting seismic lines within blocks or reclaiming existing access within a license are considered proactive access management;*
- *Maximum access thresholds should be a part of the larger access management plan i.e. Density of watercourse crossings, km of linear disturbance/sq. km etc.;*
- *What is current corporate strategy to TDA dues? Are there any changes that can be made to make meaningful changes on the ground, to get trees growing where they have been removed for other industrial purposes?*

The above listed issues is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Strategy 5.1.6, Objective 2.12, Strategy 2.12.1, Strategy 2.12.2, Strategy 2.12.3, Strategy 2.12.4, Strategy 2.12.5, Strategy 2.12.6, Strategy 2.12.7, Strategy 2.12.8

### ***Fire Salvage***

- *Develop a strategy for large scale salvaging that incorporates ecological factors.*

The above issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 2.8, Strategy 2.8.1, Strategy 2.8.2, Strategy 2.8.3, Strategy 2.8.4, Strategy 2.8.5, Strategy 2.8.6, Objective 2.9, Strategy 2.9.1, Strategy 2.9.2, Strategy 2.9.3, Strategy 2.9.4, Strategy 2.9.5

### ***Biodiversity Monitoring Program/Ecological Research Program***

- *Monitoring strategies implemented;*
- *Option of partner funding on wildlife surveys on FMA;*
- *Selected species population trend monitoring on FMA;*
- *Start New Research/Monitoring on selected species;*
- *Develop a wildlife sighting database with direct link to FWS database/staff;*
- *Grizzly bear population and habitat;*
- *Use of discretionary FMA dollars to support existing education programs (purchase educational fur kit etc).*

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Strategy 3.5.2, Strategy 2.3.9

### ***Cumulative Effects***

The above listed issue is outside the scope of the Detailed Forest Management Plan.

***Forest Resource Advisory Committee  
Issues List***

*October 21, 2002*

*Note: These topics were obtained from the meeting minutes and/or notes from previous meetings.*

*Harvesting Practices on Private Land*

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 5.5

*Purchase of Private Land Timber*

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 5.4

*Damage to Local Municipal District Roads*

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Strategy 6.3.3

*Roadside Turnout near Gift Lake*

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 6.4

*Trappers Compensation Program*

Issue is outside the scope of the Detailed Forest Management Plan.

*Buffers on Water Features*

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Strategy 2.1.4

*Turn off highway into Buchanan Mill site*

Issue is outside the scope of the Detailed Forest Management Plan.

The following is a summary of questions, issues, or topics that were raised through the additional public Open Houses conducted during the summer of 2004. The following listed in *blue italics* is a summary of the notes of questions asked during the Open House. Answers to the question were provided to the individual or group at the time of asking. The text following each issue outlines how the concerns are address in the Detailed Forest Management Plan.

### ***Employment***

- *Employment opportunities*
- *Various employment questions (i.e. What is the minimum level of education required by Tolko/Buchanan? What types of jobs are available? Do you hire women?)*
- *Employment within outer communities.*
- *Wanted to start logging for Tolko Industries Ltd.*
- *How does an individual get jobs at the mill?*
- *How do I get a job in the mill?*
- *Perception that the local suppliers are only in High Prairie.*
- *Would a catalogue of the services or a listing of contacts for the district be of assistance to Tolko Industries Ltd.?*
- *Approachability of the Woodlands and Mill.*
- *Bidding List for work in the Mill.*

Tolko Industries Ltd. and Buchanan Lumber provide numerous direct and indirect opportunities for employment and contract services for High Prairie and the surrounding communities. The above listed question, comment or issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 3.3, and Strategy 3.3.1.

### ***Purchase of Private Wood***

- *Purchase of timber from individual farmers.*
- *Reverting of land from agriculture to forestry.*
- *Does Tolko/Buchanan's have operations on Aboriginal Settlements?*
- *Purchase of timber from individual farmers.*
- *Wants to get Whitefish logging back on track.*
- *Would Tolko allow East Prairie Investment Corporation to harvest off the settlement?*
- *Will Tolko be harvesting on the settlement this year?*
- *Forest Management Plans for the Settlement.*
- *How much volume did Sturgeon Lake deliver last year on contract?*
- *Interested in selling wood from the reserve.*
- *Asked if cutting on the reserve was similar to private? and how it worked?*
- *Why does Tolko stipulate logging contractors on private land? Should we (landowners) not have the right to choose contractors or log the land ourselves?*
- *Who is logging in Grouard?*

Each year Tolko Industries Ltd. purchases deciduous timber from private landowners and aboriginal communities. Although the above listed question, comment or issue is outside the scope of the Joint or Original Forest Management Area, it has been addressed through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 5.4, Strategy 5.4.1, Strategy 5.4.2, Objective 5.5, Strategy 5.5.1, Strategy 5.5.2, Strategy 5.5.3, and Strategy 5.5.4.

### ***Hybrid Poplar Plantation***

- *Hybrid Poplar Plantation*
- *Asked what was growing in the front field at Tolko.*
- *Discussion regarding planting hybrid poplar on the reserve.*

The establishment of Hybrid Poplar plantations can only occur on private land. Although the above listed question, comment or issue is outside the scope of the Detailed Forest Management Plan it has been addressed through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 5.5, Strategy 5.5.1, Strategy 5.5.2, Strategy 5.5.3, and Strategy 5.5.4.

### ***Forest Management Planning Process***

- *What if the information in the plan is inaccurate?*
- *Are there safeguards in place?*
- *What is the difference between the gross landbase and the net landbase?*
- *Where do Tolko/Buchanan operate (FMA locations)?*
- *Could you provide information regarding the timber supply analysis? Do you have proof/research/analysis that ensure that the forest is sustainable?*
- *Of the net landbase, how much will you affect*
- *What age are the trees harvestable? Is this the most effective measure? Is this sustainable?*
- *Is the current landscape an appropriate landscape?*
- *What age is MAI?*
- *When are we going to start harvesting cutblocks?*
- *Wondered where we were logging this year*
- *Are we changing genetics on the landbase?*
- *Do we have sufficient protected areas?*
- *Example given of retention - photo*
- *Asked about time frame and if 20 years seemed applicable for the forest.*

The above issue is addressed in the Timber Supply Analysis Section 4 of Detailed Forest Management Plan.

### ***Debris Management***

- *Are nutrients being returned to the landbase where logs have been removed?*
- *Why are the piles burned if they contain the nutrients?*
- *Is it not easier to spread the debris?*

The above listed question, comment or issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 1.4, Strategy 1.4.2, Strategy 1.4.3, Strategy 1.4.4, and Strategy 1.4.5.

### ***Watercourse/Waterbodies***

- *Are the watercourses buffered?*
- *Explanation of watersbed analysis*

Ground Rule Buffers have been implemented on the landbase according to watercourse classification. Large Permanent watercourses have a sixty (60m) buffer, Small Permanent watercourses have a thirty meter (30m) buffer and Lakes greater than four (4) hectares in size have a one hundred (100) meter buffer. The above listed question, comment or issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 2.1, Strategy 2.1.1, Strategy 2.1.2, Strategy 2.1.3, Strategy 2.1.4, and Strategy 2.1.5.

### ***Access Management***

- *Is there anything that you are doing to minimize access and damage caused because of increased access?*

The above listed question, comment or issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 2.12, Strategy 2.12.1, Strategy 2.12.2, Strategy 2.12.4, Strategy 2.12.5, Strategy 2.12.6, Strategy 2.12.7 and Strategy 2.12.8.

### ***Aesthetics***

- *Aesthetics?*
- *Possible to have selective logging in aesthetically sensitive areas?*
- *What about horse logging?*
- *Individual was concerned with trees that were being cut around her house. Wants to stop cutting trees so that her kids can see them.*

The above listed question, comment or issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 1.5, Strategy 1.5.1 and Strategy 1.5.2.

### ***Other Stakeholders***

- *Trapper Consultation*

The above listed question, comment or issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 6.1, Strategy 6.1.1, Strategy 6.1.2, strategy 6.1.3, Strategy 6.1.7 and Strategy 6.1.8.

- *Oil and Gas Activities (seismic and roads)*

The above listed question, comment or issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 6.2, Strategy 6.2.1, Strategy 6.2.2, and strategy 6.2.4

- *Is a grazing lease harvestable?*
- *If you harvest on a grazing lease would you be required to regenerate? Any stand harvested*

The above listed question, comment or issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 6.1, Strategy 6.1.5, and Strategy 6.1.6

- *How do you seek public/Aboriginal input?*
- *Happy to see us in the community to give input into plans.*

The above listed question, comment or issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objectives 3.2, Strategy 3.2.1, Objective 3.4 and Strategy 3.4.1.

- *Can I buy Traditional Use Area on Crown Land*
- *Want to protect traditional landuse issues hunting/ herb collection etc.*
- *Have made a map has Tolko/Buchanan seen it?*
- *Issues involving communication between aboriginals specifically regarding acquiring information/ location of traditional landuse areas and traditional values.*

The above listed question, comment or issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 3.1, Strategy 3.1.4

- *Concerned with traditional area in G15*

The above listed question, comment or issue is outside the scope of the Joint or Original Detailed Forest Management Plan. The Forest Management Unit G15 is part of Canadian Forest Products (CANFOR) Grande Prairie Operations Forest Management Area.

### **Fire**

- *Forest Fires*

The above listed question, comment or issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 2.8, Strategy 2.8.1, Strategy 2.8.2, Strategy 2.8.3, Strategy 2.8.4.

- *Asked how long after a fire we could use burnt wood*

The usability of burnt timber after a fire is dependant on several factors. For example, the forest fire characteristics, the milling process and the final product. Generally speaking deciduous and coniferous timber should be harvested and processed within two years of a forest fire.

### **Regeneration**

- *Questions about how Tolko does regeneration surveys.*
- *Asked how Buchanan does regeneration surveys and who does the surveys.*

Establishment and Performance surveys are conducted by both Buchanan Lumber and Tolko Industries Ltd. on harvested areas as outlined in the Alberta Regeneration Survey Manual. The above listed question, comment or issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 1.10, Strategy 1.10.1, Strategy 1.10.2, Strategy 1.10.3, Strategy 1.10.4, and Strategy 1.10.7.

- *What happens if nothing grows?*

The companies are required to ensure trees established on harvested areas. Harvest areas are monitored post harvest to ensure that acceptable tree species are growing on the site. If regeneration does not meet the required standard and a block is declared NSR (Not Satisfactorily Restocked) the company utilizes a variety of site preparation and silviculture interventions to establish trees on an harvested area. The above listed question, comment, or issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Strategy 1.10.2

- *Talked about how the individual did regeneration surveys in High Level and did not enjoy it.*

The above listed comment is outside the scope of the Detailed Forest Management Plan.

### **Wildlife**

- *How can you ensure that the wildlife are sustainable?*

The Government of Alberta has the responsibility for management of wildlife populations and hunting licensing. Tolko Industries Ltd. and Buchanan Lumber managed their forestry operations and provide wildlife habitat or protect wildlife habitat features. The above listed question, comment or issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 2.3, Strategy 2.3.1, Strategy 2.3.2, Strategy 2.3.3, Strategy 2.3.3, Strategy 2.3.4, Strategy 2.3.6, Strategy 2.3.7, Strategy 2.3.8, Strategy 2.3.9, Objective 2.4, Strategy 2.4.1, Strategy 2.4.2, Strategy 2.4.3, Strategy 2.4.4, Strategy 2.4.5, Strategy 2.4.6, Strategy 2.4.7, Objective 2.5, Strategy 2.5.1, Strategy 2.5.2, Strategy 2.5.3, Strategy 2.5.4, Strategy 2.5.5, Strategy 2.5.6, Objective 2.6, Strategy 2.6.1, Strategy 2.6.2, Strategy 2.6.3.

- *Why type of analysis is completed to ensure that wildlife, water etc are protected/ maintained?*

The above listed question is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 2.1, Strategy 2.1.2, Strategy 2.1.3, Objective 2.3, and Strategy 2.3.9

### ***Donations/Money***

- *When is Tolko/Buchanan going to contribute to the Winagami Conservation Project?*

The above listed question, comment or issue is outside the scope of the Detailed Forest Management Plan.

### ***Other***

- *Water Quality in Swan Hills Area with regard to PCB's and the Waste Treatment Plant located in Swan Hills.*

The above listed comment or issue is outside the scope of the Detailed Forest Management Plan.

- *Did Buchanan Lumber change the burner because of regulations or was that a company initiative?*

The above listed question or issue is outside the scope of the Detailed Forest Management Plan.

- *Various mill process specific questions (i.e. What do you make? How are the products made? Could you explain the process?)*

Refer to Section 1 of the Detailed Forest Management Plan for a detailed description of the company mill facilities. Tolko Industries Ltd. High Prairie mill facility makes Oriented Strand Board (OSB) from deciduous timber. Buchanan Lumber mill facility makes dimensional lumber from coniferous timber.

A presentation was made to the following Municipal Districts during the summer of 2004: Municipal District of Smoky, Municipal District of Greenview, Municipal District of Big Lakes, and the Northern Sunrise County. The text presented in *blue italics* is a summary of questions or comments from notes made after the presentation to Municipal Districts or County. Answers to the question were provided to the individual or group during the question and answer period following the presentation. The text following each issue outlines how the concerns are address in the Detailed Forest Management Plan.

### **Municipal District of Smoky**

#### *General Corporate Questions*

##### *Origin of Tolko and Owners*

##### *Meadow Lake Division*

Refer to Section 1 of the Detailed Forest Management Plan for a detailed description of the company mill facilities.

##### *Hybrid Poplar Plantation*

The establishment of Hybrid Poplar plantations can only occur on private land. Although the above listed question, comment or issue is outside the scope of the Detailed Forest Management Plan it has been addressed through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 5.5, Strategy 5.5.1, Strategy 5.5.2, Strategy 5.5.3, and Strategy 5.5.4.

#### *Private Wood Purchasing*

##### *Price difference between crown and private*

##### *Location*

##### *Stumpage*

##### *Purchase of agricultural Land in MD Greenview*

##### *Amount*

Each year Tolko Industries Ltd. purchases deciduous timber from private landowners and aboriginal communities. Although the above listed issue is outside the scope of the Joint or Original Forest Management Area, it has been addressed through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 5.4, Strategy 5.4.1, Strategy 5.4.2, Objective 5.5, Strategy 5.5.1, Strategy 5.5.2, Strategy 5.5.3, and Strategy 5.5.4.

#### *Deliveries*

##### *Amount*

##### *AAC/Timber Flow*

##### *Difference between years*

##### *1998 Fire Questions*

The above listed question is outside the scope of the Detailed Forest Management Plan. This information is provided annually in the General Development Plan.

#### *CSA*

##### *Who does the third party independent Audit for the CSA?*

The above listed question is outside the scope of the Detailed Forest Management Plan.

### **Municipal District of Greenview**

- *How much does Tolko pay for private wood?*
- *Changes between 60% private last year and 37% forecast for this year - what determines*
- *Why the increase in consumption this year? Is the mill more efficient?*

Each year Tolko Industries Ltd. purchases deciduous timber from private landowners and aboriginal communities. Although the above issue is outside the scope of the Joint or Original Forest Management Area, it has been addressed through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 5.4, Strategy 5.4.1, Strategy 5.4.2, Objective 5.5, Strategy 5.5.1, Strategy 5.5.2, Strategy 5.5.3, and Strategy 5.5.4.

- *Recycling of planting boxes*

The above listed issue is outside the scope of the Detailed Forest Management Plan.

- *Government changes in licensing*

The above listed issue is outside the scope of the Detailed Forest Management Plan.

- *Hauling of Buchanan wood from Chinchangua Area*

The above listed issue is outside the scope of the Detailed Forest Management Plan.

### **Municipal District of Big Lakes**

- *Carbon credit rights*
- *Are farmers going to get credits*
- *Kyoto any additional information*

The above listed issue is outside the scope of the Detailed Forest Management Plan.

- *Reforestation activities*

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 1.10, Strategy 1.10.3, and Strategy 1.10.4.

- *Hybrid poplar plantation*
- *Are spruce more competitive to weeds*

The establishment of Hybrid Poplar plantations can only occur on private land. Although the above listed question, comment or issue is outside the scope of the Detailed Forest Management Plan it has been addressed through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 5.5, Strategy 5.5.1, Strategy 5.5.2, Strategy 5.5.3, and Strategy 5.5.4.

- *Noxious weeds - ensure equipment is washed off for road building and construction*
- *Ensure haulers wash equipment prior to going to bush*
- *Requirement to have clean equipment*

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 2.10

- *"incidental" is misleading term*

For deciduous timber operators "Incidental" timber is deciduous timber produced during the harvesting of coniferous blocks under dispositions held by other companies or individuals within a Forest Management Area. For coniferous timber operators "Incidental" timber is conifer timber produced during the harvesting of deciduous blocks under dispositions held by other companies or individuals within a Forest Management Area.

- *Trucking problems*

The above listed issue is outside the scope of the Detailed Forest Management Plan.

- *Amount of Wood in Slave Lake Yard*
- *Expansion potential with Slave Lake purchase*

The above listed issue is outside the scope of the Detailed Forest Management Plan.

- *Disease affecting aspen coming into Alberta from Saskatchewan*
- *Mountain pine beetle infestation in BC*

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 2.10. The companies are not aware of a disease affecting aspen. The mountain pine beetle is currently being monitored by Alberta Sustainable Resource Development

## Northern Sunrise County

- *Deliveries:*

*Log Deliveries: Amount/Operating Location/Log Haul Routes/Number of Loads*  
*Difference Between Private and Crown Stumpage Charges*

The above listed question is outside the scope of the Detailed Forest Management Plan. This information is provided annually in the General Development Plan.

- *Operational Questions*

*Width of lake and creek buffers*  
*Oil and Gas locations*  
*GIS Information available*  
*Noxious weeds*

The above listed issue is addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 2.10

- *Private Land*

*Private Land amount versus crown/Location*  
*What happens to land after harvest*  
*Are there any private land tree farms/wood lots managed from private land*

Each year Tolko Industries Ltd. purchases deciduous timber from private landowners and aboriginal communities. Although the above listed issue is outside the scope of the Joint or Original Forest Management Area, it has been addressed through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 5.4, Strategy 5.4.1, Strategy 5.4.2, Objective 5.5, Strategy 5.5.1, Strategy 5.5.2, Strategy 5.5.3, and Strategy 5.5.4.

- *CSA*

*community stability*  
*Road construction*  
*Joint Cooperative projects*

The above listed issue is outside the scope of the Detailed Forest Management Plan.

A Trapline Licence Holder Stakeholder communication process was conducted the week of August 23<sup>rd</sup> to 27<sup>th</sup>, 2004. A total of sixty one trapline licence holders were sent an invitation via Canada Post to attend an Open House Meeting to review the Detailed Forest Management Plan and identify any issues or concerns. The text presented in *blue italics* is a summary of questions or comments made by the Trapline License Holders. Answers to the question were provided to the individual or group during the question and answer period. The text following each issue outlines how the concerns are address in the Detailed Forest Management Plan.

**Trapline Licence: #1887**

- *Has 5 cabins located on the Trapline Area*
- *Concerned regarding notice and information*
- *Consultation one year prior*
- *Notice prior to operations*

The above listed issues are addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 6.1, Strategy 6.1.1, Strategy 6.1.2, Strategy 6.1.3

- *Concerned with protection understory conifer*
- *Mixedwood stands*
- *Wildlife leave trees*
- *Leave trees along creek*
- *Conifer Harvest Rights*

The above listed issue is outside the scope of the Detailed Forest Management Plan.

- *Contact for Tolko Operations on the Slave Lake FMA*

The above listed issue is outside the scope of the Detailed Forest Management Plan.

**Trapline Licence #1947 & Trapline Licence #2068**

- *Understory Spruce*
- *Herbicide use in the forest*
- *Operations for upcoming year*
- *Notice regarding operations*
- *Protection of cabins*
- *Do not present maps with cabins shown*

The above listed issues are addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 6.1, Strategy 6.1.1, Strategy 6.1.2, Strategy 6.1.3

**Trapline Licence #2941**

- *Main Haul Routes*
- *Access along Goose Tower and Brush Mountain*
- *Keep some lines open, Not closing up trails*
- *Bridge on McGowan to Blue Mountain*
- *Sweathouse Map*
- *5 Cabins on Trapline. No public display of cabin locations*
- *Timing of notifications*

The above listed issues are addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 6.1, Strategy 6.1.1, Strategy 6.1.2, Strategy 6.1.3

### **Trapline Licence #1835, Trapline Licence #1932, Trapline Licence #2715**

- *Discussed cabin locations. No public display of cabin locations*
- *Discussed Trapper notification*
- *Trails into area*
- *Garbage left by other users*
- *Requested copies of AVI Base Maps*

The above listed issues are addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 6.1, Strategy 6.1.1, Strategy 6.1.2, Strategy 6.1.3

### **Trapline Licence #2387**

- *Requested logs for a cabin*
- *Discussed cabin locations. No public display of cabin locations*

The above listed issues are addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 6.1, Strategy 6.1.1, Strategy 6.1.2, Strategy 6.1.3

### **Trapline Licence #2177**

- *Has two cabins.*
- *Wants to ensure cabins are protected.*
- *Consultation and information for review.*
- *Looking for improved access for trappers but does not want increased public access.*
- *Quad access only with crossings on creeks.*
- *Ensure A large buffer on lake.*

The above listed issues are addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 6.1, Strategy 6.1.1, Strategy 6.1.2, Strategy 6.1.3

### **Trapline Licence #2389**

- *Reviewed 20 year spatial harvest sequence in relation to Trapline Area*
- *Discussed notification*

The above listed issues are addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 6.1, Strategy 6.1.1, Strategy 6.1.2, Strategy 6.1.3

### **Trapline Licence #1445**

- *Reviewed 20 year spatial harvest sequence in relation to Trapline Area*
- *Discussed trapper notification*

The above listed issues are addressed in the Detailed Forest Management Plan through the following objectives or strategies identified in Section 3 of the Detailed Forest Management Plan: Objective 6.1, Strategy 6.1.1, Strategy 6.1.2, Strategy 6.1.3

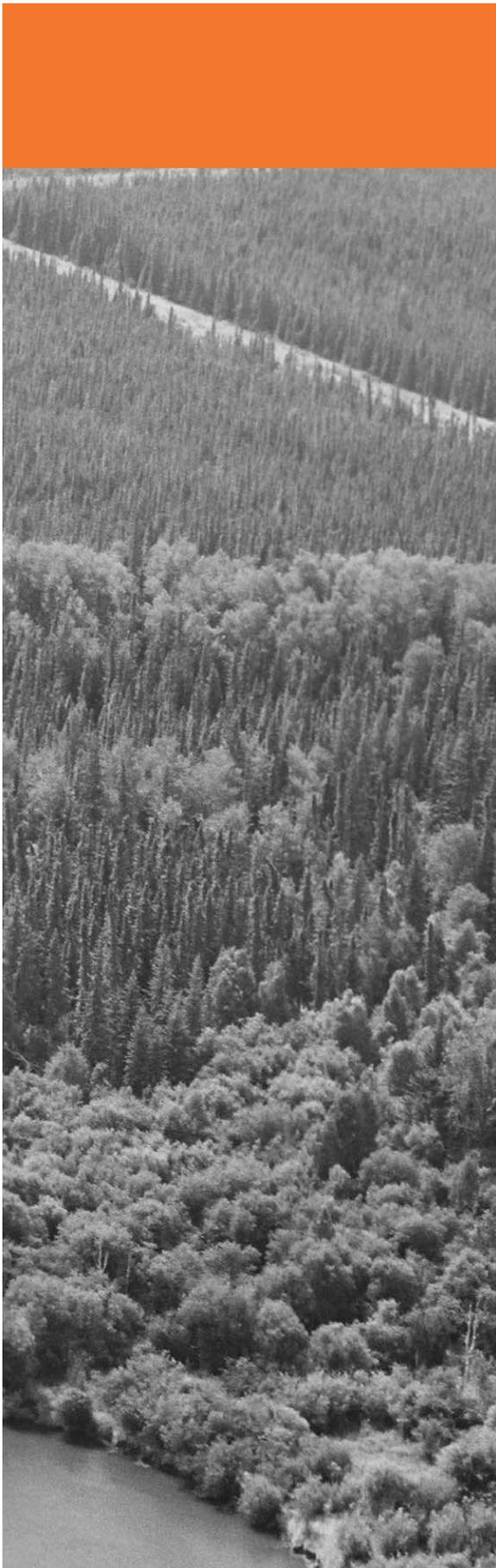


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**Appendix G**  
*Watershed Analysis Report*

DFMP



H.

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**Appendix H**  
*Under Separate Cover*

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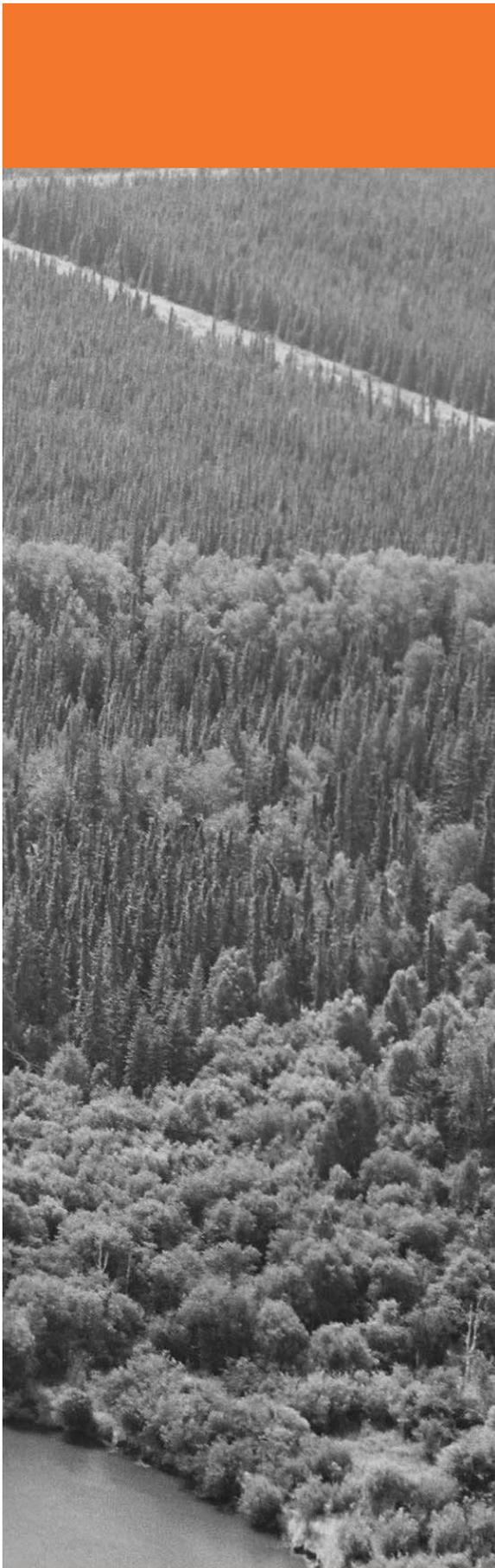


I.

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**Appendix I**  
*Under Separate Cover*

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**Appendix J**  
*Under Separate Cover*

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