Volume II

Strategic Direction for the Pasquia-Porcupine Forest Management Area 2015 to 2035

Twenty Year Forest Management Plan

February 1, 2016

Weyerhaeuser

EDGEWOOD FOREST PRODUCTS

Forest Management Plan Volume II
Strategic Direction
for the
Pasquia-Porcupine
Forest Management Area
2015 to 2035
Twenty Year Forest Management Plan

I hereby certify that I have prepared this FMP – Volume II using my best professional skill and judgement in accordance with the Forest Management Planning Document (2007 version):

Print version signed by John Daisley February 1, 2016
John Daisley, RPF
Planning Coordinator

Submitted by:

Print version signed by Mel Cadrain February 1, 2016
Mel Cadrain, RPF
Operations Manager
Weyerhaeuser Company Ltd.

Print version signed by Doug Braybrook February 1, 2016
Doug Braybrook, RPF
Regional Woodlands Manager
Edgewood Forest Products

I recommend that this Forest Management Plan document be approved for implementation and certify that it has been prepared in accordance with the requirements of the Forest Management Planning Document and relevant policies and obligations.

Certified and Recommended for Approval by:

_____ _____

Bob Wynes, RPF [date]
Executive Director
Forest Service Branch, Ministry of Environment

Approved by:

_____ _____

Hon. Herb Cox [date]
Minister of Environment

Planning Team Members

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List of Acronyms

AOH	Any other hardwood
AU	Analysis Unit
bF	Balsam fir
bP	Balsam poplar
bS	Black spruce
BSJ	Black spruce Jack pine
BSL	Black spruce Larch
BtK	*Bacillus thuringiensis kurstaki*
CBFA	Canadian Boreal Forest Agreement
CCFM	Canadian Council of Forest Ministers
CFS	Canadian Forest Service
COC	Chain of custody
ECCC	Equivalent to clear cut condition
FMA	Forest Management Area
FMA	Forest Management Agreement
FMAC	Forest Management Advisory Committee
FMP	Forest Management Plan
FMPD	Forest Management Planning Document
GIS	Geographic Information System
GPS	Geographic Positioning System
GS	Growing stock
H	Hardwood
Ha	Hectares
HPM	Hardwood pine mixedwood
HS	Hardwood dominated mixedwood
HSM	Hardwood spruce mixedwood
HVS	Harvest volume schedule
HWD	Hardwood
IFLUP	Integrated Forest Land Use Plan
IR	Indian Reserve
JLP	Jack pine Lodgepole pine
jP	Jack pine
LRSY	Long run sustained yield
MFLB	Managed Forest Land Base
m^3	Cubic metre
MHA	Minimum Harvest Age
MIT	Management Implementation Team
MU	Management Unit
NFP	Natural Forest Patterns
Non Prod	Non Productive
PAG	Public Advisory Group
PFLB	Productive Forest Land Base
PFT	Provincial Forest Types
PHSP	Pre Harvest Site Prescription
PMW	Pine dominated mixedwood
PP	Pasquia Porcupine
RAN	Representative Area Network
S	Softwood
SFI	Sustainable Forestry Initiative
SFVI	Saskatchewan Forest Vegetation Inventory
SH	Softwood dominated mixedwood
SMW	Spruce dominated mixedwood
SWD	Softwood
tA	Trembling aspen
TAB	Trembling aspen or birch dominated hardwood
tL	Tamarack
TSP	Temporary Sample Plot
UPRO	Understory Protection
VOIT	Values, Objectives, Indicator and Targets
VSA	Visually sensitive areas
wB	White birch
WFVI	Weyerhaeuser Forest Vegetation Inventory
wS	White spruce
WSF	White spruce or Balsam fir dominated softwood

Acknowledgements

The author would like to thank the many people who have contributed in some way to the production of this document. These include the members of the Pasquia Porcupine Forest Management Advisory Committee (FMAC) and the Forest Management Planning Team.

Two members of the FMAC passed away during the preparation of this document. The contributions of Edward Suwinski and Willard Antonichuk are remembered with gratitude.

A number of other individuals have also contributed to the development and/or review of portions of this Forest Management Plan. They include Tom Moore of Spatial Planning Systems, Chris Dallyn, Wildfire Management Branch; Murray Koob, Fish and Wildlife Branch; Tim Trottier, Fish and Wildlife Branch; the CBFA Saskatchewan Working Group of Gord Vaadeland, Chris Miller, Wendy Crosina, Chanda Hunnie and Dave West.

The Tactical Plan maps and tables, Forest Estate Modeling Assumptions and the Forest Estate Modeling Report have been prepared by FORSITE Consultants Ltd.

Photo Credits

I am grateful to those people and organizations listed below for the photos used in this document.

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Chanterelles	Weyerhaeuser staff
Vista	Edgewood staff
Watershed	Carrot River Valley Watershed Association
Lake	Weyerhaeuser staff
Woodland Caribou	Twyla Litton
Black Bear	Robert Daisley
Great Blue Heron	Ron Waugh
Archeological sites	Stantec Consultants
Sweat lodge frame	Evan Andrews
Stretched hide	Evan Andrews
Outfitter Camp	Weyerhaeuser staff
Trapping	Saskatchewan Ministry of Environment
Fishing	Town of Hudson Bay website
Hunting and recreation cabin	Weyerhaeuser staff
Gravel pit	Weyerhaeuser staff
E. B. Campbell Dam	Weyerhaeuser staff

Forest Service plantation	Forest Service, Saskatchewan Ministry of Environment
Rare plants	Weyerhaeuser staff
Snowmobile trails	Rick Dolezsar
Forest fire	Weyerhaeuser staff
Eastern spruce budworm larvae	Natural Resources Canada
Spruce budworm damage	Weyerhaeuser staff
Jack pine budworm larvae	Thérèse Arcand, Natural Resources Canada
Defoliated pine tree	Natural Resources Canada
Forest tent caterpillar	Natural Resources Canada
Defoliated forest	Natural Resources Canada
Large Aspen Tortrix	Thérèse Arcand, Natural Resources Canada
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White pine terminal weevil damage	Natural Resources Canada
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CZ1 Woodland caribou	Dion Morton
Greater Egret	Jennifer Cross
Moose	Saskatchewan Ministry of Environment
Fisher	US Fish and Wildlife Service
Monarch butterfly	http://en.wikipedia.org/wiki/File:Monarch_In_May.jpg
Canada warbler	http://www.allaboutbirds.org/guide/Canada_Warbler/id

Camp site
https://sites.google.com/site/porcupinehillsparks/parr-hill-lake
Petroleum exploration
http://www.google.ca/url?sa=i&rct=j&q=&esrc=s&frm=1&source=images&cd=&cad=rja&uact=8&ved=0CAcQjRw&url=http://tommyhumphreys.com
Hay meadow
http://www.google.ca/url?sa=i&rct=j&q=&esrc=s&frm=1&source=images&cd=&cad=rja&uact=8&ved=0CAcQjRw&url=http://tommyhumphreys.com
Cattle grazing
http://www.google.ca/url?sa=i&rct=j&q=&esrc=s&frm=1&source=images&cd=&cad=rja&uact=8&ved=0CAcQjRw&url=http://www.rgbstock.com

Executive Summary

This Twenty Year Forest Management Plan has been prepared in accordance with the requirements of the Forest Resources Management Act and Regulations and the Province Of Saskatchewan's Forest Management Planning Document (2007) and the Amended and Restated Pasquia Porcupine Forest Management Agreement (2013) with reference to the Pasquia Porcupine Integrated Land Use Plan (1998).

This Forest Management Plan will provide strategic level direction for the management of the FMA for the next twenty years. The Forest Resources Management Act Section 38 (3) stipulates submission of a revised Forest Management Plan every ten years.

The following preliminary documents were also prepared by the Licensees and approved by the Forest Service as per the Forest Management Planning Document which guides the forest management planning process in Saskatchewan:

- Planning Team Terms of Reference (Appendix B)
- Twenty Year FMP Work Plan (Appendix C)
- Public Consultation Plan (Appendix D)

The planning process is detailed in this document demonstrating the hierarchical linkage between the Integrated Forest Land Use Plan, the Forest Management Plan, the Tactical Plan, and Event and Operating Plans.

This Forest Management Plan was developed using the guiding principles of ecosystem based management; sustainable forest management; consultation with public, stakeholders and aboriginal people; social and economic sustainability; adaptive management and continual improvement.

The FMA land base was determined to be 2,018,073 hectares in extent, of which 869,605 hectares were available to be used for forest management. The land base has been divided into five ecological management units for the purposes of setting and tracking targets and goals at the FMP level. The land base has also been divided into seventeen Operating Units for operational purposes.

Extensive public consultation has taken place during the development of this FMP including three rounds of public meetings which are documented in the Report on Public Consultations Meetings in Appendix E.

A series of thirty one Values, Objectives, Indicators and Targets (VOITs) have been developed to assist in monitoring adherence to commitments and assumptions made in the FMP. Upon approval of the FMP, a Management Implementation Team will be formed to assess compliance with these VOITs and the FMP registry and to institute change as required.

The Forest Estate Modeling exercise explored three different scenarios and ran a sensitivity analysis on six different variables before arriving at a selected management strategy.

The selected strategy determined that the current softwood HVS of 450,000 cubic metres (m^3) can be maintained for ten years before dropping to 405,000 m^3 for the next ten years. The hardwood HVS of 840,000 m^3 can be maintained for the twenty year term of the FMP.

The Tactical Plan that was developed as an output of the modeling exercise will be used as a general development plan to show where harvest will take place over the next twenty years and in what quantities. The Tactical Plan will serve as a communication tool for use with the Forest Management Advisory Committee and at individual and public meetings with stakeholders.

Section 8 of this document details the strategies that will be used to integrate forest management activities with the wide variety of non-timber activities that take place on the FMA. The Licensees commit to continuing support for the Forest Management Advisory Committee and are grateful to the members of that committee for their continued participation in the consultation process.

Management approaches to wildfire management are discussed in section 9 and strategies to deal with forest insects and disease are laid out in section 10. Conserving and maintaining an adequate supply of natural habitat is addressed in three specific ways; habitat on the non-commercial land base, on the working land base and through emulating natural disturbances. In consultation with the Ministry of Environment, three indicator species of wildlife were chosen for inclusion in the Forest Estate Modeling process. The three species chosen are moose, fisher and woodland caribou. During the term of the FMP, the amount of habitat available for these species will be tracked and reported on at five year intervals.

Woodland caribou have been declared to be a threatened species under the Federal Species at Rick Act. A caribou conservation plan has been developed for the Pasquia Porcupine FMA in collaboration with the Saskatchewan Working Group of the Canadian Boreal Forest Agreement.

This plan conforms to the guidance provided by the Government of Saskatchewan for the development of Forest Management Plans except with regard to the methodology used to calculate disturbance levels for woodland caribou habitat. This Forest Management Plan proposes that a risk rating system be used to determine the calculated level of disturbance within caribou range.

Weyerhaeuser and Edgewood will work cooperatively to implement this Forest Management Plan and follow the strategic direction contained herein. The FMA has been partitioned by the two companies for administrative purposes but each company retains the responsibility to exercise their rights and to fulfill their obligations throughout the FMA.

A number of forest management challenges have been identified as follows:

- Assessment of the effectiveness of the woodland caribou strategy;
- Implementing the Natural Forest Patterns standard;
- Engagement of First Nations and Métis people on forest management issues;
- Balancing the harvest to match mill requirements; and
- Climate change.

Each of these challenges has been linked to an indicator in section 5 of this document and will be monitored on a regular basis.

The annual and periodic monitoring will be reported on through an Annual Report to the Public. The Licensees also have internal mechanisms contributing to performance monitoring which include Environmental Management Systems, forest certification requirements, silvicultural effectiveness monitoring and Geographic Information Systems for data collection and analysis.

This Forest Management Plan has been created using the best information that is currently available. It is however acknowledged that our knowledge and ability to predict changes to forest ecosystems, natural disturbances, social demands and market events is imperfect due to their inherent variability.

It is not anticipated that an amendment to the FMP will be required unless there is a catastrophic event which affects the ability of the Licensees to effectively implement the Tactical Plan.

The FMP Standard considers variances from the Tactical Plan of up to 15% to be within an acceptable range of variance and best dealt with through the Operating Plan process. Should an amendment to the FMP become necessary, a joint planning team (Ministry and Licensees)

will be assembled and a work plan prepared. The Pasquia Porcupine FMP Amendment Log will be updated with summary information pertaining to the proposed amendment and public consultation will take place.

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1.0 Planning Process

The general requirements for development and revision of a Forest Management Plan (FMP) are identified by Section 38 of the *Forest Resources Management Act (1999)* and Sections 26 - 28 of the *Forest Resource Management Regulations*. Specific detailed requirements for development of an FMP are contained within the Forest Management Planning Document (August, 2007) published by the Ministry of Environment.

The Forest Management Planning Document sets standards and guidelines for the development of an FMP and lists specific deliverables that must be submitted for review and approval by the Ministry of Environment.

During the time frame within which this FMP was developed, a new version of the Forest Management Planning Document was being created by the Forest Service. The Planning Team cooperatively agreed to take a hybrid approach by incorporating important elements of the 2015 draft planning standard and by removing some of the redundant requirements of the old standard. An example of a new requirement is the Natural Forest Patterns Standard which is a key part of this FMP.

1.1 Planning Hierarchy

1.1.1 Integrated Forest Land Use Plan

The Pasquia Porcupine Integrated Forest Land Use Plan (IFLUP), approved by Cabinet in 1998 provides a strategic framework for decision-making regarding land and resource use for the FMA. The Public Advisory Group that assisted in the development of the IFLUP has evolved into a Forest Management Advisory Committee (FMAC) that meets four times a year to receive updates on what is happening on the FMA and to provide management advice to the government and the Licensees.

1.1.2 Forest Management Plan

The FMP takes into account the recommendations and management strategies outlined in the IFLUP. The FMP process will take into consideration any special zones and important values identified in the IFLUP when setting the values, objectives, indicators and targets (VOITs) of the FMP.

1.1.3 Tactical Plan

A Tactical Plan is a key deliverable produced during the development of the FMP. The Tactical

Plan produces a spatial harvest sequence depicting where a licensee plans to locate their harvest events and major road corridors for the next 20 years.

1.1.4 Operating Plans

Once an FMP is approved, the Tactical Plan will be implemented through the annual submission and approval of five year operating plans which will contain event plans. The rules regarding exactly how event plans will be incorporated into the planning and approval process are still in the developmental stage.

Recommendations and management strategies identified in the IFLUP and established in the FMP will be reflected in the submission of both event plans and operating plans. The Licensees and Forest Service monitor the FMP progress through operating plans and annual reports.

1.1.5 Pre-Harvest Site Prescriptions

The Licensees prepare pre-harvest site prescriptions (PHSPs) for each block planned for harvest during the operating year. The PHSP provides site specific information which will guide forest harvesting and reforestation operations. The information provided in the PHSP serves to ensure that the inherent productivity of a harvested forest site is maintained; that a forest stand is regenerated on the post-harvest site; all forest resources are considered and that the overall objectives of the FMP and the assumptions of the timber supply analysis are met.

1.1.6 Guiding Principles

The Planning Team has developed the Forest Management Plan for the Pasquia Porcupine FMA using the guiding principles laid out in the Forest Management Planning Document. These principles are summarized below.

<u>Principle 1 - Ecosystem Based Management</u>

In ecosystem based management, the focus is on whole systems rather than on individual resources or species. The prime management objective is to maintain ecosystem integrity and health. Management decisions are based on science, traditional knowledge and human values with long term sustainability of the forest as a fundamental value. Since humans are an important component of the forest ecosystem, societal benefits need to be considered and maintained. The most effective strategy for maintaining forest health and long term sustainability is to emulate natural forest patterns using sound ecological theories and models.

<u>Principle 2 – Sustainable Forest Management</u>

Forest management planning considers all forest resource values and selects a set of values, objectives, indicators and targets (VOITs) which will be assessed over the term of the forest management plan. Practicing sustainable forest management to conserve large, healthy,

diverse and productive forest on the FMA will sustain social, economic and ecological values for future generations.

Principle 3 – Consultation/Collaboration with Public, Stakeholders and Aboriginal People

For consultation and collaboration to be successful, governments, individuals, groups and agencies must work together to identify problems, opportunities and solutions. There are many benefits derived from an effective public involvement process. Input from all interested parties before decisions are taken allows for consideration to be given to the whole resource during the planning process. The consultation process is maintained through ongoing involvement in the planning process, by keeping participants informed and by reporting on decisions and the reasons for those decisions.

Principle 4 – Social and Economic Sustainability

Forests provide substantial commercial benefits including timber, non-timber forest products, tourism and outfitting. There are also non-commercial benefits such as wildlife habitat, recreation opportunities, aesthetics, traditional land use and wilderness values. The distribution of these benefits is a key aspect of both social equity and sustainable forest management. Social and economic sustainability values that are directly affected by forest management are best tracked through the establishment of VOITs that can be assessed as the FMP is implemented.

Principle 5 – Adaptive Management and Continual Improvement

Adaptive management is a systematic process for continually improving management policies and practices by learning from the outcomes of operational programs.

Scientific knowledge of forest ecosystems will continue to expand and will modify our understanding of ecosystem dynamics and how they are influenced by human activity. Monitoring processes, including VOITs, will assist us in learning from past experience, evaluating the effects of forest management on the long term health of the forest ecosystems and assessing progress towards FMP objectives.

New understanding in the field of sustainable forest management will be incorporated into a revised FMP as part of the adaptive management and continual improvement cycle. The Forest Resources Management Act Section 38 (3) stipulates submission of a revised Forest Management Plan every ten years.

Forest management planning is a dynamic process and will incorporate new knowledge gained at the local, provincial and national scales. Linkages between the FMP, Tactical Plan and operating plans will be built and maintained to ensure FMP objectives are carried consistently through implementation of the FMP.

1.2 Volume I of the Forest Management Plan

In 2008, a Planning Team was formed consisting of representatives from Weyerhaeuser as the licensee and Saskatchewan Environment as the regulator. This team spent eighteen months producing Volume I of the FMP. Volume I is the background information which brings together a variety of information and background materials. These materials include related plans and reports, inventory documentation and a community, social and economic assessment of the area. This provides the critical background information for the sustainability assessment of the planning area.

In mid-2009, the Carrot River Sawmill and Hudson Bay Plywood Mill were sold to Edgewood Forest Products. Edgewood and Weyerhaeuser became joint Licensees (Licensees). Edgewood requested a suspension of the FMP process until the new company had time to get established in the province and determine future mill configuration and wood requirements. The Ministry of Environment granted an extension to March 31, 2015.

The Planning Team continued to work on Volume I until it was complete. Volume I of the Forest Management Plan was approved on October 20, 2009.

1.3 Volume II of the Forest Management Plan

In February 2013, Weyerhaeuser/Edgewood and the Ministry of Environment, Forest Service Branch jointly established a planning team to oversee and coordinate development of Volume II of the Forest Management Plan. The planning team was made up of a number of key advisors, Weyerhaeuser/Edgewood staff and Forest Service staff who met monthly to ensure that development of the FMP proceeded efficiently. Additionally, other Ministry of Environment and Weyerhaeuser/Edgewood staffers were designated to act in an advisory capacity to the planning team on specific technical issues.

Mr. Mo Alain has participated in the Planning Team representing the membership of the FMAC. In addition to the FMAC participation on the planning team, the environmental community was represented by Mr. Gord Vaadeland, the Executive Director of the Saskatchewan chapter of the Canadian Parks and Wilderness Society. Ms. Helene Johnson, Area Director for Métis Nation of Saskatchewan Eastern Region II, has participated in the Planning Team. Mr. Bill Cook has participated on the Planning Team as the representative of the Cumberland House Development Corporation which is composed of Cumberland House Cree Nation and the Northern Village of Cumberland House. Kinistin First Nation has been represented first by Mr. David Scott and later by Mr. Greg Scott.

The first tasks of the planning team were to create Planning Team Terms of Reference, Work Plan and Public Consultation Plan. These documents were prepared in accordance with the Forest Management Planning Document and were approved on June 27, 2013. The timeline for the FMP development is found in Table 1.2.

1.4 Planning Team Terms of Reference

The Terms of Reference reviewed the original 1999-2009 term of the current FMP and the circumstances leading to the extension to March 31, 2015. Government agencies invited to participate in the planning process were identified as were the planning team members. Mr. Pat Mackasey was identified as primary government contact (Mr. Mackasey was succeeded by Mr. Mark Doyle in 2015) and Mr. John Daisley was designated the Plan Author. A schedule of proposed meeting dates was prepared and the planning team roles and responsibilities were defined. It was agreed that approvals for the various deliverables would take place in stages as they were completed. Ministry employees responsible for approvals were identified as was a dispute resolution process.

1.5 Work Plan

The Work Plan provided a detailed list of all deliverables and the sub-tasks related to development of those deliverables, along with target timelines for starting work on each component. Target dates for completion of each component, and submission to Forest Service Branch for review when required were also provided. Target dates for Forest Service Branch to complete their review of each major FMP deliverable were also proposed.

The FMP Work Plan outlined how Weyerhaeuser/Edgewood and the Planning Team would produce the deliverables related to the production of the FMP. Once approved, the Planning Team Terms of Reference and the Work Plan became the formal starting point for development of the FMP.

Public review requirements of the Forest Management Planning process were incorporated into the Work Plan.

1.6 Public Consultation Plan

The Public Consultation Plan focused on communities and stakeholders associated with the FMA and others having an interest in the land, resources and/or forest management activities within the license area.

1.6.1 Pasquia Porcupine Forest Management Advisory Committee

The most structured public consultation forum used in developing the FMP was the Public Advisory Group (PAG). The Pasquia-Porcupine Forest Management Advisory Committee (PP FMAC) agreed to act as the PAG specified in the Saskatchewan Ministry of Environment's Forest Management Planning Document.

The PP FMAC was originally formed in 1996 by Saskatchewan Environment and Resource Management (now Ministry of Environment) as the Land Use Planning group for the negotiation of the first FMP for the Pasquia Porcupine FMA, and to provide input into the development of the Pasquia-Porcupine Integrated Forest Land Use Plan.

In 1999, the committee transformed from a Land Use Planning group to a Forest Management Advisory Committee. The PP FMAC is chaired by Ministry of Environment, Lands Branch, and provides advice to both the forest industry and the Ministry of Environment on a wide variety of topics related to forest management and other resource and land-use issues in and around the FMA. The PP FMAC membership has representatives from a broad range of stakeholder groups as shown in Table 1.1.

Table 1.1 FMAC Membership

East-Central Tourism Region	Ruby Lake Cabin Owners Association
H25 Trappers	Rural Municipality of Arborfield
James Smith Cree Nation	Rural Municipality of Hudson Bay and Town of Hudson Bay
Key, Cote, Keeseekoose First Nations	Rural Municipality of Moose Range and Town of Carrot River
Kinistin First Nation	Saskatchewan Independent Forest Operators
Yellow Quill First Nation	Saskatchewan Outfitter's Association
Nature Saskatchewan	Saskatchewan Trapper's Association
Northern Village of Cumberland House	Saskatchewan Wildlife Federation
Opaskwayak Cree Nation	Saskatchewan Eco-Network
Prince Albert Grand Council	United Steelworkers Local 1-184

In addition to the previously listed official members, a number of groups/agencies are considered corresponding members of the FMAC and are provided with meeting minutes and copies of proposed agendas for upcoming meetings. These corresponding members include:

- Cumberland House Cree Nation

- Fishing Lakes First Nation
- Manitoba/Saskatchewan Prospectors & Developers Association
- Porcupine Grazers Association
- Red Earth/Shoal Lake First Nation

A member of the FMAC, Mr. Mo Alain, has actively participated in the renewal of the FMP as a member of the Planning Team. The PP FMAC has met four times each year during the renewal of the FMP and has been kept apprised of developments. Members had the opportunity to provide input into the process.

1.6.2 Forest Fringe Community Meetings

Public meetings were the primary forum for public consultation during the development of the FMP. Forest fringe communities where public meetings were held are Endeavour, Carrot River, Hudson Bay, Porcupine Plain and Tisdale.

Letters of invitation to participate were mailed to all known stakeholders for each of three rounds of consultation. There were over 700 letters mailed in each round. Extensive advertising was also done for these public meetings.

In October 2008, the licensee introduced the FMP renewal process to the public at a series of meetings/open houses held in the five communities mentioned above as well as Cumberland House. A draft version of Volume I was also presented at these meetings.

In October of each subsequent year during the development of the FMP, updates on the process were presented in these communities at the annual Operating Plan review meetings. The initial results of the Forest Estate Modeling were presented to these communities in June 2014.

In June 2015, draft Volume II of the Forest Management Plan was presented to the public at a third series of public meetings.

1.6.3 First Nation and Métis Consultation

Saskatchewan Ministry of Environment, Forest Service sent a letter dated March 17, 2008 to 17 First Nations and 11 Métis Locals indicating that the Saskatchewan Government would like to consult on how the renewal of the FMP could affect Treaty or Aboriginal rights, such as the right to trap, or hunt and fish for food.

With the restart of the FMP process, the Forest Service sent out letters dated May 29, 2013 to First Nations and June 3, 2013 to Métis communities renewing the invitation to participate in the consultation process.

In June 2014 when the draft forest estate modeling results were available and in June of 2015 when Volume II of the plan was complete, the provincial government again sent invitations to consult to all First Nations and Métis communities with known or potential interest in the Pasquia Porcupine FMA area.

1.6.4 Local Government Engagement

During the renewal period, Weyerhaeuser/Edgewood met with representatives of the Towns of Carrot River and Hudson Bay and with representatives from the Rural Municipalities of Hudson Bay and Moose Range to keep them apprised of progress in the renewal of the FMP. Feedback from these meetings was positive with all of the municipalities pleased to see industry working again and hopeful for new job creation.

1.7 Twenty Year FMP Online

Information on the FMP planning process has been available online throughout the planning process. In June 2015, the Weyerhaeuser site was taken down as a result of changes to corporate IT policy. Information on the FMP can now be found at **http://www.environment.gov.sk.ca/ea2014-019**.

Table 1.2 Timeline for the Development of the 2015 Forest Management Plan

Submission Timeline	Forest Service Approvals
Planning Team Terms of Reference June 2008	June 2008
Public Consultation Plan June 2008	June 2008
Work Plan June 2008	June 2008
Draft Vol. 1 - Background Information October 2008	
Public Consultation Meetings #1 November 2008	
Deferral of the FMP process	June 2009
FMP Volume 1 September 2009	October 2009
Assignment of the FMA to Edgewood/Weyerhaeuser	
Annual update on FMP progress @ public meetings	
Scoping meeting to restart the FMP process May 2013	
Amended Public Consultation Plan June 2013	July 2013
Amended Terms of Reference June 2013	July 2013
Amended Work Plan June 2013	July 2013
Forest Development Report November 2013	March 2014

Submission Timeline	Forest Service Approvals
Introduction of Draft NFP Standards November 2013	
Planning Inventory February 2014	May 2014
Public Consultation meetings #2 June 2014	
Resubmission of Planning Inventory July 2014	December 2014
Suspension of FMP process due to NFP development July 2014	
NFP Standard complete - restart of FMP process November 2014	
Submission of Wildfire Management Section January 2015	January 2015
Submission of Insect and Disease Section January 2015	March 2015
Submission of the Public Consultation Report for Vol. II February 2015	March 2015
Submission of section on Integration of Forest Management Activities with Non-timber Uses February 2015	March 2015
Submission of section on Endangered Species February 2015	April 2015
Submission of the Highlights of Forest Estate Modeling March 2015	April 2015
Submission of Monitoring Programs May 2015	June 2015

Submission Timeline	Forest Service Approvals
Strategy for Plan Implementation May 2015	June 2015
Public Consultation Meetings #3 June 2015	
Tactical Plan Shape File and Description September 2015	November 2015
FMP Amendment Log September 2015	November 2015
Environmental Registry/Obligations Table September 2015	November 2015
Summary report on Public Review of Volume II September 2015	November 2015
Final version of Volume II February 1, 2016	March 11, 2016
Ministerial Approval	April 1, 2016

2.0 Forest Characterization

2.1 Forest Inventory

The forest inventory for the PP FMA (WFVI; 1:15,000) used in this Forest Management Plan was completed by Weyerhaeuser during the period of 2001 to 2007. Aerial photography acquisition was completed in 2005, photo-interpretation in 2006, and temporary sample plot (TSP) data collection in 2007. WFVI data was converted to the new Saskatchewan Forest Vegetation Inventory (SFVI) format (Saskatchewan 2004) and submitted to Saskatchewan Environment in 2007.

The inventory has been updated in this project to reflect changes (harvesting, fires, etc) since its creation and to address several other issues found in the inventory (e.g., changes in Representative Area Network (RAN) boundaries). Details of this process can be found in Appendix F, the Forest Estate Modeling Assumptions.

The starting point of the forest estate model will be year one of the FMP period (2015) so the inventory was prepared to reflect activity to this point in time.

In preparing the inventory for the forest estate modeling process, four key land base definitions are made:

- **Total FMA Area**: the gross area within the legal FMA boundaries.
- **Productive Forest Land Base (PFLB)**: the subset of the total area that is crown forested land. It is defined by removing all Permanent Exclusions from the gross FMA area.
- **Managed Forest Land Base (MFLB)**: the subset of the PFLB that is allowed to contribute toward meeting both timber and non-timber values. It consists of all Partial Exclusion areas and the Net Area as defined in the Forest Management Planning Document Appendix 6, section 13.2.4.
- **Net Area:** the subset of the MFLB where harvesting has occurred or could occur in the future. The Net Area excludes areas that are inoperable, uneconomic, or are otherwise off-limits to timber harvesting.

Table 2.1 Net Land Base Area Net-down Summary

Land Base Element	Total Area (ha)	Effective* Net Area (ha)	% Total Area	% MFLB
Total Area (PP FMA)	2,018,073		100%	
Less:				
Non FMA Lands (First Nations Reserves, Patent Lands, aggregate leases, etc)	25,139	25,139	1.2%	
Non Forest / Non Productive for timber (wetlands, lakes, meadows, roads, etc.)	930,943	906,253	44.9%	
Productive Forest Land Base (PFLB)		**1,086,681**	**53.8%**	
Less:				
Permanent Exclusions (specific RANs/Parks, Reserves)	53,405	233	0.0%	
Managed Forest Land Base (MFLB)		**1,086,448**	**53.8%**	**100.0%**
Less:				
Partial Exclusions (specific RANs/Provincial Parks, Protected Areas)	162,027	58,537	2.9%	5.4%
Dispositions (Buffered cabin sites, etc)	4,404	1,965	0.1%	0.2%
Non Merchantable/Non-Commercial Stands	138,346	120,490	6.0%	11.1%
Steep Slopes/Gullies	12,978	9,908	0.5%	0.9%
Riparian (lakes, rivers, streams)	79,300	23,885	1.2%	2.2%
Isolated Areas (Uneconomic)	2,198	2,058	0.1%	0.2%
Spatial Net Area		**869,605**	**43.1%**	**80.0%**
Less spatial net downs:				
Stand Level Retention (in-block – 9% net)		78,264	3.9%	7.2%
Effective Net Area		**791,341**	**39.2%**	**72.8%**
Less Future Non-Spatial net downs:				
Future permanent roads (0.62% x 335,864 ha**)		2,086	0.1%	0.2%
Effective Future Net Area		**789,255**	**39.1%**	**72.6%**

*Effective Net Area represents the area that was removed as a result of a given factor. Removals are applied in the order shown above; thus, areas removed lower on the list do not contain areas that overlap with factors that occur higher on the list. For example, Riparian does not include Steep slopes.

**represents non-roaded area in the FMA; 0.62% is the yield reduction calculated for future permanent roads.

2.2 Ecological Management Units

The FMA is entirely within the Boreal Plain Ecozone and includes portions of the Mid-Boreal Upland, Mid-Boreal Lowland and Boreal Transition Ecoregions. Each Ecoregion is further subdivided into Landscape Areas.

For the purposes of setting and tracking targets and goals at the Forest Management Plan level, the FMA has been divided into five static, non-overlapping Ecological Management Units for the term of the FMP.

The Ecological Management Units (EMU) are composed of Landscape Areas or groups of Landscape Areas as defined in Ecoregions of Saskatchewan (*Padbury and Acton, 1994*).

The main criteria used in grouping Landscape Areas were adjacency and geographic similarity. Lowlands were grouped with lowlands and uplands grouped with uplands. The size range of the EMUs was determined through discussions between the Licensees and the Forest Service. Figure 2.1 identifies the MUs and the area associated with each.

Management Unit #1 is characterized by a mix of lowlands and plains in the northeast corner of the FMA. The Landscape Areas included are the Mossy River Plain, the Red Earth Plain and the Tobin Lake Lowland. This unit is 335,142 ha in size.

Management Unit #2 is completely within the Mid-boreal Lowland Eco-region and is composed of two Landscape Areas, the Namew Lake Uplands and the Saskatchewan Delta. This unit is 428,740 ha in size.

Management Unit #3 encompasses the Pasquia Hills and the sloping terrain surrounding them. The Landscape Areas are the Mistatim Uplands, the Pasquia Escarpment and the Pasquia Plateau. This unit is 407,528 ha in size.

Management Unit #4 is composed of two low lying Landscape Areas to the south and east of the Pasquia Hills. These are the Hudson Bay Plain and the Overflowing River Lowland. This unit is 369,280 ha in size.

Management Unit #5 is the largest unit on the FMA but is made up of just one Landscape Area; the Porcupine Hills. This unit is 477, 374 ha in size.

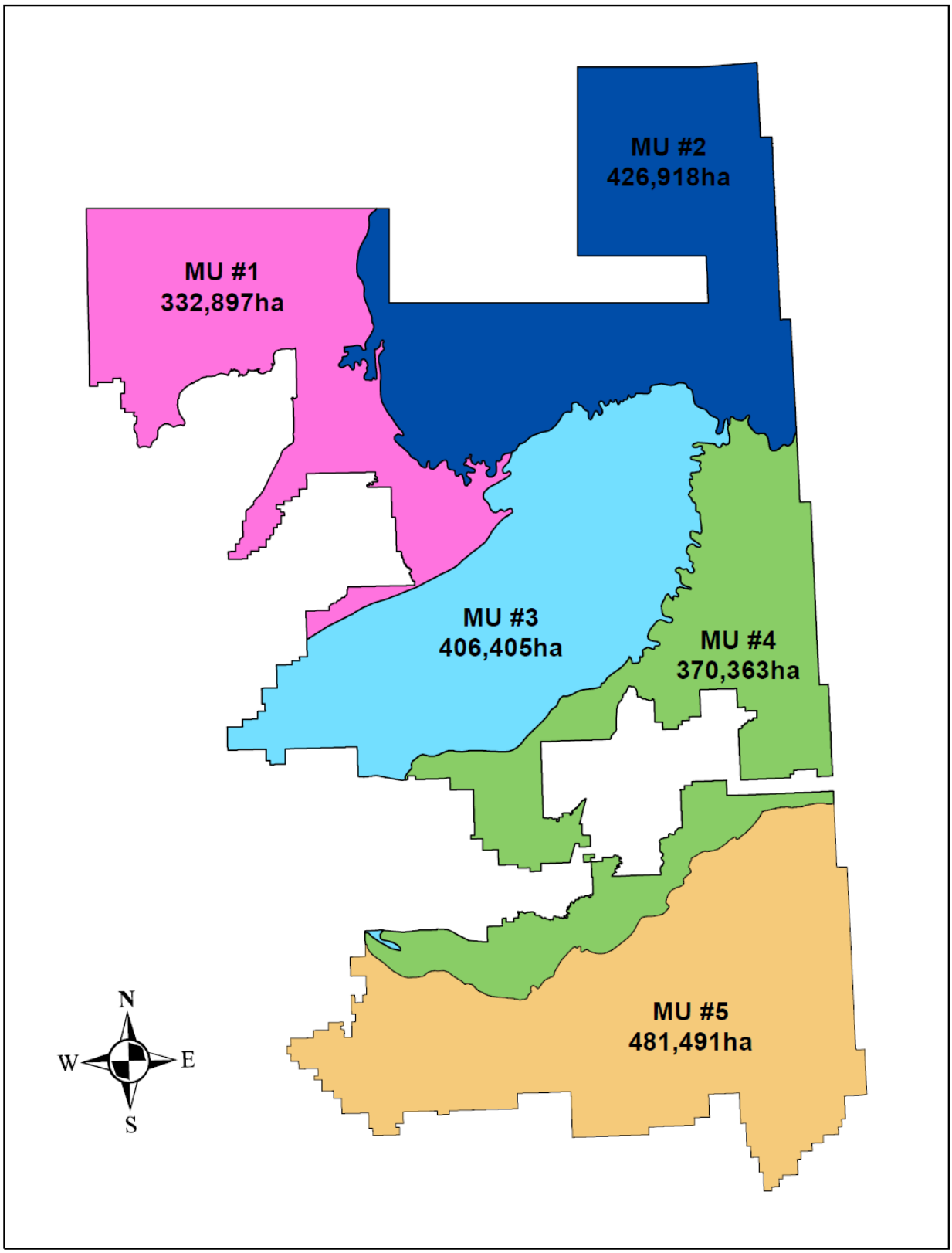

Figure 2.1 Ecological Management Units for Assessing FMP level targets

2.3 Operating Units

Beginning with the 1999 Twenty Year Forest Management Plan, the FMA was divided into "Operating Units" to accommodate systematic planning and record keeping. Figure 2.2 shows the FMA boundaries and the broad, geographic breakdown by 17 main Operating Units. Each Operating Unit is subdivided further into several numbered "Compartments" on the basis of watersheds, topography, and common main access routes. Table 2.2 identifies the Operating Units, compartments and the gross area associated with each Operating Unit. Figure 2.2 shows the boundaries of each of the Operating Units and the compartments within those Operating Units.

Table 2.2 Operating Units and Compartments

Operating Unit												Hectares
Compartment	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**Total**
Bertwell	11,915	8,784	21,646	27,914								70,260
Big Valley	10,877	7,126	3,348	4,669	9,874	12,004	5,801	12,082	7,938	7,426	8,823	89,969
Blue Jay	16,080	12,590										28,670
Ceba	15,543	7,229	15,711	27,789	41,545							107,817
Cracking River	33,693	23,769	17,656	15,764								90,883
Cumberland	53,724	27,497	22,216	54,000	7,413							164,850
Greenbush	13,836	16,728	15,799	9,375	13,746	3,564	22,828	5,219				101,095
Kelsey Trail	35,797	18,508	24,792	6,819								85,915
Mistatim	15,518	18,273	17,475	8,857	29,114							89,238
Otosquen	31,054	72,511	77,274	41,490	26,545	775						249,649
Pasquia Hills	15,414	8,575	16,169	30,790								70,948
Piwei	6,966	4,830	7,504	2,877	4,461	10,247	6,148	5,165	322			48,520
Sipanok	38,011	37,968	112,867	34,929								223,775
Smoking Tent	27,673	42,128	47,906	19,492	30,953							168,153
Tall Pines	12,399	11,713	15,482	7,630	24,949	10,675	7,889					90,736
Tennant	47,737	18,053	11,338	25,708	17,121							119,958
Torch	80,332	77,895	41,212	18,960								218,399
Total	**466,569**	**414,178**	**468,394**	**337,064**	**205,721**	**37,265**	**42,667**	**22,465**	**8,261**	**7,426**	**8,823**	**2,018,833**

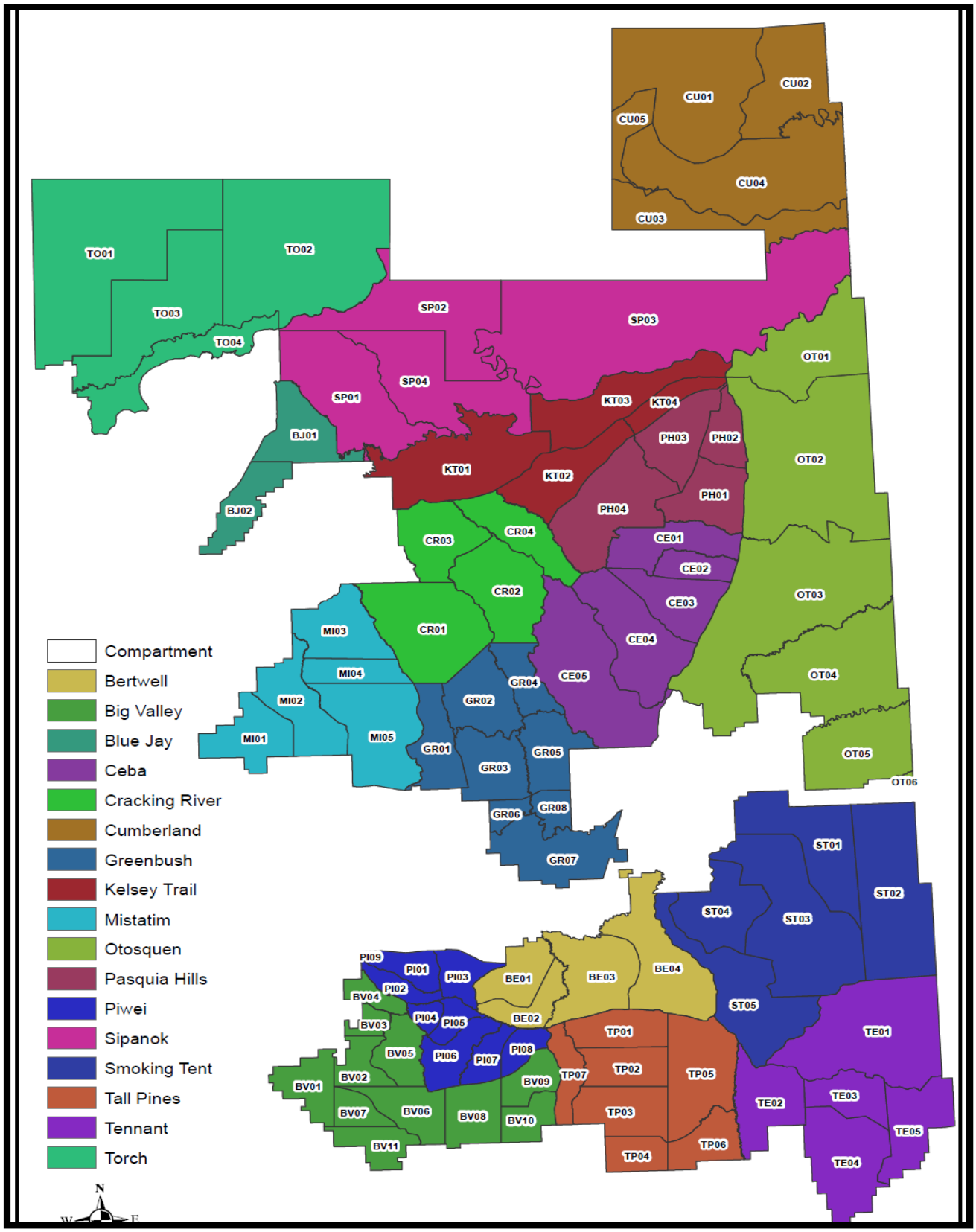

Figure 2.2 Operating Units and Compartments within the PP FMA

3.0 Forest Development Report

3.1 Yield Curve Design

The natural stand yield curves used in modelling for this Forest Management Plan were developed in 2008 by Timberline Natural Resources Group. Timberline was contracted by Saskatchewan Ministry of Environment in collaboration with Weyerhaeuser.

Yield curves were developed for twelve groups with yield group stratification based on development type. Stratification routines were designed to conform as much as possible to the requirements of Saskatchewan's Forest Management Planning Document. The Saskatchewan Forest Vegetation Inventory (SFVI) polygon was considered the base unit for analysis.

It should be noted that "A" density stands were excluded from the volume calculation when creating the yield curves in order to avoid overestimating the Harvest Volume Schedule. "A" density stands are those with between 6% and 25% crown closure as interpreted from aerial photography. The reasons that these low density stands exist on the landbase are varied and run the gamut from low productivity growing sites to natural and anthropogenic disturbances. Due to the limited amount of sampling done on these sites, the data was thought to be too variable for inclusion in the production of growth and yield curves. "A" density stands still contribute to the net area of the land base and may be harvested should the licensee choose to do so.

To reduce the complexity and volume of information in the timber supply analysis, individual stands are aggregated into yield groups based on forest management zone, stand composition, site index, and crown closure. Each yield group has an associated yield table that provides the net merchantable volume available for harvest at various stand ages.

Detailed information on the development of the yield curves can be found in publication "Yield Curve Development for the Pasquia Porcupine Timber Supply Area" Natural Stand Yield Curves, Timberline Natural Resource Group (2008) Gelhorn, Lane.

Table 3.1 demonstrates the makeup of the spatial net area used in the modeling process as described using the Provincial Forest Types (PFT).

Table 3.1 Provincial Forest Types by Description and Area

Provincial Forest Type	Broad Description of Provincial Forest Type	Total area (ha)	Net Area (ha)
AOH	Any other hardwood dominated hardwood stand except TAB	86,753	54,993
BSJ	Black spruce and Jack pine dominated mixed softwood stands	25,083	21,676
BSL	Black spruce or tamarack/larch dominated softwood stands	265,409	158,974
HPM	Hardwood with pine mixedwood	7,200	7,017
HSM	Hardwood with spruce (black spruce, white spruce, balsam fir, and tamarack/larch) mixedwood	105,859	87,858
JLP	Jack pine or lodge pole pine dominated softwood stands	34,587	32,256
PMW	Pine dominated mixedwood stands	7,853	7,115
SMW	Spruce dominated mixedwood stands	73,505	61,927
TAB	Trembling aspen or white birch dominated hardwood stands	427,091	392,626
WSF	White spruce or balsam fir dominated softwood stands	53,791	45,162
Non Forested		930,943	0
Total		**2,018,073**	**869,605**

3.1.1 Development Types

Table 3.2 shows the linkages between the yield groups assigned in 2008 by the contractor developing the curves, the Provincial Forest Types, the Cover Species Groups and the Patchwork Analysis Units (Development Types) used by Forsite in the forest estate model. The total area is 869,605ha which is the spatial net area used in the analysis. More detail is available in the Forest Estate Modelling Assumptions document in Appendix E.

Table 3.2 Linkages Between Yield Groups, Development Types, PFTs, and Patchworks AUs.

Timberline Ref		PFT	Dev Type	Cover Species Group	Forsite AU	AU Description	Total area (ha)	Net Area (ha)
Analysis Unit	Yield Group							
1	1	TAB*	tA	H	100	H-tA-CD_Density	330,222	310,365
2	2	TAB*	tA	H	200	H-tA-B_Density	58,520	55,044
3	3	AOH*	bP	H	300	H-bP	70,705	57,663
4	4	TAB*	wB	H	400	H-wB	28,581	24,547
5	5	HPM	HS	HS	570	HS-tA_jP	7,171	7,017
5	5	HSM	HS	HS	500	HS-tA_wS	100,129	87,858
6	6	PMW	SH	SH	650	SH-jP_tA	7,560	7,115
6	6	SMW	SH	SH	600	SH-wS_tA	68,603	61,927
7	7	BSJ	bS	S	750	S-bS_jP	9,550	9,269
7	7	BSL	bS	S	700	S-bS	178,480	158,974
8	8	BSJ	jP	S	850	S-jP_bS	12,719	12,408
8	8	JLP	jP	S	800	S-jP	34,248	32,256
9	9	WSF	wSbF	S	900	S-wS_bF-Zone4**	15,559	14,680
9	10	WSF	wSbF	S	1000	S-wS_bF-Zone5_6**	34,155	30,483
10	11	multi	tL11	S	1100	tL_PoorSite	26,346	0
10	12	multi	tL11	S	1200	tL_RichSite	21,841	0
none	none	multi	none	multi	none	Forested Exclusions	82,740	0
none	none	none	none	none	none	Non-Forested	930,943	0
						Total	2,018,073	869,605

*Timberline (2008) used a different approach to assign PFTs compared to the SFVI; thus, there are cases where AOH can be tA or wB dominated stand, or TAB can be bP dominated stand. In order to preserve an accurate link between SFVI and Timberline (2008), the Timberline (2008) PFTs were inherited where yield groups were already assigned.

**zone 4 refers to Boreal Transition, zone 5 to Mid-Boreal Upland, and zone 6 to Mid-Boreal Lowland / Interlake Plain

4.0 Public Consultation

A Public Consultation Plan was created in June of 2008 when the process to renew the Twenty year Forest Management Plan for the Pasquia Porcupine FMA was initiated. Please note that the term consultation used in this document does not refer to the Crown's Duty to Consult.

The Forest Management Plan author met with the Forest Management Advisory Committee (FMAC) in October 2008 and January 2009 to review Volume I of the FMP and the draft Values, Objectives, Indicators and Targets (VOITs). Subsequent updates regarding the FMP progress were given to the FMAC at the committee's regular meetings held four times a year.

A series of six public meetings were held in early November of 2008 to present the draft version of Volume I of the Forest Management Plan. Weyerhaeuser used newspaper and radio advertisements to inform the general public of the public consultation meetings to be held in PP FMA area communities in November 2008. Advertisements were placed in area newspapers in late October, 2008, while radio announcements for the public meetings were made in late October and early November, 2008.

In order to inform the largest number of potentially interested people possible about the opportunity to discuss the draft version of Volume 1 of the Forest Management Plan, letters of invitation were mailed to over 600 residents of northeast Saskatchewan who were known stakeholders or who had expressed interest in Weyerhaeuser's forest management activities in the past. These letters invited stakeholders to attend one of a series of public meetings to discuss the Forest Management Planning process and to hear a presentation on the draft version of Volume 1 – Background Information.

In addition, letters were sent to the Chiefs of all First Nation Bands whose traditional lands overlap the PP FMA area advising them of the planned public meetings, and offering to meet with and make a presentation to the Chief and Council at a meeting time suitable to them. Similar letters were mailed to the Presidents of all Métis Locals in the area of the PP FMA. The Public Consultation Report for Volume I of the Twenty year Forest Management Plan was included as Appendix 3 of Volume I.

In January 2009, the consultation plan was revised to adjust the dates at which Forest Estate Modeling results would be presented at public meetings.

The forest industry experienced a significant economic downturn between the time that the FMP process was initiated in 2008 and 2015 when it was completed. During this period, the

mills on the Pasquia Porcupine FMA were shut down for several years and the softwood mills were sold by Weyerhaeuser to Edgewood Forest Products. As a result of this economic downturn, the FMP process was suspended for a three year period from June 2010 to February 2013.

During the time that the FMP process was suspended, updates on the status of the FMP were given at annual Operating Plan meetings held in the traditional locations of Endeavour, Porcupine Plain, Hudson Bay, Tisdale, Carrot River and Cumberland House.

A new FMP Planning Team was constituted in February 2013, the Public Consultation Plan was amended a second time in April 2013 and a new schedule of meetings planned. Between June 18th and 26th, 2014, public meetings were held to present the initial results of the Forest Estate Modeling exercise.

Over 700 letters were mailed to stakeholders and advertisements were placed on local radio and in weekly newspapers inviting participation in the meetings.

Charts and maps used in the presentation were made available to those wishing to retain a copy for further study. The full text of the questions and the answers provided at these meetings can be found in Appendix E.

Delays during 2014 related to the development of new government policy on Natural Forest Patterns resulted in another hiatus in the FMP process from July to December, 2014. As a result, a third amendment was made to the Public Consultation Plan. The Public Consultation Plan can be found in Appendix D.

A third round of public meetings was held in June 2015 at which Volume II of the FMP was presented along with the final forest estate modeling scenarios. The questions and answers from the 2014 meetings were made available as a handout at these meetings.

The public meetings were fairly well attended and the questions generally dealt with individual concerns and how the Tactical Plan might affect their particular area of the FMA. A few concerns were raised with regard to the NFP standards and larger harvest events. The full text of the questions and the answers provided at these meetings can be found in Appendix E.
A number of stakeholders who were unable to attend the meetings called the FMP author and/or planner to ask questions about future plans.

4.1 Public Participation in Implementation of the 2015 Forest Management Plan

4.1.1 Operating Plan Public Meetings

Weyerhaeuser and Edgewood are committed to ongoing public consultation as the Forest Management Plan is implemented. As part of the planning process, a series of public meetings will be held in local communities to present draft plans to the public for comment and to provide opportunities for the public to have input into the Annual Operating Plan. Meetings will be scheduled in Hudson Bay, Porcupine Plain, Endeavour, Tisdale, Carrot River and Cumberland House. Locations may be added or dropped as the interest and concerns of the communities may change over time. Invitations will also be sent to surrounding First Nations and Métis communities and meetings arranged as requested.

Advertising for the operating plan public review meetings is done in local weekly newspapers and on several AM and FM radio stations that serve the area.

4.1.2 Public Advisory Group

Weyerhaeuser and Edgewood along with the Lands Branch of the Saskatchewan Ministry of Environment will continue to co-sponsor the quarterly meetings of the Pasquia Porcupine Forest Advisory Committee. An annual field tour with this group will further enable participants to contribute to the advisory process.

Landscape Stewardship Branch of Saskatchewan Environment serves as the secretariat for the FMAC and the Forest Service is represented at all of the meetings. Other Branches of government will attend on an as needed basis including Fish and Wildlife Branch and Saskatchewan Parks.

4.1.3 Individual/Group Consultations

Weyerhaeuser and Edgewood will actively encourage one on one consultation with other forest stakeholders prior to submission of annual plans to the Forest Service. Groups or individuals consulted may include the following:

- First Nation and Métis communities
- Outfitters – bear, deer
- Trappers – commercial and traditional use
- Recreational Users – snowmobilers, ATV operators and cabin owners
- Hunters – traditional and sport
- Archeologists – identification and protection of resources
- Fishing – sport, domestic and commercial
- Traditional Use – gathering sites, grave sites, sacred areas

- Gathering – berries, mushrooms, traditional medicine, floral and decorative
- Mineral, coal, oil and gas exploration and development
- Power and pipeline rights of way
- Lease holders for grazing, peat or gravel
- Silviculture Section of the Forest Service
- Department of Highways and Infrastructure

4.1.4 Pre-Harvest Assessments

Pre-harvest assessments of the proposed harvest blocks will help to identify the groups or individuals that may need to be consulted. The pre-harvest assessments will identify sites of specific importance and to ensure that appropriate harvest buffers are put in place when warranted. These may include archeological sites, burial sites, rare plant or animal occurrences, bear or wolf dens, stick nests, bat trees or salt licks.

The locations of site specific features of environmental, cultural, archeological or economic significance will be identified as part of routine operations and entered into the Pasquia Porcupine FMA GIS. The potential effect of harvesting or road construction near such sites will be assessed and subsequent consultation, mitigation or reporting will be done as applicable.

When sensitive fauna are identified in the pre-harvest survey, the Saskatchewan Activity Restrictions for Sensitive Species will be consulted and adhered to.

5.0 Values, Objectives, Indicators and Targets

Monitoring adherence to the commitments and assumptions made in the FMP provides the information required by the Licensees and the Ministry of Environment to assess performance and institute change as required.

In order to have a standard method of carrying out that monitoring, the Forest Service has developed a set of required Values, Objectives, Indicators and Targets (VOITs) based on sustainability criteria developed by the Canadian Council of Forest Ministers (CCFM).

This data is intended to provide information on which to base adaptive management and continual improvement. Information gathered through the monitoring process should lead to improvements in forest management activities and provide information for the development of future Forest Management Plans.

Baseline data for these VOITS can be found in Appendix K of this document.

Upon approval of the Forest Management Plan, a Management Implementation Team will be formed with representation from the Forest Service and the Licensees. The Management Implementation Team will have the primary role in assessing compliance with the VOITS and instituting change as required.

Table 5.1 2015 – 2035 Values Objectives Indicators and Targets

Indicator #1 – The distribution of the Managed Forest Land base by age class at the FMA level.

CCFM Criterion #1 – Conservation of Biological Diversity

1.1 Ecosystem Diversity

Value - Natural Range of Variation.

Objective - Conservation of the biological diversity of the forest on the Pasquia Porcupine FMA.

Indicator – The distribution of the Managed Forest Land base by age class at the FMA level.

Age Class	% H/HS 2015	%H/HS 2035	Age Class	% S/SH 2015	% S/SH 2035
0: 9	9%	11%	0: 9	4%	6%
10: 19	7%	13%	10: 19	7%	7%
20: 29	7%	9%	20: 29	4%	4%
30: 39	11%	7%	30: 39	14%	7%
40: 49	4%	7%	40: 49	2%	4%
50: 59	6%	11%	50: 59	5%	14%
60: 69	3%	4%	60: 69	2%	3%
70: 79	11%	6%	70: 79	8%	5%
80: 89	9%	3%	80: 89	4%	2%
90: 99	6%	8%	90: 99	5%	7%
100:109	9%	4%	100:109	5%	3%
110:119	9%	3%	110:119	9%	3%
120:129	7%	5%	120:129	14%	4%
130:139	2%	4%	130:139	7%	7%
140:149	0%	3%	140:149	5%	11%
150:159	0%	1%	150:159	2%	6%
160:169	0%	0%	160:169	2%	4%
170:179	0%	0%	170:179	0%	2%
180:189	0%	0%	180:189	0%	2%
190:199	0%	0%	190:199	0%	0%

Data Format – Shape file and graph

Reporting Frequency – 5 years

Assessment Cycle – 5 years

Indicator #2 – Amount of old and very old forest by species grouping and Management Unit.
CCFM Criterion #1 – Conservation of Biological Diversity
1.1 Ecosystem Diversity
Value - Natural Range of Variation.
Objective - Conservation of the biological diversity of the forest on the Pasquia Porcupine FMA.
Indicator – Amount of old and very old forest by species grouping and Management Unit.
Target - Area of old and very old forest will not be less than 15% of the Managed Forest Land Base and the area of very old forest will not be less than 5% of the MFLB.
Data Format – Shape file
Reporting Frequency – One time – Tactical Plan
Assessment Cycle –10 years
Allowable Variance – 10%

Indicator #3 – Size class distribution of harvest events		
CCFM Criterion #1 – Conservation of Biological Diversity		
1.1 Ecosystem Diversity		
Value - Natural Range of Variation.		
Objective - Conservation of the biological diversity of the forest on the Pasquia Porcupine FMA.		
Indicator – Size class distribution of harvest events		
Target Event Size 5 – 100 ha 101-1500 ha 1501-3500 ha 3501-8000 ha	 17% 68% 10% 5%	
Data Format – Shape file and table		
Reporting Frequency – report annually on completed events initiated or influenced by harvesting since 2015		
Assessment Cycle –10 years		
Allowable Variance – 5%		

Indicator #4 –Area of insular retention within completed harvest events.
CCFM Criterion #1 – Conservation of Biological Diversity
1.1 Ecosystem Diversity
Value - Natural Range of Variation.
Objective - Conservation of the biological diversity of the forest on the Pasquia Porcupine FMA.
Indicator – The amount of insular retention in events.
Target – On average, area of insular retention must not be less than 9% of the harvested area by event. Area of insular retention may range from 3 to 15% by harvest block. Salvage harvest events are to meet the same standard but be reported separately.
Data Format – Shape file and table
Reporting Frequency – Report on completed events annually.
Assessment Cycle –5 years
Allowable Variance – 2%

Indicator #5 – Softwood component in H cover species group is maintained.
CCFM Criterion #1 – Conservation of Biological Diversity
1.1 Ecosystem Diversity
Value - Natural Range of Variation.
Objective - Conservation of the biological diversity of the forest on the Pasquia Porcupine FMA.
Indicator – The amount of regeneration that is on track to replace softwood harvested from H and HS stands
Target – To ensure a softwood component in future H stands that is within the natural range of variability for hardwood stands.
Data Format – Shape file and table
Reporting Frequency – Report annually on the hectares of white spruce understory protection and on the percentage of roads and decking areas in summer harvested hardwood blocks planted to softwood.(2 year old blocks)
Assessment Cycle –5 years
Allowable Variance – 10% under target, no limit for over target.

Indicator #6 –Area of cover species group regenerated to a specific growth track relative to the area of each cover species group harvested.
CCFM Criterion #1 – Conservation of Biological Diversity
1.1 Ecosystem Diversity
Value - Natural Range of Variation.
Objective - Conservation of the biological diversity of the forest on the Pasquia Porcupine FMA.
Indicator – The extent to which various cover species groups are regenerated to a specific growth track relative to what was harvested.
Target – To replace the harvested stands with the same or similar relative species in proportion that were present prior to harvest taking into account the ecology of the land as represented at the Management Unit level. (FMA 11.02) (C) Proportion of softwood to hardwood will be measured at the block level using scaling data.
Data Format – Shape file and table
Reporting Frequency – Reforestation activities reported annually.
Assessment Cycle –5 years
Allowable Variance – 10% under target for softwood, no limit on hardwood or softwood over target.

Indicator #7 –Current supply of habitat for identified forest dwelling species versus predicted supply
CCFM Criterion #1 – Conservation of Biological Diversity
1.2 Species Diversity
Value – Quantity and quality of forest habitat.
Objective – Maintain habitat for identified forest dwelling species
Indicator - Current supply of habitat for identified forest dwelling species versus predicted supply
Target – The habitat supply for woodland caribou, fisher and moose has been modelled as part of the timber supply calculation. Meet or exceed the predictions of future habitat at 5, 10, 15 and 20 years.
Data Format – Maps and tables
Reporting Frequency – 5 years
Assessment Cycle –5 years
Allowable Variance – 10% under target, no limit on exceeding target.

Indicator #8 –Percentage of seedlings from wild or improved seed sources.
CCFM Criterion #1 – Conservation of Biological Diversity
1.3 Genetic Diversity
Value – Genetic Diversity of commercial tree species
Objective – No loss of natural genetic diversity through forest management activity
Indicator - Percentage of seedlings from wild or improved seed sources.
Target – During the first ten years of this agreement, a minimum of 80% of seedlings will come from wild seed sources, up to 20% may come from improved seed sources.
Data Format – Table
Reporting Frequency – Report annually
Assessment Cycle –5 years
Allowable Variance – 20%

Indicator #9 – Harvest areas regenerated and established as Free to Grow are consistent with the Silvicultural Ground Rules and the Regeneration Assessment Standard.
CCFM Criterion #2 – Ecosystem Condition and Productivity
2.1 The stability, resilience and rates of biological production in a forest ecosystem
Value – Natural forest ecosystem processes
Objective – Maintain the stability, resilience and rates of biological production in the forest ecosystem
Indicator - Harvest areas regenerated and established as Free to Grow are consistent with the Silvicultural Ground Rules and the Regeneration Assessment Standard.
Target – All harvest blocks to be satisfactorily regenerated at the time of establishment and Free to Grow surveys.
Data Format – Shape files and Tables
Reporting Frequency – Report annually
Assessment Cycle –5 years
Allowable Variance – 5%

Indicator # 10 – Change in the net forest land base in the FMA.
CCFM Criterion #2 – Ecosystem Condition and Productivity
2.1 The stability, resilience and rates of biological production in a forest ecosystem
Value – Natural forest ecosystem processes
Objective – Maintain the stability, resilience and rates of biological production in the forest ecosystem
Indicator - Change in the net forest land base in the FMA.
Target – Track the amount of net land base that is converted to other land uses such as roads. Track the amount of land added to the net land base through road reclamation. Keep the long term loss to less than the 0.62% (500 km) modelled in the FMP.
Data Format –Table
Reporting Frequency – Report annually
Assessment Cycle – 5 years
Allowable Variance – 0.5%

Indicator # 11 – Area of the MFLB disturbed by fire or stand replacing blow down events over the planning period and the proportion of each event salvaged.	
CCFM Criterion #2 – Ecosystem Condition and Productivity	
2.1 The stability, resilience and rates of biological production in a forest ecosystem	
Value – Natural forest ecosystem processes	
Objective – Maintain the stability, resilience and rates of biological production in the forest ecosystem	
Indicator - Area of the MFLB disturbed by fire or stand replacing blow down events over the planning period and the proportion of each event salvaged.	
Target -	(a) Track the cumulative natural disturbance against a 10% disturbance threshold after which re-planning must take place. (b) Report on the proportion of any such event that is salvaged (max 80%).
Data Format –Table	
Reporting Frequency – Report annually	
Assessment Cycle – 5 years	
Allowable Variance – 10%	

Indicator # 12 – Ratio of harvested to predicted volume by hardwood and softwood
CCFM Criterion #2 – Ecosystem Condition and Productivity
2.1 The stability, resilience and rates of biological production in a forest ecosystem
Value – Natural forest ecosystem processes
Objective – Maintain the stability, resilience and rates of biological production in the forest ecosystem.
Value - Ratio of harvested to predicted volume by hardwood and softwood
Target – Harvested volumes are within 15% of the volumes predicted by the FMP yield curves.
Data Format –Table
Reporting Frequency – Report annually
Assessment Cycle – 5 years
Allowable Variance – 15%

Indicator # 13–Precision with which harvest events adhere to the Tactical Plan
CCFM Criterion #2 – Ecosystem Condition and Productivity
2.1 The stability, resilience and rates of biological production in a forest ecosystem
Value – Natural forest ecosystem processes
Objective – Maintain the stability, resilience and rates of biological production in the forest ecosystem.
Indicator - Precision with which harvest events adhere to the Tactical Plan
Target – >85% adherence to the Tactical Plan
Data Format – Text – report on deviation from the Tactical Plan
Reporting Frequency – Report annually
Assessment Cycle – 5 years
Allowable Variance – 15%

Indicator # 14 – Harvest blocks are in compliance with provincial standards
CCFM Criterion #3 –Soil and Water
3.1 Quantity and quality
Value – No loss of quantity or quality of soil and water
Objective – Maintain and/or enhance the quantity and quality of the soil and water
Indicator - Harvest blocks are in compliance with provincial standards
Target - 100% of the Ministry inspected harvest blocks are in compliance with provincial standards related to soil disturbance measured by the issuance of Notice of Violation.
Data Format – Table/report
Reporting Frequency – Report annually
Assessment Cycle – 5 years
Allowable Variance – 5%

Indicator # 15 – Harvest blocks are in compliance with provincial standards related to road reclamation
CCFM Criterion #3 –Soil and Water
3.1 Quantity and quality
Value – No loss of quantity or quality of soil and water
Objective – Maintain and/or enhance the quantity and quality of the soil and water
Indicator - Harvest blocks are in compliance with provincial standards related to road reclamation
Target - 100% of Ministry inspected blocks comply with provincial standards related to road reclamation measured by the issuance of Notice of Violation.
Data Format – Table/report
Reporting Frequency – Report annually
Assessment Cycle – 5 years
Allowable Variance – 5%

Indicator # 16 – Stream crossings are in compliance with Aquatic Habitat Protection Permits
CCFM Criterion #3 –Soil and Water
3.1 Quantity and quality
Value – No loss of quantity or quality of soil and water
Objective – Maintain and/or enhance the quantity and quality of the soil and water
Indicator - Stream crossings are in compliance with Aquatic Habitat Protection Permits
Target - 100% of stream crossings are in compliance with Aquatic Habitat Protection Permits. Measured by the issuance of Notice of Violation.
Data Format –Table/report
Reporting Frequency – Report annually
Assessment Cycle – 5 years
Allowable Variance – 5%

Indicator # 17 – Harvest blocks are in compliance with FMA riparian area management standards
CCFM Criterion #3 –Soil and Water
3.1 Quantity and quality
Value – No loss of quantity or quality of soil and water
Objective – Maintain and/or enhance the quantity and quality of the soil and water
Indicator - Harvest blocks are in compliance with FMA riparian area management standards
Target - 100% of Ministry inspected harvest blocks are in compliance with FMA standards related to riparian area management. Measured by the issuance of Notice of Violation.
Data Format –Table/report
Reporting Frequency – Report annually
Assessment Cycle – 5 years
Allowable Variance – 5%

Indicator # 18 – Event Duration
CCFM Criterion #4 – Role in Global Ecological Cycle
4.1 Carbon Cycle
Value – Productive land base
Objective – Mitigate the impact of forest management activities on the land base
Indicator - Event Duration in relation to standard
Target – Harvest events will be completed within 5 years of initiation (unless otherwise approved)
Data Format –Table/report
Reporting Frequency – Report annually on completed events.
Assessment Cycle – 5 years
Allowable Variance – 5% of events over the five year period.

Indicator # 19 – Duration of winter harvest season
CCFM Criterion #4 – Role in Global Ecological Cycle
4.2 Climate Change
Value – Productive land base
Objective – Assess the impact of climate change on the land base
Indicator - Duration of winter harvest season
Target – Track changes in the start and end of the winter harvest season using the issuance and suspension of winter overweight permits by the Ministry of Highways and Infrastructure as a proxy.
Data Format –Table/report
Reporting Frequency – Report annually.
Assessment Cycle – 5 years
Allowable Variance – N/A

Indicator # 20 –	**(a) Utilization of the approved Harvest Volume Schedule** **(b) Adherence to the approved utilization standard**
CCFM Criterion #5 –Economic and Social benefits	
5.1 Economic benefits	
Value – Sustainable economic benefits over the FMP planning period	
Objective – Maximize the economic benefits without compromising the productive capacity of the forest	
Indicator - Utilization of the approved Harvest Volume Schedule and adherence to the approved utilization standard	
Target -	(a) Full utilization of the allotted HVS in each five year period. (b) Approved utilization standards not deviated from for more than one operating year over the planning cycle.
Data Format –Table	
Reporting Frequency – Report annually and cumulatively	
Assessment Cycle – 5 years	
Allowable Variance –	(a) 20% over a five year period. (b) 10%

Indicator # 21 – Stakeholder/public consultation at various levels of forest management
CCFM Criterion #5 –Economic and Social benefits
5.2 Distribution of Economic benefits
Value – Fair distribution of benefits
Objective – To ensure that other forest user needs are addressed.
Indicator – Stakeholder/public consultation at various levels of forest management.
Target - Public meetings to discuss forest management operations will be held annually. Implementation of the Forest Management Plan and annual operating plans will be discussed. Offers to meet with First Nations Bands and Métis representatives to discuss the Annual Operating Plan will be made on an annual basis.
Data Format – Document and report
Reporting Frequency – Report annually
Assessment Cycle – Annually
Allowable Variance - None

Indicator # 22 – Thematic map of the FMA showing non-timber resources and uses
CCFM Criterion #5 –Economic and Social benefits
5.2 Distribution of Economic benefits
Value – Fair distribution of benefits
Objective – To ensure that other forest user are addressed.
Indicator – an updated thematic map of the FMA showing non-timber resources and uses
Target – Annually update the GIS database with new information regarding other forest uses (cabins, ski trails, snowmobile trails, sensitive wildlife sites, etc).
Data Format –Shape file, document
Reporting Frequency – Report annually
Assessment Cycle – 5 years
Allowable Variance – None. Updates to be done as information becomes available.

Indicator # 23 – Volumes harvested by species group and Management Unit are within the range modeled in the FMP
CCFM Criterion #5 –Economic and Social benefits
5.3 Sustainability of benefits
Value – No loss of benefits
Objective – Maintain or enhance benefits
Indicator - Volumes harvested by species group and Management Unit are within the range modeled in the FMP
Target – Maximum volume harvested by species group in each Management Unit is set to 5 times the annual allowable cut in each five year period (un-harvested volume may carry over to the next period).
Data Format –Table and shape file
Reporting Frequency – Report annually
Assessment Cycle – 5 year
Allowable Variance – 10%

Indicator # 24 – Extent to which aboriginal people associated with the FMA are involved in the forest industry in consultative or operational roles
CCFM Criterion #6 Society's Responsibility
6.1 Aboriginal and Treaty Rights
Value – Aboriginal and treaty rights are respected in regard to planning and implementing forestry activities.
Objective – To ensure that aboriginal and treaty rights are respected in regard to planning and implementing forestry activities.
Indicator - Extent to which aboriginal people associated with the FMA are involved in the forest industry in consultative or operational roles
Target – Report on the number of opportunities provided for aboriginal people to participate in the consultation process regarding proposed forest management activities.
Data Format – Document
Reporting Frequency – Report annually
Assessment Cycle – 5 year
Allowable Variance – N/A

Indicator # 25 – Spatial identification and operational protection of known culturally significant aboriginal sites.
CCFM Criterion #6 Society's Responsibility
6.2 Aboriginal traditional land use and forest based ecological knowledge
Value – Protection of aboriginal traditional land use and forest based ecological knowledge
Objective – To avoid impacting culturally important sites
Indicator - Spatial identification and operational protection of known culturally significant aboriginal sites.
Target - 100% of the known culturally significant aboriginal sites are spatially and operationally protected during forest management activities.
Data Format –Shape file, document
Reporting Frequency – Report annually
Assessment Cycle – 5 year
Allowable Variance - None

Indicator # 26- Evidence of ongoing traditional land use and incorporation of traditional ecological knowledge into the planning process.
CCFM Criterion #6 Society's Responsibility
6.2 Aboriginal traditional land use and forest based ecological knowledge
Value – Protection of aboriginal traditional land use and use of forest based ecological knowledge
Objective – To maintain opportunities for traditional land use and incorporate traditional ecological knowledge of the aboriginal communities into current forest management.
Indicator - Evidence of ongoing traditional land use and incorporation of traditional ecological knowledge into the planning process.
Target - Record annually the traditional use of the land by aboriginal people. Record instances where forest based traditional ecological knowledge is incorporated into the planning process.
Data Format – Shape file where applicable, documentation
Reporting Frequency – Report annually
Assessment Cycle – 5 year
Allowable Variance - None

Indicator # 27- The Licensees will be involved in contributing to the well-being of the communities associated with the FMA.
CCFM Criterion #6 Society's Responsibility
6.3 Forest community well-being and resilience
Value – Sustainable forest communities
Objective – To contribute to the resilience of communities
Indicator - The Licensees will be involved in contributing to the well-being of the communities associated with the FMA.
Target - Record the contributions made to the Communities associated with the FMA. (Grants, summer students, apprenticeships, etc.)
Data Format – Document
Reporting Frequency – Report annually
Assessment Cycle – 5 year
Allowable Variance - None

Indicator # 28- An active public advisory group
CCFM Criterion #6 Society's Responsibility
6.4 Fair and effective decision making
Value – Involvement of stakeholders in FMP development and implementation
Objective – Maximize the involvement of stakeholders in FMP development and implementation
Indicator – An active public advisory committee.
Target - The Forest Management Advisory Committee will be scheduled to meet four times a year and be engaged in implementation of the current FMP and development of the next renewal.
Data Format – Document
Reporting Frequency – Report annually
Allowable Variance – 25%

Indicator # 29 – Stakeholders are satisfied with their involvement in forest management planning and implementation.
CCFM Criterion #6 Society's Responsibility
6.4 Fair and effective decision making
Value – Involvement of stakeholders in FMP development and implementation
Objective – Maximize the involvement of stakeholders in FMP development and implementation
Indicator - Stakeholders are satisfied with their involvement in forest management planning and implementation.
Target - A survey of participants to determine the level of satisfaction with the Forest Management Advisory Committee will be carried out every five years.
Data Format – Document
Reporting Frequency – Report annually
Allowable Variance - None

Indicator # 30 - Accurate, up to date forest inventory maps are available.
CCFM Criterion #6 Society's Responsibility
6.5 Informed decision Making
Value – Information used in forest decision making
Objective – Ensure that the information used in forest decision making is current, accurate and publicly available.
Indicator – Accurate up to date forest inventory maps are available.
Target - Forest inventory maps updated annually to reflect changes resulting from harvest operations and major natural disturbances. Updated maps used in the public consultation process and submitted in the Annual Operating Plan.
Data Format –Shape file, document
Reporting Frequency – Report annually
Assessment Cycle – 5 year
Allowable Variance - None

Indicator # 31- The percentage of Licensee and contractor workforce that is of aboriginal background.
CCFM Criterion #5 Multiple Benefits to Society
5.3 Fair Distribution of Benefits and Costs
Value – Fair distribution of employment opportunities
Objective – To reduce the gap between the percentage of Licensee and contractor employee workforce of Aboriginal ancestry and that of the populations of the communities within and adjacent to the FMA.
Indicator - The percentage of Licensee and contractor workforce that is of aboriginal background.
Target - Compare the percentage of Licensee and Contractor workforce of aboriginal (First Nations and Métis) ancestry with the percentage of aboriginal people in the populations of communities within and adjacent to the FMA every five years when new census information is available.
Data Format – Documentation
Reporting Frequency – Report annually
Assessment Cycle –5 year
Allowable Variance – N/A

6.0 Highlights of Forest Estate Modelling

The Forest Estate Modeling Assumptions document that accompanies this Volume as Appendix F lays out the background information that was used in creating the forest estate model. This includes the land base, forest development, management actions, replanning threshold, non-timber objectives and targets and model formulation. Figure 6.1 illustrates the steps involved in creating the model within PATCHWORKS™, the scenarios that were modelled and the sensitivity analyses that were run.

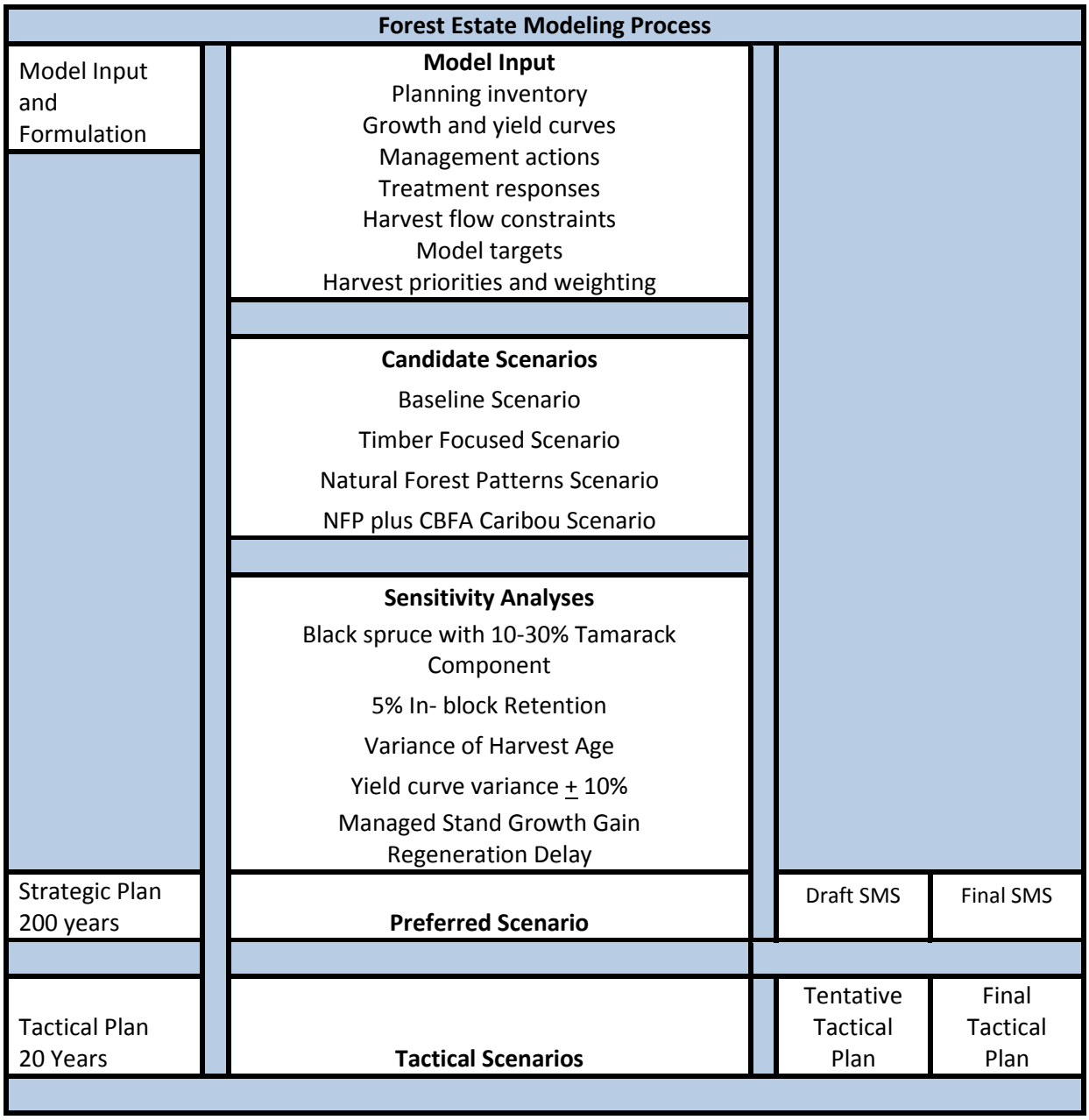

Figure 6.1 Forest Estate Modelling Process

The Forest Estate Modelling Report summarizes the methodology and results of the modelling used in arriving at the Preferred Scenario that will be used in managing the FMA over the next 20 years. The highlights of the modelling process are presented here.

Forest estate modelling is the art and science of forecasting the effects of a prescribed set of management actions on future forest characteristics. The forest is modelled in terms of its current condition, expected growth, succession and senescence and responses to a variety of potential management actions. Different management actions are modelled to explore their effect relative to the plan objectives over time. A preferred management strategy is selected from the range of options based on its forecasted achievement of objectives.

As neither Weyerhaeuser nor Edgewood has in house modelling capabilities, Forsite Consulting Limited of Salmon Arm B.C. was chosen to carry out the modelling. The leader of this project for Forsite has been Mr. Cam Brown, a Registered Professional Forester, ABCFP and ASFP.

The Forest Management Planning Document requires output from the model at two different scales. The tactical scale is for the term of the FMP and includes detailed spatial blocking which shows where activities will take place over the 20 year term. The strategic scale covers a 200 year period and is not spatially explicit but is intended to forecast the effect that proposed management actions will have on objectives and targets over a longer period of time.

The wood supply analysis is one specific facet of the forest condition within a forest estate model. In addition to wood supply, the supply of critical habitat for woodland caribou was given high priority in the modelling process.

The model has incorporated the principles of Natural Forest Patterns (NFP) and imposed a number of specific restrictions on the model in order to comply with the NFP standard.

There are a variety of forest estate models available for use. In consultation with Forsite and the Forest Service, PATCHWORKS™ modeling software was chosen for use in this modeling exercise. The suite of tools is sold and maintained by Spatial Planning Systems Inc. of Deep River, Ontario.

PATCHWORKS™ is a fully spatial forest estate model that can incorporate real world operational considerations into a strategic planning framework. It is unique in its ability to dynamically assess spatial relationships during modeling and adapt solutions to achieve spatial objectives. It utilizes a goal seeking approach and an optimization heuristic to schedule

activities across time and space in order to find a solution that best balances the targets/goals defined by the user.

6.1 Long Run Sustained Yield

In order to frame an upper limit on timber production for the FMA, the theoretical maximum sustainable harvest level or Long Run Sustained Yield (LRSY) was calculated. (Section 4 of Appendix G)
A separate LRSY was determined for hardwoods and softwoods by multiplying the area of each yield strata with the culminated mean annual increment (MAI) volume of that stratum. MAIs by products were calculated using product yields and stand ages as provided by Timberline (2008). LRSY results demonstrate the maximum sustained yield from the landbase assuming no restrictions are imposed.

6.2 Candidate Scenarios

Three scenarios were formulated in the modeling process. These were:

- Timber Focused (Baseline) Scenario
- Natural Forest Patterns Scenario
- Natural Forest Patterns plus CBFA Caribou Scenario

Initially a Timber Focused scenario was used that allowed the model to focus solely on the production of timber over time. This run of the model did not include any non-timber targets and allowed the exploration of different flow regimes without additional complexity. Table 6.1 shows the variables that were used as input into the model for the Timber Focused scenario. The same table was used in the other two scenarios with variances in the inclusion/exclusion of the key variables. Details on the Forest Estate Modeling can be found in Appendix G.

The other candidate scenarios modeled were Natural Forest Patterns Scenario and Natural Forest Patterns plus the Canadian Boreal Forest Caribou Conservation Scenario.

Key components of the Natural Forest Pattern Scenario involved retaining 9% residual volume within harvest events and 15% of the old and very old timber stands representing five major species groups in each of five Ecological Management Units. (Figure 2.1)

The Canadian Boreal Forest Caribou Conservation Scenario involved exclusion of harvest for twenty years in designated conservation zones and restricting disturbance to 35% in special

management zones. The disturbance levels were modelled using the CBFA variable width buffer protocols details of which can be found in Appendix J.

Table 6.1 Timber Focused Scenario

Key Variable	Description
Harvest Flow Regime	High Initial/HVS, Max 10% change/period; No compromise to long term.
Net Land Base	869,605 ha (Spatial), 791,341 (Effective)
Merchantable GS Control	Not Applied
Growth and Yield	2008 Curves - Weyerhaeuser utilization standards
MHA's	tA@70, jP @ 75, bS @80yrs, wS @ 90 yrs
Understory Protection	323 ha/year max, harvest all mature volume, advanced regen
In-block Retention	Not Modeled
Seral Requirements	Not Modeled
Interior Forest	Not Modeled
Harvest Event Size	Not Modeled
Caribou Habitat	Not Modeled
Moose Habitat	Not Modeled
Fisher Habitat	Not Modeled
Roads/Costs	No Controls
Annual Operation Plan	Prioritized in first 10 years
Black spruce with 10-30% tL	Included
CBFA Caribou	Not Modeled
Managed Stand Yield Gain	Not Modeled
Regeneration Delay	0yrs H and HS; -1yrs S and SH

6.3 Sensitivity Analyses

Having modeled some candidate scenarios, the scenario that incorporated the Natural Forest Patterns plus the CBFA Caribou Conservation Plan was chosen as the baseline for comparing the effects of varying some key factors/assumptions. The variables explored were:

- Harvest of timber stands with a tamarack component of up to 10% versus harvest of stands with a tamarack component of up to 30%;
- In-block retention of 5% versus 9%;
- Variance of harvest age;
- Yield curve variance;
- Managed stand growth gain;
- Regeneration delay.

The results of each of these analyses were assessed and the merits of including or excluding each of these variables were assessed. In this manner, a preferred scenario was chosen. For detail on the positive or negative effect that these variables could have on the HVS, please refer to Section 6 of Appendix G, the Forest Estate Modelling Report.

6.4 Selected Management Strategy

The selected management strategy is based on a model run that incorporates the draft NFP standards (November 2014), the CBFA habitat requirements and those black spruce stands with a tamarack component of less than 10%.

The selected Management Strategy is a tradeoff that results in more land set aside to meet biodiversity goals and lower annual allowable harvests for both softwood and hardwood. During the first ten years of the FMP, the HVS allowed in the preferred scenario drops by 60,000 m^3 for softwood and by 142,000 m^3 for hardwood.

Table 6.2 Preferred Scenario – Key Variable Description

Key Variable	Description
Harvest Flow Regime	Maintain current HVS as long as possible, no compromise to long term
Net Land Base	869,605 ha (Spatial), 791,314 (Effective)
Merchantable Growing Stock Control	Not Applied
Growth and Yield	2008 Curves - Weyerhaeuser utilization standards
MHAs	tA@70, jP @ 75, bS @80 years, wS @ 90 years
UPRO	323 ha/year max, harvest all mature volume, advance regen. age 30
In-Block Retention	9% (78,264 ha reserved)
Seral Requirements	15% old or very old; 5% very old by MU/Species group
Interior Forest	Old+ patches (min 20% for term of plan)
Harvest Event Size	Target 5% small, 55% med, 20% large, 20% very large – no HVS impact
Caribou Habitat	Minimize impact on existing habitat with no HVS impact
Moose Habitat	Tracking only
Fisher Habitat	Tracking only
Roads/Costs	Minimize costs with no impact on harvest levels
Annual Operation Plan	Prioritized in first 10 years
TL10-30% harvest	Excluded
CBFA Caribou	10 Zones: 3 conservation, 4 special management, 3 development
Growth Gain of Managed Stands	Not Modeled
Regeneration Delay	0 years H and HS; -1 years S and SH

In this preferred scenario, the current HVS can be maintained for the first 20 years for HWD and for the first 10 years for SWD saw logs. (Figure 6.2) The opportunity for a higher level of harvest during the first 20 years is due to an imbalance in the age class distribution on the FMA. The disproportionally high amount of mature timber on the FMA is postulated to be a result of active firefighting activities from the middle of the 20th century to date. These modeling results are similar to those obtained in the 1999 FMP when the opportunity for a "surge cut" in hardwood was recognized because of the large amount of standing mature wood.

At the rates of harvest projected in the model, the age classes on the FMA will return to a more normal distribution of new, young, mature and over mature forest by 2045. From that time forward, the long term harvest rate of approximately 710,000 m^3/year for hardwood and 330,000 m^3/year for softwood saw logs can be achieved for the last 170 years of the 200-year planning horizon. More detail can be found in the Forest Estate Modeling Report in Appendix G. Table 6.3 shows the recommended HVS for the twenty year term of this FMP.

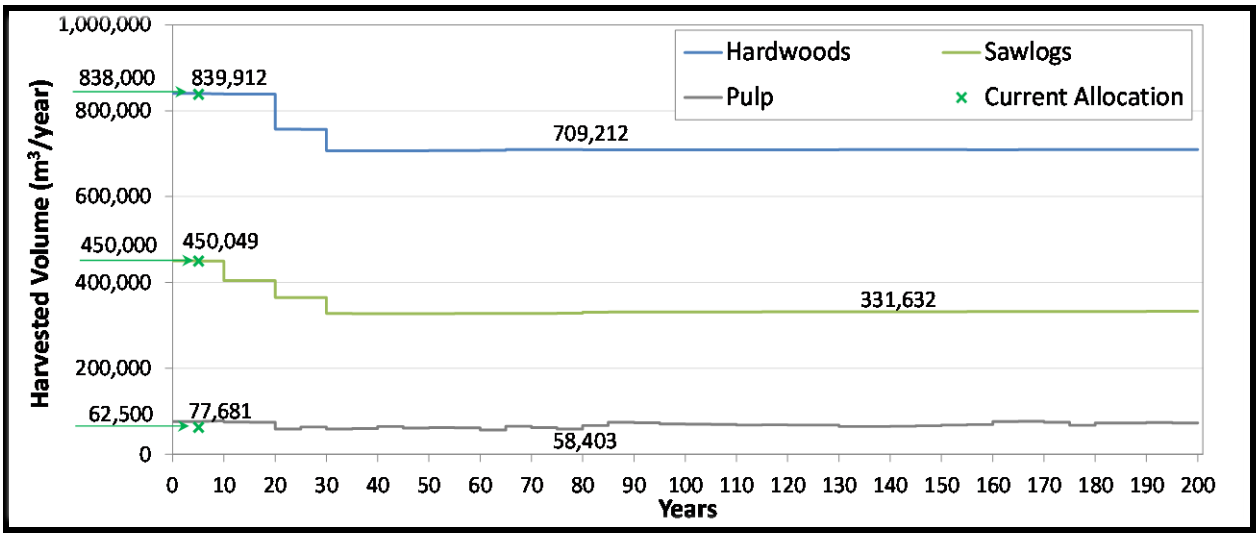

Figure 6.2 Forecast Harvest Rates for the Preferred Management Scenario – PP FMA

Table 6.3 Recommended HVS for the 2015-2035 FMP

2015-2035 FMP Timeframe	Hardwood Harvest (m^3/year)	Softwood Harvest (m^3/year)
2015-2024	840,000	450,000
2025-2034	840,000	405,000

The harvest rates in the Selected Management Strategy meet the requirements of the mills associated with the FMA while also achieving the forest management objectives of the NFP standard and the caribou habitat requirements defined by the Saskatchewan Working Group of the Canadian Boreal Forest Agreement.

By incorporating the NFP standards, a wide variety of environmental concerns are addressed including assurance that:

- Harvest of the five main timber types is distributed across time and space on the FMA;
- 15% old and very old forest is retained by timber type and by Management Unit;
- In block retention of 9% is achieved;
- Interior forest is maintained by timber type and Management Unit;
- Over time, a more natural range of patch sizes will exist on the FMA;
- Woodland caribou habitat will be maintained on the landscape.

The Selected Management Strategy incorporates a series of permanent and partial exclusions from harvest that includes wilderness areas, steep slopes, isolated stands, riparian areas and dispositions. These exclusions will assist the Licensees in meeting the goals of integrating non-timber forest activities with forest management while practicing sustainable forest management.

7.0 Tactical Plan

The Tactical Plan is designed as a working tool for forest planners during the development of the Forest Management Plan. The Tactical Plan is used as a general development plan to show the Forest Service where the harvest will take place over the next 20 years and in what quantities. The Tactical Plan will also serve as a communication tool for use with the Forest Management Advisory Committee and at individual and public meetings with stakeholders.

The Tactical Plan is part of the FMP and predicts at the highest level the spatial and temporal locations of future forest management activities. From the areas delineated in the Tactical Plan, planners will choose specific areas for submission as harvest events or harvest blocks for inclusion in Event and Operating Plans.

The general assumptions made at the Tactical Plan level will be carried forward to the event and harvest block level for implementation. These include overall levels of annual harvest, utilization assumptions, silvicultural ground rules, distribution of harvest by Management Unit, in-block retention, retention of old and very old stands and harvest event size distribution. Figure 7.1 demonstrates where the Tactical Plan falls in the hierarchy of the planning process.

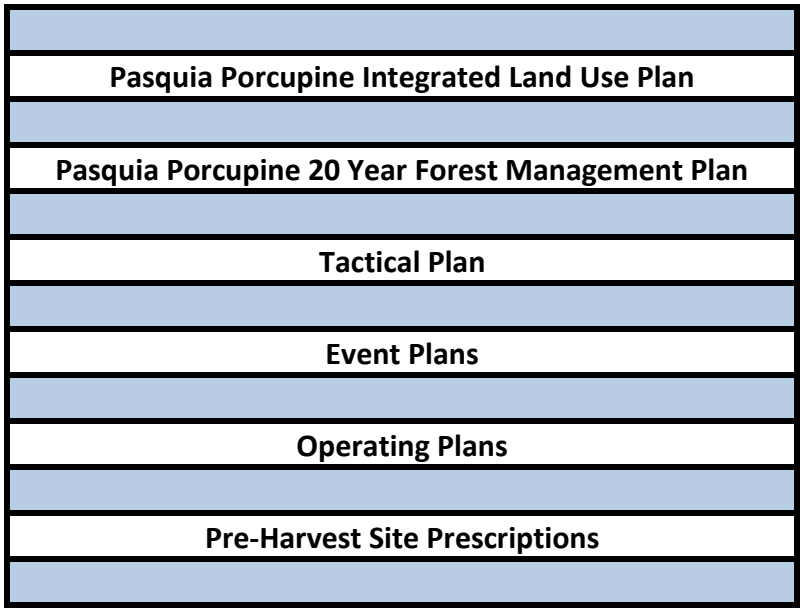

Figure 7.1 Planning Hierarchy

7.1 Model Output

Significant time and effort was spent inputting planned blocks into the model but substantial parts of the Tactical Plan were produced by the computer model. As a result there are operational reasons why some stands included in the Tactical Plan are not available to be harvested. (e.g. steep slopes, stakeholder commitments, etc) The results of the model have been examined closely and the following steps taken to edit the model output:

1. Events were created based on the four – five year periods that the model had identified for harvest.
2. All events that were less than 10 hectares in size were viewed individually in GIS.
3. For each event less than 10 hectares, the underlying stands were either:
    a. Rescheduled to a different period to incorporate them into a larger adjacent event, or
    b. Removed from the harvest schedule if they were isolated.
4. Opportunities for adding and dropping stands in surrounding events were evaluated.
    a. Stands/events created behind and within existing silviculture areas were dropped where it was deemed that they could not be accessed without causing significant disturbance to the regenerating area;
    b. Stands were added to events if it appeared that they were merchantable and at risk of being isolated from future harvest opportunity;
    c. The scheduling of stands (within different events and already selected by the model) were changed to consolidate areas into larger contiguous events.
5. All scheduled stands/events existing within the Woody Lake Fire and within the Caribou deferral zones were removed from harvest consideration.
6. A significant amount of area was added to period one to capture blocks than had been submitted in the 2014/15 Annual Operating Plan. The model had assumed that all of these areas had been harvested during the 2014/15 season where in actuality only a portion had been harvested.
7. The net change is that 25,034 polygons or 9.9% of the stands (have been manually edited, added, dropped or re-scheduled) from the original model output. The net result is that 9,552 hectares or 3.8% by area was added to the tactical plan 20 year spatial harvest schedule.

Table 7.1 Summary of Changes from Model Result

Planning Period					
	1	**2**	**3**	**4**	**Total**
Model Output (ha)	65,549	62,264	62,457	58,107	248,377
Modified Output (ha)	79,992	57,554	68,430	51,953	257,929
Net Change	14,443	-4,710	5,973	-6,154	**9,552**

There will be additional reasons why blocks or portions of blocks proposed for harvest will not be harvested. These reasons may include commitments to stakeholders, newly discovered archeological sites, First Nations concerns, and localized environmental restrictions such as steep ravines or important wildlife habitat. It is equally likely that the model will have excluded some stands from the Tactical Plan due to errors in the forest inventory data. For these reasons, some degree of variance from the Tactical Plan will be required over the term of the FMP. Based on the experience of other Licensees, it is expected that this variance will be between 5 and 15%.

7.2 Operating Methods & Principles

The operating methods and principles for the implementation of the 2015 -2035 Tactical Plan have been developed based on the Environmental Impact Assessment for the FMA approved in 1999, subsequent changes to the regulatory environment and advances in knowledge regarding forest management.

Methodologies will change as the regulatory, technical and economic drivers of change continue to evolve. Throughout those changes, the overriding principles of ecosystem based management, sustainable forest management, consultation/collaboration with the pubic and aboriginal people, social and economic sustainability, adaptive management and continual improvement will be used to guide our actions.

7.2.1 Utilization Standards

Using a shortwood (nominal 2.6 m) harvest system, the Licensees will utilize individual trees and stands as per Section 8 and Schedule “F” of the Forest Management Agreement. Bush processing and product sorting will be done for the majority of operations to ensure optimum utilization. Exceptions to this may occur in some areas where timber may be hauled tree length to summer accessible staging areas for later processing.

Timberlands staff will continue to work with mill managers to utilize the incidental tamarack that is occasionally harvested. Small amounts (max. 1% per load) of tamarack will be accepted and processed at the Carrot River sawmill. If this should change we will notify the Ministry accordingly. In the meantime, harvesting operations will not target tamarack, but we expect small volumes will continue to accrue, and in some cases will exceed our 1% tolerance. In these areas Edgewood will work with the Ministry and 3rd Party Operators to the best of our ability in an attempt to have this material is utilized.

Table 7.2 Utilization Standards

Operational standards for merchantable trees	**Stump height**	**Minimum merchantable bole length to top diameter**	**Top diameter**
Softwood	30 cm	5.2 m	9 cm
Hardwood	30 cm	5.2 m	9 cm
Utilization standard for harvested trees	**Min log length**	**Top end diameter**	**Acceptable rot in the entire log**
Softwood	5.2 m	9 cm	50%
Hardwood	4.8 m	9 cm	50%

With the continued closure of the pulp mill in Prince Albert, the market for pulp is very limited. The Tolko mill in The Pas, Manitoba is the only market. Periodic variances from the FMA utilization standard may be required when there is no viable market for certain products.

Birch has particular wood properties which make it very challenging to use in some OSB products. Since technical properties of different products (sheathing, roofing, web stock) vary, and the OSB mill must switch products regularly based on market demands (daily or at least several times per week), it is difficult to state with certainty what volume of birch, can be used in the mill on an ongoing basis. If at some point, the OSB mill finds that it is no longer able to utilize birch; attempts will be made to find a partner to utilize this material.

7.3 Harvesting

7.3.1 General

Pre-harvest Prescriptions (PHPs) will be completed for harvest blocks proposed in operating plans and will be included with the area write ups. PHPs are based on pre-harvest assessments and/or forest inventory information. Final silviculture treatment may vary from PHPs if post-harvest evaluations indicate that the site conditions are significantly different from the initial assessment. In such a case, a PHP amendment form will be completed and retained on the block file.

Potential merchantable stands are denoted on 1:15,000 scale maps for inclusion with operating plan submissions. In some cases, 10 to 12 metre height class stands are included in proposed blocks because they have merchantable fringes, or have been mistyped by the inventory and are actually of merchantable size. Merchantable stands are those that have wood of merchantable size, contain at least 60 cubic metres of volume per hectare and have reached the decadal rotation age set out in the Forest Management Plan.

7.3.2 Harvest Systems

As of 2015, both hardwoods and softwoods are harvested using feller bunchers. Approximately 25% of hardwood is delimbed and topped in the block using power saws with the remainder of the hardwood and all softwood delimbed and topped at roadside using mechanical delimbers. The use of power saws is being phased out due to safety concerns.

The majority of trees are skidded to roadside by grapple skidders where they are processed into specified lengths using cut-to-length processors or slashers.

Weyerhaeuser has implemented a policy requiring all contractors to use a skidder with low ground pressure tires whenever soft ground conditions are encountered.

Harvesting will be carried out as per the Natural Forest Patterns Standard with in-block residuals ranging from 3 to 15% at the block level with an average of 9% retention at the event level.

The exception to this methodology will be where immature white spruce understory occurs in H and HS stands. In such cases, understory spruce will be protected through careful removal of merchantable overstory trees. The objective will be to protect the majority of immature white spruce from damage. Exceptions to this may be made in the event the immature spruce is severely budworm-damaged and is not expected to survive.

Understory protection treatments were limited in the model to an average of 5% of the H and HS stands (323 ha) per year. This causes a slow transition of hardwood stands toward softwood stand types over time. The area on which this prescription is applied will vary year to year as this treatment can only be implemented on stands with an appropriate spruce understory, i.e. an understory between 2 and 15 metres tall, averaging 30 years of age and with enough density to shift the next rotation from an H to an HS or from an HS to an SH growth track.

Figure 7.2 White Spruce Understory Protection

On all harvest areas, residual stand structure additional to live leave trees and patches, will be left where practical and where worker safety is not compromised. This will include leaving snags, understory vegetation and down woody debris. Residuals will be left consistent with the NFP section of the FMP standard.

7.3.3 Season of Harvest

During the annual planning process, candidate harvest blocks chosen from the Tactical Plan will be screened for suitability for harvest during the frost free summer period. This will be done based on SFVI data, local knowledge of the area and/or information collected from pre-harvest site assessments. Using the results of this screening process, harvest blocks will be designated in the Operating Plan for either summer or winter harvest. This designation may be modified at the operational stage as site conditions can change significantly depending on precipitation received. By carrying out harvest operations during the most appropriate season the Licensees intention is to fulfill mill requirements for summer harvested wood while limiting negative impact to soils.

7.3.4 Slash Management

The Licensees have actively pursued options for the utilization of roadside slash accumulations but have yet to identify an economically viable way in which it can be utilized. Until such time as a use can be found for this material, and to prevent the potential loss of productive forest land from heavy slash accumulations at roadside processing locations, slash will be piled and burned, spread, mulched or a combination of these approaches. Standards and Guidelines concerning slash management will be followed. Burning of winter piles will normally be done after at least one growing season to ensure adequate drying of material and promote good burning. Some summer harvested areas will be burnt in the same operating year. The Licensees will follow the provincial Slash Management Guidelines which strive to have all slash dealt with within two years of harvest. The Ministry's Fire Management Officer in Hudson Bay is advised in advance of the locations and proposed timing of slash burning activities. Maps identifying burning locations are provided to the Ministry upon project completion.

7.3.5 Salvage Harvesting

The objective of the salvage program is to recover volume for the mills from trees that are scheduled to be destroyed for a development or have been killed or damaged by forest fire, insects, disease or a severe weather event.

The first step after becoming aware of an event is to assess the potential merchantability of the wood affected. This is done by consulting forest inventory maps and is often done concurrent with mapping of the event boundaries.

If it is determined that there is potentially merchantable material involved, field assessments are carried out to determine what effect the event has had on the timber and whether there is an economically viable opportunity to conduct a salvage operation. This assessment evaluates the current condition of the wood and the predicted condition by the time a salvage operation can be implemented. Factors such as access, ground conditions, product potential of the wood and the condition of the wood are all assessed prior to any pre-harvest surveys being done.

In a forest fire area, factors such as splitting of severely burnt trees and the presence of charred wood within the stems is considered. In an area damaged by hail, drying potential based on the extent to which the bark on the bole of the tree is split is a prime consideration. In blow down areas, the presence of interior splintering of the wood is considered. Any of these factors have the potential to render the wood unusable in the mill processes.

If it is determined that the wood is suitable for the mills, more extensive work to determine total volumes and volumes per hectare will be done to provide information to be used in a salvage plan that will be submitted to the Ministry.

The intention will be to salvage wood within two operating years after a natural disturbance event in order to minimize the deterioration of wood quality and any negative impacts to regenerating stands as per the NFP standard.

7.3.6 Self-Inspection & Reporting

Section 32(e) of the Forest Resources Management Regulations requires a description of the Licensees' plans for self-inspection and reporting to the Minister.

Self inspection reports will consist of e-mails or letters sent to the Area Forester that deal with ongoing operations and annual reporting. In support of this, the following procedures will be followed:

- The Licensees conduct self inspection on an ongoing basis including regular field visits to active contractor operations.
- The Area Forester will be notified by e-mail or letter before work begins in any block.
- Non-compliances will be reported by e-mail or letter to the Area Forester or designate as soon as practical after they are discovered and verified. If the officer is not available, the non-compliance will be reported to the TIPS Line at 1-800-667-7561. The notice will contain the location and specifics around the non-compliance as well as the action plan to be taken to correct the issue if applicable.
- A standardized post work checklist will be completed following completion of each logging area.
- The Area Forester will be notified by e-mail or letter when a block is complete. This will normally be done once hauling is complete.

Weyerhaeuser and Edgewood carry out internal audits of forest operations annually to ensure compliance with laws, regulations and the SFI standard. Surveillance audits of operations are also carried out by independent auditors in order to verify legal compliance and compliance with the SFI certification standards. Any non-compliance found during those audits will be reported to the Area Forester as described above.

The Licensees have a Road & Watercourse Crossing Inspection Program. The purpose of the program is to inspect FMA roads in both spring and fall to ensure they are functioning properly, and that any required maintenance is identified and carried out in a timely, effective manner.

Watercourse crossing inspections are required for all active maintained roads, as well as closed and winter roads that have major culverts or bridge installations on them.
Inspections are carried out two times per year:

- In spring following the main spring runoff (by May 31st), and
- In the fall (by October 31st), so any required maintenance work can be done prior to freeze-up.

As well, road and watercourse crossing inspections are required following unusually heavy rainfall events (on affected roads only).

Watercourse crossings and cross drain culverts less than 900 mm diameter will receive a drive-by inspection during the spring and fall road inspections to ensure that they are still in effective working order. Any small drainage structure exhibiting signs of blockage by beavers, or other conditions that require maintenance or repair will be identified on a Culvert Inspection Form. A monthly report on work done on crossing installations and maintenance is sent to the Ministry.

7.4 Forest Renewal

The details of the different reforestation activities such as scarification for natural assisted regeneration, natural unassisted regeneration, tree planting, site preparation, regeneration surveys and stand tending are discussed in this section.

7.4.1 Silviculture Strategies

The Licensees are obligated, under the Forest Management Agreement, to renew all harvested areas. Maintaining the long-term productive capacity of the forest is vital to ensuring the continued viability of milling operations on the Pasquia Porcupine FMA.

Maintaining the overall species balance at a landscape level is an important feature of the coarse filter approach to ecosystem-based forest management. Site specific prescriptions may not always attempt to return specific sites to the pre-harvest species association. For example, where past harvesting operations have reduced the white spruce component of the forest, white spruce may be planted rather than returning these sites to the pre-harvest hardwood species association.

To determine the best approach for renewal of individual harvest blocks, pre-harvest site prescriptions are developed. These PHSPs prescribe natural unassisted regeneration, natural assisted regeneration or planting.

7.4.2 Pre-Harvest Site Prescriptions

Pre-harvest site prescriptions (PHSPs) outline a renewal objective for each harvest block and the regeneration method and techniques to be used to reach this objective. Specifically, they identify the proposed harvest system, season of harvest and recommended harvesting equipment, the potential for rutting and compaction if the block is harvested on unfrozen ground, proposed slash abatement and reforestation techniques, predicted forest cover type at rotation, and planting species and density where applicable. Also included, when pertinent, is a description of special methods used to address stakeholder recreational, cultural or traditional concerns and prescriptions to address wildlife concerns within and adjacent to proposed harvest blocks.

7.4.2.1 Post Harvest Review and Prescription Confirmation

In order to ensure that the pre-harvest prescription for a specific block is correct and most likely to meet the succession transitions assumed in the Forest Estate Model, a post-harvest review of the prescription will be done for each harvest block. This will consist initially of a review of the stand types that were harvested and of the volume of hardwood and softwood that was harvested from the block. No further action is required if this review confirms the appropriateness of the prescription. If the review finds discrepancies between the mapped stand types and the ratios of volume harvested, a field visit to the block may be required and a change of prescription warranted. If a change is necessary, a PHSP change form will be completed.

7.4.2.2 Natural Unassisted Regeneration

Natural unassisted regeneration relies on the regenerative characteristics of trees classed as pioneer species to reforest the cutover. No treatment is carried out after the area is harvested. On very wet black spruce areas, special consideration is given to the retention of residual stands and trees for seed sources. Black spruce will regenerate naturally through seeding and through layering. Aspen regenerates primarily through a process called vegetative propagation where roots sprout after the original tree is cut, burned, or dies from another cause.

Natural unassisted regeneration will be the preferred prescription for the regeneration of blocks harvested primarily for hardwood. On a minority of jack pine/black spruce blocks, this will be the prescription as well.

While the vast majority of area harvested for trembling aspen, balsam poplar and white birch will regenerate naturally without any assistance, the Licensees intend, at a landscape level, to maintain the softwood component of H and HS growth types by using the following techniques.

On blocks harvested for hardwood where the softwood component harvested is less than 10% by volume, summer reclaimed roads will be planted to softwood. Associated decking areas will be field assessed to determine where planting is necessary. Reclaimed winter roads (built after December 1st) will not necessarily be planted but will be assessed in a block by block basis to determine if planting is necessary. Where fringes or imbedded S or SH stands greater than 4 hectares within a hardwood block have been harvested, these will be replanted to softwood. For blocks with more than 10% softwood by volume, reclaimed summer roads will be planted and the associated decking areas planted as deemed necessary by a field survey. Winter reclaimed roads will be planted on a case by case basis.

In addition to roads and decking areas, portions of these blocks will be considered for planting in order to maintain the original softwood component. Timely field assessments will be conducted to determine planting requirements. A general rule of thumb will be to plant softwood in proportion to what was harvested from the block.

7.4.2.3 Natural Assisted Regeneration

Natural assisted regeneration refers to creating germination sites for seed left on the cutover through the use of scarification equipment. More specifically, upland screefing is removal or displacement of the organic layer to expose and/or lightly disturb (scarify) the underlying mineral soil. To assist regeneration, the ground is scarified within two years of harvest using either ship's anchor chains or shark-finned barrels with anchor chains where higher levels of disturbance is required. The treatment of the forest floor redistributes the slash and cones left on site and exposes mineral soil creating seedbeds for seed germination. Jack pine regenerates well with natural assisted regeneration and it is within jack pine and jack pine-mixed sites that this treatment is most often prescribed.

In Saskatchewan, this technique is used primarily on jack pine sites but in other provinces, scarification has been successful on black spruce sites as well. The Licensees in consultation with the Forest Service may consider using this treatment on black spruce sites at some point during the term of this agreement. Cones are left on the site after harvest by stump delimbing or carrying back slash. In addition to providing seed, on nutrient-poor soils this will also conserve the nutrients contained in limbs and needles. In the winter, many limbs and cones break off the tree during harvesting and skidding activities, but stump delimbing may still be used.

7.4.2.4 Tree Planting

Planting of cutovers is most often prescribed on areas where natural unassisted or natural assisted regeneration is not likely to result in reforestation of the site back to the desired species association. Species planted include white spruce, black spruce and jack pine.
On sites where heavy vegetative competition may compromise seedling ability to compete, site preparation is prescribed. Site preparation is usually done the winter following harvest with planting taking place during the second spring/summer following harvest.

Planting will be the preferred prescription for the regeneration of blocks harvested primarily for softwood. If there are significant imbedded hardwood stands, field assessments may prescribe that those portions of the block be left for natural regeneration. In cases where HS stands imbedded in the softwood block have been harvested, these sites will be given specific consideration for planting to promote the maintenance of the HS type on the landscape.

The objective of the planting program will be to maintain, at a landscape level, softwood and hardwood in the same proportion as currently exists and to regenerate the sites with the same softwood species as is harvested. Black spruce will be planted on black spruce sites and white spruce planted on white spruce sites. Jack pine sites are not normally planted but this may be done if regeneration following scarification is unsuccessful or if scarification is contra-indicated due to soil/moisture conditions. The target planting density for all softwood species is 1200 stems per hectare.

All seed needed for the tree planting program originates within the FMA. Whenever possible, seedlings will be planted within the provincial seed zone from which the seed is collected in compliance with the FMA Standards and Guidelines for Conifer Seed Supply.

7.4.2.5 Understory Protection

The prescription of understory protection is used to protect a softwood understory where it will facilitate the transition of an H or HS stand to a future HS or SH stand. Understory protection in H stands or in HS stands, will require a minimum of 100 stems per hectare reasonably spaced throughout the area that is going to be tracked as understory protection for the purposes of succession. For example, in a 200 hectare block, if the understory protection is only applicable to 15 hectares, that is the only portion of the block that will be counted towards meeting this prescription. Scattered understory that is protected will not be counted but will contribute to maintaining the softwood component of the forest.

7.4.3 Site Preparation for Planting

Most sites are planted without site preparation or with manual screefing at the time of planting. Where necessary, harvested sites are prepared prior to tree planting. An area is site prepared if competing vegetation, excess debris, or a thick duff layer is expected to limit planting densities and the eventual success of the plantation. In many cases, access to these sites is limited and most harvesting work is completed during frozen ground conditions (December to March).

Numerous site preparation tools have been experimented with and used operationally. Currently, the most common tool used on the Pasquia Porcupine FMA is a dozer mounted shear blade. For decompaction in road rehabilitation; either a hoe mounted rake or a dozer mounted ripper tooth plow/sub-soiler is employed.

Shear blades and v-plow are used to provide a temporary release from competing vegetation by removing the upper portion of the organic layer without disturbing or exposing the underlying mineral soil. This technique is also used to align slash for ease of tree planting.

7.4.4 Third Party Operators

Volumes adequate to fulfill third party allocations are incorporated in the Tactical Plan. The Forest Management Agreement requires Third Party Operators to pay forest management fees into the Weyerhaeuser Forest Management Trust Fund or the Edgewood Forest Renewal Trust Fund as applicable. Reforestation of land harvested by third party operators is then carried out by the Licensees.

Over the past several years, efforts have been made to better incorporate the activities of independent operators with the Licensees' Annual Operating Plan. This improves the opportunity to effectively regenerate these areas.

7.4.5 Regeneration Assessment

Regeneration surveys are a long standing method of monitoring the regeneration success of harvested sites across the FMA area. All blocks harvested between November 1, 1995 and March 31, 2007 have had surveys completed and the results have been submitted to the Forest Service. This submission included Third Party harvest blocks.

All surveys conducted during the term of this FMP will follow the Forest Regeneration Assessment Chapter and Standard except where specific exemptions have been approved by the Forest Service.

7.4.6 Reforestation of Backlog Areas

A backlog (pre-October 1995) of not sufficiently restocked (NSR) areas exists on the Pasquia Porcupine FMA area as a result of the previous logging practices of former companies operating on the FMA. Reforestation of these sites to softwood is the responsibility of the province.

Natural disturbances such as fire occur regularly on the FMA. Historically, fire has had the most dramatic effect on the province's forested land base. It is the intent of the Licensees to allow natural regeneration and succession to occur in areas of burnt forest. Burnt cutover areas not likely to regenerate naturally are considered to be NSR, and the decision regarding treatment of these areas is made on an individual site basis.

7.4.7 Silviculture Contractors

The License holders use independent contractors to complete most of the silviculture work on the FMA. Silviculture work is awarded either by a tendering process or an allocation process. Periodically, silviculture activities are tendered to ensure competitive pricing. The Licensees also strive to provide continuing opportunities for First Nation and Métis contractors who live on or adjacent to the FMA. There is value in having an experienced and reliable contractor base that understands the importance of safety, quality, and environmental standards.

7.4.8 Stand Maintenance

The objective of stand maintenance is to reduce the density or enhance the survival and growth of trees in regenerating areas. This will either enhance the successful regeneration of planted seedlings or encourage growth of naturally regenerated sites.

Cleaning is the most common stand maintenance technique used on the FMA. In order to ensure the successful establishment of certain plantations some form of removing competing vegetation may be needed. Brush saws are currently the only tools used for this operation. During cleaning, all shrubs and aspen competition are cleaned for a minimum of one metre around planted trees.

A demonstration project began in 2006 employing a variety of techniques to control competition in plantations. These techniques included brush saws, brush saws with herbicide applicators, and plots where herbicide was applied around the crop trees using back pack sprayers. In 2007, this project continued with the use of aerially applied chemical site preparation on approximately 50 hectares of cutover. In 2008, the project was completed with an aerial application of herbicide to release established plantations. Future use of these techniques on the Pasquia Porcupine FMA will be informed by the results of this demonstration

project.

7.5 Roads

7.5.1 Road Development

Efforts will be made to build all summer roads and stream crossings at least one year in advance of logging. Ideally, in-block road construction for both summer and winter blocks will occur one year before the block is scheduled for harvest. All rights-of-way will be pre-logged.

The locations of roads proposed for construction will be plotted in their tentative locations on the AOP maps. Main haul and inter-block roads will be built with a maximum deviation of 100 metres from the proposed center line. Road locations exceeding these limits will be submitted to the Area Forester as amendments to the plan. In-block roads will be located where it is prudent to do so with the goal of minimizing the amount of disturbance.

The Tactical Plan will include the approximate location of proposed main roads for the next twenty years. Road development will comply with the DFO/SE *Fish Habitat and Protection Guidelines: Road Construction and Stream Crossings.*

7.5.2 Road Maintenance

Regular maintenance of active roads will be conducted throughout the year. Maintenance activities may include, but are not limited to, grading, ditch work, clay capping, snow-plowing, gravelling, right of way brush clearing, removal of accumulated debris or ice from culverts and bridges and/or replacement/repair of these structures, re-vegetation of ditch slopes and stream crossing approaches, etc. Where maintenance work is required for stream crossing structures, the appropriate permits will be acquired in advance and conditions/requirements followed.

7.5.3 Road Closure & Reclamation

Roads will be closed or reclaimed as per requirements contained in the FMA Standards and Guidelines. Existing and proposed closures will be shown on 1:15,000 maps as part of the annual operating plan. Closures built during the year will be identified in the next AOP submission.

Where existing locked gates are the method of temporary closure, both the Ministry and company staff have been provided keys. Any stakeholder requesting keys will be directed to the Ministry. The Ministry is responsible for deciding which stakeholders, if any, shall be provided keys and allowed to access roads behind these gates. If stakeholders are provided

gate keys by the Ministry, the Licensees request notification. To carry on normal forest management activities (e.g. timber cruising and inventory, silviculture activities and surveys, road and block layout, road and crossing maintenance), Licensees' staff and/or contractors will occasionally work behind road closures. Licensees' staff will control this activity, and provide keys to staff or contractors that require access to these areas.

7.5.4 Specifications

Road construction will be as per the current FMA Standards and Guidelines but may evolve over the term of this FMP as the linear Corridor chapter of the Saskatchewan Environmental Code is developed.

Table 7.3 Road Specifications

Road Class	1	2	3	4
Definition	All weather primary access. Accessing multiple operating areas.	Winter or summer secondary access. Typically graveled in the summer. Typically accessing more than one operating area.	Winter or summer tertiary access. May be graveled. Typically accessing one or more harvest blocks.	In-block originates and ends within the same block. Used for the decking and transport of wood from within the block. May have surface material applied (gravel, sand or clay).
Life Expectancy	Permanent	5 - 20 years	1- 15 years	< 2 yrs after harvest
Maximum Right of Way Width	40 metres	30 Metres	20 - 30 Metres winter/summer	N/A
Road Driving Surface Width	8.0 - 10.0 m	7.0 - 8.0 m	< 7.0 m	N/A

7.6 Forest Management

7.6.1 Harvest Events

In keeping with guidance received from the Forest Service and Fish and Wildlife Branch of Saskatchewan Ministry of Environment, block design in this Forest Management Plan endeavors to facilitate completion of harvest, renewal work and road reclamation in each harvest event in as short a time as possible. This will minimize the duration of access and thus mitigate the impact on wildlife. This is of particular importance in the portion of the FMA that is within woodland caribou range.

Weyerhaeuser and Edgewood have worked with the Forest Service and other industry players on the development of a standard for emulating Natural Forest Patterns (NFP). Research indicates that not only are some natural disturbances much larger than harvest blocks have been in the past, but that they are also much more complex, with unburned islands, clumps and peninsulas. The NFP principles for block and event design have been incorporated into the Tactical Plan.

Blocks in this Tactical Plan are now somewhat larger and collectively form “events” that will be analyzed for conformance to the NFP standard. Under the NFP standard the amount of standing unharvested material left within event boundaries will be 9% rather than the 2% leave approved in the 1999 Forest Management Plan.

7.6.2 Egressive Harvest

In consultation with the Ministry, a number of operating areas have been identified that are suited to the utilization of an egressive harvest strategy. The Ministry feels that an egressive harvest strategy will benefit wildlife by limiting the amount of time that main access roads are open in a given operating area. This strategy involves building the main road to the back end of an operating area in the first year of harvest. Harvesting in that first year takes place at the end of the road. The road used during that year is then reclaimed or closed. Egress from the area begins in subsequent years with harvest blocks planned sequentially closer to the beginning of the road. Reclamation or closure of the main road and feeder roads is done annually. This strategy will be employed where logistics and economics allow.

7.6.3 Lake and Stream Buffers

The lakes and streams identified on the Tactical Plan maps have been assigned fisheries buffers based on the Ministry of Environment's 1979 *Guidelines for the Protection of Aquatic Habitat during Forest Operations* modified as per 2009 discussions with Ministry Fisheries Biologist Murray Koob. The main variance is that all lakes greater than 5 hectares in size with unknown fisheries potential were assigned a designation of "30 metre buffer but requiring conformation" rather than the old designation of "90 metres pending a fisheries examination". The calculations in the Forest Estate Model have incorporated these buffers into the HVS calculations.

Buffer strip widths are based on a combination of drainage basin size and ability of the watercourse to support game or commercial fish species. Any stream or lake not capable of supporting fish and not connected to a recognizable stream system requires no buffer. Any stream with a gross drainage area of less than 50 km^2 but lacking commercial or game fish species requires a buffer of 15 m. Those streams with gross drainage basins larger than 50 km^2 require a buffer of 30 m. Finally, those streams possessing fish population suitable for angling and capable of supporting a fish population introduced by stocking require a 90 m buffer.

These buffer requirements have been, in some cases, applied to interpolated or assumed stream locations. Licensees' staff will drop mapped buffers if onsite inspections determine that these interpolated streams do not actually exist.

When encountered during pre-harvest surveys or during operations, unmapped streams will be assigned a 15 metre reserve pending discussions with Forest Service staff.

Some trials have been done with active management of stream buffers recently. These trials have included reach in harvesting with machine free zones and variable width buffers depending on stream bed development. The Licensees anticipate further trials during the term of this FMP and will cooperate with the Forest Service to arrive at Best Management Practices for harvest within these buffers when such harvest is appropriate.

Fifteen metre buffers can be waived by a Forest Service inspecting officer for forest management reasons such as flooding, forest health, blow down potential, etc. Reductions on streams designated for 30 or 90 metre buffers will require approval of a Ministry Fisheries Biologist.

Table 7.4 Pasquia Porcupine Fisheries Buffer Key

Pasquia Porcupine Fisheries Buffer Key		
Buffer Width	**Colour**	**Description**
Zero	Yellow	No buffer
15 metres	Green	No fish/part of a system
30 metres	Blue	Watershed greater than 50 km2
30 metres	Purple	Pending oxygen testing
90 metres	Red	Known or suspected fish bearing

Ponds created by beaver dams are transitory and vary in size and shape over time. Unless otherwise indicated on the maps, buffers have been applied from the original stream channel not from the beaver pond edge.

Crossing structures associated with this plan will be constructed following the Saskatchewan Environment/Department Fisheries and Oceans *"Fish Habitat Protection Guidelines: Road Construction and Stream Crossings"*, and the requirements and conditions identified in Aquatic Habitat Protection Permits.

7.6.4 Heritage Resources

Proposed operating areas, road locations, and site-preparation areas will be submitted to the Heritage Conservation Branch of Saskatchewan Parks, Culture, and Sport for screening for heritage potential. Roads, harvest blocks and site preparation areas deemed to have high potential for heritage resources will undergo on-site surveys by qualified archeologists. Areas with significant findings resulting from these surveys will be identified and reported to Heritage Branch by the archaeologist with recommendations for mitigation of impacts. These recommendations, if approved, will be incorporated into operational activities to prevent site disturbance.

7.6.5 Visually Sensitive Areas

A Visually Sensitive Areas (VSAs) map has been created for the FMA. This map designates areas visible from communities, public recreation areas and significant lookouts on major travel corridors. Many visually sensitive sites are not included on the map as they were incorporated

into the Representative Areas Network as part of the IFLUP process.

Visual Quality Objectives (VQOs) are resource management objectives for landscapes that fall within visually sensitive areas. These reflect the desired level of protection of visually sensitive areas. When harvesting is proposed within visually sensitive areas, the planner will consult with non-timber users and communities that may have an interest in these sites. The FMAC and the Annual Operating Plan public meetings will be the primary vehicle whereby this is accomplished. The planner will design the block to meet the objectives. Some of the techniques used include changing the shape of a block, concentrating leave trees in certain areas and leaving patches of standing trees in critical areas.

This Forest Management Plan does not make allowance for routine buffering along roads and highways. In areas where harvesting adjacent to Highways is likely to be perceived as unsightly, efforts will be made to mitigate this using techniques such as retaining the brush layer adjacent to the right of way and positioning leave patches strategically within the harvest block.
The VSA map will be updated periodically as new information is gathered and new priorities set.

8.0 Integration of Forest Management Activities with Non-Timber Uses

In consultation with Saskatchewan Environment, Weyerhaeuser and Edgewood will work diligently with other users of the land base to optimize the integration of the many different activities that take place on the Pasquia Porcupine FMA.

The Pasquia Porcupine Integrated land Use Plan (PP IFLUP) has been the primary vehicle used for the integration of non-timber uses with those of the Licensees. Subsequent to the PP IFLUP coming into effect in 1998, the recommendations contained within were used to guide the development of the 1999 Twenty Year Forest Management Plan.

The public advisory group involved with the development of the IFLUP was asked to stay on and form a Forest Management Advisory Committee (FMAC) to provide advice to government and industry on the development and implementation of both the IFLUP and the Forest Management Plan.

It is the intention of the current Licensees to continue to use the FMAC as the primary sounding board for the integration of the IFLUP recommendations with this 2015 Forest Management Plan.

The FMAC is kept abreast of changes in the science affecting forest management on the Pasquia Porcupine FMA. Periodic presentations are made to the committee by experts on subjects such as moose management, reforestation, cumulative effects of land use, protected area management, management of rare, threatened or endangered species and emulating natural disturbance. A number of the members have been serving in an advisory capacity for twenty years now and the expertise they have accumulated in that time is very valuable to both the regulator and to the Licensees.

It is anticipated that the PP IFLUP will be revisited in the upcoming years to bring it up to date with the myriad of changes that have taken place over the last 17 years. The Licensees look forward to participating in this process.

In addition to meeting with the FMAC, Weyerhaeuser and Edgewood staffers meet throughout the year with a variety of stakeholders who have interests in the area of the FMA in which harvest is taking place. These individual meetings supplement the annual open house consultation meetings that are held in communities throughout the north east each autumn.

During the term of the 1999 FMP, management guidance has evolved through the creation of FMA standards, the development of provincial standards and most recently the proclamation of the Saskatchewan Environmental Code. The first Chapters of the code dealing with forest management came into effect on January 5, 2015 and were adopted by the Licensees at that time.

As part of the Forest Management Planning Chapter of the Environmental Code, the planning hierarchy spanning the range from the IFLUP to the Block level pre-harvest site prescription is laid out. This is described in section 1.1 of this plan. Weyerhaeuser and Edgewood the current Licensees are committed to compliance with all levels of the Environmental Code.

In addition to meeting the legal requirements aimed at promoting sustainable forest management, both Edgewood and Weyerhaeuser have voluntarily had their forestry operations certified to the Sustainable Forestry Initiative. SFI Inc. is an independent, nonprofit organization that is solely responsible for maintaining, overseeing and improving the internationally recognized Sustainable Forestry Initiative® (SFI®) program.

Adherence to the principles (*5. Aesthetics and recreation, 6. Protection of Special Sites* and *11. Community Involvement and Social Responsibility)* of the SFI standard will assist the Licensees in addressing potential forest management issues relating to the conservation of non-timber values on the FMA.

Weyerhaeuser and Edgewood will work diligently with Saskatchewan Environment and other stakeholders to optimize the integration of the many different activities that take place on the FMA.

Table 8.1 Integration of Non-timber Values and Uses

Non-Timber Value	Strategy to Maintain Value
1. High value non-timber forest products  	Currently there is minimal commercial use of non-timber resources such as mushrooms, berries, floral products, etc. There is however a substantial amount of activity by local people gathering berries and mushrooms for personal consumption. Traditional access roads used by local people to gather berries and mushrooms will be retained as allowed by government regulation. Seasonal road closures that are required to maintain the integrity of haul roads during wet periods have been common practice since the 1990s. This practice will continue. New entrants to the gathering of non-timber forest products will be referred to Saskatchewan Environment field offices for guidance on regulations. When evidence of demand for high value non-timber forest products is identified on the FMA, Weyerhaeuser and Edgewood will work with the proponents to facilitate the harvest whenever possible.
2. Visual Resources 	The Licensees have worked with the government on identifying the primary viewscapes on the FMA and most of these have been incorporated into the Representative Areas Network. An updated Visually Sensitive Areas (VSA) map for the rest of the FMA will be created as part of this FMP process. The VSA map will be submitted to the Ministry and will be updated periodically as new information is gathered and new priorities set. Visual Quality objectives will be set for individual blocks as required on an annual basis during the planning process.
3. Recreation Areas 	Prior to carrying out any harvest adjacent to recreation areas the Licensees will assess the potential impact on the area and put mitigation measures in place which may include buffering, harvest design or harvest timing. The Licensees will work with recreation users such as snowmobile clubs to rationalize the use of established trails.
4. Watersheds	The integrity of watersheds on the FMA will be protected through monitoring on a five year cycle of the area that is in Equivalent to Clear cut Condition (ECC). Equivalent to Clear cut condition is a measure

Non-Timber Value	Strategy to Maintain Value
	of the extent to which a watershed has recovered from a disturbance such as clear cutting or fire. As the regenerating forest grows, the site slowly regains the water retention capabilities that existed prior to disturbance. Harvesting throughout the FMA will be conducted using the Natural Forest Patterns standard as a guide and in accordance with an approved Forest Management Plan. This will ensure the harvest is distributed both spatially and temporally throughout the FMA rather than concentrated in any specific watershed. When watershed issues arise in relation to forest management, the Licensees will seek guidance from the Water Security Agency and/or the Carrot River Watershed Authority and any other Watershed Authority that may be established.
5. Lakes and Streams 	Lakes and streams throughout the FMA will be protected by the use of Best Management Practices when working near those water bodies. Buffers of 15, 30 and 90 metres (these buffers are designated according to fisheries potential criteria established by Saskatchewan Environment) will be established on mapped lakes and streams and management activities within these buffers carried out only after approval by the appropriate government authorities. Watercourse crossings will be constructed, maintained and reclaimed in compliance with federal and provincial legal requirements and internal standard operating procedures. Unmapped streams will be assessed as they are encountered and protected according to the classification and rules assigned to them.
6. Wildlife Habitat 	The Licensees will incorporate a caribou management plan into the Twenty Year Forest Management Plan. This plan establishes Conservation and Special Management zones within caribou range. The Licensees have worked with the Forest Service on the development of the Natural Forest Patterns Standard with the goal of ensuring the maintenance of habitat for all species currently present on the FMA. The best available information with regard to the habitat requirements will be referenced with respect

Non-Timber Value	Strategy to Maintain Value
 	to the planning and implementation of forestry activities Mineral licks, bear dens and other important wildlife features will be protected when they are encountered. Wildlife leave trees will be left in individual harvest blocks and known or newly discovered stick nests will be left undisturbed Harvest timing and buffer recommendations from the Saskatchewan Activity Restriction Guidelines will be used to assist in avoidance of key habitats of sensitive species during sensitive periods.
7. Archeological and Cultural Resources  	Digital shapefiles of all planned harvest blocks will be forwarded to the Heritage Conservation Branch for assessment of archeological potential. A qualified archeologist will be hired to do an assessment of all harvest blocks or roads which the Heritage Conservation Branch deems to have high potential for the discovery of artifacts. Sites may be identified through the public consultation process. Such sites and sites of archeological or cultural importance that are encountered during forestry activities will be reported to the Heritage Conservation Branch as per requirements. Known or newly discovered sites will be protected by appropriate mitigation measures as set out by the Heritage Conservation Branch. Known or newly discovered gravesites or other culturally important sites will be protected in a respectful manner.
8. Traditional Use by First Nations and Métis	Several traditional use areas have been identified on the FMA where various First Nations traditionally

Non-Timber Value	Strategy to Maintain Value
 	gather to hold culture camps or ceremonies. The First Nations concerned will be consulted prior to the conduct of forestry activities adjacent to these sites. The Licensees commit to working with First Nations and Métis people to identify culturally important sites. These are recorded and tracked in the PP FMA Geographic Information System. Sundown or other traditional use structures will be buffered by a minimum of 90 metres. The Licensees will respect the treaty rights of First Nations and the aboriginal rights of the Métis people who traditionally use the land within and adjacent to the FMA. The will work with First Nations to mitigate any impact to known or newly identified areas of value such as those used for harvesting teepee poles or gathering medicinal plants.
9. Outfitting and Tourism 	The Licensees will hold operating plan meetings to share information with and gather input from outfitters and tourism operators. The Licensees will support the Forest Management Advisory Committee on which the Saskatchewan Outfitters Association and Tourism Saskatchewan have representatives. Where possible, the Licensees will work with outfitters or tourism operators with regard to the timing of forestry activities in order to mitigate the impact on their business.
10. Trapping 	Trapping cabins will be buffered by a minimum of 90 metres. The Licensees will support the Forest Management Advisory Committee on which the Saskatchewan Trappers Association has a representative. The Licensees will hold operating plan meetings to share information with and gather input from trappers. The Licensees will work with trappers to mitigate the impact of forestry activities on their trap line.

Non-Timber Value	Strategy to Maintain Value
11. Fishing 	Commercial fishing lodges or cabins used by commercial fishers will be buffered from harvest operations by a minimum of 90 metres. Water bodies suitable for recreational fishing will be buffered by the appropriate buffer as set by Saskatchewan Ministry of Environment. In most cases this will be a 90 metre buffer The Licensees will hold operating plan meetings to share information with and gather input from recreational and commercial fishers that may be directly affected by planned harvest.
12. Hunting and Recreation Cabins 	Hunting/Recreation cabins will be buffered by a minimum of 90 metres. Access to cabins will be maintained that is similar to what existed prior to harvest/road building. Operating Plan meetings and the Forest Management Advisory Committee will be used as communication vehicles to keep cabin owners informed of the areas in which the Licensees will be operating. For safety reasons, hunting will be restricted within active forestry operations. This will be in active operations, as per provincial regulations.
13. Petroleum, Mineral, Aggregate and Peat Exploration and Development 	The Licensees will seek to identify and implement opportunities for the joint use of forest roads in order to minimize the impact on the environment. The Licensees will seek the cooperation of any developers in respecting the Caribou Management Plan on the FMA. The Licensees will seek to minimize the cumulative impact that multiple forest users may have on the environment.
14. Agriculture 	The cultivated agricultural land within the FMA boundaries has all been excluded from the Forest Management Agreement area. The only agricultural activities that take place on the working land base of the FMA are grazing and haying. The haying takes place in natural meadows. Saskatchewan Environment regulates all such activities within the FMA. The Licensees will work cooperatively with any individual conducting haying operations. Road and transportation safety is the prime area of potential interaction.

Non-Timber Value	Strategy to Maintain Value
15. Range Values 	Saskatchewan Environment issues leases on several tracts of land within the FMA on which ranchers graze their cattle during the summer months. The Licensees will work with these lease holders when harvesting in these areas and attempt to accommodate their interests. Notification of harvest intentions will be communicated through the Operating Plan consultation process.
16. Rural Municipalities and Highways 	Several Rural Municipalities have aggregate leases within the FMA. The Department of Highways has a network of highways, stockpiles and aggregate pits within the FMA. The Licensees will seek to work with these entities to minimize cumulative impact on the environment through the use of road agreements, adjacent pit locations and by salvaging fibre from pit locations and access roads.
17. SaskPower 	SaskPower has a major hydroelectric development within the FMA and has a network of power transmission lines throughout the FMA. The Licensees will work with SaskPower to salvage usable fibre from rights of way in order to minimize negative impacts to the environment.
18. Forest Service Silviculture Unit 	The Forest Service Silviculture Unit has committed to carry out reforestation activities on 70,000 hectares of Non Satisfactorily Regenerated (NSR) land on the Pasquia Porcupine FMA. This project was initiated during the term of the 1999 FMP and will be completed during the term of the 2015 FMP. The Licensees will cooperate with the Silviculture Unit to communicate with stakeholders through joint Operating Plan meetings and to minimize the loss of fibre in proposed site preparation areas.
19. Rare Plants 	When rare plants are identified in any planned harvest blocks, the Licensees will institute mitigation measures to minimize the impact of harvest on these plants. This may include moving road locations, including the plants in a leave patch or other avoidance techniques.

Non-Timber Value	Strategy to Maintain Value
20. Snowmobile Trails 	There are many miles of permitted snowmobile trails on the FMA. These trails are maintained by local snowmobile clubs under authority from the Ministry of Environment. The FMA holder will invite snowmobile clubs that may be affected by harvesting to participate in the public consultation process. Accommodation of the club's concerns will take place where practical. The design of alternate routes, parallel trails, warning signs and temporary closures have been some of the methods employed to ensure safety for the snowmobiling public.

9.0 Wildfire Management

The Wildfire Act provides the legal framework to protect and manage Saskatchewan resources in relation to wildfire. The provincial government is responsible for wildfire suppression efforts within the provincial forest in general and within the Pasquia Porcupine Forest Management Area in particular.

The responsibilities of the FMA holder are defined in the Pasquia Porcupine Amended and Restated Forest Management Agreement (2013). These include:

- The annual submission of a Fire Prevention and Preparedness Plan;
- Providing and maintaining at their own expense, in good working order, such firefighting equipment as may be specified in its Fire Prevention and Preparedness Plan and to make such equipment available to the Minister for the purpose of wildfire suppression when a wildfire occurs in or adjacent to the Licence area;
- Taking wildfire protection and suppression principles into account in the preparation of operating plans;
- Training field employees in wildfire suppression techniques and in the use of firefighting equipment;
- Cooperating in wildfire prevention and suppression information programs for the public.

Figure 9.1 Licensee Staff Working on the Leaf Fire

The province's Forest Fire, Forest Insect and Disease Policy Framework (2003) was developed to provide direction for the Ministry and Licensees regarding how wildfires will be managed on the landscape. This framework represents a fundamental shift from wildfire control and suppression to wildfire management and planning.

This framework includes recognition that the boreal forest is a fire dependent ecosystem. Where opportunities exist and support resource management objectives, wildfire will be used to protect, maintain and enhance forest resources and be allowed to perform its natural ecological role. Emulation of wildfire characteristics through harvesting practices will be employed based on the best scientific information currently available.

9.1 Forest Protection

Weyerhaeuser and Edgewood have incorporated consideration of wildfire management issues into the forest estate modeling process in two ways. These involve directing the model to target the oldest, most vulnerable softwood stands first and by having the model create a range of events that emulate natural forest patterns. The Draft Natural Forest Patterns Standard has been used to guide the model in carrying out this exercise.

In order to optimize the model's ability to target appropriate areas for harvest, the inventory has been grown ahead to update stand ages and updated to include recent wildfires, completed harvest blocks and changes in road infrastructure.

9.2 Values at Risk

The Licensees have provided information to the Wildfire Management Branch (WFM) to assist them in creating a map designating wildfire protection priority areas within the FMA. The timber protection priorities of the forest companies are used in combination with a database containing the spatial locations of communities, subdivisions, cabins and other values to create a priority protection map for reference in high wildfire risk conditions with multiple wildfires and limited resources.

The Licensees submit an annual Fire Protection and Suppression Plan by April 1st of each year and keep the Ministry informed of the location of temporary work camps, tree planting and harvesting crews.

During the term of this Forest Management Plan, Weyerhaeuser and Edgewood will train their employees in wildfire suppression techniques and in the use of firefighting equipment for

emergency response to wildfires requiring suppression action as per the FMA Agreement. Where there exists a danger to any communities from wildfire, the Licensees will cooperate with WFM in wildfire prevention and suppression information programs for the public. This may include accepting delivery of wood removed from around communities as part of the FireSmart program. FireSmart is a program which encourages and teaches communities and individuals to remove combustible material from proximity to dwellings and out buildings.

In the event that a wildfire in the Licence Area is caused by the wilful act or negligence of its employees, agents or contractors, Weyerhaeuser or Edgewood, as the case may be, will ensure actions are taken to control and suppress any such wildfire as per commitments in the Forest Management Agreement (Section 15.02). T

In any area where forest management activities are being conducted, the Licensees will also action any other fire as per Sec. 19(3) of the Wildfire Act.

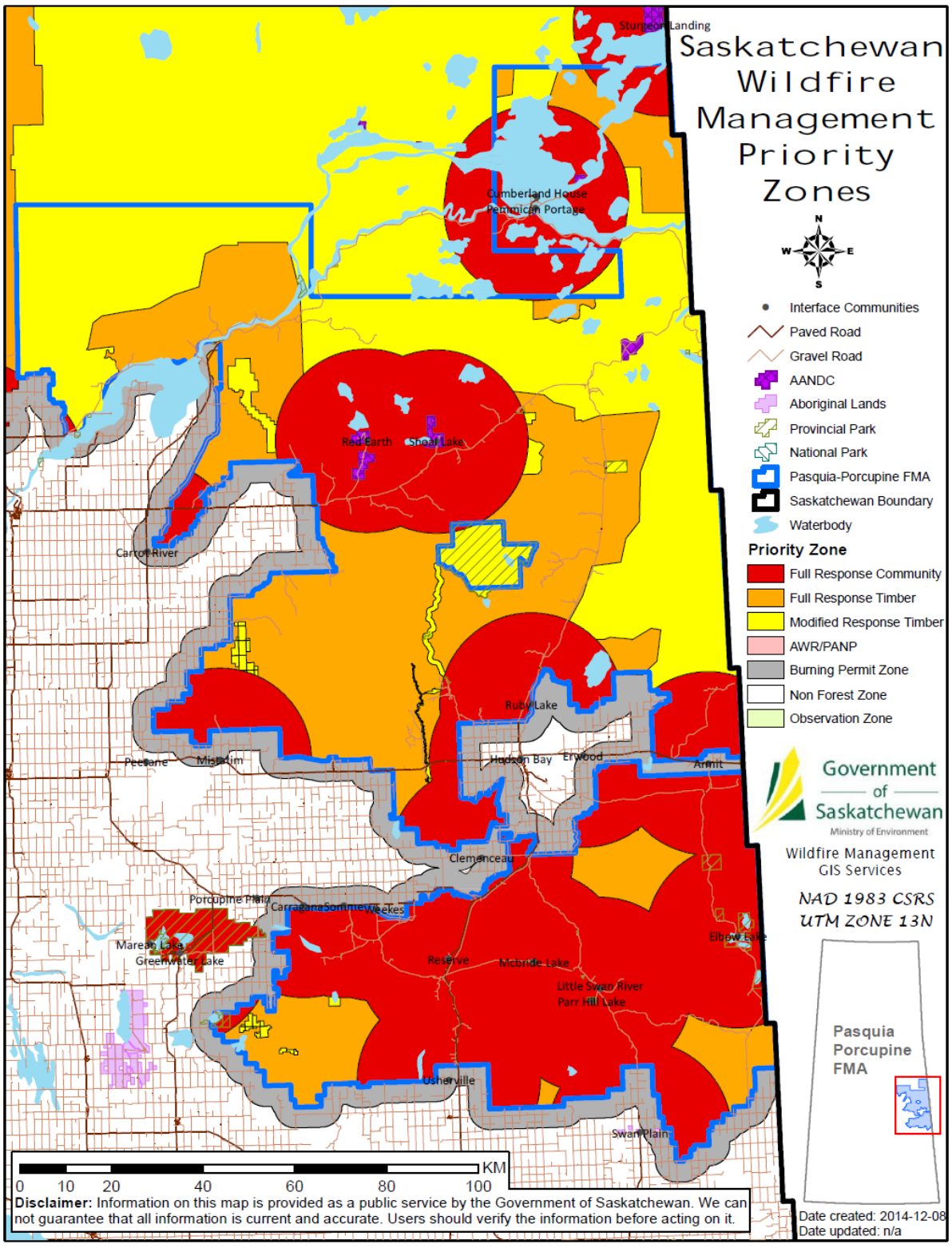

Figure 9.2 Wildfire Management Priority Response Zones

10.0 Forest Insect and Disease Management

Disturbances caused by native insects and diseases occur sporadically across the landscape at variable intensities and extents and these natural disturbance factors are part of a functioning forest ecosystem. Severe outbreaks of these disturbances can threaten the sustainability of the forest industries and the communities that depend on them. Weyerhaeuser and Edgewood will collaborate with the Forest Service with regard to the management of forest insects and diseases during the term of this Forest Management Plan. This may involve a wide range of management approaches including harvesting highly susceptible stands or salvage logging.

10.1 Strategy for Forest Insect and Disease Management

10.1.1 Eastern Spruce Budworm

Figure 10.1 (L) Eastern Spruce Budworm Larva (R) Budworm Damaged White Spruce

Despite its name, the eastern spruce budworm (*Choristoneura fumiferana*) is an insect native to Saskatchewan. The eastern spruce budworm is one of the most widely distributed forest pests with a range extending from the East Coast of Canada to Alaska. In Eastern Canada, dense forests of balsam fir are budworm's primary host. In Saskatchewan, white spruce has been the primary host. In May and June each year, the larval stage feeds on the young buds and needles of the host. In high density conditions, larval feeding extends to previous years foliage. Significant loss in tree vigour can result and if severe defoliation persists for several years, tree mortality begins to occur.

Over the course of the past three decades, beginning in 1982, there has been a persistent outbreak of the eastern spruce budworm on the Pasquia Porcupine FMA. According to provincial reports, there were no reports of moderate or severe defoliation in the 2014 aerial

surveys. This suggests that the outbreak in the province has now collapsed and as of this writing, the outbreak appears to have subsided in the Pasquia Porcupine FMA.

Initial attempts to keep ahead of the infestation by harvesting affected mature spruce stands proved fairly successful during the first decade but by the mid 1990's, the outbreak was extensive and stand mortality was occurring.

A spray program was initiated using the biological control agent, *Bacillus thuringensis* var *kurstaki* (Btk). In order for a spray program using Btk to be effective, it must be applied when the insect reaches the third or fourth instar stage of larval development and best results are obtained with a second treatment of the area within a week.

The tactics that will be used during the term of this Forest Management Plan to deal with spruce budworm are:

- Assist in monitoring infestation levels by providing field reports when infestations are encountered to supplement the annual insect and disease monitoring flights carried out by the Forest Service;
- Work together with Forest Service Insect and Disease Expert to review annual survey data to identify and risk rate stands so that, where appropriate, highly susceptible stands at risk can be targeted for harvest;
- Cooperate with the Forest Service in setting priorities for potential spray programs.

10.1.2 Jack Pine Budworm

Figure 10.2 (L) Jack Pine Budworm Larva (R) Severely Defoliated Pine

The jack pine budworm (*Choristoneura pinus pinus*) is a native insect that feeds almost exclusively on jack pine. Unlike the spruce budworm, its outbreaks are highly eruptive but

seldom last more than three years. Outbreaks occur at approximately 10-year intervals (Volney, 1988a). Outbreaks tend to develop in mature jack pine stands growing on drier sites. At the southern extreme of its range, jack pine budworm outbreaks may occur more frequently, at 5 or 6-year intervals. The consequence of these outbreaks is a period of elevated tree mortality. The amount of mortality sustained depends on the intensity of defoliation. In the outbreak in the Torch River area in the 1990s, a volume loss of 18% (of standing volume) was sustained in an outbreak that lasted two years (Volney, unpublished manuscript).

The tactics that will be used during the term of this Forest Management Plan to deal with jack pine budworm are:

- Assist in monitoring infestation occurrences by providing field reports when infestations are encountered to supplement the annual insect and disease monitoring flights carried out by the Forest Service;
- Where appropriate, target infested stands for salvage harvest.

10.1.3 Forest Tent Caterpillar

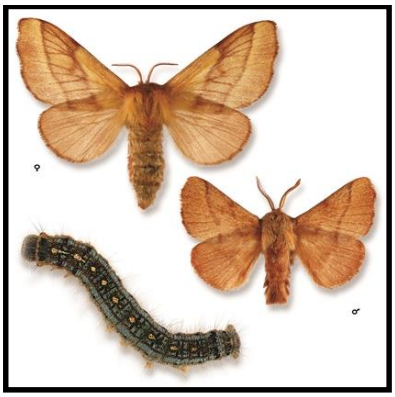

Figure 10.3 (L) FTC Stages (R) Defoliation Caused by Forest Tent Caterpillar

The forest tent caterpillar (*Malacosoma disstria*) has one of the widest ranges of native forest insect pests in North America. On the Pasquia Porcupine FMA its defoliation is confined mainly to aspen dominant stands. There have been several outbreaks of varying intensities in recent memory. The length of each outbreak appears to be related to weather conditions. Most outbreaks last two or three years during which the weaker trees in aspen stands die. In areas of the province where outbreaks have coincided with drought, extensive mortality has occurred.

No actions to control the forest tent caterpillar have been undertaken on the Pasquia Porcupine FMA. In some park areas, limited spray programs using a Btk spray have been initiated in recent years.

The tactics that will be used during the term of this Forest Management Plan to deal with forest tent caterpillar are:

- Assist in monitoring infestation occurrences by providing field reports when infestations are encountered to supplement the provincial database;
- Cooperate with the Forest Service should a Btk based spray program be necessary.

10.1.4 Large Aspen Tortrix

Figure 10.4 (L) Large Aspen Tortrix Larva (R) Rolled leaf

The large aspen tortrix (*Choristoneura conflictana*) is a leaf roller and defoliator of aspen. Although the literature indicates that widespread outbreaks are common, no major outbreak has been reported on the Pasquia Porcupine FMA. Outbreaks often coincide with those of the forest tent caterpillar. They usually last two to three years and then suddenly collapse. Outbreaks only occur where aspen is abundant. On the Pasquia Porcupine FMA, the large aspen tortrix seems to affect stands on drier sites such as those in the Piwei Valley.

The tactics that will be used during the term of this Forest Management Plan to deal with Large Aspen Tortrix are:

- Assist in monitoring infestation occurrences by providing field reports when infestations are encountered to supplement the provincial database.

10.1.5 Terminal Weevils

Figure 10.5 White Pine Terminal Weevil Damage

The white pine weevil (*Pissodes strobi*) produces a conspicuous injury to the terminal growth of young spruce trees. In late spring, new growth wilts and dies back. The affected terminals wilt into a 'shepherd's crook' form and the needles die and drop off. As a result, affected trees have stunted growth and develop a bushy appearance with multiple leaders. Sporadic occurrences have been noted on open grown plantations on the Pasquia Porcupine FMA.

Overstory or side shading as a result of aspen in the stands seems to reduce the incidence of attack as well as the occurrence and severity of damage. Since most of the plantations on the FMA are mixed wood plantations with an aspen component, no significant amount of damage has been noted.

Lodgepole terminal weevil (*Pissodes terminalis*) affects young pine trees and has been noted in Saskatchewan. While likely present, no lodgepole terminal weevil damage has been reported on the Pasquia Porcupine FMA.

10.1.6 Bark and Engraver Beetles

Figure 10.6 (L) Mountain Pine Beetle Galleries (R) Pitch Tubes

Bark beetles live under the bark, making intricate engravings on the surface of the tree trunk with their tunnels. The mountain pine bark beetle (*Dendroctonus ponderosae)* is a small bark beetle about 4.0-7.5 mm in length. It is the most destructive pest of mature pine forests in North America.

When mountain pine bark (MPB) beetle populations are low, they prefer stressed, mature or over-mature (80+ years) pine. As populations grow, any pine over 12.5 centimeters in diameter can be killed, even healthy trees. Beetles need to build local population densities to levels that enable them to initiate a “mass attack” on larger healthier pines which enables beetle populations to build at the local level and allow populations to increase from endemic and incipient levels to landscape level outbreaks.

MPB beetles kill pine trees by clogging and destroying the conductive tissue of the tree by introducing a blue-stain fungus when attacking the tree. Its larvae feed in the phloem of the tree. The collective action of blue-stain fungi and larval feeding can kill the tree within one month of the attack.

A major outbreak in British Columbia has spread to Alberta and every effort is being made to prevent the spread to Saskatchewan and beyond.

Until such time as this insect appears in Saskatchewan’s boreal forest, there will not be a strategy developed to deal with Mountain Pine Bark Beetle on the Pasquia Porcupine FMA.

10.1.7 Dwarf Mistletoe

Figure 10.7 (L) Infested Jack Pine (R) Dwarf Mistletoe Plants

Dwarf mistletoe *(Arceuthobium americanum*) is a native parasitic seed plant. It is one of the most serious diseases of pines in western North America. Damage to host trees includes deformity, growth loss and mortality. This disease generally spreads slowly through the forest over many years. Long-range dispersal can occur from movement of seeds by mammals and birds. The best way of limiting the spread and impacts of dwarf mistletoe is through silvicultural and sanitation practices as described in the Saskatchewan Ministry of Environment Forest Service Branch Dwarf mistletoe management background document.

The occurrence of dwarf mistletoe on the Pasquia Porcupine FMA is extremely low. The Licensees plan to deal with this disease are using the provincial Dwarf Mistletoe Management Standard when this disease is encountered.

10.1.8 Armillaria spp.

Figure 10.8 *Armillaria* spp.

Armillaria is a genus of soil borne fungi that causes root disease to a wide variety of plant species. *Armillaria ostoyae* is one of the most common and aggressive conifer pathogens of the genus. Spruce, pine and aspen are all susceptible.

The fruiting bodies are mushrooms which may be produced in late summer or autumn. Fruiting is erratic; mushrooms may be absent in some years and very abundant in others. Although mushroom morphology varies with the species, they are generally in clusters near or on the base of trees. Caps are honey-brown, usually with small tufts of dark hairs, gills are whitish with notched attachment, spore prints are white, and stems are white to brown, usually with an irregular, mottled appearance. Most species have a partial veil that results in a more or less delicate annulus (ring) on the stem. (American Phytopathological Society)

There have not been any reports of major infestations of *Armillaria* on the Pasquia Porcupine FMA. The strategy for dealing with *Armillaria* will be to deal with it on a block by block basis using a combination of pre-harvest surveys and operational occurrence as input to develop site-specific prescriptions.

10.1.9 Hardwood Leaf and Foliar Diseases

Figure 10.9 Hardwood Leaf and Foliar Diseases

Poplar leaf and shoot blight is a disease caused by the Ascomycota fungus *Venturia macularis* on aspen and *Venturia populina* on balsam poplar. The disease is most noticeable on young saplings. It can lead to disfigurement and growth loss in young trees. In regenerating clear-cuts, this disease often strikes in two or three year old harvest blocks and causes mortality, acting as an agent to thin the regeneration.

Typical symptoms of the disease include a blackening and wilting of the shoots and leaves. Terminal branches are wilted and bent over resembling a shepherd's crook. The leaves develop large, irregularly shaped, brownish black spots. Often the infected leaves and shoots have a

greenish-black velvet-like appearance due to the spores. Older mature leaves appear to have some resistance to the disease and are not permanently damaged.

Unless it is demonstrated that there is some negative effect to the Harvest Volume Schedule or the natural environment, no strategy to deal with hardwood leaf and foliar diseases is necessary as part of the development of this Forest Management Plan.

11.0 Conserving and Maintaining Natural Habitat

Having an adequate supply of appropriate habitat is key to maintaining the presence of a full range of species on any land base. Over the 20 year term of this FMP, habitat supply is addressed in three specific ways. These are:

- Habitat on the non-commercial landbase;
- Habitat on the working landbase;
- Emulating natural forest patterns.

11.1 Habitat Supply on the Non-Commercial Landbase

More than 50% of the landbase on the Pasquia Porcupine FMA will never be harvested for timber. Of the 2,018,073 hectares, the effective net area used for active forest management is 789,255 hectares, just 39% of the total area.

Roads, gravel leases, infrastructure and other activities take up approximately 6% of the landbase.

The remaining 55% of the FMA is available for a wide variety of plant and animal species to carry out their life cycles in a natural environment. This habitat consists of the following:

- Wetlands including bogs, fens, swamps, marshes, lakes and streams;
- Permanent exclusions such as Representative Areas and Parks;
- Steep slopes and gullies;
- Riparian reserves along streams, rivers and lakes;
- Non merchantable and/or noncommercial timber stands;
- Buffers around special features such as rookeries, grave sites and archeological sites.

The largest component of this non timber landbase contains a variety of wetland types representing approximately 1,000,000 hectares. The FMA provides suitable habitat for an expected 88,000 pairs of breeding waterfowl annually. Weyerhaeuser has been working with Ducks Unlimited Canada (DUC) since 2006 with the objective of identifying opportunities for the maintenance of wetlands and waterfowl in the managed forest. Joint projects include wetland mapping, waterfowl research including mapping areas of high waterfowl abundance, the development of Best Management Practices (BMPs) related to road placement and specialized road construction practices intended to maintain wetland hydrologic function. Together these projects have provided the foundation for information that can be applied during planning and operations to enhance the conservation of wetlands and waterfowl habitat.

Weyerhaeuser and Edgewood are committed to working with Ducks Unlimited in identifying important wetland habitat on the Pasquia Porcupine FMA. In accordance with principles of active adaptive management we will continue to collaborate with DUC to build upon and refine Best Management Practices that we expect will result in the safeguarding of wetland habitat and associated waterfowl throughout the term of the FMP.

11.2 Habitat Supply on the Working Landbase

Harvesting takes place on approximately one percent of the working landbase in any given year. During the term of this FMP, habitat supply for plants and wildlife will be maximized through the following procedures:

- In-block roads will be kept to less than 5% of the harvest area on an annual basis;
- Unmapped streams will be buffered and/or subject to careful harvesting techniques;
- 9% of timber within harvest events will not be harvested and will be kept as in-block retention;
- In-block roads will be reclaimed within two years of completion of operations;
- Reforestation will take place within two years of harvest completion;
- 15% old and very old stands of timber representing all of the main forest cover types will be retained at all times in each of five Ecological Management Units.

Harvest will take place in any given harvest event once every 70 to 90 years. During the 5 year period that a harvest event is open, there will be disruption to the natural patterns of use by wildlife. Once the event is closed and reforestation successfully completed, the natural processes of life will play out over the next 65 to 85 years until the next harvest is scheduled.

The plants and animals that require young forest for all or part of their life cycle will prosper in the regenerating stands. As the new forest ages and goes through the various stages from seedling to maturity, the plant and animal communities will follow the natural succession process and change over time.

11.3 Emulating Natural Forest Patterns

This Forest Management Plan will address the supply of appropriate habitat through adoption of the recently developed provincial forest management standard for emulating natural forest patterns.

The plants and animals in Saskatchewan's forested landscape have evolved with the stand and landscape level patterns that have been created by millennia of natural disturbances. The biotas have become adapted to and dependent on the pattern and structure that has been

created by these disturbances. Forest ecological science suggests that, as a coarse filter approach, the more closely the natural stand and landscape levels of pattern and structure can be approximated by human activities; the more likely the full range of biodiversity will be maintained. It is anticipated that by proactively planning for the maintenance of key forest attributes that are ecologically important, a more intact boreal landscape will be maintained.

To implement a natural pattern approach, the forest managers on the Pasquia Porcupine FMA will plan for forest harvest activities at three spatial scales: landscape, event, and harvest block. Natural disturbances play a key role in shaping the structure and function of boreal forest landscapes and ecosystems. Fire is the most significant natural disturbance responsible for forest renewal in the boreal forest. Other natural disturbances such as wind, flood, hail, insects and disease are also ecologically important, but generally occur at smaller landscape scales. The natural forest pattern (NFP) approach is based on an estimate of the Natural Range of Variation (NRV). In some cases NRV has been difficult to quantify, and the best approximation currently available is to quantify the Current Range of Variation (CRV). For the purposes of this Forest Management Plan, the CRV has been incorporated into the modeling.

Targets have been set in this Forest Management Plan to meet the NFP standards for:

- Harvest event size classes;
- Old and very old forest, including interior forest;
- Insular Residuals;
- Maintenance of softwood component in mixedwoods;

In applying natural forest patterns to forest harvesting, the objective is to emulate fire as a natural disturbance and approximate the characteristic structure and features following a wildfire. It is expected that with the implementation of NFP, a broad range of habitat will be available for wildlife in the future and fewer single species issues will be encountered.

12.0 Wildlife

12.1 Rare, Threatened & Endangered Species

12.1.1 Education and Monitoring

Weyerhaeuser and Edgewood provide annual training to educate employees, logging contractors and their employees about rare, threatened or endangered species and invasive species on the FMA.

During these sessions, the workers are informed about species native to the area that are rare or endangered. They are encouraged to report any sightings to their supervisor. All sightings are then passed on to the Weyerhaeuser EMS Manager for input into the database of the Saskatchewan Conservation Data Centre. Species that have been highlighted during this training include woodland caribou, Canada warbler, olive sided flycatcher, northern leopard frog, common nighthawk and swift fox.

Figure 12.1 Canada Warbler

Figure 12.2 Northern Leopard Frog

Since implementing this program, numerous sightings of rare, threatened or endangered species have been reported. These include woodland caribou (*Rangifer tarandus*), swift fox (*Vulpes velox*), northern leopard frog (*Lithobates pipiens*), common nighthawk (*Chordeiles minor*) and trumpeter swan (*Cygnus buccinators*).

The workforce is also encouraged to report sightings on the FMA of fauna that are not normally found in the area. Included in these sightings have been great egrets (*Ardea alba*) and monarch butterflies (*Danaus plexippus*).

Figure 12.3 Monarch Butterfly

Figure 12.4 Great Egret

12.2 Indicator Species

In consultation with the Wildlife Management Section of the Ministry of Environment Fish and Wildlife Branch, three species were chosen for inclusion in the Forest Estate Modeling process as indicator species.

The three species chosen were moose, fisher and woodland caribou. During the term of the FMP, the amount of habitat available for these indicator species will be tracked and reported on at five year intervals.

12.2.1 Moose

Moose (*Alces alces*) are an important animal on the PPFMA for subsistence hunting by First Nations and Métis people and for the licensed hunt that take place annually in the autumn. Moose are widely distributed across the FMA but historical records indicate that the population densities are subject to wide variations over time. There have been several periods in the twentieth century where the low numbers of animals have necessitated the closure of hunting seasons for multiple years in order to allow the population to recover. Reduced hunting seasons, restrictions for off-road vehicles and restrictions on shooting cows or calves have also been used as recovery mechanisms.

The quota for moose licenses on the Pasquia Porcupine has been reduced somewhat in recent years in line with estimated population trends. In neighboring west central Manitoba, a complete ban on moose hunting has been in effect since 2013. (Government of Manitoba website)

The type of habitat chosen by moose is strongly influenced by the quantity and quality of forage that is available. The other main factor influencing where moose can be found is the availability of adequate hiding and thermal cover. Given the recent expansion of moose populations into

southern Saskatchewan, this seems to be less of a limiting factor than browse availability.

In addition to availability of habitat, there are a large number of factors that can affect moose populations; these include predators (wolves and bears), increased hunting pressure facilitated by an increase in the number of roads, ATVs, snowmobiles and GPS technology, diseases and parasites and reduced frequency of disturbance events such as fire and flooding of the Saskatchewan River Delta.

Efforts have been made in recent years to limit the amount of roads that are open as a result of timber harvesting operations. All in-block roads are reclaimed within two years of harvest completion and inter-block and main haul roads are reclaimed or decommissioned when they are no longer needed.

During the term of this FMP, the Licensees will be tracking habitat supply for moose. This will inform future planning processes regarding the effect of the preferred scenario on the habitat utilized by this important species.

Figure 12.5 Moose

12.2.2 Fisher

Fishers (*Martes pennanti*) are widespread throughout the northern forests of North America. They are found from Nova Scotia to British Columbia and as far north as Great Slave Lake. On the Pasquia Porcupine FMA, the fisher is quite widespread and has been trapped commercially since the 18th century. They are easily trapped and their fur is one of the more valuable furs available on the FMA.

Although fishers are excellent tree climbers, they spend much of their time on the forest floor. They favor mixed softwood/hardwood or pure softwood stands. Fishers prefer areas with continuous overhead cover with greater than 50% crown closure (C and D crown closure classes). Females require moderately large trees for denning so they are more likely to be found in mature forest. Fishers also select for forest floors with large amounts of coarse woody debris. Fisher in this modeling exercise is being used to represent late succession stages of softwood and softwood dominant mixedwood forest.

Their diet is quite varied from snowshoe hares, porcupines, birds and squirrels to larger prey such as foxes. Some literature reports that analysis of stomach contents have revealed remains of insects, mushrooms, nuts and berries. Fisher will also scavenge the remains of large animals that have been killed by other predators or by hunters.

During the term of this FMP, the Licensees will be tracking habitat supply for fisher. This will inform future planning processes regarding the effect of the preferred scenario on the habitat utilized by this important fur bearer.

Figure 12.6 Fisher

12.2.3 Woodland Caribou

Woodland caribou (*Rangifer tarandus*) have been declared to be a threatened species under the Federal Species at Risk Act. The Government of Saskatchewan is currently working on a Range Plan for woodland caribou which is due for submission in 2017. During the development of this Forest Management Plan, frequent communication with the provincial committee working on the caribou recovery plan has taken place. The Pasquia Porcupine FMA is part of the provincial woodland caribou administrative unit designated as SK2 East.

Concurrent with the development of this FMP, the Saskatchewan Regional Working Group of the Canadian Boreal Forest Agreement (CBFA) has been working on a caribou conservation plan for the Pasquia Porcupine FMA. Weyerhaeuser is a member of the Saskatchewan Working Group of the CBFA while Edgewood is not. The goal of CBFA caribou conservation planning is to maintain or enhance self-sustaining boreal caribou populations within the plan area, and directly address the factors affecting the "at risk" designation.
The CBFA caribou conservation plan was adopted by the Licensees and integrated into the forest estate modeling process. The Pasquia Porcupine caribou conservation plan utilizes a 3-zone approach within the FMA:

- Conservation zones most important for caribou.
- Special management zones where forestry practices are tailored to buffer conservation zones and/or provide connectivity.
- Development zones with less significant caribou habitat where forestry will be more concentrated.

This zoning scheme provides enhanced protection for caribou while simultaneously allowing for the timber harvest that is necessary to support the mills and associated employment. The CBFA caribou conservation plan includes management recommendations for conservation and special management zones.

The CBFA caribou conservation plan was developed with advice from Al Arsenault, a leading expert in the field of caribou management. It is consistent with the CBFA Methodological Framework for Caribou Conservation Planning which can be found at http://cbfa-efbc.ca/wp-content/uploads/2014/12/CBFACaribou_guidelines_EN1.pdf. Information from federal and provincial recovery strategy documents, and relevant peer reviewed science literature and other relevant government and non-government works were also utilized.

Please see Appendix J of this document for more detail on the proposal for caribou management on the Pasquia Porcupine FMA.

As the Licensees have moved through the planning and approval process, it has become apparent that the CBFA caribou conservation plan for the Bog Herd was not broad enough in scope to meet the regulator's requirements. As a result, the caribou conservation plan within this FMP has evolved from the CBFA plan. The Licensees have added three temporary conservation zones where harvest will be deferred for twenty years and have also added seven Special Management Zones to buffer conservation areas and/or to provide connectivity between areas of preferred caribou habitat (Figure 12.7).

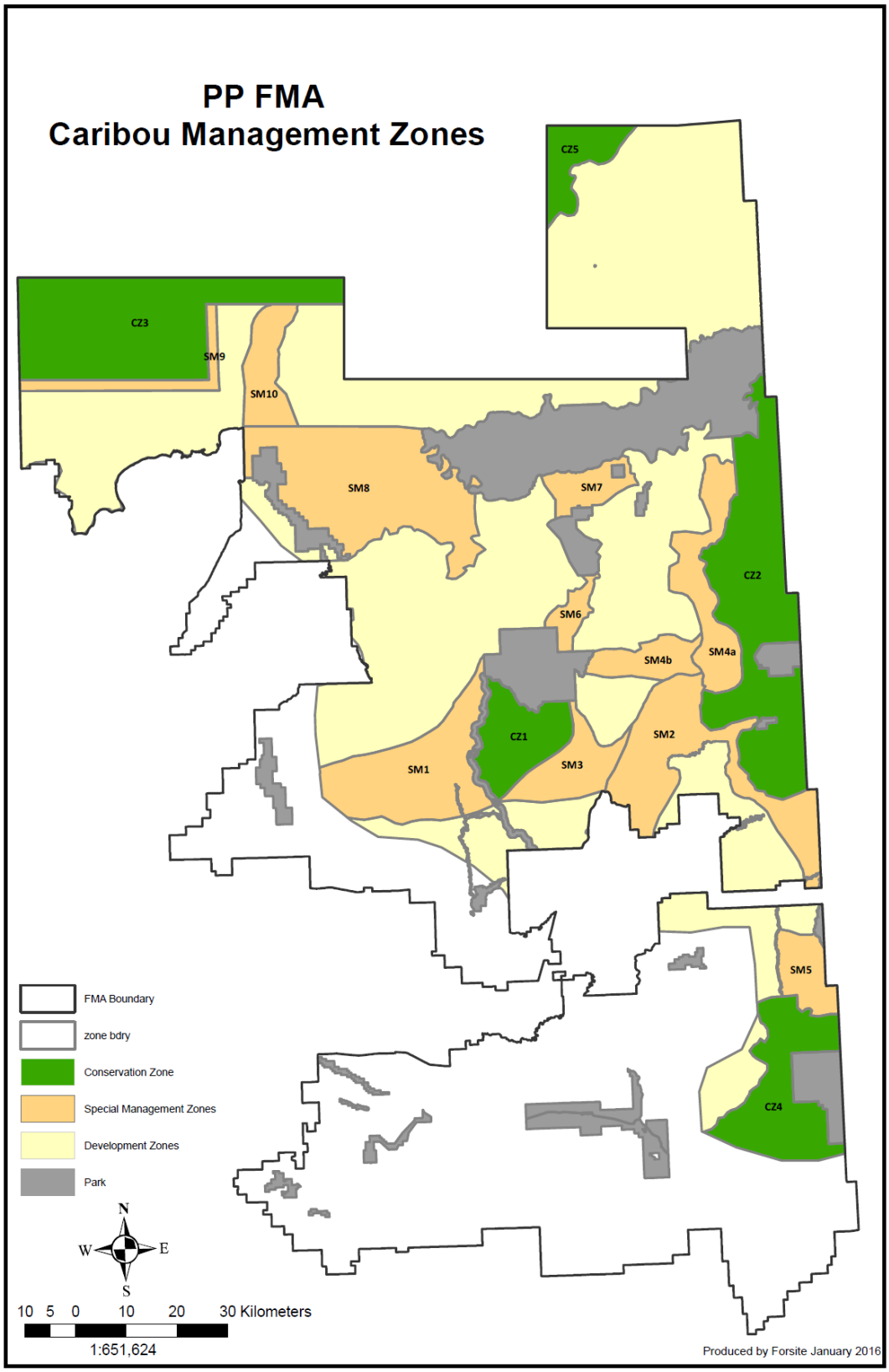

Figure 12.7 Pasquia Porcupine Caribou Management Zones

12.2.3.1 Preferred Caribou Habitat

Preferred woodland caribou habitat consists of complexes of lichen-rich open softwood peat lands, upland black spruce and mature (>60 years) upland open jack pine with arboreal and terrestrial lichen, within a matrix of well-connected mature conifer-dominated forest cover.

Preferred habitat provides habitat for predator avoidance, home range occupancy and persistence of caribou demes; redundancy in habitat availability to respond to local threats or disturbance (e.g. roads, fire); seasonal abundance of forage resources and connectivity to facilitate effective accessibility to other preferred habitat patches within the home range.

12.2.3.2 Conservation Zones

The proposed caribou conservation zones will be managed with a protection and conservation emphasis within a natural disturbance regime. The goal will be to protect the ecological integrity of preferred caribou habitat, maintain an adequate supply of preferred habitat, and ensure critical habitat function at relevant spatial and temporal scales. For the current 20-year management planning horizon, no harvesting will occur in these deferral areas. These are not meant as permanent deferrals but rather are part of an interim strategy while provincial caribou range planning takes place and scientific information is gathered to better understand the requirements of woodland caribou in the SK2 area.

- CZ1 and CZ2 have known caribou populations and concentrations of preferred habitat. Population range occupancy data was overlaid on the habitat preference model to verify this. In the modeling process, projections have been made for 200 years during which disturbance within these zones are limited to 20%.
- CZ3 has had caribou sightings in the past and has concentrations of preferred habitat. It is geographically located on the south boundary of the Amisk Atik caribou protection zone and to the east of a proposed caribou deferral area on the Sakaw Prince Albert FMA.
- CZ4 which is composed of a large forest fire (1980) has not had any caribou sightings since shortly after the Woody Fire burned in 1980. This area will be coming on stream as viable caribou habitat over the term of this FMP. This fire also burned a significant area on the Manitoba side of the border so will contribute to a patch of future caribou habitat that is 178,000 hectares is size.
- CZ5 is an area identified by First Nations and Métis people from Cumberland House as known caribou habitat. This conservation zone is adjacent to the Amisk Atik caribou conservation zone.

Figure 12.8 Woodland Caribou in CZ1

12.2.3.3 Special Management Zones SM1, SM2, SM4a

- These zones are meant to act as a disturbance buffer to ensure the integrity of the Conservation Zones. Planned harvest must consider buffering Conservation Zones to ensure the disturbance level does not change within the Conservation Zone.
- Harvesting within these zones will only take place during the winter months (December – March).
- New roads will be reclaimed as soon as possible after harvest. Old roads within harvest events will be reclaimed if agreement can be reached with other stakeholders and the Forest Service.
- A 1000 metre Area of Concern will be applied to all known calving areas and an appropriate management prescription will be developed for those areas.
- These zones have the highest potential for active caribou habitat restoration activities.
- SM1 will be managed with an emphasis on habitat enhancement, harvest consolidation and caribou population research.
- Goal of < 35% disturbance of caribou habitat within SM2 and SM4a.

12.2.3.4 Special Management Zone SM3

- This zone is meant primarily to provide connectivity between the Pasquia Bog and the Pasquia Hills. The boundaries are based on the best information currently available including caribou sightings within the Overflow River watershed and professional opinion. As more information becomes available, these boundaries may change.

- Over the course of the last fifty years, this zone has been developed as a summer operating area. Given that the infrastructure for summer operations is already in existence and that the area is dominated by hardwood forest, this area will continue as a summer operating area in the next twenty years.
- This zone borders CZ1 in order to act as a disturbance buffer, planned harvest must consider buffering of that zone to ensure that the disturbance level does not change.
- In order that this zone can serve a connectivity function, preferred habitat in this zone will be buffered by 250 metres.
- The principle of providing stepping stones of habitat within this zone will be incorporated into event planning.
- A 1000 metre Area of Concern will be applied to all known calving areas and an appropriate management prescription will be developed for those areas. Calving areas may be identified by radio telemetry, local or traditional knowledge.

12.2.3.5 Special Management Zones SM4b through SM10

- These zones have been designated to provide buffering and/or connectivity. Although these Special Management Zones have few or no known sightings of caribou, when combined with the existing provincial parks and RANS, they connect patches of high quality habitat that caribou require to prosper. No specific disturbance limits have been modeled for these zones as most of them are too small to do this effectively.
- Connectivity will be given first consideration in the planning of events in these zones. In some of these zones, connectivity will employ the stepping stone principle while in others, there will be continuous travel habitat.
- A 1000 metre Area of Concern will be applied to all known calving areas and an appropriate management prescription will be developed for those areas. Calving areas may be identified by radio telemetry, local or traditional knowledge.

12.2.3.6 Development Zones

These zones are designed to have a higher level of disturbance in order to make up for reduction in harvest opportunity in Conservation and Special Management Zones. Natural Forest Pattern Standards will be applied within these zones and caribou Best Management Practices considered in areas proximate to other zone types.

12.2.3.7 Implementation of Caribou Conservation

This caribou conservation plan will use adaptive management principles so that, as the scientific knowledge about woodland caribou improves, modifications can be made to the plan.

Through implementation of this caribou conservation plan the Licensees believe that they can maintain a continuous supply of suitable, mature, year round woodland caribou habitat distributed across the landscape in such a manner as to ensure permanent range occupancy.

Forest management activities within caribou habitat will follow the following criteria:

- No summer road development in Conservation Zones (prime habitat).
- No harvest for 20 years in the Conservation Zones.
- Harvest to occur on frozen ground, in Special Management Zones SM1, SM2 and SM4
- Harvest events in all Special Management Zones will be planned for completion within 3-5 years.
- No harvest in CZ and SM zones during late winter and calving periods. (March 31 to July 31)
- Ensure that there is no ecosite shift from softwood to hardwood. Softwood harvest blocks to be regenerated to softwood to put them on track to be softwood dominant at maturity.
- All road development in caribou zones to use best current information available on management practices for caribou management.
- All new roads leading into harvest events will be reclaimed as soon as possible after harvest with the intent of having minimal linear disturbances remaining upon completion of the event.
- The Licensees will work with the Ministry to develop protocols whereby existing roads and trails can be reclaimed concurrent with harvest. This will require a solution whereby the concerns of other authorized users of the Forest are addressed and an equitable formula established to pay for the reclaim.
- A 1000 metre area of concern will be applied to all known calving areas and appropriate prescriptions for such areas of concern will be developed in consultation with the Fish and Wildlife brand of Saskatchewan Environment. Calving areas may be identified by radio telemetry, local or traditional knowledge.

12.2.3.8 Measuring Disturbance through a Risk Rating System

The Licensees propose using a risk management approach to measure disturbance within the caribou zone. This approach was developed by the Saskatchewan Regional Working group of the Canadian Boreal Forest Agreement.

This risk management system is presented as an alternate solution to the blanket application of a 500 metre buffers on all anthropogenic disturbances as put forth by the federal government in a Canada wide caribou recovery plan.

The system is based on the principles that; forest disturbances evolve and change over time as both natural and artificial regeneration goes through the stages of succession and that the effect of linear disturbances on caribou varies according to the size and intensity of the disturbance. Detailed information on this proposed buffering system can be found in Appendix J.

The Preferred Scenario presented in the Forest Estate Modeling Report has incorporated this risk rated buffering system into the timber analysis. The result from the model is that Harvest Volume Schedules can remain at current levels for the next 10 years for softwood and for the next 20 years for hardwood. The level of disturbance within the caribou zone on the FMA will remain at or below 35% over the twenty year term of this FMP.

13.0 Strategy for Plan Implementation

Weyerhaeuser and Edgewood will work cooperatively to follow the strategic direction set out in this Pasquia Porcupine Forest Management Area 2015 to 2035 Twenty Year Forest Management Plan. Plan implementation will include the following areas of emphasis:

- Undertaking public consultation (Section 4.0);
- Providing opportunities for First Nation and Métis communities to have input into operating plans (Section 1.0);
- Monitoring progress on the Values, Objectives, Indicators and Targets (VOITs) set in this plan (Section 5.0);
- Monitoring adherence to the direction modeled in the Forest Estate Modeling Report (Sections 6.0 and 14.0);
- Coordinating operating plans with the Tactical Plan (Section 7.0);
- Integration of forest management activities with non-timber uses (Section 8.0);
- Wildfire management (Section 9.0);
- Forest insect and disease management (Section 10.0);
- Conserving natural habitat (section 11.0);
- Caribou conservation strategy (Section 12.0).

The annual operating season on the Pasquia Porcupine FMA runs from April 1st to March 31st in concert with the operating year defined in the Regulations under the Forest Resources Management Act. An annual Operating Plan will be prepared and submitted to the Forest Service by December 31st of each year or on such other date as may be agreed to by the Minister and the Licensees. This commitment is subject to change as permitted by legislation.

The content of the Operating Plan will be as defined by the Forest Operating Plan Standard and the Pasquia Porcupine Forest Management Agreement. The harvest and road construction proposed in the Operating Plan will be in accordance with the direction provided in the Tactical Plan with variances discussed with the Forest Service as necessary.

13.1 Resources to Support Plan Implementation

The implementation of the Pasquia Porcupine 2015 to 2035 Twenty Year Forest Management Plan will be a cooperative effort between the two companies involved.

Edgewood and Weyerhaeuser have separate administrative organizations and both employ Registered Professional Foresters and Forest Technicians who will provide input into event planning and the Operating Plans. The two companies will have one person coordinate the

production and submission of Operating Plans. While the Licensees will maintain and operate separate forest management organizations, they have an Operational Agreement in place dealing with forest management, road development, inventory and other matters related to the administration of the FMA.

13.1.1 Administration and Supervision

Edgewood has the managerial rights and responsibilities for all softwood on the FMA while Weyerhaeuser has the rights and responsibilities related to hardwood management. For day to day administration however, the FMA has been split into two parts, with Edgewood administering the northern portion of the FMA and Weyerhaeuser administering the southern portion.

Weyerhaeuser and Edgewood will continue to work in collaboration to co-ordinate the overall harvest taking place on the license area such that a fully integrated single pass harvest is used and wood transfers are managed between to two companies.

Edgewood and Weyerhaeuser have signed an operating agreement which stipulates that the each company will sell softwood/hardwood logs that are harvested as a necessary incident to its operations to the other company on a cost recovery basis. The two companies will work co-operatively to identify opportunities to enhance wood utilization through improved wood flow.

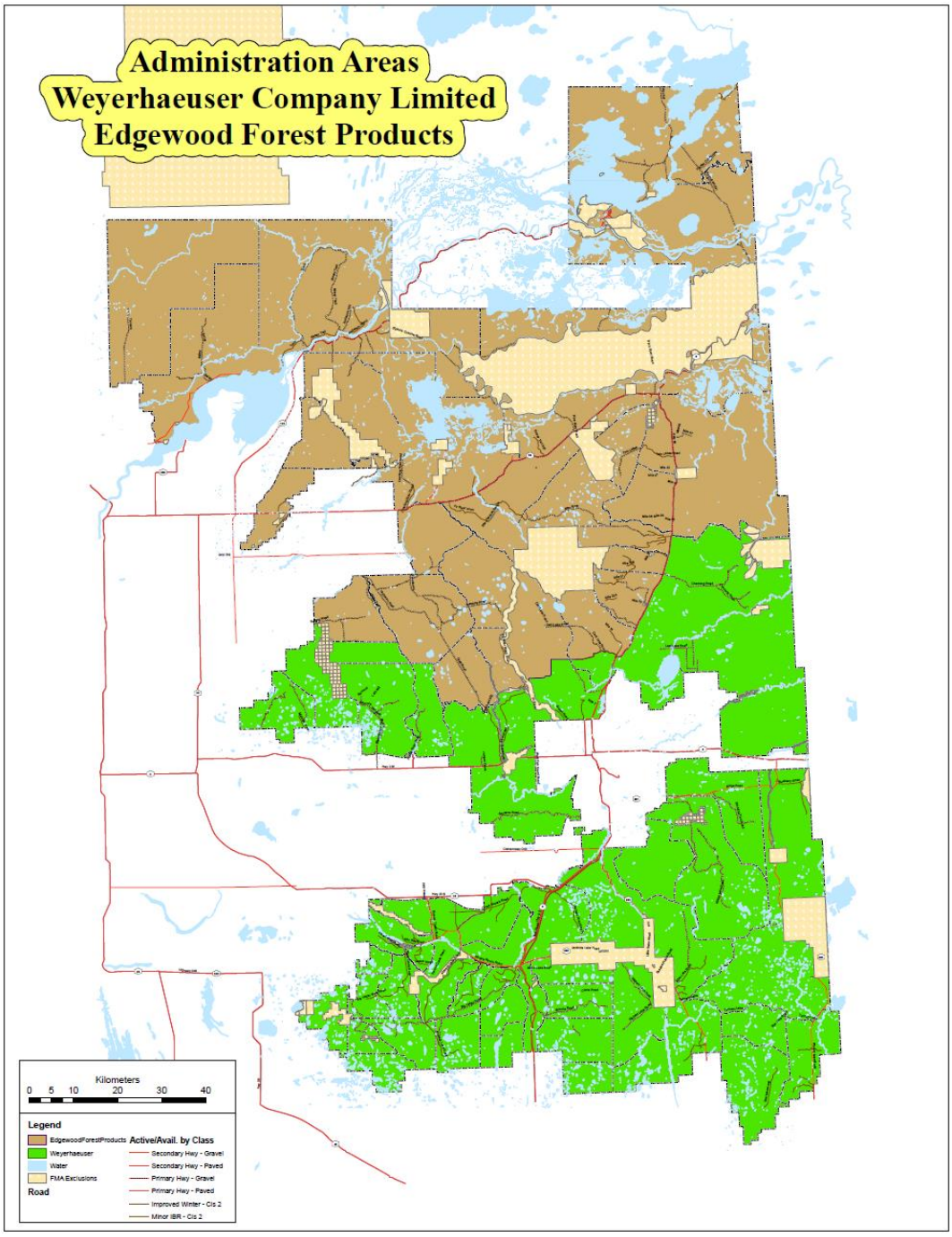

Figure 13.1 Weyerhaeuser and Edgewood Administration Areas

13.1.2 Information Management Systems

The forest inventory for the Pasquia Porcupine FMA and an associated electronic mapping system is currently maintained within a Geographic Information System (GIS) owned by Weyerhaeuser and hosted through Silvacom Online.

Spatial data delineating the areas harvested is currently collected using a Geographic Positioning System (GPS) from iPads. The feller bunchers are equipped with iPads that track the movements of the harvester within the block. These electronic records are downloaded into the GIS system. Block boundaries are periodically verified through the use of aerial/satellite photography.

Reforestation data is based on the harvest block polygons with specific plantation boundaries verified using hand held GPS units.

In addition to the inventory data and silviculture records; the location of cabin leases, snowmobile trails and records of special features are maintained within the GIS system. Some of the special features that will be tracked include special areas identified by First Nations and Métis, bird rookeries, rare plants, archeological sites, den sites and grave sites.

Weyerhaeuser and Edgewood weigh scale all wood deliveries to the mills and each track these records in separate information management systems. In keeping with the Sustainable Forest Initiative Chain of Custody standard, each load of wood delivered is tracked with a unique tracking number so that the source and ownership of the wood is readily identified.

Stakeholder consultation records are maintained by both companies in order to ensure that discussions that take place with other users of the forest are recorded and available for reference.

13.1.3 Voluntary Forest Certification Program

Voluntary third-party forest certification began in the 1990s in response to market concerns about forest management and illegal logging.

The Weyerhaeuser and Edgewood forestry operations are certified to the Sustainable Forest Initiative Program. The current forest management certificate numbers are CERT-0068742 and CERT-0067090 respectively (Edgewood certification is part of a multi-site certification held by parent company C&C Forest Resources Ltd.). The validity of these certificates may be checked online by querying www.sfiprogram.org/sfidatabase/.

SFI Inc. is an independent, nonprofit organization that is solely responsible for maintaining, overseeing and improving the internationally recognized Sustainable Forestry Initiative® (SFI®) program. Across Canada and the United States, more than 240 million acres (100 million hectares) are certified to the SFI forest management standard, the largest single forest standard in the world.

The SFI program's unique fibre sourcing requirements promote responsible forest management on all suppliers' lands. SFI Chain of Custody (CoC) certification tracks the percentage of fibre from certified forests, certified sourcing and post-consumer recycled content. SFI on-product labels identify both certified sourcing and CoC claims to help consumers make responsible purchasing decisions. SFI Inc. is governed by a three-chamber board of directors representing environmental, social and economic sectors equally.

The annual audit by independent third party auditors is a valuable component of the voluntary certification system. These audits ensure compliance with commitments and maintain an arm's length relationship between SFI and the companies certified under the standard. Third party audits also reinforce annual monitoring and accountability.

13.1.4 Management Implementation Team

Following approval of the Pasquia Porcupine FMA 2015 to 2035 Twenty Year Forest Management Plan, a Management Implementation Team (MIT) will be formed with membership comprised of representatives from the Forest Service, Weyerhaeuser and Edgewood. Representatives of the public advisory group may be invited to participate on the MIT as well.

A representative of the licence holders will be appointed as chair of the MIT. The MIT will develop Terms of Reference in alignment with regulatory requirements.

This group will meet at least twice per year to prioritize and track progress on the implementation of strategic and operational commitments made in this plan and on any requirements of the approval conditions.

13.1.5 Public Advisory Group

It is the intention of Weyerhaeuser and Edgewood to maintain support for the Forest Management Advisory Committee that currently acts as our public advisory group. Working with this group has proven to be a very effective and efficient way of keeping the stakeholders on the FMA informed of progress on implementing forest management commitments. The

need to adapt to changing circumstances and to change directions based on new scientific information is well understood by the FMAC members.

13.2 Forest Management Challenges on the Pasquia Porcupine FMA

Table 13.1 summarizes key forest management challenges on the Pasquia Porcupine FMA. Some of the challenges are immediate in nature and easily measured while others such as climate change are more speculative in nature with great variances in the predicted direction and scope of the change.

Table 13.1 Summary of Forest Management Challenges

Challenges	Status	Indicator Related	Source
1. Assessment of the effectiveness of the woodland caribou conservation strategy contained in this FMP.	New since the 1999 FMP	Yes, #7	Licensees and Ministry of Environment
2. Implementing the new NFP standard while integrating the needs of a wide variety of other resource users.	Ongoing but with new challenges.	Yes #20	Licensees
3. Engagement of First Nations and Métis people in forest management issues.	Ongoing and evolving	Yes #23, 25	Licensees and Ministry of Environment
4. Balancing the harvest to match the product mix required by the mills while adhering to the Tactical Plan	Ongoing but nuanced with two co-tenure holders involved	Yes #13, 20	Licensees
5. Climate change has the potential to disrupt the achievement of VOITS and the timing of annual harvesting in both the short term (0 – 10 years) and the long term.	New since the 1999 FMP	Yes, #19	Licensees and Ministry of Environment

13.2.1 Assessment of the Effectiveness of the Woodland Caribou Strategy

The legal status of woodland caribou under the Species at Risk Act has changed significantly since the 1999 FMP was completed. The strategy that is being put in place in this FMP is based on the latest and best information available but most experts agree that more information is required to ensure a robust recovery plan. The Licensees will work with the Ministry of Environment on research and monitoring programs to gather baseline information, monitor caribou populations and formulate measures of success. Monitoring and management of caribou populations will require collaboration between the forest companies, Forest Service Branch, Fish and Wildlife Branch, Landscape Stewardship Branch and other users of the forest.

13.2.2 Introducing Natural Forest Patterns to Non-Timber Resource Users

Managing to the Natural Forest Pattern Standard will mean changes for all other users of the forest. It will require a collaborative effort between government and industry to deliver the education necessary to have these practices accepted.

The Licensees will work collaboratively with the Forest Service to introduce the NFP standard to the other users of the forest. The FMAC will be one of the primary forums for disseminating this information. The requirements of the NFP standard will also be introduced to the other users of the forest through individual and operating plan meetings. The engagement and involvement of the Landscape Stewardship Branch will be key to meeting this challenge as that branch of government issues many of the land use permits on the FMA.

13.2.3 Engagement of Aboriginal People in Forest Management

Engagement of First Nations and Métis people in the forest management process is one of the challenges that will continue to have prominence during the term of this FMP. The Licensees acknowledge Aboriginal cultures, heritages and traditions, respect Aboriginal rights and status and will endeavor to understand Aboriginal points of view.

The Licensees will encourage participation in the FMAC as the primary method of involving First Nations and Métis people in the management of the FMA. Invitations to meet separately will also be used to promote dialogue.

Our strategies in developing business relationships include engaging in discussions that may lead to business opportunities with an Aboriginal group or individual. Examples of this could include a contract to supply goods or services to our mills or a contract to supply product or by-product from our mills to a value added aboriginal business.

13.2.4 Fibre Supply Balance and Adherence to the Tactical Plan

Balancing the harvest to match the product mix required by the mills owned by the two co-tenure holders is a challenge that we have been working on since the re-start of the Carrot River sawmill in 2012. The Carrot River sawmill will be making changes in the fourth quarter of 2015 so that it can process softwood up to 21 inches in diameter. A market for the oversize logs has not yet been found. Similarly, until there is an economically viable market for the softwood pulp from the southern portion of the FMA, this will continue to be a challenge. The two companies have been working collaboratively and have scheduled regular meetings to communicate mill requirements and to plan operations to meet those requirements.

Inter-related with fibre supply balance is the challenge of adhering to the approved utilization standard throughout the term of the agreement. This challenge is primarily related to downturns in the forest economy. During the last ten years, the forest economy crashed and all of the mills associated with the FMA were closed for varying lengths of time. When there is no market for a certain size or species of product, it is possible that utilization standards will have to change. The Licensees will work with the Forest Service to minimize variances from the approved utilization standard.

Adhering to the Tactical Plan is another facet of this challenge that is also primarily related to the economics of the industry. When the forest economy crashed in 2007, mills were forced to minimize haul costs in order to continue operations. This often meant varying from the FMP/Operating Plan that existed at the time. Now that regulations have specified that a fully spatial Tactical Plan is required, maintaining the linkage between the Tactical Plan and Operating Plan will be even more of a challenge during times of distress in the industry.

13.2.5 Climate Change

In the short term (0 – 10 years), climate change has the potential to cause relatively minor disruptions to forest management activities while in the longer term it has the potential to have major positive or negative effects on harvest levels and reforestation success. The short term effects may disrupt the Licensees ability to achieve some of the VOITS identified in Section 5.0 of this document.

There are inherent challenges in measuring climate change and differentiating climate change from cyclical climate variability. During the relatively short time frame since the last FMP there has been no definitive change in the climate for the Pasquia Porcupine FMA. That being said, there have been a number of climate/weather events during that time frame that may portend definitive change. These include a killing frost in the Pasquia Hills in late May of 2007, a one in

a hundred year rainfall/flood event in the Red Deer River Valley and several flash flood events in the Pasquia Hills that appear to be one in five hundred year events.

The boreal forest has a generally high adaptive capacity expressed through a large environmental tolerance range, large population sizes and high population level genetic diversity. The resilience of these systems is well illustrated in the boreal forest of eastern North America where the regional tree species pool has remained mostly unchanged over the past 8,000 years despite large fluctuations in climate and regional disturbance regimes. (S. Gauthier et al: Boreal Forest Health and Global Change sciencemag.org)

During the ten year term of this FMP, the Licensees will work on the assumption that the future forest environment will be different from what presently exists but that we cannot predict with certainty what those differences will be. The Licensees will collaborate with the Forest Service and other partners with respect to adapting to climate change impacts with the intent to develop best management practices.

13.2.6 Climate Related Stressors

The major climate related stressors that affect forest management are fire, insects, severe wind/storm events, variances in the number of frost free days, changes in the onset of winter and spring, increases or decreases in precipitation and flood events resulting from extreme precipitation events. A number of these potential stressors have the potential to affect the PP FMA over the ten year term of this agreement.

The stressors which may affect the FMA fall into two basic categories; those we can anticipate and those we cannot.

13.2.6.1 Flood Events

For events that we can anticipate such as the reoccurrence of severe flood events, the Licensees intend to put in place a resistance strategy to forestall damage to an important resource.

The strategy to protect the integrity of major stream and river crossings will focus on fish bearing waters that are part of commercial, recreational or aboriginal fisheries. The intent will be to forestall negative impacts and protect the fisheries resource by ensuring that new stream and river crossings exceed the minimum requirements for predicted water flow. This will entail the installation of larger culverts on small streams and the use of bridges on larger streams and rivers.

An increased focus on the maintenance of existing major watercourse crossings will also be part of this strategy. In addition, we will be re-examining existing erosion control measures and upgrading these where required. Existing Standard Operating Procedures will be reviewed and updated as required as part of an adaptive management strategy.

On non-fish bearing waters, it is the intention of the Licensees to work with the Forest Service to analyze current Standard Operating Procedures and work towards the establishment of best management practices that incorporate the latest research in the field.

13.2.6.2 Increased Moisture Regimes

Increased moisture regimes may waterlog soils and create the potential for damage to soils during summer harvest operations. In such a case, as part of an adaptive approach, the Licensees will consider moving harvest operations to contingency blocks and/or expanding use of low ground pressure equipment. The Licensees currently require contractors to have at least one skidder on site with low ground pressure tires for use when wetter soils are encountered.

13.2.6.3 Drought

Moisture deficient growing sites make up a very small proportion of the Pasquia Porcupine FMA. Those that do occur are concentrated in Management Unit #1 to the north of the Saskatchewan River. Decreased moisture regimes or droughts lasting several months at key times during the growing season have the potential to negatively affect the regenerating forest on these sites now and into the future. Suitable silvicultural prescriptions will be developed to maximize soil moisture retention on these sites.

13.2.6.4 Shifts in Seasonal Changes

Changes in the anticipated onset of winter and/or spring will be tracked using the dates on which winter overweight permits are issued and withdrawn as a proxy for the onset and end of the winter season. These shifts in the onset and end of the winter hauling season will be mitigated in part by planning contingency blocks on coarse soil types/well drained sites for early start for winter harvesting. If this eventuality comes to pass, the Licensees may choose to expand the use of low ground pressure harvesting equipment.

13.2.6.5 Unpredictable Events

Unpredictable events and changes will be dealt with through the established planning process. Examples of these could include a major increase in insect infestations, forest fires or severe wind events. Should such events occur; the Licensees will develop mitigation plans as part of the Operating Plan process. If such events exceed the 10% threshold for replanning detailed in

Appendix F Section 6.0, the Licensees will work collaboratively with the Forest Service to initiate that replanning process.

14.0 Monitoring Programs

Monitoring of the Forest Management Plan is intended to track adherence to the FMP modelling assumptions as well as to support adaptive management and continual improvement. Figure 14.1 outlines the monitoring, reporting and evaluation process that will be used during the term of this FMP.

The measurement, interpretation, assessment and evaluation of the results of the FMP and Operating Plan are critical steps in the planning process. Monitoring and reporting will track adherence to the FMP modelling assumptions, lead to improvements in forest management and provide improved information for the development of future Operating Plans and Forest Management Plans.

Details regarding data sources, data gathering and analysis methods, reporting templates and reporting timelines will be developed and presented to the Management Implementation Team for endorsement.

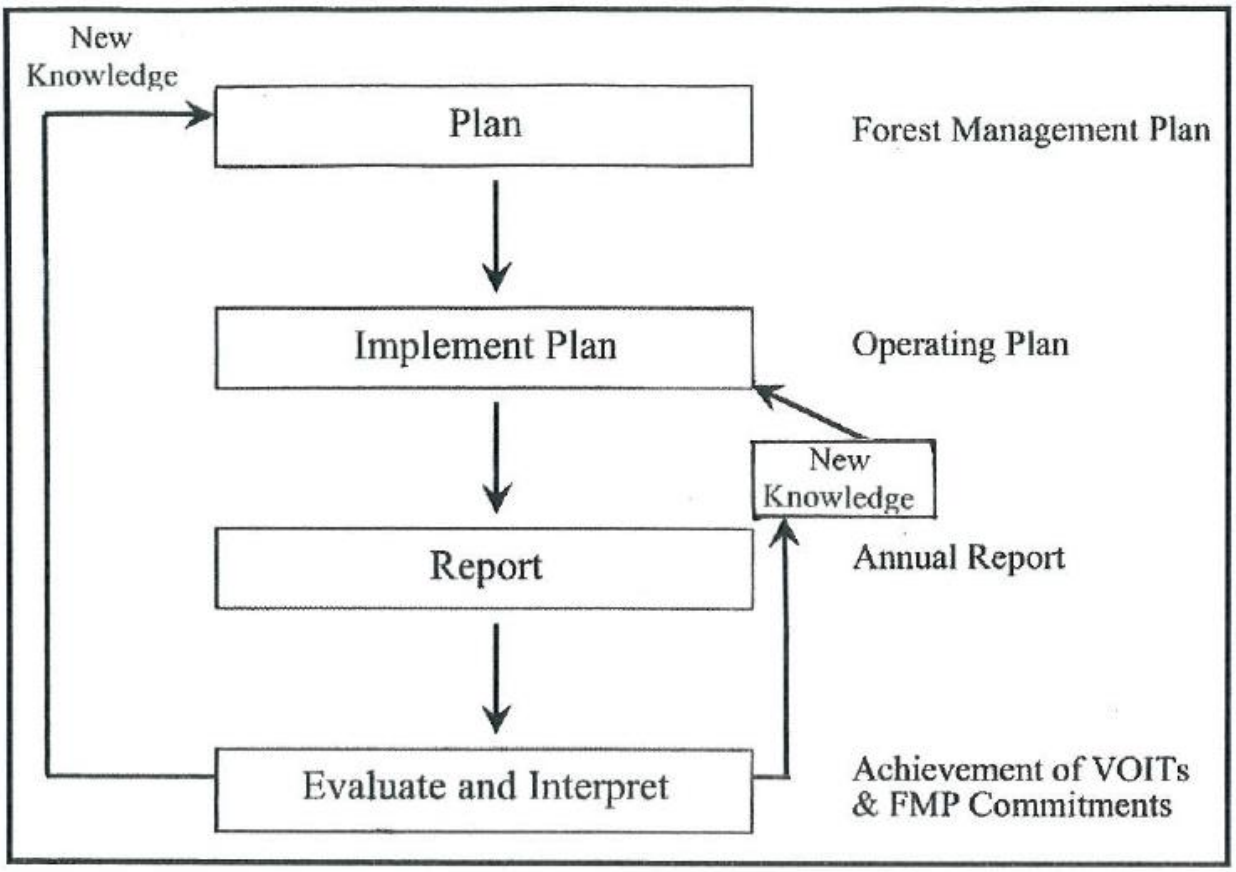

Figure 14.1 FMP Planning, Monitoring, Reporting, Evaluation and Replanning Cycle

14.1 Annual Report to the Public

The collection and analysis of the data required for the Annual Report to the Public will be the primary mechanism employed in performance monitoring. At the core of the report will be the reports on the VOITs. Also included will be reports on non-compliances that have occurred pertaining to the VOITs, FMP Registry or FMP commitments/requirements.

14.1.1 VOIT Performance Monitoring

Weyerhaeuser and Edgewood will monitor and report on the VOITs contained in Section 5 of this document on an annual basis. This reporting will provide an indication of the performance of the Licensees on specific indicators and on performance relative to the modelling assumptions.

Reporting will be done using indicator fact sheets as part of the Annual Report to the Public and as applicable, in compliance with the Forest Data Submission chapter of the Saskatchewan Environmental Code. Reporting timelines and formats have been established for each VOIT in conformance with the VOIT model created by the Forest Service.

The collection, analysis and submission of data for the Annual Report to the Public currently requires 18 months following completion of harvest operations. This is influenced largely by the requirement to order aerial or satellite photos to facilitate the updating of the GIS with the completed harvest block information. Once received, the photos require interpretation, digitization and analysis of the results. The Management Implementation Team may decide to report on some VOITS on an advanced basis rather than waiting 18 months for all data to be available. As technology changes, the Licensees may be able to provide the complete annual report in a more timely manner.

Table 14.1 PP FMA Annual Report Schedule

Operating Year	Annual Report to the Public	Submission Dates
2015/16		
2016/17	Report for 2015/16	September 30, 2017
2017/18	Report for 2016/17	September 30, 2018
2018/19	Report for 2017/18	September 30, 2019
2019/20	Report for 2018/19	September 30, 2020

14.2 Internal Mechanisms Contributing to Performance Monitoring

The Licensees have a number of internal mechanisms in place for tracking progress, recording results and reporting on performance. These will be used as the basis for performance monitoring and will be expanded as necessary to meet future monitoring/reporting requirements. These internal mechanisms include Environmental Management Systems, forest certification reporting requirements, silvicultural effectiveness monitoring and the technology systems used to record and analyze the data collected for each of these mechanisms.

14.2.1 Environmental Management Systems (EMS)

Edgewood and Weyerhaeuser each have Environmental Management Systems that are used to govern and monitor our daily actions on the FMA. We are committed to:

- Ensuring that employees are trained and are empowered to actively participate in the company's environmental management process;
- Actively supporting environmental research and technological advancement and, where appropriate, adopting innovative practices and technology;
- Promoting the development and adoption of environmental laws, policies and regulations that are balanced, are technologically sound and use incentive-based approaches for improving environmental performance;
- Managing operations for the sustainable production of raw materials while protecting water quality, fish and wildlife habitat, soil productivity, and cultural, historical and aesthetic values;

- Continuously improving our processes for reducing wastes and emissions to the environment;
- Conserving energy and natural resources by maximizing recycling and by-product reuse;
- Adopting internal standards for situations not adequately covered by law or regulation or where we believe more stringent measures are necessary to protect the environment.

The EMS requires an annual report on progress and a review by management. These requirements assist in monitoring of FMP commitments and obligations as a number of the EMS reporting requirements coincide with reporting necessary for the VOITs. Some examples of this overlap would be monitoring of harvest levels in relation to the HVS and protection of soil and water resources.

The Licensees' Environmental Management Systems have Standard Operating Procedures (SOPs) for each phase of forest management on the FMA. These SOPs meet or exceed the laws and regulations governing forest operations on the FMA. Managers are responsible to ensure that employees, contractors and contractor employees are educated about the SOPs that affect them and the importance of adhering to them.

Managers will ensure that new employees are given training in the common SOPs and the more specific ones that directly relate to their specific job function. Annual refresher training will be given to all company employees, contractors and contractor employees.

Included in that training will be STOP WORK training whereby employees are trained to stop work and seek advice if they are unsure of where they are supposed to be harvesting, if they encounter an unmapped resource or manmade structure or if they encounter soft ground that may mean exceeding the soil disturbance standard.

Employees will also be informed about procedures to follow in the event of a spill and the legal reporting requirements for various products.

Included in the EMS system is a provision for self-reporting of any non-compliance that may occur.

14.2.2 Forest Certification Reporting Requirements

Edgewood and Weyerhaeuser are both certified to the Sustainable Forest Initiative.
SFI Inc. is an independent, nonprofit organization dedicated to promoting sustainable forest management. SFI works with conservation groups, local communities, resource professionals,

landowners, and many other organizations who share a passion for responsible forest management.

The SFI Board of Directors represents environmental, social and economic interests equally, and addresses local needs through a unique grassroots network of SFI Implementation Committees. Weyerhaeuser and Edgewood belong to the Western Canada Implementation Committee.

The SFI forest certification standard is based on principles that promote sustainable forest management. The SFI 2015-2019 Forest Management Standard promotes sustainable forestry practices based on 13 Principles, 15 Objectives, 37 Performance Measures and 101 Indicators. These requirements include measures to protect water quality, biodiversity, wildlife habitat, species at risk and forests with exceptional conservation value. The SFI 2015-2019 Forest Management Standard applies to any organization in the United States or Canada that owns or manages forestlands.

Program Participants who own or manage forestland are certified to the SFI 2015-2019 Forest Management Standard (Section 4, *SFI 2015-2019 Standards and Rules*). To be certified, forest operations must undergo independent audits by competent and accredited certification bodies.

The SFI program is committed to continuously improve responsible forest management. SFI Program Participants must meet or exceed applicable water quality laws and regulations, with measures to manage and protect water wetlands and riparian zones on certified lands. They must continually evaluate habitat and biodiversity impacts from forest activities which lead to improved habitat quality, and protection of imperiled or critically imperiled species.

SFI Program Participants must comply with the comprehensive forestry laws that apply to them in the United States and Canada, and practice responsible forestry on their certified lands.

In order to maintain certification, each company must conduct an internal audit of operations on an annual basis to determine adherence to laws, regulations, SFI objectives, EMS, operating plan and forest management plan commitments. From these audits come improvement action plans with the goal of correcting deficiencies and preventing future occurrences.

All companies that are certified to SFI are also subject to regular external audits to ensure that the companies are in compliance with the same standards covered in the annual internal audits. Successfully passing the external audit conducted by independent auditors is a requirement for continued certification. Minor non-conformances or opportunities for improvement identified in the external audit also result in an improvement action plan which

must be completed to the auditor's satisfaction in order to retain certification. Major non-conformances could result in suspension of certification

The SFI program is committed to improving the practice of forestry on all forestlands in North America, whether boreal forests or plantation forests, whether naturally regenerated or planted. Its philosophy is that healthy, productive forests yield immense environmental, social and economic benefits, and mitigate the impacts of climate change by absorbing and storing carbon in trees, soil and biomass.

The reporting required for the SFI evidence package has considerable overlap with the monitoring and reporting required for the VOITs. Many of the same evidence sources will be used for the two processes. Some examples of the overlap are: conservation of biological diversity and recognition and respect of indigenous people's rights.

The SFI objectives for which companies must supply evidence of conformance are:

Objective 1 Forest Management Planning
Objective 2 Forest Health and Productivity
Objective 3 Protection and Maintenance of Water Resources
Objective 4 Conservation of Biological Diversity
Objective 5 Management of Visual Quality and Recreational Benefits
Objective 6 Protection of Special Sites
Objective 7 Efficient use of Fibre Resources
Objective 8 Recognize and Respect Indigenous People's Rights
Objective 9 Legal and Regulatory Compliance
Objective 10 Forestry Research, Science and Technology
Objective 11 Training and Education
Objective 12 Community Involvement and Landowner Outreach
Objective 13 Public Land Management Responsibilities
Objective 14 Communication and Public Reporting
Objective 15 Management Review and Continual Improvement

14.2.3 Silviculture Effectiveness Monitoring

The effectiveness of the silvicultural activities being practiced on the PP FMA will be assessed using the Forest Regeneration Assessment Chapter of the Saskatchewan Environmental Code. Reporting will be as per the Forest Data Submission Chapter. This reporting will take place on an annual basis.

The Forest Resources Management Act and Regulations require that all lands harvested are renewed with a minimum goal of maintaining the long-term productive capacity of the forest and the integrity of ecosystem processes.

The Forest Regeneration Assessment Standard establishes the regeneration standards that the forest industry must meet or exceed. It also outlines requirements and processes for the collection of survey data. The document outlines two mandatory assessment periods; Establishment and Free to Grow.

The Establishment Survey must be completed on a harvest block between 4 and 7 years after the end of the operating year of harvest and at least 12 months after artificial regeneration activities have been completed on the block. The objective of the Establishment Survey is to provide assurance early in the regeneration phase of a forest stand that adequate stocking is present on the site to contribute to the short-term development of that stand.

The Free to Grow survey must be completed on a harvest block between 8 and 14 operating years after the end of the operating year of harvest and must not be completed within 24 months after completion of a stand tending treatment. The objective of the Free to Grow survey is to provide assurance that achievement of the desired future forest condition in likely.

For both regeneration surveys, either ground or aerial surveys may be used provide that the data collection standards outlined in the Regeneration Assessment Document are followed.

14.2.3.1 Silvicultural Assumptions

In the Forest Estate Modelling process, silviculture treatments were almost always clearcut with retention. Stands were regenerated back to the same natural stand yield curve (no shifting of stand types, no managed stand yield gains) but subsequent harvests did have a 0.62% yield reduction to reflect area lost to permanent roads.

The only exception to this 1:1 transition pattern was where understory protection treatments were applied to the 5% of aspen leading and mixedwood stands expected to have a white spruce understory. This UPRO treatment was limited in the model to an average of 323 ha/year (5% of aspen and aspen leading mixedwoods) and causes a slow erosion of areas toward softwood stand types over time. The area on which this prescription is applied will vary year to year as this treatment can only be implemented on stands with an appropriate spruce understory. i.e. an understory between 2 and 15 metres tall, averaging 30 years of age and with enough density to shift the next rotation from an H to an HS or from an HS to an SH

growth track.

Table 14.2 shows the silvicultural ground rules and a summary of the modeled Analysis Units (AUs), their operability windows, and regeneration delays can be found in Appendix G the Forest Estate Modelling Report. Additional AU numbering was used during modelling to differentiate existing natural, existing managed, and future stands for purposes of tracking/reporting.

Endemic losses from pest and disease are reflected in the yield curves but no recognition of catastrophic losses (storm, flood or fire) is included in the analysis. Catastrophic losses were not modeled in favour of using a 10% disturbance threshold which would trigger a reassessment of timber supply.

Table 14.2 Silvicultural Ground Rules

Existing Stands							Treatment	Future Stands		Net Area (Time 0)
Forsite AU	Description	Yield Group	PFT	Min Age	Max Age	% of Harv		AU	Initial Age	
100	H-tA-High_Density	1	TAB (AOH)	70	140	95% 5%	CC-LFN UPro[a]	100 150	0 0	310,365
150	H-tA-High_Density_Under story Protection	5	HSM	70	140	100%	CC-LFN	500	0[b]	0
200	H-tA-Low_Density	2	TAB (AOH)	70	140	95% 5%	CC-LFN UPro[a]	200 250	0 30[c]	55,044
250	H-tA-Low_Density_Under story Protection	6	SMW	90	165	100%	CC-LFN	500	0	0
300	H-bP	3	AOH (TAB)	70	130	100%	CC-LFN	300	0	57,663
400	H-wB	4	TAB (AOH)	60	100	100%	CC-LFN	400	0	24,547
500	HS-tA_wS	5	HSM	70	140	95% 5%	CC-LFN/Plant UPro[a]	500 550	-1 30[c]	87,858
550	HS-tA_wS_Under story Protection	6	SMW	90	165	100%	CC-Plant	600	-1	0
570	HS-tA_jP	5	HPM	70	140	100%	CC-Scarify	570	-1	7,017
600	SH-wS_tA	6	SMW	90	165	100%	CC-Plant	600	-1	61,927
650	SH-jP_tA	6	PMW	80	165	100%	CC-Scarify	650	-1	7,115
700	S-bS	7	BSL	80	200	100%	CC-Plant	700	-1	158,974
750	S-bS_jP	7	BSJ	80	200	100%	CC-Plant	750	-1	9,269
800	S-jP	8	JLP	75	155	100%	CC-Scarify	800	-1	32,256
850	S-jP_bS	8	BSJ	80	155	100%	CC-Scarify	850	-1	12,408
900	S-wS_bF-Zone4[d]	9	WSF	90	160	100%	CC-Plant	900	-1	14,680
1000	S-wS_bF-Zone5_6[d]	10	WSF	90	165	100%	CC-Plant	1000	-1	30,483
										869,606

[a] Understory protection for wS understory. Percentages of Harvest are at landscape level.

[b] The age of the stand following the removal of the hardwood component is reset to 0; here the stand following the understory protection cut treatment regenerates with a larger hardwood component. Thus, the stand becomes eligible for harvesting after a complete hardwood rotation (70 years) while the age of the softwood component is reset to 30 and it develops into an older cohort.

[c] The age of the stand following the removal of the hardwood component is reset to 30; here the stand following the understory protection cut treatment regenerates with a larger softwood component due to a lower hardwood density at time of treatment. Thus, the stand becomes eligible for harvesting after 60 years (min age is 90) following the understory protection cut treatment.

[d] Zone 4 is "Boreal Transition Zone" and Zone 5_6 refers to "Mid-Boreal Upland" and "Mid-Boreal Lowland / Interlake Plain" zones.

14.2.4 Technology Systems

Data for reporting on VOITs related to harvest levels, silvicultural effectiveness and adherence to the Tactical Plan are highly dependent on technology systems.

The Licensees use a GIS to store and modify data related to all of the mapping requirements for the FMA. Forest inventory data for the Pasquia Porcupine FMA is stored digitally on remote servers and accessed from desktop computers. Updates of harvesting and planting activities are input into the system annually.

Databases containing the information associated with reporting requirements are also stored on the system and will be accessed to obtain the necessary data to complete those reports.

The feller bunchers working on the FMA have been equipped with iPads which capture the movements of the machine throughout the day. We are currently working to perfect the use of this data for harvest map updates.

Foresters and technicians working in the field are equipped with digital devices which can display field maps and geo-reference their locations. This is a rapidly advancing field and both Edgewood and Weyerhaeuser are adapting the new technology as it becomes available.

15.0 FMP Amendments

This Forest Management Plan has been created using the best information that is currently available. It is however acknowledged that our knowledge of and ability to predict changes to forest ecosystems, natural disturbances, social demands and market events is imperfect due to their inherent variability.

It is not anticipated that an FMP will require amendment unless there is a catastrophic event which affects the ability of the Licensees to effectively implement the tactical plan.

15.1 Minor Variations from the FMP/Tactical Plan

It is the intention of the Licensees to use the principles of adaptive management to deal with relatively minor changes to this FMP or variances from the Tactical Plan. These changes or variations will be dealt with through the Operating Plan process.

The FMP Standard considers variances from the Tactical Plan of up to 15% to be routine in nature and best dealt with through the Operating Plan process. These variances include such items as:

- Changes to block boundaries or road locations (provided no significant impact to other users is identified)
- Clearing rights-of-way to link tactically scheduled blocks to primary roads.
- Permanent land clearing for approved activities.
- Approval of salvage operations and incidental harvest.
- Harvest/clearing proposed by other parties.

If however, more substantive changes to circumstances occur, an amendment to the FMP may be required.

Whether the variations from the Tactical Plan are dealt with through the Operating Plan process or the Amendment process, there will be public engagement as part of that process.

15.2 FMP Replanning Threshold

An amendment to the FMP will be considered if:

1. Within the first 10 years of this FMP, an area equal to 10% of the Effective Net Area (79,134 ha) is alienated from the available timber supply by any means, including

natural disturbance such as fire or government actions such as withdrawals or changes to land use rules.

2. A recurrent change in the licensee's utilization standard is required with no plan in place for resolution of the issue.
3. Deviations to the tactical plan are required beyond the acceptable limit of 15%.
4. The Minister of Environment and the Licensees mutually agree to amend the agreement to increase, modify or decrease the License area for reasons related to timber supply and milling capacity as listed in Clause 5.12 of the FMA Agreement.

If any of these situations exist, the Licensees will meet with the Forest Service to determine the course of action to be followed.

15.3 Amendment Process

15.3.1 Amendment Work Plan

Once an agreement has been reached on the need for an amendment, a joint planning team (Ministry and Licensees) will be assembled and a work plan prepared. The Pasquia Porcupine FMP Amendment Log will be updated with summary information pertaining to the proposed amendment.

15.3.2 Public Consultation

A public consultation plan appropriate for the scale of the amendment will be developed in collaboration with the Ministry of Environment. Public notices and/or meetings will be scheduled in accordance with any regulations governing such amendments.

Input received from the public will be incorporated into the amendment as appropriate and forwarded to the Ministry of Environment for consideration

15.3.3 Approval and Updating of the Amendment Log

The Licensees will maintain an FMP amendment log throughout the term of the FMP. At the end of each amendment process, the FMP amendment log will be updated with information summarizing the reason for the amendment, any public consultation that was done and any conditions that may be attached to the approval.

The Amendment Log is appended to this document as Appendix H.