Chapter 1: Introduction to the Plan

List of Tables

1. INTRODUCTION

Chapter 1 of this Forest Management Plan provides an overview of the entire Forest Management Plan for the area of Forest Management Licence # 3.

1.1 FOREST MANAGEMENT PLAN CHAPTERS

An overview of all Forest Management Plan (FMP) chapters are described in Table 1.1. Appendices (if any) are listed under each chapter.

Table 1.1 Overview of the Forest Management Plan chapters and Appendices.

Chapter Number	Chapter Title	Description
Ch. 1	**Introduction** APP 1: Forest Management Plan Terms of Reference	This chapter is an introduction and overview of the Forest Management Plan. Signed Terms of Reference) is the blueprint (specifics) for developing the 20-Year Forest Management Plan for Forest Management Licence # 3.
Ch. 2	**Past Forest Management Activities** APP 1: MAP - Roads and Water Crossings in Forest Management Licence # 3 APP 2: MAP -Area Harvested in Forest Management Licence # 3 (2006 to 2019) APP 3: MAP -Renewal Activities in Forest Management Licence # 3 (2006 to 2019)	(2006 to 2019) roads, crossings, harvest, renewal, research, and monitoring APP1 1 to APP 3: 150,000 scale maps D-size (24" X 36")
Ch. 3	**Current Forest Conditions**	Ecological – Biophysical descriptions Socio-Economic profile Land Use overview
Ch. 4	**Information Sharing & Engagement** APP 1: Letters sent to all communities APP 2: Values survey	Communication Plan Summary of communications by community Record of Communications
Ch. 5	**Scenario Planning** APP 1: MAP - Baseline Scenario - Spatial Harvest Schedule maps– planning period 1 (1 to 10 years) and planning period 2 (11 to 20 years) APP 2: MAP - Bird Species-at-Risk Habitat Map – Canada warbler – all scenarios	Creation and sustainability evaluation of the Baseline and Moose Emphasis scenarios. Choice of 'Preferred Management Scenario' Appendices 1 to 8 are digital maps D-size (24" X 36").

Chapter Number	Chapter Title	Description
	APP 3: MAP - Indicator Bird maps – all Scenarios APP 4: MAP - Baseline Scenario – Winter moose habitat maps APP 5: MAP - Baseline Scenario – Summer moose habitat maps APP 6: MAP - Moose Emphasis Scenario - Spatial Harvest Schedule – planning period 1 (1 to 10 years) and planning period 2 (11 to 20 years) APP 7: MAP - Moose Emphasis Scenario – Winter moose habitat maps APP 8: MAP - Moose Emphasis Scenario – Summer moose habitat maps APP 9: Objectives mutually chosen to rank the two scenarios	Appendix 9 is letter size (8.5" X 11")
Ch. 6	**FMP Implementation** APP 1. MAP - Harvest operating areas – Spatial Harvest Schedule - Moose Emphasis Scenario (D-size Map (24" X 36") APP 2. Planning Standard Operating Guidelines APP 3. Biodiversity Standard Operating Guidelines APP 4. Forest Roads and Crossings Standard Operating Guidelines APP 5. Forest Operations Standard Operating Guidelines APP 6. Silviculture Standard Operating Guidelines APP 7. Softwood Silviculture Standard Operating Procedures	How the strategic plan (Moose Emphasis scenario) will be implemented on the ground.
Ch. 7	**Monitoring Framework** APP 1: Permanent Sample Plot Procedures Manual APP 2: Pre-Harvest Survey Manual APP 3: Harvesting and Roads Monitoring/Inspection form APP 4: Water Crossing Checklist form APP 5: Road decommissioning table APP 6: SFI Certification audit summary	Future monitoring and joint research efforts APP 1 to 6 are all documentation of monitoring related manuals, reports, or forms.

1.2 FOREST MANAGEMENT PLAN - TERMS OF REFERENCE

The Forest Management Plan 'Terms of Reference' is described in this section. The Plan proponent (Louisiana-Pacific Canada Ltd.) is the holder of Forest Management Licence # 3. The 20-Year Forest Management Plan (FMP) will be guided by input received from Indigenous communities, stakeholders, environmental groups and the public.

The FMP Terms of Reference (ToR) was the blueprint for developing the 20-Year Forest Management Plan (FMP) for Forest Management Licence # 3. The new 20-Year FMP included ecosystem values and was designed with a community-supported strategy to ensure the long-term conservation of moose populations. The benefits to moose management resulting from FMP development was discussed with the Provincial Wildlife and Fisheries Branch, Indigenous communities, and stakeholders.

The 20-Year FMP is for Forest Management Licence # 3 (FML # 3), which includes the Duck Mountain Provincial Forest and surrounding area. FML # 3 is located mostly within the Boreal Plain ecozone with a small portion located in the Prairie ecozone.

The FMP Terms of Reference (ToR) began on Nov. 21st, 2014 with the creation of the FMP planning Team. The FMP planning team worked exclusively on the FMP Terms of Reference. The ToR was signed in Nov. 2017, after mutually agreeing to:

- ecological yield (volume) curves
- silviculture post-harvest transitions based on regeneration survey data
- reintegrating harvested areas in the productive land base (from Potentially Productive)

The FMP Terms of Reference were amended in June and July 2019 to specify wildlife species and wildlife activities within the FMP. The revised ToR was signed by Wildlife and Fisheries Branch, Forest and Peatlands Branch, and Louisiana-Pacific Canada Ltd. on July 29th, 2019. The final Terms of Reference (July 29th, 2019) is in Appendix 1.

1.3 FOREST MANAGEMENT PLAN - KEY CONCEPTS

Key concepts used in the development of this Forest Management Plan are described in the following sub-sections.

1.3.1. Sustainable Forest Management

Sustainable Forest Management (SFM) refers to management that maintains and enhances the long-term health of forest ecosystems for the benefit of all living things while providing environmental, economic, social and cultural opportunities and goods and services for present and future generations. Examples of SFM elements include: wetlands filtering water, carbon storage and sequestration in both uplands and wetlands, wildlife habitat, and biodiversity.

Sustainability in this Forest Management Plan refers to both sustainability over the term of the 20-year plan (2020 to 2040) as well as sustainability over two softwood rotations, which is 200 years. All modeling runs are projected over 200 years.

1.3.2. Ecosystem-Based Management

Ecosystem-Based Management (EBM) is an integrated, science-based approach to the management of natural resources that aims to sustain the health, resilience and diversity of ecosystems, while allowing for sustainable use by humans of the goods and services they provide (Kappel, 1994)

The working definition of EBM as defined under the Canadian Boreal Forest Agreement (Van Damme *et. al.* 2014) is as follows:

> *"A management system that attempts to emulate ecological patterns and processes, with the goal of maintaining and/or restoring natural levels of ecosystem composition, structure and function within stands and across the landscape."*

Focusing on individual pieces often compromises the whole ecosystem. By looking at whole ecosystems, we can better manage all values such as wildlife, water, recreation, and timber.

The concept of Ecosystem-Based Management can be applied to sustainable forest management in timber-producing forests, in some cases to address values that are like those held for protected areas. Ecosystem-based Management is already used by Parks Canada. Canada's national parks are explicitly mandated to engage in an ecosystem-based management approach. Parks Canada staff engage with land managers, owners, stakeholders and interest groups (public and private) outside park boundaries to coordinate management activities.

1.3.3. Climate Change – Adaptation

A climate change vulnerability assessment for Forest Management Licence # 3 aims to evaluate the risks and opportunities, which a changing climate may impose on sustainably managing the forest currently and in the future. It will also forestry related risks from climate variability and extreme events.

Climate change adaptation efforts provide information that will allow climate change associated risks and opportunities, adaptation and/or mitigation measures to be mainstreamed into all aspects of the existing Sustainable Forest Management system. Best practices are in progress to assist with adapting to increasing climate variability and uncertainty.

1.3.4. Natural Range of Variability

The Natural Range of Variability (NRV) attempts to describe what the forest would look like without human influence. Wild fire, insects, wind throw, and disease are the natural disturbance agents in the forest. These natural stand-replacing events maintained young and old forest areas on the landscape.

In the boreal forest, wild fire and other disturbances have historically maintained ecosystems and their associated species. Therefore, NRV can be a historical tool that guides forest management. Natural Range of Variation (NRV) was a main ecological driver used to model and maintain the amount of mature and old seral stages on the landscape over time.

1.3.5. Species at Risk - Birds

There are listed species-at-risk birds in the FML # 3 area. One bird (CAWA – Canada Warbler) has enough observations to create a new habitat model that didn't exist prior. LP is contributing to the management and hopeful recovery of the Canada Warbler, by maintaining a continuous supply of habitat over time.

1.3.6. Indicator Birds

Indicator bird species represent different niches of the forest ecosystems. Some birds' habitat requirements are indicative of certain conditions (*e.g.* old conifer forest, young hardwood). A suite of indicator birds was chosen to represent the entire range of forest ecosystems by age class, cover type, and interspersion.

1.4 FOREST ADMINISTRATION

Forest Management Licence Agreement # 3 came into effect on September 21, 1994. The Forest Management Licence (FML) was allocated to the Company to ensure a long-term fiber supply for the operation of the Oriented Strand Board (OSB) mill located near Minitonas in the Swan River Valley. The FML Agreement can be extended and the licence renewed, subject to the faithful performance by the Company during the preceding period.

Forest renewal is an integral part of LP's commitment to responsible forest stewardship and forest management. Louisiana-Pacific has been assigned all obligations and responsibility with respect to forest renewal within FML # 3. The FML Agreement states:

> *"The Company acknowledges its primary forest management and renewal responsibility by ensuring that all harvested areas within FML 3 are regenerated to approved Provincial Standards".*

The newly-formed Mountain Forest Section Renewal Company has assumed the obligations and responsibilities for softwood renewal within FML # 3, as of Jan. 1st, 2007. LP continued the hardwood renewal efforts within FML # 3.

Louisiana-Pacific was issued an Environment Act Licence (No. 2191) dated May 27, 1996 to carry out forest management activities within the geographical boundaries of FML 3. The appeals process resulted in changes to the Environment Act License No. 2191, and Licence No. 2191E was issued and became effective on December 11, 1996. This licence expired January 1st, 2006.

A two-year extension (January 1st, 2006 until January 1st, 2008) was later granted, followed by annual extensions to the Environment Act Licence while Forestry Branch was reviewing the June 1st, 2006 submission of the 20 Year Plan for FML # 3.

Louisiana-Pacific and approximately 35 Quota Holders harvest hardwood and softwood trees within FML # 3. All forest management activities proposed within FML # 3 described in this 20-Year Sustainable Forest Management Plan (SFMP) apply to both LP and the Quota Holders. Forest management activities include harvesting, road construction, access development, and reforestation. The Quota Holders are collectively organized as the Mountain Quota Holders Association which is managed by the single largest Quota Holder – Spruce Products Ltd.

1.5 CORPORATE OVERVIEW

Headquartered in Nashville, Tennessee, LP produces building products that are manufactured at facilities throughout the United States, Canada, Brazil and Chile. Louisiana-Pacific (LP) is a publicly traded multi-national company. It was founded in 1973 and is one of the leading manufacturers and distributors of premium building products in North America. Louisiana-Pacific Corporation manufactures a wide variety of commodity and value-added specialty building products for retail, wholesale and homebuilding use. These building products include siding, orientated strand board (OSB) and engineered wood products.

LP is partnered with the Sustainable Forestry Initiative. The Sustainable Forestry Initiative (SFI) is an independent, nonprofit organization dedicated to promoting sustainable forest management. SFI's strategy is to provide solutions-oriented forest-based conservation and community initiatives through deep collaboration and continual learning.

More than 300 million acres of forestland across the U.S. and Canada, and over 100 companies responsible for fiber production, are certified to SFI standards. The SFI label is widely recognized in the marketplace – for example, SFI certified products are accepted by the U.S. Green Building Council for wood products in its Leadership in Energy and Environmental Design (LEED) rating system, which enables LP certified products to be eligible for LEED credits.

A critical component of the work of SFI is ongoing forest conservation research and continual improvement in forest management practices. Since 1995, SFI program participants have directly invested nearly $1.6 billion in forest research.

LP's goal is to be a respected, profitable and growing manufacturer of building products that is the supplier of choice because of our quality products and reliable services, and the employer of choice because we are a safe, ethical, fun, challenging and rewarding place to work.

The corporate structure flows down from the CEO to general manager siding to siding VP of manufacturing to director of manufacturing regional operations to Minitonas mill plant manager (Kevin Betcher) to Area Forest Manager for Swan Valley (Todd Yakielashek). The Swan Valley Forest Resources Division (FRD) has 10 employees working in the Swan River office managing forestry operations for LP.

LP's mandate is a focus on engineered wood products which demonstrates our commitment to builders. It also drives our ability to meet the needs and demands of builders with products that perform—reducing construction costs, minimizing waste, increasing energy efficiency, fostering safe home environments, and creating flexible architectural and design possibilities.

From our company to our products and programs, LP performs for builders—as well as for the architects, specifying engineers, dealers and distributors who support them—making it possible to build better homes.

Safety is a core value at LP, and we believe no one should get injured while at work. Our innovative safety and health processes are at the forefront of everything we do. We start every meeting, every mill tour, and every morning with a message about safety. Employee, contractor and guest safety is our top priority every day.

At LP, we strive to manage the environmental footprint of all our operations, and we take all of our environmental responsibilities seriously. All relevant policies, management systems and compliance efforts are overseen by the LP Environmental, Quality and Compliance Committee of the Board. The Committee receives quarterly written reports directly from functional leaders responsible for LP's environmental programs.

We have a company-wide Policy on Environmental Stewardship which is available publicly and outlines our commitment to meet the strictest standards in natural resource management and conservation, and to seek continual improvement in our environmental programs and employee awareness.

1.6 FACILITY DESCRIPTIONS

The Spruce Products Ltd. sawmill has been operating in Manitoba since 1942, and is a producer of softwood dimensional lumber, wood chips, wood shavings, and softwood pellets for the heating market. Their mill is north-west of the town of Swan River and is the largest softwood sawmill operating in Manitoba.

The mill east of Minitonas has been in operation since 1996. The mill produced Orientated Strand Board (OSB) until 2015. In 2015 the mill was converted to produce sheet siding, a value-added product, which uses OSB as the base. The mill has added several additional products, such as Weather Logic and fence board blanks, since the conversion. In late 2018 the mill did another conversion to allow production of OSB as well as siding. This gives the mill the ability to meet demands for OSB and operate when siding orders slow. Markets for the products produced are variable and change from month to month.

1.7 LITERATURE CITED

Kappel, C.V. 1994. EBM definition Oct. 3rd, 2006 The Encyclopedia of Earth website https://editors.eol.org/eoearth/wiki/Ecosystem-based_management [accessed Nov. 14, 2019]

Manitoba Conservation. 2007. Manitoba's Submission Guidelines for Twenty Year Forest Management Plans. Manitoba Conservation. Edited by Forestry Branch. 200 Saulteaux Crescent, Winnipeg, MB. 24 pp.

Van Damme, L., Burkhardt, R., Plante, L. and Saunders, K. 2014. Status Report on Ecosystem-based Management (EBM): Policy Barriers and Opportunities for EBM in Canada. Prepared for the Canadian Boreal Forest Agreement. KBM Resources Group, Thunder Bay, ON. 99 pp.

1.8 APPENDICES

Appendix 1: Forest Management Plan - Terms of Reference signed July 29, 2019

20-Year Forest Management Plan (FMP) for Forest Management Licence #3

Terms of Reference

Revised: July 23, 2019

EXECUTIVE SUMMARY

Who – The Plan proponent (Louisiana-Pacific Canada Ltd.) is the holder of Forest Management Licence #3. The plan regulator is the Province of Manitoba. The 20-Year Forest Management Plan (FMP) will be guided by input received from Indigenous communities, stakeholders, environmental groups and the public.

An FMP Planning Team consisting of staff from Louisiana-Pacific Canada Ltd., the Province of Manitoba, scientists and/or consultants will guide the creation of the 20-Year Forest Management Plan (FMP).

FMP Planning Team members will include:

AGENCY	ROLE OR TITLE	PERSON
Louisiana-Pacific (LP) Canada Ltd. Swan Valley – Forest Resources Division	Siding Business Manager, Natural Resources	Dan Toivonen
	Area Forest Manager	Todd Yakielashek
	District Forester	Paul LeBlanc
	Planner	Vern Bauman
Mountain Forest Section Renewal Company (MFSR)	Silviculture Forester	Jeannette Coote
Manitoba Sustainable Development (MSD)	Forestry and Peatlands branch (Winnipeg) A/ Director	Matt Conrod
	Forestry and Peatlands branch (Winnipeg) Industry Liaison	Jane Epp
	Forestry and Peatlands branch (Winnipeg) FMP Consultation Lead	Evan Finkler
	Forestry and Peatlands branch (Winnipeg) Wood Supply Modeller	Jianwei Liu
	Forestry and Peatlands branch (Winnipeg) A/Manager - Inventory & Analysis section	Jim Boyd
	Forestry and Peatlands branch (Swan River) Western Region Forester	*Vacant*

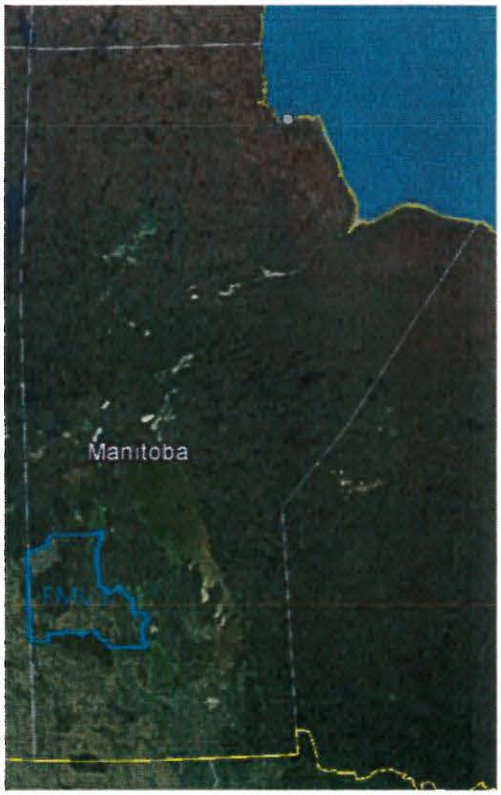
Manitoba Sustainable Development (MSD)	Forestry and Peatlands Branch (Swan River) Regional Forest Management Supervisor	David Chetyrbuk
	Wildlife and Fisheries Branch (Winnipeg) Habitat Mitigation & Wildlife Land Specialist	Brian Kiss
	Wildlife and Fisheries Branch (Swan River) Regional Biologist	Gerald Shelemy
	Wildlife and Fisheries Branch (Swan River) Regional Wildlife Biologist	Brent Fuchs
	Wildlife and Fisheries Branch (The Pas) A/Manager, Regional Wildlife Section	Maria Arlt
	Wildlife and Fisheries Branch (Dauphin) Regional Wildlife Manager	David Elliot
	Environmental Approvals Branch (Winnipeg) Environment Officer	Elise Dagdick

Additional staff from LP Canada, the Province of Manitoba, Timber Quota holders, as well as, stakeholders and the public will be involved at different stages of FMP development.

What – The FMP Terms of Reference (ToR) is the blueprint for developing the 20-Year Forest Management Plan (FMP) for Forest Management Licence #3. The new 20-Year FMP will include ecosystem values and be designed with a community-supported strategy to ensure the long-term conservation of moose populations. The benefits to Moose management resulting from FMP development will be discussed with the MSD Wildlife and Fisheries branch, Indigenous communities and stakeholders. The plan proponent will incorporate moose science and traditional knowledge regarding moose, wherever possible. Ecosystem-Based Management will continue to provide the basis for FMP development and will consider components such as land base, yield curves, modelling and management objectives.

Where – The 20-Year FMP is for Forest Management Licence #3 (FML-3), which includes the Duck Mountain Provincial Forest and surrounding area. FML-3 is located mostly within the Boreal Plain ecozone with a small portion located in the Prairie ecozone.

When - The FMP Terms of Reference (ToR) must be mutually agreed upon, in writing, by the Plan regulator (Province of Manitoba) and the Plan proponent (LP Canada Ltd.). Once written approval of the ToR occurs, the plan proponent will refer to the ToR to guide and help develop the 20- Year Forest Management Plan (FMP).



Map: Forest Management Licence #3 (FML-3)

Louisiana Pacific (LP) will undertake Engagement and Information Sharing at various stages of the FMP as identified in – *Manitoba's Submission Guidelines for Twenty Year Forest Management Plans.*
https://www.gov.mb.ca/sd/forestry/pdf/practices/20_year_forest_plan_2007.pdf.
Proponent Communication Plan (Information Sharing and Engagement):

- **Early plan development** – (post ToR approval but at the beginning of the plan process). Confirming plans for information sharing and identifying community values
- **Mid-plan development** – Scenario planning, iterative modifications to scenarios based on input
- **Late plan development** – Scoring forest management scenarios to assist in choosing the 'Preferred Management Scenario (PMS)' complete with 20 years of harvest scheduling and modeling output.

The 20-Year FMP is expected to be submitted to the Province of Manitoba by December 31, 2019.

Manitoba Sustainable Development (MSD) and LP agreed to a Chapter Approval in Principle process. Chapters of the FMP, or portions thereof, would be submitted to MSD for a full Technical Advisory Committee (TAC) review and comment as completed by LP. These comments would be forwarded to LP to edit or respond to the concern. MSD signing off on the Chapter Approval in Principle does not indicate completeness or finalize the chapter but defines direction on the chapter and addresses concerns prior to the final submission. Once the full plan is submitted, Forestry and Peatlands branch will follow the guidance in the FMP Submission Guidelines (*i.e.* Manitoba's Submission Guidelines for Twenty Year Forest Management Plans, 2007) in coordinating a review.

FMP approval is anticipated to be within two years following submission of the FMP – December 2021.

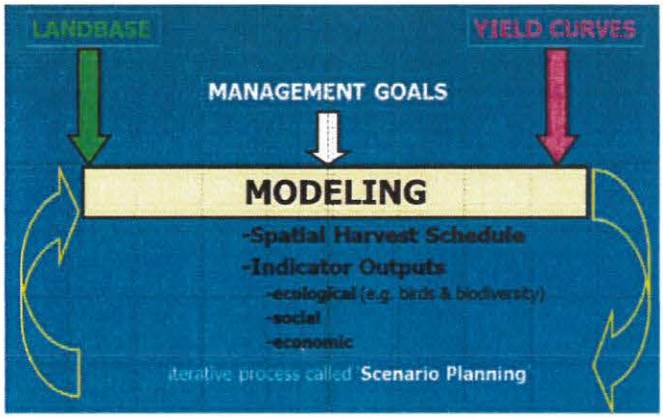
The approved Forest Management Plan (FMP) will be signed by both the proponent and Director of Forestry and Peatlands branch.

Why – The 20-Year FMP is the long-term strategic plan that will guide forestry activities in Forest Management Licence #3 over the next 20-year period.

How – The 20-Year Forest Management Plan (FMP) is a large and complex undertaking. Therefore, the FMP Terms of Reference is sub-divided into four categories:

- land base
- yield curves
- management goals
- modeling

These four FMP categories will lead into an iterative modeling process. Note that opportunities to provide input for plan development will be provided to Manitoba Sustainable Development, Indigenous communities, stakeholders and the public.



SIGNATURE PAGE

[redacted]

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Rob Olson
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Table of Contents

1. INTRODUCTION

The Plan proponent, LP Canada Ltd., is the licence holder for Forest Management Licence #3. The Plan regulator, the Province of Manitoba, is responsible for the review and approval of the 20-Year Forest Management Plan (FMP).

1.1 Ecologically-Based Approach

An **ecologically-based approach** to this proposed FMP is consistent with provincial, national, and international guidance:

Provincial

- Manitoba's Submission Guidelines for Twenty Year Forest Management Plans

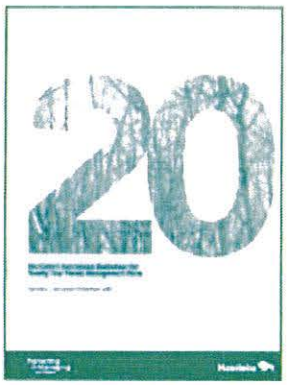
National

- Canadian Council of Forest Ministers – Indicators of Sustainable Forest Management (2003);
- Sustainable Forest Management (SFM)

Globally

- Embedded with the World Conservation Strategy (International Union for the Conservation of Nature et al. 1980)
- United Nations Conference on Environment and Development's Agenda 21 (United Nations 1992a)
- United Nations Convention on Biological Diversity (United Nations 1992b)

1.2 Terms of Reference



(From page 2, section 2.0 Pre-Planning Requirements – Manitoba's Submission Guidelines for Twenty Year Forest Management Plans)

Terms of Reference

The Terms of Reference (ToR) is a living document. The ToR is used by the Plan proponent (LP Canada), and the Plan regulator (Province of Manitoba) as a planning aid to guide the FMP Planning Team in discussions regarding the 20-Year FMP. Wood supply information and/or Base Case analysis will be provided by the Manitoba Sustainable Development (MSD). If MSD does not have a Base Case completed, in part or in total, by the time the Terms of Reference for the FMP is submitted, the Director of Forestry and Peatlands will give written instructions to the proponent on how to proceed in a timely manner.

The **Plan regulator** (Province of Manitoba) will provide:

- confirmation that the proposed indicator species (plant and/or animal) selected for modelling the Preferred Management Scenario (PMS) meet government requirements
- end date for submission of the 20-Year FMP to the Province of Manitoba
- details of the various Manitoba Sustainable Development review processes
- details of the Environmental Assessment process and Licensing Branch process, under the *The Environment Act*
- details of Manitoba's Crown-Consultation process including proponent's role in supporting the process
- the proposed date for the Province of Manitoba to approve the 20-Year FMP
- existing issues in Forest Management Licence #3 (FML-3)
- confirmation that the suite of indicator species (plant and/or animal) proposed are satisfactory
- available information regarding other resource uses
- other relevant land base management plans

The **Plan proponent** (LP Canada Ltd.) will provide:

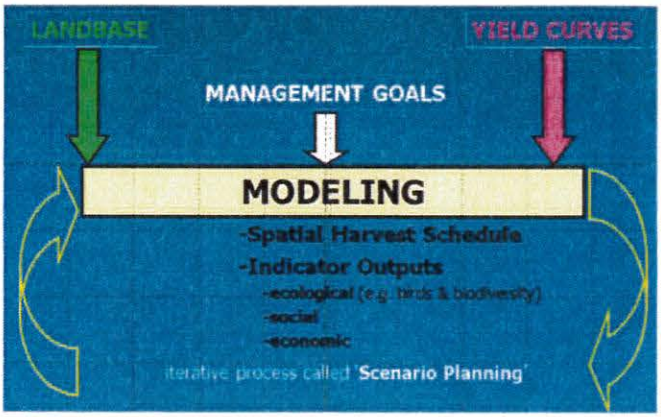
- a Communication Plan (*i.e.* Information Sharing and Engagement)
- existing issues in Forest Management Licence #3 (FML-3)
- the proposed indicator species (plants and/or animal) selected for PMS modelling of the FMP

1. FOREST MANAGEMENT PLAN OVERVIEW

A 20-Year Forest Management Plan (FMP) is a large and complex undertaking. Therefore, the FMP Terms of Reference is sub-divided into four meaningful categories:

- land base
- yield curves
- management goals
- modeling

Note that information provided by Indigenous communities, technical experts, stakeholders and the public can occur at each phase of modelling.



Embedded science – wherever possible, relevant science and traditional knowledge (verbal and written) will be added into the land base, yield curves, management goals, and modeling. For example, geographic areas can be identified that are of traditional importance to local persons, and this information can be used in the land base.

2.1 Proponent Communication Plan (Information Sharing and Engagement)

As per section 2.0 of the FMP guidelines (i.e. *Manitoba's Submission Guidelines for Twenty Year Forest Management Plans),* the Province of Manitoba will provide information on the Crown-Consultation process with Indigenous communities (including timelines and communities) and communicate the proponent's role in supporting consultation by providing information on FMP development.

The proponent will prepare a "Communication Plan" that outlines plans for FMP Information Sharing and Engagement with Indigenous communities and stakeholders.

Information Sharing and Engagement will happen at various stages of the FMP:

- **Early plan development** – (post ToR approval but at the beginning of the plan process) Confirming plans for engagement and identifying community values
- **Mid-plan development** – Scenario planning, iterative modifications to scenarios based on input;
- **Late plan development** – Scoring forest management scenarios to assist in choosing the "Preferred Management Scenario (PMS)" complete with 20 years of harvest scheduling and modeling output.

2.2 Existing Issues in Forest Management Licence #3 (FML-3)

Existing issues in FML-3 are as follows:

- low moose populations
- community-supported strategy for the long-term conservation of moose populations
- the perception of declining elk and marten habitat
- landscape-level management
- water yields
- beaver populations
- roads and road access
- species at risk
- forest access and trails

Note that the list will be updated to include information received through Information Sharing and Engagement.

Some local stakeholders have raised issues in regard to the decline in moose populations. LP will be investigating a landscape management approach for the 20-Year FMP that would significantly reduce the number of roads and thereby limit access.

2.3 Indicator Species in the FMP

Indicator species are defined as an animal or plant species that can be used to infer conditions in a particular habitat.

Indicator species that will be modelled for within the scope of this forest management plan are the 17 indicator bird species listed below. These indicator bird species represent habitat with different ages, cover types and interspersion.

Coarse-Filter Biodiversity Bird Species with existing models in the Duck Mountain:

1)	AMRE	American redstart
2)	BCCH	Black-capped chickadee
3)	BHCO	Brown-headed cowbird
4)	BHVI	Blue-headed vireo
5)	BOCH	Boreal chickadee
6)	BRCR	Brown creeper
7)	COYE	Common yellowthroat
8)	CSWA	Chestnut-sided warbler
9)	GCKI	Golden-crowned kinglet
10)	HETH	Hermit thrush
11)	OVEN	Oven bird
12)	REVI	Red-eyed vireo
13)	SWTH	Swainson's thrush
14)	VEER	Veery
15)	WIWR	Winter wren
16)	YBSA	Yellow-bellied sapsucker
17)	YWAR	Yellow warbler

Several other wildlife species, that are not indicator species, rather species of noted concern or importance are, Moose, American Pine Marten, and Elk. Bird species at risk include Golden Winged Warbler, Canada Warbler, and Olive sided fly catcher. Below is a summary of how the forest management plan will address/model habitat abundance for each species.

Moose
A Resource Selection Function (RSF) model will be used to spatially model and quantify winter moose habitat for the current forest condition as well as at years 10, 20, 30 and 40.

A Habitat Supply Model (HSM) will be used to spatially model and quantify summer moose habitat for the current forest condition as well as at years 10, 20, 30 and 40.

Marten
A Habitat Suitability Index for winter cover will be used to aspatially model marten winter cover for 200 years.
Bird Species at Risk

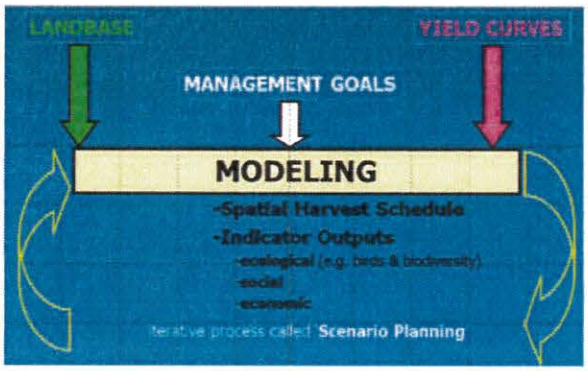
Bird species at risk have very little habitat information. Therefore, the agreed upon approach will be to use indicator bird species as a proxy for bird species at risk.

Species	Surrogate Indicator Bird Species
Canada warbler (CAWA),	American Redstart (AMRE), Veery (VEER)
Olive-sided flycatcher (OSFL),	Alder Flycatcher (ALFL), Common Yellowthroat (COYE)
Golden-winged warbler (GWWA),	American Redstart (AMRE), Veery (VEER)

Elk
Currently there is no suitable model or data available to strategically quantify or model elk habitat for the FML 3 area at the landscape level. Elk are recognized as an important species of concern. Should a validated elk model become available over the course of the plan, it would be considered for use during one of the 5-year forest reports.

2. LANDBASE

A digital modeling land base was created for Forest Management Licence #3 (FML-3) and approved January 29, 2019. In keeping with the Province of Manitoba's stated goal of an ecologically-based approach, an ecological land base consisting of uplands, peatlands and wetlands was created. Approved use of this land base information is limited to strategic planning purposes only (i.e. development of the 20-year FMP). Any use beyond this purpose should not be considered endorsed by either party, unless by written mutual consent.



The MSD Forestry and Peatlands Branch (Inventory and Analysis section) has agreed to update the ecosystem modeling land base. All disturbances up to March 31, 2018 are included in the modeling land base. All analyses by the Province of Manitoba and LP would utilize the same modeling land base file.

3.1 Ecological Boundaries

Ideally, there would be a single ecological land base that follows ecosystem boundaries at a relevant scale. This is well described in Manitoba's publication – *Five-Year Report on the Status of Forestry (2006-2011)*, under the section titled "Ecozone-Based Reporting Structure" (Figure 1).

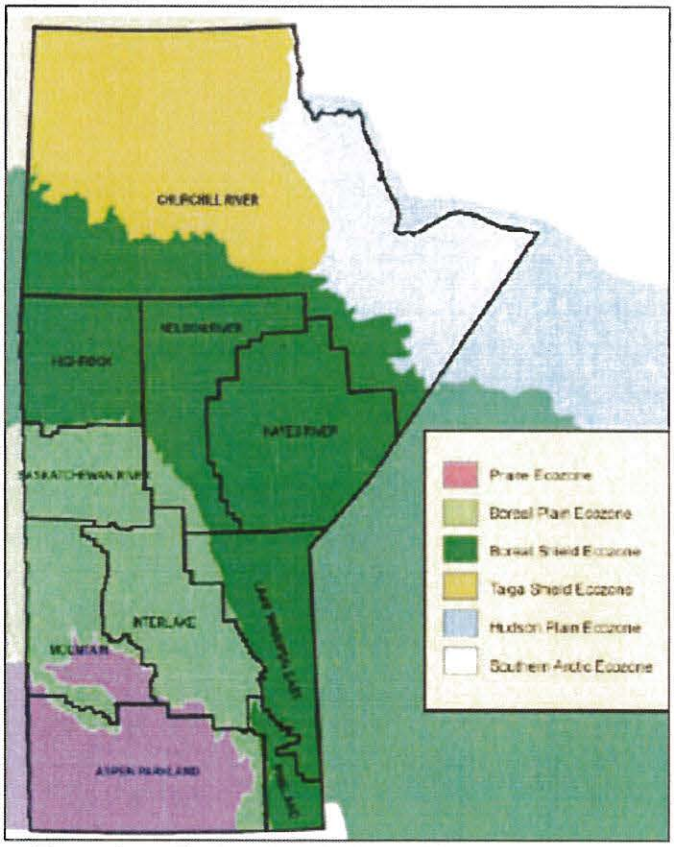


Figure 1. Ecozone boundaries and forest section boundaries in Manitoba

3.2 Ecological Land Base

Forest Management Licence #3 consists of three Forest Management Units (FMU), which include:

- FMU 10 (east and south of the Duck Mountains)
- FMU 11 (Swan-Pelican forest and Swan Valley area)
- FMU 13 (Duck Mountain Provincial Forest)

Each FMU has a separate forest inventory with a different date of origin and methodology. These differences create some challenges for amalgamating forest land bases and modelling. Various areas (peatlands, wetlands, soils, mapped ecological products) will be incorporated into the ecological land base. Ducks Unlimited Canada wetlands mapping will be used across all FMUs, wherever possible.

3.3 Land Base Strata

In keeping with the Province of Manitoba's stated goal of an ecologically-based approach, ecological strata will be used for modeling all ecosystems goods and services.

> *"The purpose of FMP is to ensure the use of forest resources in Manitoba is consistent with the province's commitment to an ecosystem-based approach to achieving sustainable forest management."* – Manitoba's Five-year report on the Status of Forestry (April 2006-March 2011).

The Plan proponent can use ecological strata and the Plan regulator can still track timber strata simultaneously. The 2006 FMP took an Ecosystem Based Management approach and used ecosystem strata throughout the FMP (i.e. Volume curves; Carbon curves; Habitat Element Curves – snags, down woody debris, % shrub cover). The ecological strata will also provide an 'ecological robustness' that will benefit biodiversity and modelling for wildlife habitat.

The ecosystem-based strata are based on two ecologically-meaningful parameters: 1) **soil moisture regime**; and 2) **soil nutrient regime**, which is highly correlated to soil texture. Forest ecosystem classification systems across Canada consistently use soil moisture regime and soil nutrient regime as environmental gradients to define ecosystems (Figure 2).

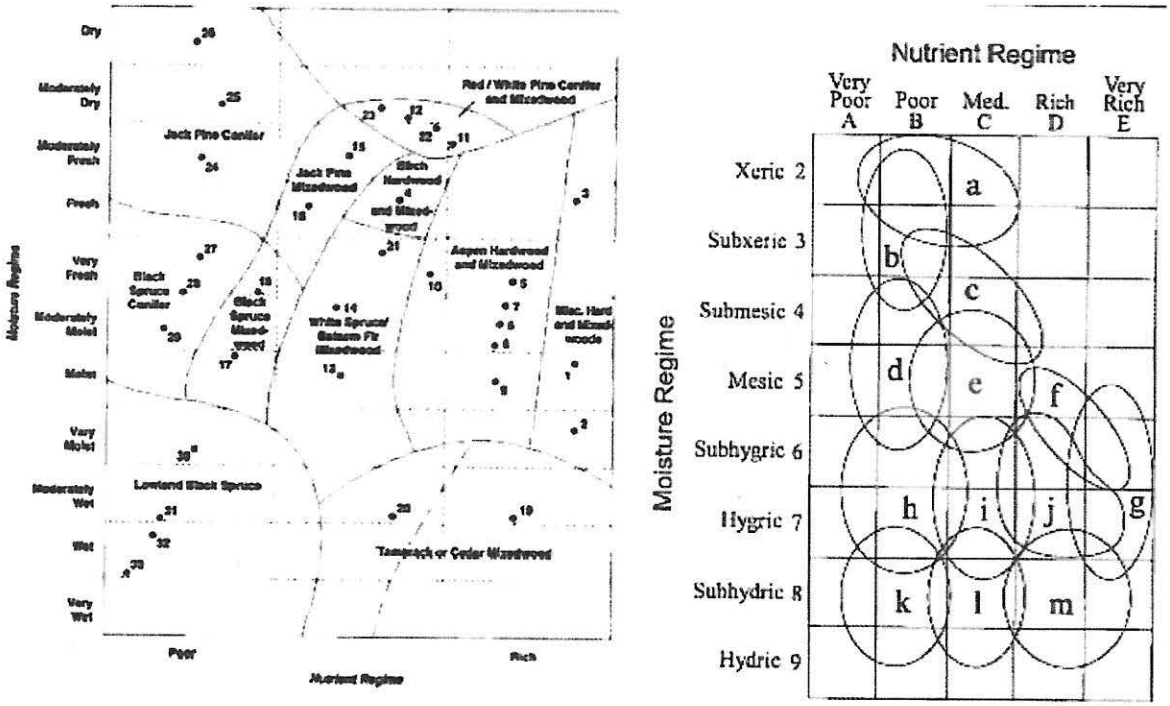


Figure 2. **Edatopic grids use soil moisture regime and soil nutrient classes. Manitoba (left) Zoladeski et al. 1995; and Alberta (right) Beckingham et al. 1996.**

Ecological strata and timber strata are not mutually exclusive on the Duck Mountain land base with the Forest Lands Inventory (FLI). Forestry Corp. consultants and LP have configured the FLI to easily allow for multiple strata to be assigned to every polygon. In the LP data, each polygon in the Duck Mountain Provincial Forest was assigned the following:

- Ecosite
- EcoSeries
- Habitat Element Curve strata
- Ecological Representation Analysis (class 1 to 5)
- Rare Ecosites (scale of 1 to 5)
- Seral stage
- Note that any other classifications can easily be added

3.4 Updating the digital modeling land base

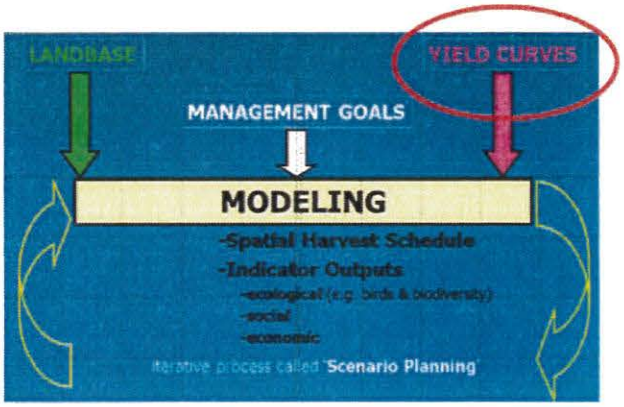
The 2006 FMP modeling landbase will be updated to the date stamp March 31, 2018 including:

- Updating natural disturbance (e.g. June 2012 blowdown event mapped by MSD; any mapped fires or mapped insect and disease events)
- Updating actual cutover boundaries to March 31, 2018
- Account for all wetlands (bogs, fens, swamps, marshes and open water) in FML #3 (using Ducks Unlimited Canada wetland mapping)
- Traditional knowledge if location-specific information is made available
- Ensuring the unique key field (FORESTKEY) is present. FORESTKEY allows us to link each polygon to ecosites, HEC strata, future wildlife habitat rankings, etc.
- Restoring the original FMU 13 Duck Mountain boundary back to the surveyed boundary edge

Harvesting that has occurred after March 31, 2018 will be 'hard wired' into the spatial harvest schedule, to avoid scheduling the harvest of recent cutovers.

3. YIELD CURVES

Yield curves provide information for forest management decisions. Ecosystem yield curves include a variety of ecosystems goods and services (*e.g.* snags and coarse woody debris) in addition to the standard yield curve of merchantable timber volume over age. Note that a yield curve is required for each strata/ ecosystem goods and services combination.



As stated in *Manitoba's Submission Guidelines for Twenty Year Forest Management Plans –*

"This guidebook is written to help professionals obtain an approved FMP. The proponent has the discretion to assemble the FMP in a form they prefer as long as the required information is contained within the FMP. The tables presented in the guidelines are not standards but are examples of showing the information required in the FMP."

4.1 Volume Curves

Volume over age (*i.e.* volume curves) is a standard modeling input that estimates changes in timber volume over time across the land base. LP will not use volume curves to determine wood supply, since Forestry and Peatlands Branch determines wood supply (*i.e.* the Annual Allowable Cut) for each Forest Management Unit. Forestry and Peatlands branch will develop a base case wood supply analysis to set the Annual Allowable Cut (AAC) using best available data for yield curves, post-harvest transitions and other inputs and assumptions.

The proposed blocks in an Operating are always subject to the Annual Allowable Cut (AAC) by Forest Management Unit. The landscape-level strategic harvest is also subject to the AAC by Forest Management Unit.

Manitoba Sustainable Development (MSD) will provide LP with the base case wood supply yield curves and related inputs. LP may either: use the base case; build upon the base case; or take a different approach to modeling. MSD will work with LP to discuss any different approaches and/or assumptions used to create an alternate modelling scenario. Any new approaches and/or assumptions to modelling used for Forest Management Plan (FMP) will require implementing a monitoring plan during the life of the FMP.

LP will use the MSD Forestry Branch's yield curves within the range of actual sampled observations (aged 40 to 120 years) from the 2002, Forest Lands Inventory (FLI). LP will not extrapolate stand age beyond 120 years but will use Riding Mountain Permanent Sample Plot (PSP) data for stand ages 120-200 years (LeVac 2012). The Riding Mountain data shows: stand volumes decline with age; canopy gaps opening; and 2-cohort stands forming a lower volume than a single cohort stand. No data is currently available for stand ages older than 200 years.

4.2 Late Stage Stand Development and Succession

It is recognized that differing approaches to modelling late stage stand development and succession may result in a different forecast of future forest conditions. LP and Manitoba Sustainable Development (MSD) agree that a comparison of the forecasted future forest conditions arising from the Base Case (Wood Supply analysis) the Preferred Management Scenario (PMS) will be included in the FMP. MSD will provide LP with the Base Case future forest condition.

MSD and LP can jointly monitor late stage stand development. Joint efforts for data collection (*e.g.* older permanent sample plots), monitoring and analyses will further validate assumptions and enhance the science of later stage stand development and succession.

4.3 Carbon Curves

The Canadian Forest Service - Forest Carbon Accounting model (CBM-CFS3) is one way to account for carbon. However, CBM-CFS3 runs outside the modeling system and requires a data export after each modeling run is completed. The use of CBM-CFS3 carbon curves for ecological strata in the Duck Mountains (Johnston 2005) allows the carbon to be accounted for inside the modeling run and is easily generated with each scenario. In

addition, the carbon curves are calibrated to local conditions using the same data that the Province of Manitoba used for creating yield curves.

4.4 Snag and Coarse Woody Debris Curves

LP will utilize a suite of ecosystem yield curves that will include: Curves for volume over age; snags by age; down woody debris; and percent shrub cover.

4.5 Modeling Inputs - Post-Harvest Transitions

Post-harvest transitions refer to the cover group (*i.e.* hardwood; hardwood-mixedwood; softwood-mixedwood; and softwood stands) that a stand regenerates to after harvest and renewal activities. Post-harvest transitions are a very sensitive input to model and have a significant influence on the species composition of the future forest. The species composition of the forest is further influenced by wildlife habitat values, biodiversity, and other important forest values.

Manitoba Sustainable Development (MSD) will develop a Base Case (Wood Supply analysis) using best available data for yield curves, post-harvest transitions and other inputs and assumptions.

Manitoba Sustainable Development (MSD) will provide LP with the Base Case wood supply yield curves and related inputs. LP may either: use the base case; build upon the base case; or take a different approach to modeling. MSD will work with LP to discuss any different approaches and/or assumptions used to create an alternate modelling scenario.

LP will use silviculture survey data (*i.e.* hardwood regeneration surveys for age 5 years; and Free-To-Grow plantation surveys at 14 years old) to provide a first approximation of post-harvest transitions for ages 5 to 14 years post-harvest. Data from 1996 harvest blocks to present time will be used.

4. MANAGEMENT GOALS

5.1 Management Goals Overview

Management goals have a significant influence over the modeling results and subsequent harvest schedule. For this reason, information received through Information Sharing and Engagement will significantly influence management goals and the harvest schedule.

As a starting point, FMP management goals include the following:

- Maintain or improve moose habitat
- Undertake significant engagement with Indigenous communities, stakeholders and the public
- Maintain or improve biodiversity which includes the selection of indicator species
- Consider climate change in the new 20-Year FMP
- Determine when and where the forest is a carbon sink or a carbon source
- Protect wetlands and waterfowl
- Ensure not to exceed 30% harvest within a watershed
- Ensure not to exceed the Annual Allowable Cut (AAC) of hardwood or softwood within each Forest Management Unit (FMU)

Note that the list of FMP management goals will be updated to include information received through Information Sharing and Engagement.

5.2 Relevant Land Base Management Plans

Land Base Management Plans within or adjacent to Forest Management Licence #3 area will be reviewed.

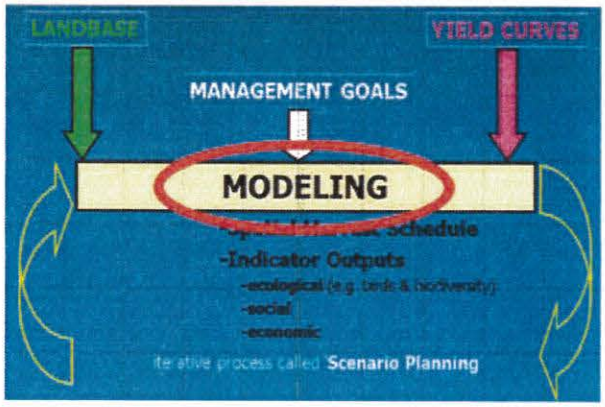
Existing Land Base Management Plans that will be reviewed are as follows:

- 2004 Swan Lake Basin Management Plan
- 2007 Duck Mountain Provincial Park Management Plan
- Saskatchewan Duck Mountain Provincial Park Management Plan
- 2009 Duck Mountain Provincial Park ATV Trail Planning Group
- Integrated Watershed Management Plans
    - 2006 Shell River
    - 2013 (draft) East Duck Mountain – Sagemace Bay Watershed
    - Swan Lake (initiated 2009; in progress)
    - Dauphin Lake (initiated 2010; in progress)
- 2007 Riding Mountain National Park management plan

The goals and objectives of each plan will be reviewed and considered. Wherever possible, forest management activities will attempt to implement or complement each plan's goals and objectives.

5. MODELING

Modeling is the culmination and mixture of the land base, yield curves and management goals. Modeling results in both a spatial harvest schedule and indicator outputs of various ecosystem values.



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Although forest management planning in Manitoba has traditionally been based on **sustained yield timber management**, the need to balance economic objectives with environmental and social needs was enshrined in Manitoba's sustainable development strategy and recommendations that Manitoba's forest management policies move towards the implementation of Sustainable Forest Management.

The practice of sustainable forest management requires different skill sets and a broader knowledge base than sustained yield timber management. The ability to prepare and implement forest management plans based on the concept of sustainable forest management will evolve over time as new data sets are created, research is carried out, and new skills are acquired.

6.1 Modeling Overview

The modeling land base and its' ecological strata utilize yield curves, management objectives, and targets. Scenarios will be run to create modeling output (indicators) and modeling will result in both a harvest schedule and a suite of ecosystem outputs.

6.2 Modeling Scenarios – Scenario Planning

The Plan proponent (LP Canada) will be working towards a forest management scenario that will consider benefits to the moose population.

Scenarios that will be evaluated include:

1. Baseline Forest Management Scenario
2. Moose Emphasis Scenario

The scenarios will be evaluated, "...analyzed and ranked against the management objectives..." as per Table 5 of the FMP Submission guidelines (Manitoba's Submission Guidelines for Twenty Year Forest Management Plans, 2007). A maximum of 10 objectives will be used to score the forest management scenarios. Input from Indigenous communities, stakeholders, and the public will guide the creation of a list of objectives, followed by prioritization of 10 objectives.

The highest ranked scenario will result in the "Preferred Management Approach" which will form part of the Forest Management Plan (FMP), modeling output, and the 20-year spatial harvest schedule.

The 'Preferred Management Approach' forest management scenario will be identified in the 20-Year Forest Management Plan (FMP), complete with harvest schedule maps and ecosystem outputs (*e.g.* amounts of old forest over time).

6.2.1 Spatial Harvest Schedule and the Base Case

The development of the MSD Base Case (wood supply scenario) normally includes a spatial analysis component. The general intent of the spatial component is to quantify the impact of various spatial constraints on indicators, such as modelled harvest levels. Manitoba Sustainable Development (MSD) recognizes that the spatial component of the LP Base Case is not intended to generate an operational spatial harvest schedule. The operational spatial harvest schedule will be generated from the Preferred Management Scenario (PMS) after Information Sharing and Engagement with Indigenous communities is complete, and values other than timber (e.g. water, wildlife, social) are incorporated.

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