

Nawiinginokiima Forest Management
Corporation

2021-2031 Forest Management Plan

Pic Forest – MU966

Plan Text



Forest Management Plan
for the
Pic Forest – MU966

Wawa District, Northeast Region, Ministry of Natural Resources and Forestry
Nawiinginokiima Forest Management Corporation
for the 10-year period from April 1, 2021 to March 31, 2031

I hereby certify that I have prepared this Forest Management Plan, including the silvicultural ground rules, to the best of my professional skill and judgement with the assistance of an interdisciplinary planning team in accordance with the requirements of the Forest Management Planning Manual and the Forest Information Manual.

Neil McDonald, R.P.F. _____
Plan Author, Nawiinginokiima Forest Management Corporation

Submitted by:

Carmelo Notarbartolo _____
General Manager, Nawiinginokiima Forest Management Corporation

I recommend that this forest management plan be approved for implementation and certify that it has been prepared in accordance with the requirements of the Forest Management Planning Manual the Forest Information Manual and relevant policies and obligations (including any relevant MNRF agreements with Indigenous peoples). I also certify that this Plan has been prepared using the applicable forest management guides. In this Plan, prescriptions that differ from specific direction or recommendations in the applicable forest management guides are identified in the attached List of Exceptions.

Certified and Recommended for Approval by:

Paul Bernier _____
District Manager, Wawa District, Ministry of Natural Resources and Forestry

Andrew Lock _____
Regional Resources Manager, Northeast Region, Ministry of Natural Resources and Forestry

Approved by:

Grant Ritchie _____
Regional Director, Northeast Region, Ministry of Natural Resources and Forestry

Natural Resources Information Portal Submission Identifier: _____

Forest Management Plan - Sections of the Forest Management Plan not Prepared by the Plan Author

Forest Management Plan
for the
Pic Forest – MU966

Wawa District, Northeast Region, Ministry of Natural Resources and Forestry
Nawiinginokiima Forest Management Corporation
for the 10-year period from April 1, 2021 to March 31, 2031

I hereby certify that I have prepared the sections of the forest management plan as indicated, to the best of my professional skill and judgement, in accordance with the requirements of the forest management planning manual.

Name	Job Title	Sections Prepared	Signature	Date
Gregg Lloyd, R.P.F.	Northeast Region Regional Planning Forester	<ul style="list-style-type: none"> Supplemental Documentation Statement of Environmental Values Supplemental Documentation Desired Forest and Benefits Summary 		
Jennifer Pine	Wawa District Resource Liaison Specialist	<ul style="list-style-type: none"> 2.3 First Nation and Metis Background Information Reports 		
Kim Mahon	Northeast Region Regional Planning Biologist	<ul style="list-style-type: none"> 3.5.1 Caribou 3.6.14 Moose Supplemental Documentation Caribou Management Strategy for the Pic Forest 		
Mark Zhang, R.P.F.	Wawa District Management Forester Assistant	<ul style="list-style-type: none"> 2.2 Social and Economic Description 		
Rebecca Merritt	NFMC Planning Forester	<ul style="list-style-type: none"> Supplemental Documentation Proposed Roads 		
Sarah Bros, R.P.F.	Co-Chair of Planning Team	<ul style="list-style-type: none"> 3.7.6 Risk Assessment Table FMP-4: Silvicultural Ground Rules 		
Taylor Wright	Wawa District Management Biologist	<ul style="list-style-type: none"> 2.1.4 Forest Resources 		

Pic Forest Management Plan – List of Exceptions

Forest Management Plan
for the
Pic Forest

Ministry of Natural Resources and Forestry, Wawa District, Northeast Region
Nawiinginokiima Forest Management Corporation
for the period of April 1, 2021 to March 31, 2031

All silvicultural treatments in the silvicultural ground rules, which are exceptions to the recommendations in the silviculture guides, and all operational prescriptions for areas of concern, which are exceptions to the specific direction or recommendations (standards and guideline) in the applicable forest management guides, are provided in this list of exceptions. The specific section of the forest management plan that provides documentation of the exception is also referenced in this list.

Description of Exception	Specific Section of Plan
None	Not Applicable

Pic Forest Management Plan – April 1, 2021 to March 31, 2031

Steering Committee Members

Name	Affiliation	Role
Carmelo Notarbartolo	NFMC	Member
Deb Weedon	MNRF	Member
Paul Bernier	MNRF	Chair

Planning Team Members

Name	Affiliation	Position/ Broad Role on Planning Team
Bailey Young	MNRF	Wawa Management Biologist
Brian Harbord, R.P.F.	MNRF	Wawa Management Forester (June 2019 – March 2021)*
Darcy Waboose	Long Lake #58 First Nation	Long Lake #58 First Nation
Don Fry	Pic Mobert First Nation	Pic Mobert
Jennifer Pine	MNRF	Resource Liaison Specialist
Jocelyn Bourgoin	Pic River Public Consultation Committee, Local Citizen Committee (LCC)	Pic River Public Consultation Committee representative
Juanita Star	Biigtigong Nishnaabeg (Ojibway's of the Pic River)	Ojibway's of the Pic River
Julian Greer	Red Sky Metis Independent Nation	Red Sky Metis Independent Nation
Kim Mahon	MNRF	Regional Planning Biologist
Krish Homagain, R.P.F.	MNRF	Regional Analysisist
Mary Lynn McKenna, R.P.F.	MNRF	Wawa Management Forester (April 2017 – December 2019)*
Michael Liukko, R.P.F.	MNRF	Regional Planning Forester (Project Manager), Co-Chair of Planning Team
Neil McDonald, R.P.F.	NFMC	Plan Author
Peter Rasevych	Ginoogaming First Nation	Ginoogaming First Nation
Raymond Weldon, R.P.F.	MNRF	Nipigon District Management Forester
Ryan Murphy, R.P.F.	AV Terrace Bay	Forest Industry Representative
Sarah Bros, R.P.F.	Merin Forest Management	Co-Chair of Planning Team (April 2017 – December 2019)*
Trent Desaulniers	Métis Nation of Ontario	Métis Nation of Ontario Representative

* Dare ranges are provided for some members of the Planning Team. Throughout plan production there was significant turnover of staffing resources across many participating groups. Past members of the planning team may be omitted from the Planning Team Members list. Should exact tenure range of past or final planning team members be required, please contact the MNRF Wawa District Management Forester.

Planning Team Advisors

Name	Affiliation	Position
Carmelo Notarbartolo	NFMC	General Manager
Daniel Kim	MNRF	Regional GIS Officer
Donna Palermo	MNRF	Regional Aboriginal Advisor
Gerry Morin	MNRF	Lands Technical Specialist
Greg Kirkland	MNRF	Fire Management
Justin Standeven	MNRF	Regional Planner
Kathleen Couture	MNRF	Wawa Forestry Technical Specialist
Jonathan Kelley / Shayle Lariviere	NFMC	GIS Specialists
Marc Roberge/Adam Tomasini	MNRF	Resource Management Technician
Mark Austin, R.P.F.	MNRF	Forest Management Planning Specialist/ Coordinator
Megan Rasmussen	MNRF	Regional Terrestrial Ecosystems Science Specialist
Mitig Forestry Services Ltd.	Mitig Forestry Services Ltd.	GIS & Planning expertise
Neil McLean, R.P.F.	McLean Forest Resource Management Inc.	Strategic Model Support
Steve Bros, R.P.F.	MERIN Forest Management	Operational planning support
Todd Copeland	MNRF	Species at Risk Biologist
Tricia Young	MNRF	District Planner
Mark Zhang, R.P.F.	MNRF	Assistant Management Forester
Rebecca Merritt	NFMC	Planning Forester

Local Citizens Committee (Pic River Public Consultation Committee) Members

Name	Position/ Interest Group
Alfie Hardy	Woods Workers
Bert Johnson	Anglers & Hunters
Connie Hunter	The General Public
Craig Schut	Forest Industry
Jeff MacDonald	Trappers and other Resource Users – Trappers Association
Jocelyn Bourgoin	Trappers and other Resource Users - Chairperson
Karlson Hunter	Other Crown Land Recreationalists – Snowmobile Club
Kathy Hudson	Woods Workers
Kevin Turner	Tourism Industry
Lynn Szydlowski	Baitfish Licensees
Ray Lelievre	Municipalities
Ron Neidrauer	Trappers and other Resource Users – Bear Management
Walter Sencza	Mineral Sector – Newmont Mining

Plan Reviewers

Position	Role and Responsibility
District GIS Data Technician(s)	Operational Review
District Planner(s)	Advisory Review
Fire Science and Planning Specialist	Regional/Advisory Review
Forest Industry Liaison Officer(s)	Regional/Advisory Review
Forest Licensing Specialist	Regional/Advisory
Forest Management Planning Specialist	Regional/Advisory Review
Management Biologist(s)	Operational Review
Management Forester(s)	Operational Review & District(s) Review Coordination
Regional Forest Analyst/ Resource Analyst(s)	Operational or Regional/Advisory Review
Regional Forested Ecosystems Science Specialist	Regional/Advisory Review
Regional GIS Officer(s)	Regional/Advisory Review
Regional Lands Specialist	Advisory Review
Regional Planner	Regional/Advisory Review
Regional Planning Biologist(s)	Operational or Regional/Advisory Review
Regional Planning Ecologist	Regional/Advisory Review
Regional Planning Forester(s)	Regional/Advisory Review & Review Coordination
Resource Liaison Specialist(s)	Advisory Review
Senior Regional Parks Planner(s)	Operational & Regional/Advisory Review
Technical Specialist(s) and technical staff	Operational Review

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1 Acknowledgments and Dedications

2 Production of a Forest Management Plan is a tireless, thankless, and occasionally ridiculous process.
3 However, for those who survive, plan writing can provide some of the richest, rewarding professional
4 accomplishments in a career. Balancing the pillars of sustainability on ever-changing social worldviews,
5 increasingly complex climate conditions, and often repeated (but never resolved) industrial challenges
6 can be quite an act. Without question it takes a team of dedicated people to sow the seeds of success
7 into a plan that will flourish into the future:

8 To the Planning team and the Ministry of Natural Resources and Forestry; All too easy to remain
9 pigeonholed into our roles. Your presence and input ensured we maintain peripheral vision to consider
10 the forest as others see it.

11 To Bob Kirkpatrick and the Pic Forest Public Consultation Committee; whether advocating for or against
12 your position, Robert “Bob” Kirkpatrick, maintained a Local Citizen Committee which was involved,
13 professional, and ensured all viewpoints were tabled. We wish you the best of luck in your new home,
14 you will be missed. The new chair, Jocelyn Bourgoin, has maintained an unwavering obligation to the
15 committee.

16 To my colleagues at the Nawiinginokiima Forest Management Corporation; this plan is proof that
17 dedication, perseverance, and heart can overcome any obstacle. I’m privileged to have worked with you
18 all.

19 To the service providers, Merin Forest Management, MITIG Forestry Services, and McLean Forest
20 Management; Your intuition, foresight, and approach to complexities is proof that new policy and new
21 blood is often not the solution in forestry. A lesson we should all consider carefully.

1 1.0 Introduction

2 This document contains the textual elements of the 2021-2031 Pic Forest Management Plan (FMP). This
3 is intended to be a stand-alone document, however, is accompanied by tables, analysis package, and
4 supplemental documentation referenced throughout the text. An FMP summary is also available which
5 provides a brief executive-style summary of this FMP.

6 Planning for this FMP began in late 2016 with the intent of implementing a 2019-2029 FMP. Planning
7 was delayed and a 2-year contingency plan was implemented between April 1, 2019 and March 31,
8 2021, at which point the current 2021-2031 FMP took over implementation. Figure 1 provides a graphic
9 representation of the 2019 LTMD being implemented across the 2019 Contingency Plan and the FMP.

10 In order to implement a 2-year contingency plan prior to a 10-year FMP, the Long-Term Management
11 Direction was required to be accepted by the planning team. Therefore, this document often refers to a
12 “2019 Long Term Management Direction (LTMD)” or “2019 LTMD” or just “LTMD”; all instances are
13 referring to the LTMD developed prior to 2019 which was used as the base for operational planning in
14 the 2019-2021 2-year Contingency Plan, and the 2021-2031 FMP.

15 Excluding the 2019-21 Contingency Plan, the 2021-31 FMP is the first planning manifestation of the
16 amalgamated Pic Forest, an amalgamation of 2 previous forests, more information on the previous units
17 and amalgamation can be found in section 1.1 The Pic Forest Management Unit.

Strategic Direction	2019 Long Term Management Direction (LTMD)	
Tactical and Operational Plans	2019-2021 Contingency Plan (CP)	2021-2031 Forest Management Plan (FMP)

18 *Figure 1: Strategic Direction and Tactical and Operational plans implemented under the 2019-2021 Pic Forest LTMD*

19 The implementation of this FMP, under the 2019 LTMD will address the legal requirements of the Crown
20 Forest Sustainability Act (CFSA) and will address the requirements of the 2020 Forest Management
21 Planning Manual (FMPM). The CFSA provides for the regulation of forest management planning,
22 information, operations, and licensing and is designed to allow for the management of all forest
23 dependent values.

24 The CFSA defines sustainability as long-term Crown forest health. The approach to a determination of
25 sustainability is described in the FMPM. A Forest Management Plan (FMP) is required to follow this
26 approach by developing objectives and targets which can be assessed to measure desired benefits to
27 achieve a desired future forest condition. An FMP also requires the development and implementation
28 of strategies to achieve those objectives and targets. Monitoring and evaluation of target achievement
29 is the last requirement, and, when compared to planned achievement, influences continual refinement,
30 and improvement of forest management activities. Forest management plans provide the authority to
31 carry out forest management activities including, road construction, harvesting, renewal, tending, and
32 forest protection treatments.

33 The FMP does not define the firm(s) which will perform the forest management activities, or mills who
34 may purchase the fibre. These determinations are made outside the forest management planning

1 process through licensing arrangements, ministerial commitments, and business-to-business
2 agreements. While the FMP refers to wood flowing to particular mills, such references are information
3 for forecasting purposes only. The FMP reflects external direction at the time it was developed and
4 does not represent a commitment of wood to a particular licensee or forest resource processing facility.
5 In short, the approval of an FMP is not an agreement to make areas available for harvest to a particular
6 licensee, or an agreement to supply wood to a particular mill.

7 1.1 The Pic Forest Management Unit

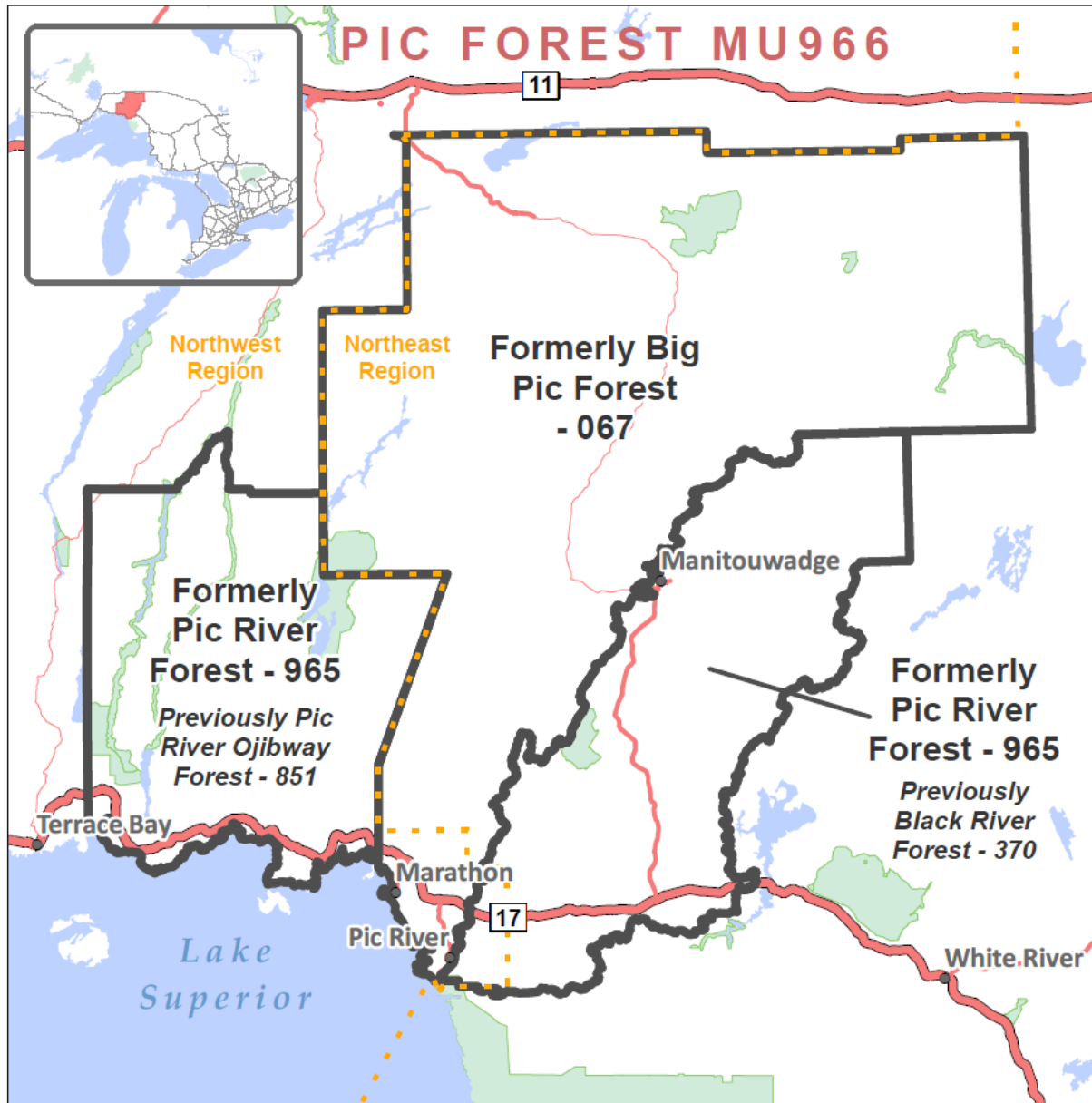
8 The Pic Forest is located in the Wawa District, Northeast Region of the Ontario Ministry of Natural
9 Resources and Forestry (MNR) and the Nipigon District, Northwest Region of the Ontario MNR. The
10 Pic Forest includes Crown land that is north of Lake Superior and south of Highway 11, and encompasses
11 the communities of Caramat, Heron Bay, Hillsport, Manitouwadge, Marathon, and Biigtigong
12 Nishnaabeg (formally Pic River First Nation). The community of Longlac lies just outside the boundary of
13 the Pic Forest. The Pic Forest shares a common boundary with Pukaskwa National Park on the southeast
14 corner of the unit. The Pic Forest is located in the Boreal Forest Region and is dominated by black
15 spruce leading conifer and mixedwood sites. Figure 2 provides a map of the location of the Pic Forest.

16 The Pic Forest is the result of amalgamation of the former Big Pic Forest (Sustainable Forest Licence (SFL)
17 No. 553604, Management Unit (MU) - 067) and Pic River Forest (SFL No. 553606, MU-965). The Pic
18 River Forest was initiated in 2013 and was a result of the amalgamation of the former Pic River Ojibway
19 Forest (SFL No. 542440, MU-851) and Black River Forest (SFL No. 542002, MU-370).

20 In order for the Big Pic and Pic River forests to be amalgamated, they had to be on the same planning
21 cycle. Two (2) Two-year Contingency Plans (plan period from April 1, 2017 to March 31, 2019) were
22 implemented for both the Big Pic and Pic River Forests. This allowed for seamless development and
23 implementation of the 2019 LTMD for the 2019-2021 CP and 2021-2031 FMP.

24 The passing of the Forest Tenure Modernization Act (2011) created the opportunity for a Local Forest
25 Management Corporation (LFMC) in Ontario. Both the Big Pic and Pic River Forests had been part of a
26 local community and First Nation-lead effort to operate as a community-based forest during the mid
27 2000's bankruptcy period. It was expected that the management responsibilities for the forests would
28 be transferred to a LFMC.

29 In April 2013, the Nawiinginokiima Forest Management Corporation (NFMC) was granted a Forest
30 Resource Licence (FRL) and became the first LFMC to be established in Ontario. The NFMC has since
31 held management responsibilities for the Big Pic and Pic River Forests similar to the responsibilities
32 under a Sustainable Forest Licence (SFL). On June 20, 2017, the NFMC was issued SFL's for both the Big
33 Pic and Pic River Forests.



1
2 *Figure 2: Location of the Pic Forest and Ministry of Natural Resources and Forestry (MNR) Regional Boundaries*

3 The Pic Forest has a total of 11,318Km² of Crown land. The Pic Forest landbase is defined by major river
4 systems (the Pic, Black, Steel, and Little Pic rivers) that mostly flow south to Lake Superior, however at
5 the north end of the forest, systems flow north to the arctic watershed. The Forest does not have many
6 large lakes, and even less that are readily accessible for public use. Some of the largest and most
7 notable lakes on the landbase include (Santoy, Pagwachuan, White Otter, Vein, Garnham, and
8 Wabikoba). The Pic Forest landbase is quite diverse between the southern and northern limits. In the
9 southern portion of the forest, topography is rugged, and the climatic influences of Lake Superior affect
10 the forest composition and growth. In the northern portion of the forest, the landscape becomes much
11 more stereotypically boreal (dominated by flatter landscape, black spruce dominated conifer forest). In

1 the southern portion mixedwood stands generally have a greater proportion of white birch, where as in
2 the north, that proportion is more often trembling aspen (poplar).

3 1.2 Administration and Management

4 Forest management of Crown land in Ontario is the responsibility of the Ministry of Natural Resources
5 and Forestry (MNRF). The majority of the Pic Forest is located in the Wawa District, Northeast Region of
6 the Ontario Ministry of Natural Resources and Forestry (MNRF). However, there is a portion of the
7 forest, specifically the former Pic River Ojibway Forest, which falls in the Nipigon District, Northwest
8 Region of the Ontario MNRF. Wawa District is the lead administrative district and has agreements and
9 processes with Nipigon District to facilitate activities such as compliance monitoring. The MNRF has
10 designated the responsibility of forest management planning on the Pic Forest to the Nawiinginokiima
11 Forest Management Corporation (NFMC), through a Sustainable Forest Licence (SFL). NFMC administers
12 its forest management planning activities and operations from its office located in Marathon, Ontario.

13 1.3 Development of the Forest Management Plan

14 Forest management plans are prepared in accordance with the planning requirements of the Forest
15 Management Planning Manual (FMPM) by a registered professional forester. This FMP has been
16 prepared in a collaborative and consultative fashion, utilizing the collective expertise of an
17 interdisciplinary planning team. The planning team terms of reference and project plan can be found
18 within the supplementary documentation.

19 The Pic Forest Public Consultation Committee (PFPC) greatly aided the planning team throughout the
20 development and production of the LTMD, and the assembly of this FMP. The planning team
21 appreciates the collective support from the PFPC, and commends their efforts requiring many
22 volunteer hours. The planning team would like to award special recognition to the former PFPC chair,
23 Robert “Bob” Kirkpatrick. Bob’s dedication to managing the committee and advocating on behalf of
24 interest groups at the planning table was uncompromising and clear. Appreciation and consideration by
25 the planning team of those viewpoints voiced have made this FMP more sustainable for all parties.
26 Thank you Bob, best of luck in your new home.

27 The report of activities for the PFPC can be found in the supplementary documentation.

28 Opportunities for participation by interested and affected persons and organizations and the general
29 public were provided. A summary of that participation is provided in the supplementary
30 documentation.

31 The MNRF has ultimate responsibility of the sustainable management of the province’s Crown forests in
32 order to meet social, environmental, and economic objectives for today’s, and future Ontarians. In
33 developing the LTMD and assembly of this FMP, the planning team considered the MNRF’s statement of
34 environmental values under the Environmental Bill of Rights (EBR). The MNRF’s goals and objectives are
35 reflected in the statement of environmental values and within this plan.

1 2.0 Management Unit Description

2 2.1 Forest Description

3 The following sections describe the historic and present forest conditions, the various forest
4 classifications used for forest management planning, and the forest resources and values on the Pic
5 Forest.

6 2.1.1 Historic Forest Condition

7 The purpose of this section is to provide a description of the forest types and conditions that historically
8 occurred on the Pic Forest.

9 The Pic Forest falls within the Central Plateau section and the Superior section of the Boreal Forest
10 Region. Forest conditions are characteristic of the boreal forest, which are recognized as having an
11 extensive history of wildfires; the Pic Forest is no exception. While frequent, small, low-intensity
12 wildfires are common, it was periodic, high-intensity, stand replacing wildfires that have been of the
13 greatest significance from an ecological perspective. Natural wildfire events were so common in pre-
14 industrial times that they exercised a great degree of control over the species composition, age class
15 structure, disturbance pattern, and residual structure on the forest.

16 A 1994 report entitled *“A Field Study of the Composition, Structure, and Pattern of Original Forests in the*
17 *Manitouwadge Area”* was prepared by Dick Fry (plan author of the 1997 and 2002 Big Pic FMPs). This
18 report was used as a source for establishing historic benchmark levels for several forest attributes that
19 could potentially be used in developing the desired future condition for the Pic Forest. The study used
20 literature reviews, historic forest inventory data, and early twentieth century wildlife data. An
21 important source of information for the study was forest inventory data collected by the former
22 American Can Canada Inc. (AMCAN) and its corporate predecessors, Marathon Paper Mills and the
23 Marathon Corporation. This information was collected over the course of four decades starting in the
24 early 1940’s and was abandoned in 1986, when it was replaced with the more universal Forest Resource
25 Inventory (FRI) system.

26 In order to determine stand level characteristics of historic wildfires in the area, the 1994 study
27 examined a total of five wildfires dating from the period between 1920 and 1936. Wildfires were
28 chosen to represent very large fires greater than 20,000 hectares (the Foch River fire and the Pinegrove
29 fire), moderately sized fires (the Hillspport fire) of approximately 7,000 hectares, and small fires less than
30 1,000 hectares (the Bullmoose Lake fire and the Twin Falls fire).

31 Several stand and landscape level attributes were examined over the course of the 1994 study.
32 Landscape level attributes include species composition, age class, and disturbance size. As mentioned
33 earlier, all of the tree species characteristic of the eastern Boreal Forest can be found in the Pic Forest.
34 At the stand level, due to succession, it is highly unlikely that the relative species composition of a thirty-
35 year-old stand will be the same as at 130 years. At the forest or landscape level, a forest with a large
36 number of young age classes will have a different relative abundance of tree species than a forest in
37 which wildfires have not been active for a number of decades.

38 Forest Types

1 The main tree species present on the landscape are: jack pine, trembling aspen, black spruce, white
2 spruce, balsam fir, eastern white cedar, tamarack, white birch, and balsam poplar.

3 Trembling aspen and Jack pine are relatively short-lived species, although provenances found north of
4 Lake Superior are slower growing than those to the east and west of the north shore. Jack pine is
5 relatively resistant to most damaging insects, diseases and abiotic events. Jack pine budworm is
6 common in Ontario but has never been recorded on the Pic Forest.

7 Studies from the early 1960's indicate that long regeneration periods of three to four decades following
8 wildfire were common for black spruce stands. These studies and current timber cruising observations
9 show the occasional black spruce tree may reach an age of 190 years.

10 White spruce occurs most often in spruce-fir associations that have escaped wildfire for long periods of
11 time. Spruce budworm outbreaks in Ontario are thought to occur in 35 to 40-year intervals. However,
12 on the Pic Forest these outbreaks occur at intervals of 70 to 80 years.

13 Pollen records show that red and white pine were common in Boreal Forests north of Lake Superior
14 more than a thousand years ago. Since then the range of these two species has shifted eastward. A
15 small outlying patch of red pine is found near One Shot Lake northwest of Hillsport. White Pine is found
16 incidentally in areas of the Pic south of highway 17, there is a small isolated stand just west off the
17 Pinegrove road, which seems to be the most northern occurrence.

18 Birch-dominated stands are commonly encountered in the more rugged, southerly areas of the Forest
19 adjacent to Lake Superior. Moving farther inland, where soils become loamier, birch becomes
20 intermixed with trembling aspen.

21 Most upland stands that regenerated following a wildfire between 1910 and 1940 were classified as
22 mixedwoods based on their composition. This artificially increased the amount of mixedwood forest
23 unit area found on the landscape in earlier inventories. Some of these areas developed into Jack pine
24 stands and others are pure trembling aspen.

25 Pre-Industrial Condition Report

26 While not often referenced within this plan, during the planning period, the Pic Forest held a Forest
27 Management Certificate through Forest Stewardship Council (FSC®). FSC® certification is a voluntary
28 process and is not required nor acknowledged in the provincial sustainability planning process.
29 However, as a condition of maintaining FSC® certification, NFMC commissioned a report "Pre-industrial
30 Forest Condition Report for the Pic River and Big Pic Forests". This document extensively covers the
31 historic condition of the Pic Forest and is available within the supplemental documentation.

32 2.1.2 Current Forest Description

33 A description of the current forest condition at the beginning of a forest management plan provides the
34 baseline for planning. The current forest condition is described below in terms of land ownership and
35 land type.

36 A summary of the land types by ownership for the Pic Forest is provided in Table FMP-1 Management
37 Unit Crown Land Summary. Table FMP-1 describes the status of the land base up until April 1, 2019.
38 The classification is categorized by land ownership (e.g. Crown, Patent, and Other) and land type (e.g.

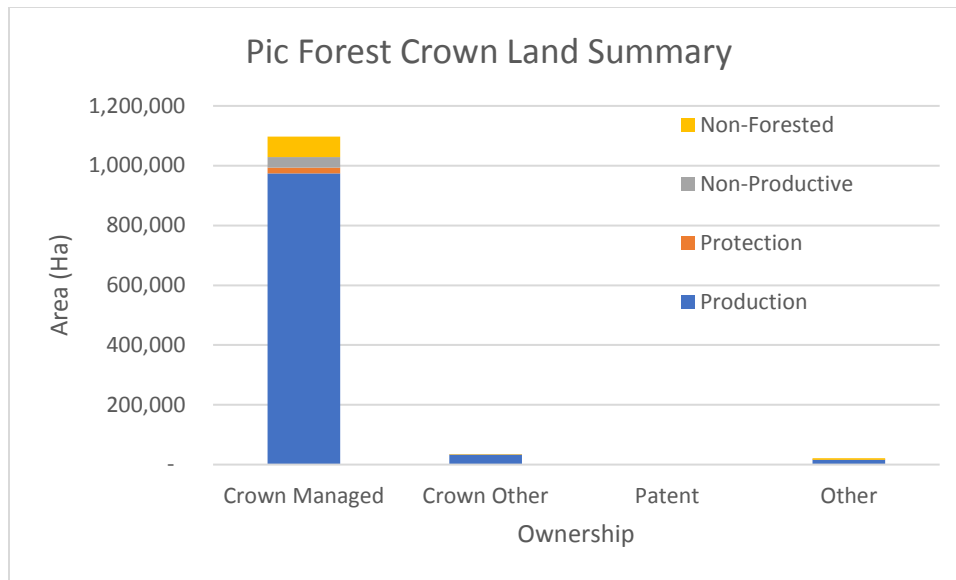
1 Forested lands and non-forested lands). Patent lands are further subdivided, based on the ownership of
2 timber on those lands. Crown lands are further subdivided as Other Crown land: areas which are not
3 available for timber production through legal designation (e.g. Provincial parks or conservation
4 reserves) and managed Crown land: all remaining Crown land, including areas unavailable for timber
5 production because of a forest management planning decision (e.g. A reserve prescription for an area
6 of concern). The land types include non-forested lands (i.e. Water, agricultural land, etc.) and forested
7 lands. Forested lands, which represent the forest cover to be addressed in forest management
8 planning, are further sub-divided into non-productive forest and productive forest.

9 Table FMP-1 provides an overview of the area of different land types by land ownership for the Pic
10 Forest. The purpose of this table is to describe the current forest condition for the start of the planning
11 term as reflected by the updated inventory. The Pic Forest encompasses a total area of 1,153,237
12 hectares of which 1,079,718 hectares is forested land and 73,519 hectares is non-forested land (i.e.
13 Water, grass, meadow, unclassified, and agricultural land).

14 Of the total forested area, 38,018 hectares is non-productive forest (i.e. Treed muskeg, open muskeg,
15 brush, alder, and rock) and 1,041,700 hectares is productive forest. The productive forest area consists
16 of 993,136 hectares of Crown productive forest, 32,621 hectares of Crown other productive forest (i.e.
17 Provincial parks and conservation reserves), 47 hectares of patent productive forest and 15,530 hectares
18 of other productive (i.e. Federal and municipal land).

19 The Crown managed production forest consists of 973,769 hectares of production forest and 19,368
20 hectares of protection forest. The Crown managed production forest is comprised of 779,969 hectares
21 of regular production forest stands, 117,555 hectares of below regeneration status stands, and 76,245
22 hectares of recent disturbance stands.

23 Forest management is limited to the Crown managed land base, although provincial parks and protected
24 areas may contribute to wildlife habitat and other non-timber objectives. Patent Crown timber includes
25 patent land where the Crown has the rights to some or all of the timber. Forest management activities
26 may occur in these areas; however, these activities are outside of the scope of the FMP. Figure 3 below
27 shows area by ownership and land type for the Pic Forest.



1
2 *Figure 3: Pic Forest Crown Land Summary*

3 As depicted in Figure 3 above, the Crown managed land base comprises the majority of the forest (95%),
4 with Crown other (3%), Patent (less than 1%), and other (2%) representing much smaller land base
5 proportions.

6 **2.1.3 Forest Classification**

7 The following sections detail the process for development and use of forest units, analysis units, and
8 other forest classifications (landscape classes, habitat classes).

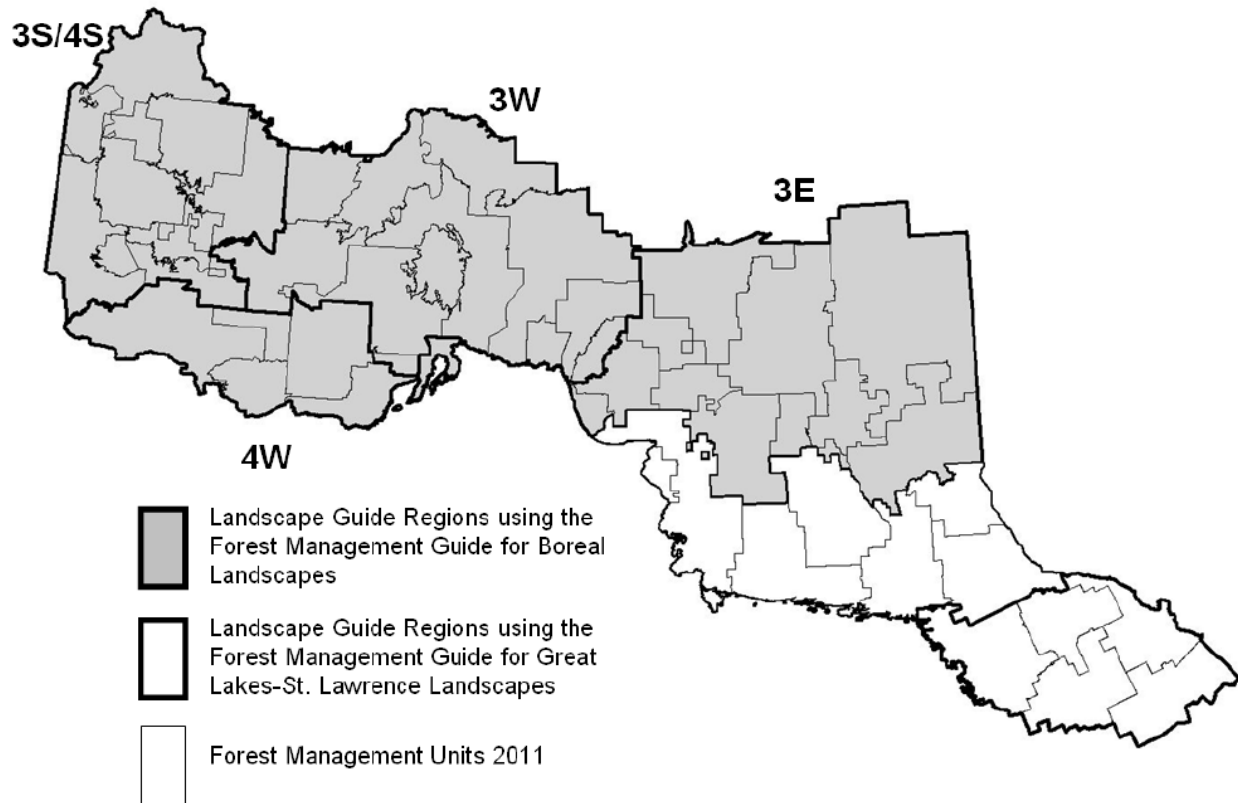
9 **2.1.3.1 Forest Units and Analysis Units**

10 The Forest Management Planning Manual (FMPM, 2017) defines forest units as: “a classification system
11 that aggregates forest stands for management purposes which will normally have similar species
12 composition; develop in a similar manner (both naturally and in response to silvicultural treatments);
13 and are managed under the same silvicultural system.” The section below describes the Forest Units
14 and Analysis Units used in the Pic Forest Management Plan. For more detail regarding the methodology
15 for development of the Forest and Analysis Units see section 3.1 of the Analysis Package.

16 One major change that was encountered during the production of the Pic Forest management plan was
17 the requirement to utilize Northwestern Regional Standard forest unit classifications. Each MNRF
18 administrative region (Northeast and Northwest) has a distinctly different regional forest unit
19 classification system. The previous management plans for the former Big Pic and Pic River utilized
20 Northeast style forest units. Although the former Big Pic and Pic River forest plan forest units were not
21 exactly the same, they could be “rolled-up” for comparison and reporting requirements.

22 The Pic Forest is located primarily in the MNRF Northeastern region, only the west half of the former Pic
23 River management unit (commonly referred to as the Pic River Ojibway Forest, or PROF) resides in the
24 Northwest region. This management plan incorporates the direction and standards of the Boreal
25 Landscape Guide (BLG). As such, there is direction to shape landscape level management direction
26 towards the Simulated Ranges of Natural Variation (SRNV) as determined by the Boreal Forest

1 Landscape Dynamics Simulator (BFOLDS) and implemented through the BLG. The Pic Forest is within the
 2 3W region (Figure 4). The BFOLDS model was run by ecozone and ecozones considered western
 3 (designated by “w”) utilized Northwestern style forest unit groupings as units of measure.
 4 The Pic Forest was therefore required to utilize Northwestern style forest units so that achievement of
 5 landscape targets could be measured. This change caused significant issues throughout plan
 6 development as all previous trends analysis, annual reports, and local knowledge was based on the
 7 utilization or comparison to Northeastern style forest units. To help eliminate future issues, specifically
 8 future forest trends analysis, the Pic Forest BMI contains the field “NER_SFU”. This field codes each
 9 applicable polygon with its Northeast Regional Standard Forest Unit. Utilization of this field will be key
 10 when comparing future and past operations.
 11
 12



13
 14 *Figure 4: Landscape Guide Regions of Ontario*

15 Northwestern Standard Forest Units vary slightly depending on the source. There are various
 16 Northwestern style categorizations or classification queries to sort forest stands. Table 1 provides a
 17 crosswalk comparison between Northwestern Regional Standard, Ontario Landscape Tool
 18 Northwestern, Analysis, and Pic Forest Plan Forest Units. The table effectively describes how particular
 19 forest units have been “broken-out” or “incorporated” within each classification system.

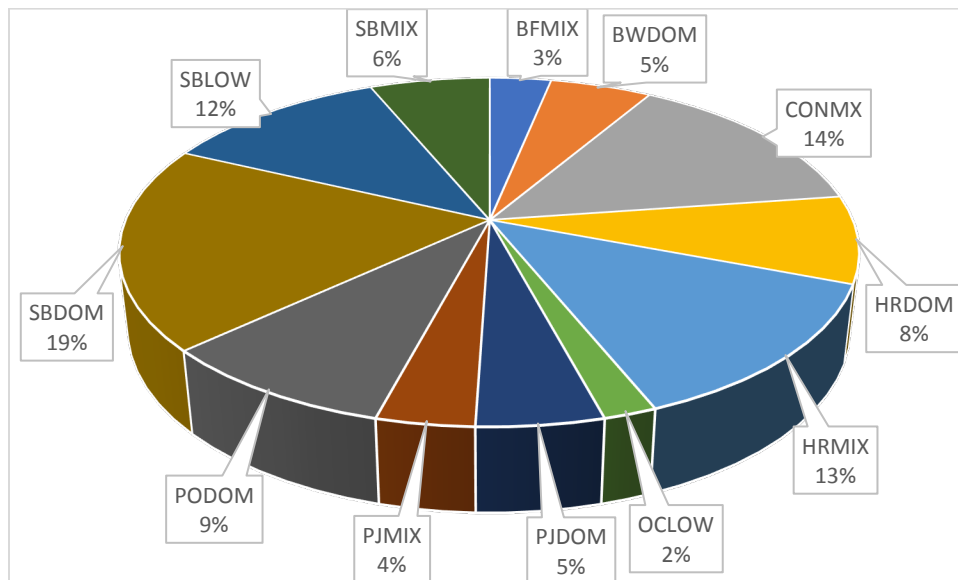
1 Table 1: Crosswalk comparison of the Northwest Regional Standard Forest Units, Northwest Forest Units (OLT), Pic Forest
 2 Analysis Forest Unit, and Pic Forest Plan Forest Units

Northwest Regional Forest Unit	Northwest Forest Unit (OLT)	Pic Forest Analysis Forest Unit	Pic Forest Plan Forest Unit
BWDEE	BWDOM	BWDOM	BWDOM
BWSHA			
CONMX	CONMX	CONMX	CONMX**
UPLCE	UPLCE	UPLCE	
HRDOM	HRDOM	HRDOM	HRDOM
OTHHD	OTHHD		
HRMX1	HRDMX	HRMXB	HRMIX
		HRMXP	
		HRMIX (not Bw or Po leading)	
OLOW	OLOW	OLOW	OLOW
PJDEE	PJDOM	PJDOM	PJDOM
PJSHA			
PRDOM	PRDOM	PRWMX	
PRWMX	PRWMX		
PWDOM	PWDOM		
BFMX1	BFDOM	BFMIX	BFMIX
BFPUR			
PJMX1	PJMX1	PJMIX	PJMIX

Northwest Regional Forest Unit	Northwest Forest Unit (OLT)	Pic Forest Analysis Forest Unit	Pic Forest Plan Forest Unit
PODEE	PODOM	PODOM	PODOM
POSHA			
SBDEE	SBDOM	SBDOM	SBDOM
SBSHA			
SBLOW	SBLOW	SBLOW	SBLOW
SBMX1	SBMX1	SBMIX	SBMIX

1 ** In the Pic Forest Plan Forest Units Upland Cedar (UPLCE) is grouped into the CONMX Plan Forest Unit primarily based on the
 2 proportional area of UPLCE forest unit (3,777ha or 0.4% of the landbase). There are no SGR's related to UPLCE and thus no
 3 need, at the FMP level, to maintain UPLCE as a separate entity. Concerns were raised by MNR regarding tracking UPLCE area
 4 separately because of impacts on Boreal Landscape Targets. UPLCE was maintained as an analysis unit within the Strategic
 5 Forest Management Model (SFMM) model so that the planning team could accurately assess adherence to landscape targets.

6 As a result, there are twelve (12) Pic Forest Plan Forest Units. Plan forest units are summarized in table
 7 FMP-2. Refinement of the Northwestern regional forest units created the Pic Forest units. These forest
 8 units fulfill the intent of the standard forest units and may be aggregated to the landscape level via the
 9 same pathways that are supported by the standard forest units.



10
 11 *Figure 5: Proportion of the Crown Managed Productive Forest by Pic Forest Plan Forest Unit*

12 To facilitate strategic modeling, Pic Forest Plan forest units were expanded to create four (4) additional
 13 analysis forest units. Analysis forest units were required to accurately measure achievement of

1 landscape targets, or to assign different yield or successional pathways to stands. These four (4) analysis
2 forest units, and rationale for their creation is outlined in the following points:

- 3 1. HRMXB – white birch leading hardwood mixedwood. The planning team identified the need to
4 split the Plan Forest Unit HRMIX into two analysis units due to the local variation between
5 HRMIX occurring on the northern half of the Pic Forest, and HRMIX occurring on the southern
6 half of the Pic Forest. On the southern portion of the Pic Forest, specifically near, and thought
7 to be influenced by Lake Superior, HRMIX in this zone is mostly white birch dominated and
8 lower stocked. This causes a substantial reduction in forecast volume from these sites when
9 compared to HRMIX occurring on the north half of the forest. The planning team felt it
10 necessary to model these stands separately to more accurately reflect forecast volume.
11 Additionally, successional pathways, and post harvest renewal packages within the model lead
12 HRMXB toward more white birch mixed or dominant future species composition.
- 13 2. HRMXP – trembling aspen (poplar) leading hardwood mixedwood. The planning team identified
14 the need to split the plan forest unit HRMIX into two analysis units due to the local variation
15 between HRMIX occurring on the northern half of the Pic Forest, and HRMIX occurring on the
16 southern half of the Pic Forest. On the northern portion of the Pic Forest HRMIX in this zone is
17 mostly Poplar dominated and higher stocked. This causes a substantial inflation in forecast
18 volume from these sites when compared to HRMIX occurring on the south half of the forest.
19 The planning team felt it necessary to model these stands separately to more accurately reflect
20 forecast volume. Additionally, successional pathways, and post harvest renewal packages
21 within the model lead HRMXP toward more poplar mixed or dominant future species
22 composition.
 - 23 a. HRMIX – it should be noted that there is a contingent of HRMIX stands which are not
24 white birch nor poplar leading. These stands were not reclassified into analysis units
25 and exist in the model as HRMIX. The splitting of Plan forest unit HRMIX in the strategic
26 model was to better model yields, succession, and regeneration based on stand
27 characteristics. However, generic yields applied as a proxy for landscape class indicators
28 were applied equally to all three analysis units within the model. The Boreal Landscape
29 Guide does not delineate HRMIX by leading species.
- 30 3. PRWMX – red pine white pine mix. Red and white pine forest units were grouped into two
31 different Plan Forest Units. Red pine dominated (PRDOM) and red and white pine mix (PRWMX)
32 were grouped into jack pine dominated (PJDOM) because of the silvics of red pine and the type
33 of ecosites it occurs on. White pine dominated (PWDOM) was included in balsam fir mix
34 (BFMIX) because the ecosites that BFMIX occur on overlap with PWDOM ecosites, and there are
35 occurrences of White Pine intermixed with Balsam Fir on the Pic Forest. Ontario's Landscape
36 Tool (OLT) has specific targets for Red and White pine on the Pic Forest. To accurately reflect
37 achievement of those targets, Red and White pine must be tracked and measured as a single
38 entity.
- 39 4. UPLCE – upland cedar. Upland cedar was grouped with conifer mixed (CONMX) Plan Forest
40 Unit. Concerns were raised about tracking UPLCE area, particularly as it related to the
41 determination of caribou habitat targets. By incorporating UPLCE into the CONMX forest unit,

1 SFMM would have inflated the amount of Caribou habitat. The Modeling Task team agreed to
2 manage the UPLCE in the model as a separate analysis unit. However, for the purposes of the
3 FMP, all UPLCE area will remain as part of CONMX. In the model UPLCE has its own natural and
4 disturbance succession parameters that mostly succeed UPLCE back to itself, however 0.5% of
5 BFDOM will succeed into UPLCE. More importantly, the UPLCE analysis unit will have a related
6 set of generic yields that account for its area such that the area does not contribute to the
7 Caribou landscape classes. The base model UPLCE silviculture options will be identical to those
8 of the CONMX Forest Unit.

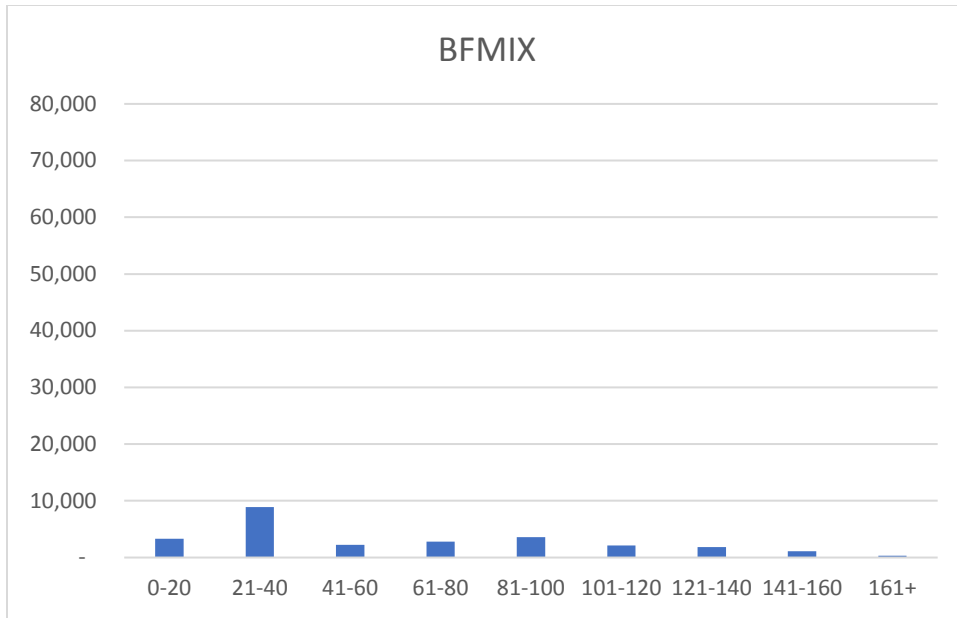
9 The last consideration regarding development and use of analysis units is other hardwood. Although
10 other hardwood is not observed in the model, nor the plan forest units. Consideration was given, by the
11 analysis task team to ensure the classification was appropriately tracked.

- 12 • OTHHD – other hardwood. Other hardwood was grouped into the hardwood dominated
13 (HRDOM) Plan Forest Unit. However, other hardwood is regarded as mutually exclusive when
14 measuring Boreal Landscape targets in Ontario’s Landscape Tool (OLT). To accurately reflect
15 achievement of Landscape targets, other hardwood needed to be tracked and measured
16 uniquely. Despite OTHHD being mutually exclusive within OLT, the two forest units “OTHHD”
17 and “HRDOM” contribute to landscape guide targets and wildlife indicators in the same manner.
18 Therefore, within SFMM, all stands tagged as OTHHD were selected and re-calculated to
19 HRDOM. This allowed the planning team to reduce the number of unwarranted forest units and
20 to accurately measure adherence to Boreal Landscape Targets.

21 [2.1.3.1.1 Managed Crown Productive Forest](#)

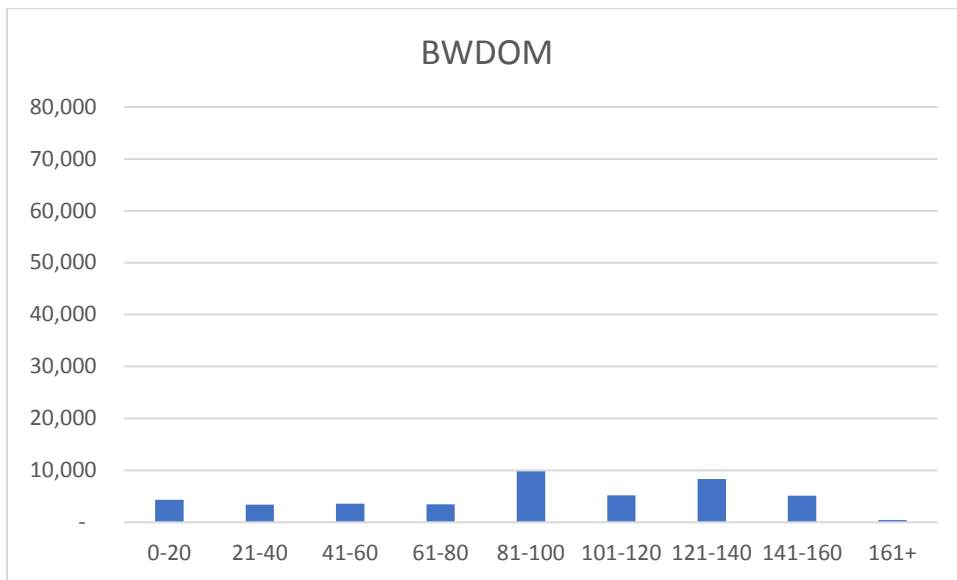
22 A summary of the managed Crown productive forest by plan forest unit and age class is provided in
23 table FMP-3. Productive forest is made up of both protection forest and production forest. Protection
24 forest includes sensitive site class forests stands (site class 4) and islands. Production forest includes
25 both managed Crown forest available for timber production and unavailable area. Unavailable area
26 mainly consists of management reserves (Area of Concern [AOC] prescriptions) placed on identified
27 values across the forest. Figure 5 summarizes the managed crown productive forest by Pic Forest plan
28 forest unit. Black spruce leading forest units dominate the Pic Forest, followed by hardwood leading,
29 mixedwoods, and trailed by jack pine leading and balsam fir.

30 Figure 6 through Figure 17 provide an age class distribution by forest unit. It is interesting to note that
31 forest units containing historically unmarketable species (e.x. HRDOM in Figure 9) exhibit a normal
32 distribution or “bell curve” representative of natural forest condition. Whereas forest units containing
33 more historically desirable species (e.x. PJDOM in Figure 12) begin to exhibit a uniform distribution or
34 “flat curve” due to sustainable management practices.



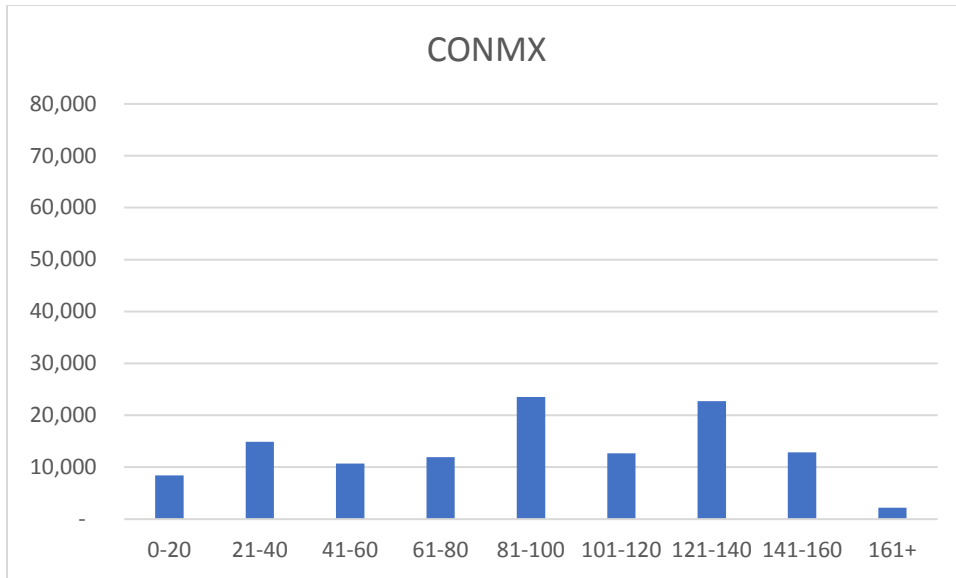
1

2 *Figure 6: Age Class Distribution of Available BFMIX*



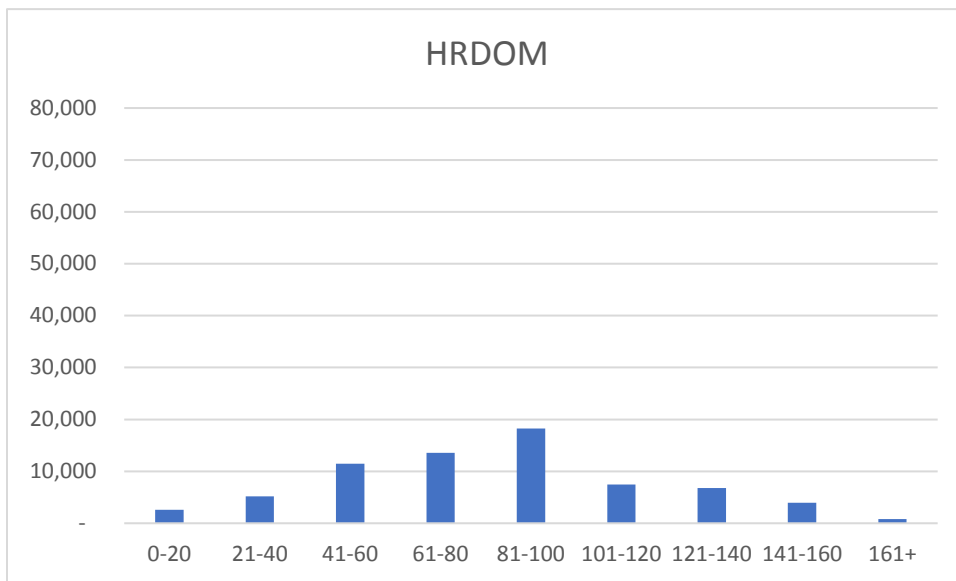
3

4 *Figure 7: Age Class Distribution of Available BWDOM*



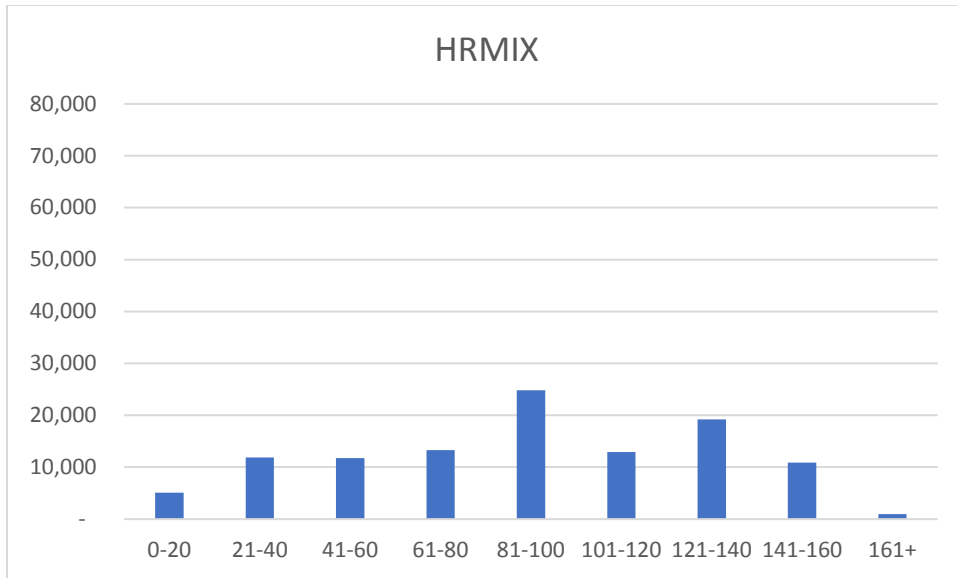
1

2 *Figure 8: Age Class Distribution of Available CONMX*



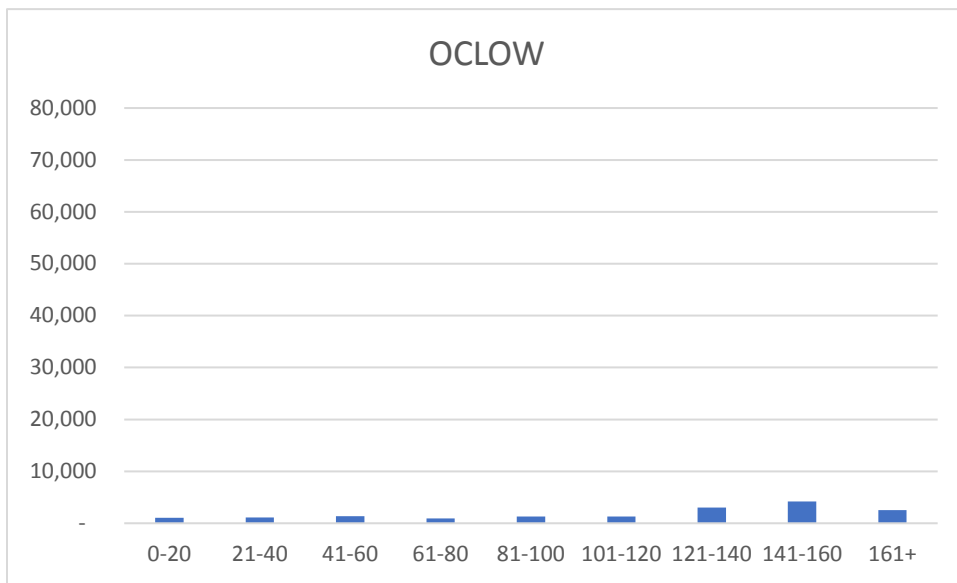
3

4 *Figure 9: Age Class Distribution of Available HRDOM*



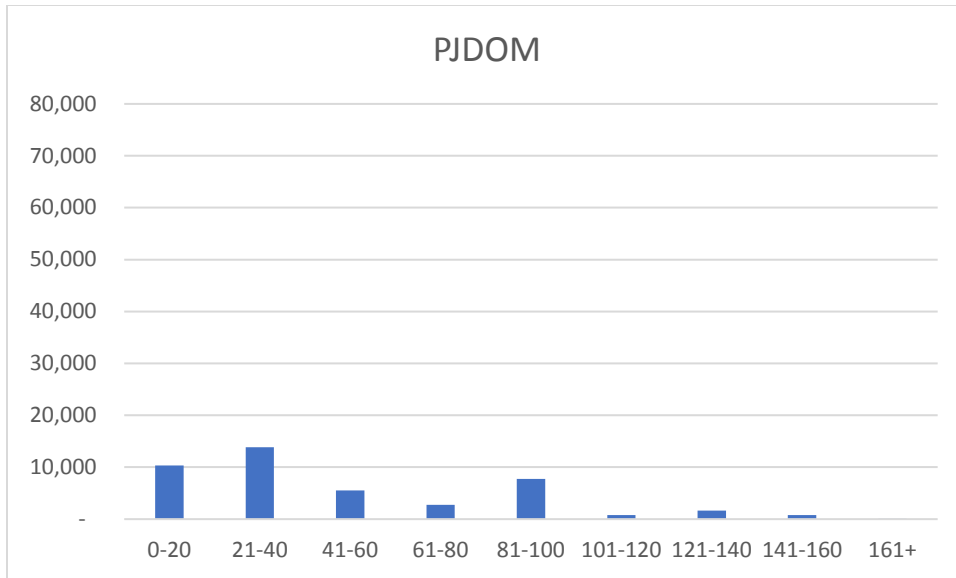
1

2 *Figure 10: Age Class Distribution of Available HRMIX*



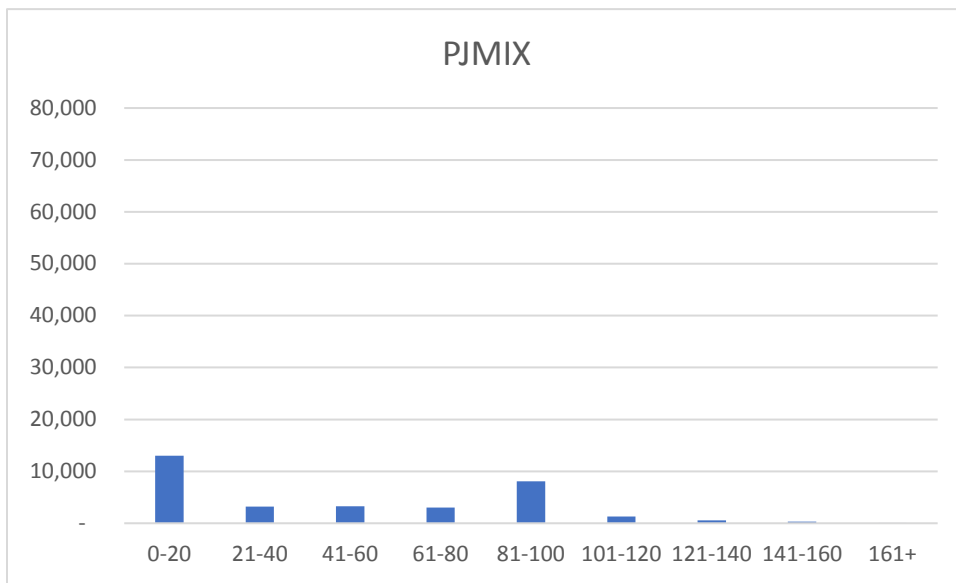
3

4 *Figure 11: Age Class Distribution of Available OLOW*



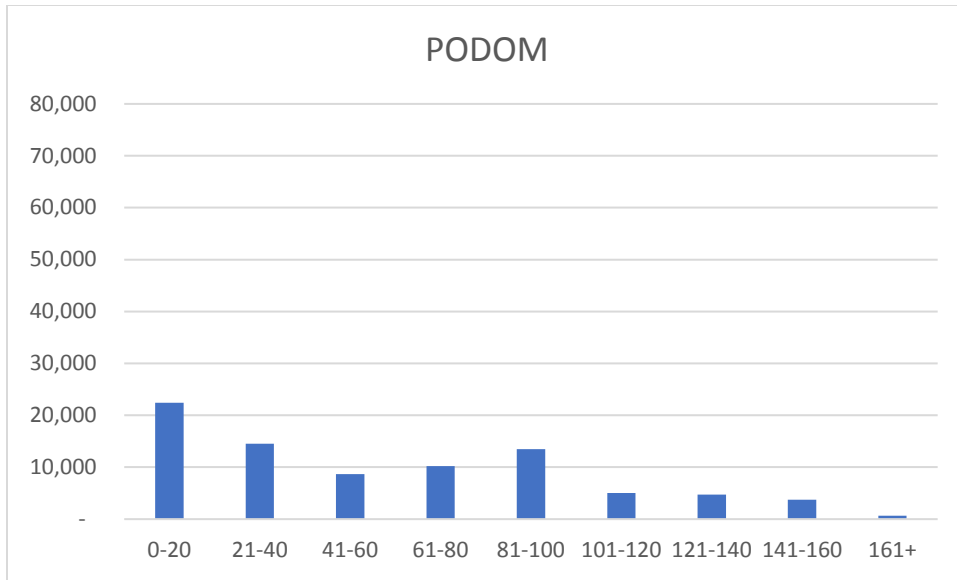
1

2 *Figure 12: Age Class Distribution of Available PJDOM*



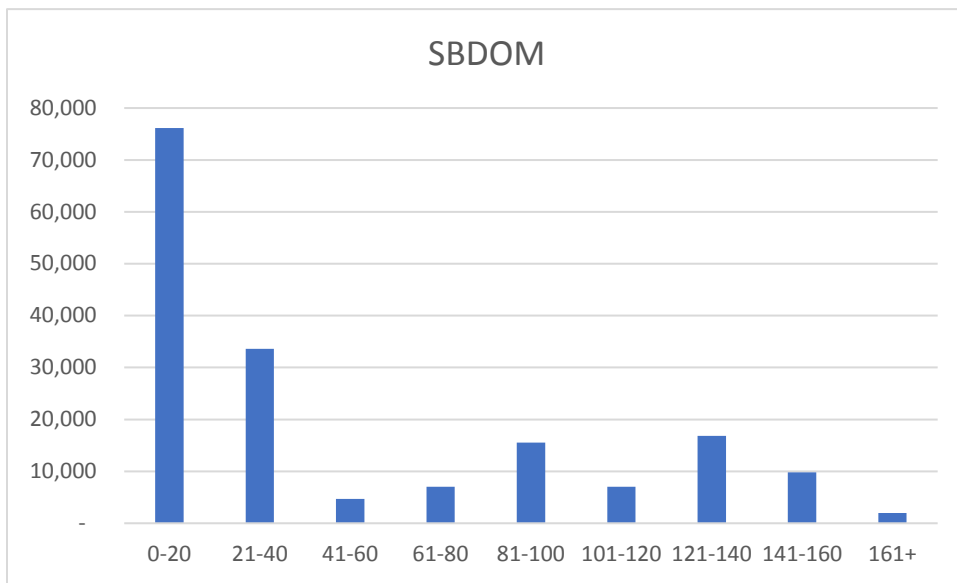
3

4 *Figure 13: Age Class Distribution of Available PJMIX*



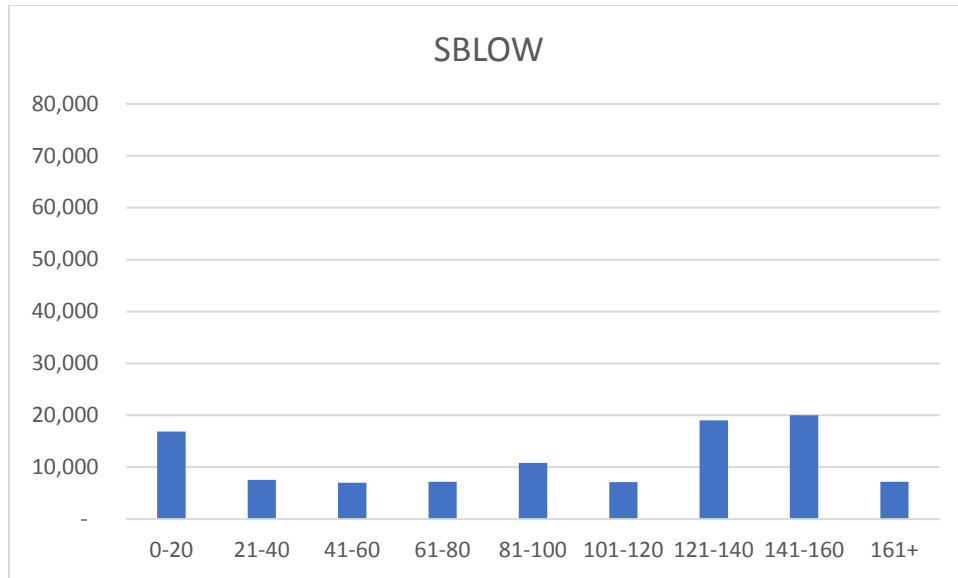
1

2 *Figure 14: Age Class Distribution of Available PODOM*

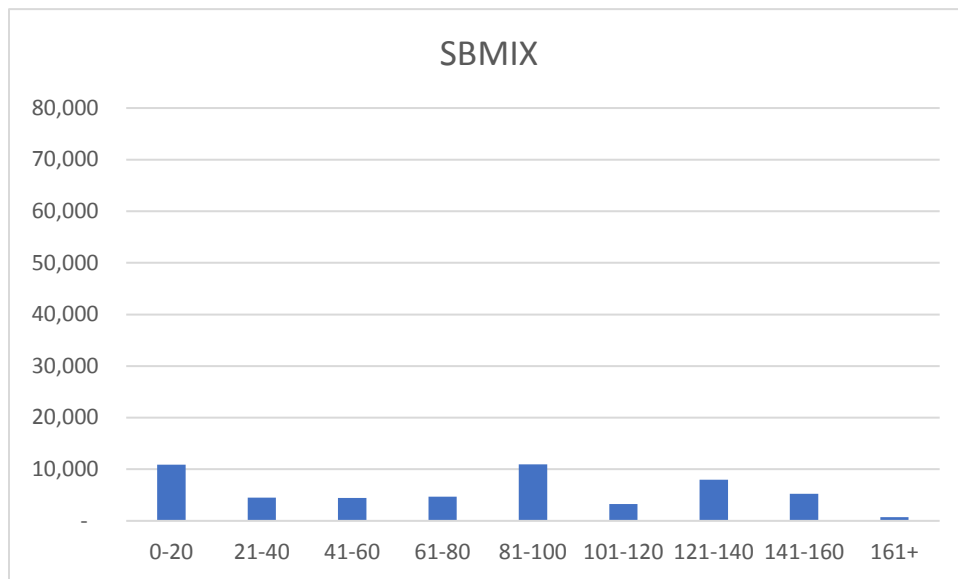


3

4 *Figure 15: Age Class Distribution of Available SBDOM*

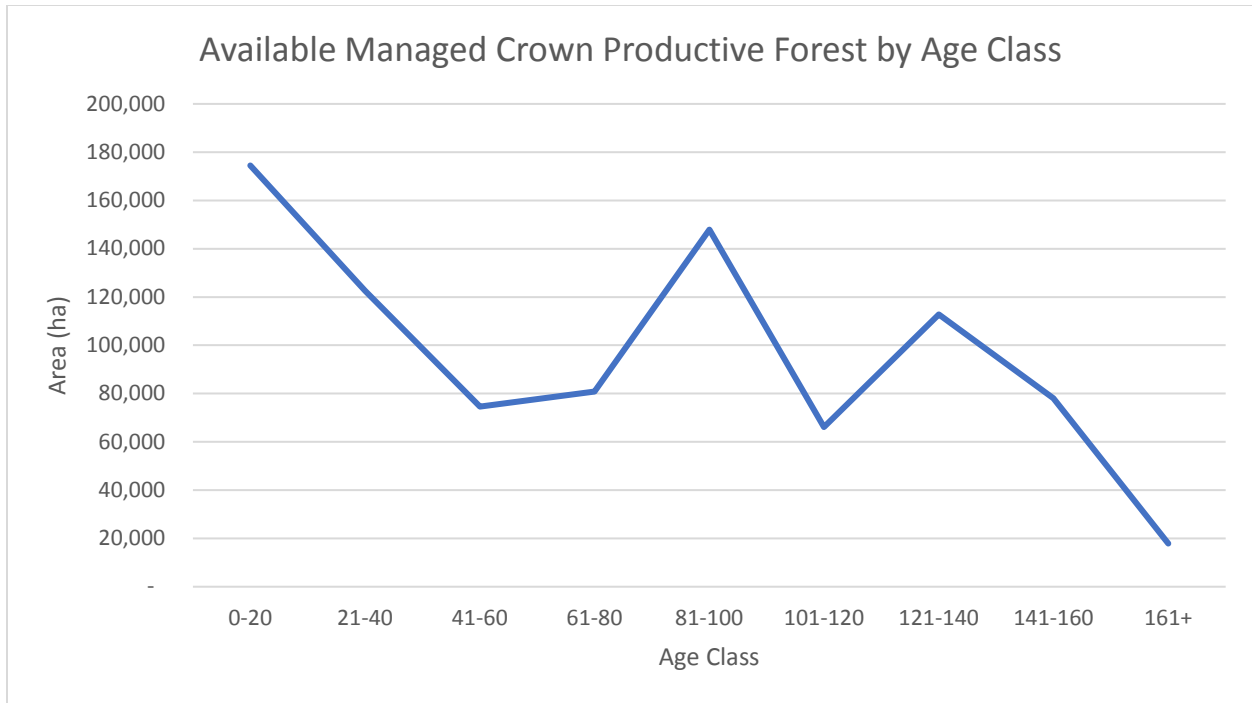


1
2 *Figure 16: Age Class Distribution of Available SBLOW*



3
4 *Figure 17: Age Class Distribution of Available SBMIX*

5 Figure 18 provides an overview of all available forest by age class. It is interesting to note the “swell” of
 6 mature forest (age class 81-100) which was not evident in the former Big Pic and Pic River Management
 7 Plans. Amalgamation of the former units has had an impact; however the larger influence is the use of
 8 the new forest resource inventory (eFRI).



1

2 *Figure 18: Available Managed Crown Productive Forest by Age Class*

3

4 *2.1.3.2 Forest Landscape Classes*

5 Ontario’s Forest Management Guide for Boreal Landscapes (Boreal Landscape Guide or Landscape
 6 Guide) creates and uses landscape classes to measure Landscape Guide indicators. Indicators are
 7 defined as “variables that are used to describe the current landscape mosaic, make predictions on the
 8 future landscape mosaic and assist in evaluating the effectiveness of the Landscape Guide.” The forest
 9 management plan uses these regional indicators as the biodiversity indicators for objective
 10 achievement.

11 Ontario’s Landscape Tool (OLT), version 2017(LSL64) Build 3.5.6571, was used to classify and analyze the
 12 current forest condition to determine if plan start levels and future forest condition through
 13 management decisions meet provincial legislation (i.e. Landscape Guide targets and indicators). As
 14 described in the Boreal Landscape Guide “Landscapes provide habitat for many wildlife species, each
 15 with its own preferences for combinations of vegetation types, development stages, patch sizes and
 16 configurations. It would be difficult to manage wildlife habitat with a species-by-species approach
 17 within the context of a forest management plan. To reduce the complexity of this problem, the
 18 landscape development team suggested the development of landscape classes according to our
 19 understanding of how forests function as habitat. Landscape classes are groupings of forest units by
 20 development stage. They were developed based on cluster analyses of used and preferred habitat types
 21 depicted in MNRF’s habitat matrices. The landscape classes express meaningful differences in wildlife
 22 use”.

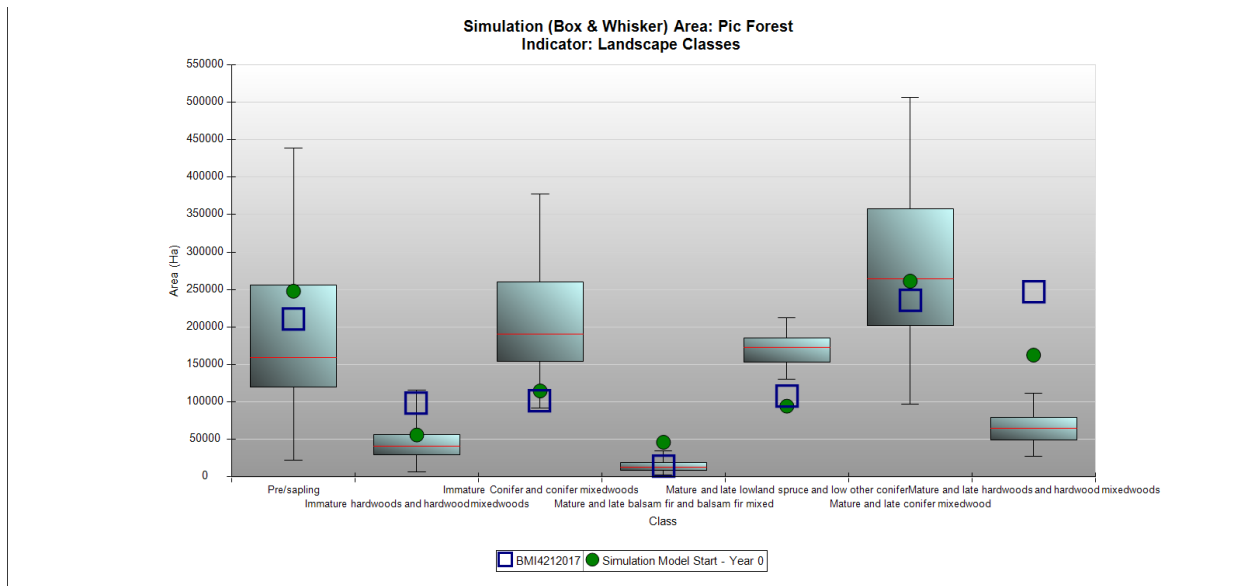
1 Forest landscape classes for the Pic Forest 2019 FMP have been defined based on direction in the Forest
 2 Management Guide for Boreal Landscapes or Boreal Landscape Guide (BLG). Landscape classes are
 3 designed to represent ecologically similar groupings at a landscape level. In practice, landscape classes
 4 are groupings of forest units by age class (or stages of development stage) which are distinct enough to
 5 describe particular forest conditions. In the context of forest management planning, landscape classes
 6 are used as a proxy for wildlife habitat. Using a coarse filter approach, managing for the appropriate
 7 amount and arrangement of landscape classes across a forest will provide enough suitable habitat to
 8 support all wildlife regardless of their preferred habitat. Figure 19 displays the relationship between Pic
 9 Forest analysis unit and age class (development stage) combinations are grouped to create landscape
 10 classes.

Pic Forest Analysis Forest Unit	Development Stage					Landscape Class Legend
	Presapling	Sapling	Immature	Mature	Late	
BFDOM	0	5	10	60	80	Presapling and Sapling
BWDOM	0	5	10	50	110	Immature Conifer
CONMX	0	10	30	70	110	Immature Hardwood
HRMXB	0	5	10	60	110	Mature and Late Balsam Fir
HRMXP	0	5	10	60	110	Mature and Late hardwood and Hardwood Mixed
HRDOM	0	5	10	60	100	Mature and Late Lowland Conifer
OLOW	0	10	30	70	120	Mature and Late Upland Conifer and Mixed
PJDOM	0	10	30	70	100	
PJMIX	0	10	30	70	100	
PODOM	0	5	10	60	100	
PRWMX	0	10	20	80	140	
SBDOM	0	10	30	70	120	
SBLOW	0	10	30	70	160	
SBMIX	0	10	30	70	110	
UPLCE	0	10	30	70	190	

11
 12 *Figure 19: Pic Forest Analysis Units, Development Stages, and Landscape Classes (Development Stage measured in age [years])*

13 The area within the Pic Forest contributing to each landscape class at the start of the 2019 FMP is
 14 portrayed in Figure 20 as the centre of a blue box within the simulated ranges of natural variation
 15 (SRNV). The SRNV is represented in the figure by the gray/teal box (interquartile range) and whiskers
 16 (extent of simulation range) and the median portrayed as a red line. For the 2019 Pic Forest FMP, four
 17 (4) of the seven (7) landscape classes were managed as indicators. Only those managed as indicators
 18 were strategically modeled and have objective targets within the plan. The four (4) landscape classes
 19 managed for in the Pic Plan are:

- 20 1. Mature and Late Balsam Fir,
- 21 2. Mature and Late Hardwood and Hardwood Mixedwood,
- 22 3. Mature and Late Lowland Conifer, and
- 23 4. Mature and Late Upland Conifer and Mixed



1
2 *Figure 20: OLT Landscape Class Targets and T1 Values*

3 The objective targets of the four (4) landscape classes is, generally, to move toward or maintain the
4 amount of area contributing to that landscape class within the interquartile range. Of all the landscape
5 classes, mature and late hardwood and hardwood mixedwood is the farthest from the interquartile
6 range and will require significant silvicultural intervention over the next 100 years to bring within the
7 interquartile range. Speaking in general, reduction of the mature and late hardwood and hardwood
8 mixedwood landscape is the most vexing objective within the plan, and will continue until enough time
9 has passed that intensively treated silvicultural activities begin to contribute to other mature landscape
10 classes.

11 A map of the Pic Forest by landscape classes can be found in the supplemental documentation.

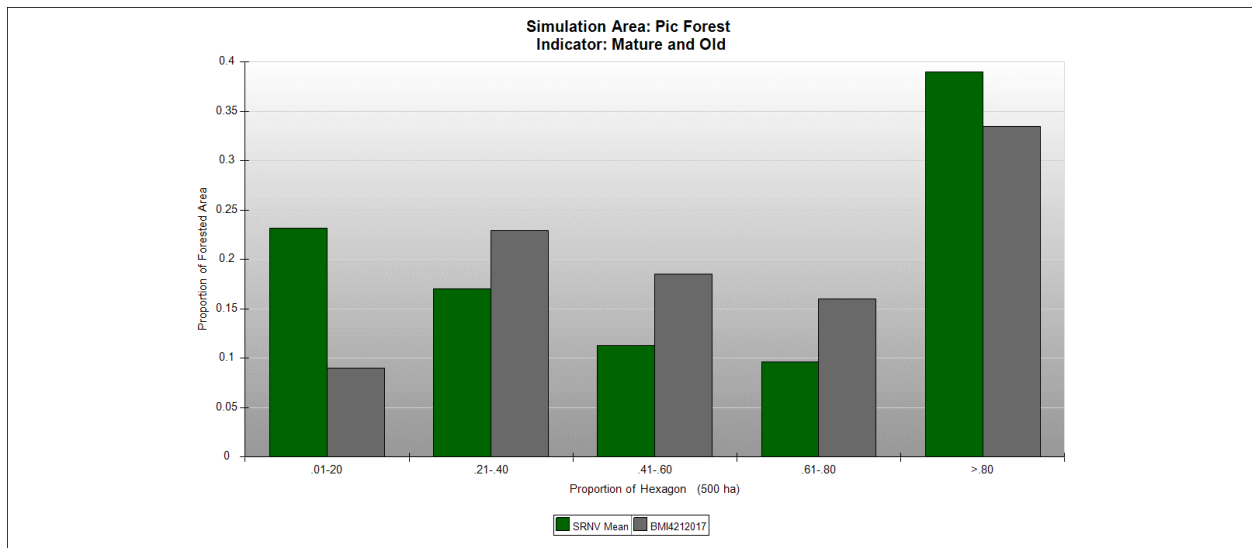
12 As discussed earlier in the section, in the context of forest management planning, landscape classes are
13 used as a proxy for wildlife habitat. Using a coarse filter approach, managing for the appropriate
14 amount and arrangement of landscape classes across a forest will provide enough suitable habitat to
15 support all wildlife regardless of their preferred habitat. Landscape classes provided for the amount of
16 habitat available, however did not address arrangement.

17 *2.1.3.3 Old Growth Forest*

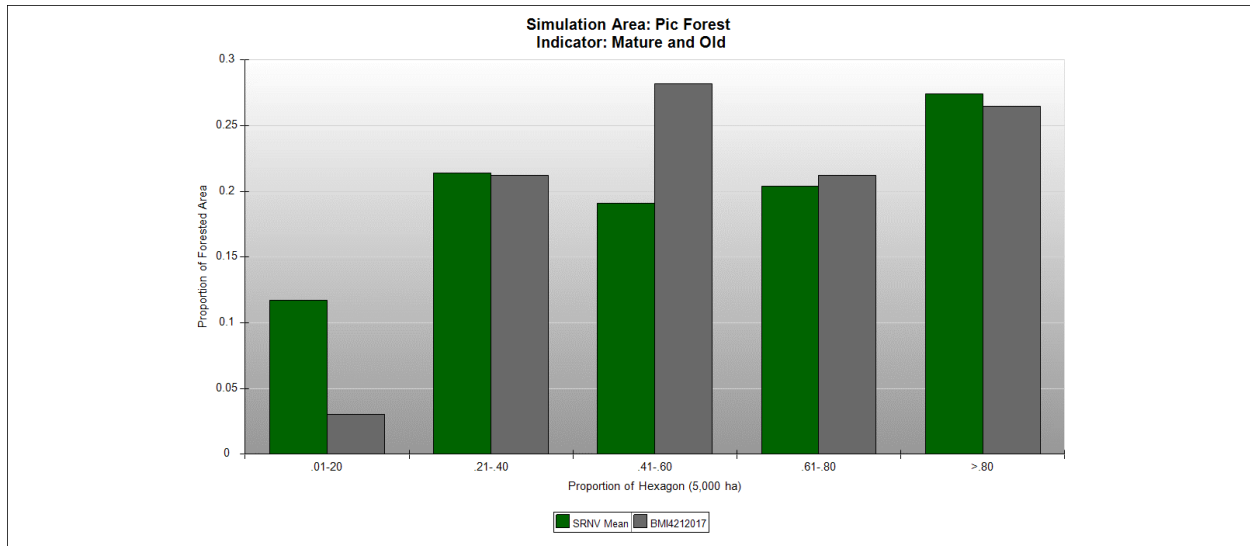
18 The discussion on old growth can be unclear due to inconsistent use of the terms “old growth” and
19 “mature” forest. For the purposes of this management plan, a forest is in a mature stage of
20 development when overstory trees attain full development and sexual maturity, mortality of over-storey
21 trees begins to create gaps and encourages understory development, and height growth slows
22 dramatically. On the other hand, the old growth period is a condition of dynamic forest ecosystems that
23 tends to include complex forest stand structure, relatively large dead standing trees (snags),
24 accumulations of downed woody material, up-turned stumps, root and soil mounds, accelerating tree
25 mortality, and ecosystem functions that may operate at different rates or intensities compared with
26 earlier stages of forest development.

1 Ongoing discussions regarding the ecological importance of old growth forests has been documented in
 2 scientific literature. This discussion indicates that there are no boreal wildlife species that depend
 3 entirely on the old growth forest condition for their life cycle requirements (OMNR 2003, Euler and
 4 Wedeles 2005), but that many utilize mature and old seral habitat interchangeably (e.g. Hollaway et al.
 5 2004). For habitat management purposes, the Landscape Guide therefore includes coarse filter
 6 indicators for the area of mature and old forest combined.

7 The texture of the mature and old forest and young forest patch size are coarse filter indicators used to
 8 characterize landscape pattern for the 2019 FMP. Mature and old forest texture is measured at two (2)
 9 scales; 500 and 5,000 hectares. For each scale, a 500 or 5,000 hexagon overlay of the forest determines
 10 if any hexagon contributes to the mature and old forest condition. Histograms are generated to
 11 represent the relative amount of mature and old forest within each hexagon. Figure 21 and Figure 22
 12 portray the histograms generated at the 500 and 5,000-hectare scales at plan start (2019) on the Pic
 13 Forest, compared to the SRNV.



14
 15 *Figure 21: Percent frequency distribution of 500ha polygons by mature and old forest proportion class for the plan start (2019)*
 16 *compared to the SRNV mean*



1
 2 *Figure 22: Percent frequency distribution of 5,000ha polygons by mature and old forest proportion class for the plan start (2019)*
 3 *compared to the SRNV mean*

4 *2.1.3.4 Red and White Pine*

5 The all ages of red and white pine forest units indicator was selected by an MNR science team based on
 6 differences between current landscape conditions, pre-industrial condition, and simulated ranges of
 7 natural variation. This indicator is used to direct the total amount of area in all development stages of
 8 red and white pine forest units on the landscape. This direction is consistent with *Old Growth Policy for*
 9 *Ontario’s Crown Forests* (OMNR 2003) which contributes to the maintenance of all ages of red and white
 10 pine and includes old growth stands, within their natural geographic ranges by maintaining no less than
 11 the 1995 amount while permitting a sustainable harvest of red and white pine now and in the future.

12 Red and white pine communities occur mostly in the southern parts of the boreal Landscape Guide
 13 Regions. However, at the time of running these simulations BFOLDS was limited to stand replacing fires
 14 only (i.e., no surface fires). Surface fires are a significant ecological process required to regenerate red
 15 and white pine stands. Examination of alternative information for natural disturbance and landscape
 16 patterns allowed us to reconcile estimates of the amount of red and white pine in these areas to use as
 17 milestones in landscape guide appendices. The Pre-Industrial Condition (PIC) estimate for the all ages of
 18 red and white pine forest units’ indicator is expressed as percent of forest landscape area and can be
 19 found in OLT and Science Package A (Elkie *et al.* 2013b).

20 Using both the BFOLDS-based SRNVs combined with historic survey-derived milestones is a compatible
 21 and valid method for determining direction. Red and white pine estimates fit within the estimate of the
 22 mature and older upland conifer landscape class indicator. Forest management planning teams should
 23 use professional judgment when applying forest composition guidelines and take into account the
 24 contribution of red and white pine forest units to the mature and older upland conifer landscape class.

25 *2.1.3.5 All Ages Conifer*

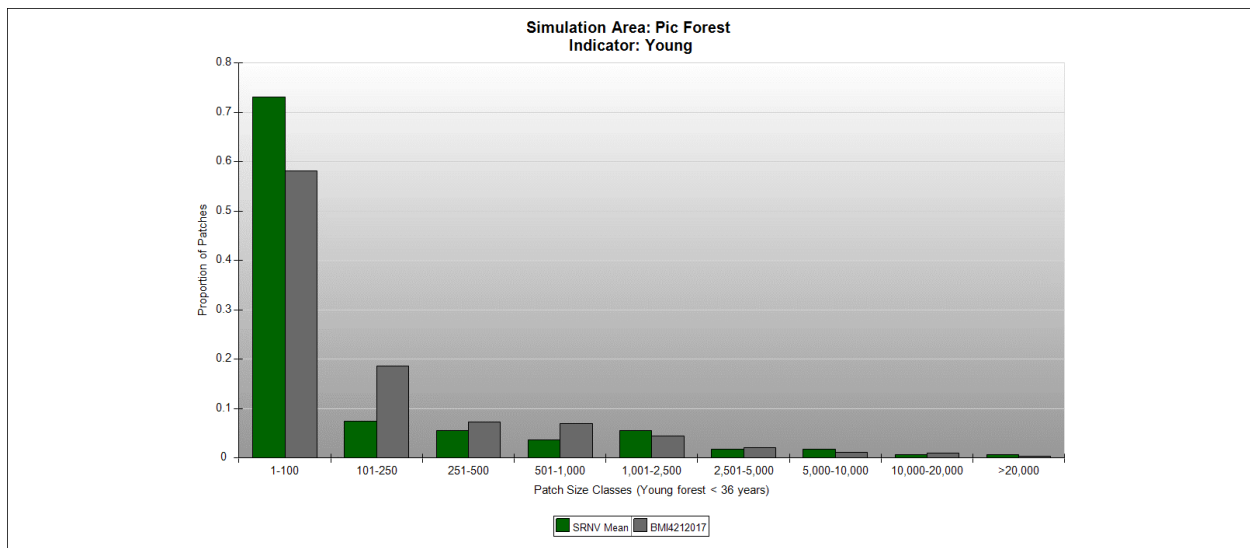
26 The conifer indicator was selected by an MNR science team based on differences between current
 27 landscape conditions, pre-industrial condition, and simulated ranges of natural variation. This indicator

1 is used to direct the total area in all development stages of upland black and white spruce and jack pine
 2 forest units on the landscape.

3 *2.1.3.6 Young Forest*

4 Young forest provides important ecological functions for numerous wildlife species. Forest harvest and
 5 wildfire are the dominant disturbance agents that create young forest in boreal forest management
 6 units. Although young forest is generally not in short supply, and it is the inverse to mature and old
 7 forest, the development team felt it was necessary to include the young forest indicator with general
 8 non-time specific “*move towards or maintain within*” direction.

9 Young forest patch size is measured at a finer scale, 15-hectare hexagons are overlain to determine
 10 whether each polygon contributes to young forest. Identified young forest hexagons that are adjacent
 11 to each other are counted as one patch. Figure 23 presents a frequency distribution of young forest
 12 patch size at plan start on the Pic Forest.



13
 14 *Figure 23: Percent frequency distribution of young forest by patch size class for the start compared to the SRNV mean.*

15 *2.1.3.7 Other Forest Classifications*

16 Other forest classifications in this Plan include additional classifications for caribou habitat. The Pic
 17 Forest intersects three distinct provincial caribou zones. Each zone has strategic and operational
 18 direction, along with objectives and targets that are included within this Plan. There are no additional
 19 classifications for other wildlife (i.e. Moose, marten, white tailed deer, etc.).

20 The Pic Forest intersects the Northern Continuous Caribou Range, the Lake Superior Caribou Coastal
 21 Range, and the Discontinuous Caribou Zone. To facilitate the implementation of Ontario’s Woodland
 22 Caribou Conservation Plan (CCP), Range Management Policy in Support of Woodland Caribou
 23 Conservation and Recovery (RMP) and the Boreal Landscape Guide caribou habitat management
 24 strategies were put into place on the Pic Forest. The northern portion of the forest is within the
 25 Northern Continuous Zone, where a full 100-year Dynamic Caribou Habitat Schedule (DCHS) is
 26 established. The Coastal Range utilizes a mosaic type structure to ensure the availability of refuge
 27 habitat and connectivity to the discontinuous zone is maintained and enhanced. Within the

1 discontinuous zone opportunities to enhance characteristics that would support caribou movement
 2 through this area were developed. Figure 24 displays the provincial caribou zones in context of the Pic
 3 Forest.



4
 5 *Figure 24: The Pic Forest with overlapping Caribou ranges: the Lake Superior Coastal Range (Coastal Continuous Range), the*
 6 *Discontinuous Distribution Zone, and the Pagwachuan Range (Northern Continuous Range)*

7 Plan objectives and indicators in FMP-10 describe the specific assessments and targets within each
 8 caribou zone. Although there are unique amount or arrangement targets within each caribou zone, the
 9 classification of habitat remains constant. The forest was classified by caribou habitat units Winter
 10 Useable, Winter Preferred, and Refuge. Like landscape classes, described in section 2.1.3.2 Forest
 11 Landscape Classes, caribou habitat classes are combinations of specific forest units by age class. Table 2
 12 details the Pic Forest Analysis Unit by age class matrix for caribou habitat classifications.

1 *Table 2: Pic Forest Caribou Habitat Classifications*

Pic Forest Analysis Forest Unit	Onset Age for Habitat		
	Winter Useable	Winter Preferred	Refuge
BFDOM			61
CONMX			71
OLOW	51	61	1
PJDOM	41	61	1
PJMIX	41		41
SBDOM	61		14
SBLOW	41	101	1
SBMIX	61		41

2

3 There are no classifications for moose habitat within the Pic Forest FMP. Current moose habitat is
4 described in section 3.6.14 Moose of the FMP.

5 2.1.4 Forest Resources

6 *2.1.4.1 Inventories and Information for Species at Risk*

7 **a) Known sites of occurrence of habitat for flora, fish and wildlife species listed as endangered**

- 8 • Little Brown Myotis and Northern Myotis are known to occur in the Pic Forest, however
9 LIO (Land Information Ontario) does not contain any element occurrences for either of
10 these two species. MNRF has local information on their known occurrences and
11 habitats.
- 12 • During migration, Golden Eagles have been documented in the Pic Forest, and Red Knot
13 are suspected to occur. However it is unlikely that either of these species breed in the
14 Pic Forest.
- 15 • Endangered species occurrences are considered sensitive data and are not shown in this
16 Plan.

17 **b) Known sites of occurrence of habitat for flora, fish and wildlife species listed as threatened**

- 18 • Woodland Caribou are known to occur in the Pic Forest, with the majority of recent
19 occurrences documented in the northern and coastal continuous caribou zones.
20 Wolverine are known to occur in the Pic Forest, however there are no element
21 occurrences of individuals or den sites documented in LIO.
- 22 • There are six threatened avian species that are either known to occur or are suspected
23 to occur in the Pic Forest. Of these, element occurrences and evidence of breeding exist
24 in LIO and in local MNRF databases for Eastern Whip-poor-will, Bank Swallow and Barn

1 Swallow. It is likely that Chimney Swift also breed in the Pic Forest, while American
2 White Pelican and Bobolink may pass through in small numbers during migration.

3 • Blanding’s turtle are known to occur in at least one location within the Pic Forest.

4 • Lake Sturgeon belonging to the threatened Great Lakes – Upper St. Lawrence River
5 population are known to occur and breed in the Pic Forest. Element occurrences are
6 documented in LIO.

7 • Occurrences for threatened species are considered sensitive data and are not shown in
8 this Plan.

9 **c) *Known sites of occurrence of flora, fish and wildlife species of special concern***

10 • LIO contains element occurrences for Common Night Hawk, Eastern Wood-peewee,
11 Canada Warbler, Peregrine Falcon, Bald Eagle, and Bald Eagle nest sites. Olive-Sided
12 Flycatcher, Wood Thrush, and Short-Eared Owl are also known to occur in the Pic Forest
13 and MNRF has local knowledge on habitats of these species. Black Tern, Yellow Rail,
14 Golden-Winged Warbler, and Horned Grebe may pass through in small numbers during
15 migration.

16 • Northern Brook Lamprey are known to occur in the Pic Forest. Element occurrences are
17 documented in LIO.

18 *2.1.4.2 Fish and Wildlife Inventories*

19 **a) *Known fish species present, and known fish habitats***

20

21 • Fish species presence and known fish habitat are identified in LIO (Land Information
22 Ontario) data layers which are maintained by the Ministry of Natural Resources and Forestry
23 (MNRF). LIO data layers that contain thermal characteristics of lakes may help determine
24 what fish species are likely to be present in cases where no fish species data is available.

25

26 • The Pic Forest has a predominance of cold water lakes and streams, and the fish
27 communities within the forest reflect this. Common naturally-occurring cold water fish
28 species within the Pic Forest include brook trout, lake trout, lake whitefish, cisco (lake
29 herring), long-nosed sucker, and burbot (ling). Cool water fish species include walleye,
30 northern pike, lake sturgeon, yellow perch, and white sucker. Various species of darters,
31 shiners, and dace are present in streams, lakes, and ponds throughout the forest.

32 • There are 18 stocked (put-grow-and-take) lakes in the the Pic Forest, 11 of which are
33 stocked with brook trout, 2 are stocked with splake, 2 are stocked with lake trout.

34 *2.1.4.3 Values Information*

35 • ***Information on each park and protected area, including the name, designation, class and area***

36 The Pic Forest hosts a number of provincial parks and protected areas both within and
37 adjacent to the management unit and one national park bordering the southern

1 boundary. The following are descriptions of the parks and protected areas within the
2 Pic Forest. These descriptions as well as further information including digital maps, land
3 use intent, management direction and source of direction are outlined in the MNRF's
4 Crown Land Use Policy Atlas.

5
6 ***Nagagamis (P1524e):*** *Nagagamis Provincial Park is located 75 kilometres southwest of*
7 *Hearst and is also located on the western fringe of the Great Clay Belt of Northeastern Ontario.*
8 *The campground is located on the eastern side of the park off Hwy 631 which provides access*
9 *to Nagagamis Lake and the Nagagami River. The dominant landforms are moderately*
10 *broken interlobate moraine and lacustrine deposits. Dominant vegetation types include mixed*
11 *conifer and mixed deciduous forests.*

12
13 ***Pan Lake Fen Provincial Park (P1504):*** Pan Lake Fen Provincial Park is a nature reserve class
14 park. It was determined to be the most diverse site in Site District (3E-4) which contains
15 approximately 20 different landform vegetation combinations. The predominant landform is
16 broken ground moraine.

17
18 ***Craig's Pit Provincial Park Reserve (P1501e):***

19 Craig's Pit Provincial Park is located southeast of Marathon in Pic Township. It is a 530 hectare
20 site which encompasses a series of kettle holes and bluffs and is an important migratory bird
21 observation area. The area represents three earth science landform/process themes
22 consisting of glacial, fluvial and lacustrine. Commercial timber harvesting is not permitted.

23
24 ***Craig's Pit Provincial Park Addition (P1501):***

25 Craig's Pit Provincial Park Addition is 413 hectares of land adjacent to the existing Craig's Pit
26 Provincial Park. The dominant landform vegetation type present within this site is strongly
27 broken end moraine with mixed conifer forest. Other vegetation types on this landform
28 include: mixed deciduous forest, sparse forest and deciduous forest. This site also contains
29 mixed conifer forest on moderately broken end moraine. Commercial timber harvesting is not
30 permitted.

31
32 ***Red Sucker Point Provincial Nature Reserve (P2672):***

33 Red Sucker Point Provincial Nature Reserve Provincial Park is a 360 hectares nature reserve
34 class provincial park located in Nipigon. The Park is located along the Lake Superior shore,
35 about 10 kilometres northwest of Marathon. Along the shores of this nature reserve is a
36 notable series of raised cobble beaches. Historic water levels of the lake, from ancient to
37 modern times, are visible on the stones. At their greatest height, the beaches tower some 45
38 metres above the water. Ancient lichen communities thrive on some of the cobblestones.
39 Also present are about 70 excavated rock structures attributed to historic and prehistoric
40 peoples. Timber harvest and road development is not permitted. Fishing is the main tourism
41 activity in the park.

42
43 ***Neys Provincial Park (P2212e):***

44 Neys Provincial Park is a 5475 hectares nature environment class provincial park located in the
45 Nipigon district. This area consists of all land and water of Neys Provincial Park and the main
46 activities are recreation, protection and interpretation of the natural environment. On the

1 islands and the land and waters area, commercial road development and harvesting is not
2 permitted. New commercial tourism in the development zone may be permitted. Proposals
3 will be reviewed through future planning. Recreation activity in the park include, fishing,
4 motor boat use (commercial and private on Lake Superior only), camping, and none motorised
5 recreation travel.
6

7 ***Prairie River Mouth Provincial Nature Reserve (P2669):***

8 Prairie River Mouth Provincial Nature Reserve Provincial Park is a 380 hectares nature reserve
9 class provincial park located in the Nipigon district. The Prairie River drains into Lake Superior
10 through a narrow gap in the bedrock between Marathon and Terrace Bay. From this gap, an
11 undulating ridge-dune complex radiates northward. Moving north, the swales between the
12 ridges become progressively wetter. A swale is a marshy depression in a tract of land, usually
13 rolling prairie. Timber harvest and new road development is not permitted in the park.
14 Currently, the main tourism and recreation activity is fishing.
15

16 ***Steel River Provincial Park (P2678):***

17 Steel River Provincial Park is a 11,240 hectare waterway class provincial park located northeast
18 of Terrace Bay and encompasses a 200 metre corridor along each side of the Steel Lake and
19 River system north of Santoy Lake including Diablo Lake. The 160 kilometers waterway is a
20 designated Provincial canoe route consisting of 3 separate published trips. Present recreation
21 usage is mainly unstructured public recreation with the emphasis on canoeing, fishing and
22 hunting. There is some fly-in tourism for the same recreational purposes. Cairngorm Lake is
23 considered a prime lake trout lake. Timber harvest and road development for commercial
24 purposes is not permitted.
25

26 ***Slim Jim Lake Conservation Reserve (C1507)***

27 Slim Jim Lake Conservation Reserve is located approximately 45 km north of the town of
28 Manitouwadge and has an area of 6,460 hectares. The site is dominated by moderately
29 broken bedrock of lacustrine deposit. There are wetland areas and a number of small lakes.
30 No commercial timber harvesting is permitted.
31

32 ***North Thornben Lake Moraine Conservation Reserve (C1510)***

33 North Thornben Lake Moraine Conservation Reserve is located approximately 55 km northeast
34 of the town of Manitouwadge and has an area of 454 hectares. This site is located on top of a
35 flat end moraine deposit. It contains mostly lacustrine deposits and mixed forests. Some
36 headwaters of feeder streams of the Osawin River are present. No commercial timber
37 harvesting is permitted.
38

39 ***Killala Lake Conservation Reserve (C2208)***

40 Killala Lake Conservation Reserve area is 13,190 hectares, located approximately 35 km
41 northwest of Marathon. It contains representative landform and vegetation types, including
42 conifer and deciduous forests on lacustrine deposits and weakly to moderately broken
43 bedrock. Killala Lake is a fish sanctuary (lake trout refuge) where angling is not permitted.
44 Commercial timber harvesting and associated road development are not permitted.
45

46 ***Isko Dewabo Lake Complex Conservation Reserve (C1505)***

1 Isko Dewabo Lake Complex Conservation Reserve is located approximately 18 km southwest of
 2 the town of Manitouwadge, east of Highway 614 and has an area of 2,967 hectares. The site
 3 consists of weakly and moderately broken ground moraine and weakly and moderately broken
 4 bedrock with bog. No commercial timber harvesting is permitted.

5 *Table 3: Summary of Provincial Parks and Conservation Reserves within the Pic Forest*

Number	Name	Type	Total Area (ha)	Area in PF (ha)
P1524e	Nagagamisis	Natural Environment	40683	1390.7
P1504	Pan Lake Fen	Natural Environment	496	496
P1501e	Craig's Pit Provincial Park Reserve	Nature Reserve	530	530
P1501	Craig's Pit Provincial Park Addition	Nature Reserve	413	413
P2672	Red Sucker Point Provincial Nature Reserve	Nature Reserve	360	360
P2212e	Neys Provincial Park	Natural Environment	5475	5475
P2669	Prairie River Mouth Provincial Nature Reserve	Nature Reserve	380	380
P2678	Steel River	Waterway	11240	7944
C1507	Slim Jim Lake	Conservation Reserve	6460	6460
C1510	North Thornben Lake Moraine	Conservation Reserve	454	454
C2208	Killala Lake	Conservation Reserve	13190	13190
C1505	Isko Dewabo Lake Complex	Conservation Reserve	2967	2967
<u>Total</u>				40059.7 ha

- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- **Cultural heritage resource inventory information, including:**
 - I. **Known archeology sites and cultural heritage landscapes**
 - Cultural heritage resource information is a critical part of the planning process for the Pic Forest. On the Pic Forest there are a number of unique cultural heritage sites and values that must be protected and conserved through the planning process. Cultural heritage information comes in various forms, including known cultural heritage sites and/or features, and Aboriginal specific values and/or

1 cultural sites. In order to effectively plan for cultural heritage resources, the
2 cultural heritage inventory for the Pic Forest must be as complete as possible. The
3 known cultural heritage site/features information is generally gathered from local
4 knowledge of the Pic Forest, as well as from the Ministry of Heritage, Sport,
5 Tourism, and Culture Industries.
6

7 **II. Aboriginal values information**

- 8 • Aboriginal values information is gathered in partnership with the First Nation
9 Communities involved in the development of the Pic Forest FMP. In some cases,
10 specific values information is not provided by the First Nation communities as this
11 information is considered sacred and confidential. In most cases, Aboriginal values
12 information is identified through the planning of harvest operations and roads in
13 order to ensure the protection and preservation of the Aboriginal values and/or
14 sites. Aboriginal values and/or sites have been and will continue to be protected
15 by AOC prescriptions and done so in consultation with the affected First Nation
16 community.

17 **III. Areas of archeological potential**

- 18 • Areas of high archaeological potential are identified through an analytical tool
19 called the *Heritage Assessment Tool* (HAT). An archeological potential area (APA)
20 refers to locations where physical features on the land suggest there is a potential
21 for the presence of a cultural heritage value and/or site. Values identified by the
22 HAT model are confirmed through further analysis by the MNRF and the Planning
23 Team.
24

25 • **Mineral resource assessment maps**

- 26 • The Mineral Values maps are provided by the Ministry of Northern Development
27 and Mines, Regional Land Use Geologist.
28

29 • **Ecosite information, based on the forest ecosystem classification system for the province**

- 30 • The ecosite for each forest stand is included in the planning inventory.
31 • Forest stands have been classified to one of 25 ecosites as described in the “Field
32 Guide to Forest Ecosystems of Central Ontario (OMNR 1997).
33

33 **2.2 Social and Economic Description**

34 One of the components of forest sustainability is the provision for the needs of people who receive
35 benefits from the forest resource. Decisions made in the forest management plan (FMP) have
36 significant impacts on the local economy, as well as the regional and provincial economies. Therefore, it
37 is important to be knowledgeable about these social and economic impacts and to measure the
38 magnitude of these impacts on people in our society.

39 The knowledge and measurement of these social and economic impacts are obtained by first
40 establishing the baseline socioeconomic profile of the communities impacted by the wood flow from the

1 management unit; secondly, a social and economic assessment (SEA) will be prepared to identify the
2 expected social and economic impacts of implementing the proposed management strategy.

3 2.2.1 Overview of Social and Economic Context

4 The socioeconomic profile includes demographic profiles for communities that are dependent on the
5 wood flow from the Pic Forest, and profiles of industrial and non-industrial users of the forest. The
6 socioeconomic profile provides the baseline information on the social and economic environment,
7 which will affect long-term management decisions in the forest management plan.

8 Table 4 shows communities that have been included in the social and economic profile for Pic Forest and
9 compares the 2016 and 2011 census data. The socio economic description of three communities
10 (Wawa, Dubreuilville, and Chapleau) who used to depend on Pic Forest have been omitted from the
11 current plan due to changing economic times, such as mills closures.

12 *Table 4: Total population of communities who depend on Pic Forest Community*

Community	2011 Census			2016 Census			Trend
	Male	Female	Total	Male	Female	Total	
Hearst	2,490	2,595	5,090	2,480	2,595	5,070	↓
Hornepayne	550	500	1,050	525	455	980	↓
Manitouwadge	1,075	1,030	2,105	990	945	1,937	↓
Marathon	1,735	1,625	3,353	1,675	1,600	3,273	↓
Terrace Bay	745	725	1,471	810	800	1,611	↑
White River	320	285	607	340	305	645	↑
Greenstone	2,425	2,300	4,724	2,375	2,260	4,636	↓

13
14 Nine indigenous communities have been contacted by the Ministry of Natural Resource and Forestry
15 (MNRF) and were invited to participate in the development of the forest management plan for the Pic
16 Forest. These communities were: Constance Lake First Nation, Ginoogaming First Nation, Pic Moberg
17 First Nation, Long Lake #58 First Nation, Pays Plat First Nation, Hornepayne Aboriginal Community,
18 [Biinjitiwabik Zaaging Anishnabek](#) (Rocky Bay First Nation), [Bingwi Neyaashi Anishinaabek](#) (Sand Point
19 First Nation), and Biigtigong Nishnaabeg (Ojibways of the Pic River First Nation). Their involvement in
20 the development and implementation of the plan is based upon an agreed consultation approach.

21 2.2.2 Summary of Demographic Profiles

22 The demographic profile gives a snap-shot of the social and economic health of the communities that
23 derive benefits related to forest management activities from the forest. It provides the information on
24 basic socio-economic indicators, such as employment, and associated trends, income, labour force,
25 migration, language and education, information on forest industry and communities' dependencies on
26 different sectors of the economy, especially the forest industry, which is defined in North American

1 Industrial Classification System (NAICS, 2017) as Forest Services and Logging, Support activities for
2 forestry (e.g., forest management; log hauling), Wood Product Manufacturing, and Paper Product
3 Manufacturing.

4 The demographic profile consists of profiles of individual communities impacted by the wood flow from
5 the Pic Forest. A description of statistical information is provided on population, labour force,
6 community diversity, official languages, household characteristics, average income by gender, and
7 education. The communities that receive wood from the Pic Forest have higher than provincial
8 employment dependency on the forestry sector, which indicates that the forest industry is very
9 important for these communities.

10 Data in the demographic profiles are derived from Statistics Canada Census of Population, using multiple
11 sources (2011, and 2016) as well as information from the Ministry of Northern Development and Mines,
12 based on data availability. Two small communities of Calstock and Hillsport are considered dependent
13 on the Pic Forest but the demographic profiles were integrated in census subdivisions of Cochrane
14 (Unorganized, North Part) and Thunder Bay (Unorganized) respectively, for their very small populations.

15 **Hearst**

16 The township of Hearst has a population of 5,070 and a labour force of 2,610 with 135 unemployed
17 (Stats Canada, 2016). The population of Hearst decreased by 0.4% compared to the 2011 census data.
18 The majority (98.4%) are Canadian born with 6.2% English speaking, 23.3% French speaking and 70.4%
19 bilingual.

20 The average total income of individuals is \$44,617 and there are 2,380 households in Hearst earning an
21 average income of \$78,759 in 2015. Educational accomplishment within the community is 13.3% at
22 bachelor level or above, 2% with University certificate or diploma below bachelor level, 23.2% College,
23 10% Trades certificate or diploma, 22.9% Secondary school diploma, and 28.5% primary with no
24 certificate, diploma, or degree.

25 **Hornepayne**

26 The township of Hornepayne has a population of 980 and a labour force of 565 with 105 unemployed
27 (Stats Canada, 2016). The population of Hornepayne decreased by 1.4% compared to the 2011 census
28 data. The majority (97.9%) are Canadian born with 77.2% English speaking, 1.6% French speaking,
29 20.7% bilingual, and 0.5% speaking neither English nor French.

30 The average total income of individuals is \$55,675 and there are 410 households in Hornepayne earning
31 an average income of \$108,279 in 2015. Educational accomplishment within the community is 5% at
32 bachelor level or above, 2.5% with University certificate or diploma below bachelor level, 19.4% College,
33 7.5% Trades certificate or diploma, 35% Secondary school diploma, and 31.9% primary with no
34 certificate, diploma, or degree.

35 **Manitouwadge**

36 The township of Manitouwadge has a population of 1,937 and a labour force of 845 with 85
37 unemployed (Stats Canada, 2016). The population of Manitouwadge decreased by 3.3% compared to
38 the 2011 census data. The majority (90.9%) are Canadian born with 78.2% English speaking, 1% French
39 speaking, 20.5% bilingual, and 0.3% speaking neither English nor French.

1 The average total income of individuals is \$45,447 and there are 890 households in Manitouwadge
2 earning an average income of \$84,070 in 2015. Educational accomplishment within the community is
3 8.8% at bachelor level, 2.6% with University certificate or diploma below bachelor level, 20.9% College,
4 15.9% Trades certificate or diploma, 23.2% Secondary school diploma, and 28.2% primary with no
5 certificate, diploma, or degree.

6 **Marathon**

7 The township of Marathon has a population of 3,273 and a labour force of 1,750 with 130 unemployed
8 (Stats Canada, 2016). The population of Marathon decreased by 1.6% compared to the 2011 census
9 data. The majority (96%) are Canadian born with 83.3% English speaking, 0.3% French speaking, 16.4%
10 bilingual, and 0.0% speaking neither English nor French.

11 The average total income of individuals is \$49,857 and there are 1,445 households in Marathon earning
12 an average income of \$90,131 in 2015. Educational accomplishment within the community is 11.6% at
13 bachelor level or above, 0.7% with University certificate or diploma below bachelor level, 27% College,
14 13.7% Trades certificate or diploma, 26.2% Secondary school diploma, and 21.1% primary with no
15 certificate, diploma, or degree.

16 **Terrace Bay**

17 The township of Terrace Bay has a population of 1,611 and a labour force of 825 with 85 unemployed
18 (Stats Canada, 2016). The population of Terrace Bay increased by 2.8% compared to the 2011 census
19 data. The majority (88.7%) are Canadian born with 88% English speaking, 0.0% French speaking, 11.7%
20 bilingual, and 0.6% speaking neither English nor French.

21 The average total income of individuals is \$49,502 and there are 740 households in Terrace Bay earning
22 an average income of \$88,290 in 2015. Educational accomplishment within the community is 14% at
23 bachelor level or above, 0.7% with University certificate or diploma below bachelor level, 29.2% College,
24 12.5% Trades certificate or diploma, 28.4% Secondary school diploma, and 15.1% primary with no
25 certificate, diploma, or degree.

26 **White River**

27 The township of White River has a population of 645 and a labour force of 350 with 10 unemployed
28 (Stats Canada, 2016). The population of White River increased by 0.7% compared to the 2011 census
29 data. The majority (95.5%) are Canadian born with 81.4% English speaking, 0.8% French speaking,
30 17.8% bilingual, and 0.0% speaking neither English nor French.

31 The average total income of individuals is \$45,800 and there are 305 households in White River earning
32 an average income of \$85,244 in 2015. Educational accomplishment within the community is 3.6% at
33 bachelor level or above, 3.6% with University certificate or diploma below bachelor level, 22.3% College,
34 21.4% Trades certificate or diploma, 25.9% Secondary school diploma, and 24.1% primary with no
35 certificate, diploma, or degree.

36 **Greenstone**

37 The Municipality of Greenstone was created on January 1, 2001 by the amalgamation of the former
38 municipalities of the Town of Geraldton, Town of Longlac, the Township of Nakina and the Township of
39 Beardmore, and an extensive area of unincorporated territory including numerous settlement areas
40 such as; Caramat, Jellicoe and MacDiarmid. Greenstone is located in the District of Thunder Bay and has

1 an area of 3,172 sq. Km (1,224 sq. Mi.) making it one of the largest municipalities in Canada. Among all
2 communities comprised in Greenstone, Nakina, Geraldton, Longlac, and Caramat are the four
3 communities that are of social and economic importance depending on Pic Forest.

4 The Municipality of Greenstone has a population of 4,636 and a labour force of 2,165 with 230
5 unemployed (Stats Canada, 2016). The population of Greenstone decreased by 1.7% compared to the
6 2011 census data. The majority (96.8%) are Canadian born with 66.8% English speaking, 2.1% French
7 speaking, 31% bilingual, and 0.1% speaking neither English nor French.

8 The average total income of individuals is \$43,137 and there are 2,040 households in Greenstone
9 earning an average income of \$77,505 in 2015. Educational accomplishment within the community is
10 10.7% at bachelor level or above, 2% with University certificate or diploma below bachelor level, 22.3%
11 College, 8.1% Trades certificate or diploma, 24.5% Secondary school diploma, and 32.2% primary with
12 no certificate, diploma, or degree.

13 **Indigenous Communities and Groups**

14 The Pic Forest is an important resource for many indigenous communities. It is essential to the
15 indigenous way of life, providing a source of traditional foods and medicines, and a place where First
16 Nation and Metis peoples conduct cultural practices. Indigenous people also participate in the forest
17 economy. Based on data availability, different sources were utilised to describe the indigenous
18 populations, for example, from Statistics Canada census data (Stats Canada, 2016), and from the
19 “Registered Indian Population by Sex and Residence 2014 - Statistics and Measurement Directorate
20 (2014)”, a document produced by Indigenous and Northern Affairs Canada (INAC). Below are brief
21 descriptions of demographic profiles for First Nations & Métis situated in or immediately adjacent to the
22 Pic Forest. Each community has an opportunity to provide more detailed information about its
23 relationship with the forest through the preparation of a Background Information Report.

24 **Constance Lake First Nation**

25 Constance Lake First Nation is primarily the successor of the English River First Nation, which was
26 considered an offshoot of the Albany Band by the commissioners at the time of signing and conclusion
27 of Treaty 9. The total population is 1,678 while 862 are on Reserve and on Crown land (includes lands
28 affiliated with First Nations operating under Self-Government Agreements) and 816 are off Reserve
29 (INAC, 2014).

30 Constance Lake 92 is one of the reserves of the Constance Lake First Nation in Cochrane District,
31 Ontario. The majority (99.2%) of population are English speaking, 0.8% bilingual, and 17.8% also
32 speaking Aboriginal languages (Stats Canada, 2016). The average total income of individuals is \$23,718
33 and there are 195 households in Constance Lake 92 earning an average income of \$47,683 in 2015.
34 Educational accomplishment within the community is 4.9% at bachelor level or above, 0% with
35 University certificate or diploma below bachelor level, 9.8% College, 11% Trades certificate or diploma,
36 12.2% Secondary school diploma, and 61% primary with no certificate, diploma, or degree. The
37 population is 590. The size of labour force is 195 with 60 unemployed.

38 **Ginoogaming First Nation**

39 Ginoogaming First Nation (formerly the Long Lake 77 First Nation) is a small Anishinaabe (Ojibway) First
40 Nation reserve located in Thunder Bay District, located approximately 40 km east of Geraldton, Ontario,

1 Canada, on the northern shore of Long Lake, immediately south of Long Lake 58 First Nation and the
2 community of Longlac, Ontario. The total population is 919 while 212 are on Reserve and on Crown land
3 (includes lands affiliated with First Nations operating under Self-Government Agreements) and 707 are
4 off Reserve (INAC, 2014).

5 The majority (~100%) of population on reserve are English speaking and 11.9% also speaking Aboriginal
6 languages (Stats Canada, 2016). The average total income of individuals is not available and there are
7 65 households in Ginoogaming First Nation earning a median total household income of \$39,808 in
8 2015. Educational accomplishment within the community is 0% at bachelor level or above, 0% with
9 University certificate or diploma below bachelor level, 10.3% College, 6.9% Trades certificate or diploma,
10 13.8% Secondary school diploma, and 72.4% primary with no certificate, diploma, or degree.

11 ***Pic Moberg First Nation***

12 The Pic Moberg First Nation is comprised of two reserves: Pic Moberg North and Pic Moberg South, both
13 located approximate 60 km east of Marathon, Ontario off Highway 17.

14 The total population is 960, in which 344 are on Reserve and on Crown land (includes lands affiliated
15 with First Nations operating under Self-Government Agreements) and 616 are off Reserve (INAC, 2014).

16 The Pic Moberg North reserve has a population of 197 and a labour force of 70 with 25 unemployed
17 (Stats Canada, 2016). The majority (99.2%) of population are English speaking, 0.8% bilingual, and 17.8%
18 also speaking Aboriginal languages (Stats Canada, 2016). The average total income of individuals is not
19 available and there are 65 households earning a median income of \$32,064 in 2015. Educational
20 accomplishment within the community is 0% at bachelor level or above, 0% with University certificate or
21 diploma below bachelor level, 7.7% College, 7.7% Trades certificate or diploma, 19.2% Secondary school
22 diploma, and 69.2% primary with no certificate, diploma, or degree.

23 The Pic Moberg South reserve has a population of 125 and a labour force of 50 with 10 unemployed
24 (Stats Canada, 2016). Information about the knowledge of official language and total income is not
25 available. Educational accomplishment within the community is 0% at bachelor level or above, 0% with
26 University certificate or diploma below bachelor level, 20% College, 10% Trades certificate or diploma,
27 15% Secondary school diploma, and 50% primary with no certificate, diploma, or degree.

28 ***Long Lake No.58 First Nation***

29 Long Lake 58 First Nation is a Anishinaabe (Ojibway) First Nation band government located in Northern
30 Ontario, approximately 40 km east of Geraldton, Ontario, Canada, on the northern shore of Long Lake,
31 immediately north of Ginoogaming First Nation and west of the community of Longlac, Ontario. The
32 total population is 1,468, in which 487 are on Reserve and on Crown land (includes lands affiliated with
33 First Nations operating under Self-Government Agreements) and 981 are off Reserve (INAC, 2014).

34 Long Lake No.58 First Nation has a population of 385 and a labour force of 120 with 50 unemployed
35 (Stats Canada, 2016). The majority (98.7%) of population are English speaking, 1.3% bilingual, and 7.8%
36 also speaking Aboriginal languages (Stats Canada, 2016). The average total income of individuals is
37 \$16,609 and there are 115 households earning an average income of \$35,162 in 2015. Educational
38 accomplishment within the community is 0% at bachelor level or above, 3.8% with University certificate
39 or diploma below bachelor level, 3.8% College, 9.6% Trades certificate or diploma, 15.4% Secondary
40 school diploma, and 67.3% primary with no certificate, diploma, or degree.

1 ***Pays Plat First Nation***

2 Pays Plat First Nation is a First Nation community located near Rosspoint, Ontario, Canada, about 175
3 kilometres northeast of Thunder Bay. The total population is 233, in which 76 are on Reserve and on
4 Crown land (includes lands affiliated with First Nations operating under Self-Government Agreements)
5 and 157 are off Reserve (INAC, 2014).

6 The Pays Plat 51 Reserve is in the boundaries of the territory described in the Robinson-Superior Treaty
7 of 1850, located along Highway 17, has a population of 89 and a labour force of 45 with 10 unemployed
8 (Stats Canada, 2016). The majority (~100%) of population are English speaking, and 22.2% also speaking
9 Aboriginal languages (Stats Canada, 2016). The information about total income is not available.
10 Educational accomplishment within the community is 0% at bachelor level or above, 0% with University
11 certificate or diploma below bachelor level, 28.6% College, 14.3% Trades certificate or diploma, 28.6%
12 Secondary school diploma, and 28.6% primary with no certificate, diploma, or degree.

13 **Biinjitiwabik Zaaging Anishnabek (Rocky Bay First Nation)**

14 The Biinjitiwaabik Zaaging Anishnabek (also known as Rocky Bay First Nation) is an Ojibway First
15 Nation band government in Northwestern Ontario, Canada. The total population is 718, in which 339
16 are on Reserve and on Crown land (includes lands affiliated with First Nations operating under Self-
17 Government Agreements) and 379 are off Reserve (INAC, 2014).

18 Their territory is located on the Rocky Bay 1 reserve in Greenstone, Ontario. Rocky Bay 1 has a
19 population of 184 and a labour force of 95 with 35 unemployed (Stats Canada, 2016). The majority
20 (~100%) of population are English speaking, and 8.1% also speaking Aboriginal languages (Stats Canada,
21 2016). The total income of individuals is not available and there are 60 households earning a median
22 income of \$43,008 in 2015. Educational accomplishment within the community is 6.7% at bachelor level
23 or above, 0% with University certificate or diploma below bachelor level, 20% College, 13.3% Trades
24 certificate or diploma, 20% Secondary school diploma, and 40% primary with no certificate, diploma, or
25 degree.

26 **Bingwi Neyaashi Anishnabek (Sand Point First Nation)**

27 The Bingwi Neyaashi Anishnabek (also known as Sand Point First Nation) is an Ojibway First Nation
28 reserve in Northwestern Ontario, Canada. Their traditional territory is the Sand Point, located on the
29 south east shores of Lake Nipigon, in Greenstone. The total population is 256, in which 90 are on
30 Reserve and on Crown land (includes lands affiliated with First Nations operating under Self-
31 Government Agreements) and 166 are off Reserve (INAC, 2014). The survey information is not available
32 on Stats Canada website.

33 **Biigtigong Nishnaabeg (Ojibways of the Pic River First Nation)**

34 The Biigtigong Nishnaabeg (also known as Ojibways of the Pic River First Nation) is an Ojibway
35 (Anishnabek) First Nation reserve on the northern shore of Lake Superior at the mouth of the Pic River,
36 located on the Pic River 50 Indian reserve. The total population is 1,141, in which 529 are on Reserve
37 and on Crown land (includes lands affiliated with First Nations operating under Self-Government
38 Agreements) and 612 are off Reserve (INAC, 2014).

39 The Pic River 50 reserve has a population of 443 and a labour force of 185 with 30 unemployed (Stats
40 Canada, 2016). The majority (98.9%) of population are English speaking, 1.1% bilingual, and 4.5% also

1 speaking Aboriginal languages (Stats Canada, 2016). The average total income of individuals is \$35,253
 2 and there are 165 households earning an average income of \$66,047 in 2015. Educational
 3 accomplishment within the community is 4.5% at bachelor level or above, 0% with University certificate
 4 or diploma below bachelor level, 34.8% College, 7.6% Trades certificate or diploma, 19.7% Secondary
 5 school diploma, and 30.3% primary with no certificate, diploma, or degree.

6 **Hornepayne Aboriginal Community**

7 Hornepayne is a township located in the Algoma District of Ontario, Canada. According to Stats Canada
 8 2016 survey, there is a small aboriginal population: 7.8% First Nations and 2.1% Métis of the total
 9 population (Stats Canada, 2016).

10 2.2.3 Industrial and Non-Industrial Uses of the Forest

11 The industrial and non-industrial description has been divided into different uses of the Pic Forest,
 12 including forestry and wood products, recreation and tourism, mining, aggregate and hydro generation,
 13 and others. Information used in this part of the description has been obtained through reviewing
 14 documentation, such as TREES Data Warehouse Query, pertinent Wawa District MNRF archive, and
 15 through feedback received from surveys that were mailed out in spring and summer of 2017, to a wide
 16 range of pertinent individuals or organizations. Table 5 provides a basic summary of the district survey
 17 that was undertaken for this Pic Forest plan; the turnover of the response was relatively low despite that
 18 follow-up reminder notes were sent.

19 *Table 5: Summary of the survey report of industrial and non-industrial uses of Pic Forest*

Category	Survey sent	Returned	%
Trappers	57	11	19
Mining claims	52	2	4
Forest industry	11	4	36
Bait fish	10	2	20
Aggregate extraction	19	7	37
Bear management areas	10	1	10
Remote Tourism (RMT)	7	1	14
Angler and hunter (OFAH)	1	1	100

20 Note: With the return rate being low, the description does not rely heavily on the results.

21 2.2.3.1 Forestry and Wood Products

22 In April 2013, the Nawiinginokiima Forest Management Corporation (NFMC) was granted an enhanced
 23 Forest Resource Licence (FRL) and became the first Local Forest Management Corporation to be
 24 established pursuant to the *Ontario Forest Tenure Modernization Act, 2011*. An enhanced FRL includes
 25 the assignment of all forest management responsibilities. In June 2017, the NFMC was issued two

- 1 Sustainable Forest Licences (SFL), one for the Big Pic Forest, and one for the Pic River Forest. The two
 2 forests will be amalgamated to form the Pic Forest April 1, 2019, with one SFL.
- 3 As shown in Table 6, there are many mills that receive harvest timber for processing in order to produce
 4 various products: biomass Cogeneration, pulp, sawmill, and veneer on Big Pic and Pic River Forests for
 5 2016/17. Levesque Plywood Limited (Columbia Forest Products Ltd.) (Hearst) is the only mill process
 6 veneer product (25447 m³).
- 7 *Table 6: Communities and associated mills which have recently received substantial amounts of timber (m3), chips or other*
 8 *forest products from the Pic Forest in 2016/17.*

Receiving Facility	Biomass	Pulp	Sawmill	Veneer
(a) Big Pic				
Atlantic Power Corporation (Hearst)	9828			
AV Terrace Bay Inc. (Terrace Bay)	26053	187048		
Hornepayne Lumber LP (Hornepayne)			6681	
Lecours Lumber Co. Limited (Calstock)			52780	
Levesque Plywood Limited (Columbia Forest Products Ltd.) (Hearst)				21502
Longlac Lumber Inc. (Longlac)			37280	
White River Forest Products Ltd. (White River)			77024	
Grand Total	35882	187048	173765	21502
(b) Pic River				
Atlantic Power Corporation (Hearst)	6855			
AV Terrace Bay Inc. (Terrace Bay)	11779	67946		
Lecours Lumber Co. Limited (Calstock)			1552	
Levesque Plywood Limited (Columbia Forest Products Ltd.) (Hearst)				3945
Longlac Lumber Inc. (Longlac)			1604	
White River Forest Products Ltd.			32011	

Receiving Facility	Biomass	Pulp	Sawmill	Veneer
(White River)				
Grand Total	18635	67946	35168	3945

1
 2 Table 7 details the flow of harvested timber from Pic Forest for the 10-year period from 2007/08 to
 3 2016/17 by receiving mills. In total just over about 4,100,000 m³ of wood was harvested and supplied to
 4 several mills. Table 8 shows the total volume (m³) by wood type in percentage during 2007/08 and
 5 2016/17. The majority of the harvest has been Spruce Pine Fir (SPF) to supply the local mills. Table 9
 6 shows the details about the issuance of commercial Forest Resource Licences (FRL’s) and Sustainable
 7 Forest Licence (SFL’s) on Big Pic and Pic River Forests between 2007/08 and 2017/2018, which reflects
 8 the historical information and the current situation in wood allocation and licensing. The harvest
 9 volume and Crown charges (stumpage and payments for forest renewal and forestry future trust) from
 10 Pic Forest is detailed in Table 10.

11 Table 10 provides information regarding stumpage paid to the Crown, Forest Renewal Trust Fund and
 12 Forestry Futures Trust Fund relating to the Big Pic and Pic River Forests in the years 2011/12 – 2017/18.
 13 All information has been sourced from the TREES Data Warehouse for the corresponding years. The
 14 ‘average stumpage paid’ shown is the result of dividing Crown Revenues by the actual harvest volume.
 15 It should be noted that ‘harvest volume’ includes normal harvest and salvage harvest and invoiced and
 16 undersized produce.

17 Forest Resource Licences for Personal Fuel Wood are issued annually to those members of the public
 18 who request and purchase them from MNRF Wawa District Office.

19 *Table 7: Product utilization from 2007/08 to 2016/17 by receiving mills (In appendix only).*

Receiving mills Total Volume of Product Utilization by Year (m³)

(a) Big Pic										
	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Atlantic Power Corporation (Hearst)			89259	111946	107187	62582	38539	23794	13280	9828
AV Terrace Bay Inc. (Terrace Bay)	7840	31790		99270	104672	102583	317031	213036	192974	213101
Domtar Inc. (Espanola)			7	281						
Dubreuil Forest Products Limited (Dubreuilville)	58383									

Receiving mills Total Volume of Product Utilization by Year (m³)

Global Sticks Inc. (Thunder Bay)					183	89				
Hornepayne Lumber LP (Hornepayne)				10807	26498	17991	48850	48393	7077	6681
Lecours Lumber Co. Limited (Calstock)				420	1092	1894	10771	32065	95796	52780
Levesque Plywood Limited (Columbia Forest Products Ltd.) (Hearst)			9292	7591	12284	9118	24348	11871	24677	21502
Longlac Lumber Inc. (Longlac)								5481	64687	37280
Longlac Wood Industries Inc. (Longlac)	20312	14094								
Marathon Pulp Inc. (Marathon)	145450	234976	-132	-281						
Midway Lumber Mills Limited (Thessalon)			2392	4045						
Ontario (Commercial Fuelwood)	450		97		587		665	1376	292	160
Resolute FP Canada Inc. (Iroquois Falls)			35008	23981	20416	1983				
Resolute FP Canada Inc. (Thunder Bay)				17208	4458	5260				
St. Marys Paper Corp. (Sault Ste. Marie)	1980									
Tembec (Chapleau)			8792	62882	25790	15262	787			
Tembec (Hearst)				14576	9971	59564	26950	281		

Receiving mills Total Volume of Product Utilization by Year (m³)

Tembec (Kapusking)		22081	45534	4259	8275					
Weyerhaeuser Company Limited (Wawa)	3277									
White River Forest Products Ltd. (White River)							19808	31154	32626	77024
Grand Total	237691	302941	190249	356985	321413	276327	487750	367451	431409	418357
(b) Pic River										
Atlantic Power Corporation (Hearst)							4892	17155	9582	6855
AV Terrace Bay Inc. (Terrace Bay)	56558	34705					33106	93471	108671	79725
Black Sturgeon Enterprises Ltd. (Nipigon)		1533								
Dubreuil Forest Products Limited (Dubreuilville)	1365									
Hornepayne Lumber LP (Hornepayne)							7357	511		
Hornepayne Power Inc. (Hornepayne)									366	
Lecours Lumber Co. Limited (Calstock)							406	397	1557	1552
Levesque Plywood Limited (Columbia Forest Products Ltd.) (Hearst)							1353	2445	5195	3945
Longlac Lumber Inc. (Longlac)	181									1604

Receiving mills Total Volume of Product Utilization by Year (m³)

Longlac Wood Industries Inc. (Longlac)	1864									
Marathon Pulp Inc. (Marathon)	60852	35108								
Northern Sawmills Inc. (Thunder Bay)	1651									
Ontario (Commercial Fuelwood)	247	586	534					384		
Tembec (Chapleau)							647	56		
White River Forest Products Ltd. (White River)							15439	51908	44527	32011
Grand Total	122717	71932	534	0	0	0	63199	166327	169899	125694

1

2 Table 8: Total volume (m3) by wood type in percentage during 2007/08 and 2016/17.

Scaling year	Hardwood	Mixedwood	Softwood	Total volume
(a) Big Pic				
2007/08	17%	0%	83%	237691
2008/09	10%	0%	90%	302941
2009/10	5%	47%	48%	190249
2010/11	2%	36%	62%	356985
2011/12	4%	36%	60%	321413
2012/13	3%	25%	71%	276327
2013/14	5%	23%	72%	487750
2014/15	4%	12%	84%	367451
2015/16	9%	7%	84%	431409
2016/17	7%	9%	84%	418357

Scaling year	Hardwood	Mixedwood	Softwood	Total volume
(b) Pic River				
2007/08	41%	0%	59%	122717
2008/09	33%	3%	64%	71932
2009/10	100%	0%	0%	534
2010/11				0
2011/12				0
2012/13				0
2013/14	2%	17%	80%	63199
2014/15	2%	20%	78%	166327
2015/16	5%	25%	70%	169899
2016/17	4%	15%	81%	125694

1

2 *Table 9: Forest Resource Licensees during 2007/08 and 2017/18.*

Big Pic Forest

Licensee Name	Licence type (*FRL or SFL)	Years
686860 Ontario Limited	FRL	2007 - 2013
AV Terrace Bay	FRL	2012
B & M Hauling Ltd	FRL	2010 - 2012
Columbia Forest Products Ltd	FRL	2012
Marathon Pulp Inc	SFL	2007 to 2011
Nawiinginokiima Forest Management Corporation	FRL	2013 - 2017
Nawiinginokiima Forest Management Corporation	SFL	2017- present

Pic River Forest		
Licensee Name	Licence type (*FRL or SFL)	Years
Great West Timber Limited	SFL	2007 to 2013
Ken Dooley & Son Logging Inc.	FRL	2007 - 2009
Pic River Development Corporation	FRL	2007 - 2011
Nawiinginokiima Forest Management Corporation	FRL	2013-2017
Nawiinginokiima Forest Management Corporation	SFL	2017- present

1 *FRL = Forest Resource Licence and SFL = Sustainable Forest Licence

2 *Table 10: Ten-year summary of Harvest Volume, Crown Timber Charges and Average Stumpage Paid from Big Pic and Pic River*
 3 *Forests (2007/08 to 2016/17).*

Year	Actual Harvest Volume (m ³)	Total Stumpage	Payments to FRT	Payments to FFT	Average Crown Timber Charges (\$/m ³)
(a) Big Pic Forest					
2007/08	238336	\$613,014	\$37,726	\$103,907	\$3.2
2008/09	303136	\$729,562	\$1,071,562	\$130,659	\$6.4
2009/10	190474	\$179,235	\$381,123	\$59,927	\$3.3
2010/11	357564	\$488,814	\$969,677	\$133,727	\$4.5
2011/12	321886	\$503,899	\$844,001	\$377,086	\$5.4
2012/13	277012	\$40,383	\$868,717	\$371,387	\$4.6
2013/14	488278	\$2,281	\$1,725,156	\$213,291	\$4.0
2014/15	368058	\$2,656	\$1,518,690	\$169,774	\$4.6
2015/16	432007	\$2,645	\$1,820,192	\$207,010	\$4.7
2016/17	418658	\$1,429	\$1,658,780	\$203,904	\$4.5
Total	3395408	2563919	10895625	1970674	\$4.5
(b) Pic River Forest					

Year	Actual Harvest Volume (m ³)	Total Stumpage	Payments to FRT	Payments to FFT	Average Crown Timber Charges (\$/m ³)
2007/08	123309	\$253,735	\$153,074	\$49,604	\$3.7
2008/09	72383	\$124,110	\$271,854	\$29,530	\$5.9
2009/10	949	\$1,421	\$600	\$288	\$2.4
2010/11	237	\$1,062	\$0	\$0	\$4.5
2011/12	378	\$1,888	\$0	\$0	\$5.0
2012/13	258	\$1,100	\$0	\$0	\$4.3
2013/14	63509	\$1,336	\$249,825	\$28,146	\$4.4
2014/15	166967	\$1,738	\$634,233	\$74,051	\$4.3
2015/16	170457	\$2,473	\$594,388	\$76,290	\$3.9
2016/17	126066	\$1,491	\$463,403	\$58,679	\$4.2
Total	724514	\$390,354	\$2,367,377	\$316,588	\$4.2
<i>Source: TREES Data Warehouse 2018-01-15</i>					
<i>Note:</i>					
<i>1) Actual Volume includes undersized volume</i>					
<i>2) Stumpage consists of minimum stumpage, residual value and administrative fees</i>					
<i>3) Forestry Futures consists of Forest Futures Trust, FRI charges and forest management fees</i>					

1

2 [2.2.3.2 Recreation and Tourism](#)

3 The Pic Forest hosts a number of provincial parks and protected areas both within and adjacent to the
4 management unit and one national park bordering the southern boundary. The following are
5 descriptions of the parks and protected areas on the Pic Forest. These descriptions as well as further
6 information including digital maps, land use intent, management direction and source of direction are
7 outlined in the MNRF's Crown Land Use Policy Atlas.

8 **Craig's Pit Provincial Park**

9 Craig's Pit Provincial Park is located southeast of Marathon in Pic Township. It is a 530 hectare site
10 which encompasses a series of kettle holes and bluffs and is an important migratory bird observation
11 area. The area represents three earth science landform/process themes consisting of glacial, fluvial and
12 lacustrine. Commercial timber harvesting is not permitted. Craig's Pit Provincial Park Addition is 413

1 hectares of land adjacent to the existing Craig's Pit Provincial Park. The dominant landform vegetation
2 type present within this site is strongly broken end moraine with mixed conifer forest. Other vegetation
3 types on this landform include: mixed deciduous forest, sparse forest and deciduous forest. This site
4 also contains mixed conifer forest on moderately broken end moraine. Commercial timber harvesting is
5 not permitted.

6 **Nagagamis & Nagagami Lake Provincial Park Addition**

7 Nagagamis and Nagagami Lake Provincial Park Addition is 32,539 hectares in size and is located partly
8 in the northeastern area of the Pic Forest. The site contains a combination of earth and life science
9 features. Portions of two provincially significant earth science sites are present within the area. These
10 sites contain esker, kettle and kame landforms which are exceptionally well developed. Life science
11 representation features within this site include: moderately broken end moraine with sparse forest and
12 lacustrine deposits with dense coniferous and mixed deciduous stands. There is also a good diversity of
13 aquatic resources present within the area. No commercial timber harvesting is permitted.

14 **Neys Provincial Park**

15 Neys Provincial Park is a 3445 hectares nature environment class provincial park located in the Nipigon
16 district. This area consists of all land and water of Neys Provincial Park and the main activities are
17 recreation, protection and interpretation of the natural environment. On the islands and the land and
18 waters area, commercial road development and harvesting is not permitted. New commercial tourism
19 in the development zone may be permitted. Proposals will be reviewed through future planning.
20 Recreation activity in the park include, fishing, motor boat use (commercial and private on Lake Superior
21 only), camping, and none motorised recreation travel.

22 **Pan Lake Fen Provincial Park**

23 Pan Lake Fen Provincial Park is 496 hectares in size and is located approximated 40 kilometres northeast
24 of the town of Marathon, 40 kilometres south of Manitouwadge and west of Highway 614. The park
25 occurs on an organic deposit and is surrounded by moderately broken fluvial deposits. The main
26 biological features of this nature reserve include a coniferous swamp near Pan Lake, tall shrub thickets,
27 graminoid fen with some areas dominated by low shrubs. Bedrock knolls and ridges of moderate relief
28 occur along the west side of the site and define the west bank of Namebin Creek. Some of the bedrock
29 is well exposed in cliffs and steep slopes, especially in the northwest corner of the site. The bedrock of
30 the site lies within the Wawa Subprovince of the Superior Structural Province, part of the Precambrian
31 Shield. No commercial timber harvesting is permitted.

32 **Prairie River Mouth Provincial Nature Reserve Provincial Park**

33 Prairie River Mouth Provincial Nature Reserve Provincial Park is a 380 hectares nature reserve class
34 provincial park located in the Nipigon District. The Prairie River drains into Lake Superior through a
35 narrow gap in the bedrock between Marathon and Terrace Bay. From this gap, an undulating ridge-
36 dune complex radiates northward. Moving north, the swales between the ridges become progressively
37 wetter. A swale is a marshy depression in a tract of land, usually rolling prairie. Timber harvest and new
38 road development is not permitted in the park. Currently, the main tourism and recreation activity is
39 fishing.

40 **Red Sucker Point Provincial Nature Reserve Provincial Park**

41 Red Sucker Point Provincial Nature Reserve Provincial Park is a 360 hectares nature reserve class

1 provincial park located in Nipigon. The Park is located along the Lake Superior shore, about 10
2 kilometres northwest of Marathon. Along the shores of this nature reserve is a notable series of raised
3 cobble beaches. Historic water levels of the lake, from ancient to modern times, are visible on the
4 stones. At their greatest height, the beaches tower some 45 metres above the water. Ancient lichen
5 communities thrive on some of the cobblestones. Also present are about 70 excavated rock structures
6 attributed to historic and prehistoric peoples. Timber harvest and road development is not permitted.
7 Fishing is the main tourism activity in the park.

8 **Steel River Provincial Park**

9 Steel River Provincial Park is a 11,240 hectares waterway class provincial park located northeast of
10 Terrace Bay and encompasses a 200 metre corridor along each side of the Steel Lake and River system
11 north of Santoy Lake including Diablo Lake. The 160 kilometers waterway is a designated Provincial
12 canoe route consisting of 3 separate published trips. Present recreation usage is mainly unstructured
13 public recreation with the emphasis on canoeing, fishing and hunting. There is some fly-in tourism for
14 the same recreational purposes. Cairngorm Lake is considered a prime lake trout lake. Timber harvest
15 and road development for commercial purposes is not permitted.

16 **Fishnet Lake Conservation Reserve**

17 Fishnet Lake Conservation Reserve is a 3,505 hectares, and is located approximately 15 km northeast of
18 Terrace Bay in the Nipigon district. The conservation reserve contains representative landform and
19 vegetation types, including mixed conifer forest with some deciduous on weakly, moderately and
20 strongly broken ground moraine. No commercial timber harvest or road development is permitted in
21 the conservation reserve.

22 **Isko Dewabo Lake Complex Conservation Reserve**

23 Isko Dewabo Lake Complex Conservation Reserve is located approximately 18 km southwest of the town
24 of Manitouwadge, east of Highway 614 and has an area of 2,967 hectares. The majority of the site is
25 located in a neighbouring Forest Management Unit, with only a very small proportion of the western
26 side of the Reserve located in the Pic Forest. The site consists of weakly and moderately broken ground
27 moraine and weakly and moderately broken bedrock with bog. No commercial timber harvesting is
28 permitted.

29 **Killala Lake Conservation Reserve**

30 Killala Lake Conservation Reserve area is 13,190 hectares, located approximately 35km northwest of
31 Marathon. It contains representative landform and vegetation types, including conifer and deciduous
32 forests on lacustrine deposits and weakly to moderately broken bedrock. Killala Lake is a fish sanctuary
33 (lake trout refuge) where angling is not permitted. Commercial timber harvesting and associated road
34 development are not permitted.

35 **Slim Jim Lake Conservation Reserve**

36 Slim Jim Lake Conservation Reserve is located approximately 45 km north of the town of Manitouwadge
37 and has an area of 6,460 hectares. The site is dominated by moderately broken bedrock of lacustrine
38 deposit. There are wetland areas and a number of small lakes. No commercial timber harvesting is
39 permitted.

1 **North Thornben Lake Moraine Conservation Reserve**

2 North Thornben Lake Moraine Conservation Reserve is located approximately 55 km northeast of the
3 town of Manitouwadge and has an area of 454 hectares. This site is located on top of a flat end moraine
4 deposit. It contains mostly lacustrine deposits and mixed forests. Some headwaters of feeder streams
5 of the Osawin River are present. No commercial timber harvesting is permitted.

6 **Lake Superior Shoreline Enhanced Management Area**

7 Lake Superior Shoreline Enhanced Management Area comprises 25,647 hectares along the northern
8 coast of Lake Superior between the town of Nipigon and the Pic River, south of Marathon, and generally
9 includes all Crown lands between Highway 17 and Lake Superior, except where the lands have been
10 recommended for regulation as Provincial Park or Conservation Reserve. It is a scenic and highly
11 travelled coastline with rugged cliffs and bays that provide habitat for representative and endangered
12 wildlife and vegetation. A 200-hectare Area of Natural and Scientific Interest is located along the west
13 bank of the Pic River near its mouth. This ANSI contains a significant array of earth science, life science,
14 historic and prehistoric values. The enhanced management area has high tourism and recreational
15 value and many pristine environments. Commercial timber harvesting is not generally permitted within
16 the Enhanced Management Area.

17 **Pic River Recreation Access Area Enhanced Management Area**

18 Pic River Recreation Access Area Enhanced Management Area is 50,258.7 hectares in size. The area
19 consists of the Upper and Lower Pic River Waterway and two kilometres of the shoreline on either side
20 of the river. This waterway has cultural and heritage values of historical importance; a significant
21 waterway for the Hudson's Bay Company fur trading route, an important waterway for log driving in the
22 early days of forestry in addition to the natural heritage of the various waterfalls in the this area. This
23 significant waterway includes rugged scenic topography with good recreational capabilities. Forest
24 management activities are permitted and will be compactable with protecting and promoting
25 recreational values in the area. Strategic road planning and development must consider enhancing
26 recreational opportunities in the area.

27 ***Pukaskwa National park***

28 Pukaskwa National park is situated where the Canadian Shield meets Lake Superior, the largest fresh
29 water lake by area in the world. The park is a large, wild, rocky place with a strong and continuing
30 aboriginal presence. Pukaskwa is the only wilderness park in Ontario and protects 1, 878 square km of
31 primary wilderness area, an ecosystem that features boreal forest and Lake Superior shoreline.

32 The park was founded in 1978, and plays an important role in protecting national and cultural resources
33 within the Lake Superior basin. As one of 46 national parks administered by Parks Canada, its purpose is
34 to protect for all time, a representative example of the Central Boreal Uplands and the Great Lakes
35 Shoreline and to encourage public understanding, appreciation and enjoyment of its heritage so as to
36 leave it unimpaired for this and future generations.

37 Further information on Pukaskwa Park can be located at: [http://www.pc.gc.ca/eng/pn-
38 np/on/pukaskwa/contact.aspx](http://www.pc.gc.ca/eng/pn-
38 np/on/pukaskwa/contact.aspx); or contact the park directly at (807) 229-0801, email [ont-
39 pukaskwa@pc.gc.ca](mailto:ont-
39 pukaskwa@pc.gc.ca)

1 2.2.3.2.1 Remote Tourism

2 Commercial tourism is an important economic activity on the Pic Forest. There are 32 remote outpost
3 lakes and 1 remote lodge lake on the Pic Forest identified in FMP-11 RTLO AOC.

4 In general the tourism business is seasonal resulting in limited to no full time employment. The major
5 activities offered by the industry is angling and hunting, although canoeing, hiking, ATV and snowmobile
6 riding, and camping are often advertised in conjunction. Clients are mainly from the USA and non-local
7 Ontario residents.

8 2.2.3.2.2 Recreation

9 Other important non-industrial recreational uses of the forest activities include hiking, camping,
10 canoeing, mountain biking, and snowmobiling. Opportunities for year-round outdoor activities in the
11 area attract a substantial number of tourists, which greatly contribute to the local economy. All of these
12 activities benefit local suppliers of outdoor recreation equipment as well as local motels, restaurants
13 and businesses.

14 The Pic Forest has many scenic waterfalls and rapids for the public to enjoy. Some of the more popular
15 falls can be accessed by logging roads with a short hike. Some of the falls have camp sites. Other camp
16 sites in the Pic Forest are found along the Kagiano River, Waboosekon Lake and throughout the Forest.
17 Crown land camping is free to Canadian residents and there is no requirement for campers to check-in,
18 therefore it is impossible to know how much the forest is used for camping. However, non-residents are
19 required to purchase a permit for each night they wish to camp on Crown land.

20 It is recognized that road restrictions have an impact on Crown land recreation opportunities. Data is
21 not available to quantifying the opportunity cost of road access restriction. It is important to note that
22 while access restriction may result in loss of opportunity for some, access restrictions ensure other
23 forms of crown land recreation can continue to occur. Road restrictions are implemented in the case of
24 public vehicular access prohibited in close proximity to designated remote lakes and Pukaskwa National
25 Park to ensure the long-term integrity of the values identified in those areas.

26 Crown land camping occurs across the forest, however there are no campsites maintained by MNRF.
27 Trail use by trapping industry, baitfish industry and mining industry exists on the forest however no trails
28 are maintained by MNRF.

29 2.2.3.2.3 Sport Fishing and Hunting

30 Hunting and fishing activities are common on the Pic Forest. The Wildlife Management Unit (WMU) 21B
31 and 21A covers about 62.5% and 37.5% total area of the Pic Forest respectively. Hunting and fishing
32 licences can be purchased through licensed retailers or through Service Ontario. Sport fishing and
33 hunting are important cultural and recreational activities in the Pic Forest.

34 Moose and bear hunting are of particular importance on the Pic Forest. The forest is
35 characterized by plenty of mature conifer and young hardwood, offering excellent quality
36 habitat for both game species. Due to a long history of forestry and mining operations, there is
37 a well-developed road network that offers both resident and non-resident hunters plenty of
38 access to high quality hunting areas. Recent (last 5 years) moose aerial inventories on WMU
39 21A and 21B demonstrate stable, slightly increasing moose populations. Since the introduction

1 of the spring bear hunt pilot (2016), there has been an increase in the number of bear hunters.
 2 This represents an opportunity for communities on the Pic Forest to attract new business and
 3 provide recreational opportunities to both residents and visitors.

4 *Table 11: Moose Hunting Profile: number to be changed (Pool 1 & Choice 1).*

WMU	% in Pic Forest	# Adult Moose Tag Applications in 2017	# of Adult Moose Tag Applications prorated for the Pic Forest
Gun			
21A	60.7	1,869	1134
21B	84.1	2568	2160
	Total	4,437	3294
Archery			
21A	60.7	262	159
21B	84.1	344	289
	Total	606	448

5
 6 *Table 12: Deer Hunting Profile.*

WMU	% in Pic Forest	# Antlerless deer tag quota in 2017	# Antlerless deer application prorated for the Pic Forest
21A	60.7	200	121
21B	84.1	50	42
	Total	250	163

7
 8 Since the deer season opened on 21B in 2009, only one deer has been harvested on the unit (2017).
 9 Deer hunting is not a primary source of hunting revenue, as compared to moose and bear hunting.

10 **Commercial Bear Management Area (BMA) operations**

11 There are 37 Bear Management Areas (BMAs) that are entirely within or intersect the Pic Forest. The
 12 areas may span into neighbouring forest management units and MNR districts. Please refer to the
 13 values maps in the supplementary documentation for the plan to view the bear management areas on
 14 the Pic Forest. Each BMA is registered to a bear management licensee.

1 There are 10 licensed BMA operators on the Pic Forest having approximately 100 hunters each year
 2 (65% resident and 35% non-resident hunters). According to data from Wawa District MNRF, the average
 3 number of bears harvested from 2012 to 2016 is about 180 (check the math) per year.
 4 MNRF Wawa District office administers commercial BMA licences on the Pic Forest. The district charges
 5 \$35.00 for issuing licences. BMAs generate revenue at a rate of \$2.00 per square kilometre (excluding
 6 wetlands) within each bear management area. BMAs less than 50 square kilometres are charged a flat
 7 \$100.00 fee.

8 *Table 13: Black bear Harvest Profile in WMU 21B (2012-2016)*

Year	Resident Hunters		Non-resident Hunters		harvest success rate
	# of hunters	total harvest	# of hunters	total harvest	
2012	194	24	274	161	0.40
2013	226	34	234	121	0.34
2014	230	36	197	107	0.33
2015	341	52	213	135	0.34
2016	443	57	232	173	0.34

9 (Source: WAWA District MNRF)

10 *2.2.3.3 Mining, Aggregate and Hydro Generation*

11 *2.2.3.3.1 Mining*

12 There have been active mining activities around the Pic Forest during past decades.

13 The 3 Hemlo Mines, Williams, Golden Giant and David Bell have produced ~24M oz of gold since 1985;
 14 at \$1,230 US per ounce this equates to gross proceeds of \$29.5 Billion dollars. Current employment is
 15 ~700 direct employees (including contractors); a multiplier of 3:1 is commonly used for total
 16 employment in the province of Ontario, i.e. Total current employment related to the Williams Mine is
 17 ~2,800 people.

18 The only producing mine in the Pic Forest Management Unit is the Williams Mine operated by Barrick-
 19 Hemlo under the Williams Operating Corporation. This gold mine has been in continuous production
 20 since 1985.

21 As most areas of the Pic Forest have a well-established road infrastructure, the opportunity for
 22 prospectors to explore the mineral potential is ideal.

23 There have been many exploration projects in both the Hemlo and Manitouwadge areas over the past
 24 several decades; this exploration has resulted in 100s of \$millions in exploration expenses with
 25 continued seasonal employment.

1 It is important to note about exploration expenditures is that they can fluctuate widely from year to
 2 year. This is because they are influenced by a number of factors, most obviously commodity prices,
 3 which affect the ability of exploration companies to raise money through the markets to fund
 4 exploration. Significant new discoveries are another important factor influencing exploration activity, as
 5 they typically lead to big increases in exploration interest in the surrounding area for a period of time
 6 after the initial discovery. A good example of this is Hemlo, where exploration interest peaked during
 7 the early- to mid-1980s.

8 2.2.3.3.2 Aggregate

9 There are a total of 45 aggregate permits on the Pic Forest. Of these, 5 permits are held by the SFL
 10 (NFMC) which are category #9 pits and these are considered active pits. The remaining 40 permits are
 11 held by private companies. The main traditional uses of aggregates are for forestry road construction
 12 and maintenance, highway/road construction, and commercial gravel productions.

13 2.2.3.3.3 Hydro Generation

14 One hydro generation station (the Wawatay Generating Station) is located near the communities of
 15 Heron Bay and Marathon. It is a 13.5 mega-watt facility that was built in 1992 and is still operation
 16 today. This facility has strong connections with the *Biigtigong Nishnaabeg* providing both employment
 17 and revenues to the community. There are a number of locations for generating facility that have
 18 potential to be developed given the topography and size of river systems near the shores of Lake
 19 Superior. Another hydro generation facility is located at Twin Falls on the Kagiano River. The operation
 20 of the facility is undertaken remotely and thus there is little employment associated with it.

21 2.2.3.4 Traplines, Baitfish and Others

22 2.2.3.4.1 Trapping

23 Trappers are active on the Pic Forest and use many active and inactive logging roads and trails to access
 24 traplines, which cover the entire forest. Trapping provides seasonal employment for 55 registered
 25 trappers within the Pic Forest. There are roughly 63 traplines registered on the forest.

26 Wawa district office administers trapping licences on Pic Forest. Licencing generates Crown revenue at
 27 a rate of \$39.55 for the harvest licence (\$16.95 for 2nd Trapping Licence). According to the district office,
 28 on average about 1273 animals are trapped each year in Pic Forest.

29 *Table 14: Number of animals approximately harvested in trapping between 2012 and 2016 in Pic Forest.*

Animal	2012	2013	2014	2015	2016
Beaver	462	465	370	376	318
Mink	96	37	55	24	61
Marten	1337	414	354	271	290
Otter	46	33	24	18	26
Fisher	19	6	19	11	13
Lynx	60	57	23	26	27

Animal	2012	2013	2014	2015	2016
Muskrat	17	45	22	25	45
Raccoon	2	0	1	0	0
Red Squirrel	9	5	10	13	24
Weasel	208	70	70	71	166
Coloured Fox	19	11	14	33	12
Others	24	33	9	35	32
Total	2299	1176	971	903	1014

1 Source: Wawa District MNRF Office

2 Socioeconomic survey was sent out to 57 trappers in May 2017 and 11 trappers (19%) completed the
3 survey representing 16 trapline areas. On average each trapper has over 30 years of trapping
4 experience, two traplines and spent up to five days per week during trapping season. Truck, ATV, boat,
5 and snowmobiles were the major mode of transportation used by trappers in the Pic Forest.
6 Respondents changed their trapping effort over the past five years by expanding their traplines that led
7 to increased income for some. Marten and beaver were the most important species trapped for furs
8 and sold mainly to North American Fur Auctions (NAFA) though income figures from sales were not
9 provided by respondents. However, many reported that the incomes were not enough to cover the
10 costs resulting in economic loss, partially attributable to the low prices on the fur market.

11 2.2.3.4.2 Commercial Baitfish Operations

12 For the year 2016 there were 10 individuals with commercial baitfish licence areas registered on Pic
13 Forest, however the areas may span into other forest management units. The FMP Values Maps shows
14 the baitfish areas on the Pic Forest.

15 Socioeconomic survey was sent to all the ten baitfish licensees in May 2017 and two (20%) responded to
16 the survey. The one of the respondent was not active during the year of 2015-16; The other respondent
17 reported ten baitfish licence areas, a large amount of water bodies utilized, and approximate 1755
18 dozens of baitfish harvested, out of which 98% to anglers and 2% to dealers, about 2300 km road
19 accessed, and about \$5000 - \$6000 sale revenue.

20 The Ministry of Natural Resources and Forestry Wawa District office administers commercial baitfish
21 licences on the Pic Forest.

22 2.2.3.4.3 MNRF District Office

23 The MNRF Wawa District office is responsible for the administration of the Pic Forest Management Unit.
24 There are 26 people employed at the district office and of these 8 are directly involved in the
25 administration of the management unit as Management Forester, Management Biologist, Resources
26 Management Supervisor, Senior Forestry Technical Specialist, Resources Clerk, District Planner,
27 Resource Liaison Officer, and Resource Management Technician.

1 [2.2.3.5 References](#)

2 The following references were used to source information from sections 2.2 Social and Economic
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<http://www.wesdome.com/resources/technical-reports/technical-report-eagle-river.pdf>
(Accessed July, 2017).

4 [2.3 First Nation and Metis Background Information Reports](#)

5 The following First Nations and Métis communities have participated as representatives on the planning
6 team, or in the planning process for the 2021-2031 Pic Forest Plan:

- 7 • Biigtigong Nishnaabeg (formerly Ojibways of the Pic River First Nation)
8 • Pic Mobert

9 The First Nation and Metis communities have requested that these reports and maps not be made
10 available to the public nor shared with other indigenous communities without written permission of the
11 respective chief and council. Thus, they are not available on the electronic Forest Management plan
12 website but are retained as part of the FMP at the District MNRF and Timmins Regional offices.

1 3.0 Development of the Long-Term Management Direction

2 3.1 Introduction

3 The purpose of this section is to establish the long-term strategic direction for managing the Forest in
4 order to achieve the desired future forest condition. That condition may be similar to the current forest
5 condition or may be totally different. The desired future forest condition is a forest unit and age class
6 structure that contributes to meeting the long-term objective of attaining a forest structure that is
7 representative of a natural disturbance regime.

8 This section describes the factors that influence the long-term strategic direction for managing the Pic
9 Forest including legislation, Ministry of Natural Resources and Forestry (MNR) policy and regional
10 strategies, forest industry requirements, resource management or other issues on the management unit
11 and the current state of the Forest. These factors, along with the benefits that are desired from the
12 Forest and the values that require protection, were considered by the Planning Team and Pic Forest
13 Public Consultation Committee (PFCC) during the development of objectives and strategies for the Pic
14 Forest.

15 This section also describes the objectives and indicators that have been applied in the Long-term
16 Management Direction, which was analysed for its ability to provide the desired benefits over time. The
17 analysis included an initial test of sustainability through the use of non-spatial and spatial indicators of
18 forest sustainability criteria.

19 The establishment of the long-term strategic direction for management of the Pic Forest was an iterative
20 process. Throughout this process, the objectives, indicators, strategies and possible management
21 alternatives were tested and modified in response to preliminary results from analyses and further
22 analyses were performed until the Long-term Management Direction was selected.

23 As the 2021-2031 FMP for the Pic Forest is implemented, operations will be monitored, reports of
24 management unit activities will be produced and the effectiveness of the management alternative in
25 achieving the objectives and forest sustainability will be assessed.

26 3.2 Management Considerations

27 The Pic Forest is a large and diverse area, possessing an abundance of natural resources that are utilized
28 by a variety of users. The Nawiinginokiima Forest Management Corporation (NFMC) conducts forest
29 management activities including planning, road construction, harvesting, and silviculture. First Nation
30 and Métis utilize the forest for a full range of activities. Additionally, associated with the Forest are
31 Provincial Parks and conservation reserves, commercial remote and road-based tourism operations, as
32 well as road-based recreation including hunting and fishing, berry picking, trapping, etc. Numerous
33 lakes and rivers within the Forest also provide a wide scope of recreational opportunities for cottagers,
34 local users, and tourists alike.

35 Conflicts can develop when all these diverse forest interests converge and share the same land base
36 with the forest industry. Historical issues for the Forest are an important consideration in the
37 development of an FMP. Previous FMPs, Independent Forest Audits, and other similar Forest
38 documents are valuable sources of information for identifying local concerns. Balancing the needs

1 among the diverse groups and issues is a challenge, requiring dialogue and good communication among
2 all of the affected parties.

3 The intent of this section is to identify historical and current issues for consideration in the forest
4 management planning process that are not easily addressed through the application of individual forest
5 management policy, guides, and practices; although, the issues may be addressed by the collective
6 policy of the Ontario FMP process. Other issues may not be directly addressed in the FMP process, such
7 as some issues related to district land-use policies or business arrangements.

8 3.2.1 Enhanced Forest Resource Inventory

9 The Pic Forest utilized a new enhanced Forest Resources Inventory (eFRI), which was updated to the
10 year 2019 based on recent harvesting, regeneration and a forecast of harvesting to occur by March 31,
11 2019. This inventory is referred to as the Base Model Inventory (BMI) and was partially prepared for use
12 in SFMM using the Model Information Support Tool (MIST). Additional model inputs were prepared or
13 adjusted including yield tables, natural forest succession rules, fire cycles and post-fire succession rules,
14 potential wildlife habitat and strategic silvicultural options.

15 The enhanced Forest Resource Inventory was completed by the Forest Resources Inventory Unit of the
16 MNRF in time to use for the development of the 2019 Planning Inventory. This new inventory was
17 derived from aerial imagery captured in 2008. The inventory was delivered to NFMC via the FI Portal
18 May 2016.

19 The planning inventory (PCI or PCM) was derived by combining multiple spatial data layers to satisfy the
20 requirements of the Forest Information Manual (FIM – 2009). This section describes the inventory
21 information and classifications that have been used for the analysis.

22 The development of the planning composite inventory begins with the primary forest layer containing
23 productive and non-productive forest polygons referred to as the enhanced Forest Resource Inventory
24 (eFRI). The imagery used as the basis for the Pic Forest eFRI was flown and photographed in 2007-2008.
25 This inventory is accepted as the most relevant information available to the planning team to produce
26 the forest management plan. To uphold its relevance for the development of the FMP, it is combined
27 with multiple spatial data layers to represent a current forest condition. These updates can be physical
28 such as depletions (natural disturbances and harvested area), and accruals (area declared free growing
29 of competition), administrative such as ownership changes and land base withdrawals, linear such as
30 roads, railways and utility lines (pipelines and utility lines) and forecasted information such as planned
31 harvest blocks remaining to be harvested in the existing plans. Updates include harvest depletions and
32 natural depletions to 2015, accruals to 2015, ownership updates (of any available information up to April
33 2017), and the most recent regulated provincial park and conservation reserve boundaries, as well as
34 corrections to all other known spatial issues (e.g. Ownership boundary matching). Finally, a separate
35 layer of the forecast harvest allocations to the end of the contingency plans (2017 to 2019) was included
36 with the submission as directed by the Forest Information Manual (OMNR, 2009) for Checkpoint No.1.
37 Further information regarding the development of the PCM can be found in the Analysis Package,
38 Section 2.0.

1 3.2.2 Implementation of the Forest Management Guide for Boreal Landscapes

2 The Forest Management Guide for Boreal Landscapes (Boreal Landscape Guide, or Landscape Guide) has
 3 established the desirable levels for the Pic Forest landscape guide indicators. The Landscape Guide
 4 indicators quantify landscape structure, composition and pattern and are variables that are used to
 5 describe the current landscape mosaic and make predictions on the future landscape mosaic. Indicators
 6 were selected by compiling and categorizing previous landscape-level direction and then comparing
 7 them to simulations of forest management landscapes.

8 As directed by the Boreal Landscape Guide, forest management plans will use the Landscape Guide
 9 indicators as the biodiversity indicators of objective achievement. Landscape Guide indicators will
 10 replace previous forest management planning direction for landscape pattern, area by forest type and
 11 age and amount and distribution of old growth forest. Landscape guide indicators are applied to
 12 management units within ecoregions. The Pic Forest is in ecoregion 3W (three-west), Table 15 provides
 13 3W landscape guide indicators addressed by the Pic Forest Management Plan, and a section reference
 14 to the achievement of those indicators.

15 *Table 15: Landscape Guide Indicators for Landscape Region 3W (Pic Forest)*

CFSA Objective Category	Landscape Guide Indicator Group	Landscape Guide Indicator	Section Reference
Caribou Habitat	Habitat Amount	Refuge Habitat	3.6.15 Caribou Objective Achievement
		Winter Habitat	3.6.15 Caribou Objective Achievement
	Habitat Arrangement and Connectivity	Texture of woodland Caribou Refuge Habitat	3.6.15 Caribou Objective Achievement
		Texture of Woodland Caribou Winter Habitat	3.6.15 Caribou Objective Achievement
Structure and Composition	Landscape Classes	Balsam Fir and Balsam Fir Mixedwoods	3.6.5 Mature and Late Balsam Fir and Balsam Fir Mixed – Objective 2.1.1
		Lowland Conifer	3.6.6 Mature and Late Lowland Spruce and Low Other Conifer – Objective 2.1.2
		Upland Conifer and Conifer Mixedwoods	3.6.7 Mature and Late Conifer Mixedwood – Objective 2.1.3

CFSA Objective Category	Landscape Guide Indicator Group	Landscape Guide Indicator	Section Reference
		Hardwood and Hardwood Mixedwoods	3.6.8 Mature and Late Hardwoods and Hardwood Mixedwoods – Objective 2.1.4
	Old Growth Forest		3.6.9 Old Growth Forest – Objective 2.1.5
	Forest Unit Groupings	Red and White Pine	3.6.10 Red and White Pine – Objective 2.1.6
		Spruce and Pine Dominated Forest Units	3.6.11 All Ages Conifer – Objective 2.1.7
	Young Forest		3.6.12 Young Forest – Objective 2.1.8
Pattern	Texture of Mature and Old Forest		3.6.13.3 Texture of Mature and Old Forest – Objective 3.1.1
	Young Forest Patch Size		3.6.13.4 Young Forest patch Size – Objective 3.1.2

- 1
- 2 Landscape classes are made up of a combination of Forest Units and age groups. In the Pic Forest, the
- 3 following Forest Unit and age class combinations make up all the landscape guide and habitat targets.
- 4 Table 16 provides a description of the Analysis Unit combinations used to classify landscape classes.
- 5 Table 17 provides a description of how caribou habitat units are classified.

1 *Table 16: Pic Forest Analysis Units, Development Stages, and Landscape Classes.*

Pic Forest Analysis Forest Unit	Development Stage					Landscape Class Legend
	Presapling	Sapling	Immature	Mature	Late	
BFDOM	0	5	10	60	80	Presapling and Sapling
BWDOM	0	5	10	50	110	Immature Conifer
CONMX	0	10	30	70	110	Immature Hardwood
HRMXB	0	5	10	60	110	Mature and Late Balsam Fir
HRMXP	0	5	10	60	110	Mature and Late hardwood and Hardwood Mixed
HRDOM	0	5	10	60	100	Mature and Late Lowland Conifer
OLOW	0	10	30	70	120	Mature and Late Upland Conifer and Mixed
PJDOM	0	10	30	70	100	
PJMIX	0	10	30	70	100	
PODOM	0	5	10	60	100	
PRWMX	0	10	20	80	140	
SBDOM	0	10	30	70	120	
SBLOW	0	10	30	70	160	
SBMIX	0	10	30	70	110	
UPLCE	0	10	30	70	190	

2
3 *Table 17: Pic Forest Boreal Caribou Habitat Model/ Classifications*

Pic Forest Analysis Forest	Onset Age for Habitat		
	Winter Useable	Winter Preferred	Refuge
BFDOM			61
CONMX			71
OLOW	51		1
PJDOM	41	61	1
PJMIX	41	61	41
SBDOM	61		41
SBLOW	41	101	1
SBMIX	61		41

4
5 Landscape classes encapsulate and represent wildlife and forest diversity qualities. While not
6 specifically identified as an objective, reserves represent quiet areas, where no industrial activity occurs.
7 Reserves are accounted for in the base model and all scoping runs. All water features on the unit were
8 buffered by 45m and classified as reserve. Although the typical reserve on a water feature is 30m, the
9 additional 15m acts as assurance that enough reserve area is strategically accounted for in the model,
10 understanding more values than water are protected. Reserves contribute to the extent of the
11 landscape classes.

12 The concept of coarse and fine filters has been developed to provide direction for a range of habitat
13 types. A coarse filter that emulates natural disturbances and landscape patterns should provide
14 adequate amount of habitat in general across the landscape. Fine filters may then be used to provide
15 for or evaluate the landscape scale habitat requirements for specific species. This approach will provide
16 a more transparent way of providing direction for wildlife habitat needs and provide for healthy forests.

1 To measure and assess the Forest on meeting spatial indicators, the Base Model Inventory was run
2 through Ontario's Landscape Tool (OLT). Spatial objectives are required to be assessed through OLT as
3 the strategic model (SFMM) is an a-spatial model. All other landscape and habitat indicators were
4 assessed within SFMM. Analysis forests units were tagged with generic yields corresponding to Table 16
5 and Table 17 within SFMM to measure the amount of area contributing to Landscape of habitat classes
6 across all terms.

7 The desirable levels for all landscape guide indicators are directed by Simulated Ranges of Natural
8 Variation with the intention of emulating natural disturbance. The development and application of the
9 Simulated Ranges of Natural Variation is detailed within the Boreal Landscape Guide. There are a couple
10 of landscape guide indicators that are a departure from the direction provided in the Boreal Landscape
11 Guide. The following lists the rationale for the departure:

- 12 • The Boreal Landscape Guide was published in 2014. The milestones were set using the 2008
13 Forest Resource Inventory;
- 14 • The 2021-2031 Plan is using a new Forest Resource Inventory. There have been improvements
15 in the quality of information provided in the Forest Resource Inventory;
- 16 • The change in direction may be a departure but the intent is still the same, to move the forest
17 towards the natural range.

18 3.2.3 Crown Land Use Atlas Harmonization Project (CLUAH)

19 A major land use amendment to the provincial Crown Land Use Policy Atlas (CLUPA) for Wawa District
20 was approved in April 2016. The Crown Land Use Atlas Harmonization (or CLUAH) project was initiated
21 in 2006 to consider a major land use amendment to the CLUPA in order to address public and
22 stakeholder concerns and recommendations regarding the compatibility of remote tourism and Crown
23 land access. The new CLUPA policy includes land use direction for all unregulated Crown lands and
24 waters within Wawa District. CLUPA includes the CLUAH Management Guidelines that provide
25 protection for designated tourism and recognized high value recreational values. The Pic Forest FMP
26 will be consistent with higher order Crown land use plans such as CLUPA.

27 3.2.4 Tourism and Recreation

28 Harvesting and road construction activities will be proposed in areas near lakes used by remote tourism
29 operators and cottagers. The three most common tourist operator concerns regarding forestry activities
30 are access, aesthetics, and noise. To the extent possible, operations in the vicinity of designated tourism
31 lakes will be avoided, and where this is not possible, or policy directs, road use management strategies
32 and AOC prescriptions will be implemented to minimize impacts. AOC prescriptions have been
33 developed following the CLUPA.

34 While the intent of a Resource Sharing Agreement (RSA) is to avoid conflict between the tourism and
35 forest industries, the potential for difficulty in developing and implementing these agreements exists.
36 The terms of any RSA's do not bind or limit the Minister's right to make land use decisions for Crown
37 Land in Ontario. NFMC has contacted the resource-based tourism industry with an interest in the Pic
38 Forest to develop an RSA; to date there are no RSA's in effect on this forest.

39 NFMC has developed a good working relationship with the resource-based tourism industry. Both
40 industries are finding ways to work together to minimize any negative effects on the other interests.

1 3.2.5 Forest Amalgamation

2 Implications of the amalgamation of the former Big Pic and Pic River management units will influence
3 the management of the Pic Forest. Planning a new LTMD for one cohesive management unit allowed
4 the planning team to re-consider many previous planning decisions made while the forests were
5 separated.

6 Strategic Management Zones (SMZs) were adjusted to reflect the Pic Forest as a whole, and reduce any
7 “artificial” boundaries between SMZs, allowing the SMZs to follow more natural, or landscape driven
8 boundaries.

9 Amalgamation has created a larger forest, and as such, benefits from the economies of scale that would
10 not be realized by smaller management units. These economies of scale are predominant while
11 selecting a management alternative and applying harvest areas to the ground. A larger landbase creates
12 more flexibility to create larger, more contiguous harvest zones, and strategically meet landscape
13 objectives. In effect, the amalgamation of the forests, with regard to strategic planning, and harvest
14 selections, has created benefits greater than the sum of its parts.

15 Developing plan standards for a cohesive management unit has allowed for uniformity in many program
16 areas. Silvicultural standards, Silvicultural Programs, Area of Concern prescriptions, and conditions on
17 regular operations can now apply across the entire forest without any minor variation between plans.
18 This reduction on variation in standards should lead to more efficient harvest and silviculture programs
19 and fewer compliance issues.

20 Amalgamation will allow certain fiscal accounts to be merged. Provincial roads funding, Forest Renewal
21 Trust, and Forestry Futures Trust accounts will be merged. This will allow for more efficient distribution
22 of these funds, whereas before funds were marked for a specific forest.

23 3.3 Base Model

24 The base model serves as the common starting point for the scoping analysis and the development of a
25 management strategy. The base model includes assumptions related to the land base, forest dynamics
26 (growth and yield, natural forest succession, forest disturbance), available silvicultural options, essential
27 biological limits, and other model assumptions identified by the Planning Team.

28 The starting point of the base model is the Forest Resource Inventory (FRI). The enhanced Forest
29 Resource Inventory (eFRI) was completed by the Forest Resources Inventory Unit of the MNRF in time to
30 use for the development of the Planning Inventory for the 2019-2029 Pic Forest FMP. This new
31 inventory was derived from aerial imagery captured in 2008. The inventory was delivered to NFMFC via
32 the FI Portal May 2016.

33 The Pic Forest is using a brand new eFRI which was updated to the year 2019 based on recent
34 harvesting, regeneration and a forecast of harvesting to occur by March 31, 2019. This inventory
35 referred to as the Base Model Inventory (BMI) was prepared for use in Strategic Forest Management
36 Model (SFMM) using the Model Information Support Tool (MIST). Additional model inputs were
37 prepared or adjusted including yield tables, natural forest succession rules, fire cycles and post-fire
38 succession rules, potential wildlife habitat and strategic silvicultural options.

1 Common management assumptions were then provided as inputs to SFMM. These include such things
2 as harvest operability age limits, a determination of volumes that will be left unharvested, forest
3 renewal costs and post renewal forest succession, and the proportion of harvested area that is
4 converted to non-forest. This model is referred to as the base model.

5 The eFRI and the development of the Base Model are described in detail in the Analysis Package, Section
6 4.0.

7 3.3.1 Analysis of Silvicultural Activities

8 The level of achievement for silviculture operations is directly related to harvesting – as the harvest level
9 decreases, so does the area requiring silvicultural treatment. The Big Pic and Pic River Forests were
10 separate management units until their amalgamation, however the same forest company was
11 responsible for the management of these forests until the licenses were surrendered in 2010 for the Big
12 Pic Forest and 2013 for the Pic River Forest. From that point forward both management units were
13 managed by Wawa District MNRF (as Lead) until 2013, when the NFMC took over forest management
14 responsibilities under an eFRL. The influence of changes in manager and management on silviculture
15 activities and silvicultural performance is evident in reported actual achievements during that period.

16 **Big Pic Forest**

17 During the 2007-2017 FMP for the Big Pic Forest, there were 27,344 hectares scheduled for artificial
18 regeneration, and 18,093 hectares of tending planned, plus 652 hectares of aerial chemical site
19 preparation. At the completion of the Big Pic FMP, 22,190 hectares of artificial regeneration (81.1% of
20 planned) and, 13,260 hectares of tending (73.3% of planned) plus 1,970 hectares of aerial chemical site
21 preparation (302% of planned) were completed. On the Big Pic Forest there were 11,289 hectares of
22 ground establishment surveys conducted in 2016-2017. This survey area represents approximately 18%
23 of the total area requiring FTG surveying. A total of 818 hectares of the area surveyed was declared FTG
24 based on the regeneration standards identified in FMP-4, representing 7% of the total area surveyed. Of
25 the area declared FTG, 422 hectares (52%) were considered a silvicultural success and 396 hectares
26 were considered a regeneration success. The remaining 10,471 hectares, representing 93% of the total
27 area surveyed, was not declared FTG because it did not meet the target SGR. The NFMC was part of a
28 pilot project to test the new regeneration standards in the 2017 FMPM prior to the Manual's release.
29 The NFMC's participation in the pilot project is the main reason for the small amount of area declared
30 FTG in 2016-2017. Areas eligible for an Establishment (2017 FMPM) survey, based on stratification,
31 would not meet the regeneration standards identified in the 2007-2017 FMP SGRs. In addition to
32 surveying for FTG, the NFMC used the data to determine the status of regeneration in the surveyed
33 areas.

34 The year 10-AR reported the ratio of artificial to natural regeneration over the past 25-year period
35 (1992-2017) as 50:50. The focus of harvest over the past nineteen years has been in conifer dominated
36 stands due to marketability. These stands are generally regenerated through artificial means such as
37 tree planting.

38 **Pic River Forest**

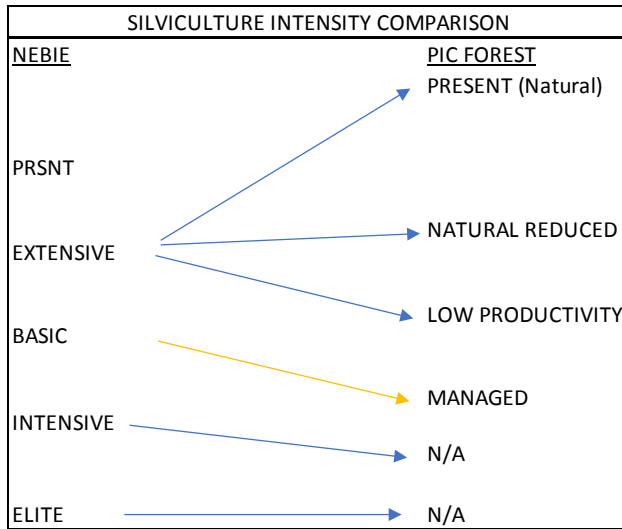
39 The Pic River Forest was formed in 2013 as an amalgamation of the Black River Forest and the Pic River-
40 Ojibway Forest. The Black River Forest was managed by the Ontario Paper Company (pulp) from 1938-
41 1986. These operations were conducted under a Forest Management Agreement (FMA) from 1982-

1 1986. Great West Timber Limited (sawmill) managed the forest from 1986 until 2013. The Pic River-
2 Ojibway SFL was held by Great West Timber until 2013. Prior to 1996, the Forest was a Crown
3 management unit (CMU) where MNR was responsible for the silviculture. The silvicultural
4 performance on these management units has been influenced by the forest manager and the tenure
5 (FMA vs. SFL vs. CMU).

6 During the first four years of 2013-2023 FMP for the Pic River, 7,366 hectares of artificial regeneration
7 and, 4,341.2 hectares of aerial chemical tending plus 1,960 hectares of chemical site preparation were
8 planned. Actual reported area treated for the same period includes 2,041 hectares of artificial
9 regeneration (27.7% of planned), 1,289 hectares of aerial chemical tending (29.7% of planned), and 322
10 hectares of chemical site preparation (16.4% of planned). On the Pic River 48,239 hectares were
11 planned for FTG surveys during the ten-year period of 2013-2023. No FTG surveys were completed
12 during the three-year period from 2013-2015. In 2016, 7,422 hectares of FTG surveys were conducted.
13 A total of 3,474 hectares was declared free-growing, representing 47% of the total area surveyed. Of
14 the area declared free-growing, 1,162 hectares (33%) were considered a silviculture success and 2,312
15 hectares (67%) were considered a regeneration success. The remaining 3,948 hectares, representing
16 53% of the total area surveyed, were not declared FTG because they did not meet the target SRG. The
17 NFMC was part of a pilot project to test the new regeneration standards in the 2017 FMP prior to the
18 Manual's release. The NFMC's participation in the pilot project is the main reason for the small amount
19 of area declared FTG in 2016-2017. Areas eligible for an Establishment (2017 FMP) survey, based on
20 stratification, would not meet the regeneration standards identified in the 2007-2017 FMP SGRs. In
21 addition to surveying for FTG, the NFMC used the data to determine the status of regeneration in the
22 surveyed areas.

23 The year-3 AR for the Pic River Forest shows the ratio of artificial to natural regeneration over the past
24 19-year period (1996-2015) is 53:47. The focus of harvest over the past nineteen years has been in
25 conifer dominated stands due to marketability. These stands are generally regenerated through
26 artificial means such as tree planting.

27 The results of silviculture performance and silviculture achievements for both Forests have been
28 influenced by forest managers, tenure models, and harvest levels during each plan period. In the
29 development of the Base Model, the planning team took a new direction when classifying the forest by
30 silvicultural intensity. An IFA recommendation related to the treatment of degraded forest and
31 discussions with experienced field foresters compelled the planning team to revise how site conditions
32 were represented on the Pic Forest. Instead of using the NEEBIE classification system the planning team
33 choose to classify the inventory according to the following silvicultural intensities, which can be seen in
34 Figure 1 below and are described in detail in the Analysis Package. It was felt these new intensities
35 better reflected the sites encountered, would aid planning for operations (roads and harvest) and
36 provide unique information for silviculture planning (e.g. Where to best spend renewal funds).



- the Penner Extensive Yield curve for the Kenogami closely resemble actual yields on Pic Forest therefore the natural yield curve will be derived from the NWR Extensive curve
- lowered based on lower ave. stking
- adjusted based on average stocking (0-40%)
- yields based on higher stocked stands and species composition
- Pic Forest does not reach the yields associated with curve
- Pic Forest does not carry out stand improvements (e.g. spacing, pr-comm. Thin)

1
2 *Figure 25: Silviculture Intensities for the Pic Forest*

3 The development of new silvicultural intensities meant new yield curves were required to reflect each
4 intensity. The Pic Forest switched to north west forest units which also require the development of new
5 yield curves. Figure 25 briefly describes the ruleset of each yield curve for each silvicultural intensity
6 included in the Base Model. The silvicultural intensities were also key in the development of FMP-4
7 (Silvicultural Ground Rules).

8 Data from the planning inventory (BMI) was run through “MIST”. MIST is a Crown endorsed model
9 inventory support program which helps planning teams prepare inventories for input into SFMM.
10 Primarily, MIST is used to develop yield projections by plan forest unit and silvicultural intensity. Yield
11 projections for the present, or natural (SI=NATUR) were adjusted based on comparisons between
12 historic yield information documented in Annual Reports and discussions with professionals with
13 experience on the Pic Forest. Pure forest units align more closely with the previous Northeastern Forest
14 Units, and where possible, comparisons were made between new and previous yield projections.
15 Overall the pure forest unit yield projections were marginally decreased, when compared to the past
16 yield projections. Mixed forest units apply a factor, depending on the average forest unit condition, to
17 create yield projections.

18 The new silvicultural options are designed to more accurately classify the silvicultural, or yield, pathways
19 on the Pic Forest. The Pic Forest has very few examples of harvest occurring in a stand where the
20 silvicultural intensity was not present, or natural. There has of course, been harvest in areas which were
21 harvested in the 30’s and 40’s, but those stands were not reflected on a different silvicultural intensity,
22 as the original harvest occurred so long ago, and any silviculture, if any, records have been lost. As such,
23 there is little industrial yield data to determine how much yield gain, or loss, is realistic for each
24 silvicultural intensity.

25 It is expected that within a managed stand, density regulation and competition control will result in a
26 gain in yield compared to the natural. However, overestimating volume, particularly future volume
27 forecast by modeled silvicultural yield gains, would cause many negative implications to future forest
28 managers. The new yield projections are designed to mitigate risk of yield estimates. Whereas,

1 managed stands are only forecast to have a slightly greater yield than the natural condition, and
2 extensive stands slightly less.

3 As future harvest operations begin to harvest stands with a recorded silvicultural past, NFMC will be
4 able to extract yield data to adjust forecast yield in subsequent plans.

5 3.3.2 Analysis of Past Silvicultural Performance

6 The year 10 AR for the Big Pic Forest and the year 3 AR for the Pic River Forest examines trends in
7 silvicultural performance. The discussion in the Big Pic AR is fuller, referencing the impact of the housing
8 market crash and how the subsequent surrender of the SFL affected silvicultural records. The report
9 shows that silviculture efforts have been successful in moving the forest in the direction of the desired
10 future forest condition. The Big Pic AR examined the trends in regeneration against the area harvested
11 over the most recent 2007-2017 FMP. It was concluded that silviculture efforts to reduce the amount of
12 hardwood-leading forest units on the Big Pic Forest have been successful and that the forest is moving
13 towards the desired future forest condition. The harvest reported during that time period was 33% in
14 hardwood-leading forest types and 67% in conifer-leading forest types. The regeneration reported
15 during the same period found that 28% of harvest areas have regenerated to hardwood-leading forest
16 types and 72% have regenerated to conifer-leading forest types. The year 3 AR for the Pic River does
17 not include a similar discussion on silviculture performance. The AR did conclude that silviculture has
18 been keeping pace with harvest levels but that there is a backlog of area on the forest that requires
19 surveying to determine regeneration status.

20 When the NFMC took over management of the Pic Forest in 2013 there was a substantial backlog in
21 regeneration that required surveying to determine its status. Working in conjunction with MNRF
22 Silviculture Guides and Monitoring Section and CNFER, a pilot project was designed, in 2016, to address
23 the large backlog based on the Silvicultural Enhancement Initiative (SEI) and proposed changes to the
24 2017 FMPM. The company conducted ground surveys on over 17,000 ha of regeneration on the Pic
25 Forest. The results were reported and used to update the planning inventory in advance of the
26 development of the Base Model.

27 A new FRI for the Pic Forest was delivered in advance of the development of the Base Model. Field
28 checks on the correctness of polygon information were carried out by field foresters in addition to the
29 checks on young forest (i.e. Stands ≤ 20 years) conducted through a GIS exercise. These checks were
30 endorsed by Corporate MNRF Silviculture Guides and Monitoring Section and resulted in corrections and
31 updates to the inventory.

32 Following the discussion above, an analysis of past silvicultural performance was completed.
33 Specifically, the analysis was designed to investigate how well past post harvest transition rules followed
34 actual on-the-ground silvicultural performance. The development of the Pic Forest post harvest
35 transitional rules was based on the results of this analysis, and validated by comparisons to the past
36 Annual Reports, and historic and present silvicultural expertise. Post harvest transition rules are
37 presented in Table FMP-5.

38 Pure forest units align more closely with the previous Northeastern forest units which allowed past
39 silvicultural performance to more directly influence post harvest transitional pathways. Mixed forest
40 units drew on historic analysis of forest units with the closest average forest condition. There are no

1 post harvest transition rules that are in contravention of past silvicultural performance. Analysis of
2 silvicultural performance through establishment or free-to-grow surveys, under the new forest units and
3 silvicultural intensities will confirm or influence adjustments in subsequent FMPs.

4 3.4 Desired Forest and Benefits

5 Desired forest and benefits are the combination of forest structure and composition, as well as the
6 goods and services that are desired from the Forest to achieve a balance of social, economic and
7 environmental needs over time. The desired forest and benefits were developed by the Planning Team
8 and Pic Forest Public Consultation Committee (PFPPCC).

9 The Desired Forest and Benefits Meeting was held in Manitouwadge on November 15th, 2017. A
10 summary of comments received is contained in the Supplementary Documentation, Section “Desired
11 Forest and Benefits Summary”. The meeting was attended by members of the PFPPCC along with
12 members from the Planning Team who provided background information and overview of the purpose
13 for this meeting. Additional Desired Forest and Benefits meetings were held at all First Nations & Métis
14 communities who expressed interest to the planning team. Desired Forest and Benefit meetings were
15 held in Pic Mobert November 14th, 2017, Biigtigong Nishnaabeg November 16th, 2017, and Long Lake
16 #58 November 23rd, 2017.

17 Below is a brief outline of responses received at the desired forest and benefits meetings. For a more
18 detailed list of responses received, consult the supplemental documentation.

- 19 • Concerns regarding wildlife management through policy and forest management planning.
- 20 • Concerns regarding public access and recreational restrictions across the unit.
- 21 • Expressed interest in buffers left on highways, rail lines, hydro lines, etc.
- 22 • Concerns regarding protection for unique landform features.
- 23 • Concerns regarding access to the central portion of the forest, considering the failed bridge at
24 the Kaganio River.
- 25 • Concerns regarding the notification afforded to trappers regarding harvest on their trapping
26 areas.

27 The PFPPCC understands that a balance needs to be reached between the environment, social and
28 economic benefits from the Forest.

29 The Desired Forest and Benefits Meeting confirmed several objectives and indicators from the 2019-
30 2029 Pic Forest FMP. There were six (6) new objectives created and nine (9) corresponding indicators
31 also created.

32 3.5 Strategic Management Zones

33 The Pic Forest has applied strategic management zones (SMZs) to comply with policy direction. Figure
34 26 provides a visual oversight on the spatial orientation of the SMZs. The management zones have
35 specific management objectives and direction applied to them. Table 18 and Figure 26 provide a brief
36 summary of the SMZs direction, for more detailed explanation please refer to the Pic Forest
37 Supplementary Documentation “Caribou Habitat Strategy for the Pic Forest”.

1 *Table 18: Summary of SMZs and specific criterion for each*

SMZ Name	Specific criterion
A1-to-A4	Open for harvest 2019-2039
B1-to-B2	Open for harvest 2039-2059
C1-to-C2	Open for harvest 2059-2079
D1	Open for harvest 2079-2099
E1-to-E4	Open for harvest 2099-2119
NDC & SDC	Open for harvest, must maintain 50% of area as mature and late conifer dominated forest.
REF1-to-REF3	Deferred from harvest for 20 years (2019-2039)
CCH1,2,3,4,5,6,8,9,10,11,13,14,15	Deferred from harvest for 20 years (2019-2039)
Z,CCH7,CCH12,REF4	Open for harvest
P1	Provincial Park, or conservation reserve

2



1
2 *Figure 26: Pic Forest Caribou Strategic Management Zones*

3 **3.5.1 Caribou**

4 The Pic Forest intersects the Northern Continuous Caribou Range, the Lake Superior Caribou Coastal
5 Range, and the discontinuous caribou zone. To facilitate the implementation of Ontario’s Woodland
6 Caribou Conservation Plan (CCP), Range Management Policy in Support of Woodland Caribou
7 Conservation and Recovery (RMP) and the Boreal Landscape Guide caribou habitat management
8 strategies were put into place on the Pic Forest. The northern portion of the forest is within the
9 Northern Continuous Zone, where a full 100-year Dynamic Caribou Habitat Schedule (DCHS) is
10 established. The Coastal Range utilizes a mosaic structure to ensure the availability of refuge habitat
11 and connectivity to the discontinuous zone is maintained and enhanced. Within the discontinuous zone
12 opportunities to enhance characteristics that would support caribou movement through this area were
13 developed.

14 Ontario’s Woodland Caribou Conservation Plan (CCP), Range Management Policy in Support of
15 Woodland Caribou Conservation and Recovery (RMP) and associated policies give broad-level direction,
16 including priorities on sustaining boreal caribou at both the range and provincial level (OMNR 2009;
17 MNR 2014a). The purpose of the CCP is to:

- 1 • provide broad policy direction regarding Woodland Caribou conservation and recovery;
- 2 • summarize the actions the Government of Ontario intends to take in response to
- 3 recommendations in the Ontario Woodland Caribou Recovery Strategy and the government's
- 4 priorities in taking those actions; and
- 5 • outline initiatives to support Woodland Caribou recovery (OMNR 2009).

6 **Northern Continuous Range**

7 The CCP identifies that that there will be a focus on the long-term sustainability of caribou ranges
8 through considerations of the amount and arrangement of habitat, road densities and decommissioning,
9 and use of various silvicultural, harvest and deferral strategies (OMNR 2009).

10 The Range Management Policy in Support of Woodland Caribou Conservation and Recovery (RMP)
11 applies to the northern continuous caribou ranges in Ontario and excluded the Lake Superior Coastal
12 Range. The purpose of the RMP is to implement the Range Management Approach to support Ontario's
13 conservation goal for caribou, and includes direction on the integration of range condition into activity
14 review and assessment, and when planning and authorizing activities within caribou ranges (MNRF
15 2014a). The objective of this policy is, 'To maintain or move towards a sufficient range condition in all
16 caribou ranges in Ontario'. Population trend (i.e., increasing, stable or decreasing) is an indicator of self-
17 sustainability and current science indicates that the trend is reflective of the state of the habitat within a
18 range (i.e., amount of cumulative disturbance, and habitat amount and arrangement). It is population
19 trend that ultimately influences the classification of range condition. Three principles are identified in
20 the RMP to be applied to achieve the objective of the RMP:

- 21 • Principle 1– Cumulative Disturbance: Ranges will be managed such that the amount of
22 cumulative disturbance remains at or moves towards a level that supports a self-sustaining
23 caribou population.
- 24 • Principle 2 – Habitat Amount and Arrangement: The amount and arrangement of habitat within
25 a range will be managed consistent with the level that has been estimated to occur in natural
26 landscapes.
- 27 • Principle 3 – Sub-range Habitat Features: Within a range, forest composition, pattern and
28 structure will be managed to promote the maintenance of the ecological function of sub-range
29 habitat features for caribou in the context of range condition (MNRF 2014a).

30

31 Application of the above-mentioned principles ensures the following are addressed: each range's
32 condition; landscape level habitat planning (in addition to finer scale planning); sufficient habitat
33 through time; and disturbances.

34 In forest management planning, the intent of CCP and RMP is delivered through the application of the
35 Forest Management Guide for Boreal Landscapes (Boreal Landscape Guide) (OMNR 2014). The primary
36 mechanism used to plan caribou habitat in forest management planning is the preparation of a Dynamic
37 Caribou Habitat Schedule (DCHS), plus specific stand and site level measures where required.

38 The state of the Pagwa Range and level of risk to caribou within the range is reported in the Integrated
39 Range Assessment for Woodland Caribou and their Habitat: Pagwachuan Range 2011 (Pagwa IRAR)
40 (MNRF 2014b), which is a fundamental part of the Range Management Approach. It provides essential
41 historical, ecological and contextual knowledge relevant to the range and its management. It relied on

1 quantitative lines of evidence to identify the level of risk and range condition relative to its ability to
2 sustain caribou. The Pagwa IRAR indicates that there is a declining short-term population trend and is
3 the result of comparatively low calf recruitment and survival estimates, and is supported by other long-
4 term trend indicators. A geospatial analysis estimated 31% of the range can be currently characterized
5 as natural and (primarily) anthropogenic disturbances. The resulting likelihood of stable or increasing
6 population growth is estimated to be 0.65, and at this level the Pagwachuan Range is capable of
7 sustaining the caribou population. Analysis of the amount and arrangement of caribou habitat, as well
8 as the amount of young forest, indicates that there is generally less caribou habitat in the Pagwachuan
9 Range than would be expected in a natural landscape. The Pagwa IRAR concludes that risk to caribou is
10 intermediate within the Pagwachuan Range and it is uncertain whether range condition is sufficient to
11 sustain caribou.

12 **Lake Superior Coastal Range (Coastal Continuous Range)**

13 The Caribou Conservation Plan states that “the Lake Superior coastal population will be managed for
14 population security and persistence. The focus will be to protect and manage habitat and encourage
15 connectivity to caribou populations to the north.”

16 To be in line with the intent of the CCP the Pic Forest portion of the coastal range will focus on
17 preserving and creating refuge habitat for caribou by creating and identifying deferral and open for
18 harvest blocks within the Lake Superior Coastal Range to manage for population security and
19 persistence. The management strategy within this zone will additionally target a reduction in
20 disturbance by creating a roads strategy to minimize new disturbances.

21 **Discontinuous Zone**

22 The Caribou Conservation Plan states that the “Discontinuous range....will be managed with a focus on
23 specific landscapes that may support temporary caribou occupancy or movement between the
24 continuous range and Lake Superior”.

25 To support temporary caribou occupancy and connectivity between the northern Continuous Range and
26 the Lake Superior Coastal Range the Pic Forest management plan adopts harvesting practices that
27 emphasize specific landscape classes that are characteristic of caribou habitat. A Zone of Connectivity
28 was developed within the Discontinuous Distribution Zone that spans between the northern Continuous
29 Range and the Lake Superior Coastal Range. The area within the Zone of Connectivity was managed to
30 emphasize for characteristics of caribou habitat through the use of representative landscape classes.
31 Additionally, roads strategies were put into place to reduce disturbance and to minimize new
32 disturbances.

33



1
 2 *Figure 27: The Pic Forest with overlapping Caribou ranges: The Lake Superior Coastal Range (Coastal Continuous Range), the*
 3 *Discontinuous Distribution Zone, and the Pagwachuan Range (Northern Continuous Range).*

4 **3.6 Objectives and Indicators**

5 Plan objectives were developed specifically for this Plan and all fall under the broad criterion and
 6 objective categories of the Crown Forest Sustainability Act, 1994.

7 Objectives from the former Big Pic and Pic River FMPs were reviewed, and some objectives and targets
 8 were carried forward into the current proposed plan. However, due to many changes in provincial
 9 policies, guides, and direction, most of the proposed objectives and targets are new for this Plan.

10 Comments received from the Desired Forest and Benefits meetings were considered in the development
 11 of plan objectives. Although every comment received at the Desired Forest and Benefits meetings
 12 received a response, only those comments that fit within the scope of Forest Management Planning
 13 were integrated into plan objectives. Many of the comments received will be addressed through the
 14 next stage of planning; operational planning.

1 For each objective, at least one indicator of sustainability was developed, along with an associated
2 desired and target levels. Some objectives have multiple indicators to measure that objective. Most
3 indicators developed for the management plan are quantifiable. The establishment of a target for each
4 management objective often reflects the necessity to balance conflicting objectives and targets that may
5 be the same or differ from the desired levels because of balancing all targets. The Strategic Forest
6 Management Model (SFMM) was used to develop a management strategy that balances the
7 achievement of all objectives over time. A complete list of all plan objectives, targets, and achievement
8 is contained in FMP-10.

9 3.6.1 Strategic Analysis

10 The Strategic Forest Management Model (SFMM) was used as the primary analytical tool in the
11 development of the management strategy, which is a key component of the Long-Term Management
12 Direction. This tool is capable of tracking the entire forest through time, and is used to project forest
13 growth and report changes to forest structure and composition over a 160 year planning horizon.
14 SFMM also forecasts the contribution that the forest makes to future timber production and potential
15 wildlife habitat.

16 The Ontario Landscape Tool (OLT), which is a GIS-based landscape structured language (LSL) model, was
17 used to complete the spatial assessments that were conducted as part of the development of the LTMD.

18 3.6.2 Scoping Analysis

19 Scoping analysis involves conducting a series of investigations with SFMM to explore a range of
20 opportunities and to provide insight into what the forest is capable of producing and potential
21 management considerations. Scoping analysis provides direction for setting specific targets or limits in
22 the development of the management strategy. The investigations were grouped into the following;

- 23 1. Maximization of harvest volume
- 24 2. Maximization of habitat and landscape class achievement
- 25 3. Balance harvest volumes with habitat and landscape class achievement
- 26 4. Constrain the balanced approach to determine limits

27 The process of scoping began by investigating each of these elements individually to assess achievement
28 of targets independent of other constraints. In subsequent analysis, the targets for various elements
29 were combined and analysis was conducted to determine the effect of various combinations of target
30 levels on the potential of the forest to produce timber and wildlife habitat. Each investigation
31 considered implications on wood supply, forest conditions and wildlife habitat for the short-term (10
32 years), medium term (20 year average) and long-term (100 year average). Some of the lessons learned
33 from scoping investigations are as follows:

- 34 • Excluding the maximize volume runs, which target neither landscape nor habitat objectives,
35 Caribou habitat objectives in the northern continuous blocks is always maximized to the fullest
36 extent possible.
- 37 • In the model, caribou refuge blocks REF1, REF2, and REF3 are deferred for 20 years.
- 38 • The benchmark flatline Spruce, Pine, and Balsam Fir (SPF) harvest volume when fulfilling neither
39 landscape nor habitat objectives is 610,000m³ annually.

- 1 • When fulfilling to highest extent possible both landscape and habitat objectives, as is done in
2 run 214, the greatest flatline (0% change between terms) is 445,000m³SPF annually.
- 3 • The difference, 165,000m³, represents the impact in SPF wood supply of implementing
4 provincial legislation, policy, and direction, specifically landscape and habitat objectives.
- 5 • Scoping Run 214 represents the benchmark to attain the best possible landscape class and
6 habitat class objective indicators. Whereas previous runs focused on the greatest achievement
7 of one specific target, run 214 incorporates all modeled targets. As landscape guide indicators
8 are so interrelated, sometimes competing with one another, run 214 provides the best
9 achievement possible, of non-volume targets, regardless of impact to other targets (i.e. Volume,
10 silviculture, etc.). Implementation of standards detailed in the Boreal Landscape Guide, 2014,
11 has a large impact on wood supply. In run214 first term SPF annual harvest volume is
12 469,000m³. The analysis team demonstrated that there's a potential surplus of 81,000m³ – in
13 other words, when the SFMM model solves run214, the first term harvest volume is 469,000m³.
14 However, in run214, users can manually direct a first term harvest of 550,000m³, and the model
15 will solve with no impact to target achievement.
- 16 • Scoping Run 215 demonstrates that in order to meet just landscape and habitat objectives, the
17 model must harvest annually an average of 373,000m³ SPF for the first 100 years.
- 18 • Constraining the model to achieve the milestone objective for the mature and late conifer
19 mixedwood has a dramatic impact on the wood supply in the first two terms. Isolating this
20 constraint alone results in a 20% decline in SPF wood supply over the first two terms.
- 21 • Unconstrained, the model drops after 50 years to 70% of the milestone objective for the mature
22 and late conifer mixedwood, which allows a first term harvest level above the industrial demand
23 of 625,000m³ SPF annually.
- 24 • Run 229, the selected management alternative, reports the first term SPF harvest level at
25 675,000 m³, and achieves all the achievable milestones in the 100-year term.

26 3.6.3 Plan Objectives and Targets

27 The Pic Forest Management Plan contains plan objectives designed to protect or enhance the ecological,
28 economic, and social values delivered from managed forests. Some objectives within the FMP were
29 developed through consultation with public or First Nations & Métis communities through processes like
30 the Desired Forest and Benefits Meetings. Many of the plan objectives are prescribed through policy
31 manuals such as the Boreal Landscape Guide, or Caribou Conservation Plan. Lastly, some objectives
32 were collectively developed by the Planning Team.

33 Each objective is evaluated via an indicator. Objectives can often be intended to achieve intent (e.x.
34 Wetland ecosystems filtering and providing clean water). However, intent can be particularly difficult to
35 measure, so indicators are developed as a proxy measurement to support the achievement of an
36 objective. Indicators are included in Table FMP-10 and strive to provide an exact criterion to be
37 measured, often at some given point in time (e.x. Harvest is measured and reported annually).

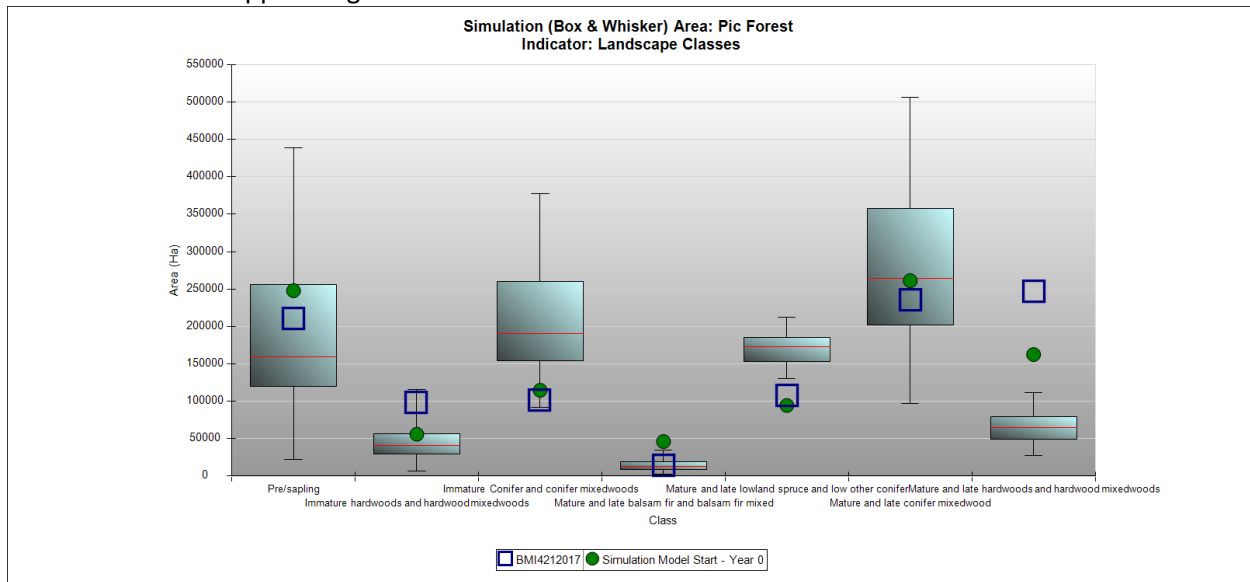
1 The Forest Management Guide for Boreal Landscapes (Boreal Landscape Guide, or Landscape Guide) has
 2 established the desirable levels for the Pic Forest landscape classes. The following sections detail
 3 achievement of plan objectives and targets for modeled and non-modeled targets.

4 **3.6.4 Application of the Boreal Landscape Guide**

5 The Forest Management Guide for Boreal Landscapes has become the primary reference and source of
 6 direction for the composition of the future landscape. The Guide provides for a set of Landscape Classes
 7 direction on their abundance for 10, 20 and 100-year periods.

8 Landscape classes are groupings of forest units by development stage and have meaningful differences
 9 in wildlife use. There are 7 different landscape classes in the Boreal West Region. The current area
 10 contributing to those landscape classes (blue box) within the 7 landscape classes for the Pic Forest are
 11 present in Figure 28. Also presented in Figure 28 for each landscape class is the simulated range of
 12 natural variation:

- 13 • median
- 14 • lower and upper quartile
- 15 • lower and upper range



16
 17 *Figure 28: OLT Landscape Class Targets and T1 Values*

18 Although there are 7 landscape classes established. As directed by the Boreal Landscape Guide, the Pic
 19 Forest only has strategic targets for 4 of those landscape classes within the plan objectives. The current
 20 area in each landscape class was compared to the milestone targets set for the Forest by the Boreal
 21 Landscape Guide. It was determined if the individual landscape indicator required an increase,
 22 maintain, or decrease to achieve alignment with the milestones, based on the current forest condition.

23 For each Landscape Guide Indicator, these are the known and fixed values:

- 24 • Current Value
- 25 • Interquartile range
- 26 • Short term (10), medium term (20) and long term (100) direction milestones

1
 2 For this analysis we devised a percentile and colour coded scheme to represent landscape class target
 3 achievement, described as follows in Table 19.

4 *Table 19: Landscape Indicators for reporting*

Trending	Colour
Below target and decreasing	Red
Above target and increasing	Red
Below target and static	Orange
Above target and static	Orange
Below target and increasing	Light Green
Above target and decreasing	Light Green
Between quartile targets	Dark Green

5
 6 Landscape targets are provided in the Ontario Landscape Tool (OLT). Table 20 lists the Landscape Guide
 7 Indicators and associated short-form, or code, used for scoping.

8 *Table 20: Landscape Class Codes*

Landscape Guide Indicator	Code
Caribou Refuge Northern DCHS	CRF
Caribou Winter Use Northern DCHS	CWU
Caribou Preferred Northern DCHS	CWP
Mature and late balsam fir and balsam fir mixed	LBF
Mature and late lowland spruce and low other conifer	LLC
Mature and late conifer mixedwood	LCX
Mature and late hardwoods and hardwood mixedwoods	LMX
Old Growth	LOD
Coastal DCHS Refuge	CCO
Discontinuous Zone - Caribou Habitat Connectivity	CZZ
All Ages Conifer	LSP
Young Forest	LYG
Red and White Pine	LRW

9

1 Table 21 Presents the landscape class targets, associated bounds of natural variation (upper and lower
 2 quartile) and the number of hectares contributing to those classes at plan start (base model start)

3 *Table 21: landscape class targets, associated bounds of natural variation (upper and lower quartile) and the number of hectares*
 4 *contributing to those classes at plan start (base model start)*

Landscape Class	Lower Quartile	Upper Quartile	Base Model Start
Caribou Refuge Northern DCHS	133,657	150,427	110,284
Caribou Winter Useable Northern DCHS	47,125	68,826	41,123
Caribou Preferred Northern DCHS	47,889	62,125	41,899
Mature and late balsam fir and balsam fir mixed	9,018	19,246	15,397
Mature and late lowland spruce and low other conifer	152,853	184,867	109,408
Mature and late conifer mixedwood	201,845	357,211	239,176
Mature and late hardwoods and hardwood mixedwoods	49,430	79,251	247,426
Old Growth	161,105	245,100	237,268
Coastal DCHS Refuge	43,834	58,351	23,808
Discontinuous Zone - Caribou Habitat Connectivity*	20,985	40,570	20,279
All Ages Conifer	520,756	578,089	340,125
Young Forest	161,341	322,538	295,349
Red and White Pine **	1,128	1,128 +	57

5 * The Discontinuous Zone - Caribou Habitat Connectivity lower quartile value represents 50% of the area in the class as
 6 calculated by the regional MNR staff.

7 ** The target for the Red and White Pine landscape class is 1,128 hectares, which represents the estimated pre-industrial
 8 condition. The selected management alternative will demonstrate achieving the target by year 100.

9 For the purposes of the remainder of this document, objective achievement and the selected
 10 management alternative will compare the following SFMM cases, detailed in Table 22. Other cases used
 11 for comparison will be explained as they appear.

12 *Table 22: SFMM Cases commonly compared in the development of the LTMD*

102	Maximize SPF and Intolerant (Po/Bw) harvest volume across entire planning period for the entire forest constrained by +/- 10% harvest flow from term to term. No constraints on the landbase.
214	Maximize SPF and Intol harvest volume across entire planning period for the entire forest constrained by +/- 10% harvest on SPF and +/-20% on Intol. Flow from term to term. Northern DCHS implemented with respective block deferrals and minimum harvest area constraints to enforce harvests during eligibility periods.

	All Landscape Classes and Habitat targets achieved to greatest extent.
215	Minimize the harvest area with +/- SPF harvest flow to determine silviculture schedule required to implement the Northern DCHS with respective block deferrals and minimum harvest area constraints to enforce harvests during eligibility periods and all Landscape Classes and Habitat targets achieved to greatest extent.
229	SPF Volumes targeted T1-675 2T-600 T3 -500. Northern DCHS implemented with respective block deferrals and minimum harvest area constraints to enforce harvests during eligibility periods. Modified Landscape targets. SPF Volumes targeted T1-675 T2-600 T3-500. Northern DCHS implemented with respective block deferrals and minimum harvest area constraints to enforce harvests during eligibility periods. Modified Landscape targets. Proposed management alternative.

1

2 3.6.5 Mature and Late Balsam Fir and Balsam Fir Mixed – Objective 2.1.1

3 The only forest unit that contributes to the mature and late balsam fir and balsam fir mixed landscape
4 class is balsam fir dominated (BFDOM) and only when it is greater than 60 years old. The most recent
5 scientific studies regarding natural forest succession show an overwhelming trend of most forest units
6 succeeding to BFDOM at some point during their succession.

7 The upper limit target for the Pic Forest for this landscape class is 19,246ha (shown in Table 21). The
8 analysis task team tried to maintain the amount of area within this landscape class below the upper
9 limit, however this was only possible until term 4 (or 30 years into the future). At which time, after term
10 4, natural succession in areas of the forest unavailable for harvest (Provincial Parks, Conservation
11 Reserves, Area of Concern “no cut” buffers) succeed enough area to BFDOM, that the upper limit is
12 exceeded. The Landscape guide milestone direction for this target is to maintain within the interquartile
13 ranges of variability (IQR) in the short, medium and long term. The milestone is achieved in the short
14 and medium, but long term the area of balsam fir exceeds the IQR for the reasons aforementioned.

15 In run 205, where the model is free of other constraints, the model’s objective to maintain the amount
16 of mature and late balsam fir and balsam fir mixed below the upper limit could only be achieved until
17 term 4 (30 years into the future).

18 Table 23 displays the percent achievement of the mature and late balsam fir and balsam fir mixed
19 landscape class between runs 102 (representing a run where a sustainable harvest is maximized where
20 no other non-volume targets apply), run 205 (representing the best possible achievement of the mature
21 and late balsam fir and balsam fir mixed landscape class), run 214 (representing the benchmark to attain
22 the best possible landscape class and habitat class objective indicators when applying all targets
23 simultaneously), run 215 (representing the minimum amount of harvest required to meet landscape
24 guide targets), and run 229 (the proposed management alternative) across 11 terms (100 years into the
25 future). Note that there is not much difference. In other words, regardless of the demands of wood
26 supply, or targeted management intervention, the target can never be achieved in the long term.

1 *Table 23: Achievement of mature and late balsam fir and balsam fir mixed*

Percent LC	Case	Term 1	2	3	4	5	6	7	8	9	10	11
LBF	102	100%	100%	100%	87%	64%	60%	60%	68%	53%	43%	37%
	205	100%	100%	100%	100%	73%	62%	65%	65%	52%	52%	52%
	214	100%	100%	100%	100%	58%	54%	54%	54%	54%	54%	54%
	215	100%	100%	100%	100%	57%	54%	54%	54%	54%	54%	54%
	229	100%	100%	100%	100%	57%	54%	57%	59%	54%	54%	54%

2 Table 24 presents a numerical value of the amount of area contributing to the mature and late balsam
 3 fir and balsam fir mixed landscape class at term 2 (ten years in the future), 3 (20 years into the future),
 4 and 11 (100 years into the future) in run 229 (the selected management alternative).

5 *Table 24: Numerical achievement of mature and late balsam fir and balsam fir mixed at objective assessment terms*

LCArea Case	At Year				
	Lower Quartile	Upper Quartile	2029	2039	2119
229	9,018	19,246	13,613	18,766	35,700

6

7 **3.6.6 Mature and Late Lowland Spruce and Low Other Conifer – Objective 2.1.2**

8 The mature and late lowland spruce and low other conifer is comprised of lowland black spruce
 9 (SBLOW) and other lowland conifer, tamarack, larch, cedar (OCLOW), greater than 70 years of age.

10 The lower limit target for the Pic Forest for this landscape class is 152,853ha (shown in Table 21). The
 11 common denominator for this landscape class is that these sites occur on lowland (wet) ecosites. The
 12 analysis task team discovered that regardless of tree cover, there are not enough lowland ecosites on
 13 the Pic Forest to meet the lower limit for this class. To support this conclusion, run 204 was examined
 14 which was devoid of any other constraints other than the achievement of the mature and late lowland
 15 spruce and low other conifer landscape class indicator. The results of run 204 indicated that the
 16 projected forest units were only able to achieve 82% of the lower target by term 4 and no further
 17 increase was possible (Table 25). Run 229 (the selected management alternative) is the same, still
 18 achieving 82% of the lower target.

19 Operationally, it is not reasonable to create an allocation where no lowland spruce nor other low conifer
 20 can be harvested. That practice would contribute to forest fragmentation and undermine some of the
 21 broader staples of forest management. Therefore run 229 (the proposed management alternative)
 22 plans to harvest some lowland conifer, resulting in a 15% reduction from what could be achieved if no
 23 wood supply constraints were considered. The landscape guide milestone direction for this target is to
 24 increase in the short and medium and maintain in the long run. For the reasons mentioned above, the
 25 milestone targets are not met in the short, medium, or long term.

26 Table 25 displays the percent achievement of the mature and late lowland spruce and low other conifer
 27 landscape class between runs 102 (representing a run where a sustainable harvest is maximized where
 28 no other non-volume targets apply), run 204 (representing the best possible achievement of the mature
 29 and late lowland spruce and low other conifer landscape class), 214 (representing the benchmark to

1 attain the best possible landscape class and habitat class objective indicators when applying all targets
 2 simultaneously), run 215 (representing the minimum amount of harvest required to meet landscape
 3 guide targets), and run 229 (the proposed management alternative) across 11 terms (100 years into the
 4 future).

5 *Table 25: Achievement of mature and late lowland spruce and low other conifer*

Percent LC	Case	Term										
		1	2	3	4	5	6	7	8	9	10	11
LLC	102	72%	72%	42%	31%	30%	29%	39%	41%	43%	60%	63%
	204	72%	71%	70%	69%	68%	71%	79%	78%	80%	80%	82%
	214	72%	71%	70%	69%	68%	71%	79%	78%	80%	80%	82%
	215	72%	68%	68%	69%	68%	71%	79%	78%	82%	82%	82%
	229	72%	71%	61%	59%	59%	59%	62%	60%	60%	65%	67%

6 Table 26 presents a numerical value of the amount of area contributing to the mature and late lowland
 7 spruce and low other conifer landscape class at term 2 (ten years in the future), 3 (20 years into the
 8 future), and 11 (100 years into the future) in run 229 (the selected management alternative).

9 *Table 26: Numerical achievement of mature and late lowland spruce and low other conifer at objective assessment terms*

LCArea Case	Lower Quartile	Upper Quartile	At Year		
			2029	2039	2119
229	152,853	184,867	107,945	93,130	102,336

10

11 **3.6.7 Mature and Late Conifer Mixedwood – Objective 2.1.3**

12 The landscape class, mature and late conifer mixedwood is a culmination of multiple conifer dominated
 13 forest units, usually greater than 70 years of age.

14 The lower limit target for the Pic Forest for this landscape class is 201,845ha (Table 21). Although the
 15 forest is within the interquartile range at plan start, the analysis task team determined that this
 16 landscape class had the greatest restriction on wood supply objectives.

17 Table 27 shows that if no wood supply constraints are applied (run 214), the forest can maintain the
 18 class within the natural bounds of variation throughout the long-term planning horizon.

19 However, the analysis task identified that this landscape class has a disproportionate implication when
 20 wood supply constraints are applied. Whereas, allowing the target to reduce the amount of mature and
 21 late conifer mixedwood on the forest, to a maximum of 30% in term 5, creates a 206,000m³ reduction in
 22 term 1 SPF wood supply. The analysis task team allowed the landscape class to fluctuate and agreed
 23 that the landscape class still adheres to the long-term strategic target when measured in the long term.
 24 This direction deviates from the milestone targets for the Pic Forest, where the direction is to maintain
 25 the amount of area within the interquartile ranges in the short, medium, and long term.

26 Table 27 displays the percent achievement of the mature and late conifer mixedwood landscape class
 27 between runs 102 (representing a run where a sustainable harvest is maximized where no other non-
 28 volume targets apply), run 206 (representing the best possible achievement of the mature and late

1 conifer mixedwood landscape class), 214 (representing the benchmark to attain the best possible
 2 landscape class and habitat class objective indicators when applying all targets simultaneously), run 215
 3 (representing the minimum amount of harvest required to meet landscape guide targets), and run 229
 4 (the proposed management alternative) across 11 terms (100 years into the future).

5 *Table 27: Achievement of mature and late conifer mixedwood*

Percent LC	Case	Term 1	2	3	4	5	6	7	8	9	10	11
LCX	102	100%	100%	86%	75%	59%	67%	79%	89%	99%	100%	100%
	206	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	214	100%	100%	99%	100%	100%	100%	100%	100%	100%	100%	100%
	215	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	229	100%	97%	85%	78%	70%	79%	97%	100%	100%	100%	100%

6
 7 Table 28 presents a numerical value of the amount of area contributing to the mature and late conifer
 8 mixedwood landscape class at term 2 (ten years in the future), 3 (20 years into the future), and 11 (100
 9 years into the future) in run 229 (the selected management alternative).

10 *Table 28: Numerical achievement of mature and late conifer mixedwood at objective assessment terms*

LCArea Case	Lower Quartile	Upper Quartile	At Year		
			2029	2039	2119
229	201,845	357,211	194,935	172,228	202,792

11 **3.6.8 Mature and Late Hardwoods and Hardwood Mixedwoods – Objective 2.1.4**

12 The landscape class mature and late hardwoods and hardwood mixedwoods is a culmination of
 13 hardwood dominated forest units, as described in Table 16.

14 The upper limit target for the Pic Forest for this landscape class is 79,251ha (Table 21). At plan start, and
 15 currently on the forest there are 247,426ha contributing to the class, 3x the maximum prescribed by the
 16 Boreal Landscape Guide and the Ontario Landscape Tool. As a general statement, this is the landscape
 17 class which has the greatest over-arching influence on the proposed long-term management direction of
 18 the plan. Specifically, the Pic Forest has too much mature hardwood and hardwood mixedwoods, and
 19 the largest goal of this Plan is to reduce the amount of hardwood, and hardwood mixedwood across the
 20 forest.

21 The analysis task team identified that if no wood supply nor silvicultural realities were constrained (run
 22 214) the forest can meet the maximum target by term 7 (60 years into the future). However, in order to
 23 achieve this target by term 7, the model had to apply significant silvicultural interference in the form of
 24 converting hardwood and hardwood mixedwood stands to conifer dominated stands. Although there
 25 will be some stand conversion in the proposed long-term management direction, silvicultural and
 26 industry market conditions limit the amount of stand conversions that can be achieved. Stand
 27 conversion normally involves higher cost silvicultural activities and the industrial demand for hardwood
 28 has been historically poor across the forest.

1 The analysis task team determined, that, to bring targets in line with realistic silvicultural activities, and
 2 market demands, the target would be pushed further, and would not be met until term 11 (100 years
 3 into the future). Therefore, the target cannot be met in the short nor medium terms, but movement
 4 towards the target is constant, and is met in the long term. This direction is consistent with the
 5 milestone direction for the Pic Forest where the direction is to decrease in the short and medium term,
 6 and maintain in the long term.

7 Table 29 displays the percent achievement of the mature and late conifer mixedwood landscape class
 8 between runs 102 (representing a run where a sustainable harvest is maximized where no other non-
 9 volume targets apply), run 207 (representing the best possible achievement of the mature and late
 10 hardwoods and hardwood mixedwoods landscape class), 214 (representing the benchmark to attain the
 11 best possible landscape class and habitat class objective indicators when applying all targets
 12 simultaneously), run 215 (representing the minimum amount of harvest required to meet landscape
 13 guide targets), and run 229 (the proposed management alternative) across 11 terms (100 years into the
 14 future).

15 *Table 29: Achievement of mature and late hardwoods and hardwood mixedwoods*

Percent LC	Case	Term										
		1	2	3	4	5	6	7	8	9	10	11
LMX	102	32%	61%	58%	63%	58%	71%	42%	52%	67%	58%	55%
	207	32%	33%	40%	47%	55%	71%	100%	100%	100%	100%	100%
	214	32%	32%	37%	42%	51%	63%	100%	100%	100%	100%	100%
	215	32%	31%	35%	39%	46%	50%	100%	100%	100%	100%	100%
	229	32%	35%	40%	45%	48%	53%	58%	61%	67%	82%	100%

16
 17 Table 30 presents a numerical value of the amount of area contributing to the mature and late
 18 hardwoods and hardwood mixedwoods landscape class at term 2 (ten years in the future), 3 (20 years
 19 into the future), and 11 (100 years into the future) in run 229 (the selected management alternative).

20 *Table 30: Numerical achievement of mature and late hardwoods and hardwood mixedwoods at objective assessment terms*

LCArea Case			At Year		
	Lower Quartile	Upper Quartile	2029	2039	2119
229	49,430	79,251	227,655	198,102	79,251

21
 22 **3.6.9 Old Growth Forest – Objective 2.1.5**

23 Old growth forest is a culmination of all forest units between a period of time in their older mature and
 24 overmatured stand conditions.

25 The upper and lower ranges for this target are displayed in Table 21. The amount of old growth on the
 26 forests is currently within the natural bounds of variation. The indicator is able to be achieved
 27 throughout the entire 160-year planning horizon regardless of wood supply constraints. The target is
 28 achieved in the short, medium, and long term. The landscape guide milestone direction for this
 29 objective is to increase in the short, and maintain in the medium and long term. As the Pic Forest is

1 within the IQR at plan start, the direction is to maintain within the IQR throughout the planning horizon,
 2 which is achieved in the selected management alternative.

3 Table 31 displays the percent achievement of the old growth forest objective between runs 102
 4 (representing a run where a sustainable harvest is maximized where no other non-volume targets
 5 apply), run 208 (representing the best possible achievement of old growth forest), 214 (representing
 6 the benchmark to attain the best possible landscape class and habitat class objective indicators when
 7 applying all targets simultaneously), run 215 (representing the minimum amount of harvest required to
 8 meet landscape guide targets), and run 229 (the proposed management alternative) across 11 terms
 9 (100 years into the future).

10 Notice that only where the objective to maximize volume and no other objectives are applies is the
 11 amount of old growth not achieved.

12 *Table 31: Achievement of old growth forest*

Percent LC	Case	Term 1	2	3	4	5	6	7	8	9	10	11
LOD	102	100%	100%	83%	69%	67%	60%	61%	54%	55%	56%	59%
	208	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	214	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	215	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	229	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

13

14 Table 32 presents a numerical value of the amount of area contributing to old growth forest at term 2
 15 (ten years in the future), 3 (20 years into the future), and 11 (100 years into the future) in run 229 (the
 16 selected management alternative).

17 *Table 32: Numerical achievement of old growth forest at objective assessment terms*

LCArea Case	Lower Quartile	Upper Quartile	At Year		
			2029	2039	2119
229	161,105	245,100	220,495	210,809	161,105

18

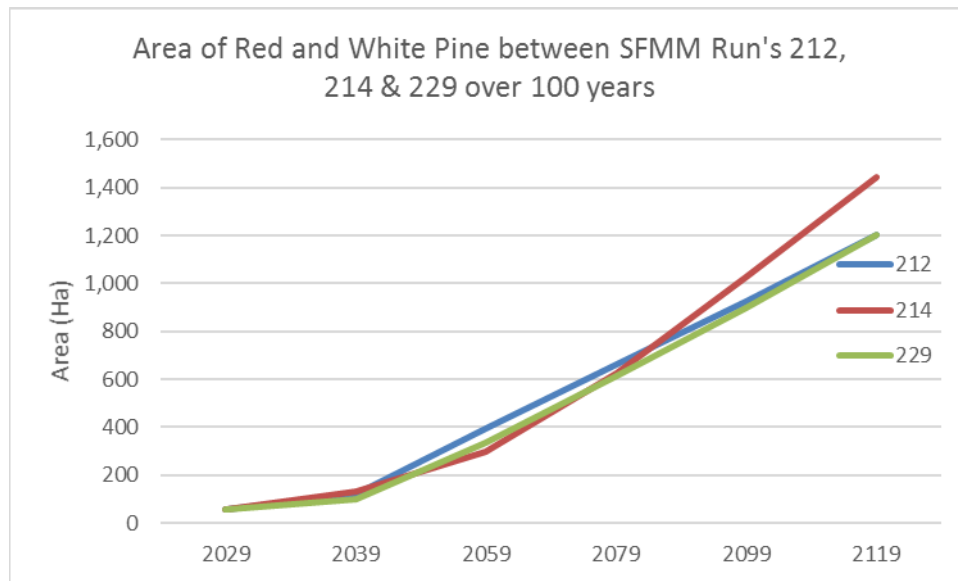
19 **3.6.10 Red and White Pine – Objective 2.1.6**

20 Red and white pine objective targets are a small proportion of the Pic Forest (0.006%). At plan start
 21 there are 57ha that contribute to the red and white pine indicator (Table 21). There are no bounds of
 22 variation (upper and lower limits) for red and white pine. Instead, the objective is to strategically move
 23 the forest towards the estimated pre-industrial amount of red and white pine. The estimated pre-
 24 industrial amount of red and white pine on the Pic Forest is 1,128ha.

25 In the model, strategically, the amount of red and white pine is increased by applying a CLAAG
 26 treatment to the forest unit CONMX. Whereas when a CLAGG treatment is applied to CONMX, 60% of
 27 the time the stand returns to the forest unit PRWMX. The intent is that, where encountered, red and
 28 white pine trees within or adjacent to a harvest area will be maintained, and special silvicultural

1 treatments will be applied to foster the natural ingress (through seed), of the pine trees. In operation,
 2 this will happen quite rarely, and will only be applied where red and/or white pine are present. For
 3 more details, consult the “Red and White Pine” CRO (Link to CRO - [Red and White Pine](#)). Within the
 4 model there is only a lower target for Pr+Pw. Due to succession, the amount of Pr+Pw increases
 5 regardless of generic yield targets in the model. Because we have no post harvest renewal pathway
 6 leading to Pr+Pw, it would be futile to apply a target, as there is no tool the model has to promote
 7 Pr+Pw through harvest. The landscape guide milestone direction is to increase the amount of red and
 8 white pine in the short, medium, and long terms. Milestone direction is achieved across the planning
 9 horizon.

10 Figure 29 provides an overview of the strategic increase in the amount of red and white pine over the
 11 planning horizon, compared across 3 runs. Run 212 representing a model run with the only objective to
 12 promote the area of red and white pine to the preindustrial level, 214 (representing the benchmark to
 13 attain the best possible landscape class and habitat class objective indicators when applying all targets
 14 simultaneously), and run 229 (the selected management alternative).



15
 16 *Figure 29: Area of Red and White Pine between SFMM Run's 212, 214 & 229 over 100 years*

17 Table 33 presents a numerical value of the amount of area contributing to red and white pine at term 2
 18 (ten years in the future), 3 (20 years into the future), and 11 (100 years into the future) in run 229 (the
 19 selected management alternative).

20 *Table 33: Numerical achievement of red and white pine at objective assessment terms*

LCArea Case	Lower Quartile	Upper Quartile	At Year 2029	2039	2119
229	57	57	57	99	1,200

21

1 3.6.11 All Ages Conifer – Objective 2.1.7

2 All ages conifer is a culmination of all pure or conifer dominated forest units as detailed in Table 16. The
3 lower limit of all ages conifer is 520,753ha (Table 21). At plan start, 359,018ha contribute to the class.

4 The analysis task team determined that without wood supply constraints applied (run 214), the forest
5 could meet the minimum target for the class at term 7 (60 years into the future). If achievement of all
6 ages conifer is the only model objective (run 209) then the target can be met in term 5 (40 years in the
7 future). There is no possibility for the forest to meet the targets in the short, or medium terms. The
8 analysis task team determined that meeting the target at term 11 (100 years into the future) allowed
9 enough flexibility for wood supply targets to be met. The target is met in the long term. This direction
10 adheres to the milestone direction for the Pic Forest where the direction is to increase in the short and
11 medium term, and maintain in the long term.

12 Table 34 displays the percent achievement of the all ages conifer objective between runs 102
13 (representing a run where a sustainable harvest is maximized where no other non-volume targets
14 apply), run 209 (representing the best possible achievement of all ages conifer), 214 (representing the
15 benchmark to attain the best possible landscape class and habitat class objective indicators when
16 applying all targets simultaneously), run 215 (representing the minimum amount of harvest required to
17 meet landscape guide targets), and run 229 (the proposed management alternative) across 11 terms
18 (100 years into the future).

19 *Table 34: Achievement of all ages conifer*

Percent LC	Case	Term 1	2	3	4	5	6	7	8	9	10	11
LSP	102	69%	70%	79%	81%	82%	82%	83%	82%	81%	81%	82%
	209	69%	71%	82%	92%	100%	100%	100%	100%	100%	100%	100%
	214	69%	72%	81%	85%	90%	94%	99%	100%	100%	100%	100%
	215	69%	69%	80%	84%	91%	94%	100%	100%	100%	100%	100%
	229	69%	69%	79%	84%	87%	92%	94%	95%	95%	99%	100%

20

21 Table 35 presents a numerical value of the amount of area contributing to all ages conifer at term 2 (ten
22 years in the future), 3 (20 years into the future), and 11 (100 years into the future) in run 229 (the
23 selected management alternative).

24 *Table 35: Numerical achievement of all ages conifer at objective assessment terms*

LCArea Case	Lower Quartile	Upper Quartile	At Year		
			2029	2039	2119
229	520,756	578,089	361,348	413,759	528,756

25

26 3.6.12 Young Forest – Objective 2.1.8

27 The young forest target is a summation of all forest, regardless of origin, less than thirty-six (36) years in
28 age. The lower and upper bounds for this objective are 161,341ha and 322,538 respectively (Table 21).
29 At plan start, the forest is within the target range and has 295,349ha that contributes to young forest.

1 The analysis task team determined that the young forest objective was not a binding target in the
 2 model. The only runs that do not sustain the full achievement of young forest were the maximize
 3 volume (102) runs, where maximize harvest exceeds the amount of young forest prescribed. The
 4 indicator is able to be achieved throughout the entire 160-year planning horizon regardless of wood
 5 supply constraints. The target is achieved in the short, medium, and long term.

6 Table 36 displays the percent achievement of the young forest objective between runs 102
 7 (representing a run where a sustainable harvest is maximized where no other non-volume targets
 8 apply), run 209 (representing the best possible achievement of young forest), 214 (representing the
 9 benchmark to attain the best possible landscape class and habitat class objective indicators when
 10 applying all targets simultaneously), run 215 (representing the minimum amount of harvest required to
 11 meet landscape guide targets), and run 229 (the proposed management alternative) across 11 terms
 12 (100 years into the future).

13 *Table 36: Achievement of young forest*

Percent LC	Case	Term 1	2	3	4	5	6	7	8	9	10	11
LYG	102	100%	80%	77%	77%	89%	100%	100%	100%	99%	100%	100%
	213	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	214	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	215	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	229	100%	100%	98%	100%	100%	100%	100%	100%	100%	100%	100%

14

15 Table 37 presents a numerical value of the amount of area contributing to young forest at term 2 (ten
 16 years in the future), 3 (20 years into the future), and 11 (100 years into the future) in run 229 (the
 17 selected management alternative).

18 *Table 37: Numerical achievement of young forest at objective assessment terms*

LCArea Case	Lower Quartile	Upper Quartile	At Year		
			2029	2039	2119
229	161,341	322,538	316,662	330,182	322,538

19

20 **3.6.13 Pattern**

21 The Forest Management Planning Manual (FMPM), requires certain indicators to be planned and
 22 measured based on their spatial arrangement (or pattern) across the forest. Distribution of proposed
 23 harvest impacts spatial targets, and therefore, planning of preferred harvest areas considers the relation
 24 to the impact on the spatial (or pattern) targets.

25 Many important concepts in landscape ecology (e.g., fragmentation, edge effect, corridors and
 26 connectivity, metapopulation dynamics, reverse size) are related to pattern as well as amount of area.
 27 Numerous studies identified differences in landscape patterns resulting from forest harvest when
 28 compared to fire disturbances. Results vary depending on scale of measurement and spatial proximity
 29 rules for defining “disturbances”. Differences in opinion exist about the importance of landscape

1 pattern biodiversity conservation. Whereas there is not yet a definite answer on whether the primary
2 importance of habitat is its amount, regardless of arrangement, or a factor of amount by arrangement.
3 Therefore, although operations are designed to move toward spatial means, the primary goal at this
4 early stage in spatial planning is to begin a record to documenting spatial arrangement for future use.

5 The Ontario Landscape Tool (OLT) was used to generate landscape pattern maps for all pattern
6 objectives. Landscape maps can be viewed in the Supplemental Documentation.

7 The following pattern objectives are related in many ways to habitat provided for wildlife persisting in
8 both interior forest environments, and forest edge environments. Results are often outcomes of
9 different forest management actions such as having large or small areas. Pattern and connectivity
10 objectives mean different things to different species and are designed to provide habitat requirements
11 for a wide range of species.

12 The strategic model used to aid in the development of the proposed Long-Term Management Direction
13 for this Plan was the Strategic Forest Management Model (SFMM). SFMM is a non-spatial, linear,
14 optimization model. SFMM does not have the ability to model spatial targets, nor to plan preferred
15 harvest areas. Some other strategic models available today have the ability to provide spatial context
16 (e.g., Woodstock/Stanley, Patchworks), however, these models are often more complex, and are not as
17 widely understood, or used in forestry. SFMM remains the industry standard for forest management
18 planning.

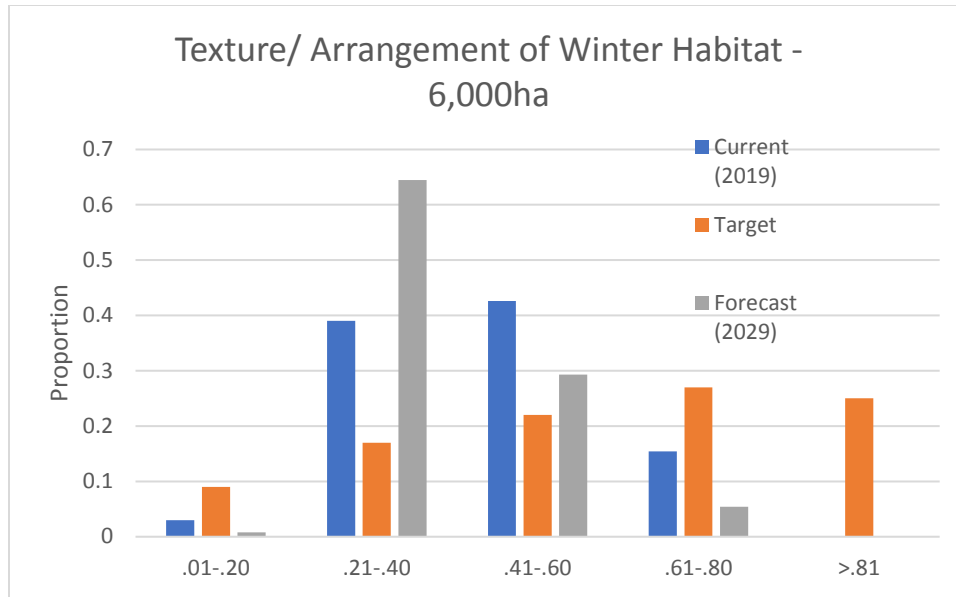
19 *3.6.13.1 Texture and Arrangement of Caribou Winter Habitat – Objective 1.1.3*

20 The arrangement and connectivity of caribou habitat is directed by the identification and placement of
21 forest management activities intended to emulate disturbances that will encourage the maintenance
22 and enhancement of caribou range occupancy including developing specific forest composition
23 attributes that allow those landscape patches to fulfill their ecological role for caribou.

24 Spatial targets for the texture and arrangement of caribou winter habitat were set through the Ontario
25 Landscape Tool (OLT) and confirmed by the analysis task team. Although spatial factors were
26 considered in the development of the Dynamic Caribou Habitat Schedule (DCHS), this pattern indicator
27 is directly tied to the scheduled harvest in this zone.

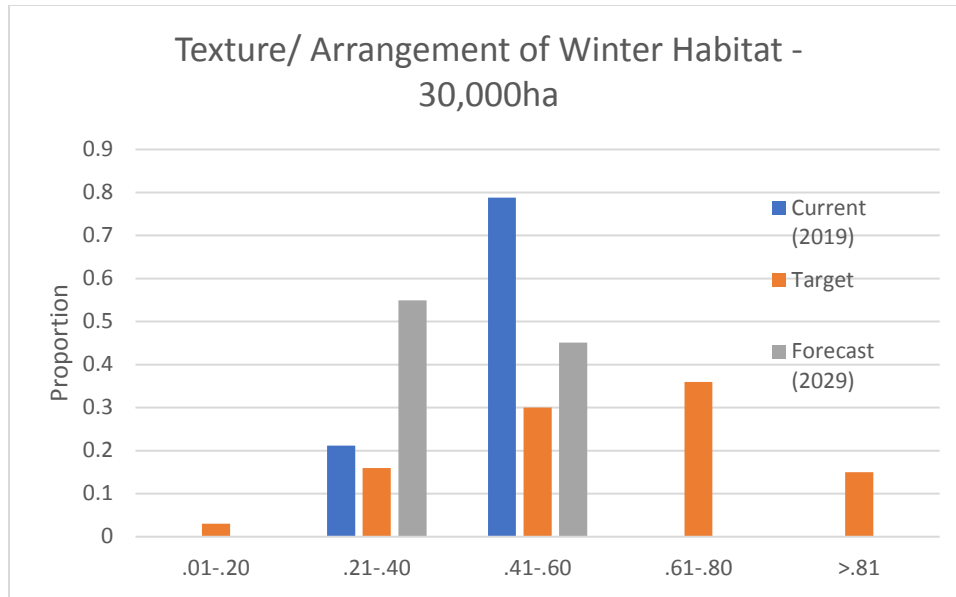
28 This indicator is measured at two (2) scales; 6,000ha and 30,000ha. Figure 30 and Figure 31 show the
29 texture and arrangement of the caribou winter habitat indicator as a histogram to qualify the proportion
30 of caribou winter habitat (Y axis) by the relative proportion of winter habitat within different patch size
31 classes (X axis). Table 38 and Table 39 display the numeric values of the texture and arrangement of
32 caribou winter habitat. Implementation of the DCHS throughout time greatly influences the
33 achievement of these targets. The landscape guide milestone direction is to move toward the target
34 mean (orange bar) focusing on 60% and greater proportion classes. Results of forecasting harvest of
35 preferred harvest areas result in mixed achievement of milestone targets. Pattern and size
36 consideration were given while designing the DCHS blocks, and one would assume create larger patches
37 of habitat. Perhaps in subsequent plans when larger disturbance patches grow to contribute to habitat,
38 60% and greater proportion classes will move toward the mean. Future monitoring will track
39 achievement of the target.

40



- 1
- 2 *Figure 30: Achievement of texture/ arrangement of winter habitat - 6,000ha*
- 3 *Table 38: Achievement of texture/ arrangement of winter habitat - 6,000ha*

Texture/ Arrangement of Winter Habitat			
6,000ha frequency (Proportion of Hexagon)	Current (2019)	Target	Forecast (2029)
.01-.20	0.03	0.09	0.008
.21-.40	0.39	0.17	0.645
.41-.60	0.426	0.22	0.293
.61-.80	0.154	0.27	0.054
>.81	0	0.25	0



- 1
- 2 *Figure 31: Achievement of texture/ arrangement of winter habitat - 30,000ha*
- 3 *Table 39: Achievement of texture/ arrangement of winter habitat - 30,000ha*

30,000ha frequency (Proportion of Hexagon)	Current (2019)	Target	Forecast (2029)
.01-.20	0	0.03	0
.21-.40	0.212	0.16	0.549
.41-.60	0.788	0.3	0.451
.61-.80	0	0.36	0
>.81	0	0.15	0

4

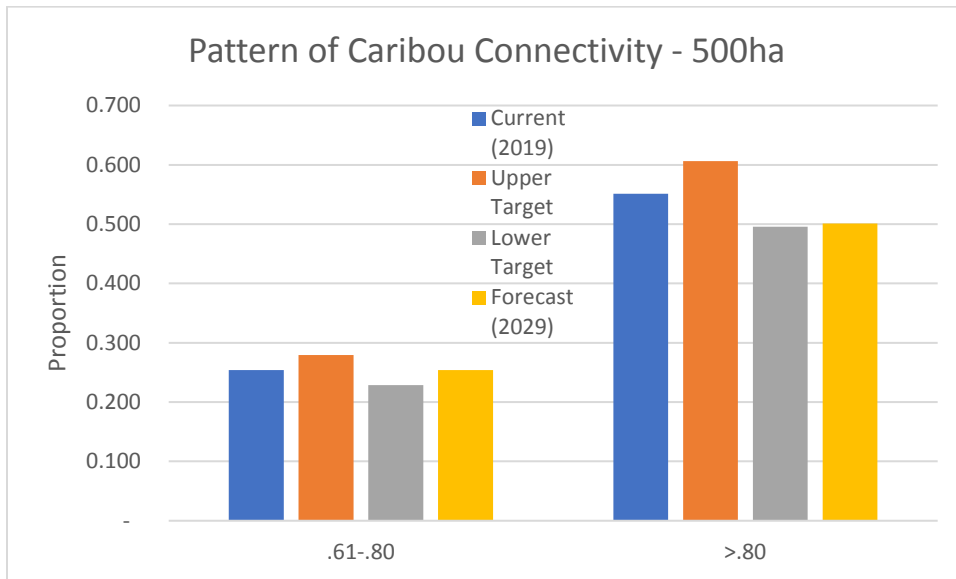
5 *3.6.13.2 Pattern of Caribou Connectivity – Objective 1.3.2*

6 The arrangement and connectivity of caribou habitat in the zone of connectivity is directed by the
 7 identification and placement of forest management activities intended to emulate disturbances that will
 8 encourage the movement of caribou through this zone including developing specific forest composition
 9 attributes that allow those landscape patches to fulfill their ecological role for caribou.

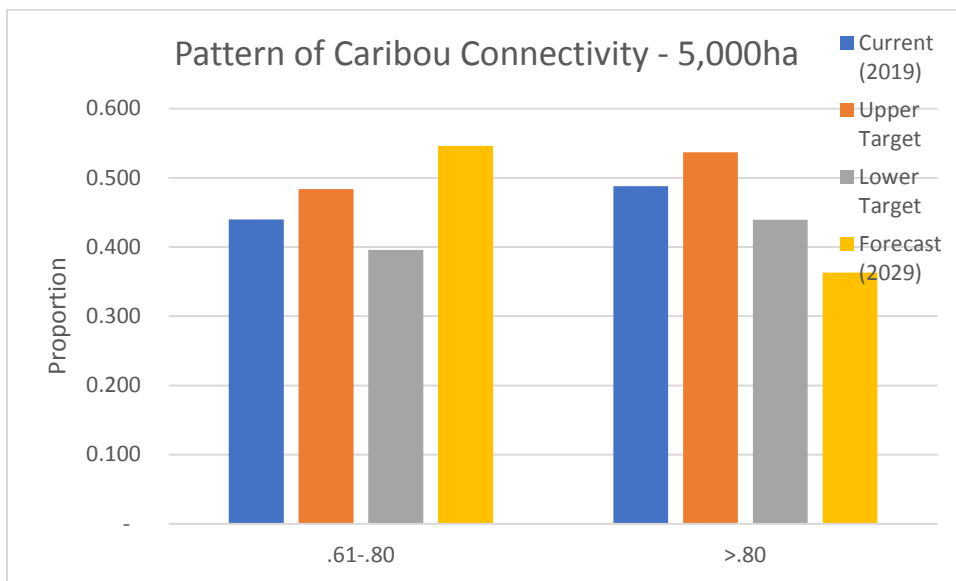
10 This indicator measures the relative proportions of mature and old forest within the zone of connectivity
 11 (on the east side of the forest, adjacent to the White River Forest). Results for this indicator were
 12 measured through OLT, however targets were set by the planning team. Targets for this indicator are
 13 no more than a 10% change in the first term.

14 This indicator is measured at two (2) scales; 500ha and 5,000ha. Figure 32 and Figure 33 show the
 15 pattern of caribou connectivity (proportion of mature and old forest) indicator as a histogram to qualify

- 1 the proportion of caribou connectivity (Y axis) within different patch size classes (X axis). Table 40
- 2 displays numeric achievement of caribou habitat connectivity at the 500ha and 5,000ha scale.



3
4 *Figure 32: Pattern of Caribou Connectivity - 500ha*



5
6 *Figure 33: Pattern of Caribou Connectivity - 5,000ha*

7
8 *Table 40: Pattern of Caribou Connectivity - 500 and 5,000ha*

Proportion of Hexagon - 500ha	Current (2019)	Upper Target	Lower Target	Forecast (2029)
.61-.80	0.25	0.28	0.23	0.25
>.80	0.55	0.60	0.50	0.50

.61-.80	0.254	0.28	0.23	0.254
>.80	0.551	0.61	0.50	0.501
Proportion of Hexagon - 5,000ha	Current (2019)	Upper Target	Lower Target	Forecast (2029)
.61-.80	0.440	0.48	0.40	0.546
>.80	0.488	0.54	0.44	0.363

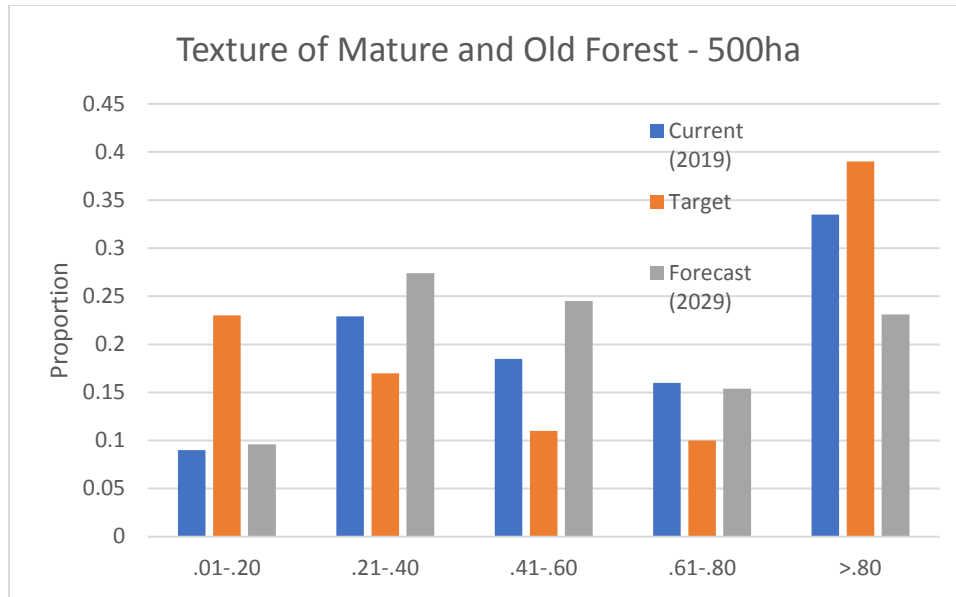
1

2 *3.6.13.3 Texture of Mature and Old Forest – Objective 3.1.1*

3 Two assessment levels for this indicator are used because it is possible that the texture measurement at
 4 one level, as expressed in a proportional frequency histogram, is exactly the same between two
 5 landscapes while the same texture measurement at a finer or coarser scale is quite different. In other
 6 words, measuring the landscape texture at two (2) levels allows better characterization of the spatial
 7 configuration of the landscape than just a single measurement.

8 The texture of mature and old forest is measured at 500ha and 5,000ha scales. Spatial targets for the
 9 texture and arrangement of caribou winter habitat were set through the Ontario Landscape Tool (OLT)
 10 and confirmed by the analysis task team. The landscape guide milestone direction is to move toward
 11 the target mean (orange bar). Results of forecasting harvest of preferred harvest areas result in mixed
 12 achievement of milestone targets. Pattern and size consideration were given to allocations planning to
 13 create a future landscape of more large/contiguous disturbance patches. Perhaps in subsequent plan as
 14 management intervention begins to erase the past management objectives (i.e. Moose management)
 15 the target for mature and old forest will move toward the mean. Future monitoring will track
 16 achievement of the target.

17 Figure 34 and Figure 35 show the pattern of mature and old forest indicator as a histogram to qualify
 18 the proportion of mature and old forest (Y axis) by the relative proportion mature and old forest within
 19 different patch size classes (X axis). Table 41 and Table 42 provide a numeric expression of the
 20 achievement of texture of mature and old forest.

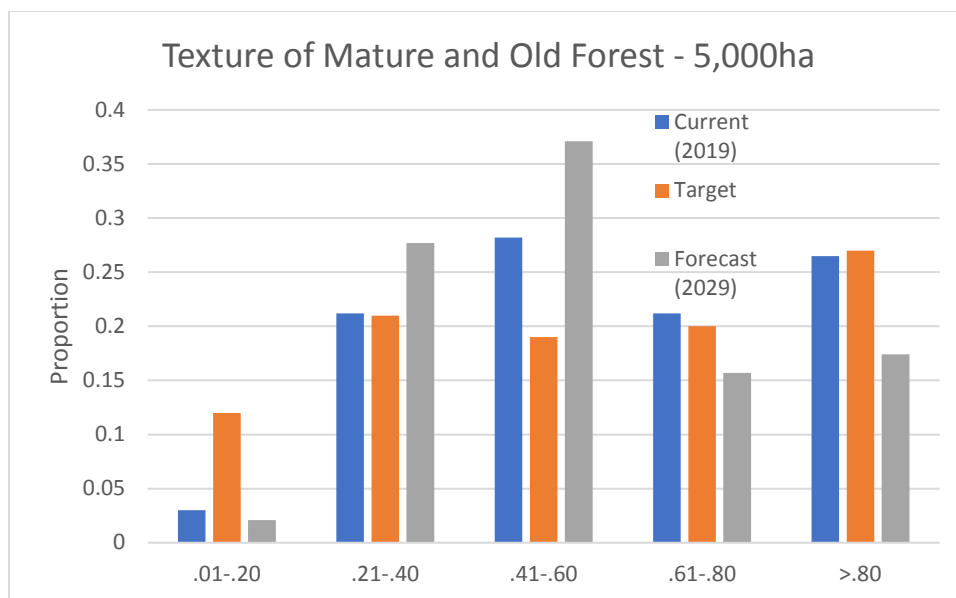


1

2 *Figure 34: Texture of Mature and Old Forest - 500ha*

3 *Table 41: Texture of Mature and Old Forest - 500ha*

500ha Frequency (Proportion of Hexagon)	Current (2019)	Target	Forecast (2029)
.01-.20	0.09	0.23	0.096
.21-.40	0.229	0.17	0.274
.41-.60	0.185	0.11	0.245
.61-.80	0.16	0.1	0.154
>.80	0.335	0.39	0.231



- 1
- 2 *Figure 35: Texture of Mature and Old Forest - 5,000ha*
- 3 *Table 42: Texture of Mature and Old Forest - 5,000ha*

5,000ha Frequency (Proportion of Hexagon)	Current (2019)	Target	Forecast (2029)
.01-.20	0.03	0.12	0.021
.21-.40	0.212	0.21	0.277
.41-.60	0.282	0.19	0.371
.61-.80	0.212	0.2	0.157
>.80	0.265	0.27	0.174

4

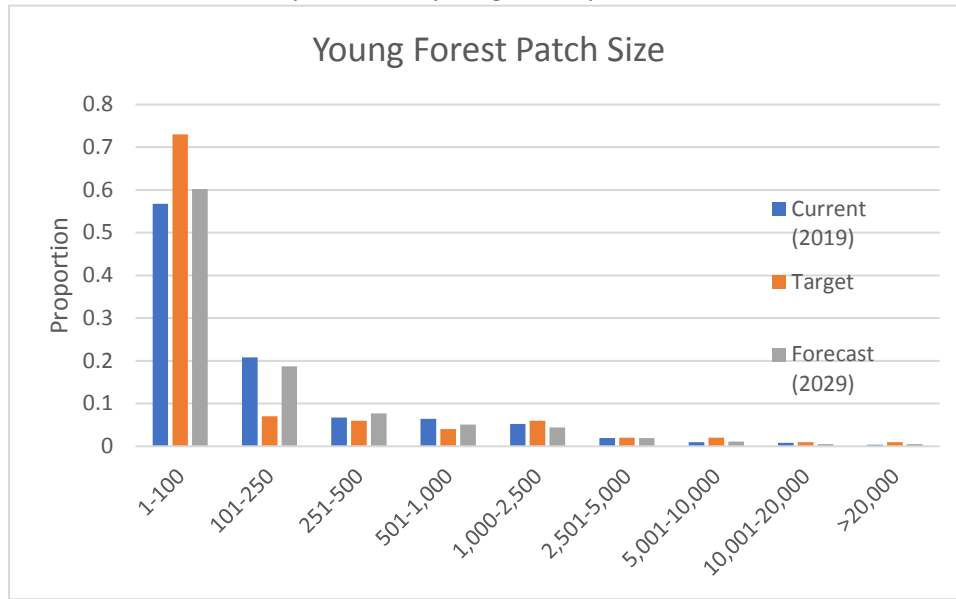
5 *3.6.13.4 Young Forest patch Size – Objective 3.1.2*

6 Young forest includes all forest, regardless of origin, that is younger than 36 years of age. From a forest
 7 management perspective, experience with past forest management guides in Ontario demonstrated
 8 that use of specific patch sizes and shapes can have long-lasting consequences for forests that will
 9 require focused efforts over very long time periods to reverse. Thus it is important to document the
 10 forests at these early stages of development to assist in the long-term sustainable management of the
 11 entire forest. The landscape guide milestone direction is to move toward the target mean (orange bar).
 12 Results of forecasting harvest of preferred harvest areas results in general achievement of milestone
 13 targets.

14 Figure 36 shows the young forest patch size indicator as a histogram to qualify the relative proportion of
 15 young forest patches (Y axis) by the different patch size classes (X axis). Table 43 provides a numeric

1

expression of young forest patch size.



2

3 *Figure 36: Achievement of young forest patch size*

4 *Table 43: Achievement of young forest patch size*

Proportion of Hexagon	Current (2019)	Target	Forecast (2029)
1-100	0.568	0.73	0.602
101-250	0.208	0.07	0.187
251-500	0.067	0.06	0.077
501-1,000	0.064	0.04	0.051
1,000-2,500	0.052	0.06	0.044
2,501-5,000	0.019	0.02	0.019
5,001-10,000	0.01	0.02	0.011
10,001-20,000	0.008	0.01	0.005
>20,000	0.004	0.01	0.005

5

6 3.6.14 Moose

7 3.6.14.1 Moose Landscape Level Moose Habitat Management

8 Moose habitat is managed at the coarse filter level throughout the Pic Forest through the use of
 9 landscape guide indicators (see section 3.2 Ontario Forest Management Guide for Boreal Landscapes).
 10 The indicators that most closely align with moose habitat are young and mature and old forest both in
 11 structure and composition and pattern. The intent of the coarse filter is to maintain biodiversity at the
 12 landscape level with opportunities for enhancement. Moose are habitat generalists and can use a broad
 13 range of forest conditions to meet their needs. In the majority of cases, moving towards the type and
 14 distribution of habitats that is expected under natural disturbance patterns will also provide a suitable
 15 matrix of habitat for moose.

1 *3.6.14.2 Targeted Moose Habitat Management*

2 In some cases, certain aspects of the amount and arrangement of forest may be targeted for
3 management. Large Landscape Patches (LLPs) with targets/objectives specific to Pic Forest can be used
4 to emphasize moose habitat within a specific geographic area. These LLPs (commonly referred to as
5 Moose Emphasis Areas, or MEAs) should be implemented to achieve a specific goal related directly to
6 moose habitat, where it is determined that the current system (i.e., Boreal Landscape Guide) of meeting
7 landscape level habitat objectives is insufficient. In the case of the Pic Forest 2019-2029 FMP, it was
8 determined that MEAs, or additional specific habitat zones for moose were not required.

9 *3.6.14.3 Pic Forest Moose Habitat Assessment*

10 Within the context of moose policy, and current population status, the specific ability of the habitat
11 arrangement and availability within Pic Forest was assessed by examining the following; habitat
12 capacity, summer browse, winter cover, aquatic feeding areas, and road planning.

13 *3.6.14.4 Policy Context*

14 The management intent for various cervid species within Ontario is outlined within the Cervid Ecological
15 Framework. The Cervid Ecological Framework applies broad management guidance at the zone scale.
16 Broad management guidance should not be used directly as a forest unit or wildlife management unit
17 target, but instead as a tool to direct objective-setting in order to move the forest unit to a desired level
18 of population and habitat density. The Pic Forest falls within Cervid Ecological Zone (CEZ) B. Within this
19 zone, the intent is to maintain a low to moderate moose density population, and to emphasize moose
20 habitat where appropriate.

21 *3.6.14.5 Population Estimates and Targets*

22 Moose population objectives have been set for Wildlife Management Units (WMU) across Ontario,
23 including those that intersect the Pic Forest. The Pic Forest intersects WMU 21A and 21B. Moose
24 population objectives are guided by the broad approach to cervid management outlined in Ontario's
25 Cervid Ecological Framework and Moose Management Policy. These moose population objective setting
26 guidelines are a process of determining a moose population objective that considers a broad range of
27 ecologically-based moose population goals and objectives, at a variety of management scales including
28 broad Cervid Ecological Zones, subZones and WMUs. A moose population objective supports a variety
29 of sustainable social, cultural and economic benefits and activities. Moose population objectives are
30 based on the optimal mix of socio-economic benefits (stakeholder interests, range of activities,
31 accessibility) and the ecologically sustainable (habitat suitability, other cervids, moose ecosystem
32 interactions – predators) bounds of the population. Moose population objectives within the Pic Forest
33 were used to provide direction for moose habitat planning.

34 Current population estimates, trends overtime, and objectives for the two WMUs; 21A, and 21B, located
35 within the Pic Forest were examined (Table 44, Figure 37). The Pic Forest encompasses approximately
36 30 percent of the WMU 21A and approximately 50 percent of WMU 21B. Historical moose observations
37 for both WMU 21A and 21B suggest that moose populations have been relatively stable over the last 25
38 years. The current population estimate for WMU 21B exceeded the objective, whereas the current
39 population estimate for 21A was within the objective range.

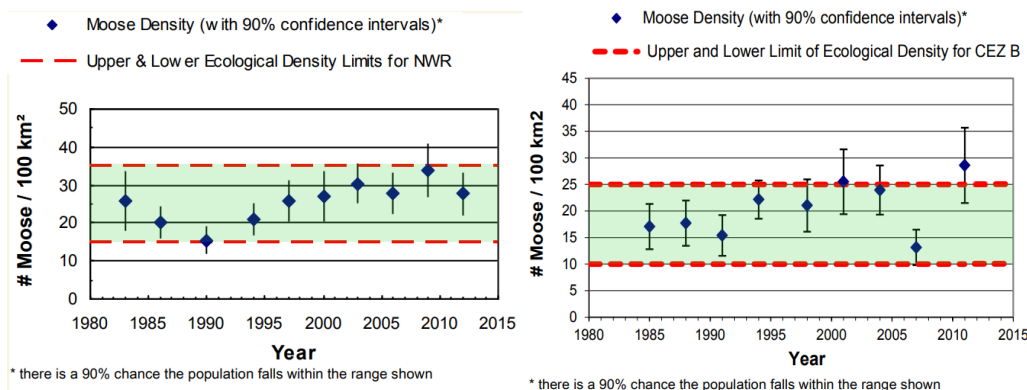
40 The moose population assessment on the Pic Forest would suggest that the moose population is not
41 limiting in this area. This assessment supports the use of the coarse filter level to manage moose

1 habitat within these units. This includes meeting targets associated with structure and composition, as
 2 well as pattern. Also included is the implementation of site specific considerations, including the
 3 protection of features (mineral lick AOC) and consideration for higher quality Moose Aquatic Feeding
 4 Areas (MAFAs) when planning harvest near shorelines.

5 *Table 44: Moose population objectives and estimates within the Pic Forest Wildlife Management Units (WMU) (source; Moose*
 6 *Project 2015)*

WMU	Year 2030 Moose Population Objective	Population Objectives (moose/100km ²)	Current Density (moose/100km ²)	Current Population Estimates (Year)
21A	2800-3800	21.0-28.5	22.0	2928 (2018)
21B	2400-3100	17.8-23.0	26.2	3539 (2015)

7



8

9 *Figure 37: Moose density throughout time within Wildlife Management Units that intersect the Pic Forest (with upper and lower*
 10 *limits of the ecological density for as defined by Cervid Ecological Zones)*

11 **3.6.14.6 Current Habitat**

12 The amount and distribution of moose habitat in the Pic Forest was assessed using a spatial model. The
 13 model used to conduct an initial screening for potential habitat deficiencies or opportunities is included
 14 in Ontario’s Landscape Tool (OLT). It is based on Standard Forest Unit (OWHAM). The results can be
 15 presented in terms of percent available habitat (within a fixed hexagon, how much habitat is suitable),
 16 or in terms of carrying capacity (how many moose the habitat could support). The model does not take
 17 into account additional factors including roads/access, mortality rates in excess of natural (e.g., road or
 18 rail mortality, hunting mortality). The carrying capacity (moose/km²) is not intended to represent the
 19 actual number of moose on the landscape, but rather the capacity of the habitat to support moose
 20 populations without consideration of additional management decisions.

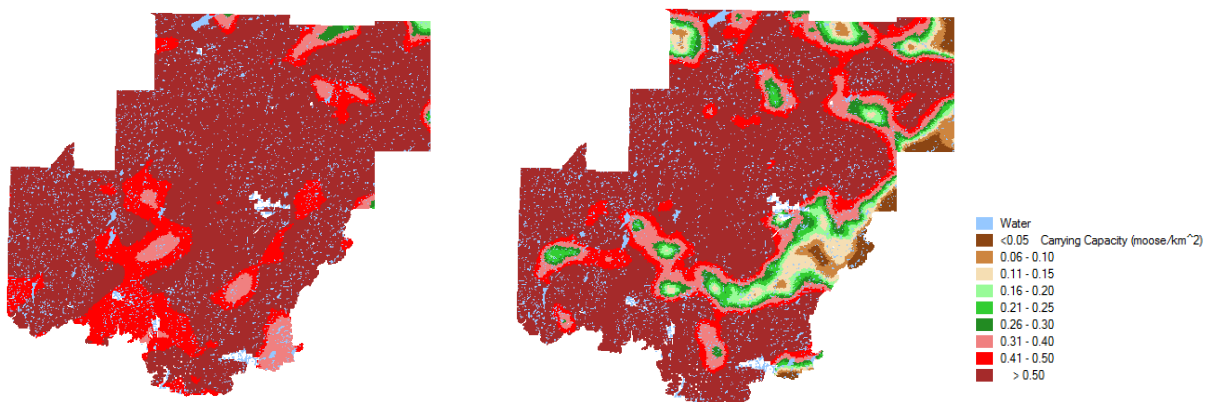
21 Moose habitat is a mosaic in that they require a balance of mature conifer (wintering habitat), open
 22 young forest (foraging), and wetlands (aquatic feeding).

23 Forage is important for growth and reproduction. Generally, forestry operations create foraging
 24 opportunities for moose, particularly in the years post-harvest. The Growing Season Carrying Capacity

1 map (Figure 38-A) indicates that throughout a large portion of the forest, moose have access to suitable
 2 amounts of forage. Some potentially less productive areas were identified; in the caribou continuous
 3 range in the most northern range of the forest unit, along the eastern boarder of the forest, and slightly
 4 reduced within the caribou coastal range. The amount and distribution of this type of habitat will be
 5 managed within the landscape targets for young forest, and young forest patch size.

6 Wintering areas are areas that function to intercept snowfall, creating open areas beneath the canopy
 7 for easy movement in high snowfall years. Moose do not require these habitats every winter, but it is
 8 vital to protect these features for use over the lifetime of a moose. Generally these habitats are mature,
 9 well-stocked, conifer stands with a low topographical relief. The Winter Carrying Capacity map (Figure
 10 38-B) indicates that throughout a large portion of the forest, moose have access to suitable amounts of
 11 winter cover. These habitat types are managed through the mature conifer landscape indicators, as well
 12 as the Mature and Old pattern indicator.

13 Moose Aquatic Feeding Areas are generally not features that can be created through forest
 14 management actions. However these features are not considered to be limiting on the forest. Aquatic
 15 Feeding Areas are maintained and emphasized at the operational phase by applying the water body AOC
 16 prescriptions.



17
 18 *Figure 38: Moose Growing Season Carrying Capacity (A) and Winter Carrying Capacity (B). Darker red support higher densities*
 19 *of moose, while light green areas support the lowest densities of moose based on the different seasonal requirements*

20 Overall, the projected carrying capacity for the seasonal needs of moose all indicates that the majority
 21 of the Pic Forest has the habitat available to maintain moose populations at or above the densities
 22 indicated in the Cervid Ecological Framework.

23 *3.6.14.7 Road Planning*

24 Beyond the changes of the amount and arrangement of moose habitat due to forestry, operations may
 25 impact moose habitat through the creation of access. Ease of hunting is one consideration for the
 26 capacity of a landscape to produce sustainable moose populations. Consideration during planning was
 27 given to the identification of potential areas that currently comprise of suitable habitat with few roads.
 28 The intention is to initiate planning to restrict the placement of new primary or branch roads within this
 29 area, and work to actively decommission any new access roads within a reasonable timeframe post-

1 harvest. This is a similar intent to what is provided within the caribou habitat management zones for
2 road use management strategies. Both moose and caribou habitat can benefit from limitations on
3 roads. During operational planning road planning will be conducted with this intent.

4 In another effort to reduce the pressure of access on moose caused by forest management practices
5 residual forest practices will be planned to minimize this effect. Residual forest planning will follow the
6 guidelines from the Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales,
7 and in addition, opportunities to use residual forest to restrict line of sight to harvested areas along
8 roadways will be planned at the operational planning phase.

9 *3.6.14.8 Pic Forest Moose Habitat Direction*

10 The assessment of currently available moose habitat on the Pic Forest, supported by population
11 observations, indicates that the coarse filter approach on the Pic Forest is adequately managing for
12 moose habitat. Coarse level moose habitat management throughout the Pic Forest will be carried
13 through with the use of the landscape guide indicators. The indicators that most closely align with
14 moose habitat are young, and mature and old forest both in structure and composition and pattern.
15 The current amount and arrangement of these indicators will be assessed and projected through time to
16 ensure alignment with the targets.

17 From the current assessment there does not appear to be a need to establish specific Moose Emphasis
18 Areas, as habitat does not appear to be a limiting factor on the Pic Forest. However, the fine filter
19 application for mineral licks and aquatic feeding areas, through the implementation of Area of Concern
20 prescriptions, within operational planning will continue. In addition to the habitat management
21 strategies, road management strategies will also be considered with the intent on limiting access to
22 reduce the pressure on moose populations within the forest.

23 *3.6.15 Caribou Objective Achievement*

24 *3.6.15.1 Northern Continuous Range*

25 For all runs excluding the Maximize Volume series runs, application of the Northern Dynamic Caribou
26 Habitat Schedule (NDCHS) is, for all intents and purposes, constant. We have applied in the model
27 explicit minimum harvest area constraints in the “A” to “E” blocks in order to force the model to harvest
28 all the eligible area in the specified Terms. The solution is not perfect as there remains in each block a
29 relatively small amount of eligible area in excess of the minimum. In other words, each of the minimum
30 harvest constraints could be slightly increased.

31 A primary issue is the conflict between the NDCHS and the Caribou habitat targets. The constraint to
32 implement the harvest blocks has priority over the Caribou habitat targets. Ideally the targets would
33 align with the blocking. However too many variables, particularly spatial variables, preclude finding a
34 solution that satisfies both the NDCHS requirements and the targets specified for Caribou Winter
35 Refuge, Caribou Winter Preferred and Caribou Winter Use. Table 45, Table 47, and Table 49 present the
36 respective habitat class results. These results, as noted above, remain practically constant, with very
37 minor variation among the cases in which the NDCHS is in effect.

38 **Refuge – Objective 1.1.1**

1 Table 45 displays the percent achievement of the northern continuous range refuge indicator between
 2 runs 102 (representing a run where a sustainable harvest is maximized where no other non-volume
 3 targets apply), 214 (representing the benchmark to attain the best possible landscape class and habitat
 4 class objective indicators when applying all targets simultaneously), run 215 (representing the minimum
 5 amount of harvest required to meet landscape guide targets), and run 229 (the proposed management
 6 alternative) across 11 terms (100 years into the future). Notice there is little difference between runs
 7 214, 215, and 229. In these runs, the DCHS is enforced, therefore harvest is defined and the
 8 achievement, or non-achievement, of targets within the northern continuous range are fixed. The
 9 milestone achievement direction is to increase in the short and medium term and maintain in the long.
 10 The target is achieved in the long term, however does not follow the milestone direction in the short
 11 and medium term because of the enforcement of the DCHS.

12 *Table 45: Achievement of northern continuous range refuge*

Percent LC	Case	Term										
		1	2	3	4	5	6	7	8	9	10	11
CRF	102	83%	71%	64%	69%	76%	79%	80%	78%	81%	79%	81%
	214	83%	75%	77%	84%	94%	100%	100%	100%	100%	100%	100%
	215	83%	76%	77%	83%	94%	100%	100%	100%	100%	100%	100%
	229	83%	75%	77%	83%	93%	100%	100%	100%	100%	100%	100%

13
 14 Table 46 presents a numerical value of the amount of area contributing to the northern continuous
 15 range refuge indicator at term 2 (ten years in the future), 3 (20 years into the future), and 11 (100 years
 16 into the future) in run 229 (the selected management alternative).

17 *Table 46: Numerical achievement of the northern continuous range refuge indicator at objective assessment term*

LCArea Case	At Year		2119		
	Lower Quartile	Upper Quartile	2029	2039	2119
229	133,657	150,427	99,921	102,468	133,657

18
 19 **Winter Preferred – Objective 1.1.2**

20 Table 47 displays the percent achievement of the northern continuous range winter preferred indicator
 21 between runs 102 (representing a run where a sustainable harvest is maximized where no other non-
 22 volume targets apply), 214 (representing the benchmark to attain the best possible landscape class and
 23 habitat class objective indicators when applying all targets simultaneously), run 215 (representing the
 24 minimum amount of harvest required to meet landscape guide targets), and run 229 (the proposed
 25 management alternative) across 11 terms (100 years into the future). Notice there is little difference
 26 between runs 214, 215, and 229. In these runs, the DCHS is enforced, therefore harvest is defined and
 27 the achievement, or non-achievement, of targets within the northern continuous range are fixed. The
 28 milestone achievement direction is to increase in the short and maintain in the medium and long term.
 29 The target is not achieved in the short, medium or long term, and does not follow the milestone
 30 direction in the short medium and long term because of the enforcement of the DCHS.

1 *Table 47: Achievement of northern continuous range winter preferred*

Percent LC	Case	Term										
		1	2	3	4	5	6	7	8	9	10	11
CWP	102	87%	78%	36%	26%	29%	33%	32%	32%	29%	27%	24%
	214	87%	81%	75%	66%	62%	63%	66%	70%	70%	73%	69%
	215	87%	81%	75%	62%	62%	64%	66%	71%	72%	78%	68%
	229	87%	80%	75%	61%	61%	63%	66%	69%	68%	76%	68%

2

3 Table 48 presents a numerical value of the amount of area contributing to the northern continuous
 4 range winter preferred indicator at term 2 (ten years in the future), 3 (20 years into the future), and 11
 5 (100 years into the future) in run 229 (the selected management alternative).

6 *Table 48: Numerical achievement of the northern continuous range winter preferred indicator at objective assessment term*

LCArea Case	Lower Quartile		Upper Quartile		At Year		
	2029	2039	2119	2029	2039	2119	
229	47,889	62,125	38,441	35,699	32,542		

7

8 **Winter Useable – Objective 1.1.2**

9 Table 49 displays the percent achievement of the northern continuous range winter useable indicator
 10 between runs 102 (representing a run where a sustainable harvest is maximized where no other non-
 11 volume targets apply), 214 (representing the benchmark to attain the best possible landscape class and
 12 habitat class objective indicators when applying all targets simultaneously), run 215 (representing the
 13 minimum amount of harvest required to meet landscape guide targets), and run 229 (the proposed
 14 management alternative) across 11 terms (100 years into the future). Notice there is little difference
 15 between runs 214, 215, and 229. In these runs, the DCHS is enforced, therefore harvest is defined and
 16 the achievement, or non-achievement, of targets within the northern continuous range are fixed. The
 17 milestone achievement direction is to increase in the short and maintain in the medium and long term.
 18 The target is not achieved in the short, and medium terms. The target is achieved in the long term. The
 19 target does not follow the milestone direction in the short and medium term because of the
 20 enforcement of the DCHS.

21 *Table 49: Achievement of northern continuous range winter useable*

Percent LC	Case	Term										
		1	2	3	4	5	6	7	8	9	10	11
CWU	102	87%	67%	51%	55%	61%	83%	100%	99%	88%	99%	100%
	214	87%	68%	64%	71%	82%	100%	98%	93%	91%	100%	100%
	215	87%	69%	65%	71%	84%	100%	95%	90%	92%	100%	100%
	229	87%	67%	63%	70%	80%	100%	99%	92%	88%	100%	100%

22

1 Table 50 presents a numerical value of the amount of area contributing to the northern continuous
 2 range winter useable indicator at term 2 (ten years in the future), 3 (20 years into the future), and 11
 3 (100 years into the future) in run 229 (the selected management alternative).

4 *Table 50: Numerical achievement of the northern continuous range winter useable indicator at objective assessment term*

LCArea Case	At Year		2029	2039	2119
	Lower Quartile	Upper Quartile			
229	47,125	68,826	31,493	29,633	60,153

5
 6 *3.6.15.2 Discontinuous Zone – Objective 1.3.1*

7 The objective in the corridor delineated (Figure 26) in the discontinuous zone is to maintain at least 50%
 8 of the area as mature and late conifer dominated forest. The analysis task team established that that
 9 target was equivalent to 20,985ha (Table 21).

10 Much like the Northern Continuous Range, the difference between the scoping runs in the achievement
 11 of the objective to enhance mature and later conifer dominated forest in the areas delineated within the
 12 discontinuous zone (strategic management zones – NDC & SDC, Table 18, Figure 26) is minimal. Table
 13 51 shows a negligible difference in objective achievement in term 7 (60 years into the future). At plan
 14 start the forest is within the lower and upper limits of variation for discontinuous zone – caribou habitat
 15 connectivity (Table 21) and maintains that amount in the short, medium, and long term.

16 Table 51 displays the percent achievement of the discontinuous zone habitat indicator between runs
 17 102 (representing a run where a sustainable harvest is maximized where no other non-volume targets
 18 apply), 211 (representing the caribou habitat connectivity minimum targets achieved to greatest extent)
 19 214 (representing the benchmark to attain the best possible landscape class and habitat class objective
 20 indicators when applying all targets simultaneously), run 215 (representing the minimum amount of
 21 harvest required to meet landscape guide targets), and run 229 (the proposed management alternative)
 22 across 11 terms (100 years into the future). Notice there is little difference between runs 214, 215, and
 23 229.

24 *Table 51: Achievement of discontinuous zone*

Percent LC	Case	Term										
		1	2	3	4	5	6	7	8	9	10	11
CZZ	102	100%	84%	68%	40%	26%	30%	28%	30%	40%	50%	70%
	211	100%	96%	95%	98%	98%	98%	98%	98%	100%	100%	100%
	214	100%	98%	98%	98%	98%	98%	100%	100%	100%	100%	100%
	215	100%	98%	98%	100%	100%	100%	100%	100%	100%	100%	100%
	229	100%	98%	98%	98%	98%	98%	98%	100%	100%	100%	100%

25
 26 Table 52 presents a numerical value of the amount of area contributing to the discontinuous zone
 27 indicator at term 2 (ten years in the future), 3 (20 years into the future), and 11 (100 years into the
 28 future) in run 229 (the selected management alternative).

1 *Table 52: Numerical achievement of the discontinuous zone indicator at objective assessment term*

LCArea LandscapeClass	Case	Lower Quartile	At Year 2019	2029	2039	2119
Discontinuous Zone - Caribou Habitat Connectivity	229	20,985	20,279	19,802	19,802	20,985

2 *3.6.15.3 Coastal Continuous Zone – Objective 1.2.1.1*

3 The objective in the coastal continuous zone is to maintain between 42,107ha and 63,024ha of refuge
4 habitat throughout time (Table 21). Most of the area in the coastal continuous zone, with the exception
5 of strategic management areas CCH7 and CCH12 (Table 18, Figure 26) are deferred for 20 years, or two
6 (2) terms.

7 Table 53 displays the percent achievement of the costal continuous zone refuge indicator between runs
8 102 (representing a run where a sustainable harvest is maximized where no other non-volume targets
9 apply), 210 (representing the caribou habitat coastal minimum targets achieved to greatest extent) 214
10 (representing the benchmark to attain the best possible landscape class and habitat class objective
11 indicators when applying all targets simultaneously), run 215 (representing the minimum amount of
12 harvest required to meet landscape guide targets), and run 229 (the proposed management alternative)
13 across 11 terms (100 years into the future). Notice there is little difference between runs 214, 215, and
14 229.

15 *Table 53: Achievement of coastal continuous zone refuge*

Percent LC	Case	Term										
		1	2	3	4	5	6	7	8	9	10	11
CCO	102	54%	52%	49%	50%	51%	54%	44%	47%	48%	56%	57%
	210	54%	54%	67%	79%	96%	96%	96%	96%	96%	96%	96%
	214	54%	56%	69%	77%	96%	96%	96%	96%	96%	96%	96%
	215	54%	56%	70%	77%	96%	96%	96%	99%	98%	96%	96%
	229	54%	54%	68%	77%	96%	96%	96%	96%	96%	96%	97%

16
17 Table 54 presents a numerical value of the amount of area contributing to the coastal continuous zone
18 refuge indicator at term 2 (ten years in the future), 3 (20 years into the future), and 11 (100 years into
19 the future) in run 229 (the selected management alternative).

20 *Table 54: Numerical achievement of the coastal continuous zone refuge indicator at objective assessment term*

LCArea Case	Lower Quartile	Upper Quartile	At Year 2029	2039	2119
229	42,107	63,024	23,668	29,665	42,483

21
22 **3.7 Long-Term Management Direction**

23 The Long-Term Management Direction represents a balance in the achievement of plan objectives and
24 indicators which include:

- 1 • The provision of a healthy forest ecosystems and diversity (pattern, distribution, composition
- 2 and structure);
- 3 • The provision for values dependent on forest cover (wildlife);
- 4 • The provision for community well-being; and
- 5 • To the provision of a sustainable harvest level.
- 6

7 The Long-Term Management Direction is represented by the types and levels of access, harvest, renewal
8 and tending activities required to achieve the management strategy. SFMM was utilized to develop the
9 Long-Term Management Direction that balances the achievement of all the objectives and indicators
10 that are presented in FMP-10. The long-term management direction and details regarding how the
11 achievement of objectives and indicators was interpreted from the model results can be found in
12 Section 5.2 of the Analysis Package.

13 The outputs of forest modelling provide 100-year projections for quantifiable objectives and are
14 documented in the plan. The projections include:

- 15 • Forest condition for the Crown productive forest (FMP-6)
- 16 • Habitat for selected wildlife species
- 17 • Available harvest area by forest unit (FMP-8)
- 18 • Available harvest volume by species group (FMP-9)
- 19

20 Analysis was conducted in a repetitive manner in order to test hypothesis and to provide opportunities
21 to balance the achievement of objectives and indicators while developing the LTMD for the Pic Forest.
22 Results of the scoping analysis were used to guide the balancing of the objectives and indicators.

23 The LTMD was presented to and endorsed by the Planning Team and the Pic Forest Public Consultation
24 Committee (PFPC). Two presentations were made to the PFPC regarding the proposed LTMD; June
25 20th, 2018 and May 14th, 2018. The LTMD was presented to the MNRF Regional Director, MNRF
26 Northeast Region for endorsement. The public was provided an opportunity to review the LTMD at
27 Stage Two – Review of the Proposed Long-Term Management Direction.

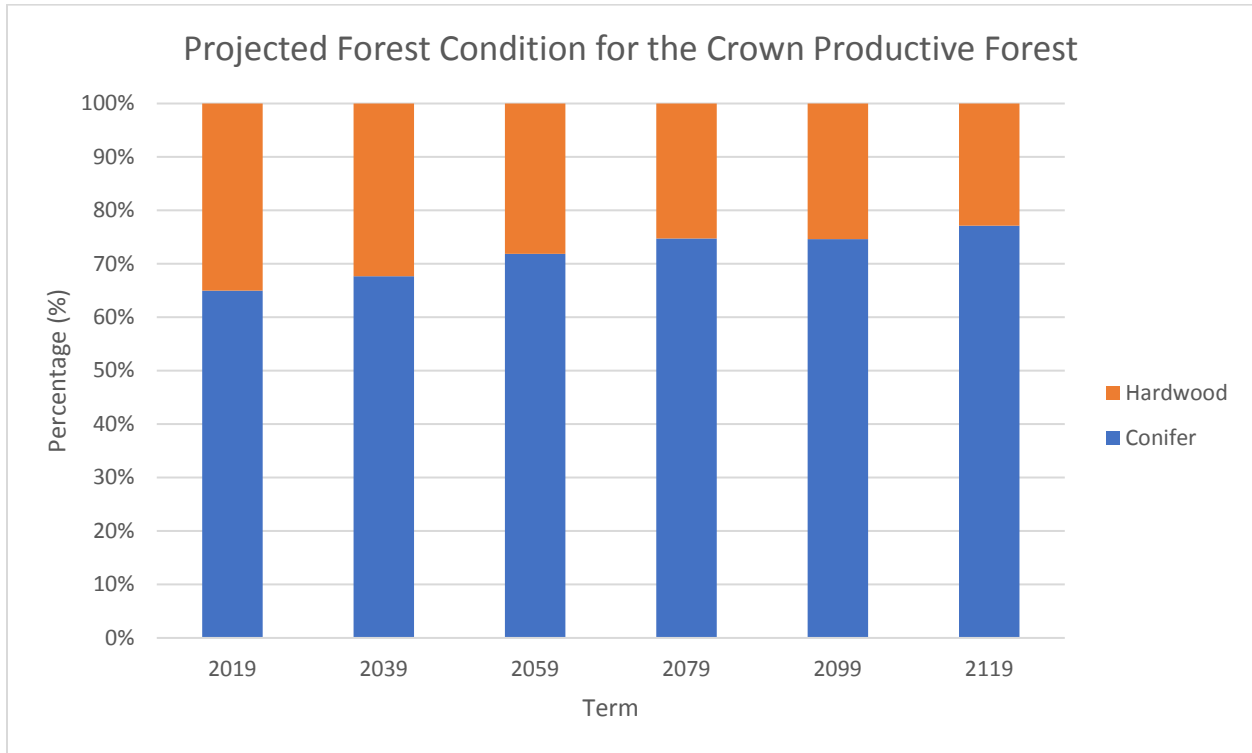
28 Summaries of the desired forest and benefits, plan objectives, indicators, desirable and target levels are
29 included in FMP-10 and have been previously discussed in Section 3.5. The Long-Term Management
30 Direction was assessed for sustainability using the objectives and indicators listed in FMP-10. The
31 assessment of objective achievement is described in detail in Section 3.5.3.

32 **Forest Condition for the Crown Productive Forest**

33 FMP-6 summarizes the area of Crown productive forest by forest unit and age class by twenty-year
34 projections for the management strategy (229). FMP-5 is prepared for ten-year periods every twenty
35 years (i.e. Every second ten year term is shown in the table).

36 Figure 39 shows the proportion of crown productive forest over time. As stated in section 3.6.8 Mature
37 and Late Hardwoods and Hardwood Mixedwoods, the reduction of hardwood and hardwood

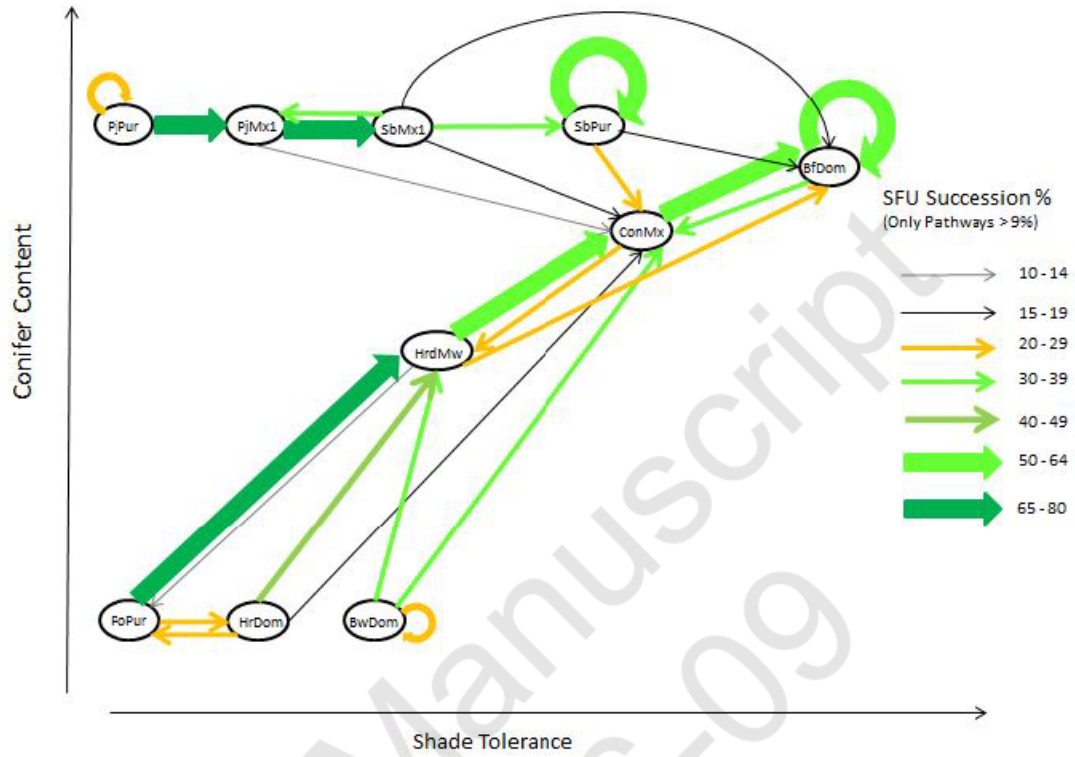
- 1 mixedwoods is among the largest and most overarching targets within the proposed management
- 2 direction.



3
4 *Figure 39: Projected Forest Condition for the Crown Productive Forest*

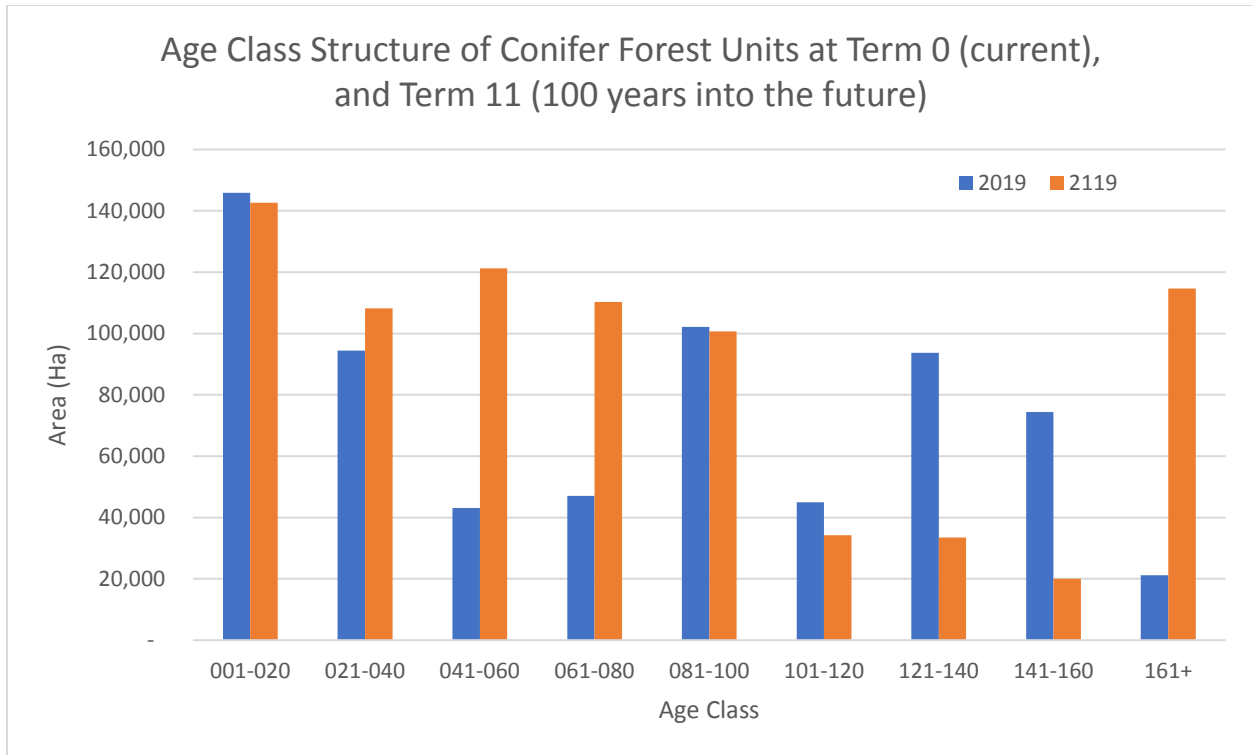
5 Figure 41 and Figure 42 represent the change in age class structure between conifer and hardwood
 6 dominated forest units respectively. The two graphs (Figure 41 and Figure 42) are displayed together in
 7 the aforementioned Figure 39, and show an overall direction towards balancing age classes, and
 8 reduction on mature and late hardwood and hardwood mixedwood forest. The accumulation of area in
 9 the 161+ age class in conifer dominated forest (Figure 41) is due to the successional rules imposed on
 10 the model. Specifically, the succession of forest units to Balsam Fir dominated (BFDOM), and non-
 11 succession of lowland Black Spruce (SBLOW). The most recent scientific studies led by MNRF (*Lennon,*
 12 *Parton, Major, Bowen, 2016, Evidence-based natural successional pathways for forest management*
 13 *planning in northwestern Ontario, Science and Research Branch, Ontario Natural Resources and*
 14 *Forestry.*) regarding natural forest succession show an overwhelming trend of most forest units
 15 succeeding to BFDOM at some point during their succession, as shown in Figure 40. This occurs at the
 16 mature state as forest stands age, and therefore accumulate at older age classes. Additionally, because
 17 of the amount of forest “tied-up” in areas where forest management activities are not prescribed (i.e.
 18 Provincial Parks, Conservation Reserves, Area of Concern buffers), much of this area is not renewed and
 19 transitions in the model to BFDOM.

20 As described in section 3.6.6 Mature and Late Lowland Spruce and Low Other Conifer, the management
 21 direction has applied limits on the harvest of lowland spruce. Lowland spruce can live for an extremely
 22 long period of time, and can effectivity, succeed back into itself at an already mature age. Limiting
 23 harvest in this forest unit, causes the older age classes to accumulate.



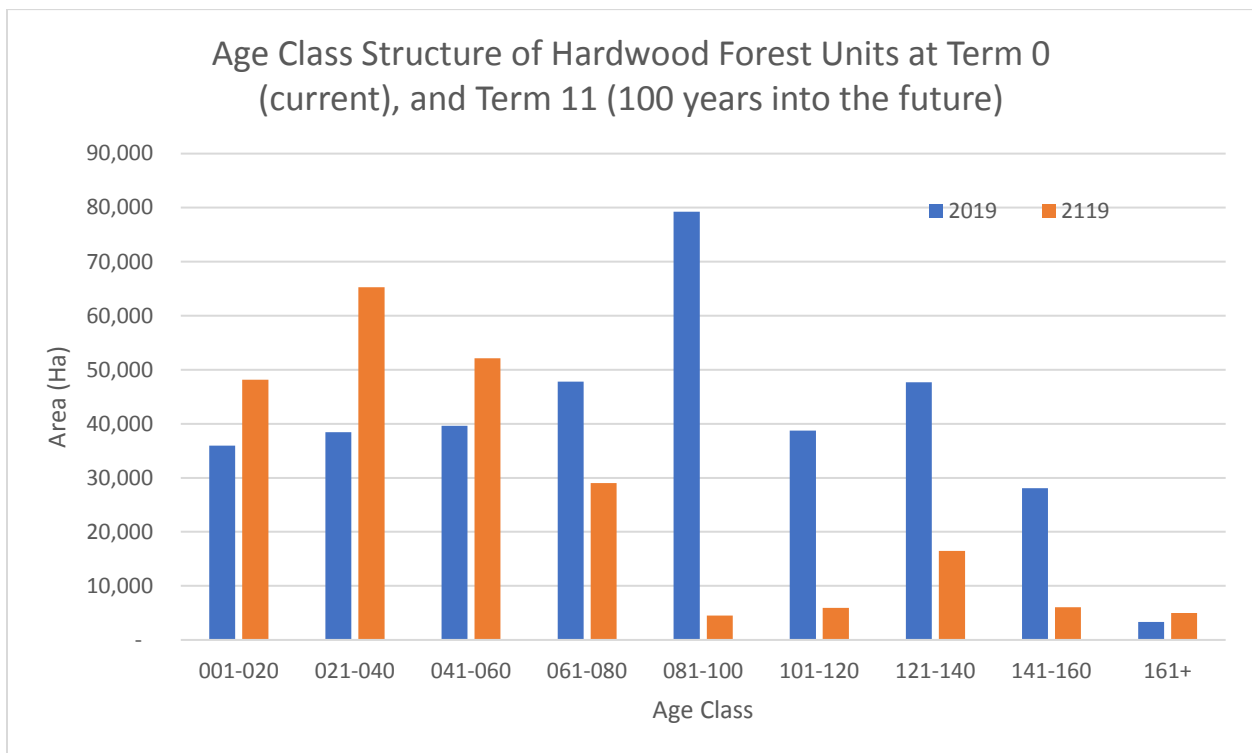
- 1
- 2
- 3
- 4
- 5

Figure 40: Pathways of Boreal Natural Forest Succession (Lennon, Parton, Major, Bowen, 2016, Evidence-based natural successional pathways for forest management planning in northwestern Ontario, Science and Research Branch, Ontario Natural Resources and Forestry.)



1

2 *Figure 41: Age Class Structure of Conifer Forest Units at Term 0 (current), and Term 11 (100 years into the future)*



3

4 *Figure 42: Age Class Structure of Hardwood Forest Units at Term 0 (current), and Term 11 (100 years into the future)*

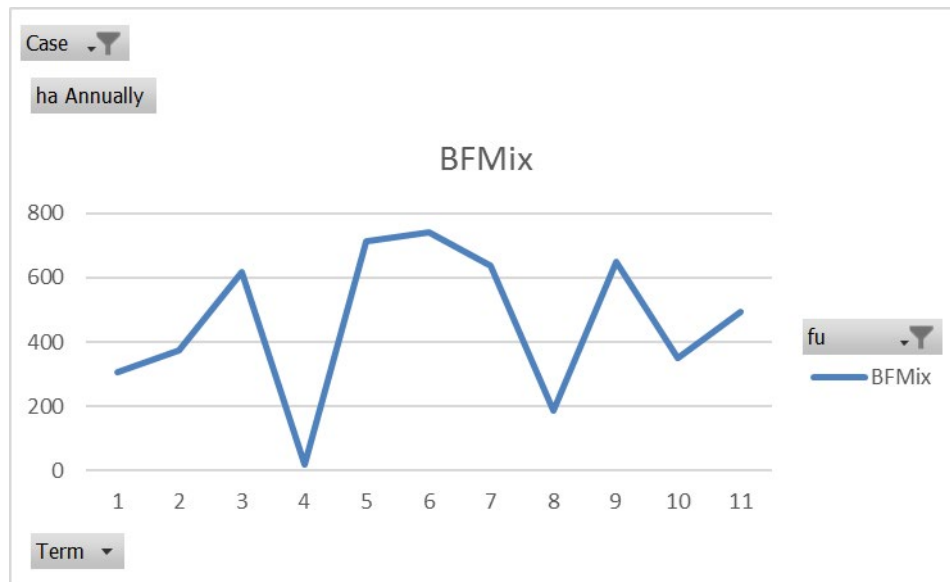
1 3.7.1 Available Harvest Area

2 FMP-8 documents the available harvest area (AHA) for this plan term, as well as projected areas for
 3 future terms, by forest unit. The available harvest area was derived from the management strategy
 4 (229). FMP-8 is prepared for ten-year periods every twenty years (i.e. Every second ten-year term is
 5 shown in the table).

6 Table 55 shows the ten-year available harvest area by forest unit grouping. The overall trend shows a
 7 steady decrease in 10-year available harvest area of 104,642 hectares to a low of 72,409 hectares in
 8 2059 and increasing slightly to 82,155 hectares by 2119.

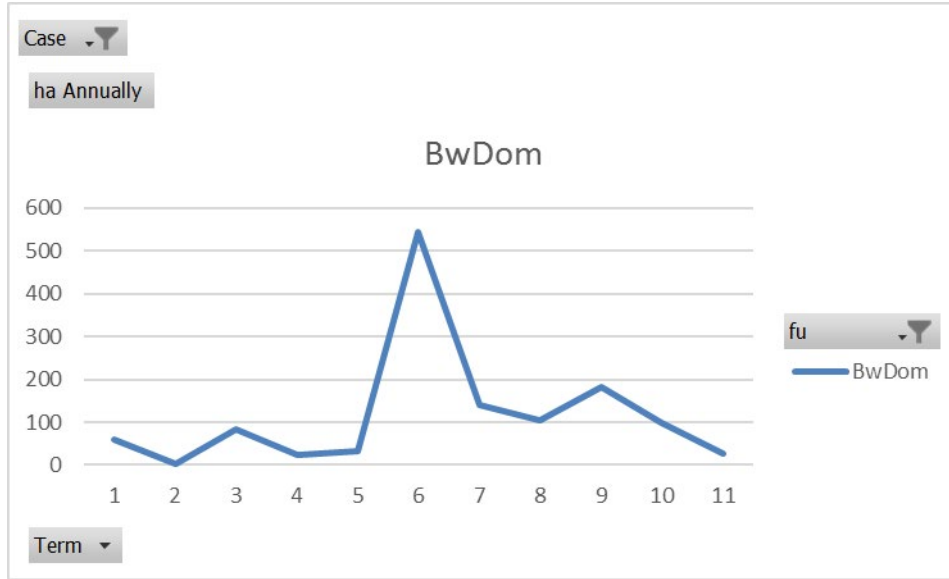
9 The preferred management strategy allocates mostly stands that are all on the present yield curve of
 10 natural origin for the 10-year FMP. In the later terms 2079, 2099 and 2119 the management strategy is
 11 selecting second growth stands that are on yield curves that have more volume per hectare than the
 12 present yield curves thus reducing the area required to achieve the same volume.

13 The following figures and table review available harvest area by forest unit over the planning horizon
 14 (100 years)



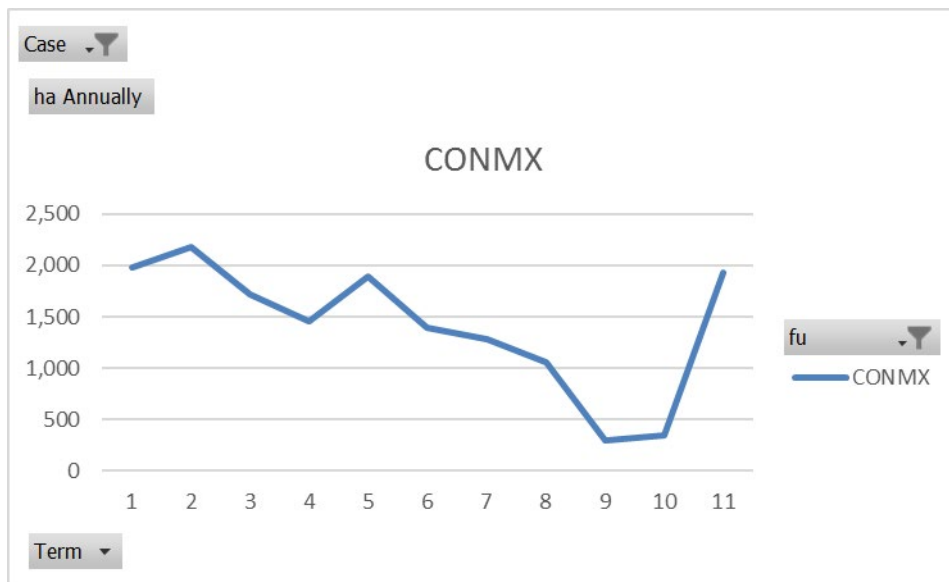
15
 16 *Figure 43: Projected Annual Harvest of BFMIX Across the Planning Horizon*

17



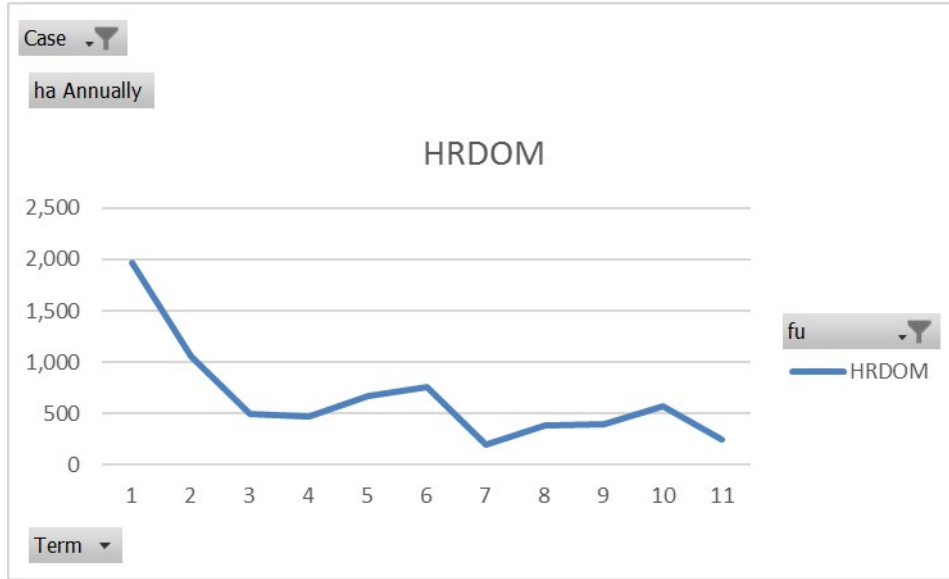
1

2 *Figure 44: Projected Annual Harvest of BWDOM Across the Planning Horizon*

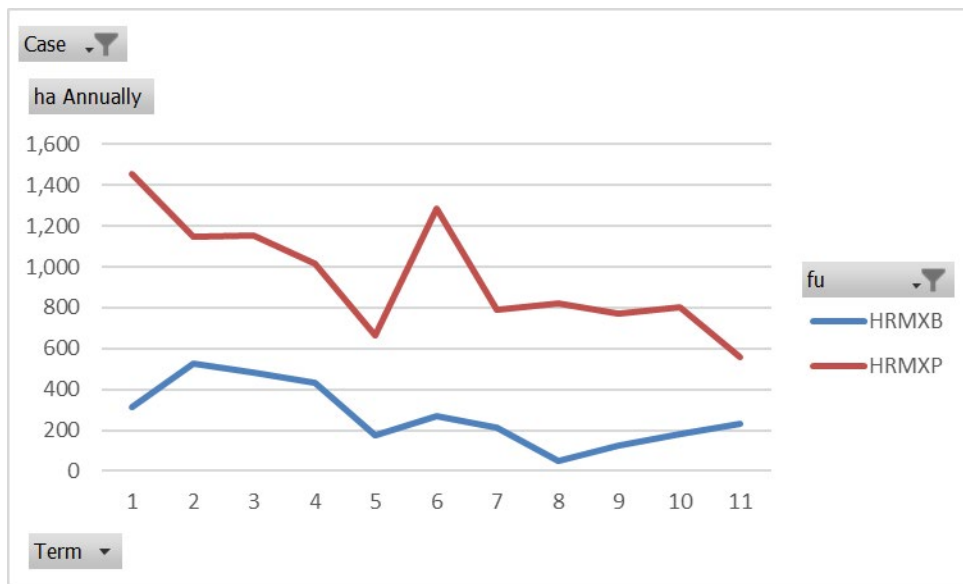


3

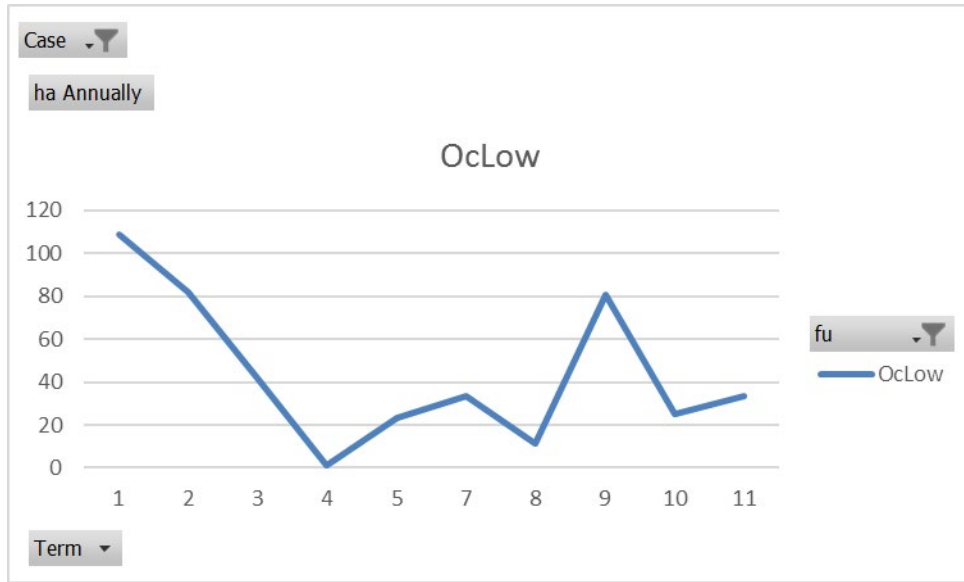
4 *Figure 45: Projected Annual Harvest of CONMX Across the Planning Horizon*



1
2 *Figure 46: Projected Annual Harvest of HRDOM Across the Planning Horizon*

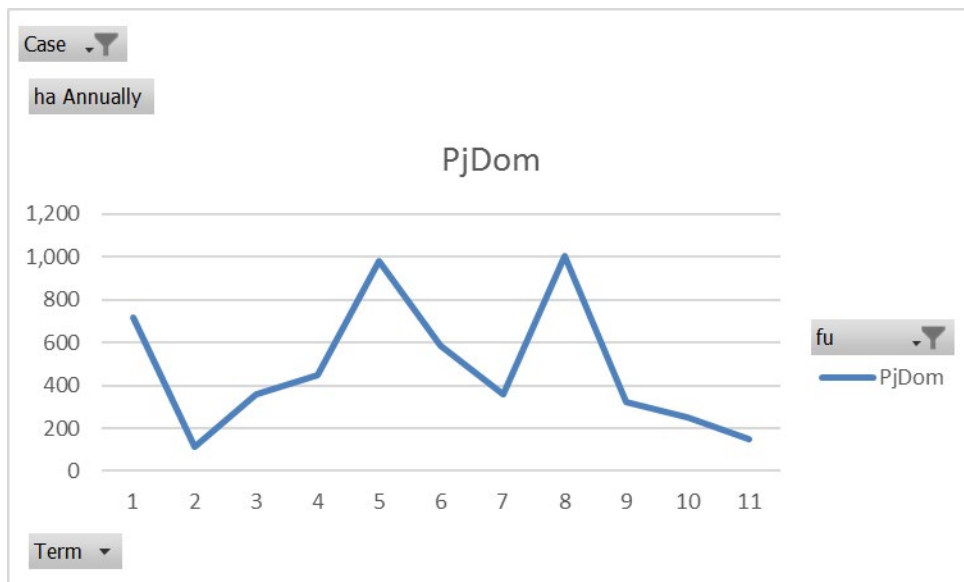


3
4 *Figure 47: Projected Annual Harvest of HRMPB & HRMXP Across the Planning Horizon*



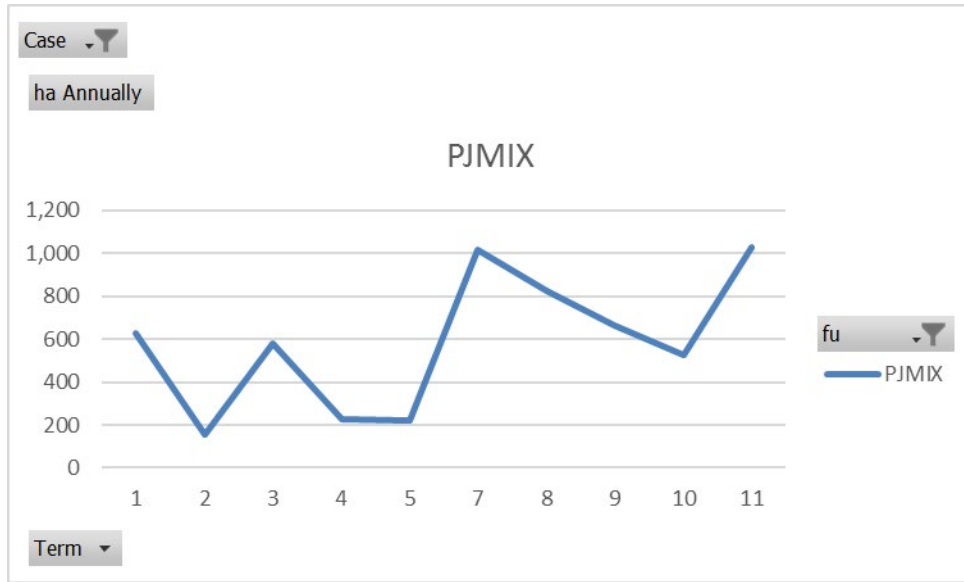
1

2 *Figure 48: Projected Annual Harvest of OCLOW Across the Planning Horizon*



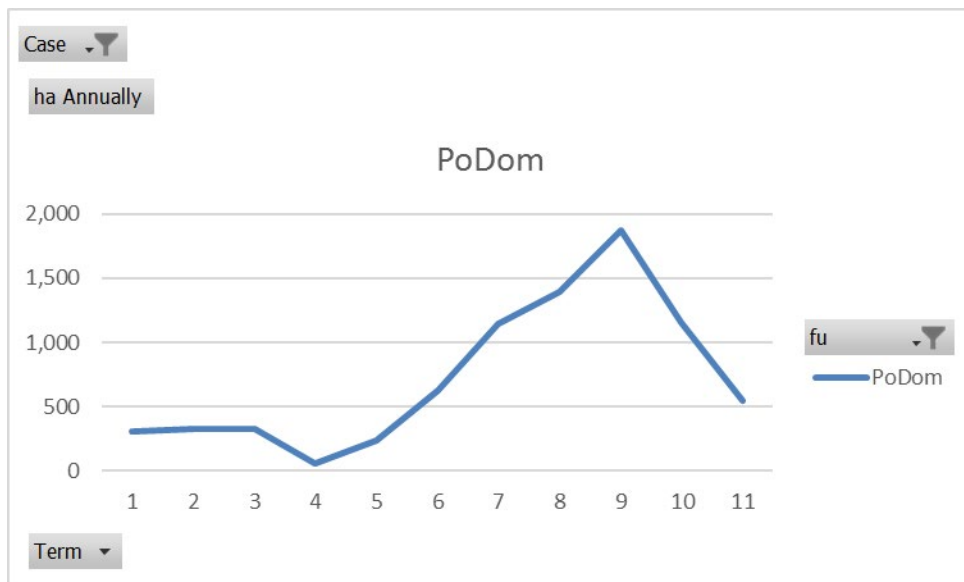
3

4 *Figure 49: Projected Annual Harvest of PJDOM Across the Planning Horizon*



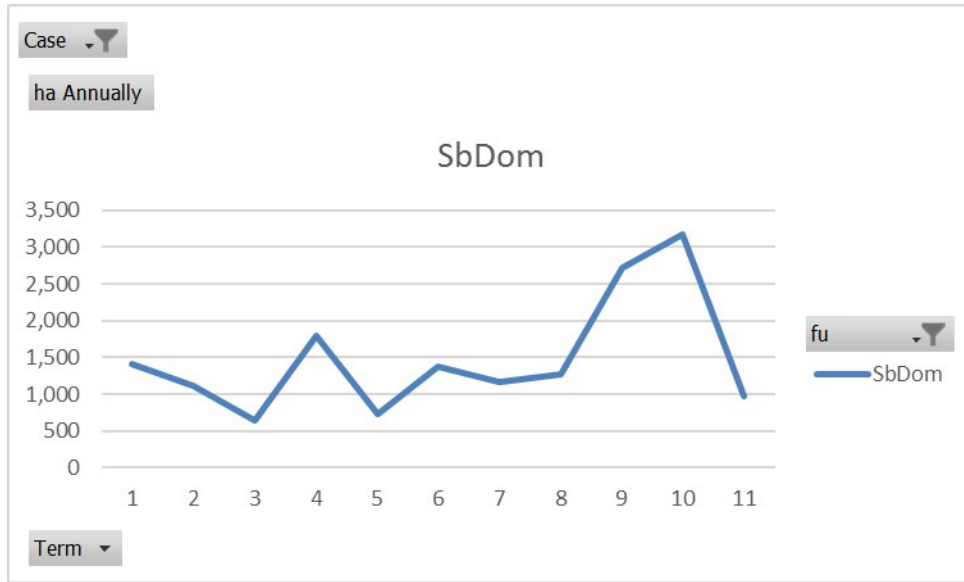
1

2 *Figure 50: Projected Annual Harvest of PJMIX Across the Planning Horizon*



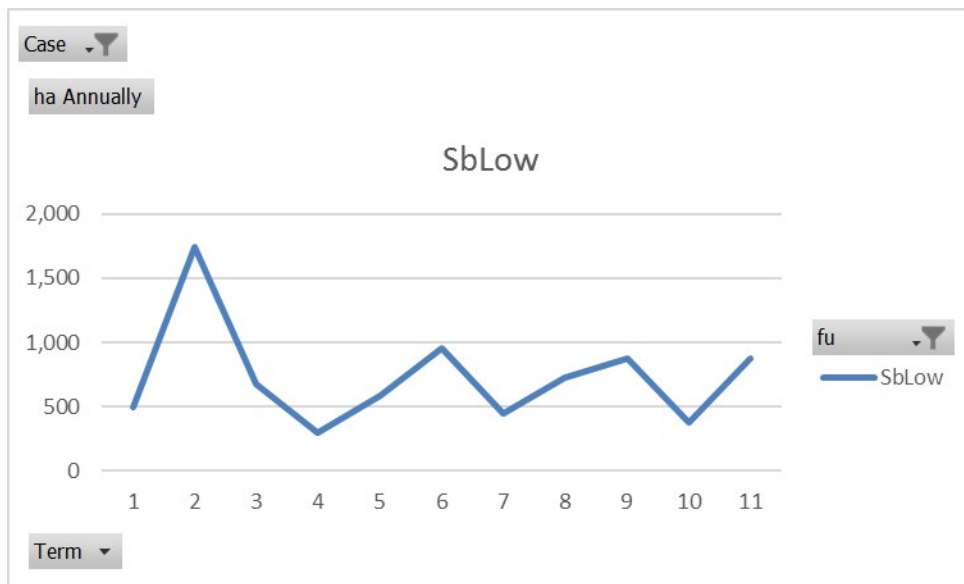
3

4 *Figure 51: Projected Annual Harvest of PODOM Across the Planning Horizon*



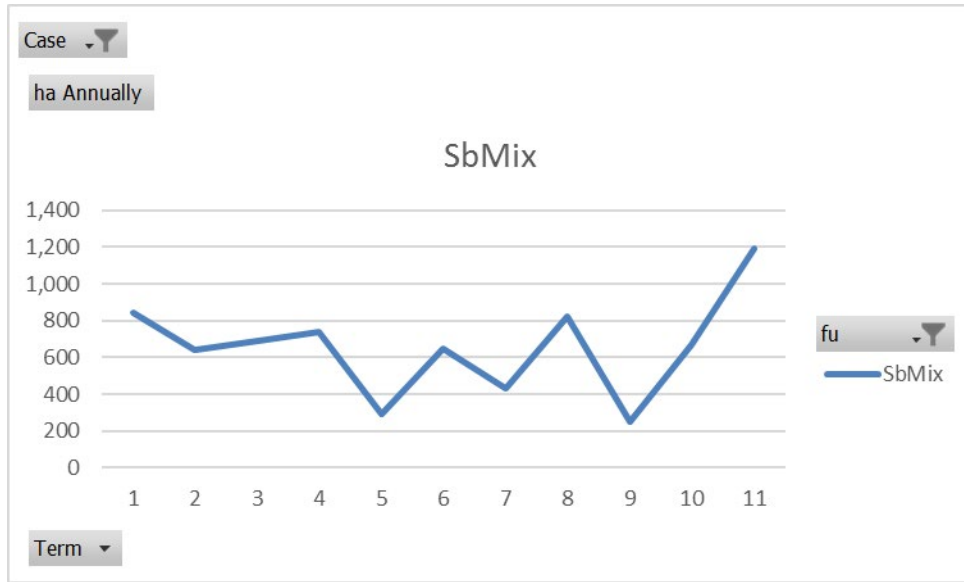
1

2 *Figure 52: Projected Annual Harvest of SBDOM Across the Planning Horizon*

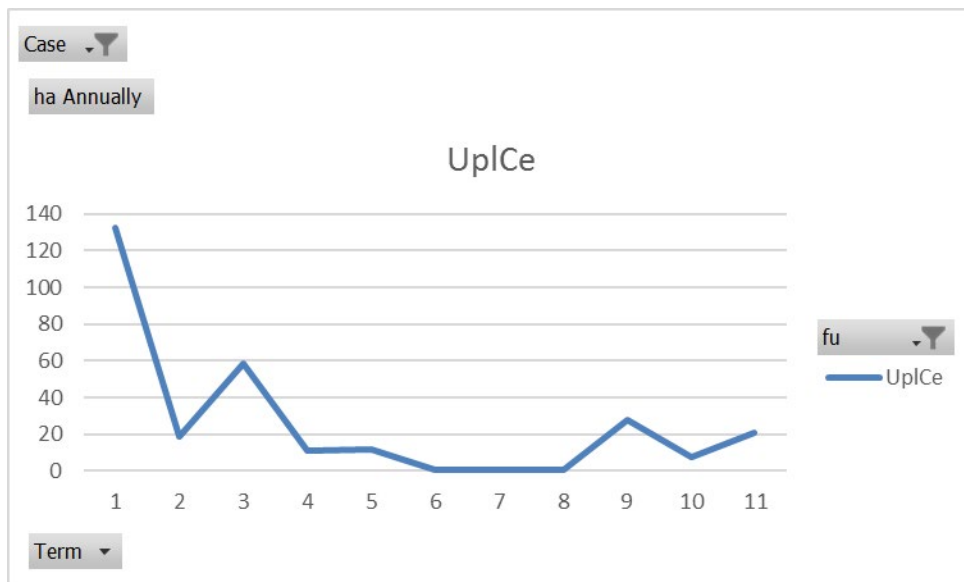


3

4 *Figure 53: Projected Annual Harvest of SBLOW Across the Planning Horizon*



1
2 *Figure 54: Projected Annual Harvest of SBMIX Across the Planning Horizon*



3
4 *Figure 55: Projected Annual Harvest of UPLCE Across the Planning Horizon*

1 *Table 55: Projected Annual Harvest by Forest Unit Across the Planning Horizon*

ha Annually	Terr											
fu		1	2	3	4	5	6	7	8	9	10	11
BFMix		308	376	619	21	714	740	639	187	649	352	494
BwDom		59	4	84	24	34	544	142	104	181	99	26
CONMX		1,974	2,178	1,717	1,453	1,894	1,399	1,282	1,058	300	354	1,925
HRDOM		1,968	1,059	496	474	677	753	200	388	396	567	246
HRMXB		313	526	482	429	175	268	213	48	125	181	230
HRMXP		1,454	1,147	1,154	1,015	665	1,284	787	820	769	804	560
OcLow		109	82	42	1	23		34	11	81	25	34
PjDom		717	114	360	446	979	586	361	1,007	323	253	147
PJMIX		628	156	582	227	222		1,017	823	666	527	1,028
PoDom		306	324	324	56	241	628	1,143	1,394	1,870	1,157	544
SbDom		1,416	1,107	639	1,795	728	1,377	1,175	1,280	2,711	3,180	968
SbLow		497	1,746	681	300	592	957	451	732	874	379	878
SbMix		845	639	689	741	291	646	435	819	254	671	1,191
UplCe		132	18	58	11	12	1	1	1	28	8	21

2

3 As discussed in section 3.6.8 Mature and Late Hardwoods and Hardwood Mixedwoods – Objective 2.1.4,

4 the reduction of Mature and Late Hardwoods and Hardwood Mixedwoods is the largest overarching

5 influencer of the Pic Forest 2019-2029 FMP. This is the target which requires the largest management

6 intervention to reduce within the Inter Quartile Range. The impacts of implementing current policy has

7 created a change from past management trajectories. Table 56 displays a breakout of planned harvest

8 area by forest unit of the previous Big Pic and Pic River management plans and the Current Allowable

9 Harvest Area of the Pic Forest by dominant species group. Although the dynamics of forest

10 amalgamation, and the distinct influence of the costal ecology influencing the previous Pic River Forest

11 greater than the Big Pic, it can be seen that over time, the annual harvest area has transitioned from

12 allocating proportionally more conifer dominated area, to more mixedwoods. Figure 56 through Figure

13 58 graphically display the changing dynamics of harvest allocations between the two previous

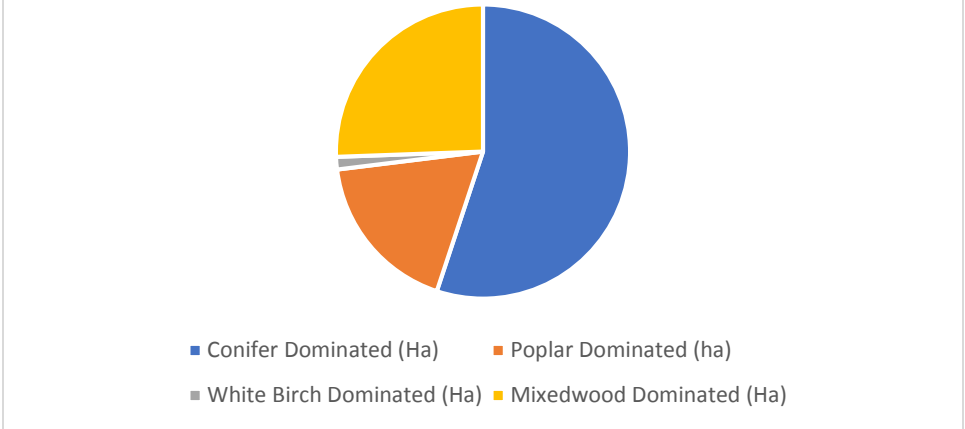
14 management units FMPs, and the current Pic Forest plan.

1 *Table 56: Planned annual harvest area by Forest Unit of the previous Big Pic and Pic River Forests, and the current Pic Forest.*
 2 *Displayed by dominant species proportional breakout.*

Big Pic (2007-2017) (Ha)		Pic River (2013-2023) (Ha)		Pic Forest (2019-2029) (Ha)	
BW1	86	BW1	718	BFMIX	308
LC1	84	LC1	84	BWDOM	59
MW1	191	MW1	98	HRMXB	313
MW2	1,405	MW2	922	HRMXP	1454
PJ1	62	PJ1	160	OLOW	109
PJ2	217	PJ2	75	HRDOM	1968
PO1	1,121	PO1	438	CONMX	1974
SB1	950	SB1	477	PJMIX	628
SF1	634	SF1	231	PJDOM	717
SP1	1,575	SP1	698	PODOM	306
				PRWMX	0
				SBLOW	497
				SBMIX	845
				SBDOM	1416
				UPLCE	132
Conifer Dominated (Ha)		1,641		4103	
Conifer (%)		42%		38%	
Poplar Dominated (ha)		438		306	
Poplar (%)		11%		3%	
White Birch Dominated (Ha)		718		2027	
White Birch (%)		18%		19%	
Mixedwood Dominated (Ha)		1,020		4049	
Mixedwood (%)		26%		38%	
Total %		98%		98%	

3

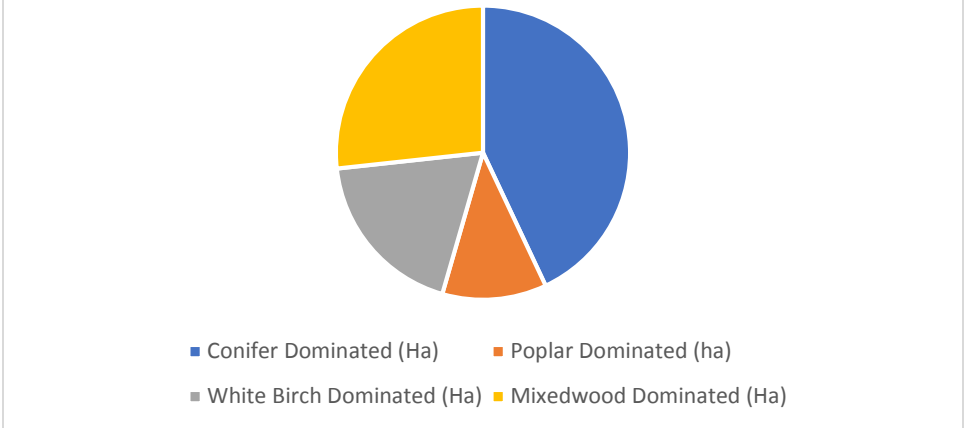
Big Pic 2007-2017 FMP Planned Harvest Area Displayed as Dominant Species Groupings



1

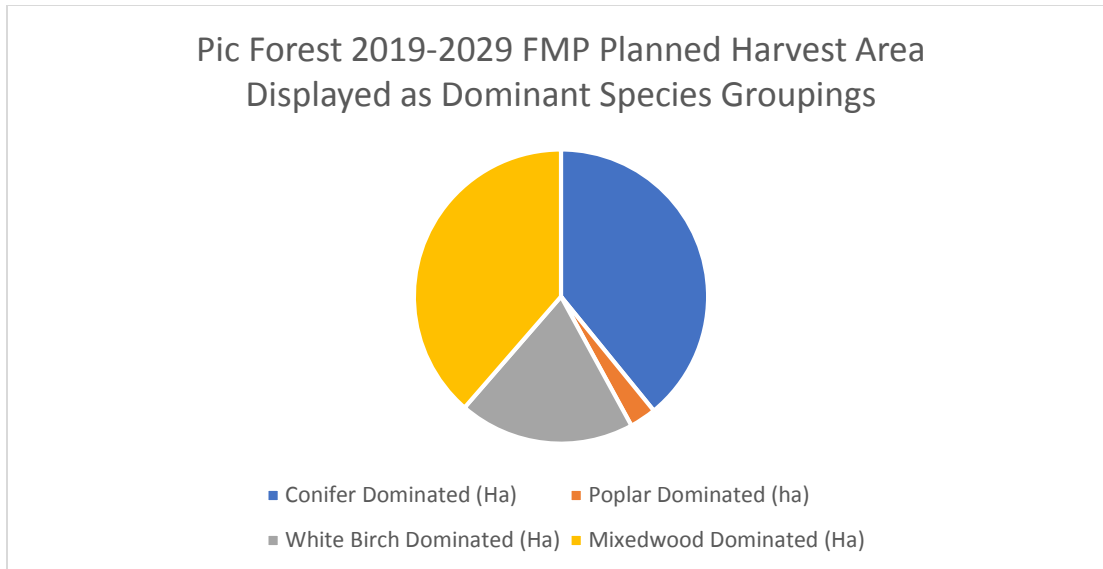
2 *Figure 56: Big Pic 2007-2017 FMP Planned Harvest Area Displayed as Dominant Species Groupings*

Pic River 2013-2023 FMP Planned Harvest Area Displayed as Dominant Species Groupings



3

4 *Figure 57: Pic River 2013-2023 FMP Planned Harvest Area Displayed as Dominant Species Groupings*



1

2 *Figure 58: Pic Forest 2019-2029 FMP Planned Harvest Area Displayed as Dominant Species Groupings*

3 Management implications of allocating more mixedwood dominated forest units is positive for future
 4 forest condition. Whereas those mixedwood stand are converted to more uniform, or dominant forest
 5 units. However, annual reports and trends analysis of both the Big Pic and Pic River have shown that
 6 hardwood dominated, and to a lesser extent, mixedwood stands are difficult to merchandise. At the
 7 current time, the ability for AV Terrace Bay (Pulp mill, Terrace Bay) to consume poplar is extremely
 8 limited, and the only other hardwood purchaser is Columbia Forest Products (Veneer mill – Hearst).
 9 Birch has no commercial demand at the current time.

10 If there is no market demand or access to hardwood from the Pic Forest, it is expected that harvest will
 11 focus on more conifer dominated, and conifer leading mixedwoods into the current plan. As there is
 12 less proportional conifer dominated harvest allocations, it can be expected that, unless alternative
 13 markets are identified, fibre supply from the Pic Forest will be reduced from what was available in the
 14 past. Section 4.3.6 Wood Utilization further describes the implications of a lacking hardwood market.

15 *3.7.1.1 Harvest Distribution*

16 The map titled “*MU966_2019_FMP_P1_MAP_HarvestDistribution*” contains the 40-year harvest
 17 distribution, which details available harvest areas over the next 4 terms (40 years). It should be noted
 18 that the harvest distribution is not an operational harvest plan for the next 40 years, and that there are
 19 some strategic management zones on the forest with specific harvest regimes tied to model targets. For
 20 example, most of the area in the coastal continuous zone is available for harvest in term 4, however
 21 there are still model restraints on the amount of harvest which may occur, and additional considerations
 22 regarding the pattern of that harvest. Harvest progression across the management unit largely
 23 continues to follow an expected pattern. Harvest continues to focus on most mature forest, even within

1 the DCHS, and continues to plan access and harvest toward the centre, more southern portion of the
 2 unit.

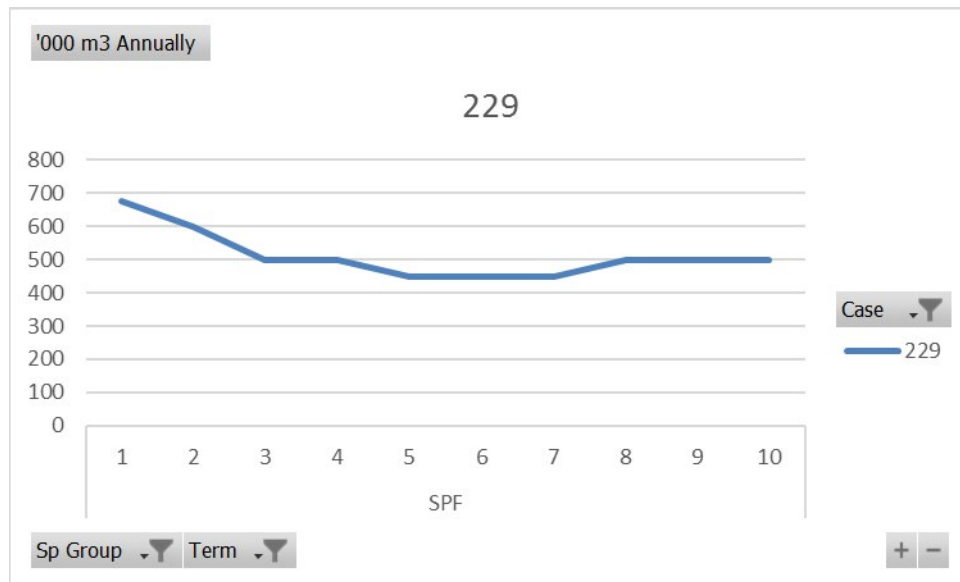
3 *3.7.1.2 Available Harvest Volume*

4 FMP-9 summarizes the estimated available harvest volume by species group by twenty-year projections
 5 for the management strategy (229).

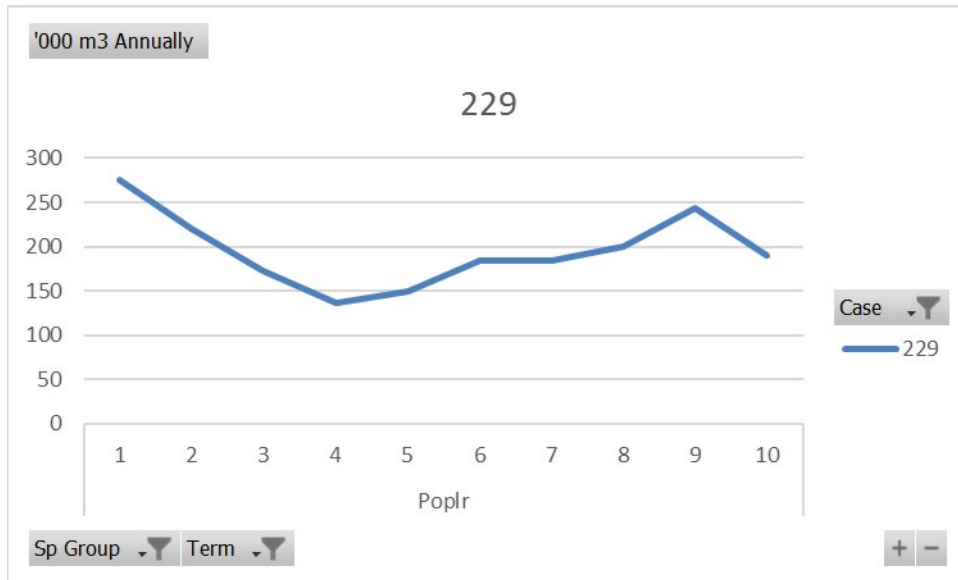
6 Figure 59 through Figure 61 summarizes the available annual harvest volume (m³/yr) by species group
 7 for the management strategy. The total annual available harvest for the 2019-2029 FMP is
 8 1,082,549m³/yr and forecast to drop to 666,270m³/yr in 2059, increasing to 807,066m³/yr in 2099.

9 Cedar and Larch have volume assigned to each group, but limited harvesting of these species is expected
 10 to occur in this term. There will be no harvest of Red and White Pine in this term.

11 The following figures and table review available harvest area by species groupings over the planning
 12 horizon (100 years)

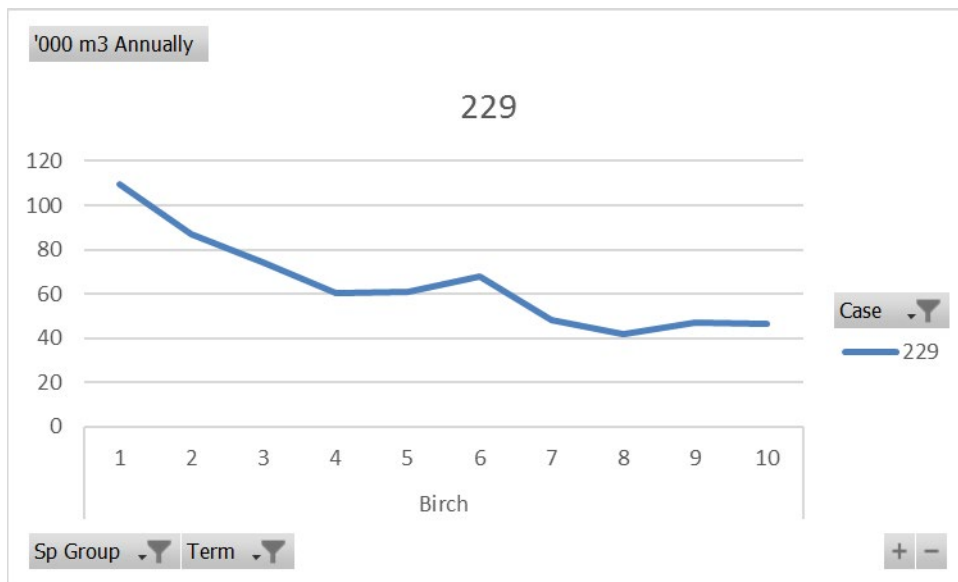


13
 14 *Figure 59: Projection of SPF annual Harvest across all planning terms*



1

2 *Figure 60: Projection of Poplar annual Harvest across all planning terms*



3

4 *Figure 61: Projection of Birch annual Harvest across all planning terms*

1 Table 57: Projection of Annual Harvest Volume Across all Planning Terms by species group

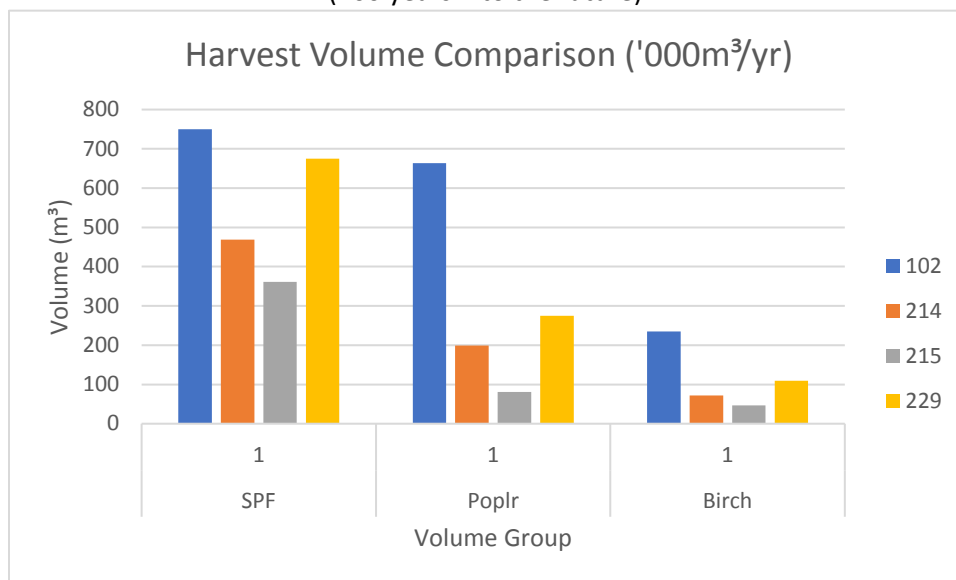
'000 m3 Annual	Case	
Sp Group	Term	229
SPF	1	675
	2	600
	3	500
	4	500
	5	450
	6	450
	7	450
	8	500
	9	500
	10	500
SPF Average		513
Poplr	1	275
	2	220
	3	172
	4	137
	5	149
	6	185
	7	184
	8	200
	9	243
	10	190
Poplr Average		195
Birch	1	109
	2	87
	3	74
	4	60
	5	61
	6	68
	7	48
	8	42
	9	47
	10	46
Birch Average		64
TotAll	1	1,080
	2	939
	3	763
	4	711
	5	673
	6	720
	7	694
	8	756
	9	810
	10	753
TotAll Average		790

2

1 One component of determining the available harvest volume for the Forest was the completion of a
 2 number of specific investigations (scoping runs) as required by the FMPM according to MNR's *Forest*
 3 *Resources Assessment Policy* (FRAP). The FRAP investigations required examining the production
 4 potential and the ability of the forest to meet various wood supply demands. These investigations
 5 included:

- 6 • OFAAB Benchmark (OFB);
- 7 • Meet the current industrial demand (CID);
- 8 • Maximize Volume Production Potential (MXV):
- 9 • Increase wood supply to support industrial expansion and additional non-industrial goods and
 10 services, parks and protected areas (IW).

11
 12 Figure 62 shows a comparison in term 1 annual volumes between runs 102 (representing a run where a
 13 sustainable harvest is maximized where no other non-volume targets apply), 214 (representing the
 14 benchmark to attain the best possible landscape class and habitat class objective indicators when
 15 applying all targets simultaneously), run 215 (representing the minimum amount of harvest required to
 16 meet landscape guide targets), and run 229 (the proposed management alternative) across 11 terms
 17 (100 years into the future).



18
 19 *Figure 62: Harvest Volume Comparison ('000m³/yr)*

20 **3.7.2 Selection of Areas for Harvest**

21 This section of the plan text contains a description of the criteria used for the selection of preferred and
 22 optional areas for harvest. The main objective in selecting areas for harvest was to match the harvest
 23 allocation with the available harvest area defined in the management strategy (229) for the ten-year
 24 term 2019-2029 by forest unit and age class. The following text will also explain why some age class
 25 substitution was necessary rather than those defined by the management strategy available harvest
 26 area.

1 Stand age (at the year 2019) was the primary factor used to determine if a stand was eligible for harvest.
2 Prior to selecting areas for harvest, the first step is to identify at what age forest stands are eligible for
3 harvest. This produced an eligibility map depicting all stands that are eligible for harvest. The
4 determination of operability ranges was influenced by the development information for forest stands
5 (yield curves by forest unit and silviculture intensity) and local knowledge on the Pic Forest. Harvest
6 operability ranges define the stand ages when the various forest units are eligible for harvesting in
7 relation to the different silvicultural intensities. For all stands there is no upper age limit used as the
8 natural succession rules serve as a default by removing older age classes through natural succession.
9 The 2019 lower operability limits were set very close to the prior plans' limits since these were deemed
10 to be operationally feasible, there were no problems with these limits during the implementation of the
11 previous plans. However, there were some adjustments made to age of operability as the current plan
12 implemented Northwest Forest Units, which do not align directly with the previous Northeast Forest
13 Units. In addition, the Planning Team plotted the operable ages onto yield curves to ensure that they
14 occurred near the yield peaks for each forest unit. Refer to Analysis Package Section 4.4.3.1 for full
15 details on operability ages, yield curves and natural succession rules.

16 Once the harvest eligibility map was completed, work began on defining preferred and optional harvest
17 areas for the ten-year plan period. As mentioned previously, the management strategy provided the
18 available harvest area by forest unit and age class. Identification of optional harvest areas was the first
19 step in the allocation process. Optional harvest areas were largely selected through querying age
20 eligible stands, within operable strategic management zones, and available for management (i.e. Not
21 patent, or parks, etc.). Preferred harvest areas were then selected from the identified optional harvest
22 areas. Revisions to allocations at operational planning will re-allocate some preferred allocations by
23 selecting from optional areas of harvest, if necessary. Optional and preferred harvest areas are
24 portrayed in the map titled "*MU966_2019_FMP_P1_MAP_PreferredOptionalHarvest*". Preferred and
25 optional harvest areas were selected based on the following general criteria:

- 26 • Allocate oldest first subject to the management strategy requirements for old growth;
- 27 • Parks and patented lands were excluded;
- 28 • No harvesting was proposed in the PRMIX forest units;
- 29 • Fully allocate the AHA within the northern caribou zone (DCHS)
 - 30 ○ Allocate within the management intent of the connectivity corridor and costal
 - 31 continuous zone.
- 32 • Consider designing both conifer and hardwood harvest blocks according to mill requirements;
- 33 • The remaining Big Pic and Pic River FMP harvest allocations were reviewed to define any regular
- 34 allocations, contingency allocations, and forecast depletions that would not be completed by
- 35 the end of the plan period (2019) so that they could be re-allocated in the 2019-2029 FMP as
- 36 regular harvest areas, or bridging harvest areas in the 2019-2029 FMP period. The exercise did
- 37 not result in any changes to the BMI or reallocating previously approved harvest allocations. As
- 38 operational planning occurred, forecast harvest areas were re-assessed and considered for re-
- 39 allocation.
- 40 • Consider access to harvest areas to ensure harvest allocations could truly be accessed within
- 41 this plan term;
- 42 • Planned harvest areas had to consider the level of past and planned harvesting as it affected
- 43 designated tourism lakes or specific traplines; and

- 1 • The Base Model Inventory had the year of origin updated for the preferred harvest areas and
2 run through OLT to ensure the new disturbances would meet plan objectives or show
3 movement towards them.

4 The following provides more details on the harvest selection criteria:

5 **a) Forest Units**

6 The preferred harvest areas for the 2019-2029 FMP operations must not exceed the 10 year available
7 harvest area by forest unit from the management strategy. Several iterations of stand selection or
8 rejection were required to ensure that the proper balance of forest units was achieved. All AOC and
9 block level residual planning had to be completed prior to this step and the available harvest area must
10 be firmly established in order to reduce the number of iterations.

11 **b) Age Class**

12 In order to ensure sustainability criteria are met, the areas selected for harvest operations during the
13 2019-2029 FMP should closely match the management strategy available harvest area forest unit by age
14 classes as well. The age classes selected for harvest by forest unit attempted to follow the management
15 strategy as close as possible, but age class substitutions were required according to limitations on
16 access, the need for separation from adjacent existing cuts and to make operationally feasible blocks.

17 Reasons for the age class substitution can be attributed to many factors. Certain factors apply broadly
18 to the forest and its landscape pattern (road access, geographic location of concentrations of mature
19 eligible forested stands), and other factors apply specifically to individual operating areas. The
20 combination of these factors has been reviewed in detail and supported by the Pic Forest Operations
21 Task Team and it is felt that based on environmental and operational considerations, harvest allocations
22 have been selected in conjunction with provincial guides and direction, consultation with the public, and
23 sound operational logistics.

24 The potential impact of the level of age class substitution in the harvest allocations was analyzed
25 through the “Preliminary Test of Sustainability” by inputting the actual planned harvest, by forest unit
26 and 10-year age class, into the SFMM model with the same constraints and assumptions as the Long
27 Term Management Direction run. The preliminary test analysis confirmed that the planned allocations
28 do not negatively impact overall objective achievement, definition of the desired future forest condition,
29 nor do they compromise the long-term sustainability of the Pic Forest.

30 **c) Implementing Caribou Direction**

31 Caribou direction was a primary consideration while selecting harvest areas. Most of the Caribou
32 direction was applied using strategic management zones and strategic targets. Selection of harvest
33 areas gave consideration to adhering to the management zones and strategic targets as follows:

34 c1) Northern Continuous Zone – within this zone the forest is parsed into to 20 year harvest
35 blocks forming a Dynamic Caribou habitat Schedule (DCHS) as described in section 3.5 Strategic
36 Management Zones. Strategically, the model allocates all of the eligible forest within the “A” blocks in
37 the first two terms. Harvest areas are only planned in “A” blocks and are fully allocated as determined
38 by the strategic allowable harvest. Future FMPs will adjust the DCHS to maintain the intent of
39 management within this zone, as operations progress.

1 c2) Discontinuous Distribution Zone – within this provincial zone, the objective is to create a
2 landscape that facilitates the temporary use of, and movement of caribou. The management zones NDC
3 and SDC have strategic targets applied to maintain a forest structure to provide for caribou movement.
4 Harvest selections have respected the strategic allocation, and therefore provide for the maintenance of
5 caribou movement. Future FMPs will adjust the allocation within this zone based on the silviculture
6 renewal of areas currently regenerating, and regenerating in the future.

7 c3) Coastal Continuous Zone – within this provincial zone, the management intent is to manage
8 for caribou security and persistence. The Pic Forest has broken this zone into 15 different SMZs (CCH1-
9 to-CCH15). Two of the management zones are open and follow similar direction as Northern
10 Continuous Zone, whereas harvest in these areas is scheduled to fully harvest these areas and create a
11 patchwork of unified aged forest. Additionally, strategic targets are applied to the model to maintain an
12 amount of refuge habitat within this zone. Most coastal SMZs are deferred from operations for 20
13 years, however, regardless of deferrals, the model strategically allocates harvest to maintain the refuge
14 habitat.

15 **d) Overlapping Uses and Other Values**

16 Other users of the forest must be considered in selecting areas for harvest. Public, tourism operator,
17 trapper and First Nation and Métis concerns have influenced localized selection of harvest areas. This
18 was a primary consideration for planned harvest areas near designated tourism lakes and on particular
19 trap lines. Consideration was given to try to avoid too much harvesting on a particular trap line or near
20 a particular designated tourism lake. However, new pattern objectives within this Plan lead to planning
21 of larger, more continuous blocks, which unavoidably, create larger disturbance patches on traplines.
22 Other values not depicted on the values map were solicited and considered as part of the planning
23 process.

24 **e) Existing and Potential Access**

25 Although the forest unit and age class criteria have priority, the 2019-2029 FMP harvest allocations also
26 had to be accessible with an existing primary, branch or operational road or by a planned road that
27 could be constructed. New access development also had to consider impacts on designated tourism
28 lakes and ensure consistency with the Crown Land Use Atlas Policy. Access to present and future
29 allocations will be influenced, and take into consideration roads objectives and management strategies.
30 More detailed information regarding roads use management strategies can be found in section 4.5
31 Roads.

32 **f) Mill Requirements**

33 Operating areas are selected and designed to meet the individual needs of the primary mills to the
34 greatest extent possible. Each area must be balanced to provide for the best end use of the harvested
35 volume.

36 **g) Stand and Block Merchantability and Eligibility**

37 Stand age should normally be within the operability age range by forest unit during the 2019-2029 FMP
38 period. The general stand condition in terms of total merchantable volumes per hectare, cull, health

1 and vigour are normally related to age, and these were considered in the selection of areas for harvest
2 in order to select a range of conditions across the Forest. It is important that the allocations choose
3 some of the poorer quality stands along with the good quality stands so that on average the forest is not
4 degraded in quality.

5 **h) Seasonal Requirements**

6 Areas were also selected to balance upland and lowland ground whenever possible to allow the best
7 operating chance according to the season, and to minimize site disturbances such as rutting. The
8 management strategy also forecast a specific proportion of hardwood and mixedwood forest units that
9 should be harvested in winter to facilitate higher levels of natural regeneration to hardwood and
10 mixedwood forest units.

11 **i) Silvicultural Considerations**

12 Silvicultural considerations also had to be accounted for in the planning of harvest blocks.

- 13 • About the lag between harvest and regeneration;
 - 14 • Converting mixedwoods to pure conifer stands (PJDOM/SBDOM);
 - 15 • Reducing the amount of the silvicultural intensity LOWPS; and
 - 16 • Aerial tending using herbicides.
- 17

18 Current renewal practices on the Pic Forest are to renew the harvest area within one to three years after
19 harvest. This practice has many positives:

- 20 • The new forest becomes established quicker;
 - 21 • Lower silviculture costs as some sites will not need site preparation or tending to control
22 competing vegetation; and
 - 23 • The potential to decommission unneeded roads sooner because the stand is established
24 quicker, free-to-grow/establishment surveys can occur sooner.
- 25

26 The amount and distribution of forest types within the Pic Forest needs to be managed to move towards
27 (or stay within) targets set for broad groupings of wildlife habitat (called landscape classes). The desired
28 levels of these landscape classes are set to move the forest towards a composition that is more
29 representative of a natural unmanaged system. Conversions from one forest type (mixedwood) to
30 another (jack pine) will need to be considered within the context of the targets for landscape classes –
31 these targets help balance the potential to convert all stands capable of carrying high – profit forest
32 types with the need to protect and maintain the diversity of habitat types for wildlife.

33 The use of herbicides for controlling competing vegetation in renewing the forest has often been a
34 contentious issue with members of the public concerned about the effects of these chemicals on the
35 health of themselves and wildlife populations. Using herbicides registered for forestry use continues to
36 be the most effective tool for controlling unwanted brush competition aiding in the renewal of conifer
37 tree species. NFMC conducts surveys after artificial regeneration to determine if the area actually
38 requires tending. Only areas that required tending are treated. Also the amount of total active
39 ingredient in the herbicide utilized per hectare has been lowered while maintaining forest productivity.

1 Harvest allocations were concentrated wherever possible to create patterns similar to a natural fire
 2 driven disturbances. The concentrated harvest areas increase efficiencies, with less road building
 3 required and reducing the environmental impact of harvesting and road building.

4 Finally, the areas selected for harvest for the 2019-2029 ten-year period were designed to meet, but not
 5 exceed the available harvest area by forest unit.

6 **3.7.3 Assessment of Objective Achievement**

7 Sections 3.6.5 Mature and Late Balsam Fir and Balsam Fir Mixed – Objective 2.1.1 through 3.6.15.3
 8 Costal Continuous Zone – Objective 1.2.1.1 detail all plan objectives and indicators where objective
 9 achievement requires strategic modeling. Achievement of those targets is assessed through strategic
 10 modeling and normally include long-term objectives which span the planning horizon. In essence,
 11 achievement of those modeled objectives are set through scoping analysis and implemented through
 12 the selected management alternative.

13 There are however, plan objectives and targets in FMP-10 which do not necessitate strategic modeling.
 14 For instance, some objectives and targets are based on their spatial arrangement or placement on the
 15 landscape. These targets are detailed in section 3.7.4 Spatial Assessment of Projected Harvest Areas.
 16 Both strategic modeled and spatial objectives and targets are documented in section 3.0 Development
 17 of the Long-Term Management Dire, as part of the preliminary determination of sustainability.

18 Table 58 details objectives and indicators were assessed during the preparation of the LTMD and are in
 19 some fashion achieved through the implementation of the selected management alternative.

20 *Table 58: Assessment of Management Objectives*

Management Objective Category	Objective	Indicator Sub-Group	Results of Assessment
1. Forest Diversity and Provision of Forest Cover	1.1. Habitat for Forest Dwelling Woodland Caribou Within Local Population Range(s) - Northern Continuous Range	1.1.1. Refuge Habitat	See section 3.6.15.1 Northern Continuous Range
		1.1.2. Winter Used and Preferred Habitat	See section 3.6.15.1 Northern Continuous Range
		1.1.3. Texture/ Arrangement of Winter Habitat	See section 3.6.13.1 Texture and Arrangement of Caribou Winter Habitat – Objective 1.1.3
		1.1.4. Ensure there is sufficient amount of mature conifer caribou habitat at all times and that they are arranged in a way to	This objective is assessed in section 3.7 Objective Achievement, subsection 5 Proportion of On-line DCHS blocks and Relative Connectivity Indicator within the Caribou Habitat Strategy for the Pic

Management Objective Category	Objective	Indicator Sub-Group	Results of Assessment
		facilitate movement	Forest in the Supplemental Documentation.
		1.1.5. Ensure that areas identified for renewal to a conifer dominated forest unit are successfully regenerated to those caribou habitat related conifer forest units	This objective is assessed in section 3.7 Objective Achievement, subsection 6 Area Regenerated to the Projected Conifer Forest Unit Indicator within the Caribou Habitat Strategy for the Pic Forest in the Supplemental Documentation.
		1.1.6. Maintain or increase the proportion of conifer species that are linked to winter preferred habitat in each of the pure conifer forest units, to ensure that the habitat quality within forest units does not decline	This objective is assessed in section 3.7 Objective Achievement, subsection 7 Proportion of Jack Pine, Black & White Spruce in Future Conifer Forest Units Indicator within the Caribou Habitat Strategy for the Pic Forest in the Supplemental Documentation.
		1.1.7. Maintain or reduce road density within the northern continuous range, and thereby minimize increases to cumulative disturbances	This objective is assessed in section 3.7 Objective Achievement, subsection 8 Density of Permanent Roads Relative to Crown Land Indicator within the Caribou Habitat Strategy for the Pic Forest in the Supplemental Documentation.

Management Objective Category	Objective	Indicator Sub-Group	Results of Assessment
		1.1.8. Future Habitat created through Harvest	This objective was put in place by the planning team as an overarching objective to measure achievement of planned harvest within identified “A” blocks. Within SFMM, we have applied strict harvest targets to force harvest within the "A" blocks. Within the model the total land area of the "A" blocks is 55,558ha; 44,533ha available, 6,814ha reserve, & 4,211ha non-forested. Not all available forest is operable (outside ages of operability). Operable area within "A" blocks is 39,168ha in T1. Planned harvest of 20,920ha is planned for T1 (53% of the operable area). In T2 operable area is 17,771ha; 16,210 planned for harvest. This "cleans-up" the "A" blocks. In T3 operable area is 2,385ha (6% of the original operable area today).
	1.2. Habitat for Forest Dwelling Boreal Caribou within Local Population Range(s) - Coastal Range	1.2.1. Refuge Habitat	See section 3.6.15.3 Coastal Continuous Zone – Objective 1.2.1.1
		1.2.2 Maintain or reduce road density within the Lake Superior Coastal Range	This objective is assessed in section 4.9 Coastal Objective Achievement, subsection 3 Density of Permanent Roads Relative to Crown Land Indicator within the Caribou Habitat Strategy for the Pic Forest in the Supplemental Documentation.
	1.3. Discontinuous Zone - Caribou Habitat Connectivity	1.3.1. Landscape Class Indicators (Support Caribou Habitat)	See section 3.6.15.2 Discontinuous Zone – Objective 1.3.1
		1.3.2. Pattern Indicator (Support Caribou Habitat Connectivity)	See section 3.6.13.2 Pattern of Caribou Connectivity – Objective 1.3.2

Management Objective Category	Objective	Indicator Sub-Group	Results of Assessment
		1.3.3 maintain or reduce road density within the zone of connectivity	This objective is assessed in section 5.10 Objective Achievement, subsection 3 Density of Permanent Roads Relative to Crown Land Indicator within the Caribou Habitat Strategy for the Pic Forest in the Supplemental Documentation.
2. Forest structure and composition	2.1. To Provide for a Forest Age Class Structure, Composition and Abundance that Emulate a Natural Disturbance	2.1.1. Mature and Late Balsam Fir and Balsam Fir Mixed	See section 3.6.5 Mature and Late Balsam Fir and Balsam Fir Mixed – Objective 2.1.1
		2.1.2. Mature and Late Lowland Spruce and low Other Conifer	See section 3.6.6 Mature and Late Lowland Spruce and Low Other Conifer – Objective 2.1.2
		2.1.3. Mature and Late Conifer Mixedwood	See section 3.6.7 Mature and Late Conifer Mixedwood – Objective 2.1.3
		2.1.4. Mature and Late Hardwoods and Hardwood Mixedwoods	See section 3.6.8 Mature and Late Hardwoods and Hardwood Mixedwoods – Objective 2.1.4
		2.1.5. Old Growth Forest (all forest)	See section 3.6.9 Old Growth Forest – Objective 2.1.5
		2.1.6. All Ages Red and White Pine Forest	See section 3.6.10 Red and White Pine – Objective 2.1.6
		2.1.7. All Ages Conifer	See section 3.6.11 All Ages Conifer – Objective 2.1.7
		2.1.8. Young Forest	See section 3.6.12 Young Forest – Objective 2.1.8
3. Landscape Pattern	3.1. To Provide for a Distribution of	3.1.1. Texture of mature and old forest	See section 3.6.13.3 Texture of Mature and Old Forest – Objective 3.1.1

Management Objective Category	Objective	Indicator Sub-Group	Results of Assessment
	Disturbance Patches that More Closely resembles the expected size, composition, and age produced by wildfire.	3.1.2. Young forest patch size	See section 3.6.13.4 Young Forest patch Size – Objective 3.1.2
4. Social and Economic	4.1. Long Term Wood Supply	4.1.1. Available Harvest Area by Pic Forest Analysis Unit	See section Error! Reference source not found.
		4.1.2. Available Harvest Volume by Species Group	See section Error! Reference source not found.
	4.3. Utilized Wood Supply	4.3.1. Utilized Harvest Area by Pic Forest Unit	See section Error! Reference source not found.
		4.3.2. Utilized Harvest Area by Volume Species Group	See section Error! Reference source not found.
	4.5. Roads Management	4.5.1. Roads Density Outside of Caribou Zones	The planning team thought it was necessary to establish a roads density target for areas of the forest where other roads density targets do not apply. This target is of particular interest to other users of the forest, as recreationalists enjoy the maintenance of road infrastructure across the landbase. Strategically, and as a best practice, there are targets to rehabilitate productive forest lost to roads and landings back to productive land. Within the strategic model, rehabilitation targets are not differentiated between strategic management zones (as they are in

Management Objective Category	Objective	Indicator Sub-Group	Results of Assessment
			practice). There are defined zones on the forest where increased emphasis for roads and landings decommissioning will occur. The intent and target within this zone is to maintain a status-quo. Whereas for every road constructed, another will be re-habilitated. With this approach, considering the increased rehabilitation targets within other zones, the intent of the strategic model is address across the entire forest.

1

2 FMP-10 includes other plan objectives and indicators which are not detailed in Table 58. Generally,
 3 these additional objectives, while influencing FMP planning, are not measured until the plan has been
 4 fully or partially implemented. For instance, social objectives, such as involvement of the LCC or First
 5 Nations & Métis, or compliance objectives may influence planning, but are not measured for success
 6 until the plan has been in implementation. Silvicultural objectives are another example, whereas
 7 strategically, there are silvicultural objectives in the model, operationally, silviculture is a function of
 8 actual harvest. Therefore, silvicultural objectives are measured periodically throughout the plan as a
 9 comparative to actual harvest levels.

10 **3.7.4 Spatial Assessment of Projected Harvest Areas**

11 One of the greatest changes within the Boreal Landscape and the new FMPM is the requirement to plan
 12 for, track, and document spatial conditions of forest cover through time. Except for the Northern
 13 Continuous Zone, Dynamic Caribou Habitat Schedule (DCHS), the Ontario Landscape Tool (OLT) is the
 14 program used to measure and assess spatial indicators. The following spatial indicators are included in
 15 FMP-10 and were assessed as part of developing the LTMD for the Pic Forest:

- 16 • 3.6.13 Pattern
 - 17 ○ 3.6.13.1 Texture and Arrangement of Caribou Winter Habitat – Objective 1.1.3,
 - 18 ○ 3.6.13.2 Pattern of Caribou Connectivity – Objective 1.3.2,
 - 19 ○ 3.6.13.3 Texture of Mature and Old Forest – Objective 3.1.1, and
 - 20 ○ 3.6.13.4 Young Forest patch Size – Objective 3.1.2

21

22 **3.7.4.1 Projected Distribution of Harvest Over the First Four Terms (40-years)**

23 Another new requirement of the 2017 FMPM is the creation of a 40-year harvest distribution projection.
 24 This projection aids in many aspects of forest management planning including, public awareness and
 25 education of harvest over time, strategic planning of access, and economic outlook of harvest feasibility.
 26 Section 3.7.2 Selection of Areas for Harvest, discusses the criteria for how harvest blocks were selected.

1 In the context of spatial assessment, 2 of the major driving forces for allocation planning were, i) plan
2 larger cohesive harvest areas, and develop access for future harvest. The map titled
3 “MU966_2019_FMP_P1_MAP_HarvestDistribution” contains the 40-year harvest distribution. The
4 following sections detail the feasibility of the spatial distribution of harvest, and economic feasibility of
5 that harvest.

6 *3.7.4.1.1 Feasibility of Spatial Distribution of the Harvest*

7 The 40-year harvest distribution was influenced by numerous factors. The following factors are listed in
8 order of importance of designing the 40-year harvest distribution.

9 **Dynamic Caribou Habitat Schedule (DCHS)**

10 Implementation of the DCHS is the highest order planning objective when planning the 40-year harvest
11 distribution. Whereas, over a 40-year cycle, harvest will have effectively harvested and regenerated the
12 “A” and “B” blocks completely. Access to these zones is limited today, but strategic roads planning will
13 ensure that access into “B” blocks is available in 20-years.

14 **Caribou Costal Continuous and Refuge Zones**

15 The second order planning objective is the implementation of the Caribou Costal Continuous and Refuge
16 Zones. Despite being the second order priority, this factor includes the greatest risk to future harvest
17 distribution. Strategically, most of the costal continuous and refuge zones are deferred from any
18 operations for the next 20 years. After 20-years, much of the forest within these blocks is age-eligible
19 and would be planned for harvest (excluding the lake superior enhances management area located
20 south of highway 17). However, this is contingent on no further changes in provincial policy
21 surrounding costal caribou. This is unlikely as new provincial policy is currently being revised which will
22 influence the land management within this zone. Additionally, at the time of publishing, Endangered
23 Species Act (ESA) exemption for forests managed under the Crown Forest Sustainability (CFSA) had
24 expired and was in a 2 year stay. Implications of the CFSA/ESA integration may have implications for
25 overall land management. Access to these areas is marginal. Current direction limits access within
26 these areas, and thus, access will be questionable for future harvest operations should that option exist
27 in the future.

28 **Forest Fires**

29 Like others, the Pic Forest has a varied history where fire has created unplanned large landscape
30 disturbances. Examining the harvest distribution map, notice the large tracts of uniform age continuous
31 harvest areas. These features predominately run in a Southwest-to-Northeast orientation. Access to
32 these fire originated stands varies by area. Strategic roads planning will create access to not-previously
33 accessed areas over the next 40 years.

34 **Past management**

35 As documented in section 2.1.1 Historic Forest Condition, there is a long history of ongoing forest
36 operations on the Pic Forest. In areas where forest operations have been relatively steady (e.g. The old
37 Black River Subunit), harvest distribution shows as more “patchy”, fragmented, and non-continuous.
38 This pattern is predominantly due to implementation of past harvest and planning practices. It will take
39 many years of adjustments to create a more continuous landscape. Access to these areas is good and
40 will attract harvest planning for the next 40-years.

1 3.7.4.1.2 Economic Feasibility of the Harvest

2 Although wood harvested on the Pic Forest has traditionally traveled south toward Lake Superior, today
3 the wood flow across the unit is quite different. The spatial distribution of harvest shows an
4 arrangement of harvest that is spread across the forest. While this may not be ideal for forests with a
5 defined wood flow, and a central processing facility (i.e. White River, or Nagagami), wood off the Pic
6 Forest flows many different directions. There is a variety of consuming mills surrounding the Pic Forest.
7 Including commitments to Crown Wood Supply holders, wood off the Pic Forest flows to Longlac,
8 Hearst, Terrace Bay, White River, and Hornepayne. Therefore, as there are several wood flow routes, in
9 the case of the Pic Forest, it is advantageous that the harvest distribution over the next 40 years is not
10 centrally located. Maintaining a wide arrangement of harvest distribution will balance wood supply
11 costs to all consuming facilities over the long run.

12 The distribution of harvest will result in many primary roads being utilized for long periods of time. This
13 can be viewed as advantageous for recreation activities, as well as rationale to preform costly road
14 upgrades.

15 3.7.5 Social and Economic Assessment

16 The FMPM requires that a Social and Economic Assessment (SEA) be prepared to identify the expected
17 social and economic impacts of implementing the proposed management strategy. The assessment
18 examines how the quantity of timber supplied to the wood-processing facilities, and the silvicultural
19 investment requirements of the proposed management strategy may affect the communities identified
20 in the Social & Economic Description.

21 The socio-economic impact analysis is not designed to evaluate the relative merits of sending wood to
22 one community over another, nor does the *Crown Forest Sustainability Act* (CFSA) or the Forest
23 Management Planning Manual require wood to be utilized in a forest resource processing facility within
24 a particular management unit. The primary objective of forest management is the sustainability of the
25 forest which is defined in the CFSA as the long-term health of the forest. The Forest Management Plan
26 (FMP) determines how much area is available for harvest. The FMP also provides a forecast of how
27 much volume is available and will be utilized. However, the FMP is not the mechanism by which to
28 determine who will harvest the wood or which mill receives the harvested wood. These determinations
29 are made outside the forest management planning process through licensing arrangements, ministerial
30 commitments, and business to business agreements.

31 The general impacts of harvesting, road construction and renewal operations can have both potentially
32 positive and negative effects. In order to access the allocated harvest areas, new roads will be required.
33 As a general principle, roads constructed on Crown land may be used by the public to access natural
34 resources.

35 For new roads built near lakes, there is the potential to increase road-based tourism and recreational
36 activities such as fishing, hunting, camping and site-seeing. Commercial activities such as mining,
37 aggregates, hydro generation, ecotourism, trapping, baitfish and bear management may also benefit
38 from new roads due to the additional access provided to the related resources. New cutovers can also
39 make mineral exploration, mineral sampling and mapping easier.

1 New roads can also negatively impact fish and wildlife resources due to potential over-harvesting of the
2 resources as a result of improved access. Without proper protection, mining claim posts can be harmed
3 by harvesting operations. New roads and harvest areas near remote tourism lakes can have a negative
4 impact on remote based tourism operations if these lakes are accessed by parties using roads and by the
5 additional hunting pressure on wildlife resources in the vicinity of remote tourism operations. Impacts
6 to individual traplines may be created by forest management activities through the loss of cover and
7 disruption of trapline trails.

8 Road use management strategies and prescriptions for operations in areas of concern are designed to
9 mitigate or minimize the potential negative effects of forest management activities. Public comments
10 received during the preparation of the plan are considered in the development of road use management
11 strategies and prescriptions for operations in areas of concern.

12 Unlike other SFL holders in the province, the Nawiingnokima Forest Management Corporation, as a
13 Crown Corporation, is mandated among other things to; manage Crown forests in a manner necessary
14 to provide for and maintain the sustainability of Crown forests: provide for economic development
15 opportunities for indigenous people; to manage its affairs to become a self-sustaining business entity; to
16 optimize the value from Crown forest resources while recognizing the importance of local economic
17 development; to market, sell and enable access to a predictable and competitively-priced supply of
18 Crown forest resources. This mandate helps to ensure the Crown forest resources are put to their best
19 use in an economically, socially and environmentally sustainable fashion.

20 The Social and Economic Assessment (SEA) framework is a comparative impact analysis. That is, SEA
21 compares and contrasts the perceived impacts of the proposed long-term management direction of the
22 plan under development to the estimated impacts of the current plan. In this case the analysis
23 compares the combined Big Pic and Pic River Planned utilization from the current Plans to the planned
24 utilization for the amalgamated units.

25 The *Forest Management Planning Manual (2017)* (FMPM) requires a social and economic assessment
26 will be prepared for the proposed LTMD. The Pic Forest assessment will be prepared using a qualitative
27 analysis based on the social and economic description. This assessment will identify the expected social
28 and economic impacts of implementing the LTMD. The Pic Forest assessment will examine how the
29 quantity of harvest volume supplied to the wood-processing facilities, and the silvicultural investment
30 requirements, may affect the communities, forest resource processing facilities, and the other industrial
31 and non-industrial users of the forest identified in the social and economic description.

32 The average actual annual harvest volume from the Big Pic and Pic River Forests during the last ten year
33 period was less than the forecasted annual average volume. The average harvest since 2009 on the
34 combined units was less than 400,000 m³/yr. This was mainly due to mill closures and lack of market for
35 hardwood species. Fiber utilization has increased after reopening of some of the local mills.

36 The Pic Forest contributes the most to the mills and communities located within Wawa and Nipigon
37 Districts. The Forest also contributes to the mills and communities located within Hearst, Sault Ste
38 Marie and Thunder Bay Districts. The Pic Forest has wood supply commitments to AV Terrace Bay Inc.
39 (Terrace Bay), Levesque Plywood Limited (Columbia Forest Products Ltd.) (Hearst), Lecours Lumber Co.
40 Limited (Calstock), Olav Haavaldsrud Timber Company Limited, (Hornepayne) and Smoke Signals

1 Firewood Inc.(Nipigon) The NFMC has also entered into a business to business agreement with White
 2 River Forest Products (White River). With the forecast utilization on the Pic Forest there is no reason
 3 that the wood commitment cannot be met.

4 *3.7.5.1 Silviculture Expenditures*

5 Comparison of planned annual silviculture expenditures between the previous combined CP (Big Pic and
 6 Pic River) and the 2021/31 Pic Forest FMP.

7

	Combined old MU's	2021-2031 FMP	Difference
Planned annual silviculture expenses (000's \$/yr).	417	345	18%

8

9 The decrease in strategic silvicultural costs is a result of more “extensive” renewal treatments (i.e. Claag,
 10 fill) which were not applied as often in past plans as forecast in the current plan. This may result in
 11 decreased employment opportunities in silviculture; however, it is difficult to make a reasonable
 12 assumption on this because operating costs will certainly be higher, if for no other reason than
 13 increasing fuel prices, and minimum wage. As silvicultural activities follow harvest, and greater harvest
 14 achievement is forecast in the current plan, silvicultural and spinoff economic benefits may in reality,
 15 experience a boost.

16 The Pic Forest SFL contributes greatly to the economic and social health of local communities. In
 17 addition to timber, it is managed for values that range from wildlife habitat and old growth, to tourism,
 18 recreation and trapping.

19 *3.7.5.2 Non-Timber Values*

20 This Social and Economic Assessment identifies the potential impacts of the implementation of the
 21 LTMD (specifically harvesting and construction of new roads) on recreation and tourism, mining,
 22 aggregate extraction and hydro generation and other sectors. It is not a quantitative assessment of the
 23 impacts of the proposed management strategy because the detailed data and analysis required to make
 24 such an assessment is beyond the scope of the forest management plan.

25 A. Recreation and Tourism

26 **1. Tourism outfitters**

27 Possible Impacts:

28 Current and/or additional timber haul roads have the potential to increase access to remote
 29 tourism lakes. Timber harvest, hauling and other mechanical forest management operations
 30 have the potential to impact visual and acoustic aesthetics, and the sense of remoteness often
 31 marketed by tourism operators.

32

33 Management Considerations:

34 As a general principle, all roads constructed on Crown land may be used by the general public to
 35 access natural resources.

1 The FMP will include road use management strategies to limit the provision of access to remote
2 tourism lakes.
3 Road closures/restrictions are a highly sensitive issue and are only utilized where this measure is
4 necessary. This measure would be considered beneficial to remote tourism.
5 Specific harvest prescriptions and operational timing restrictions will be employed to minimize
6 the impacts.
7 Operating prescriptions and road use management strategies are consistent with the Crown
8 Land Use Atlas and are intended to minimize or mitigate the potential negative effects of forest
9 management activities on remote tourism operations.

10

11 **2. Crown Land Camping**

12 Possible Impacts:

13 Proposed new primary, branch and operational roads may increase opportunities for Crown
14 Land Camping.

15 Forest operations may impact visual and acoustic aesthetics.

16 Management Considerations:

17 Depending upon the user's perspective, increased access has the potential to improve Crown
18 land camping opportunity, or conversely, increased access has the potential to negatively
19 impact the availability of remote Crown land camping opportunity.

20

21 **3. Hunting**

22 Possible Impacts:

23 For road-based hunting, the addition of roads would have an apparent benefit to the activity.
24 This may however, have a negative effect on remote-based hunting or in maintaining the
25 remoteness of the forests and forest aesthetics.

26 In contrast, when road closures are planned, remote-based hunting and habitat protection
27 would be positively impacted, but this could be detrimental to road-based hunting.

28 Management Considerations:

29 As a general principle, all roads constructed on Crown land may be used by the general public to
30 access natural resources.

31 Habitat protection requirements in FMP may, over time, provide enhanced habitat for game
32 animals.

33 Road closures/restrictions are a highly sensitive issue, especially with respect to limiting hunting
34 opportunities for the local public. They are only utilized where this measure is deemed to be
35 necessary for the protection of remote tourism values.

36

37 **4. Fishing**

38 Possible Impacts:

39 The establishment of access roads may provide more fishing opportunities which could have
40 beneficial effects by spreading fishing pressure over a wider area, but may also put additional
41 pressure on specific fisheries.

42 Fish habitat may be affected by forest management activities.

43 Management Considerations:

1 As a general principle, all roads constructed on Crown land may be used by the general public to
2 access natural resources, including sport-fish angling.

3 Area of Concern (AOC) prescriptions will be employed to minimize the impacts of forest
4 management activities on fish habitat.

5

6 **5. Cottages**

7 Possible Impacts:

8 Additional timber haul roads will have the potential to create/increase access to cottage lakes.

9 This will be perceived as a benefit by some and detrimental by others.

10 Timber harvest, hauling, and other mechanical forest management operations have the
11 potential to impact visual and acoustic aesthetics, and the sense of remoteness often valued by
12 cottagers.

13 Management Considerations:

14 As a general principle, all roads constructed on Crown land may be used by the general public to
15 access natural resources, including cottage lakes. Cottagers may utilize roads constructed for
16 forestry purposes as a means of accessing their property, however, public access to the lake and
17 road maintenance may then become potential issues.

18 Specific harvest prescriptions and operational timing restrictions may be employed to minimize
19 these impacts, consistent with the Crown Land Use Atlas.

20

21 **6. Ecotourism**

22 Possible Impacts:

23 Current and/or additional timber haul roads have the potential to create/increase access for
24 road based ecotourism. This may provide additional business and/or recreational opportunities.

25 Timber harvest, hauling and other mechanical forest management operations have the potential
26 to impact the visual and acoustic aesthetics often valued by this client group.

27 Management Considerations:

28 As a general principle, all roads constructed on Crown land may be used by the general public to
29 access natural resources.

30 Specific harvest and operational prescriptions may be employed to minimize these impacts,
31 consistent with the Crown Land Use Atlas.

32

33 **7. Snowmobiling**

34 Possible Impacts:

35 Sections of current trail network on the forest make use of old logging roads which are no longer
36 in use or roads which are only used intermittently.

37 Sections of trails (that use forest roads) may have to be rerouted if the road is being actively
38 used for forestry purposes.

39 Sections of trails that fall within allocated stands may become blocked by logging debris or new
40 roads.

41 Trees felled across the trail have the potential to become a hidden hazard when covered by
42 snow.

43 New roads provide opportunities for low cost additions to the trail system in the future when
44 these roads are no longer required for forest management purposes.

1 Management Considerations:
2 Trails are considered as values.
3 Develop AOC prescription for snowmobile trails.

4

5 B. Mining, Aggregate and Hydro Generation

6 **8. Mining**

7 Possible Impacts:

8 When additional roads are built to increase access for mining exploration, a positive effect may
9 result in increasing the profitability of mining companies.

10 With more roads, increased access for timber harvesting can clear areas for mining sampling and
11 mapping, on the other hand, it would increase the chance of removing mining survey lines, and
12 destruction of claim posts could occur.

13 Management Considerations:

14 As a general principle, all roads constructed on Crown land may be used by the general public to
15 access natural resources. Individuals or companies conducting exploration/development
16 activities may apply to the MNR District Manager for authority to travel on roads with access
17 restrictions.

18 The utilization of cleared harvest areas for mineral exploration activities may conflict with the
19 SFL holder's forest renewal objectives.

20 The logging operator is required, under the *Mining Act*, to ensure mining claim markers are not
21 disturbed.

22

23 **9. Aggregate**

24 Possible Impacts:

25 Current and/or additional timber haul roads have the potential to create/increase access to
26 aggregate resources.

27 Aggregates discovered through forestry operations may be utilized to construct forest access
28 roads.

29 Management Considerations:

30 *The Aggregate Resources Act* and regulates this activity.

31 The FMP contains Operational Standards for Forestry Aggregate Pits.

32

33 **10. Hydro Generation**

34 Possible Impacts:

35 Current and/or additional timber haul roads have the potential to create/increase access for
36 hydro generation activities.

37 C. Other

38 **11. Traplines**

39 Possible Impacts:

40 The building of roads to provide access for timber harvesting operations may increase trapping
41 opportunities.

1 Habitat protection and/or improvement due to FMP guide implementation (potential habitat
2 increase for some wildlife species).
3 Loss of habitat for some species, improvement of habitat for others.
4 Timber harvest, hauling and other forest management operations have the potential to impact
5 traplines.
6 Management Considerations:
7 Habitat protection requirements in FMP guidelines may, over time, provide enhanced
8 opportunities for trapping by increasing the available habitat of fur-bearers.
9 Short-term impacts to individual traplines may be created by forest management activities
10 through the loss of cover.
11

12. Baitfish Operators

12 Possible Impacts:
13 Current and/or additional timber haul roads have the potential to create/increase access to
14 baitfish area.
15 Fish habitat may be affected by forest management activities.
16 Management Considerations:
17 Specific harvest and operational prescriptions may be employed to minimize habitat impacts.
18
19

20. 13. Bear Management Area (BMA)

21 Possible Impacts:
22 Additional access for BMA operators is provided.
23 Timber harvest, hauling and other forest management operations have the potential to impact
24 bear management areas and/or bear habitat.
25 Management Considerations:
26 Specific harvest and operational prescriptions may be employed to minimize these impacts.
27 Operations in this plan must follow the Bear Stands Condition on Regular Operations.
28

29. 14. Parks and Protected Areas

30 Possible Impacts:
31 Forestry operations near these values may cause damage to the value.
32 Roads constructed near Parks and Protected Areas may result in unplanned access and impact
33 on Natural Heritage values within the Parks and Protected Areas.
34 Management Considerations:
35 Forest operations are not permitted in Parks and Protected Areas.
36 Road Use Management strategies may be employed which make use of: road orientation (away
37 from boundaries), winter roads and decommissioning to minimize these impacts.
38 The location and road use management strategies of all new roads will comply with the Crown
39 Land Use Policy Atlas.
40 Area of Concern Prescriptions will be implemented in the FMP in close cooperation with Park
41 Managers.
42

43. 15. Point Specific Values

44 Possible Impacts:

1 Many other non-commercial and non tourism/recreational values would include such items as
2 stick nests, bat hibernacula and research plots.

3 Forestry operations within, on, or near these values may cause damage to the value.

4 Management Considerations:

5 Guidelines for the protection of point specific values normally require a reserve (no-harvest)
6 buffer to be placed around these values to ensure forestry operations do not impact them.

8 **16. Cultural Heritage Values**

9 Possible Impacts:

10 Forestry activities may have detrimental effect on protecting and maintaining cultural heritage
11 values, such as archaeological values, archaeological potential sites, cultural heritage
12 landscapes, and Aboriginal values.

13 Management Considerations:

14 Guidelines for the protection of Cultural Heritage Values will be applied to ensure forestry
15 operations do not impact them.

16 **3.7.6 Risk Assessment**

17 There are always risks associated with not fully achieving the proposed LTMD that could impact the
18 future forest condition and the benefits from the forest. Some of these risks are inherent or obvious
19 (i.e. Economic) while others are less tangible or easy to define (e.g. Wildlife habitat). Some of these
20 risks may have an immediate impact and some risks may have long term or little to no impact.

21 Forest Cover & Diversity: The most significant and obvious risk is the likelihood that the full planned
22 harvest area and volume is not realized. Over the last thirty years, the level of utilization has fluctuated
23 widely, especially in some forest types and species groups. This fluctuation is reflective of changing
24 market conditions for certain tree species (i.e. Poplar and Birch). The changing market conditions or lack
25 of markets for some species is an inherent risk to the LTMD that has been considered for at least the
26 past 30 years. Changes to and flexibility in policies and guidelines have assisted with minimizing this risk
27 while a change in silviculture focus and treatments have adapted to these changes to continue to move
28 the forest towards the future forest condition and achievement of the LTMD.

29 As an example, the Year 10 Annual Report (Trends Analysis) for the Big Pic Forest examined the trends in
30 regeneration against the area harvested over the most recent 2007-2017 FMP and concluded that,
31 silviculture efforts to reduce the amount of hardwood-leading forest units on the Big Pic Forest has been
32 successful in moving the forest towards the future forest condition. Specifically, the harvest reported
33 during that period was 33% in hardwood-leading forest types and 67% in conifer-leading forest types.
34 The regeneration reported during the same period found that 28% of harvest areas have regenerated to
35 hardwood-leading forest types and 72% are regenerated to conifer-leading forest types. The results of
36 the Trends Analysis for the Big Pic Forest were used in the inputs used in the determination of the
37 Allowable Harvest Area (AHA), a key consideration in developing the proposed LTMD.

38 When the planned harvest area is not fully utilized, there is less forest disturbance. Less forest
39 disturbance while favourable to forest objectives for old growth or mature and old forest is
40 unfavourable to meeting forest management objectives tied to the creation of young forest or to large
41 disturbances. Natural forest disturbance such as fire, blowdown or pest outbreaks is an inherent risk on

1 the Pic Forest. The fire cycle on the Pic Forest is approximately 80-100 years and was considered in the
2 development of the proposed LTMD. The last catastrophic fires on the Pic Forest were between 1996-
3 2006. Before that, 1923 was the last large fire recorded on the forest. The last major pest outbreak was
4 the Spruce budworm in the 1980's. Experts report it is on a 40-year cycle. There have been no
5 catastrophic wind events in recorded history on the Pic Forest. Although climate change could impact
6 on the level of risk associated with a major disturbance, there is not enough evidence at this time to
7 suggest it would increase the risk beyond what is already considered in the proposed LTMD. Forest
8 management, in a fire management system, has been using harvest to emulate fire and the variety of
9 disturbance sizes fire creates. This has been included through landscape pattern targets in the proposed
10 LTMD. For this reason, the greatest risk to a catastrophic natural disturbance is not implementing the
11 proposed LTMD.

12 Economic: One of the policies that has only been a factor in the last decade is the Species at Risk Act
13 (2007) and, the Caribou Conservation Plan. These policies and legislation have created additional
14 requirements as to how, when and where harvest operations are conducted. The forest industry has
15 been operating in an uncertain forest products market for at least the last decade that resulted in mill
16 idles and closures, in some instances, and a loss of some markets permanently. This economic climate
17 has had the greatest impact on logging contractors and communities' dependent on the forest industry.
18 The Tenure Modernization Act (2011) that resulted in the establishment of an LFMC, specifically the
19 NFMC, with a mandate to "*market and sell wood through both negotiated and open market sales to
20 generate sufficient revenue*" is directly impacted by the additional requirements to meet the policies
21 and legislation in place within the economic climate that it operates in. That impact is also felt by the
22 contractors, communities, and mills that depend on forest products from the Pic Forest. This risk has
23 been managed through a diverse representation on the planning team of forest industry, community
24 representation, aboriginal community representatives and task teams (e.g. Aboriginal Task Team) that
25 advise and/or recommend to the Plan Author during the development of the proposed LTMD. The
26 greatest risk to economic growth on the Pic Forest and to achieving the proposed LTMD is the economic
27 climate, a lack of markets for some forest products. All the above has been included and/or considered
28 in the development of the proposed LTMD to minimize the risk of a more negative outcome.

29 Social: Social pressures on a forest are increasing and ever-present. More and more of the public are
30 living on and recreating in the Pic Forest. In addition to the public, there are tourism businesses that are
31 located on the forest and use its resources. Some of the public express concerns related to access, while
32 others are opposed to logging and/or the use of herbicides. The local citizens committee known as the
33 Pic Forest Public Consultation Committee (PFPC) serves as the public voice on public issues and
34 education and, forest management issues or plan implementation changes. The PFPC has been in
35 place, in one form or another, since the late 1980's. The PFPC is an integral part of the forest
36 management planning process including having a representative on the FMP planning team. The PFPC
37 has been instrumental in bridging the "gap" between the forest industry and the public. One important
38 function of the PFPC during the development of the LTMD was their participation in the "*Desired Forest
39 and Benefits*" meeting that determines; a) what benefits from the forest are most important to the
40 public and, b) what are the biggest ongoing public issues on the Pic Forest. The proposed LTMD
41 considered the results of the desired forest and benefits meeting in its development. The risk that

1 something unforeseen could arise that could impact on the achievement of the proposed LTMD is
2 minimized because of the outreach to and inclusion of the PFPCC.

3 Another process that has been evolving over the last 30 years has been the engagement of aboriginal
4 communities and Metis with interests on the Pic Forest. The creation of the NFMC included 3 local First
5 Nation seats on the Board of Directors. There are 11 First Nation and Metis communities invited to
6 participate in the Pic Forest planning process, of which 5 communities have participated to varying
7 degrees. The Pic Forest planning team has established an Aboriginal Task Team. The purpose of the
8 Aboriginal Task Team is to; provide information to indigenous people, engage the communities in the
9 development of the forest management plan including the proposed LTMD, and provide a feedback loop
10 so that concerns raised at the task team can be voiced and addressed at the planning team table.
11 Additional to the purpose is the opportunity for non-aboriginals to listen and learn from aboriginal
12 people. Community presentations through the individual consultation process, available to each of the
13 5 local aboriginal communities and Metis with interests on the Pic Forest, have been ongoing
14 throughout the FMP planning process and the development of the proposed LTMD. A requirement of
15 the FMPM and part of the mandate of the NFMC are economic opportunities for First Nations & Métis.
16 The NFMC has been working with the economic arm of two communities to create harvest opportunities
17 as part of the proposed LTMD. Additionally, participating aboriginal communities with interest on the
18 Pic Forest can share their values to ensure they are protected from forest management activity. This
19 early engagement with interested aboriginal communities reduces the risk of not achieving the
20 proposed LTMD.

21 Silviculture: Silviculture is key to achieving the proposed LTMD. Not achieving the full planned harvest
22 level has a direct impact on achieving silviculture objectives for the future forest condition and, specific
23 objectives such as the maintenance of White Pine at historical levels on the forest. As described above,
24 silviculture efforts over the last FMP period have moved the Pic Forest towards the desired future forest
25 condition. The results of the trends analysis on the Big Pic Forest and company knowledge of silviculture
26 performance over the last 40 years on the Pic Forest were used to inform inputs into the calculation of
27 the AHA that is a key component of the proposed LTMD. The risk to not achieving the proposed LTMD
28 through silviculture would be if a) the full planned harvest was not achieved or, b) if the use of
29 herbicides is no longer permitted. As above, the opposition to the use of herbicides in forest
30 management is becoming increasing loud. The indigenous culture is the most vocal in this issue.
31 Silviculturalists know that if herbicides can no longer be used for the control of vegetative competition,
32 that will increase the risk of not achieving the desire future forest condition as presented in the
33 proposed LTMD. The suite of silviculture techniques referred to as the Silvicultural Ground Rules
34 developed for the Pic Forest consider herbicides will be available throughout the FMP. Also, new
35 silvicultural intensities that better capture the types of conditions found on the Pic Forest, in addition to
36 addressing Independent Forest Audit (IFA) recommendations related to this. As such, the risk to not
37 achieving the proposed LTMD from a silvicultural perspective is minimal.

38 Other: Another inherent risk is the quality and correctness of the forest resource inventory (FRI).
39 Planning and the proposed LTMD are based on a numerical representation of the forest. If this
40 numerical representation is not correct (i.e. Stand types and description), the associated growth and
41 yield curves may not be accurately represented. Also, incorrect representation in the inventory of forest
42 types, depending on how severe, could impact achievement of the planned harvest and volumes. This

1 further impacts the achievement of economic objectives related to wood supply and, could mean the
2 proposed LTMD may not be achieved as anticipated.

3 These types of errors could also have a trickle effect on silviculture objectives in that these objectives
4 could be based on erroneous data. The same logic applies to forest cover and wildlife. We may not
5 achieve the landscape targets because the starting point was incorrect.

6 For this Plan, there is a new FRI for the Pic Forest. Prior to development of the proposed LTMD, checks
7 on the correctness of the inventory were carried out on the ground. To complement the ground checks
8 GIS techniques combined with individuals experienced with the Pic Forest were used to verify the
9 quality and correctness of the FRI. Additionally, extensive work was carried out to ensure growth and
10 yield information is representative of historical yields on the Pic Forest in addition to developing new
11 silviculture intensities that more accurately represent the types of sites found on the Pic Forest (an IFA
12 recommendation) and, expected yields on those sites. Based on this work, the risk to the achievement
13 of the proposed LTMD due to an incorrect FRI has been thoroughly considered and is minimal.

14 All the risks identified have been thoughtfully and thoroughly considered in the development of the
15 proposed LTMD. Many of the risks to achieving the proposed LTMD are tied to economics that directly
16 affect the full utilization of planned harvest and volumes and the planned silviculture program. Others
17 are tied to social or cultural concerns. The proposed LTMD for the Pic Forest has demonstrated that it
18 has considered all the risks associated with not achieving the proposed LTMD. In summary, the
19 proposed LTMD for the Pic Forest represents the best balance of objectives to achieving forest
20 sustainability at the strategic level.

21 4.0 Planned Operations

22 4.1 Introduction

23 The following subsections provide a detailed description of operational activities to implement the Long-
24 Term Management Direction for the 2021/31 Pic Forest Management Plan. The plan describes areas
25 identified for harvesting, renewal and tending. In addition, approaches to road construction,
26 maintenance and decommissioning, as well as forestry aggregate pits activities are described. Planned
27 harvest allocations, receiving mills and any available by-products from Pic Forest are outlined. All
28 planned operations are provided also digital format as per the requirements of the Forest Information
29 Manual (2017) and/or the phase in provisions of the 2020 FMPM.

30 4.2 Prescriptions for Operations

31 4.2.1 Operational Prescriptions and Conditions for Areas of Concern

32 The Forest Management Planning Manual defines an Area of Concern (AOC) as a geographic area within
33 an area of operations which is adjacent to an identified natural resource feature, land use or value that
34 may be affected by forest management activities. Operational prescriptions for AOCs are designed to
35 prevent, minimize or mitigate adverse effects on identified values within the management unit. These
36 prescriptions list conditions on harvesting operations, renewal, tending and road construction and
37 maintenance for the ten-year duration of the Plan.

38 To address or mitigate the effects of forestry operations on each value, it is useful to identify an

1 area or zone that encompasses the value, inside of which forestry operations may or may not proceed,
2 depending on the value. These forestry operations may have some effect on the buffer area but beyond
3 which no adverse effect to the value is anticipated. This area or zone is the AOC for the value. AOCs are
4 identified for all known values that could be affected by forest management operations in the 2021
5 FMP.

6 Prescriptions to modify harvest, renewal and/or tending operations in AOCs have been developed by
7 the Planning Team to protect the variety of non-timber values that may be encountered over the course
8 of forest operations from adverse effects. A prescription may be prepared for an individual area of
9 concern or a group of areas of concern with a common value(s). For a group of areas of concern, the
10 value(s) that must be protected, and the selected prescription, are common to the group. Prescriptions
11 may include reserves (i.e., prohibition of operations), modified operations (i.e., specific conditions or
12 restrictions on operations), or regular operations (i.e., in accordance with the silvicultural ground
13 rules), individually or in combination.

14 Detailed AOC prescriptions were prepared based on input from planning team members, interest
15 groups, members of the general public and the MNRF's Natural Resources Information System (NRVIS)
16 database. Many of the AOC prescriptions developed for the protection of fish and wildlife values has
17 come from the direction in the Forest Management Guide for Conserving Biodiversity at the Stand and
18 Site Scales (SSG). Some AOCs have been developed by the planning team based on prescriptions used
19 in previous FMPs and others have been developed following emerging direction (i.e., Remote Tourism in
20 the Wawa District). Prescriptions developed for Archaeological Potential Areas and other confidential
21 cultural heritage values are based on direction in the Forest Management Guide for Cultural Heritage
22 Values. AOCs are developed for the sole purpose of protection of a particular value, regardless of the
23 longevity of the value (i.e., stick nest locations). In cases where there are proposed operations within
24 an AOC (i.e., cut-to-shore harvest prescriptions) regeneration will be accomplished for the most part by
25 natural treatments (i.e., CLAAG). None of the AOC prescriptions and conditions developed differ from
26 the specific direction or recommendations in the forest management guides, thus no exceptions have
27 been identified in FMP-11 for the ten-year term. The AOC prescriptions and conditions described in
28 FMP-11 will also apply to candidate bridging areas carried over from the 2019 Contingency Plan.

29 Any concerns over harvesting near a trail that a trapper has traditionally used, will be brought forward
30 through the MNRF consultation process and dealt with at that time.

31 Encountering Unidentified or New Values

32 There will be cases during the planning term where previously unidentified values are discovered while
33 forest operations are being carried out. These values could be unidentified nesting sites or previously
34 unidentified creeks that would require application of an AOC to protect the value. As a general rule,
35 upon discovery of a new or unidentified value, operations will be halted until 1) the value can be
36 identified (which may require assistance of MNRF Biologists, or joint resolutions made by professional
37 foresters), and 2) an appropriate prescription can be put in place. In cases where the value is obvious,
38 and the supervisor is comfortable applying an AOC, such as an unidentified creek, an AOC is to be
39 applied, as encountered in the field. AOC prescriptions will be applied to values as they occur on the
40 ground, not as they are mapped (i.e. Riparian Habitat Zone reserves are to be applied following the
41 water feature as it truly exists, not as portrayed on the map). All values which require application of an

1 AOC prescription will have the appropriate prescription applied (i.e. Flagged out or otherwise identified)
 2 before operations proceed. All adjustments, new values, or application of AOC’s that differs from the
 3 maps will be reported to NFMFC. NFMFC will file values updates to MNRF.

4 Encountering Non-Existing Values

5 There will be cases where mapped values do not exist on the ground (e.x. The operations maps show a
 6 Riparian Habitat Zone “water system” AOC, however no water value physically exists). As a general rule,
 7 where mapped values do not exist on the ground, operations will be halted until 1) the missing value is
 8 reported to NFMFC and 2) NFMFC confirms direction to contractors (this may involve a collaborative
 9 investigation with MNRF Biologists, foresters, or technicians). In cases were the non-existent value is
 10 obvious, and the supervisor is comfortable removing an AOC, such as a mapped creek where the is no
 11 evidence of water movement, the AOC is to be removed, as encountered in the field. AOC prescriptions
 12 will be applied to values as they occur on the ground, not as they are mapped (i.e. Riparian Habitat Zone
 13 reserves are to be applied following the water feature as it truly exists, not as portrayed on the map).
 14 All values which require application of an AOC prescription will have the appropriate prescription
 15 applied (i.e. Flagged out or otherwise identified) before operations proceed. All adjustments, removal
 16 of values, or application of AOC’s that differs from the maps will be reported to NFMFC. NFMFC will file
 17 values updates to MNRF.

18 *Table 59: Summary of AOCs identified in the Pic Forest.*

AOC	Count
Cultural Heritage Values	9
Fish and Wildlife	55
Recreational Values	15
Research Plots	4
Railway	1
Private Well	1
Archaeological Potential Areas	1
Other	1

19
 20 Table 59 summarizes FMP-11. There are 87 unique AOC prescriptions which were identified in the Pic
 21 Forest. These include cultural heritage values, wildlife values, recreational values and species at risk
 22 such as Blanding’s Turtles. The operational descriptions on these values were developed using the
 23 guidance from MNRF (e.g., Forest Management Guide for Conserving Biodiversity at the Stand and Site
 24 Scale (2010), the Management Guidelines for Forestry and Resource-Based Tourism (2001), and the
 25 Forest Management Guide for Cultural Heritage Values (2007)), Planning Team and/or other groups with
 26 an interest in the Pic Forest. Prescriptions were prepared either for an individual AOC or a group of
 27 AOCs with a common value(s), and included reserves (prohibition of operations), modified operations
 28 (specific conditions or restrictions on operations), or regular operations (in accordance with the
 29 silvicultural ground rules), individually or in combination. Modified operations may be regular
 30 operations with conditions (e.g., timing, equipment), or unique prescriptions that are developed to

1 protect or manage specific natural resource features, land uses or values. All AOCs and their operational
2 prescriptions were also available to the public for review and input.

3 The proposed operational prescriptions and conditions for AOCs will be documented in FMP-11, with
4 the following information for each AOC:

- 5 • The unique identifier which is illustrated on maps and links the value to the AOC supplementary
6 documentation if required;
- 7 • A description of the value;
- 8 • The operational prescription;
- 9 • The source of the prescription such as a guideline;
- 10 • If it is a group AOC (an AOC prescription that covers more than one of the same type of value);
- 11 • It identifies if there are conditions on roads, landings, and forestry aggregate pits;
- 12 • If the AOC is an exception to a guide (there are no exceptions to the guidelines in the AOCs).

13 *4.2.1.1 Operational Prescriptions and Conditions for Areas of Concern Information Products*

14 Area of Concern information products are submitted with this plan within the layer titled
15 “MU96621AOC000”.

16 *4.2.2 Prescriptions for Harvest, Renewal, and Tending Areas*

17 Silvicultural ground rules (SGR) are prescriptions for harvest, renewal, and tending operations developed
18 for the forest units being managed on the Pic Forest. The prescriptions for harvest, renewal and tending
19 presented in FMP-4 will serve as the prescriptions for operations, for the 2021-2031 Plan, including
20 naturally depleted areas that are salvaged.

21 *4.2.2.1 Silvicultural Ground Rules*

22 Silviculture Ground Rule were developed for applicable forest unit/ecosite combinations by the plan
23 author, a Registered Professional Forester, with the support of the planning team and planning team
24 advisors. Each silvicultural ground rule is a unique combination of four major components: the current
25 forest condition, the silvicultural treatment package, the regeneration standards and the future forest
26 condition. The current forest condition describes the pre-harvest condition of forest stands in terms of
27 a forest unit and ecosite type. Silvicultural treatment packages refer to the range of acceptable
28 silvicultural treatments (for harvest, renewal and tending) that can be undertaken at various intervals
29 throughout the life of a forest stand to achieve the future forest condition. Each silvicultural
30 treatment package includes: silvicultural system, harvest method, logging method, renewal
31 treatments (site preparation and regeneration), and tending treatments. The regeneration
32 standards identify the target and/or acceptable species composition, minimum stocking value (with
33 the associated density) as well as timeframes associated with the amount of years to reach free-to-
34 grow. The standards of regeneration success are consistent with the development information (i.e.,
35 post-renewal response reflected in the base model) associated with each SGR. The future forest
36 condition describes the forest that is expected to develop over time as a result of applying a
37 silvicultural treatment package.

1 The post-renewal response was calculated by forest unit and treatment type from the analysis of
 2 silviculture activities, particularly annual report free-to-grow data from the last trends analysis for the
 3 Big Pic and Pic River Forests.

4 *4.2.2.2 Conditions for Important Ecological Features*

5 Conditions for Important Ecological Features, commonly referred to as Conditions on Regular
 6 Operations or “CROs” are conditions applied in areas of harvest, renewal and tending operations and
 7 are required to maintain or protect features not addressed by operational prescriptions for Areas of
 8 Concern (AOCs). CROs are also required to implement specific operational standards and guidelines (i.e.
 9 From the stand and site guide). The CROs are conducted in accordance with the silvicultural ground
 10 rules.

11 The Stand and Site Guide was used as the source for development of most of the following CROs.
 12 Direction within the guide is characterized as standards, guidelines, or best management practices. It is
 13 important to understand the differences between these three terms as they have different implications
 14 with respect to their implementation within the FMP.

- 15 • Standard – a component of a guide that provides mandatory direction. Standards must be
 16 followed as written; there is no room for interpretation by forest managers, supervisors, or
 17 operators.
- 18 • Guideline -a component of a guide that provides mandatory direction, but requires professional
 19 judgement for it to be applied appropriately at the operational level. Guidelines are mandatory
 20 and must be followed, but professional judgement can apply the direction as best suited.
- 21 • Best Management Practice – a component of a guide that suggests a practice or strategy to help
 22 implement the overall purpose of the standard or guideline. Best management practices are not
 23 mandatory, but rather are examples or management practices that forest managers may wish to
 24 adopt.

25 Standards, guidelines, and best management practices were used to develop the following conditions on
 26 regular operations for the Pic Forest. The following conditions apply to all operations, roads, landings,
 27 and aggregate pits (Table 60).

28 *Table 60: Pic Forest Conditions on Regular Operations (CROs)*

<i>Bear Stands</i>
<p>Bear stands are used in commercial bear hunting to hunt bears within licensed Bear Management Areas (BMAs). These stands are manmade, temporary, often move and are utilized during the spring and fall bear hunt in mid May, June, late August and September. There is an AOC associated with these stands (FMP-11, BMS). The following additional conditions apply to bear stands and are not detailed in the AOC:</p> <p>Conditions on Regular Operations, Roads, Landings, and Aggregate Pits</p> <ul style="list-style-type: none"> • BMA operators will be notified by MNRF as part of AWS review process; • BMA holders are responsible for reviewing the AWS and advising NFMC when planned operations are in the vicinity of the bear stands; • NFMC and BMA holders will develop measures to mitigate the potential impacts of harvesting on bear stands.

Biofibre Harvest

Biofibre is a forest resource from Crown lands that is not being fully utilized for other forest products and that are made available under an approved forest management plan. Forest biofibre is comprised of un-merchantable timber such as undersized wood, cull trees or portions of trees, individual trees and stands of trees that are "merchantable", and trees that may be salvaged because of a natural In the disturbance. Biofibre could potentially be used for bioenergy, wood pellets and biochemicals. The following conditions on regular harvest operations have been developed.

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

- Only harvested trees are available for biofibre harvest;
- Biofibre harvest will be subjected to the same conditions as regular harvest;
- Below ground portions of the tree and organic matter that is not part of harvested trees will remain on site.

Caribou (Discontinuous Distribution Zone – Connectivity Zone)

A set of conditions on regular operations were developed by the Planning Team during the 2019-2029 FMP to manage for caribou within the caribou discontinuous distribution zone in order to provide Connectivity between the Northern Continuous and the Lake Superior coastal range. The conditions on regular operations include:

Conditions on Regular Harvest, Renewal and Tending Operations

- To increase the patch size distribution within the caribou travel corridor;
- Silviculture in the travel corridor will be done in such a way as to favour conifer regeneration over mixed wood and hardwood regeneration (early tending or chemical site preparation) that is consistent with silviculture objectives, revenues and expenditures, and SGRs;
- Tending treatments will be used to protect conifer regeneration and reduce brush and hardwood species and shrubs that are attractive browse for moose. Limiting browse that attracts moose will also help reduce the use of caribou areas by predators such as wolves and bears. Tending will also be used as required to control browse species in branch road corridors. Where appropriate, more than one herbicide application may be required to maintain the conifer component on competition prone, upland mixedwood sites. This may involve chemical site preparation and one or two tending treatments;
- Operational activities will be scheduled to limit the number of times the travel corridor is accessed. Hauling, silviculture and road removal will take place in a timely fashion to shorten the duration of disturbance;
- During harvest operations, residuals will be left on the site so that they will not promote the regeneration of undesirable species such as hardwoods, balsam fir and larch. Residuals will be retained mainly in clumps while minimizing forest edge;
- Care will be taken to minimize rutting and compaction to prevent regeneration delays and increase of undesirable vegetation and species such as larch and balsam fir;
- Harvesting poplar in the summer and minimizing exposure of mineral soil during harvesting will help reduce density and vigor of poplar regeneration. If summer harvesting is implemented, new road development will be minimized and when possible, hauling of wood will be delayed until winter to minimize the need for all weather roads and increase the use of poorer quality winter roads;
- When building access roads within the caribou travel corridor, care will be given to avoid areas of preferred habitat and caribou values;

- When feasible, all-weather roads will be constructed to avoid areas of higher relief, since these features (such as esker ridges and rock knobs) often contain an abundance of lichen and are potentially important winter habitat;
- Planting of roads will be done in the same manner as in adjacent blocks. In some cases, retaining a portion of intact road bases on deep sandy soils may be desirable to encourage lichen regeneration.

The following strategies will be employed to ensure caribou are protected from harm and harassment during regular operations:

- Forest workers will receive training to help identify caribou;
- Forest workers will be responsible for reporting caribou sightings immediately to their supervisor who will contact NFMC who in turn will then immediately notify MNRF;
- Forest workers will be required to stop or adjust operations as advised by MNRF to avoid harm or harassment to caribou. Mitigative measures will be developed with MNRF as required.

Caribou (Northern Continuous Zone – Dynamic Caribou Habitat Schedule)

The following direction applies to regular operations within the Northern Continuous Zone (Dynamic Caribou Habitat Schedule). Direction is consistent with the Pic Forest Management Plan Caribou Habitat Strategy for the Pic Forest and the Boreal Landscape Guide (2014).

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

- Silvicultural prescriptions will be consistent with caribou habitat management objectives.
- To maintain or provide a long-term supply of suitable caribou habitat, the following principles will be applied:
 - harvest stands in large contiguous tracts;
 - regenerate contiguous harvest tracts to a conifer dominated, shrub and herb-poor forest condition, of similar age class distribution (i.e., creating even-aged class structure);
 - minimize the amount of residual forest and prevent conversions to mixedwoods or hardwoods in all harvest blocks (e.g., to the extent possible, residual forest will be associated only with AOC prescriptions or CROs (conditions on regular operations);
 - where the objective includes a future forest condition that is pure conifer (jack pine and/or black spruce and/or white spruce only), as measured over the multi-stand cutblock area, create silvicultural objectives and use silvicultural treatments that prevent increases in balsam fir and hardwood and keep them from exceeding their natural (e.g., pre-harvest) levels; and
 - maintain pattern, stand structure and composition objectives consistent with objectives for the LLP.
 - Emphasis on the management of caribou winter feeding habitat will occur in areas identified as having been used by caribou as winter feeding habitat, or specific areas with a high potential to develop into winter feeding habitat. In these areas, the following direction will apply:
 - on dry upland conifer sites conducive to lichen rich ground cover (e.g., *Cladina* spp.), use silvicultural practices to maintain or enhance jack pine or black spruce stands that favour the lichen rich ground cover condition; and

- in lowlands (e.g., lowland black spruce; treed bogs) and shoreline forests, where feasible and consistent with site conditions, use silvicultural practices to maintain or enhance black spruce stands that favour the growth of arboreal lichens (e.g., *Bryoria* spp.). Sandy or dry sites more suitable for Jack Pine should still be regenerated to Pine.
 - To manage for calving and nursery habitat (e.g., large lakes with islands, complexes of smaller lakes, or open peatland complexes with treed islands):
 - include these habitats in caribou tracts and schedule them for protection or harvest consistent with habitat tract pattern and composition objectives developed through implementation of this guide; proceed with allocation and harvest of a habitat tract with known or potential calving sites and nursery areas provided they are in an unsuitable condition (e.g. Over mature, with a dense understory of shrubs such as raspberry); or if there is a sufficient supply of calving and nursery habitat in suitable condition on the management unit. For example, forest operations could occur if at least one third of the forest stands on the perimeter and islands of a known, large calving/nursery lake were retained or maintained in a suitable condition. Stands in suitable condition are generally mature, conifer dominated, sparsely to well-stocked, with a relatively open understory. Suitable calving and nursery habitat will also be contiguous with tracts of mature, conifer dominated forest cover; and
 - for known calving sites and nursery areas that are in a suitable condition, establish a 1 km area of concern (AOC) and do not conduct forest operations within the AOC from May 1 to August 15.
 - To minimize the potential negative impacts to caribou populations associated with forest roads and road networks:
 - where it is reasonable to do so, avoid traditional and potential high quality caribou habitat tracts (i.e., tracts which contain calving sites and nursery areas, and/or winter feeding habitats) when planning primary (permanent) road locations; and
 - adopt road use management strategies for primary, branch and operational roads consistent with caribou management objectives and approved actions identified in the CCP.
- Harvest operations in caribou tracts should be concluded as quickly as possible, ideally 10 years; the maximum time should be no more than 20 years after the commencement of operations.
- Renewal of conifer dominated stands, especially fine textured soils, should occur within two years of harvest to minimize ingress of deciduous trees and shrubs, maximize regeneration potential and shorten the time to stand closure.
- Following large wildfires or blowdown, consider allocation of harvest blocks adjacent to the perimeter of the wildfire, consistent with direction on landscape pattern and composition provided elsewhere in this guide. If salvage operations are planned within the perimeter of the fire, use practices consistent with maintenance or enhancement of spruce and/or jack pine content.
- The development of road use management strategies in areas where there is an objective to maintain or provide caribou habitat should consider:
 - minimizing the amount of road construction and increasing normal skid distances;

- minimizing public access restrictions (e.g. Gates, signs), providing for both public and commercial travel on forestry roads and road networks for the period of time forest operations are occurring within a LLP (i.e. A DCHS or mosaic block) or until harvested areas have begun to decline in quality with respect to moose feeding habitat (e.g., 20 years following harvest);
- the use of winter roads where feasible;
- decommissioning operational roads as quickly as possible following cessation of forest operations; and
- regenerating operational roads, branch roads and branch road networks to conifer (other than balsam fir) as soon as possible.

Cedar Harvest

Eastern White-Cedar (Cedar or *Ce*) occurs across the Pic Forest mainly in swampy areas (presumably where the underlying rock is limestone). Cedar also occurs on very shallow dry soils over rock and in sphagnum bogs. Grows in small pure stands often not delineated as its own stand, more likely occurring within a larger delineated stand. Slow growing. Where Cedar is encountered in a forestry operation, the following standards are to be implemented:

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

- Non-marketable Single or scattered trees are to remain standing. Harvest or removal of single trees for road building, skidding, or harvest pattern, is permitted.
- If non-marketable pure stands are encountered, those stands are to be left as by-pass. Road construction through pure stands should be avoided, however, if there is no reasonable alternative, is permitted.
- If marketable pure stands are encountered, harvest may occur. Harvest will retain half (1/2) of the mature trees in the stand.
 - Retention of mature trees will provide a seed source for natural regeneration of the pure stand. Cedar is not planned for artificial regeneration.
 - Harvest should occur in narrow strips. Cedar will grow best after such cutting because hardwood competition is less than after partial cutting. Shelterwood cutting is preferred, however, strip cutting ensures adequate natural seeding. This method of cutting also provides the partial overstory shade necessary to reproduce white-cedar in areas with frequent hot, dry spells.

Crown Disposition Lease

Across the forest, the Crown has issued leases to entities for various reasons. The exact nature of each lease may be different and would need to be investigated on a case-by-case basis. This CRO has been developed as a “catch-all” standard for operations around or adjacent to Crown Disposition Leases. On operations maps, Crown disposition leases have been identified and labelled. There are no AOCs specific to Crown disposition leases, however, the following standards will be applied.

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

- Operations planning will avoid allocating harvest stands where an overlapping lease is in place. When the spatial geometry and exact placement, from LIO, of the lease is not accurate, the following standards will apply.
- Regular harvest, renewal, roads, landings and aggregate pits are permitted outside the lease boundary as agreed to by the lease holder and the NFM.

<ul style="list-style-type: none"> • Where operations are planned adjacent to a lease, the contractor and NFMC will work with the lease holder to establish the lease boundary and ensure no negative impacts will occur to the lease holder. • If harvest, access or other operations are permitted on a lease the contractor and NFMC will work with the lease holder to ensure forestry operations will not negatively impact the lease or create non-compliances of lease conditions or standards (e.x. Creation of a new access road causing the lease to be non-compliant)
<p><i>Debris Management (Slash Pile Management)</i></p>
<p>Debris management (commonly referred to as “slash piles”) refers to the handling of logging debris created at roadside through processing activities. Accumulation of roadside debris increases the area within a harvest block “lost” to roads and landings. Although these areas will eventually return to productive forest, it will take much longer than the surrounding harvested land. The overarching goal of debris management is to increase the silvicultural treatable area, reduce fire hazard, and maintain forest aesthetics.</p> <p>Conditions of Regular Operations, Roads, Landings, and Aggregate Pits</p> <ul style="list-style-type: none"> • Logging debris (slash) accumulated at roadside is treated through the NFMC annual silvicultural program. • NFMC will discuss debris management plans with harvesting contractors prior to block start-up. Ideally, the harvesting contractor will manage their own slash, as agreed to by NFMC, reducing costs of additional programs. • Where heavy angle blade is prescribed as a silvicultural tool, debris will be left untreated, as the site preparation will align the slash. • Debris management will mainly focus in areas of “intensive” silvicultural treatments. I.e. Areas regenerating under a managed silvicultural ground rule. • Poplar slash in “extensively” (natural reduced) treated stands will generally not be managed. • At a minimum, where debris management occurs, slash must be piled. However slash may also be: <ul style="list-style-type: none"> ○ Burned or piled and burned (via a low complexity prescribed burn program) ○ Pushed into the ditch, if applicable. This will reduce water speed and possibility of erosion. Mainly for use on primary and secondary roads. ○ Dispersed back into the cut-over. • Chipper or grinder debris should remain piled to take up as little ground area as possible. Grinder or chipper debris can be dispersed back into the cutover but should not be spread out at the piling site. • All debris management activities will be monitored, and reported in the appropriate Annual Report.
<p><i>Downed Woody Debris</i></p>
<p>Downed woody debris refers to wood above the soil and on the ground. The following conditions will be applied to regular harvest operations not including salvage harvest:</p> <p>Conditions on Regular Operations, Roads, Landings, and Aggregate Pits</p> <ul style="list-style-type: none"> • Downed woody debris that is on the ground at the time of harvest will be left on site; • A portion of non-merchantable or non-marketable wood that is felled during harvest will also be left on site as prescribed in the NE Region Operations Guide for Marketability Issues

(2013). However, if a biofibre market exists this material may be brought to roadside and utilized;

- Stems retained as wildlife trees that fall down, or are felled for worker safety reasons, will be left on site for downed woody debris. Moving such trees for silvicultural purposes is permitted;
- Logging debris will be left on site at the stump where compatible with logging methods (cut-to-length processing) and markets (hardwood veneer only). However, other logging methods (full tree to roadside) may mean this material is brought to roadside where trees are processed. It can then be disposed of by piling, piling and burning, dispersal within the harvest block, or sold as biofibre if markets exist;
- Passive or power disc trencher or excavator site preparation should retain some coarse woody debris on site and avoid long continuous windrows as much as possible. Angle or sheer blade bulldozer site preparation will cause windrows.

Erosion

Erosion can be defined as the overland movement of soil particles by water, wind or gravity. Erosion can be the result of either natural causes or human alterations. The following conditions on regular operations have been developed to prevent, mitigate and or rehabilitate erosion associated with forest management activities.

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

- Forest operations will not be conducted on extremely steep slopes;
- Skid trails will avoid steep slopes (>30% slope) where possible;
- Skid trails will be kept to a minimum, with an emphasis on the protection of advanced regeneration;
- Post-harvest prescriptions and renewal efforts will be carried out as quickly as possible on shallow soils or blow sand sites to encourage full site occupancy. This will minimize problems with erosion and loss of nutrients;
- Green wildlife trees, organic matter and surface vegetation will be preserved on steep slopes (>30% slope);
- Decommission main skid trails constructed on steep slopes by installing water bars, diversion ditches, straw bales, etc. At appropriate intervals or critical landform junctures to filter runoff water through surrounding vegetation.;
- Minimize mineral soil exposure to that required for efficient operations and effective silviculture consistent with SGR being applied to the site;
- Implement road and water crossing construction and maintenance practices in accordance with the requirements;
- Mitigate or rehabilitate areas of significant erosion that are transporting, or are likely to transport, sediment into a water feature.

Equipment Only Crossings

The Protocol for the Review and Approval of Forestry Water Crossings and the Crown Land Bridge Management Guidelines, discussed in section 4.5.6 Road Water Crossings specify the standards and management practices that apply to water crossings on Crown land roads.

The intent of this standard is to provide general guidance on short term temporary crossings that provide access to harvest and road construction areas prior to installation of proper water crossing

infrastructure. Additionally, equipment only structures may be used to provide short term access for silvicultural equipment following the removal of crossings.

Equipment only options may only be used where no access is available to the public (i.e. Licensed vehicular traffic cannot access the structure). It is the responsibility of the supervisor to ensure that equipment only structures are replaced with crossings that meet applicable standards when public access to the crossing is established. Crossing of haul vehicles of any type or licensed vehicular traffic (i.e. Gravel trucks, haul trucks, pick-up trucks etc.) is not permitted. The road leading up to the equipment only crossing will not be passable/driveable in order to prevent highway vehicles from accessing the crossing.

Equipment only structures are not subject to the provisions in the Protocol for the Review and Approval of Forestry Water Crossings or the Crown Land Bridge Management Guidelines, however supervisors must ensure that they satisfy Occupational Health and Safety Act provisions and take all reasonable care for the safety of forest workers. This includes installing and using equipment only structures in accordance with manufactures specifications and utilizing bearing structures as directed by those specifications.

Equipment only structures must be removed before Spring freshet or by March 31st (whichever comes first) of each operating year. If a structure must remain in place more than six (6) weeks, then MNRF will also be advised.

Fur Bearing Mammal Dens in Enduring Features

Dens are important to furbearing mammals for hibernation and reproduction. This includes dens in caves, excavated burrows, under large piles of coarse woody material, or other enduring features that are known to have been occupied by furbearing mammals (other than red foxes, skunks, wolves and wolverines) at least once within the past 5 years.

No fur bearing mammal dens are currently identified on the LIO values maps for the Pic Forest. The following conditions on regular operations are designed to minimize disturbance of animals using dens, to help maintain den structures and maintain habitat surrounding dens. Direction applies to dens known before or found during operations:

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

- Harvest, renewal and tending operations are not permitted within 20 metres of the den entrance;
- New roads, landings and aggregate pits are not permitted within 20 metres of the den entrance;
- Hauling and road maintenance operations are not permitted within 20 metres of occupied dens unless the road predates the den and is required for safety reasons or environmental protection.
- Road construction and aggregate extraction are not permitted within 20 m of occupied dens, except in extraordinary circumstances as specifically identified and justified through the FMP AOC planning process

Fur Bearing Mammal Dens in Transitory Features

Dens are important to furbearing mammals for hibernation and reproduction. This includes dens in tree cavities, hollow logs, brush piles, or other transitory features that are known to be occupied by

fur-bearing mammals (other than red foxes, skunks, wolves and wolverines) that are encountered during operations.

There are no fur-bearing mammals dens currently identified on the LIO values maps for the Pic Forest. The following conditions are designed to minimize disturbance of animals using dens in transitory features, to help maintain den structures and maintain habitat surrounding dens:

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

- Known occupied dens encountered during operations will not be destroyed;
- Reasonable efforts will be made to minimize disturbance of furbearers occupying known dens.

Highways (provincial roadways 17, 614, 625)

Provincial highways are present on the forest. Forest operations will often have to work around or adjacent to provincial highways. The following conditions must be applied when operations occur near or adjacent to provincial highways.

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

- Harvesting is permitted. Within 10m of the highway Right-of-Way (ROW), operations must retain smaller diameter trees (less than 14 cm dbh). These trees will serve as a barrier to minimize winter snow drift across the highway.
- Renewal and tending operations are permitted so long as the operations maintain the standing trees.
- In areas where operations adjacent to a highway overlaps with the APA AOC, the specific direction in the APA AOC prescription must be applied.
- Any primary, branch or operations roads connecting to highways must apply for, and have on record, a valid highway entrance permit, issued by the Ministry of Transportation (MTO).
- Conditions for maintenance of any roads connecting to provincial highways must adhere to CROs; Planned Road Construction and Maintenance inside AOCs and Planned Road Construction and Maintenance outside AOCs.
- Aggregate pits are not permitted within 10m of highways.

Hydro Lines

Hydro lines are present on the forest. Forest operations will often have to work around or adjacent to hydro lines. The following conditions must be applied when operations occur near, adjacent to, or under hydro lines.

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

- Regular forest operations are permitted, however, trees must be felled away from the hydro line and skidding and piling along the hydro line right-of-way will not be permitted.
- Regeneration operations are not permitted within the right-of-way.
- Any new primary, branch or operational road crossing the transmission line will require prior approval from Ontario Power.
- No landings are permitted in the hydro line right-of-way.

Hydrological Linkages

Hydrological linkages Can be described as changes in potential flow rates and/or patterns of surface/shallow groundwater flow throughout the forest ecosystem. Hydrological disruption is the

alteration of the physical characteristics of a site such that the natural flow of water, on or below the surface, is significantly impeded (e.g. By damming), accelerated (e.g. By channelization), or diverted (e.g. By ditching). Note: the natural 'watering up' process associated with the removal of forest cover is not considered a hydrological disruption.

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

- Hydrological impacts arising from harvest, renewal and/or tending operations will be minimized.
- Based on local conditions, explore reasonable alternatives to crossing organic and saturated mineral soils during frost-free period.
- The conditions outlined under rutting and compaction apply when crossing organic saturated mineral soil cannot be avoided during the frost-free period.
- The silvicultural ground rules in Table FMP-4 present the prescriptions for harvest, renewal and tending for all forest stands being managed, based on relevant MNRF silvicultural guides, and they identify ecosite types susceptible to erosion, rutting and compaction.
- Based on local conditions, reasonable precautions will be taken to ensure harvest, renewal and tending operations will not result in disturbance of the forest floor that impedes, accelerates or diverts water movement within recognizable ephemeral streams, springs, seeps, and other areas of groundwater discharge connected to lakes, ponds, rivers, or streams.
- Operational staff will be trained to recognize unmapped sensitive sites which they may encounter during course of harvest planning and boundary layout, particularly adjacent to flowing and standing waters.
- Operational staff will be instructed to implement preventative measures to protect such sensitive sites during the course of harvest and renewal operations.
- To the best extent possible, hydrological linkages will be maintained within harvest areas and will contribute to reduction of sight lines and provide shaded travel corridors for wildlife to traverse harvest areas. Trees within these areas can be harvested, but shrubs, advanced regeneration, should be maintained.
- Avoid skidding through areas of accumulated flow, particularly when near a water feature.
- Where possible, locate landings so skidding and forwarding does not have to cross natural drainage patterns.

Jack Pine on Dry Sandy Sites

The current practice of randomly leaving the 25 wildlife trees per hectare does not work well on dry sandy jack pine sites. The trees left standing after harvest operations are susceptible to be blown over and are now downed woody debris instead of a wildlife tree. The following conditions were developed by the Planning Team and will apply to jack pine on dry sandy sites;

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

- Roads, landings and aggregate pits are permitted;
- The wildlife trees will be grouped together with 10 trees per group, there will be 2.5 groups on average per hectare. The clumped wildlife trees will be more wind firm and not be as susceptible to being blown over.

Loss of Productive Land

The loss of productive land is the conversion of previously productive forest land to a long term or permanently non-forested condition because of forest management activities. Some loss of productive land through the conversion to other land types (forestry access roads, landings, and pits)

is inevitable even in the most efficient forest management operation. The following conditions have been developed by the Planning Team to minimize the loss of productive land:

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

- Minimize the amount of area being converted to non-forest because of roads, landings and roadside slash accumulations to that required for efficient operations as per the FMP objectives:
- To minimize the area of productive land lost to unutilized woody material at roadside, one of the following will be done:
 - Piled and burned and regenerated;
 - Slash alignment and regenerated.
- Exposure of bedrock should be minimized.
- Ponding created by operations and roads will be mitigated where possible.
 - This includes installation or removal of cross drains or creating “trenches” across the road (where water is ponding on one side) with operations or road building equipment or using silvicultural equipment (e.x. Mechanical site preparation equipment).

Nests of Songbirds or Other Small Birds Containing Eggs or Young

This includes known nests of songbirds or other small birds containing eggs or young encountered during operations. The following conditions will be applied:

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

- Known nests of songbirds or other small birds containing eggs or young encountered during operations will not be destroyed and reasonable efforts will be made to avoid disturbance of the nest.

Nests of Species at Risk Identified During Operations

There are ten bird species at risk (SAR) known or suspected to occur on the Pic Forest. Six species at risk (Bald Eagle, Bank Swallow, Barn Swallow, Eastern Whip-poor-will, Common Nighthawk and Short Eared Owl) are managed with AOCs (BSC, BCSN, EAG, EWW, GNR2 and GNR4). The remaining four species at risk (Canada Warbler, Eastern Wood-Pewee, Olive-sided Flycatcher and Wood Thrush) do not have AOCs and will be addressed with the following conditions developed by the Planning Team:

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

- Known nests and nesting sites defined in LIO for the Canada Warbler, Common Nighthawk, Eastern Wood-Pewee, Olive-sided Flycatcher and Wood Thrush will be protected with a 30-metre reserve to ensure they will not be disturbed or destroyed during operations;
- If new (unknown) nests of the five SAR bird species not protected by an AOC are encountered during operations, then a 30 metre AOC will be established to protect the nesting site;
- If necessary, further direction will be provided by MNRF biologists in a timely manner before proceeding with operations.

Nests of Waterfowl and Grouse Containing Eggs

Known nests of waterfowl and grouse containing eggs may be encountered during layout and operations. The following conditions will be applied:

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

- Known nests of waterfowl and grouse containing eggs encountered during operations will not be destroyed and reasonable efforts will be made to avoid disturbance of the nest.

Non-forested Wetlands

Non-forested wetlands include open wetlands, treed wetlands, brush and alder which are defined as mapped polygon types OMS, TMS and BSH. These features are normally associated with water and are often protected by AOCs. Brush and alder that is not wetlands such as old fields and roads are excluded. The boundary between non-forested wetlands and forest is defined where the canopy cover of trees ≥ 10 centimetre dbh is $\geq 25\%$ or the canopy cover of trees ≥ 1.5 metres tall is $\geq 30\%$. The following conditions will be applied to non-forested wetlands:

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

No harvest, renewal, or tending operations are permitted that will result in significant damage to wetland vegetation or disruption of hydrological function. Operations specifically prohibited include:

- Machine travel during the frost-free period within 3 metres of those portions of the wetland dominated by open water or non-woody vegetation (vegetation communities with $< 25\%$ canopy cover of trees, tall (≥ 1 metres high) woody shrubs such as alder or willow, or low (< 1 metres high) woody evergreen shrubs such as Labrador tea or leatherleaf);
- Excessive removal or damage of sapling-sized trees (< 10 centimetres dbh) and shrubs within 3 metres of those portions of the wetland dominated by open water or non-woody vegetation;
- Felling of trees during the frost-free period into, or within, 3 metres of those portions of the wetland dominated by open water or non-woody vegetation. Trees accidentally felled into those portions of the wetland dominated by open water or non-woody vegetation will be left where they fall;
- Operations that leave ruts, a significant area of exposed mineral soil, or disrupt hydrological function within the wetland itself or within the forest that is within 15 metres of those portions of the wetland. Ruts or significant patches of exposed mineral soil will be promptly rehabilitated;
- Aggregate pits are not permitted within 15 metres of non-forested wetlands;
- No contamination of wetlands by foreign materials is permitted. Specifically, the use and storage of fuels will be carried out in accordance with the Liquid Fuels Handling Code and no equipment maintenance (washing or changing oil) is permitted within 15 metres of non-forested wetlands;
- Landings are not permitted within the wetland itself or within adjacent forest that is less than 15 metres from those portions of the wetland dominated by open water or non-woody vegetation;
- Reasonable efforts will be made to avoid crossing wetlands with extraction trails during the frost-free period. During all seasons, crossings will be minimized and will follow appropriate operating practices described to minimize potential site damage and effects on hydrological function;
- Reasonable efforts will be made to avoid construction of new all-weather roads within wetlands or portions of wetlands characterized by open water or non-woody vegetation. When construction of all-weather roads in wetlands is necessary, it will follow appropriate design principles to minimize risk of sediment entering the wetland and disruption of hydrological function.

<p><i>Normal Harvest</i></p>
<p>Where an approved harvest area is not immediately adjacent to a road and there is an intervening unallocated stand or plantation, incidental harvest within said area is permitted to facilitate equipment access, skidding and downpiling of harvested timber at roadside according to the following conditions:</p> <p>Conditions on Regular Operations, Roads, Landings, and Aggregate Pits</p> <ul style="list-style-type: none"> • Both the block and area to be skidded through are licensed and in an area approved for operations (e.g. ORB). For example, in the case of a FRL, in addition to the harvest block, the area to be skidded through must be identified as part of the licensed area on the license map(s). • Efforts will be made to limit the number of skid trails through the unallocated area, with trails located at least 250m apart where feasible (i.e. When not constrained by terrain), having a maximum length of 300m and width of 15m. • Landing areas are to be located where skid-trails meet the road, at a spacing of 250m apart where feasible (i.e. When not constrained by terrain). The area cleared/disturbed at roadside for piling should be sufficient only to accommodate the wood from the respective skid-trail. To facilitate piling, a disturbance of up to 2 treelengths perpendicular from the road edge into the unallocated area will be accepted. • Skid-trails and landings will be regenerated to an appropriate species (i.e. Pre-existing condition) using the most appropriate treatment method (e.g. Plant). • Compliance reports for the unallocated areas will be filed as harvest, renewal or tending under the CRA that the skidded wood came from. • Wood can stay at roadside no longer than the term of the harvest approval under which it was cut (i.e. Current AWS), or in extenuating circumstances with approval from MNRF, the term of the associated authority to haul (i.e. When the latter is granted an extension).
<p><i>Nutrient Loss</i></p>
<p>Nutrient loss can be described as the release and off-site transport of nutrients following forest management activities. The following conditions on regular operations have been developed to avoid nutrient loss:</p> <p>Conditions on Regular Operations, Roads, Landings, and Aggregate Pits</p> <ul style="list-style-type: none"> • Implement the SGRs to avoid nutrient loss on susceptible sites; • Avoid full tree harvesting on shallow soils whenever possible; • Maintain slash and biomass within the harvest block as much as possible.
<p><i>Permitted Pits</i></p>
<p>There are a number of permitted pits within the boundary of the Pic Forest not to be confused with forestry aggregate pits. Permitted pits are commonly referred to as category 9 pits (“Cat 9”). These pits have an established boundary, site plan, and reports to be filed. The following conditions have been developed by the Planning Team and apply to all known or new permitted pits.</p> <p>Conditions on Regular Operations, Roads, Landings and Aggregate Pits</p> <ul style="list-style-type: none"> • Harvest may occur only after consultation with the permitted pit holder:

- Pit boundary markers are to be re-established if damaged or removed during operations.
- Tending, roads, landings, forestry aggregate pits and aggregate extraction areas are not permitted within the boundary of the permitted aggregate sites.
- There is no AOC developed for permitted pits. Permitted pits are displayed on maps, but do not have any buffer, reserved or modified zone.

Planned Road Construction and Maintenance inside AOCs

Despite planning, some roads will traverse AOCs. The following provides direction intended to mitigate potential adverse effects that apply generically to all AOCs. Also reference AOC prescriptions for additional restrictions on roads based on the specific values associated with individual AOCs. The following conditions on regular harvest operations have been developed.

Conditions on Roads, Landings, and Aggregate Pits

- Before construction of any road in an AOC, ensure all considerations with respect to road planning, location, use management strategy and other mitigation techniques are consistent with the specific direction for the associated value as described in the AOC prescriptions (FMP-11 and FMP-18);
- Road construction and maintenance operations that may enter a water feature or that may potentially cause sediment to enter a water feature are not to occur in shoreline AOCs during periods of fish spawning, incubation and fry emergence. For the Pic Forest these periods will be as follows:
 - Cool Water – Work in water to proceed only between June 16th and March 31st.
 - Cold Water – Work in water to proceed only between June 16th and August 31st.
- Fill material used to build the road below high water level within the floodplain of a water feature will be erosion resistant and or protected from erosion;
- When new roads traverse residual forest within the AOC, the width of the cleared corridor will be as narrow as practical and feasible and will not exceed 20 metres. The AOC width can be widened to remedy a safety concern however the rationale must be documented in the FOIP report;
- To maintain drainage patterns and minimize the potential for sediment laden roadbed or ditch run-off to reach a water feature, use cross drainage culverts whenever a road crosses a gully or other natural drainage feature;
- To minimize the potential impacts on fish habitat and water quality in shoreline AOCs:
 - Fill in or around a water feature will be erosion resistant.
 - In erodible soils, it will be necessary to use erosion control techniques.
 - Trees will be felled so they do not fall into water.
 - Ditches will be designed so they do not discharge directly into a water feature.
 - Ditches will be diverted to flow into the bush so that the water filters through natural vegetation before entering a water feature unless impractical to do so.
 - Where it is not practical to disperse ditch water before the ditch reaches a water feature, mitigative measures will be required.
- Roads built within 15 m of a water feature and not associated with a water crossing will: use techniques and practices to reduce the possibility of roadbed erosion; avoid grubbing; and, design ditches to minimize the possibility of sediment entering the water feature;
- Reasonable efforts will be made to ensure that recreational trails (portage, skidoo, trapline) are passable following forest management activities.

Planned Road Construction and Maintenance outside AOCs

The following conditions have been developed to provide direction to address environmental, social and safety concerns associated with the planning, construction and maintenance of roads.

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

- Material moved during construction shall not block drainage courses;
- Fill materials for roads built within the floodplain of a water feature will be erosion resistant or protected from erosion;
- Exposed mineral soil between the height of land and a water crossing, or within 100 metres of a water crossing, whichever is less will be trimmed to a stable angle and be protected from erosion so sediment will not enter the water after construction;
- MNRF will ensure that the signs used to identify the use management strategies for roads are maintained;
- Roads will be planned according to the FMP requirements;
- Ensure safety considerations have been incorporated into the road planning;
- When roads cross wetlands, cross drainage culverts will be installed as required to ensure that surface water is equalized on both sides of the road and impacts to hydrologic flow and wetland function are minimized;
- Roads will be located where possible to avoid crossing ephemeral streams, springs, seeps or other groundwater discharge that are connected to lakes, ponds, rivers, streams or small unmapped wetlands. If such areas cannot be avoided, construction and maintenance techniques and practices to minimize impacts to hydrologic flow and wetland function will be used. Natural water movements will not be impeded, accelerated or diverted;
- Identify areas of concentrated surface water flow and prevent blockage through appropriate use of cross drainage culverts. Some of these locations may best be determined the following spring when ponding is evident at unpredicted locations along a new road.
- Ditches leading downhill from rock cuts and passing over earth material will have erosion controls in place;
- Have a monitoring program for roads or road networks and use appropriate mitigation to prevent or stop erosion in ditches, on steep slopes, etc;
- Grubbing of low vegetative cover between the height of land (e.g., the high point on a ditch line) and a water crossing, or within 100 m of a water crossing, whichever is less, will be limited to that required to address engineering issues and safety concerns, such as the removal of hazards;
- If blasting or explosives are required, the area to be blasted will be covered to ensure the blasted material stays within the road right of way;
- When constructing roads during the bird nesting season and occupied nests are encountered direction from CROs related to nests identified during operations;
- Primary and branch roads will avoid high value wildlife habitat when feasible;
- Do not place windrows or grubbing materials across known migration paths of wildlife in a manner that could impede their travel;
- Reasonable efforts will be made to ensure that recreational trails (portage, skidoo, trapline) are passable following forest management activities.

Public Access Points

Public access points are often found on identified Cottaging Lakes. Cottaging Lakes are identified in LIO and have a designated AOC in table FMP-11. Public access points include boat launching areas,

driveways, and parking lots. Contractors will notify NFMC if non-identified public access points are encountered during regular operations.

- Bonne Lake,
- Cache Lake,
- Canoe Lake,
- Cedar Lake,
- Dunc Lake,
- Ell Lake,
- Flanders Lake,
- Foxxe Lake,
- Hare Lake,
- Jackfish Lake,
- Kern Lake,
- Little Cedar Lake,
- Little Santoy Lake,
- Little Steel Lake,
- Loken Lake,
- Nagagami Lake,
- Pagwachuan Lake,
- Poppy Lake,
- Rous Lake,
- Santoy Lake,
- Three Finger Lake, and
- Wabikoba Lake,
 - The source of the Cottaging Lakes - Cottage Lots locations were located in LIO (PATENT_LAND_EXTERNAL).

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

- Considering the protection afforded to Cottage structures, and cottaging lakes (outlined in FMP-11), regular harvest is permitted.
- Adjacent operations must keep the public access point clear of all logging debris, garbage, ruts, equipment, or otherwise. The public access point must be kept clear/clean.
- No new operational roads or landings are permitted within 90 metres of the public access point.
- No aggregate pits are permitted within 90 metres of the public access point.

Red and White Pine

Red and white pine may be encountered on the Pic Forest as either single trees, scattered trees, or dominated stands. Red and white pine trees are considered a rare species on the forest and, as such, are valued by stakeholders, and have specific plan targets and objectives applied. The following conditions on regular operations, roads, landings, and aggregate pits are to be applied when red or white pine trees, or stands are encountered.

As a general statement, the plan objective is to increase the proportion within stands, and area of dominated red and white pine stands across the forest. In all cases, and where determined to be appropriate, actions (outlined below) will favour a prescription where red and white pine are promoted and not just avoided.

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

- Operations planning will avoid allocating harvest stands where the proportion of Pr or Pw is >10%. However, the planning inventory may not always be 100% correct, therefore, the following will apply.
- If a single tree is encountered during operations, the tree is to be retained, and no damage to the stem is to occur. The contractor is to notify NFMC of the encounter with either species.
- If scattered trees are encountered, the contractor is to notify NFMC. NFMC will liaise with MNRF and the contractor to apply a prescription of either:
 - Avoidance – the area of scattered trees will be removed from planned harvest, or,
 - Improvement – normal harvest will occur. Pr and Pw will be retained. No, or as little as possible, damage is to occur to Pr and Pw stems. Harvest which results in higher than normal soil exposure or “messy harvest” is encouraged. Rutting and soil compaction is not permitted, but, grapple skidding, or buncher tracks exposing soil is encouraged. Silvicultural prescriptions will focus on creating further soil exposure (mechanical site preparation). The intent is to provide adequate mineral soil exposure for the existing Pr and Pw trees to naturally seed. Silviculturally, natural seeding will be tracked, and supplemented with planting other species to meet density requirements.
- If a dominant stand of trees is encountered, the contractor will notify NFMC. NFMC will liaise with the MNRF and the contractor to apply the following prescription:
 - The stand will be removed from harvest (if applicable). Regardless if the Pr or Pw stand was initially planned for harvest, any harvest adjacent to a Pr or Pw dominant stand will apply silvicultural and harvest practices to promote the natural seeding of Pr or Pw. Adjacent harvest, which results in higher than normal soil exposure or “messy harvest” is encouraged. Rutting and soil compaction is not permitted, but, grapple skidding, or buncher tracks exposing soil is encouraged. Silvicultural prescriptions will focus on creating further soil exposure (mechanical site preparation). The intent is to provide adequate mineral soil exposure for the existing Pr and Pw trees to naturally seed. Silviculturally, natural seeding will be tracked, and supplemented with planting other species to meet density requirements.
- Pr and Pw trees are not to be removed for road construction. Road construction adjacent to Pr and Pw trees will be far enough away so that compaction of soil under the road does not compact tree roots.
- Pr and Pw trees are not to be removed to establish aggregate pits. Aggregate pits adjacent to Pr and Pw trees are to be far enough away as to not destabilise trees or affect roots. Pr and Pw trees adjacent to aggregate pits being decommissioned will be given opportunity to naturally seed the pit before alternative decommissioning takes place.
- If removal of Pr and Pw trees for harvest, road construction, or aggregate pit establishment is unavoidable, the contractor will contact NFMC. NFMC will liaise with MNRF and the contractor to determine the best positive outcome of harvesting the tree. This can include, but is not limited to:
 - Collection of seed
 - Transplanting (if tree is small enough)
 - Donation of stem, or “cookie”, to local First Nations & Métis, schools, libraries, etc..

Residual Forest Structure

Residual forest is defined as being Free-to-Grow (FTG) Crown productive forest that is 35 years of age or older or 10 metres in height or taller, in patches that are a minimum of 0.1 hectares in size, with a

canopy closure of at least 50% based on dominant or co-dominant trees and have a species composition and size pattern similar to the stand before harvesting.

The sub-stand pattern will resemble an older forest with small gaps, rather than a mixture of discrete young and old forest patches. Ideally trees will be uniformly spaced. However moderate concentration to facilitate operations is acceptable. Unless otherwise specified in the FMP (SGR for the general harvest area, prescription for the AOC, conditions on regular operations), residual forest will normally have a species composition, average stem diameter, and average stem quality similar to that found in the stand before harvest.

There may be occasions where mapped and un-mapped residual needs to be moved to allow operations and to better protect values. Mapped residual forest is defined during operations planning. Unmapped residual forest is located during plan implementation. Mapped residual forest includes:

- Unallocated stands or portions of stands that meet the definition of residual forest;
- Stands or portions of stands scheduled for harvest that will retain residual forest;
- Residual forest within AOCs associated with known values.

Therefore, the following conditions on regular operations have been included to address instances where unmapped and mapped residual forest needs to be moved, added or removed:

Note: there are not planned residual patches within defined caribou management zones. Retention of residue patches is contrary to the overarching goal of uniform stand replacement in caribou zones.

Conditions on Regular Harvest Operations

- Tactical planning will:
 - Follow stand boundaries and/or natural features.
 - Ensure that any point within a planned harvest area will have at least 25 hectares of mapped residual within a 500-hectare circle (or hexagon) about that point.
 - Normally, additional mapped residual forest that is required during operational planning will be preferentially retained so it is connected to the shoreline of a lake, pond, river, or stream that is within, or directly adjacent (<200m) to the planned harvest area with a preference for areas of hydrological linkage (ephemeral streams, springs, seeps, groundwater discharge, etc). Otherwise, additional mapped residual may be connected to known values, located to encompass uncommon forest types, or located consistent with expected disturbance behavior.
 - Ensure A minimum of 5 ha of the mapped residual within any 500 ha circle (or hexagon) will belong to a patch greater than 5 ha.
 - Residual planning analysis identified no deficiencies at this level. See section 4.3.1.1 Stand Level Residual Patch Requirements for more detail.
- Operational Planning will
- Implementation of the harvest plan will ensure that any point within a new clearcut harvest area will have at least 0.5 hectares of residual within a 50-hectare circle (or hexagon) about that point;
 - The harvest operations maps have “residual-requirement” polygons that require a minimum of 0.5 hectares of residual be left somewhere within the polygon.

- 0.5 hectares will be left within every residual-requirement polygon, even when polygons may be touching.
- During harvest block start up the contractor will be made aware of the areas requiring 0.5 hectares of residual to be left.
- The areas will be flagged the same time as the boundary; the remaining portion may be harvested.
 - i. More information can be found in section 4.3.1.1 Stand Level Residual Patch Requirements
- Operational planning will ensure the area of residual forest averaged over all planned clearcut harvest areas, using a 500-hectare moving window assessment, is greater than or equal to 20% of the crown forested area;
- When measuring achievement of direction requiring a 50 hectare or 500-hectare targets, a moving window analysis, a point spacing or grid cell size of no more than 50 metres will be used;
- Movement of the mapped residuals will not require an amendment, revision, or special reporting. The following conditions will apply if movement of these mapped residual forest areas are moved;
 - The total available harvest area will not be exceeded for the FMP.
 - The conditions identified in Residual Forest Structure will be followed.
- When locating unmapped residual forest, preference will be given to locations connected to habitat features encountered during operations such as bird nests, furbearer dens, woodland pools, etc. When additional habitat features are not encountered, preference will be given to:
 - Uncommon forest types; or
 - Locations connected to known values (water, nests, etc.); or
 - Located consistent with expected disturbance behaviour.
- Residual assessments for actual harvest areas will occur at the Annual Report stage with the help of supplemental aerial photography.
- If residual requirement areas are not connected to Hydrological Linkages or other unique features, then residual patches should be positioned parallel to the road to restrict sightlines into the harvest area. This practice will contribute to reduction of sight lines and provide shaded travel corridors for wildlife to traverse harvest areas. Trees within these areas can be harvested, but shrubs, advanced regeneration, should be maintained.

Rich Lowland Hardwood Dominated Forest

These can be mapped or unmapped stands of rich lowland hardwood-dominated forest. On the Pic Forest these will likely be composed of black ash and in more very rare cases white elm. The following standards and guidelines will be followed when pockets of rich lowland hardwood-dominated forest ≥ 0.5 hectares in size encountered during operations;

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

- Harvest will occur when the substrate is frozen when possible to avoid site damage and exceed the rutting and compaction standards;
- Advanced regeneration will be protected;
- No renewal operations are permitted that exceed the rutting and compaction standards;
- Landings and aggregate pits are not permitted within rich lowland hardwood-dominated forest;

- Reasonable efforts will be made to avoid crossing rich lowland hardwood dominated forest with extraction trails during the frost-free period. During all seasons, crossings will be minimized and will follow the appropriate operating practices described to minimize potential site damage and effects on hydrological function;
- Reasonable efforts will be made to avoid constructing new roads within rich lowland hardwood dominated forest. When necessary, road construction will follow the design principles to minimize disruption of hydrological function.

Road Decommissioning

Roads and road networks are often decommissioned with the removal of water crossings. Road decommissioning is planned in FMP-18 - Road Construction and Use Management and Supplementary Documentation. The following conditions have been developed to provide direction for the decommissioning of forestry access roads.

Conditions on Roads, Landings, and Aggregate Pits

- Where the road is unlikely to be required to conduct forest management activities the road will be decommissioned:
 - Road decommissioning has been planned and incorporated into the Road Use Management Strategies (Section 4.5 Roads) for the Pic Forest 2019-2029 FMP.
 - Priority areas for road decommissioning will be within:
 - 2,000 metres of designated remote tourism lodge lakes
 - 1,000 metres from designated remote tourism outpost camp lakes
 - 1,000 metres of designated self sustaining lake trout lakes
 - The caribou (boreal population) travel corridor.
 - The Caribou Northern Continuous Range
- Stabilize slopes and areas of the road with known or identifiable hazards to prevent erosion and protect the public;
- Decommissioning of roads will be done in conjunction with the decommissioning of any water crossing(s) associated with the road if there is any and at the same time cross drain culverts will be removed and the road bed will be stabilized to prevent erosion;
- Materials which have been moved and piled during construction, such as grubbed or other earth fill materials will be re-distributed so they contribute to the productive land base;
- MNRF will have an appropriate monitoring program to address environmental and or safety concerns.

Rutting and Compaction

A rut is a continuous trench or furrow that is ≥ 4 metres long and ≥ 30 centimetres deep created by machine wheels or tracks through soil displacement and/or compaction. When operating on shallow soils the lesser of depth to bedrock (large boulders or 30 centimetres) will be used. Compaction is the compression of soil caused by a machine load that exceeds the strength of the soil to resist it. Compaction can occur independent of rutting through machine vibration and slipping tires. Rutting may occur independent of compaction but in general a rut can be thought of as a visual proxy for compaction.

The following conditions on regular operations have been developed to prevent, mitigate, and of rehabilitates rutting and compaction associated with forest management activities.

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

- No more than 50% of any 0.1 hectare circle is permitted in ruts;
- No ruts permitted that channel water into, or within 15 metres of lakes, ponds, rivers, streams, woodland pools, or those portions of mapped non-forested wetlands dominated by open water or non-woody vegetation;
- No more than 5% of any 20 hectare area is permitted in ruts on shallow soils (<30 centimetre);
- No more than 10% of any 20 hectare area is permitted in ruts on all other soils (>30 centimetre);
- The area of rutting and compaction will be minimized;
- Harvest and site preparation will be scheduled for the appropriate season for the site. Sensitive sites will be cut in winter (or drier periods in summer);
- During spring break-up, operations will be limited to frozen or dry ground conditions;
- Large blocks where a return winter cut is planned, organic and wet lowland areas will be harvested after freeze-up;
- Where advanced regeneration is a significant contributor to future forest development and Careful Logging Around Advanced Regeneration (CLAAG) is applied, extraction trails will be minimized. On sites susceptible to rutting, achievement will be balanced against the increased rutting that may occur when extraction is concentrated on fewer trails;
- High floatation tires or other low impact equipment will be used on organic sites, during the spring and fall;
- When possible and feasible roads will be built in advance of harvest operations so lack of access is not a recurring reason for damaging susceptible sites;
- The AWS will contain a mix of summer and winter harvest opportunities to minimize the need/chance of working on susceptible sites in shoulder seasons;
- A group of harvest blocks within economical floating distance will be scheduled in the AWS to provide operational flexibility to minimize the chances of rutting and compaction of susceptible sites;
- If damage occurs, operations will shift to less sensitive areas.
- Compliance inspectors will assess rutting damage using the methodology outlined in the Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales, Appendix 5.2a – Measuring ruts.

Salvage Harvest

As described in section 4.3.7 Salvage, The direction in this section will apply to all salvage operations, regardless of the origin or type of natural disturbance that led to the decision to engage in salvage operations.

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

- Salvage harvest will normally retain a minimum average of ≥ 25 stems/ha ≥ 3 m in height and ≥ 10 cm dbh. This is the minimum average for the harvest block (or minimum average per 20 ha if the harvest block ≥ 20 ha) contingent upon sufficient numbers and types of standing stems being available and in a condition suitable for retention.
- Salvage operations will consider strategic landscape objectives.
- When finalizing boundaries of a salvage operation that results from wildfire, the area of undisturbed forest included in the salvage operation will be minimized.

- When finalizing boundaries of a salvage operation that results from blowdown, insect infestation, or other factors (e.g., ice storms), the area of the salvage operation can include undisturbed forest.
- The trees retained following salvage operations will have a range of distribution patterns (relatively even-spaced to some clumping), recognizing operational limitations, and subject to the availability of standing trees.
- Adjust the timing of entry and/or other operational factors to minimize unnecessary site disturbance that could potentially result in ecological damage (e.g., avoid salvaging a swamp in the frost-free period).
- Reasonable efforts will be made to avoid windrowing or crushing of downed woody material.
- Whenever possible, the trees retained following harvest will be the same species and size classes as trees that would have been retained following normal harvest
- When leaving unsalvaged patches of disturbed forest, give preference to areas adjacent to, or in close proximity to, the undisturbed forest.
- Consider limiting or concentrating skid trail coverage when salvage operations are extended for ≥ 3 years, particularly in fire salvage areas.
- In fire salvage areas, preferably retain conifers such as jack pine and black spruce as wildlife trees.

Trails

Trails and portages provide traditional access routes to fishing, hunting, trapping areas, canoe routes or registered recreational trails (OFC snowmobile trail). These features are not always mapped and are normally identified during layout and operations or by users of the trails. The Planning Team developed the following conditions.

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

- MNRF or the trail owner or user is to identify trails to NFMC during the AWS review stage;
- Trails to be marked prior to harvest. If the trail cannot be found NFMC will request the assistance of the trail owner or user;
- Harvesting operators to ensure that trees or logging debris are not left on the trail after felling and trail remains marked after operations are complete;
- If cultural heritage or archeological values are found, then the APA or CH AOC will be applied.
- No mechanical site preparation will be allowed across the trail;
- No new aggregate pits are permitted within 15 metres of a trail bed, unless prior acceptance by trail representative is obtained.

Water Crossing Decommissioning and Rehabilitation

The following conditions apply to water crossing decommissioning and rehabilitation and are in addition to the respective water crossing standards found in Section 4.5.6 Road Water Crossings.

Conditions on Water Crossing Decommissioning and Rehabilitation

- Table AWS-2 will identify which water crossings are scheduled for decommissioning as part of the annual AWS for MNRF fisheries review;
- If decommissioning of a road or road system is being considered, all water crossings on that road or road system will be assessed. Water crossings that will no longer be maintained will be formally decommissioned in an environmentally sound manner and approved by MNRF. Decommissioning will include the removal of all water crossings for the segment of road

being decommissioned and signage will be placed at the start of the road warning the general public that the road is decommissioned;

- During decommissioning, workers will prevent contamination of a water feature by foreign materials such as lumber, nails, logs, brush, fuel and oil;
- Decommissioning and rehabilitation operations that may enter a water feature (in-water work) or that may potentially cause sediment to enter a water feature are not to occur during periods of fish spawning, incubation, or fry emergence according to timing restrictions identified in water crossing AOCs (FMP-11);
- NFMC will monitor operations and mitigation techniques to prevent the harmful alteration, disruption, or destruction of fish habitat, the impairment of water quality, and, problems related to fish passage;
- Fill material placed below the high water level within the floodplain of a water feature will be erosion resistant and/or protected from erosion;
- Any exposed mineral soil between the height of land and the water crossing, or within 100 m of the water crossing, whichever is less, will be trimmed to a stable angle and be protected from erosion so sediment will not enter the water;
- Upon completion of decommissioning, any temporary fill, construction materials, culverts and refuse will be removed from the construction area and disposed of in a satisfactory manner;
- Following decommissioning, on-site inspections will be made by NFMC to confirm the standards are being met. Problems will be reported to MNRF immediately;
- For decommissioned water crossings that have not been removed, have a monitoring program to identify and mitigate safety and environmental issues;
- Whether a water crossing structure is to be removed and how a water crossing structure is to be removed will be based on an analysis by NFMC of biological, water quality, engineering and safety criteria, which considers, at a minimum, the following items;
 - **Biological**
 - History of beaver activity.
 - Sensitivity of fish species.
 - Whether the structure is currently an impediment to fish migration or may be an impediment to fish migration in the future.
 - The presence of critical fish habitat and the likelihood of the habitat being impacted should a washout occur.
 - Whether removal activities would cause damage to fish or fish habitat.
 - **Water Quality**
 - In the event of a washout or erosion problems, will additions to natural background levels of suspended sediments affect downstream fish habitat or other values.
 - **Engineering**
 - The type of the water crossing structure (culvert).
 - The length of time the structure was designed to be functional (whether the crossing has been designed for a 10-year or 100-year storm event).
 - The expected life of the materials used in the construction of the crossing structure.
 - Whether the fill material is similar to the streambed/stream bank material.
 - Whether the road will allow for floodwaters to pass without washing out.
 - The amount and type of fill used in construction of the water crossing.
 - Impact of removal of the crossing on the use management strategy of the associated road or road network.

- Costs of removal.
- **Safety**
 - If the water crossing structure failed or if a washout occurred, would a hazardous situation result.
- Decommissioning of water crossings is related to decommissioning of roads. Ensure the schedules for water crossing and road or road network decommissioning are coordinated;
- Decommissioning of the water crossing will be consistent with the vehicular traffic expected by the use management strategy for the road or road network;
- The appropriate technique for the conditions encountered at each water crossing will be utilized to minimize disturbance of the water feature and the potential for erosion and sedimentation during and after decommissioning.

Water Crossing Design, Installation and Maintenance

The following conditions apply to the design, installation and maintenance of water crossings and are in addition to the respective water crossing standards found in Section 4.5.6 Road Water Crossings. All water crossing installations will follow the Ministry of Natural Resources and Forestry/Fisheries and Oceans Canada Protocol for the Review and Approval of Forestry Water Crossings (2017).

Conditions on Water Crossing Installation and Maintenance

- Culvert and bridge opening size will be determined by hydrologic analyses:
 - A water crossing structure with a single span greater than 3 metres is considered a bridge.
- All permanent culvert and bridge crossings shall be sized to a minimum Q25 design flow standard:
 - Temporary winter bridges that will be removed before the spring freshet are not required to be designed for the 25-year flood (Q25).
- Table AWS-1 will identify which water crossings are scheduled for construction as part of the annual AWS for MNRF fisheries review;
- Selection of the type of water crossing structure, its location and its capacity to pass water and allow for the movement of fish, will consider:
 - Possible negative effects on the form and function of the undisturbed natural channel and its floodplain.
 - The fish species present and the impact of the crossing structure on them, as required by the Fisheries Act.
 - Whether the water crossing is over navigable waters.
- Avoid crossing in areas which affect known critical fish habitat, such as fish spawning, feeding, over-wintering, or nursery areas;
- Choose a site where the road approaches are favourable and earth cuts are not required within 100 m of the water's edge when possible;
- Avoid steep high banks or sites where actively slumping banks are evident;
- Those responsible for installation and maintenance will monitor operations and select operating practices, materials, and mitigation techniques at each water crossing to prevent any serious harm to fish. Section 35 of the Fisheries Act prohibits the death of fish or permanent alteration to, or destruction of fish habitat;
- The installation of a water crossing will use mitigative techniques that will ensure that all in-water activities, or associated in-water structures, do not interfere with fish passage, constrict the channel width, reduce flows or result in the stranding or death of fish;

- The removal of stream boulders is generally not acceptable, except where necessary for installation of a crossing structure which retains a natural streambed (bridge);
- Construction operations that may enter a water feature (in-water work) or that may potentially cause sediment to enter a water feature, are not to occur during periods of fish spawning, incubation, or fry emergence as per the timing restrictions applied to water crossing AOCs;
- Fill material required to build the road at the site of the crossing, below the high water level and within the floodplain of the water feature, will be erosion resistant and, or protected from erosion;
- Any exposed mineral soil between the height of land and the water crossing, or within 100 metres of the water crossing, whichever is less, will be trimmed to a stable angle and be protected from erosion so sediment will not enter water;
- During construction and maintenance of a water crossing, contamination of a water feature by foreign materials such as lumber, nails, fuel, herbicides, or oil is not permitted;
- Prevent sediment from entering the water features by using erosion and sediment control techniques;
- Avoid using explosives in or near water. Use of explosives in or near water produces shock waves that can damage a fish swim bladder and rupture internal organs. Blasting vibrations may also kill or damage fish eggs or larvae. If explosives are required, the potential for impacts to fish and fish habitat should be minimized by implementing the measures described by the DFO;
- Upon completion of a water crossing, any temporary fill, construction material, culverts or refuse will be removed from the construction area and properly disposed of in a satisfactory manner;
- After construction, on-site inspections will be made by NFMCC to confirm these standards are being met and reported within FOIP;
- If using temporary winter-only crossings, materials other than ice and snow will be removed from the stream prior to spring break-up. Plastic culverts may be used in conjunction with winter-only crossings to ease melt runoff. Plastic culverts may not contact natural channel bottom;
- Upon installation, each new water crossing will be incorporated into the approved program for monitoring roads and water crossings;
- These standards are applicable to previously installed water crossings when they are replaced or upgraded to address safety, environmental, or operational issues;
- Use techniques and materials appropriate for the conditions encountered at each water crossing, to minimize disturbance of a water feature and significantly reduce the potential for erosion and sedimentation;
- Ensure logs and brush which may need to be removed or trimmed at the crossing site do not enter the water feature;
- Grubbing of low vegetative cover between the height of land and a water crossing or within 100 metres of a water crossing, whichever is less, will be limited to that required to address engineering issues and safety concerns, such as the removal of hazards;
- When diverting and/or removing water for dry installations, chase away or trap and relocate live fish before completely dewatering the area;
- Apply mitigative techniques to provide for fish passage if there is potential to impede or block fish migration during installation of the crossing;

- Begin site stabilization and clean-up as soon as possible after the water crossing has been installed, including the removal of all diversions;
- Trim fill slopes to a stable angle or use other mitigative stabilization techniques. A person should be able to walk up the slope without causing slumping and sliding of soil particles. When a temporary channel is no longer required, it should be stabilized to avoid long term erosion;
- Material used within the stream and on the banks to improve the crossing will be clean, non-erodible, and non-toxic to aquatic life;
- Install culverts on a straight section of stream. When installation of a culvert on a straight section of stream is not possible, minimize the change in stream morphology and impacts on fish habitat;
- Water crossings that pose a risk to public safety or fish passage or fish migration will be replaced as soon as possible.

Wildlife Trees, Cavity, and Supercanopy Trees

Wildlife trees are left after harvesting to form part of the residual forest structure similar to a wildfire or blowdown natural disturbance event. Wildlife trees will normally consist of wind firm live trees, dead or dying trees (snags), super canopy and veteran trees (large old white spruce), cavity trees (poplar and cedar), diversity trees (white pine, red pine, black ash, or red maple) and stubs. Wildlife trees will be measured based on any given 20 hectare area within a harvest block. The block area will exclude the areas within roads, landings and roadside work areas.

Wildlife trees must be ≥ 10 cm dbh and ≥ 3 m in height unless the direction specifies:

- That 'large' stems or stubs are to be retained. In this case, the minimum dbh is ≥ 25 cm; or
- That cavity trees, mast trees, scattered conifers, veteran trees, or supercanopy trees are to be retained. In this case the minimum dbh is normally ≥ 25 cm. However, mast trees as small as 10 cm dbh may be retained if only ironwood mast trees are available. Moreover, supercanopy trees will generally be ≥ 60 cm dbh.

The following conditions on regular operations will be applied:

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

- Retain an average of 25 or more trees per hectare > 10 centimetres diameter at breast height and ≥ 3 metres in height;
- Retain an average of 10 or more large trees (minimum dbh is normally ≥ 25 centimetres) per hectare with at least 5 living trees;
- Wildlife trees that fall to the ground, or are purposely felled for worker safety reasons, will be left for downed woody material.
- Trees that are stubbed to no less than 3 metres in height can contribute to the 25 trees per hectare target. Ideally no more than 50% of the trees will be stubbed;
- 'Stub' some wildlife trees (all tree species can be stubbed, but in boreal forests, the preferred species to be stubbed are jack pine and black spruce):
 - a. to a height of ≥ 3 m (5 m is preferred);
 - b. generally, do not stub existing cavity trees (however, it is acceptable to stub a tree with cavities below the stubbing height);
 - c. do not stub trees being relied upon as a seed source; and
 - d. do not stub wildlife trees if they are better suited for other wildlife tree functions (e.g., mast trees; fire resistant species like white pine, red pine [and hemlock, if

available] are generally more appropriate to help achieve veteran and super canopy direction).

- Wildlife trees will generally be well dispersed. Retain an average of at least 15 individual stems per hectare with the remaining stems may occur in clumps;
- Wildlife trees will be well dispersed. Clumps of 10 or more trees can contribute up to 10 trees per hectare to the 25 trees per hectare target;
- Wildlife trees that are also cavity trees, veteran trees, super canopy trees or diversity trees will be retained as a priority. Wildlife trees will otherwise reflect the tree species, age and size class mixes of the particular harvest block;
- In stands where Supercanopy trees occur (sites with large dominating white spruce or white or red pine – Jack pine and black spruce are never considered Supercanopy trees). An effort will be made to retain a token amount of these trees on site, to act as habitat and a seed source.
- Reasonable efforts will be made to avoid knocking down standing wildlife trees during renewal and tending treatments.

Woodland Pools

Woodland pools are recognizable temporary bodies of open water encountered during operations that have a surface area ≥ 500 square metres (about 25 metres in diameter if circular), are not ponds (< 0.5 hectares in size), and are not connected to a stream or associated with a mapped non-forested wetland. Woodland pools typically hold water intermittently, and generally do not support fish, but support a wide range of both vertebrates and invertebrates, are generally very small in size (≤ 0.5 hectares), and are not mapped so they are only encountered during operations layout and implementation. The following conditions will be applied:

Conditions on Regular Operations, Roads, Landings, and Aggregate Pits

No harvest, renewal, or tending operations are permitted that will result in deposition of sediment within, or reduction of the water-holding capacity of, woodland pools. Operations specifically prohibited include:

- Machine travel within 3 metres of the high water mark of pools during the frost free period;
- Excessive removal or damage of sapling-sized trees (< 10 centimetre dbh) and shrubs within 3 metres of the high water mark of pools;
- Felling of trees into pools or within 3 metres of the high water mark of pools during the frost-free period. Trees accidentally felled into pools will be left where they fall;
- Disturbance of the forest floor that leaves ruts or a significant area of exposed mineral soil within 15 metres of the high water mark of pools. Ruts or significant patches of exposed mineral soil will be promptly rehabilitated
- No contamination of pools by foreign materials is permitted. Specifically, the use and storage of fuels will be carried out in accordance with the Liquid Fuels Handling Code;
- No equipment maintenance (washing or changing oil) is permitted within 15 metre of the high water mark of pools;
- Landings and aggregate pits are not permitted within 15 metres of the high water mark of pools;
- Retention of residual forest within and adjacent to pools. Unmapped residual patches will preferentially be connected to pools. When connecting residual patches to pools, trees will be retained in and within 3 metres of the high-water mark to provide overhead shade and

residual forest will be retained within at least 15 metres of the high-water mark to provide amphibian cover;

- New roads are not permitted within 15 metres of the high-water mark of pools unless there is no practical or feasible alternative and appropriate mitigative measures are taken to minimize the risk of sediment entering pools and disruption of hydrological function.

1

2 4.3 Harvest Operations

3 The following sections discuss harvest operations planned to occur through implementation of the
4 2021-2031 FMP.

5 4.3.1 Harvest Areas

6 Available Harvest Area (AHA) and the planned harvest area for the ten-year period of the 2021-2031 Pic
7 Forest Management Plan is documented in FMP-12. The projected 100-year AHA by forest unit was
8 determined through SFMM model outputs and the endorsed Long-Term Management Direction. For
9 more information regarding the Long-Term Management Direction refer to Sections 3.7.1 Available
10 Harvest Area. The AHA for this plan term (2021-2031) was derived from the AHA defined from the
11 management strategy (run 229) for the ten-year term of 2019-2029 by forest unit and age class.

12 Harvest eligibility criteria was used to defined age eligible stands, within operable strategic management
13 zones. Preferred harvest areas were then selected from the identified optional harvest areas (refer to
14 Section 3.7.2 Selection of Areas for Harvest. The Planning Team concentrated on selecting harvest areas
15 which maximize existing road infrastructure, allow for successful implementation the caribou direction,
16 ensure a proper balance of forest units, and achieve long-term sustainability while maintaining wood
17 supply commitment levels.

18 Table 61 summarizes the total available (AHA) and planned ten-year harvest areas by forest unit for Pic
19 Forest. The total available harvest area is 107,271 hectares for the 2021-2031 Plan. The ten-year
20 planned harvest area is 105,177 hectares, which is slightly below the AHA (98%). Additionally, the total
21 planned harvest area by forest unit does not exceed the ten-year total AHA by forest unit.

1 *Table 61: Summary of the two-year total harvest area by forest unit (Available and Planned)*

Plan Forest Unit	TMD 10-year Available Harvest Area (Ha)	Planned 10-year Harvest (Ha)	Deviation of Planned Harvest areas from LTMD (Ha)
BFMIX	3,077	2,898	- 179
BWDOM	595	597	2
HRMIX	17,665	17,525	- 140
OLOW	1,090	1,064	- 26
HRDOM	19,683	19,401	- 282
CONMX	21,065	20,978	- 87
PJMIX	6,279	6,244	- 35
PJDOM	7,170	6,994	- 176
PODOM	3,063	3,047	- 16
SBLOW	4,970	4,931	- 39
SBMIX	8,452	7,379	- 1,073
SBDOM	14,161	14,119	- 42

2
3 In addition to planned harvest areas, each Annual Work Schedule (AWS) will identify areas where
4 fuelwood can be obtained. It is important to note that the approval of the forest management plan
5 does not represent an agreement to make harvest areas available to a licensee.

6 Currently, there are no insect pest outbreaks on the Pic Forest, therefore there are no insect pest
7 management strategies in place. However, if conditions change and an area is identified for harvest as a
8 result of an insect pest management strategy, an amendment will be made to the FMP and the area
9 planned for harvest will be documented. Similarly, there are no harvest related silvicultural trial areas
10 on the Pic Forest. If trials are initiated during plan implementation, MNRF will be made aware and an
11 amendment to the Plan will be made to include the eligibility of treatment(s), the eligibility of forest
12 type(s), and any additional limitations of the trial (e.g. Size, location, number).

13 *4.3.1.1 Stand Level Residual Patch Requirements*

14 Residual forest is defined in the Stand and Site Guide as being FTG Crown productive forest that is 35
15 years or older or 10 metres in height or taller, in patches a minimum of 0.1 hectares in size, with a
16 canopy closure of at least 50% based on dominant or co-dominant trees and have a species composition
17 and size pattern similar to the stand before harvesting. Residual forest can include un-allocated stands
18 or portions of stands that meet the definition of residual forest, stands or portions of stands scheduled
19 for harvest that will retain residual forest and stands or portions of stands within AOCs designed to
20 protect known values.

21 Residual forest is a forested patch that generally functions more as habitat for wildlife that inhabit older
22 forest than as habitat for wildlife that inhabit younger forest. Residual stand structure is important
23 when implementing the clearcut silviculture system. Wildlife species have evolved with the structure of
24 individual residual trees (dead and alive) and groupings or patches of living trees that are often left after

1 a fire occurrence. Residual patches may act as wildlife corridors or as sanctuaries that permit fuller use
2 of the disturbed area and more rapid re-colonization of its interior by species characteristic of later
3 forest successional stages.

4 Within the Stand and Site guide section 3.2.2.2, there are standards that define the occurrence of
5 residual patch requirements. To help facilitate adherence to these guidelines, the Crown developed the
6 “Evaluate Forest Residual Tool” (EFRT). The EFRT examines the impact of plan implementation and
7 identified areas requiring residual patches at scales appropriate with the stand, specifically 25, 50, and
8 500.

9 The EFRT was run against the 2021-2031 FMP allocations to identify areas where residual patch planning
10 was required. The following should be noted with regard residual patch planning:

- 11 • The BMI was used as the input file with the following revisions:
 - 12 ○ The 2019/20 depletions were included. Forecast harvest for 2020/21 was included.

13 It should also be noted that residual requirements are only examined and applied where species specific
14 emphasis has not been identified. In the case of the Pic Forest, this means that residual patch
15 requirements are only applied to harvest areas within the Strategic Management Zones (SMZ) “Z” and
16 “REF4”. All other SMZs have specific Caribou direction applied to them, addition of residual patches
17 would violate higher order planning objectives. More information on SMZs can be found in section 3.5
18 Strategic Management Zones.

19 500-hectare scale

20 The EFRT did not identify any issues at the 500ha scale. In other words, tactical planning has ensured
21 that there is at least 25 hectares of residual forest within a 500-hectare circle (or hexagon) about that
22 point. Additionally, the tool did not find any conflicts with a 5-of-25 rule, where at least 5ha of residual
23 must belong to a patch greater than 5ha at a 500ha scale. As there are no conflicts at this scale, there
24 are no additional mapping, spatial, or harvest considerations given within this plan.

25 50-hectare Scale, Mapped Residual Polygons

26 The EFRT identified areas within harvest blocks where there were offending harvest patterns at the 50ha
27 scale. To ensure that at least 0.5ha of residual is within a 50ha circle (or hexagon) about that point, a
28 residual patch of at least 0.5ha must be left within each of the identified “residual requirement” area.
29 The residual patch requirement areas are identified on operational maps and applied in the field at the
30 most preferable location identified by the, supervisor, or layout person. Layout of residual patches must
31 be marked as a boundary (i.e. Pink flagging tape) and will preferably be within, but at a minimum, must
32 be touching the mapped residual polygon. Residual polygons must be applied per the conditions on
33 regular operations section Residual Forest Structure. Additional considerations for locations of residual
34 patches may be discussed in other CROs (e.x. CROs - Woodland Pools, Red and White Pine, and Rich
35 Lowland Hardwood Dominated Forest, or to minimize sight lines into harvest areas). More information
36 on application and implementation residual areas can be found in section Residual Forest Structure CRO.

1 *4.3.1.2 Operational Sliver Management*

2 The overall intent of sliver management is to manage forest stands at a scale that is meaningful and real
3 to forest managers so that data can be used to inform strategic decision making. The NFMC
4 acknowledges the increased need for detail in the inventory due to the current usage of this data.
5 Today's forest management practices, planning objectives, and the needs of field staff are often more
6 sensitive to spatial detail, especially in areas of recent forestry activity. Even strategic modelling
7 requirements for data accuracy are more stringent.

8 "Slivers" are defined as polygons whose presence is in-consequential to forest management. Slivers are
9 understood to be errors commonly caused from various interpretations of the same area. Slivers do not
10 exist in real life (i.e. On-the-ground) and are a result of the high precision of geoprocessing tools used in
11 forest management.

12 "Small polygons", like slivers are defined as in-consequential to forest management. However, whereas
13 slivers are considered false errors, small polygons are legitimate polygons resulting from forest
14 management activities.

15 It is now well recognised that slivers and small polygons are created through a variety of different
16 processes and that slivers introduced by some of the mandatory processes can be considered errors
17 regardless of their size. It is also recognised that slivers and small polygons have no effect on
18 sustainable modeling, planning, and operations.

19 Slivers and small polygons will be encountered through the implementation of the FMP. These will
20 commonly occur where planned harvest is adjacent to old harvest boundaries. Historic harvest
21 reporting was not as precise as methods used today. There are scenarios where historic harvest is not
22 precise enough to mesh well using today's technology. In these cases, where planned harvest is
23 scheduled to end flush with the previous harvest, implementing harvest exactly as mapped will result in
24 small stands (or portions of stands) remaining after harvest. In this scenario, conflicting with the intent
25 of the FMP.

26 Slivers will be reported to NFMC, NFMC will determine the intent of the FMP. This will include cross
27 referencing the Operational Planning Inventory (OPI), previous harvest records, etc. Where slivers are
28 not intended to remain and are less than a 50m deviation from the planned harvest polygons, NFMC will
29 provide directions to contractors and notify MNRF (notification to include justification for sliver
30 management direction). Where slivers are greater than a 50m deviation from the planned harvest
31 polygons, the NFMC and MNRF will jointly consider the intent of the FMP and agree on direction.

32 *4.3.2 N/A*

33 Not Applicable

34 *4.3.3 Completion of On-going Harvest operations from Previous Plan*

35 The use of bridging areas eases the transition from one plan to another, whereby there are situations
36 where the harvest from the previously approved FMP is not completed prior to the implementation of
37 the current FMP. Bridging operations are contained within the 2021 FMP.

38 In general, bridging operations were selected based on the following criteria;

- 1 1. Areas were included in the 2020/21 AWS, and
- 2 2. where operations had commenced (i.e. Road building and harvesting had begun), and
- 3 3. where the completion of those harvest areas was not forecast to be completed before March
- 4 31st, 2021, and
- 5 4. those areas are not identified as regular harvest in the 2021 FMP, and
- 6 5. those areas have not been depleted through the 2019/20 Annual Report, then
- 7 6. those areas will be selected as bridging operations.

8 Table 62 describes the selected bridging area in terms of area by block. Bridging area will be included in
 9 each consecutive AWS until it is completed. Bridging operations must be completed before the 5th year
 10 of the new FMP (2025/26).

11 *Table 62: Summary of Bridging Wood Included in the 2021 FMP.*

Sum of Area (Ha)	
BLOCK ID 2019-21 Contingency Plan	Total
19Bambino Lake	13
19Beavercross Lake	1,022
19Catlonite Creek	669
19Chain Lakes	87
19Charon Creek	54
19Dot Lake	1,018
19Eric Lake	144
19Everest Lake	44
19Gaffhook Creek	262
19Kerria Creek	217
19Kerria Lake	488
19Lampson Lake	66
19Loughlan Lake	615
19McKergow Lake	256
19Mickey Creek	144
19Mistake River	209
19Olie Lake	63
19Otasawian Lake	1,718
19Pagwachuan River	48
19Pan Lake	332
19Prairie River	8
19Quacker Lake	34
19Robb Lake	22
19Salix Lake	535
19South Gowan Creek	103
19Turcak Lake	134
19Wabikoba Lake	326
19White Otter River	29
Grand Total	8,660

1 Harvest of bridging operations will count toward the sustainable harvest of the 2019/21 Pic Forest
2 Contingency Plan and not the current FMP.

3 There are no second pass harvest areas identified for the 2021 FMP.

4 4.3.4 Second Pass Harvest

5 The Pic Forest FMP contains a small amount of planned second pass harvest operations. The planned
6 area is west of Paguachuan Lake near the north east boundary of the Pic Forest. The area can be viewed
7 on operations maps. This area was initially harvested in 2019/20. The harvested area contains enough
8 standing Poplar that Columbia Forest Products (CFP) intends to re-harvest the site, as a second pass
9 operation, to capture more volume from the remaining poplar trees.

10 Although this is the only planned area on the FMP maps, this is not an uncommon occurrence on the
11 forest. Epically in the North, where CFP frequently deploys their own contractors, blocks are often
12 harvested in a two-pass system. Whereby the first contractor normally constructs the access, and
13 removes the conifer, the second utilizes the pre-constructed access, and removes the residual
14 hardwood.

15 If this system occurs within the Couse of 1 year, then it is reported as a regular depletion in Annual
16 Reports. If, however, the system occurs over the course of more than 1 year (i.e. There is more than 1
17 year between the initial harvest and the subsequent second pass) then the area will be reported as
18 “second pass” in Annual Reports. This ensures that harvest areas are not “double counted” in Annual
19 Reports.

20 For areas identified as second pass operations at the start of the FMP, their harvest will count toward
21 the 2019/21 Contingency Plan, not the 2021 FMP (similar to section 4.3.3 Completion of On-going
22 Harvest operations from Previous Plan). However, volume harvested will be reflected in the Annual
23 Report for the year in which the second pass operations occurred.

24 4.3.5 Harvest Volume

25 FMP-13 provides a summary by forest unit of the ten-year available harvest volume (from the Long-
26 Term Management Direction) and an estimate of the ten-year planned harvest volume based on the
27 planned operations for this term. The available harvest volume is summarized by forest unit and species
28 type (conifer or hardwood). The planned harvest volume is further broken down by individual species.

29 The available harvest volume was calculated using the Modelling and Inventory Support Tool (MIST).
30 MIST generated the yield curves for all the forest units and silvicultural intensities using the Empirical
31 yield calculations. The available harvest volumes were then generated based on the area weighted
32 average site class, species composition, and stocking by forest unit and adjusted by the Planning Team.
33 For more information on the yield curves and MIST outputs refer to Section 4.4.2.2 of the Analysis
34 Package.

35 The planned harvest volume is based on the actual stand volumes for the stands planned for harvest in
36 the ten-year Plan term. Volumes calculated account for the specific attributes of each stand (age, site
37 class, stocking, species composition). Section 3.7.2 Selection of Areas for Harvest explains why some
38 age class substitution was necessary when selecting the planned harvest areas. These stand level
39 volumes were then netted down to reflect the amount of growing stock left unharvested to meet

1 wildlife tree, residual patch, and silviculture requirements. The methodology used to determine the
 2 proportions of growing stock left unharvested (% species volume by forest unit) and the resulting
 3 proportions are discussed in Section 4.4.3.1 of the Analysis Package.

4 *Table 63: Summary of the total net merchantable harvest volume by forest unit (Available and Planned)*

Forest Unit	10-Year Available Harvest Volume (m ³)		10-Year Planned Harvest Volume (m ³)	
	Conifer	Hardwood	Conifer	Hardwood
BFMIX	119,620	38,552	117,578	33,668
BWDOM	7,803	23,234	6,808	24,586
CONMX	1,446,623	655,269	1,496,637	740,920
HRDOM	434,137	1,473,632	470,396	1,370,219
HRMIX	787,958	1,073,391	674,184	848,323
OLOW	50,663	473	49,224	603
PJDOM	773,318	34,309	742,581	55,853
PJMIX	647,684	61,466	630,246	91,916
PODOM	32,903	218,498	43,500	205,388
SBDOM	1,515,373	146,595	1,580,342	115,658
SLOW	395,880	7,663	384,093	5,515
SBMIX	742,683	108,893	654,841	107,084
Total:	6,954,645	3,841,975	6,850,430	3,599,733

5
 6 Table 63 summarizes the information found FMP-13. The total ten-year net merchantable available
 7 conifer volume is 6,954,645m³ and hardwood volume of 3,841,975m³ for a total available harvest
 8 volume of 10,796,620m³. The total ten-year net merchantable planned conifer harvest volume is
 9 6,850,430m³ and hardwood volume of 3,599,733m³ for a planned total harvest volume of 10,450,163m³.
 10 Approximately 97% of the projected available harvest area is operationally planned for harvest in the
 11 2021 FMP.

12 4.3.6 Wood Utilization

13 Wood utilization in the previous Big Pic and Pic River plans was under achieved. Throughout most of the
 14 2007 Big Pic plan, the forest industry experienced an unprecedented economic downturn generally
 15 connected to the 2007-2008 global economic recession and U.S. Housing downturn. Influence of the
 16 downturn impacted the later 2013 Pic River Forest FMP as well. Through that time, a significant portion
 17 of the industrial capacity throughout North Ontario had been reduced through mill closures and down-
 18 sizing. It was only in the later years of the Big Pic and Pic River management plans that forest managers
 19 began to see an increase in harvest and utilization.

20 Macro economic factors will always play a role in the harvest and utilization within a plan. At the time
 21 of plan development, the forest industry is stronger, and planned utilization over this is expected to be
 22 closer to target levels. However, as hinted above, at the time of plan development a softwood lumber
 23 dispute, and re-negotiation of the North American Free Trade Agreement between the Canadian and

1 American governments are examples of macro factors which will inevitably influence the utilization
2 within this plan.

3 A total of 105,177 hectares are planned for harvest in the Plan, which is expected to produce a total net
4 merchantable volume of 6,850,430m³ of conifer and 3,599,733m³ of hardwood. It is assumed that all
5 volume will be utilized and as such no unutilized volume has been identified in Table FMP-14.

6 FMP-15 details the planned wood utilization by mill. The NFMC will abide by all wood supply
7 commitments in place on the Pic Forest. Any volumes above mill's wood supply commitments will be
8 sold through business agreements with the NFMC.

9 Any cedar or any larch encountered during operations on the forest, will typically be left standing and will
10 contribute towards achieving residual, wildlife tree requirements or as road corduroy material (as
11 described in Section 4.2.2.2 Conditions). These species are not a significant component of the Pic Forest
12 and may be available to the public for fuelwood or other use subject to an approved permit from the
13 MNRF. In addition, as outlined in section 4.3.6.2 Pic Forest Hardwood Utilization Strategy any unutilized
14 poplar may also contribute to wildlife trees and fuelwood or for road construction. Potential fuelwood
15 areas are identified on the operations maps.

16 The NFMC will continue to pursue markets for hardwood and, in consultation with MNRF, assess
17 economically and environmentally reasonable opportunities for hardwood utilization. These species
18 may also be available for fuelwood or other use (e.g. Biofibre) subject to an approved license from the
19 MNRF.

20 Currently there is a great deal of interest in utilizing logging debris (e.g. From slash and chipper piles) for
21 bio-fuels and to reduce energy costs for various industries, including forest industry facilities.

22 *4.3.6.1 Wood Utilization by Mill*

23 The Pic Forest 2021-2031 Plan determines how much area is available for harvest. The Plan also
24 provides a forecast of how much volume is available and how much is planned to be utilized.

25 However, the Plan is not the mechanism by which to determine who will harvest the wood or which
26 forest resource processing facility will receive the forest products. These determinations are made
27 outside of the forest management planning process through licensing arrangements, ministerial
28 commitments, and business to business agreements.

29 While the Pic Forest Plan refers to forest products flowing to particular mills, such references are
30 information for forecasting purposes only. The Plan thus reflects external direction at the time it was
31 developed and does not represent a commitment of wood to a particular licensee or forest resource
32 processing facility.

33 A summary of the volume by product type that is forecast to be received by mills with Ministerial
34 Directives, business to business agreements and historic utilization from the Pic Forest is provided in
35 FMP-15. Other volumes forecast to be utilized have been identified in the open market column.

36 **AV Terrace Bay**

37 Based on a supply agreement, it is expected that AV Terrace Bay will receive and utilize a total planned

1 volume of 419,700 m³/yr of merchantable spruce-pine-fir (SPF) pulp from the Pic Forest during the
2 2021-2031 Plan.

3 **White River Forest Products**

4 Based on business arrangements, it is expected that White River Forest Products will receive and utilize
5 a total volume of 100,000m³/yr of SPF sawlogs from the Pic Forest during the 2021-2031 Plan.

6 **Lecours Lumber Co. Limited**

7 Based on a supply agreement, it is expected that Lecours Lumber Co. Limited will receive and utilize a
8 total planned volume of 82,000 m³/yr of SPF sawlogs from the Pic Forest during the 2021-2031 Plan

9 **Hornepayne Lumber GP**

10 Based on a conditional wood supply offer, it is expected that Hornepayne Lumber GP could receive and
11 utilize a total volume of 24,000m³/yr. Of SPF sawlogs from the Pic Forest during the 2021-2031 Plan

12 **Levesque Plywood Ltd.**

13 Based on a supply agreement, it is expected that Levesque Plywood Ltd. In Hearst will receive and
14 utilize a total planned volume of 19,800 m³/yr of aspen veneer from the Pic Forest during the 2021-2031
15 Plan

16 **Smoke Signals Firewood Inc**

17 Based on a supply agreement, it is expected that Smoke Signals Firewood Inc. Will harvest a total
18 planned volume of 10,000 m³/yr of merchantable white birch firewood from the Pic Forest during the
19 2021-2031 Plan.

20 Unutilized volume may be available for fuelwood harvesting once timber harvesting has been completed
21 in designated areas on the forest. Areas with available fuelwood will be identified in the Annual Work
22 Schedule for the upcoming operational year.

23 *4.3.6.2 Pic Forest Hardwood Utilization Strategy*

24 The following section details the background, goals, risks, operational implementation, and report and
25 monitoring of the Pic Forest Hardwood Utilization Strategy.

26 *4.3.6.2.1 Introduction*

27 Currently, a lack of market demand for non-veneer quality trembling aspen (poplar) and white birch
28 wood requires special consideration for operational harvest and renewal. Conditions must provide for
29 hardwood veneer and conifer harvesting opportunities while at the same time economically meeting
30 silviculture objectives. NFMC is working with partners to ensure that as much of the non-veneer poplar
31 and birch is utilized as possible; however, when markets are not present for non-veneer quality aspen
32 and birch, this utilization strategy supports harvest operations through a period of low demand for non-
33 veneer quality wood.

34 This strategy is effective for the term of the 2021-2031 FMP. Non-veneer market ability presents
35 ongoing silviculture challenges. There is acknowledgement that this marketability situation is not
36 optimal for NFMC which aims for full utilization and promotion of best end use as a standard. Where a
37 moderate to high risk of partial harvest has been identified due to market constraints and stand
38 conditions, extra focus on identified sites where success of some silvicultural treatments may be less

1 predictable will be applied through the Utilization Strategy. This Utilization Strategy has a focus on a
2 robust silviculture monitoring and results program to promote healthy future forest conditions.

3 The “Northeast Region Creating Forest Operations Opportunities in Low Market Conditions Strategy
4 (2020)” (or “Northeast marketability strategy”) is the over-arching document to the utilization and
5 marketability strategy in this plan. The following provides detail that falls within the Northeast
6 marketability strategy framework. In the case of a discrepancy, Northeast marketability strategy will
7 take president.

8 The Pic Forest Utilization Strategy meets the direction of the Northeast Region Creating Forest
9 Operations Opportunities in Low Market Conditions Strategy while recognizing conditions specific to the
10 Pic Forest. This strategy provides direction that ensures consistency in outcomes generated from
11 forestry operations that promote site renewal, forest health and habitat objectives as well as encourage
12 markets for underutilized hardwoods. With a focus on promoting utilization of underutilized
13 merchantable trees in meeting the Scaling Manual (OMNR 2020) direction for “(...) ensuring optimum
14 utilization of Crown forest resources” and meeting or exceeding standards and guidelines for renewal in
15 the Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales (OMNR 2010),
16 the Pic Forest Hardwood Utilization Strategy focuses on:

- 17 • Application of Northeast Region Creating Forest Operations Opportunities in Low Market
- 18 Conditions Strategy best practices, and its guiding principles,
- 19 • Promoting optimum utilization of Crown forest resources of underutilized species,
- 20 • Promoting best end use,
- 21 • Forest sustainability and emulating natural disturbances,
- 22 • Maximizing socio-economic benefits to the local communities, people and economy of Ontario,
- 23 • Supporting renewal practices suitable to each site to ensure desired future forest conditions
- 24 and,
- 25 • Effective monitoring of potential silvicultural exceptions

26 4.3.6.2.2 Determination of Markets

27 Since the collapse of the 2007/08 U.S housing market and the associated economic recession that
28 followed, there has been a long-standing, well-known absence of non-veneer hardwood markets
29 available to the Pic Forest. The 2007/08 recession caused detrimental effects to the regional forest
30 industry. However, a recovering pulp and softwood lumber market, coupled with what appears (at the
31 time of this plans approval) to be a favorable end to the latest Softwood Lumber dispute, much of the
32 regional markets for pulp and softwood lumber have resumed operations. However, facilities which
33 used non-veneer hardwood (Marathon Pulp Inc, Longlac waferboard, as examples) which shuttered in
34 2007/08 have never resumed operations and thus, a market for non-veneer hardwood is scarcely
35 available on the Pic Forest.

36 Objectively, the Pic Forest FMP assumes harvest of approximately 2,131,000m³ of Poplar over the 10-
37 year term. Assuming a return of 10% veneer quality material, we are assuming 1,918,000m³ of poplar to
38 be unmarketable fibre throughout the plan. However, limited market conditions, measured at a tactical
39 scale should generally only affect stands and blocks where the proportion of Poplar is >30%.

1 *“Regeneration established in >70% sunlight (by general extension lesser than 30% canopy*
2 *closure) is included in the definition of the clear-cut silvicultural system in the Forest Management Guide*
3 *to Silviculture in the Great Lakes st Lawrence and Boreal Forests of Ontario (2015).”*

4 Therefore, as a course measurement, assuming that proportional volume equates to canopy closure
5 (which is obviously an inaccurate assumption, and can only be used for a course scale estimate), we are
6 assuming the following blocks, identified in Table 64, will need to apply this strategy to achieve full
7 harvest. These blocks represent approximately 32,600ha of the regular harvest identified in the plan,
8 roughly 30%.

Table 64: List of Blocks where the Pic Forest Hardwood Utilization Strategy will likely be Applied

21ALBERTA LAKE
21ARMS LAKE
21BARBARA CREEK
21BARBARA LAKE
21BAREHEAD CREEK SOUTH
21BEAVERCROSS CREEK
21BEELINE LAKE EAST
21BLACK RIVER C
21BLACK RIVER D
21BLUEJAY CREEK
21BOOMERANG CREEK
NORTH
21BOOMERANG CREEK
SOUTH
21CANDYBAR CREEK
21CARAGANA LAKE
21CHAIN CREEK
21CHAIN LAKES
21CHARON CREEK B
21CHARON CREEK C
21CHARON CREEK D
21CHARON CREEK E
21CHARON LAKE
21CORNISH LAKE SOUTH
21CORNISH LAKE WEST
21DEADHORSE LAKE
21DEWEY CREEK
21DIANE CREEK
21DOT LAKE
21DOTTED LAKE
21EVEREST CREEK SOUTH
21EVEREST LAKE NORTH
21EVEREST LAKE SOUTH
21EXPLORER LAKE WEST
21FAKELOO LAKE
21FIRST LAKE
21FOCH RIVER
21GAFFHOOK LAKE ROAD
EAST
21GLORY LAKE
21GUTCHER CREEK
21HUCK LAKE
21ISLEALONE LAKE
21ISLINGTON LAKE WEST
21JACKFISH POND NORTH

21JACKFISH POND SOUTH
21KAGIANO LAKE SOUTH
21KALZ LAKE SOUTH
21LAMPSON LAKE EAST
21LAMPSON LAKE NORTH
21LAMPSON LAKE WEST
21LITTLE JOE CREEK
21LITTLE NAMA CREEK
21LITTLE PIC RIVER EAST
21LITTLE PIC RIVER WEST
21LITTLE VEIN LAKE
21LONG ALICE LAKE NORTH
21LONG LAKES NORTH
21LUNAM
21MARMOTA CREEK
21MCKAY LAKE ROAD
21MCKERNAN LAKE
21MICHAL LAKE WEST
21MILOTTE LAKE EAST
21MILOTTE LAKE WEST
21MISTAKE RIVER
21MOBERT CREEK
21MUSHER LAKE
21MY LAKE
21NAMA CREEK
21NAMA CREEK SOUTH
21NAMA CREEK WEST
21OLSON
21OSAWIN RIVER NORTH
21PAGWACHUAN RIVER EAST
21PAGWACHUAN RIVER
SOUTH
21PAN LAKE EAST
21PENDANT LAKE
21PETRANT LAKE
21PHILIP LAKE
21PHILIPS CREEK SOUTH
21PHILLIP CREEK
21PIC RIVER C
21PIC RIVER D
21PIC RIVER E
21PIC RIVER H
21PISTOL LAKE ROAD EAST
21PRAIRIE LAKE
21PRAIRIE LAKE WEST
21RABBITSKIN LAKE
21RAMSAY LAKE
21REEVES CREEK

21ROUTE LAKE
 21RUDDER CREEK
 21RUFFLE LAKE
 21SALIX LAKE
 21SLINGSHOT CREEK EAST
 21SLINGSHOT CREEK WEST
 21SLINGSHOT LAKE
 21SOLANN LAKE EAST
 21SOLANN LAKE WEST
 21SOUTH GOWAN CREEK
 21SUMMERS LAKE
 21TUFFY LAKE C
 21TUFFY LAKE D
 21TUFFY LAKE G
 21TUFFY LAKE H
 21TUFFY LAKE I
 21TWIST
 21TWIST LAKE SOUTH
 21VEIN CREEK EAST
 21VEIN CREEK NORTH
 21VEIN CREEK SOUTH
 21VEIN CREEK WEST
 21VEIN LAKE A
 21VEIN LAKE L
 21WABOOSEKON LAKE
 21WASKISK LAKE
 21WELLWOOD LAKE
 21WHITE OTTER RIVER

1

2 4.3.6.2.3 Utilization Efforts

3 At this time, there is not a guaranteed market to ensure full utilization of the non-veneer-grade aspen
 4 that is produced in conjunction with the veneer logs harvested on the Pic Forest as market conditions,
 5 distance from markets and cost recovery for the collection and use of non-veneer grade OSB/fibre
 6 continue to be a challenge. Where partial harvesting has taken place, efforts are made to promote
 7 those opportunities and identify buyers as maximizing utilization increases efficiency and cost recovery
 8 of operations while generating revenue for renewal and management.

9 Columbia Forest Products works extensively at resolving the utilization challenges for non-veneer aspen.
 10 In 2016, they invested \$15 million in their hardwood plywood plant in Hearst to increase efficiency and
 11 utilization of smaller sized logs. In 2015 Columbia Forest Products was successful in exporting
 12 approximately 10,000m³ non-veneer grade Aspen by rail to Louisiana Pacific in Michigan. Despite
 13 limited markets Columbia Forest Products takes advantage of all volume opportunities and delivery
 14 quotas available. They also worked steadily at finding markets for OSB.

15 Rentech biomass plant in Wawa (recently closed), Georgia Pacific North Woods LP in Englehart, Norbord
 16 Inc in Barwick, and Weyerhaeuser Company Limited in Kenora are potential purchasers, however

1 distance limits the amount, if any, of fibre that can be sold. In a seemingly “one-off” occurrence NFMC
2 sold around 14 truckloads of non-veneer poplar to Weyerhaeuser in Kenora in 2017. However, that
3 market opportunity only briefly existed.

4 Other potential purchasers include, from time to time, Hornepayne Power Cogen facility, Atlantic Power
5 in Calstock, and AV Terrace Bay. In 2017, White River Forest Products engaged in a pilot project to begin
6 production of hardwood lumber. However, the consumption was very limited, and the project was
7 discontinued shortly after.

8 In 2020, NFMC completed agreements with AV Terrace Bay for the sale of approximately 80,000m³ of
9 non-veneer poplar. In this scenario, the contractor ground piles of roadside poplar which had been
10 created as early as 2017. Although it is not expected that this opportunity will always be available, as AV
11 Terrace Bay will most assuredly have access to a more efficient supply of biomass on the Kenogami
12 Forest, it demonstrates that NFMC is ready to take action when market opportunities appear.

13 NFMC makes additional efforts to incentivize full utilization by reducing the renewal rate for poplar and
14 biomass. NFMC has met and worked with a number of proponents wishing to gain access to
15 underutilized fibre supplies for the production of wood pellets, power production, district heating and a
16 number of other ideas and concepts.

17 4.3.6.2.4 Risk Evaluation

18 4.3.6.2.4.1 Forest Health Evaluation

19 Northeast Region Creating Forest Operations Opportunities in Low Market Conditions Strategy (2020)
20 provides tactical considerations and a decision-making process that would see some stands allocated in
21 the forest management plan deferred from operations until market conditions improve. Deferral is
22 meant to postpone harvest presumably until optimal utilization can be achieved where a more ‘clear
23 cut’ condition is reached which may result in improved site occupancy by hardwood species following
24 harvest operations. Markets for forest products however change slowly, requiring substantive
25 improvement in macro-economic factors and government policies to promote new investment.

26 It is generally acknowledged, especially on the Pic Forest, which has silty rich sites and soils, that
27 deferring high content hardwood stands for future harvest promotes degraded future stand conditions,
28 as the future harvest rarely occurs. Furthermore, as areas are deferred from harvest and natural forest
29 succession occurs, not only is there lost economic opportunity for the local and provincial economy, but
30 as trees fall out of the canopy, brush species such as alder, hazel and mountain maple have an
31 opportunity to become established which will diminish adequate conditions for aspen root suckering.
32 Succession additionally promotes balsam fir, which is largely planned to be above target levels after 100
33 years per the Long-Term Management Direction. Deferring stands that are heavy to hardwood in the
34 caribou zone will also increase tract fragmentation and promote species that will attract and sustain
35 moose populations and diminish the capacity to meet desired forest structure and composition
36 objectives, habitat targets and long-term harvest objectives per the Boreal Landscape Guide.

37 Although it is well demonstrated that retaining unutilized fibre on site following harvest poses its own
38 risks, this section demonstrates there are risks and future consequences to avoidance of the issue
39 through deferral of forested area. In the context of the Pic Forest, deferral is used as a last option taking
40 into consideration the risk of silvicultural success.

1 4.3.6.2.4.2 Categorizing Risk

2 The following sections outline the process to determine the risk of partial harvest (where this strategy
3 may need to be applied) and provides direction for operations and renewal standards to be applied
4 depending on assessed risk level. Although the risk of partial harvest may exist across all forest units for
5 various reasons, this section details only scenarios where unmarketable hardwood content is the reason
6 for risk.

7 It is generally accepted that canopy cover reduction of 70% ($\leq 30\%$ residual canopy cover) permits
8 enough sunlight to reach the forest floor, warming soils and promoting Poplar root suckering and Birch
9 stump suckering. Therefore, only forest units that have an average hardwood content of greater than
10 30% are referenced in this strategy. It is assumed there are no hardwood utilization issues where less
11 than 30% of the stand is hardwood species. Specifically, the following forest units will be assessed at a
12 tactical and operational level to assess risk of partial harvest, Table 65.

13 *Table 65: Forest Units Assessed for Risk of Partial Harvest*

Forest Unit	Average proportion of Hardwood	Average Proportion of White Birch (Bw)	Average Proportion of Poplar (Po & Bp)
BWDOM	79%	71%	8%
CONMX	32%	19%	14%
HRDOM	75%	28%	47%
HRMIX	55%	32%	24%
HRMXB*	56%	48%	9%
HRMXP*	56%	10%	46%
PODOM	89%	4%	85%

14 * HRMXB and HRMXP are Pic Forest Analysis Forest Units used to differentiate White Birch leading (HRMXB) from Poplar
15 leading (HRMXP) from one another. The yields for Poplar leading (HRMXP) are significantly higher than White Birch leading
16 (HRMXB). HRMXP occurs more northerly on the forest, HRMXB occurs more towards the Lake Superior coast. They have been
17 separated in this strategy, a field level, operational assessment will determine if Bw or Po is the leading species.

18 Determining risk level will occur in a two-stage process of tactical and operational assessments. Tactical
19 and Operational assessment standards must be maintained for operations to be carried out.

20 **Tactical Assessment**

21 Stands where the proportion of hardwood is lesser than 30% are deemed to be at low risk of partial
22 harvest and normal operations will occur as detailed in section 4.2.2.2 Conditions for Important
23 Ecological Features.

24 Hardwood leading mixedwoods, and Poplar and Birch dominated stands allocated for harvest will be
25 assessed during the preparation of the annual work schedule (AWS) to identify where, and if there is a
26 risk of partial harvesting. Stands where the proportion of hardwood species is greater than, or equal to
27 30% will be deemed a moderate to high risk of partial harvest and will be identified on maps and in the
28 AWS.

29 Net stocking may be used to estimate the risk level and help inform operational assessment of risk and
30 residual retention standards. The following formula (Figure 63) will be used to estimate net stocking:

1	$Net\ Stocking = \frac{Species\ composition \times Average\ Stand\ Stocking}{100}$
2	Example: species composition = Bw ₅ Sb ₃ Bf ₂ , 70% stocked
3	$Bw\ Net\ Stocking = \frac{50 \times 70}{100}$
4	$Bw\ Net\ Stocking = 35stems/ha$

5 *Figure 63: Calculation for estimating Net Stocking*

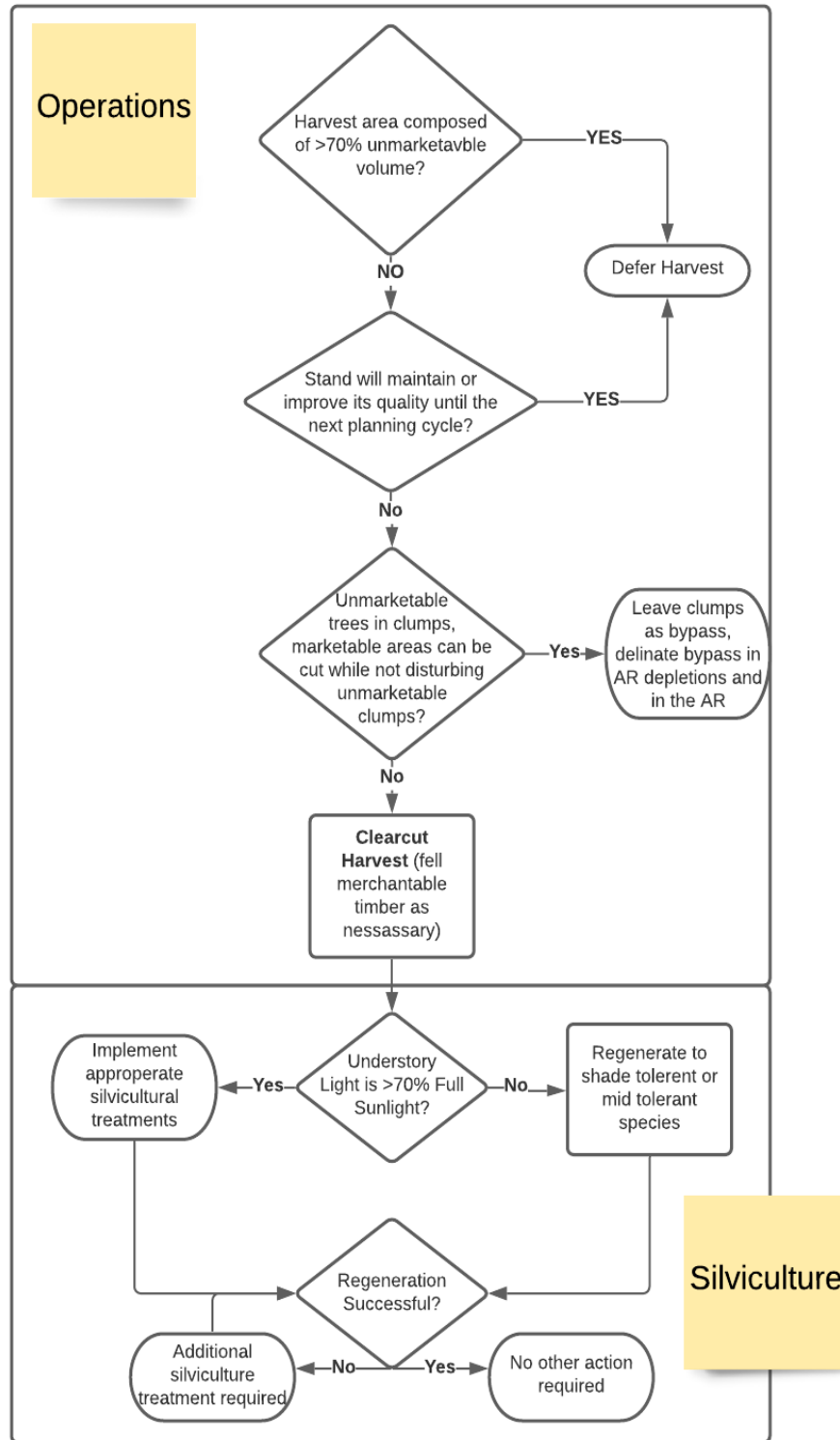
6 Operational Assessment

7 With respect to stands where the proportion of hardwood is greater than, or equal to 30%, specific post-
 8 harvest stand conditions must be met to ensure the successful regeneration to the target species
 9 identified in the Silvicultural Ground Rule (SGR). These conditions are necessary to influence the
 10 development and growth of the regeneration to the target species, and to control and meet future
 11 stand composition and structure.

12 4.3.6.2.5 In field Application of Hardwood Utilization Strategy

13 Figure 64 details the tactical decision making used to determine if a stand or area will be harvested,
 14 deferred, and the high-level silvicultural direction.

15 Operational silvicultural direction for the establishment of intolerant hardwood or mid to shade tolerant
 16 conifers can be found starting with referencing Table 66.



1

2 Figure 64: Tactical decision chart for Operations and Silviculture

1 *Table 66: Maximum crown closure, stem density, and Basil Area for regeneration of specific forest units*

Regeneration Target Species	Residual (Overstory) Stand Condition				
	Max Crown Closure (%)	Max Live Density (Stems/ha)		Max Live BA (M ² /ha)	
	BWDOM, CONMX, HRDOM, HRMIX (HRMXB, HRMXP), PODOM	PODOM, HRDOM, HRMXP	BWDOM, CONMX, HRMXB,	PODOM, HRDOM, HRMXP	BWDOM, CONMX, HRMXB,
Po	30%	75	75	6.0	2.5
Bw	30%	75	75	6.0	2.5
Pj	<10%	25	25	<1	<1
Sb		250	180	16	6.0
Sw		450	380	26	12.0

2 Source: Adapted from the Northeast Region Operations Guide for Marketability Issues (MNRF 2013)

3 Forest sustainability, more specifically silvicultural success and regeneration are paramount when
 4 implementing a partial harvest system in the Boreal forest. The Silvicultural Ground Rules (SGRs) in
 5 FMP-4 identify various methods of regeneration that may be employed to attain a prescribed future
 6 forest condition. Target species are the focus of the silvicultural activities, and treatments are primarily
 7 aimed at encouraging their establishment and growth. The target species are identified in the
 8 regeneration standards of the SGRs and are ecologically suited to the site and consistent with the
 9 management objectives in FMP-10.

10 With respect to partial harvest in the boreal forest, specific post-harvest stand conditions must be met
 11 to ensure the successful regeneration to the target species identified in the SGR. These conditions are
 12 listed in Table 66 and are necessary to influence the development and growth of the regeneration to the
 13 target species, and to control and meet future stand composition and structure. If these post-harvest
 14 conditions are not met, then successful regeneration to the target species and future stand condition is
 15 not anticipated and implementation of this practice will represent an exception to the boreal or
 16 mixedwood silvicultural guides and will require an exceptions monitoring program to be enacted. More
 17 information on enactment of silvicultural exceptions monitoring can be found in section 4.7.2 Exceptions
 18 of the FMP.

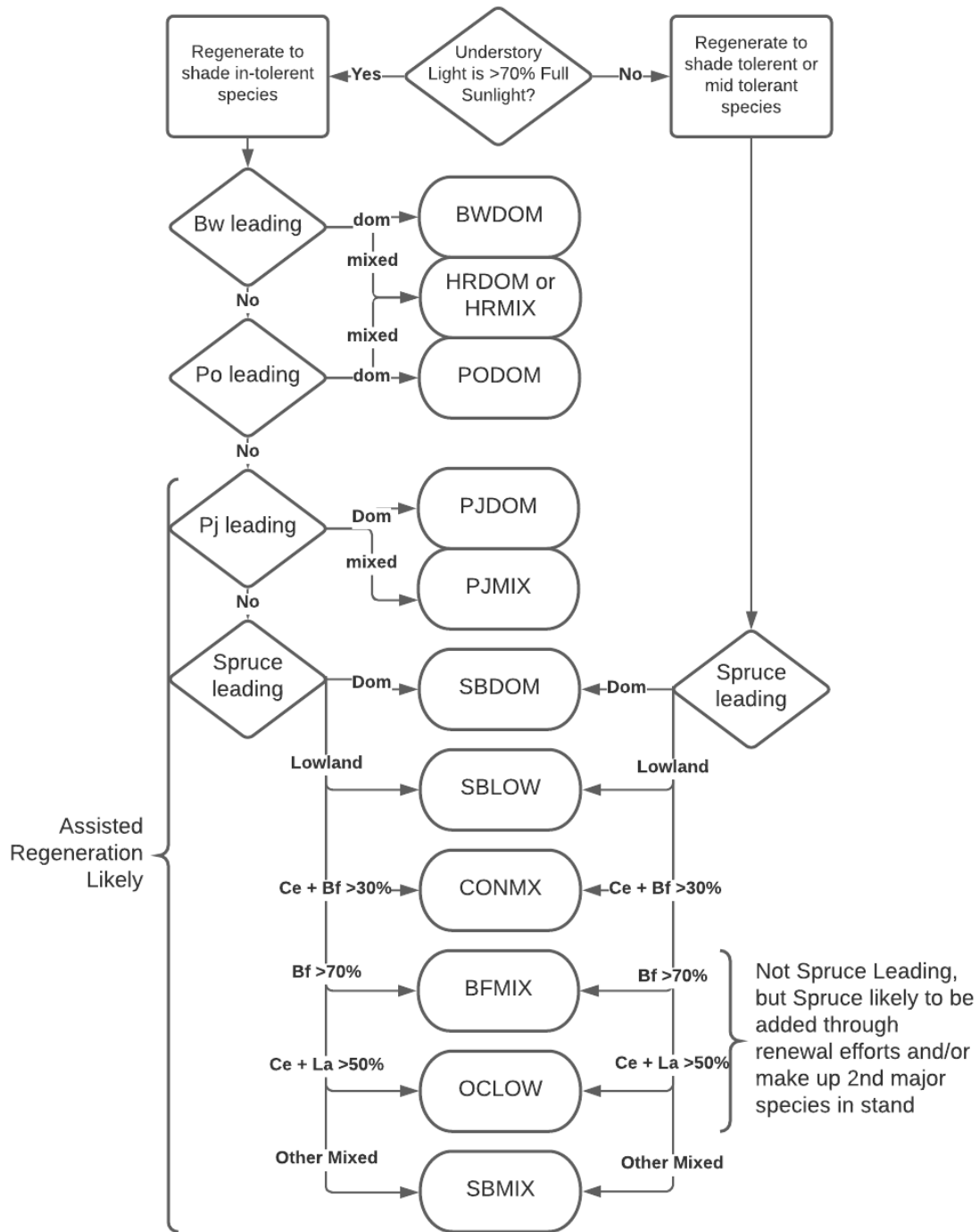
19 The partial harvest with retention of residual canopy approach for boreal forest stands provides several
 20 operational and ecological benefits:

- 21 • Varying levels of residual canopy (from 10 to 450 live stems per hectare) may be retained,
 22 depending on the residual tree species and the target species being regenerated, providing a
 23 greater range of silvicultural options;
- 24 • Since more residual canopy may be retained, fewer (if any) unmarketable stems will be felled
 25 and left on the harvest site;
- 26 • The natural successional pathway of boreal mixedwoods is emulated;

- 1 • Partial shade maximizes height growth of mid- and shade tolerant species, and reduces aspen
- 2 suckering and shade intolerant competition;
- 3 • Frost and low humidity protection is provided for white spruce regeneration;
- 4 • More wildlife trees are retained to provide future inputs of dead coarse woody material; and
- 5 • May be perceived as a more aesthetically pleasing alternative to clearcut harvesting
- 6

7 This utilization direction is intended to provide the necessary steps to ensure successful regeneration of
8 target species through the control of residual stand composition and structure.

9 Figure 65 provides general “high level” direction for post harvest forest renewal pathways on the Pic
10 Forest. Using the information support tools reviewed in Table 65, Table 66, and Figure 64; Figure 65 can
11 be used to provide direction to the most appropriate forest renewal pathway. Application of a specific
12 Silvicultural Ground Rule (SGR) will be assigned by a Registered Professional Forester (R.P.F) considering
13 the direction within this strategy. Once a renewal pathway has been generally selected, additional
14 tables Table 67 and Table 68 can be referenced for more specific standards relating to the establishment
15 of conifer, or intolerant hardwoods by Forest Unit.



1

2 *Figure 65: General Regeneration Pathways for Pic Forest Renewal*

3 Direction for the Establishment of Intolerant Hardwoods

1 Table 67: Direction for the Establishment of Intolerant Hardwoods under the Hardwood Utilization Strategy

Pre-Harvest Forest Unit	Operational and Silvicultural Requirements
BWDOM	<p><u>Operational Direction</u></p> <ul style="list-style-type: none"> • If harvested in a two-pass system, the second pass must be conducted within two years of the initial harvest, unless specific circumstances are warranted. • Post-harvest residual trees will be left per the standard for a clearcut silvicultural system in the Stand and Site Guide and Conditions on Regular Operations (CROs), section Wildlife Trees, Cavity, and Supercanopy Trees. • Post-harvest residual trees will be within the allowances detailed in Table 66 for the regeneration of the target species Bw (i.e. <30% crown closure, and <75 residual stems) • For successful vegetative regeneration of white birch, white birch trees must be harvested to promote stump sprouting. If birch trees are not harvested from the stand, and the post-harvest conditions exceed either of the conditions identified above, vegetative regeneration for the establishment of white birch as a target species is not recommended, and an alternative regeneration strategy must be considered. There must be a sufficient distribution of white birch stems to meet hardwood compositional requirements for the future forest unit. • There must be an adequate number and distribution of Bw trees in the original stand to foster root suckering. The understory must allow sunlight to reach the forest floor. If the understory is covered in dense brush (hazel, alder, cherry, maple, ssp.), then the brush must be removed, or an alternative silvicultural treatment applied. • If the post-harvest conditions exceed either of the conditions identified above, vegetative regeneration for the establishment of birch as a target species is not recommended, and an alternative regeneration strategy must be considered. • All felled white birch are to be brought to roadside, and made accessible to the public as fuelwood. All other felled species, up to 25 stems/ha may be harvested and left on site. <p><u>Silvicultural Direction</u></p> <ul style="list-style-type: none"> • Following site evaluation, where appropriate, implement a white birch natural reduced (SI=NATRR) as per preferred SGR.

Pre-Harvest Forest Unit	Operational and Silvicultural Requirements
	<ul style="list-style-type: none"> • The above measures will establish the most favorable conditions possible to foster high density hardwood regeneration. Where subsequent regeneration is insufficient, may proceed with artificial regeneration through mechanical or chemical site preparation, tree planting, and tending if required. • Or, with no further treatment there is a concern for the success of natural treatments, designate as a silvicultural exception and proceed with exceptions monitoring.
CONMX	<p><u>Operational Direction</u></p> <ul style="list-style-type: none"> • If harvested in a two-pass system, the second pass must be conducted within two years of the initial harvest, unless specific circumstances are warranted. • Post-harvest residual trees will be left per the standard for a clearcut silvicultural system in the Stand and Site Guide and Conditions on Regular Operations (CROs), section Wildlife Trees, Cavity, and Supercanopy Trees. • Post-harvest residual trees will be within the allowances detailed in Table 66 for the regeneration of the target species Po (i.e. <30% crown closure, and <75 residual stems). • To maximize sucker production, it is recommended that the overstory be completely removed to ensure optimal soil temperature for sucker development. Since residual crown closure influences the density and size of aspen regeneration, optimal conditions for sucker production may still be attained under partial harvest conditions providing crown closure is less than or equal to 30%. • There must be an adequate number and distribution of Po trees in the original stand to foster root suckering. The understory must allow sunlight to reach the forest floor. If the understory is covered in dense brush (hazel, alder, cherry, maple, ssp.), then the brush must be removed, or an alternative silvicultural treatment applied. • If the post-harvest conditions exceed either of the conditions identified above, vegetative regeneration for the establishment of aspen as a target species is not recommended, and an alternative regeneration strategy must be considered. • All felled white birch are to be brought to roadside, and made accessible to the public as fuelwood. All other felled species, up to 25 stems/ha may be harvested and left on site.

Pre-Harvest Forest Unit	Operational and Silvicultural Requirements
	<p><u>Silvicultural Direction</u></p> <ul style="list-style-type: none"> • Following site evaluation, where appropriate, implement a poplar natural reduced (SI=NATRR) as per preferred SGR. • The above measures will establish the most favorable conditions possible to foster high density hardwood regeneration. Where subsequent regeneration is insufficient, may proceed with artificial regeneration through mechanical or chemical site preparation, tree planting, and tending if required. • Or, with no further treatment there is a concern for the success of natural treatments, designate as a silvicultural exception and proceed with exceptions monitoring.
HRDOM	<p><u>Operational Direction</u></p> <ul style="list-style-type: none"> • If harvested in a two-pass system, the second pass must be conducted within two years of the initial harvest, unless specific circumstances are warranted. • Post-harvest residual trees will be left per the standard for a clearcut silvicultural system in the Stand and Site Guide and Conditions on Regular Operations (CROs), section Wildlife Trees, Cavity, and Supercanopy Trees. • Post-harvest residual trees will be within the allowances detailed in Table 66 for the regeneration of the target species Po (i.e. <30% crown closure, and <75 residual stems). • To maximize sucker production, it is recommended that the overstory be completely removed to ensure optimal soil temperature for sucker development. Since residual crown closure influences the density and size of aspen regeneration, optimal conditions for sucker production may still be attained under partial harvest conditions providing crown closure is less than or equal to 30%. • There must be an adequate number and distribution of Po trees in the original stand to foster root suckering. The understory must allow sunlight to reach the forest floor. If the understory is covered in dense brush (hazel, alder, cherry, maple, ssp.), then the brush must be removed, or an alternative silvicultural treatment applied. • If the post-harvest conditions exceed either of the conditions identified above, vegetative regeneration for the establishment of aspen as a target species is not recommended, and an alternative regeneration strategy must be considered.

Pre-Harvest Forest Unit	Operational and Silvicultural Requirements
	<ul style="list-style-type: none"> • All felled species, up to 25 stems/ha may be harvested and left on site. <p>Silvicultural Direction</p> <ul style="list-style-type: none"> • Following site evaluation, where appropriate, implement a poplar natural reduced (SI=NATRR) as per preferred SGR. • The above measures will establish the most favorable conditions possible to foster high density hardwood regeneration. Where subsequent regeneration is insufficient, may proceed with artificial regeneration through mechanical or chemical site preparation, tree planting, and tending if required. • Or, with no further treatment there is a concern for the success of natural treatments, designate as a silvicultural exception and proceed with exceptions monitoring.
HRMIX	<p>Note: A field level assessment will determine the leading species, this will identify if the HRMIX is a Birch leading (HRMXB analysis forest unit) or Poplar leading (HRMXP analysis forest unit). Regeneration to BWDOM is the preferred alternative for birch leading HRMXB. Regeneration to PODOM is the preferred alternative for poplar leading HRMXP. If the proportion of birch and poplar are within 10%, the preferred regeneration alternative will be to PODOM.</p> <p>Operational Direction</p> <ul style="list-style-type: none"> • If harvested in a two-pass system, the second pass must be conducted within two years of the initial harvest, unless specific circumstances are warranted. • Post-harvest residual trees will be left per the standard for a clearcut silvicultural system in the Stand and Site Guide and Conditions on Regular Operations (CROs), section Wildlife Trees, Cavity, and Supercanopy Trees. • Post-harvest residual trees will be within the allowances detailed in Table 66 for the regeneration of the target species Po or Bw (i.e. <30% crown closure, and <75 residual stems). • If regenerating to PODOM: <ul style="list-style-type: none"> ○ To maximize sucker production, it is recommended that the overstory be completely removed to ensure optimal soil temperature for sucker development. Since residual crown closure influences the density and size of aspen regeneration, optimal conditions for sucker production may still be attained under partial harvest conditions providing crown closure is less than or equal to 30%.

Pre-Harvest Forest Unit	Operational and Silvicultural Requirements
	<ul style="list-style-type: none"> ○ There must be an adequate number and distribution of Po trees in the original stand to foster root suckering. The understory must allow sunlight to reach the forest floor. If the understory is covered in dense brush (hazel, alder, cherry, maple, ssp.), then the brush must be removed, or an alternative silvicultural treatment applied. ○ All felled trees, up to 25 stems/ha may be harvested and left on site. ● If regenerating to BWDOM: <ul style="list-style-type: none"> ○ For successful vegetative regeneration of white birch, white birch trees must be harvested to promote stump sprouting. If birch trees are not harvested from the stand, and the post-harvest conditions exceed either of the conditions identified above, vegetative regeneration for the establishment of white birch as a target species is not recommended, and an alternative regeneration strategy must be considered. There must be a sufficient distribution of white birch stems to meet hardwood compositional requirements for the future forest unit. ○ All felled white birch are to be brought to roadside, and made accessible to the public as fuelwood. All other felled species, up to 25 stems/ha may be harvested and left on site. ● There must be an adequate number and distribution of Bw or Po trees in the original stand to foster stump or root suckering. The understory must allow sunlight to reach the forest floor. If the understory is covered in dense brush (hazel, alder, cherry, maple, ssp.), then the brush must be removed, or an alternative silvicultural treatment applied. ● If the post-harvest conditions exceed either of the conditions identified above, vegetative regeneration for the establishment of birch as a target species is not recommended, and an alternative regeneration strategy must be considered. <p><u>Silvicultural Direction</u></p> <ul style="list-style-type: none"> ● Following site evaluation, where appropriate, implement a poplar natural reduced (SI=NATRR) as per preferred SGR. ● The above measures will establish the most favorable conditions possible to foster high density hardwood regeneration. Where subsequent regeneration is insufficient, may proceed with artificial regeneration through mechanical or chemical site preparation, tree planting, and tending if required.

Pre-Harvest Forest Unit	Operational and Silvicultural Requirements
	<ul style="list-style-type: none"> • Or, with no further treatment there is a concern for the success of natural treatments, designate as a silvicultural exception and proceed with exceptions monitoring.
<p>PODOM</p>	<p><u>Operational Direction</u></p> <ul style="list-style-type: none"> • If harvested in a two-pass system, the second pass must be conducted within two years of the initial harvest, unless specific circumstances are warranted. • Post-harvest residual trees will be left per the standard for a clearcut silvicultural system in the Stand and Site Guide and Conditions on Regular Operations (CROs), section Wildlife Trees, Cavity, and Supercanopy Trees. • Post-harvest residual trees will be within the allowances detailed in Table 66 for the regeneration of the target species Po (i.e. <30% crown closure, and <75 residual stems). • To maximize sucker production, it is recommended that the overstory be completely removed to ensure optimal soil temperature for sucker development. Since residual crown closure influences the density and size of aspen regeneration, optimal conditions for sucker production may still be attained under partial harvest conditions providing crown closure is less than or equal to 30%. • There must be an adequate number and distribution of Po trees in the original stand to foster root suckering. The understory must allow sunlight to reach the forest floor. If the understory is covered in dense brush (hazel, alder, cherry, maple, ssp.), then the brush must be removed, or an alternative silvicultural treatment applied. • If the post-harvest conditions exceed either of the conditions identified above, vegetative regeneration for the establishment of aspen as a target species is not recommended, and an alternative regeneration strategy must be considered. • All felled species, up to 25 stems/ha may be harvested and left on site. <p><u>Silvicultural Direction</u></p> <ul style="list-style-type: none"> • Following site evaluation, where appropriate, implement a poplar natural reduced (SI=NATRR) as per preferred SGR. • The above measures will establish the most favorable conditions possible to foster high density hardwood regeneration. Where subsequent regeneration

Pre-Harvest Forest Unit	Operational and Silvicultural Requirements
	<p>is insufficient, may proceed with artificial regeneration through mechanical or chemical site preparation, tree planting, and tending if required.</p> <ul style="list-style-type: none"> • Or, with no further treatment there is a concern for the success of natural treatments, designate as a silvicultural exception and proceed with exceptions monitoring.

1

2 Direction for the Establishment of Conifer

3 The successful establishment and growth of conifer species after harvest is influenced by the silvics of the

4 target species. Understory light has a significant impact on the survival and development of conifer

5 species. Seedling height growth and light relationships have been established for many tree species, in

6 field and controlled environment studies. Although these relationships may vary with site and seedling

7 size, they are generally consistent within species. Jack pine and red pine are considered as shade

8 intolerant species, whereas black spruce, white spruce and balsam fir range from mid-tolerant to tolerant

9 of shade. The following direction provides standards for the successful regeneration of conifer under a

10 partial harvest system.

11 *Table 68: Direction for the Establishment of Conifer under the Hardwood Utilization Strategy*

Pre-Harvest Forest Unit	Operational and Silvicultural Requirements
BWDOM	<p>Operational Direction</p> <ul style="list-style-type: none"> • If harvested in a two-pass system, the second pass must be conducted within two years of the initial harvest, unless specific circumstances are warranted. • Post-harvest residual trees will be left per the standard for a clearcut silvicultural system in the Stand and Site Guide and Conditions on Regular Operations (CROs), section Wildlife Trees, Cavity, and Supercanopy Trees. • Post-harvest residual trees will be within the allowances detailed in Table 66 Error! Reference source not found. for the regeneration of the target species: <ul style="list-style-type: none"> ○ Pj (<10% canopy cover, <=25 residuals per ha) ○ Sb (<50% canopy cover, <180 residuals per ha) ○ Sw (<50% canopy cover, <380 residuals per ha) • If the understory is covered in dense brush (hazel, alder, cherry, maple, ssp.), then the brush must be removed, or an alternative silvicultural treatment applied. • If the post-harvest conditions exceed either of the conditions identified above, regeneration for the establishment of conifer as a target species is not recommended, and an alternative regeneration strategy must be considered. • All felled species must be brought to roadside so as to not impede silvicultural activities. Roadside fibre will be made available to the public as fuelwood, and marketed to industry for possible utilization.

Pre-Harvest Forest Unit	Operational and Silvicultural Requirements
	<p><u>Silvicultural Direction</u></p> <ul style="list-style-type: none"> • Following site evaluation, where appropriate, implement a conifer managed plant or fill treatment (SI=MANAP or FILL) as per preferred SGR. • The above measures will establish the most favorable conditions possible to foster high density conifer regeneration. Proceed with artificial regeneration through mechanical or chemical site preparation, tree planting, and tending if required. • Or, with treatment there is a concern for the success of managed or fill treatments, designate as a silvicultural exception and proceed with exceptions monitoring.
CONMX	<p><u>Operational Direction</u></p> <ul style="list-style-type: none"> • If harvested in a two-pass system, the second pass must be conducted within two years of the initial harvest, unless specific circumstances are warranted. • Post-harvest residual trees will be left per the standard for a clearcut silvicultural system in the Stand and Site Guide and Conditions on Regular Operations (CROs), section Wildlife Trees, Cavity, and Supercanopy Trees. • Post-harvest residual trees will be within the allowances detailed in Table 66 for the regeneration of the target species: <ul style="list-style-type: none"> ○ Pj (<10% canopy cover, <=25 residuals per ha) ○ Sb (<50% canopy cover, <180 residuals per ha) ○ Sw (<50% canopy cover, <380 residuals per ha) • If the understory is covered in dense brush (hazel, alder, cherry, maple, ssp.), then the brush must be removed, or an alternative silvicultural treatment applied. • If the post-harvest conditions exceed either of the conditions identified above, regeneration for the establishment of conifer as a target species is not recommended, and an alternative regeneration strategy must be considered. • All felled species must be brought to roadside so as to not impede silvicultural activities. Roadside fibre will be made available to the public as fuelwood, and marketed to industry for possible utilization. <p><u>Silvicultural Direction</u></p> <ul style="list-style-type: none"> • Following site evaluation, where appropriate, implement a conifer managed plant or fill treatment (SI=MANAP or FILL) as per preferred SGR. • The above measures will establish the most favorable conditions possible to foster high density conifer regeneration. Proceed with artificial regeneration through mechanical or chemical site preparation, tree planting, and tending if required. • Or, with treatment there is a concern for the success of managed or fill treatments, designate as a silvicultural exception and proceed with exceptions monitoring.
HRDOM	<p><u>Operational Direction</u></p> <ul style="list-style-type: none"> • If harvested in a two-pass system, the second pass must be conducted within two years of the initial harvest, unless specific circumstances are warranted.

Pre-Harvest Forest Unit	Operational and Silvicultural Requirements
	<ul style="list-style-type: none"> • Post-harvest residual trees will be left per the standard for a clearcut silvicultural system in the Stand and Site Guide and Conditions on Regular Operations (CROs), section Wildlife Trees, Cavity, and Supercanopy Trees. • Post-harvest residual trees will be within the allowances detailed in Table 66 for the regeneration of the target species: <ul style="list-style-type: none"> ○ Pj (<10% canopy cover, <=25 residuals per ha) ○ Sb (<50% canopy cover, <250 residuals per ha) ○ Sw (<50% canopy cover, <450 residuals per ha) • If the understory is covered in dense brush (hazel, alder, cherry, maple, ssp.), then the brush must be removed, or an alternative silvicultural treatment applied. • If the post-harvest conditions exceed either of the conditions identified above, regeneration for the establishment of conifer as a target species is not recommended, and an alternative regeneration strategy must be considered. • All felled species must be brought to roadside so as to not impede silvicultural activities. Roadside fibre will be made available to the public as fuelwood, and marketed to industry for possible utilization. <p>Silvicultural Direction</p> <ul style="list-style-type: none"> • Following site evaluation, where appropriate, implement a conifer managed plant or fill treatment (SI=MANAP or FILL) as per preferred SGR. • The above measures will establish the most favorable conditions possible to foster high density conifer regeneration. Proceed with artificial regeneration through mechanical or chemical site preparation, tree planting, and tending if required. • Or, with treatment there is a concern for the success of managed or fill treatments, designate as a silvicultural exception and proceed with exceptions monitoring.
HRMIX	<p>Note: A field level assessment will determine the leading species, this will identify if the HRMIX is a birch leading (HRMXB analysis forest unit) or poplar leading (HRMXP analysis forest unit). Ensure standards outlined in Table 66 are adhered to.</p> <p>Operational Direction</p> <ul style="list-style-type: none"> • If harvested in a two-pass system, the second pass must be conducted within two years of the initial harvest, unless specific circumstances are warranted. • Post-harvest residual trees will be left per the standard for a clearcut silvicultural system in the Stand and Site Guide and Conditions on Regular Operations (CROs), section Wildlife Trees, Cavity, and Supercanopy Trees. • Post-harvest residual trees will be within the allowances detailed in Error! Reference source not found. for the regeneration of the target species: <ul style="list-style-type: none"> ○ If HRMXB: <ul style="list-style-type: none"> ▪ Pj (<10% canopy cover, <=25 residuals per ha) ▪ Sb (<50% canopy cover, <180 residuals per ha) ▪ Sw (<50% canopy cover, <380 residuals per ha) ○ If HRMXP <ul style="list-style-type: none"> ▪ Pj (<10% canopy cover, <=25 residuals per ha)

Pre-Harvest Forest Unit	Operational and Silvicultural Requirements
	<ul style="list-style-type: none"> ▪ Sb (<50% canopy cover, <250 residuals per ha) ▪ Sw (<50% canopy cover, <450 residuals per ha) <ul style="list-style-type: none"> • If the understory is covered in dense brush (hazel, alder, cherry, maple, ssp.), then the brush must be removed, or an alternative silvicultural treatment applied. • If the post-harvest conditions exceed either of the conditions identified above, regeneration for the establishment of conifer as a target species is not recommended, and an alternative regeneration strategy must be considered. • All felled species must be brought to roadside so as to not impede silvicultural activities. Roadside fibre will be made available to the public as fuelwood, and marketed to industry for possible utilization. <p>Silvicultural Direction</p> <ul style="list-style-type: none"> • Following site evaluation, where appropriate, implement a conifer managed plant or fill treatment (SI=MANAP or FILL) as per preferred SGR. • The above measures will establish the most favorable conditions possible to foster high density conifer regeneration. Proceed with artificial regeneration through mechanical or chemical site preparation, tree planting, and tending if required. • Or, with treatment there is a concern for the success of managed or fill treatments, designate as a silvicultural exception and proceed with exceptions monitoring.
PODOM	<p>Operational Direction</p> <ul style="list-style-type: none"> • If harvested in a two-pass system, the second pass must be conducted within two years of the initial harvest, unless specific circumstances are warranted. • Post-harvest residual trees will be left per the standard for a clearcut silvicultural system in the Stand and Site Guide and Conditions on Regular Operations (CROs), section Wildlife Trees, Cavity, and Supercanopy Trees. • Post-harvest residual trees will be within the allowances detailed in Table 66 for the regeneration of the target species: <ul style="list-style-type: none"> ○ Pj (<10% canopy cover, <=25 residuals per ha) ○ Sb (<50% canopy cover, <250 residuals per ha) ○ Sw (<50% canopy cover, <450 residuals per ha) • If the understory is covered in dense brush (hazel, alder, cherry, maple, ssp.), then the brush must be removed, or an alternative silvicultural treatment applied. • If the post-harvest conditions exceed either of the conditions identified above, regeneration for the establishment of conifer as a target species is not recommended, and an alternative regeneration strategy must be considered. • All felled species must be brought to roadside so as to not impede silvicultural activities. Roadside fibre will be made available to the public as fuelwood, and marketed to industry for possible utilization. <p>Silvicultural Direction</p> <ul style="list-style-type: none"> • Following site evaluation, where appropriate, implement a conifer managed plant or fill treatment (SI=MANAP or FILL) as per preferred SGR.

Pre-Harvest Forest Unit	Operational and Silvicultural Requirements
	<ul style="list-style-type: none"> • The above measures will establish the most favorable conditions possible to foster high density conifer regeneration. Proceed with artificial regeneration through mechanical or chemical site preparation, tree planting, and tending if required. • Or, with treatment there is a concern for the success of managed or fill treatments, designate as a silvicultural exception and proceed with exceptions monitoring.

1

2 4.3.6.2.6 Reporting and Monitoring

3 Reporting

4 Stage one reporting will occur at time of Annual Work Schedule (AWS) development. As discussed in
 5 section 4.3.6.2.4.2 Categorizing Risk, all stands that may require the application of the hardwood
 6 utilization strategy will be symbolized on maps and tagged within the harvest layer attribute table. This
 7 action will a) call specific attention to high hardwood stands for logging contractors, and b) allow NFMC
 8 and MNRF to specify stands or blocks where concern over hardwood is present.

9 Stage two reporting will occur commensurate with Annual Reporting (AR), specifically the harvest
 10 depletion layer. Harvest depletion records will include an attribute tagging the harvested stands which
 11 will be Silviculturally managed using the hardwood utilization strategy. This will a) allow NFMC to track
 12 and monitor these areas, and b) provide data to MNRF so joint assessments, tracking, and/or analysing
 13 data can be completed. The AR text will include a discussion on the area managed under this strategy.

14 Stage three will only be applicable if high risk treatments or strategies are applied. Application of the
 15 harvest standards, and regeneration treatments above, are generally considered low and perhaps
 16 moderate risks. Monitoring of these sites will be completed through regular silvicultural procedures,
 17 and establishment surveys.

18 Where high risk treatments are applied; reporting will be commensurate with AR, with the
 19 submission of a “High Risk Hardwood Utilization Strategy Monitoring” layer. Using the data reported in
 20 stage two as a base, NFMC will monitor and report the findings of high risk areas managed under the
 21 Hardwood Utilization System. This information will be provided to MNRF through AR’s to ensure a) all
 22 areas managed under this system are monitored, and b) success of the treatments meet silvicultural
 23 standards.

24 Monitoring

25 Monitoring will occur on areas identified in stage two reporting. Following the silvicultural direction in
 26 Table 67 and/or Table 68 monitoring will ensure that silvicultural standards are being met. Specifically:

- 27 • For Direction for the Establishment of Intolerant Hardwoods in Table 67 – that acceptable
 28 hardwood species are becoming established, and a future forest unit meeting silvicultural
 29 standards is likely.

- 1 • For Direction for the Establishment of in Table 68 – that planted conifer species are becoming
2 established, and that a future forest unit meeting silvicultural standards is likely.

3 As directed in Table 66 and/or Table 67 if there is concern over the likely success of silvicultural
4 activities; then a) a silvicultural exceptions monitoring program and trail establishment will be put in
5 place, and subsequent stage three reporting measures or b) if possible, enact silvicultural intervention
6 whereby the stand is no longer managed under the high risk treatment or Hardwood Utilization Strategy
7 (e.x. Strong application of site prep (chemical or mechanical), followed by natural regen, or planting and
8 likely tending).

9 4.3.7 Salvage

10 There are no salvage activities planned on the Pic Forest at time of plan approval. Natural forces (e.g.
11 Forest fire, pest outbreak, weather event) may necessitate the planning of salvage harvest through the
12 implementation of the plan. Where salvage operations may occur in a management plan, they are as
13 harvest operations in areas of natural depletion. Salvage harvest is not counted against the available
14 harvest area because allowances for natural depletion have been incorporated into the strategic model.

15 Any salvage operations will be amended into the management plan if, and when, required. Salvage
16 operations will follow the normal conditions on regular operations as detailed in section 4.2.2.2
17 Conditions and Salvage Harvest.

18 4.3.8 Contingency Area and Volume

19 During the ten-year period of the forest management plan, circumstances may cause some of the
20 planned regular harvest area to be unavailable for harvest. Examples of those circumstances could be
21 wildfire, pest outbreak, blowdown, a new unresolved land use conflict, or to protect newly identified
22 critical habitats such as caribou calving sites. To accommodate such circumstances, contingency harvest
23 areas have been planned. These contingency harvest areas will serve as replacement area for regular
24 harvest areas that cannot be operated. Contingency area will only be used if required. An amendment
25 to the Forest Management Plan will occur to permit forest operations to proceed in the contingency
26 area. Depending on amendment classification, additional consultation may occur as directed by Part “C”
27 of the Forest Management Planning Manual.

28 Contingency areas and volumes were selected during planning and are summarized in FMP-16.
29 Selection of contingency wood was generally given the same considerations as regular harvest areas.
30 However, it was a challenge to identify areas on the forest where cohesive patches of contingency wood
31 could be planned without impacting strategic management zone harvest limits. Specifically, conifer
32 dominated, and conifer pure forest units were challenging to select. As an additional consideration, at
33 the time of contingency wood selection, the bridge over the Kagiano River on the Pistol Lake road was
34 decommissioned, and therefore caused an access consideration to the selection of contingency wood.

35 Contingency wood was selected so that an adequate volume of wood was available to forest industry
36 with few access considerations should contingency wood be required quickly. A second and equal
37 volume of contingency wood was selected in a large cohesive piece behind the Kagiano Bridge. This
38 second piece would not be accessible without a large capital access investment. This investment is
39 planned to be completed by the later half of the FMP, making that contingency wood available by the
40 end of the plan.

1 *4.3.8.1 Contingency Areas Pre-identified for re-allocation to Regular Harvest*

2 This plan pre-identifies areas of contingency wood for re-allocation to regular harvest. As discussed in
3 the previous section, normally, contingency wood is brought into the plan reactively, following some
4 disturbance, or unforeseen circumstance. However, during the planning process, the planning team
5 became aware of a future need to re-allocate some contingency wood. This section discusses the issue
6 identified by the planning team, provides background context, and documents the resolution for why
7 the planning team has pre-identified contingency areas. The areas are identified on a supplemental
8 map includes with the FMP titled: MU966_2021_FMP_MAP_IndexPreIdentifiedContingencyAreas_00

9 Issue Identified by the Planning Team

10 Late in the planning process, the planning team was made aware that approximately 3,200ha of planned
11 regular harvest allocations were projected to be harvested prior to the implementation of the FMP. A
12 subset of the planning team, mainly Foresters and strategic analysts, discussed various options to
13 resolve the issue. Culminating in a decision to pre-identify a proportion of contingency wood planned to
14 be brought into regular harvest allocations, to replace areas harvested prior to plan implementation.
15 This would occur after the second year of the 10-year FMP, when the 2020/21 Annual Report had been
16 finalized, and a definitive amount of area harvested prior to plan approval was known.

17 Background

18 In 2017, as part of stage two planning NFMC had identified preferred harvest areas. These areas form
19 part of the LTMD and would typically be refined into 10-year regular harvest allocations as the plan
20 progressed from strategic, to operational planning.

21 However, once it became obvious that a 2-year contingency plan was necessary to sustain continuous
22 operations. 2 years worth of preferred harvest areas were segregated and refined to form the 2019/21
23 Contingency Plan regular harvest areas.

24 At that time, NFMC preformed an analysis to forecast the harvest that would occur in that 2-year
25 Contingency Plan. Knowing that operational capacity limits the harvest off the Pic forest to typically
26 5,000-6,000ha/year, it was not reasonable to forecast that contingency plan would be entirely
27 harvested. The analysis used industry input, and historic harvest trends to provide a conservative
28 estimate of what would be harvested in the 2-year Contingency Plan.

29 The intent was that the remainder of area in the 2-year contingency plan (the areas not planned to be
30 harvested) would be brought forward into the 2021/31 10-year FMP. From a sustainability standpoint,
31 this course of action makes sense, as it limits the new harvest areas required in the FMP, keeping the
32 10-year harvest allocations as close to the preferred harvest allocations as possible, minimizing the
33 deviation from the LTMD.

34 However, in early summer of 2020, when the 2019 harvest was first digitized, it became obvious that the
35 original analysis forecasting the 2019/21 harvest was not perfect. Approximately 40% (2,300ha) of the
36 actual harvest in 2019 occurred in areas not forecast to be harvested (i.e. Were not part of the 2017
37 forecast harvest analysis, and therefore were planned to be regular harvest allocations in the 2021/31
38 10-year FMP).

1 It is noted that the 2017 forecast harvest analysis was not 100% perfect, it assumed a conservative
2 harvest estimate (i.e. It was assumed and accepted that there would be a marginal amount of 2021/31
3 regular harvest that would be harvested prior to plan implementation). However, over the term of the
4 Contingency Plan, there were several factors which impacted the operational harvest schedule forecast
5 in 2017.

6 The factor contributing the greatest to the adjustment in operational harvest plans was the
7 identification and mitigation of new “unidentified” First Nation Community Values. In winter 2019,
8 MNRF advised NFMC of numerous new unidentified First Nation Community values. To mitigate the
9 impact of forest management activities on the newly identified values, NFMC re-organized harvest to
10 avoid operations in 8 blocks. This adjustment in harvest scheduling impacted the 2019/21 forecast
11 harvest analysis (i.e. The adjustment pushed harvest into blocks and areas not initially planned to be
12 harvested over the 2-year term).

13 Secondly, in early spring 2020, the impacts of the Covid-19 world pandemic took hold in the local area.
14 Specifically, the sawmill in White River Ontario temporarily closed. At which time operational harvest
15 was adjusted further to favour pulpwood delivery’s to AV Terrace Bay, which continued to operate.

16 Resolution

17 Following the adjustment of operational harvest plans, and digitization of the 2019/20 depletions.
18 NFMC completed an updated harvest forecast for the 2019-21 Contingency Plan. The updated harvest
19 forecast estimated that 3,217ha of regular harvest areas in the 10-year 2021/31 FMP would be
20 harvested prior to plan implementation. A subset of the planning team discussed various options to
21 resolve this issue.

22 The team discussed selecting new areas to be brought into the FMP, however, resolved that this course
23 of action posed to much risk without re-running the 1.3.9 test of sustainability, and associated
24 information. Time and resource restraints rendered this option mute.

25 The team determined that the best solution was to pre-identify areas of planned contingency wood
26 which, in the future, would form an amendment to bring in those pre-identified areas as a replacement
27 for what was harvested prior to plan implementation. The team thought that pre-identifying areas
28 would give the public advanced notice, whereby the public would be aware of future intentions to use
29 the identified contingency wood. Secondly, the team felt that pre-identifying the areas documented the
30 future intent and need to replace wood harvested prior to plan approval.

31 4.3.9 Harvest Area Information Products

32 Harvest area information products are included within the layer titled “MU966_PHR00”.

33 Forecast Depletions Layer

34 The FMPM calls for the submission of a Forecast Depletions layer to be submitted with the FMP. The
35 intent is that this forecast depletions layer detail all the planned harvest to occur in the prior plan from
36 the point where planning initiates (or such a time where no more depletion AR information is available)
37 until the start of the new FMP. This information is brought into the planning model (spatial or
38 otherwise) and classified as depleted at plan start. This typically gives a more precise estimate of the

1 age class distribution, silviculture in term 1, etc. However, as the prior plan to this FMP was a
 2 Contingency Plan written under the same LTMD, there was no reason to submit a forecast depletions
 3 layer. No modeling was being completed. Any areas planned to be harvested prior to the
 4 implementation of this FMP may likely be approved allocations on this plan as well, or arrive through
 5 bridging operations (see 4.3.3 Completion of On-going Harvest operations from Previous Plan). A
 6 forecast Submission layer was provided prior to checkpoint 3 in the early planning for the 2019 LTMD
 7 used to develop the 2019 Contingency Plan and this FMP. There is a blank submission file included with
 8 this FMP used as a placeholder for the absent forecast depletions layer.

9 4.4 Renewal and Tending Operations

10 The following section details the renewal and maintenance activities planned to occur the 2021-2031 Pic
 11 Forest FMP.

12 4.4.1 Renewal and Tending Areas

13 Planned renewal and tending operations to be undertaken during the FMP period can be found in FMP-
 14 17 (Planned Renewal and Tending Operations). The table summarizes the types and levels of:

- 15 • Renewal
 - 16 ○ natural regeneration (even-aged silvicultural harvest system)
 - 17 ○ artificial regeneration
 - 18 ○ Site preparation (mechanical, chemical or prescribed burn), and
- 19 • Tending
 - 20 ○ Cleaning (manual, chemical or prescribed burn)
 - 21 ○ Spacing, Thinning and improvement cuts (even-aged and uneven-aged silvicultural
 - 22 harvest system)
 - 23 ○ Other (cultivation or pruning)

24 Forecast levels for renewal and tending that will be carried out during the FMP are based on the LTMD
 25 projections as determined through SFMM. Simply, SFMM is an optimization model and silvicultural
 26 assumptions included in the model are based on:

- 27 • actual treatment costs;
- 28 • all areas forecast for harvest are renewed except for a small percentage of the landbase lost to
- 29 roads and landings;
- 30 • a small incremental gain (5%) in yield for treatments that require site preparation, artificial
- 31 renewal and tending and a small loss (5%) in yield for natural renewal treatments;
- 32 • predicted silvicultural treatment outcomes (FMP-5 Post-harvest Renewal Transition Rules), and;
- 33 • all LOWPD stands forecast for harvest will be renewed to a different silvicultural intensity.

34 Results from the LTMD that were used to inform FMP-17 consist of the following:

- 35 • 80% of pure hardwood forest units (e.g. PODOM, BWDOM, HRDOM) will be renewed by natural
- 36 regeneration, with the balance being converted to conifer mixedwood forest units;
- 37 • 85% of PJDOM will be artificially regenerated while the balance will naturally regenerate;

- 1 • 90% of the time SBLOW and OCLOW will be harvested using CLAAG allowing the harvested area
- 2 to regenerate through natural means (branch layering and ingress) and the balance (10%)
- 3 supplemented with planting;
- 4 • 50% of HRMX1 harvested area will be renewed through natural regeneration, while the balance
- 5 will comprise a combination of fill plant or stand conversion back to conifer forest units;
- 6 • 70% of HRDOM will be renewed through natural regeneration while the balance (30%) will be
- 7 renewed using a combination of fill plant or stand conversion back to a conifer-dominated
- 8 forest unit;
- 9 • 80% of CONMX and BFMIX forest unit harvest will be renewed through full planting or a fill
- 10 plant. The remaining 20% will be allowed to renew naturally;
- 11 • 80% of SBDOM and PJDOM will be renewed through high density planting, with the balance
- 12 renewed via a combination of natural regeneration or fill plant, and;
- 13 • 75% of SBMIX and PJMIX will be planted with the remainder left for either natural regeneration
- 14 or fill plant.

15 The renewal treatments output from SFMM did not account for nor consider the following:

- 16 • 90% or more of the area proposed for planting in all but SBLOW and OCLOW, will require
- 17 mechanical site preparation except for harvested area classified as LOWPS silvicultural intensity;
- 18 • 100% of SBLOW and OCLOW harvested area slated for planting will not receive mechanical site
- 19 preparation;
- 20 • 50% of the LOWPS (e.g. Shallow soils) harvest area will require mechanical site preparation;
- 21 • 100% of the LOWPD harvest area will require mechanical site preparation and 50% of same
- 22 area may require chemical site preparation prior to planting;
- 23 • Approximately 85% of area regenerated, excluding forest units where hardwood regeneration is
- 24 the objective, will require at least one cleaning treatment with herbicide.
- 25 • As part of the objective to maintain red and white one on the landscape, were red and white
- 26 pint are encountered in a planned harvest stand refer to the condition on regular operations for
- 27 Red and White Pine

28 Proposed areas for treatment during the FMP period consist of:

- 29 • All areas proposed for harvest in the FMP;
- 30 • Any depletion area from past FMPs and Contingency Plans where regeneration standards have
- 31 not yet been achieved;
- 32 • Any depleted area from past FMPs and Contingency Plans where silvicultural treatments failed
- 33 to meet minimum stocking standards and require retreatment, and;
- 34 • Any known area depleted through natural means that qualifies for future remedial treatment
- 35 from the Forestry Futures Trust Fund (FFTF).

36 Areas managed under the clearcut silvicultural system have the option of planning harvest in two

37 passes. There are no areas proposed for harvest during the FMP that will be harvested using the two-

38 pass harvest system. There are also no renewal and tending trials proposed for the FMP.

39 Prescribed burning is a very effective and useful site preparation tool in the Boreal Forest. The exclusion

40 of fire from the ecosystem is having some negative impacts at this time and may lead to larger negative

1 impacts over time. Without the benefit of burning, some sites (especially low ground sites) are
2 experiencing an increase in the amount of organic material on the site, which is leading to cooler soil
3 temperatures, which affects the growth rate of the trees on site negatively. Prescribed burns would
4 help reduce this build up of organic material, allow the soils to warm, and benefit the growth rates of
5 the trees on site. There are no high complexity prescribed burns planned for the FMP. However, low
6 complexity slash pile burning may occur as part of an approved prescribed burn plan within an Annual
7 Work Schedule.

8 Renewal and tending areas are portrayed on index and operational maps.

9 *4.4.1.1 Herbicide Use and Reduction*

10 One of the core principles of forest management is that we try our best to mimic natural forest
11 dynamics and patterns. The science on this topic is extensive and ongoing, however, the basic thread is
12 that science has concluded that it would be unimaginably complicated to provide perfectly balanced
13 habitat for every species (flora and fauna) present on the forest. So rather, we focus on maintaining a
14 forest landscape similar to how we theorize it would function in our absence. This theory forms the
15 foundation of all forest management activities and dictates where and how we harvest, how large
16 clearcuts are, how we treat water and other AOC's, and how we regenerate the forest.

17 In natural boreal forest landscapes, forest fires are the largest influence on the forest. As fires occur
18 across the landscape, some would be large-intense fires, others small-smouldering. This process would
19 result in a forest landscape where regeneration of the forest was completely natural. Most boreal
20 species have evolved in such a way to fit within this framework (for example; take the serotinous cones
21 on Jack Pine, that only open when exposed to extreme heat, or Balsam Fir, which as a late successional
22 species, has extremely flammable sap).

23 Now as society has progressed we have, for very obvious reasons, suppressed fire and instead replaced
24 fire with forest harvesting as the primary driver of landscape dynamics.

25 One fallback of utilizing harvesting instead of fire as a primary driver of the forest landscape is that
26 harvesting has a much lighter footprint on the landscape than fire. Whereas fires will often remove all
27 ground vegetation, roots, and organic material in the soil, harvesting does not. Often natural fires will
28 "sterilize" a site in such a way that only coniferous stands are able to survive the harsh environment.
29 Thus is why natural boreal landscapes have such vast stands of pure pine and spruce.

30 Through time, we have realized that harvest often regenerated to more of a mixedwood, or deciduous
31 dominated forest. This is in conflict with our first principle "mimic natural forest dynamics and patterns"
32 as we are creating more mixedwood and deciduous forest than would have naturally. The current
33 Forest Management Plan has targets to, over time, reduce the amount of mixedwood and deciduous
34 forest across the landscape and return the forest to a more conifer dominated landscape, as it would
35 naturally be.

36 Planting conifer trees after harvest is the main method we use to promote the regeneration for conifer
37 forest (because, as stated above, the post harvest forest does a poor job of naturally regenerating
38 conifer. There is too much other vegetation, roots of trees, and organic material left on the site for
39 conifer trees to naturally regenerate).

1 Herbicides are used to control vegetation which out-compete conifer trees. Poplar, Birch, and Alder
 2 being the main target species, will out-compete conifer species, smothering them from sunlight until
 3 they die. Herbicides are used to control these species until planted conifer trees have a chance to
 4 establish themselves on the site.

5 There are alternatives to herbicides. For example we could use fire (in the form of a prescribed burn
 6 after harvest), manual thinning (people with brush saws) or heavy mechanical site preparation (i.e.
 7 Using a bulldozer to strip layers of soil off the site). However, those treatments are very costly, risky (in
 8 terms of human resources, human infrastructure, and environmental health), and have been shown to
 9 be less effective. Forest renewal is paid for as a portion of harvesting trees, and as such, implementing
 10 those other alternatives would significantly raise the cost of forest renewal, creating a negative
 11 influence on the forest industry.

12 Even so, NFMC remains dedicated to using the least amount of herbicide necessary to meet our forest
 13 objectives. Each site is assessed at least twice to ensure herbicide use is absolutely necessary, and only
 14 the least amount of herbicide necessary is applied to the site. NFMC continues to seek out alternatives
 15 which could be an effective substitute to herbicides including application of mycorrhiza fungi to enhance
 16 seedling growth, utilizing heavy mechanical site preparation, and planting more shade tolerant species.

17 4.4.2 Renewal Support

18 Renewal support represents the activities required to support artificial regeneration proposed in FMP-
 19 17. Renewal support is comprised of tree seed collection, tree seedling production and any tree
 20 improvement that will be carried out on the management unit. Currently, the Pic Forest does not have
 21 any tree improvement areas (e.g. Seed orchards) located within the management unit boundaries.

22 Cone Collection

23 Seed collection is undertaken through a general cone collection program. Cones will be collected from
 24 harvest areas and purchased by the NFMC on a per hectolitre basis. White Spruce cone may be
 25 collected from an old White Spruce tree improvement area. The cones are shipped to a seed extraction
 26 and storage facility in Timmins or Dryden for use in the production of tree seedlings.

27 Tree Seedling Production

28 Table 69 summarizes the forecast of tree seedling or nursery stock production requirements for the
 29 2021-2031 FMP period. All nursery stock production is contracted to independent tree nursery facilities
 30 within Ontario. Currently the NFMC utilizes two stock types: a container and a mini. A mini stock type
 31 refers to the size of the tree seedling (e.g. 6-8 cm height) while a container stock type could include tree
 32 seedlings ranging in height from 8 cm to 25 cm.

33
 34

Table 69: Forecast of Nursery Stock Production for the Pic Forest

Tree Species	Stock Type	No. Trees
Jack Pine	Container	11,500,000
Black Spruce	Container	11,000,000
White Spruce	Container	2,000,000
Jack Pine	Mini	500,000
Black Spruce	Mini	500,000

1

2 Tree Improvement

3 There are no tree improvement projects planned for the duration of this FMP for the Pic Forest because
4 there are no established tree improvement areas located on the management unit.

5 4.5 Roads

6 Road access to areas of the Pic Forest for forest management activities is a critical component of forest
7 management planning. Detailed planning is required for the construction of new roads and the
8 extension and/or upgrade of existing roads. The use management strategy for these roads needs to be
9 carefully planned to ensure safe travel, minimize environmental impacts and minimize impacts to other
10 forest users.

11 Forest access roads are generally meant for short-term access only and planned for
12 decommissioning/rehabilitation once forest management operations in the area have been completed.
13 This is important for several reasons including:

- 14 • Returning the landbase lost to roads/landings to the productive landbase, contributing to forest
15 land and wildlife habitat
- 16 • To address public safety or environmental risk, roads may be decommissioned
- 17 • To address consideration of impacts to wildlife habitat

18 A primary road is a road that is usually permanent and provides principle access for the management
19 unit and is constructed, maintained and used as part of the main road system. A branch road is a road
20 other than primary road that branches off an existing or new primary or branch road providing access
21 to, through, or between areas of operations on the management unit. An operational road is a road
22 within an operational road boundary, other than a primary or branch road that provides short-term
23 access, for harvest, renewal and tending operations. Operational roads are normally not maintained
24 after they are no longer required for forest management activities.

25 FMP-18 lists the existing primary, branch and operational roads/road networks, and the new primary
26 and branch roads planned for construction during the 2021-2031 Forest Management Plan term. FMP-
27 18 also presents the use management strategy for each road/road network, including, but not limited to
28 monitoring and maintenance, and access restrictions. There are approximately 1,513 km of primary and
29 375 km of branch roads existing on the Pic Forest that are the responsibility of NFMC at the start of the
30 2021 Management Plan. There are roads scheduled to be decommissioned or transferred to the Crown
31 in the Plan term. No new road construction proposed in this plan will traverse provincial parks or
32 conservation reserves.

33 A previously approved road access restriction which will be continued into the FMP is on Esker Lake
34 Road, located in the former Pic River Ojibway sub-unit area along the Lake Superior coast. The Esker
35 Lake Road Crosses Steel River Provincial Park between Esker Lake and the lower portion of Steel Lake.
36 This crossing was contentious during a previous planning period due to concerns about unauthorized
37 access to the park. The prescription developed in the 2001 – 2006 planning term consists of signage
38 restricting access between Esker Lake and Lower Steel Lake. New, more restrictive measures were
39 suggested in the 2013-2023 Pic River Forest FMP. These measures proposed posting new signage at the

1 fifth water crossing across Steel River Provincial Park and at the second water crossing south of Catlonite
 2 Road.

3 More information about road access control, the environmental analysis of alternative corridors for new
 4 roads and rationale for the selected corridor can be found in FMP-18 as well as in Supplementary
 5 Documentation

6 The following conditions (Table 70) apply to new primary, branch and operational roads and landings,
 7 and the maintenance of existing roads that are not located within an area of concern.

8 *Table 70: General Conditions on Road Planning, Construction, and Maintenance*

General Conditions on Road Planning, Construction, and Maintenance
<ul style="list-style-type: none"> • The planning, construction, and maintenance of primary and branch road corridors and road network locations (including operational roads), and their applicable use management strategies considered: <ul style="list-style-type: none"> ○ The strategic direction associated with other resource plans, policies and directives; ○ The management objectives and emphasis for specific areas; and ○ The potential impact (including benefits) to other natural resource features, land use and values. • Ensure engineering safety considerations are incorporated into road planning. • When feasible, if the road use strategy indicates short term use and/or future decommissioning intent, then plan and construct the road in order to better facilitate future decommissioning. Use of temporary or winter water crossing structures, winter roads, limited sub-grading and/or gravelling may aid in road decommissioning/regeneration. • Harvested road right-of-way widths outside of areas of concern will be to a maximum width of: <ul style="list-style-type: none"> ○ 50 meters (treeline to treeline) for Primary Roads, ○ 40 metres for Branch Roads, ○ 30 metres for operational Roads, <ul style="list-style-type: none"> ▪ Operation roads are to be constructed to the safest minimum standard. 30m right-of-way widths are permissible to help ease operations and therefore reduce compliance issues. However, in practice, the expectation is that operational right-of-way’s of less than 30m will be targeted. Any circumstance where a right-of-way width is determined by a compliance inspector to be a “wood grab” will be subject to an operational and non-compliance issue similar to an oversized right-of-way and trespass. ○ In occurrences when a wider width is needed based on appropriate engineering, safety, environmental or biological rational, it must be discussed with MNRF prior to initiating the harvest of the wider right-of-way. • Harvested road right-of-way widths inside areas of concern will not exceed 20 meters in width, except in occurrences when a wider width is needed based on appropriate engineering, safety, environmental or biological rational, it must be discussed with MNRF prior to initiating the harvest of the wider right-of-way. • Materials moved during construction, such as grubbed or earth fill material, will not be piled where they block drainage courses.

General Conditions on Road Planning, Construction, and Maintenance

- Fill material for roads built below the high-water level, within the floodplain of a water feature, will be erosion resistant and/or protected from erosion.
- Any exposed mineral soil between the height of land and a water crossing, or within 100 meters of a water crossing, whichever is less, will be trimmed to a stable angle and be protected from erosion so sediment will not enter the water after construction.
- A monitoring program for roads and road networks will be implemented.
- Appropriate mitigation techniques will be used to prevent or stop erosion in ditches, on steep slopes, etc.
- When all-weather roads must cross wetlands, frequent cross-drainage culverts will be used to ensure surface water is equalized on both sides of the road and impacts to hydrologic flow and wetland function are minimized.
- When the road location and landings within the approved corridor are being finalized, recognizable ephemeral streams, springs, seeps and other areas of groundwater discharge that are connected to lakes, ponds, rivers, or streams and small, unmapped wetlands will be avoided.
- If recognizable ephemeral streams, springs, seeps, and other areas of groundwater discharge or hydrological connections that are connected to lakes, ponds, rivers, or streams and small, unmapped wetlands must be crossed, construction and maintenance techniques and practices to minimize impacts to hydrologic flow and wetland function will be used. Natural water movement will not be impeded, accelerated, or diverted.
- Road building or skidding through areas of accumulated flow, particularly when near a water feature will be avoided.
- Whenever feasible, locate roads and landings so skidding and forwarding does not have to cross natural drainage patterns.
- Identify areas of concentrated surface water flow and prevent blockage through the appropriate use of cross drainage culverts. Some of these locations may best be determined the following spring when ponding is evident at unpredicted locations along a new road.
- Where ditches leading downhill from a rock cut pass over earth material, techniques to protect the earth/rock interface from erosion will be used.
- Grubbing low vegetation cover between the height of land (e.g. The high point of a ditch line) and a water crossing, or within 100 meters of a water crossing, whichever is less, will be limited to that required to address engineering issues and safety concerns, such as the removal of hazards.
- Where explosives and blasting are required, this work will be planned to ensure rock and earth remains within the right-of-way.
- Do not place windrows or grubbing materials across known migration paths of wildlife in a manner that could impede their travel.
- When planning primary and branch road corridors, high value wildlife habitats such as ungulate wintering areas will be avoided.
- When constructing roads during bird nesting season and occupied nest are encountered, the appropriate area of concern prescription will be followed.
- MNRF will ensure that the signs used to identify the use management strategies for roads (e.g. Travel restrictions) are maintained.

General Conditions on Road Planning, Construction, and Maintenance
<ul style="list-style-type: none"> In instances where road access must be developed across existing regenerating forest/plantations, minimize destruction of regeneration by minimizing road right-of-way widths.

1

2 4.5.1 Primary and Branch Roads

3 All primary and branch road corridors are one-kilometre in width and allow for road construction
4 activities to occur in this planned corridor. Crossing of water quality AOCs are only permitted in
5 approved water crossing locations, as approved in the Annual Work Schedule (AWS). Forestry aggregate
6 pits and landings to pile road right-of-way wood are permitted in the corridor. Table 71 summarizes
7 each planned new road identified in FMP-18. The road lengths are estimates based upon approximate
8 digital centre lines, actual road lengths constructed will be documented in the appropriate Annual
9 Report.

10 *Table 71: Summary of new primary and branch roads on the Pic Forest during the 2021-2031 Plan period.*

Road Name and Road Class	Length
Primary	
BASELINE ROAD	15
BLOOD LAKE ROAD EAST	23
GAFFHOOK LAKE ACCESS	11
LOUGHLAN CREEK ROAD	11
MILEAGE 17 CREEK ROAD	9
PINCERS LAKE ROAD	15
PISTOL LAKE ROAD BYPASS	6
PISTOL LAKE ROAD EAST	19
RUNNALLS LAKE ROAD	19
SPRUCETOP LAKE ROAD	20
VEIN LAKE ROAD	18
ZIZIGINIGA CREEK ROAD	12
Subtotal:	179
Branch	
AMWRI ROAD	5
ARMS CREEK ROAD	5
BEATH LAKE ROAD	7
BEELINE ROAD	10
BEGGS LAKE ROAD	13
CADAWAJA LAKE ROAD	8
CHARON CREEK ROAD	16
CORNISH LAKE ROAD	8
DIABLO CREEK ROAD	15

DOTTED LAKE ROAD	6
DOWNER CREEK ROAD	15
DOWNER LAKE ROAD	5
FOXTRAP CREEK ROAD	5
FOXTRAP LAKE ROAD	12
GLORY LAKE ROAD	4
GOODCHILD CREEK ROAD	12
HARE ROAD	8
HARRIET LAKE ROAD	13
HOOK ROAD	5
JACKFISH POND ROAD	7
KALZ CREEK ROAD	6
KALZ LAKE ROAD	6
KERRIA LAKE ROAD	10
LITTLE WHITE OTTER RIVER ROAD	4
MANN LAKE ROAD	7
MCGRAW CREEK ROAD	10
MCKELLAR LAKE ROAD	4
MCKERGOW LAKE ROAD	13
MILOTTE LAKE ROAD	10
MOBERT CREEK ROAD	16
MOOSEJAW ROAD	6
MORAN LAKE ROAD SOUTH	7
MUSKEG EXT ROAD	16
NAMEBIN CREEK ROAD	5
OTASAWIAN RIVER ROAD	11
OWL LAKE ROAD	14
PAGWACHUAN RIVER ROAD	7
PISTOL LAKE ROAD	12
POND ROAD	6
PRAIRIE LAKE ROAD	8
PRAIRIE RIVER ROAD	25
RAVEN ROAD	7
RUFFLE LAKE ROAD NORTH	8
SALIX LAKE ROAD	9
SAMBUCUS LAKE ROAD	4
SOUTH GAMSBY CREEK ROAD	6
STEEL LAKE ROAD	9
STEEL RIVER ROAD	13

SWEDE CREEK ROAD	7
TRAPPER ROAD	7
TUFFY LAKE ROAD	15
VEIN CREEK ROAD	4
WABIKOBA LAKE ROAD NORTH	6
WASKISK LAKE ROAD	7
WELLWOOD LAKE ROAD	7
Subtotal:	494
Total:	673

1

2 *4.5.1.1 Primary Roads*

3 During the development of the FMP, it was identified that 12 new primary roads will be required. FMP-
4 18 identifies the road construction and use management strategy for the new and existing primary
5 roads on the Pic Forest.

6 The proposed locations of the primary road corridors were planned using digital 3-D aerial photography,
7 local knowledge and direction from CLUPA to develop viable access while minimizing potential negative
8 effects on non-timber values. Where possible, planned road corridors upgrade existing branch and
9 operational roads. They are also developed to minimize potential operational and/or environmental
10 constraints such as rough topography, exposed bedrock, lowland sites, etc.

11 As mentioned previously, Supplementary Documentation contains a detailed description and
12 environmental analysis of the alternative corridors (advantages and disadvantages) for each new
13 primary road corridor. Also included in Supplementary Documentation is rationale for the selected
14 corridor, associated use management strategy (monitoring, maintenance, access controls and transfer
15 of responsibility), project cost and summary of public comments.

16 Primary roads will be constructed such that the maximum right of way width outside harvest allocations
17 will be a maximum of 50 metres to maintain adequate sight line distances. When a primary road passes
18 through an AOC, the road right of way width will be reduced to a maximum of 20 metres, unless safety
19 concerns dictate a wider right of way. MNRF must be consulted and permission received before right of
20 way widths greater than 20 metres are constructed through an AOC. Where a primary road does not
21 intersect an AOC, all conditions on regular operations apply to the construction of the primary road.

22 *4.5.1.2 Branch Roads*

23 During the development of the FMP, it was identified that 55 new branch roads will be required to
24 provide medium term access for forest management activities (Table 71). These planned branch roads
25 will access planned harvest allocations, provide access for silviculture activities and will provide access
26 to future allocations in future forest management planning. FMP-18 identifies the road construction,
27 road length and use management strategy for each new branch road.

28 The proposed locations of the branch road corridors were planned using digital 3-D aerial photography,
29 local knowledge and direction from CLUPA to develop viable access while minimizing potential negative
30 effects on non-timber values. Where possible, the planned corridors upgrade existing operational

1 roads. They are also developed to minimize potential operational and/or environmental constraints
2 such as rough topography, exposed bedrock, lowland sites, etc.

3 Supplementary Documentation contains a detailed description of new branch road, use management
4 strategy (monitoring, maintenance, access controls and transfer of responsibility) and summary of public
5 comments. Branch roads that have the same rationale and Use Management Strategies will be grouped
6 together.

7 Branch roads will be constructed such that the maximum right of way width outside harvest allocations
8 will be a maximum of 40 metres to maintain adequate sight line distances. When a branch road passes
9 through an AOC, the road right of way width will be reduced to a maximum of 20 metres unless safety
10 concerns dictate a wider right of way. MNRF must be consulted and permission received before right of
11 way widths greater than 20 metres are constructed through an AOC. Where a branch road does not
12 intersect an AOC all conditions on regular operations apply to the construction of the primary road.

13 4.5.2 Operational Roads

14 Operational roads are defined as “a road within an operation road boundary, other than a primary or
15 branch road, that provides short-term access for harvest, renewal and tending operations”. Therefore,
16 new operation roads planned for construction must be within an operational road boundary (ORB),
17 which is defined as “the perimeter of, the planned harvest area plus the area from an existing road or
18 planned road corridor to the harvest area within which an operation road is planned to be constructed”
19 (FMPM 2017). Operational road locations are not identified in the FMP process. ORBs are designed to
20 allow for operational flexibility (with respect to operational road location, stream crossings, hydrological
21 impacts, and construction) to limit future plan amendments, while providing a boundary for operational
22 road and forestry aggregate pit construction. Operational roads are normally not maintained after they
23 are no longer required for forest management purposes and are often decommissioned immediately
24 after operations are complete.

25 In addition to operational roads, forestry aggregate pits are permitted within ORBs. ORBs for all planned
26 operations are identified on the operations maps. Area of concern planning has been completed for all
27 areas within ORBs which are also identified on the operations maps.

28 4.5.3 Area of Concern Crossings – Primary and Branch Roads

29 Construction of new primary or branch roads (and associated landings) will only occur within an AOC
30 where necessary and as permitted in the conditions listed in table FMP-11. For each new primary or
31 branch road water crossing to be constructed, the location, crossing structure and conditions on
32 construction and decommissioning will be finalized in the applicable AWS in accordance with the
33 *Protocol for the Review and Approval of Forestry Water Crossings*. FMP-11 identifies conditions that
34 apply to new primary or branch roads intersecting or landing within an AOC.

35 The decision framework in the Ministry of Natural Resources and Forestry/Fisheries and Oceans
36 Canada’s *Protocol for the Review and Approval of Forestry Water Crossings* will be used to assist in
37 determining crossings that require an MNRF, and if necessary, a Department of Fisheries and Oceans
38 (DFO) review. In instances where a water crossing standard does not exist, or an approved water
39 crossing standard cannot be met in its entirety, an MNRF review is required. Any approved water

1 crossing standard from this Protocol that will be used during forest operations are documented in
2 Supplementary Documentation.

3 All water crossings expected to be worked on during a given AWS year will be submitted for approval as
4 part of the AWS, or as a revision to the AWS. In addition to the applicable construction conditions, all
5 applicable water crossing standards will be documented in AWS-1a, AWS-1b and AWS-2 by their water
6 crossing standard identifier. The final locations and conditions on the crossings will be finalized in the
7 applicable AWS and will be consistent with the conditions found in the Forest Management Plan.

8 4.5.4 Area of Concern Crossing – Operations Roads

9 For each new operational road water crossing to be constructed, the location, crossing structure and
10 conditions on construction and decommissioning will be finalized in the applicable AWS in accordance
11 with the *Protocol for the Review and Approval of Forestry Water Crossings*. FMP-11 identifies conditions
12 that apply to new operational roads intersecting or landing within an AOC.

13 The decision framework in the Ministry of Natural Resources and Forestry/Fisheries and Oceans
14 Canada's *Protocol for the Review and Approval of Forestry Water Crossings* will be used to assist in
15 determining crossings that require an MNRF, and if necessary, a Department of Fisheries and Oceans
16 (DFO) review. In instances where a water crossing standard does not exist, or an approved water
17 crossing standard cannot be met in its entirety, an MNRF review is required. Any approved water
18 crossing standard from this Protocol that will be used during forest operations are documented in
19 Supplementary Documentation.

20 All water crossings expected to be worked on during a given AWS year will be submitted for approval as
21 part of the AWS, or as a revision to the AWS. In addition to the applicable construction conditions, all
22 applicable water crossing standards will be documented in AWS-1a, AWS-1b and AWS-2 by their water
23 crossing standard identifier. The final locations and conditions on the crossings will be finalized in the
24 applicable AWS and will be consistent with the conditions found in the Plan.

25 4.5.5 Existing Roads

26 Forest access roads and water crossings are constructed by the forest industry for the purposes of forest
27 management activities. Many are intended to be temporary in nature and are not always maintained
28 after the completion of forest management activities. A process was developed to address who has
29 responsibility for roads and water crossings which are no longer required for forest management
30 purposes. NFMC is the SFL holder for the Pic Forest and, therefore, all roads are considered the
31 responsibility of the NFMC, until they have been transferred to the Crown in accordance with the MNRF
32 "Transferring Forestry Road Responsibility" Implementation Bulletin (2019), referenced throughout this
33 section.

34 FMP-18 documents the existing roads or road networks that are the responsibility of NFMC on the Pic
35 Forest at the start of the FMP. FMP-18 also identifies the associated use management strategy for each
36 existing road, which includes maintenance operations (grading, snow plowing, dust control, water
37 crossing repair, etc.) access controls, monitoring frequency and future use.

1 Where NFMC indicated intent to transfer responsibility for an existing road during the next 20 years, a
2 preliminary indication of the management intent for the road or road network has been documented in
3 FMP-18.

4 Roads under “continued planned use” are roads that will be used in the plan for forest management
5 activities or that are main roads that NFMC requires for other activities. During active harvest/hauling
6 operations; these roads will be monitored on an on-going basis to identify the need for routine
7 maintenance or emergency repairs. When the road network is not being used to support active
8 operations, the road network will receive a minimum of one inspection every three years. Roads classed
9 as “limited planned use” are roads that may be used during the plan period for silviculture, survey work,
10 or have a chance of being used in the next FMP. A minimum of one inspection every three years will be
11 completed normally following spring run-off.

12 For more detailed information regarding the use management strategies and the projected level of
13 maintenance of existing roads refer to the Roads Section of the Supplementary Documentation.

14 Road Maintenance

15 Road maintenance operations will be undertaken when necessary depending on the level of use
16 supporting forest management activities. Most primary and branch roads will be maintained on a
17 regular basis, with routine maintenance such as summer grading or winter snow removal carried out
18 while the road is in use to ensure the safe movement of personnel and equipment for operations.
19 Operational roads will only be maintained when necessary, while in active use for operations, or to
20 address public safety or environmental concerns.

21 Under normal operating conditions, maintenance operations on the roads and road networks listed in
22 FMP- 18 will occur such as:

- 23 • Culvert repairs and cleaning
- 24 • Bridge repairs
- 25 • Bridge and culvert replacement
- 26 • Regular inspection of stream crossings
- 27 • Summer grading
- 28 • Ditch line cleaning
- 29 • Road base improvement - gravelling and grading, ditching
- 30 • Applying material to mitigate or enhance long- term erosion protection around water-crossings
- 31 • Clearing road surface of right of way obstacles (i.e. Windfalls)
- 32 • Brushing along roadsides, around signs, line of sight etc.
- 33 • Snow plowing
- 34 • Sanding and salting
- 35 • Dust control
- 36 • Signage and safety structure repairs (i.e. Guide rails)

37
38 It is important to note that there is no obligation by NFMC or the MNRF to undertake repair work on
39 behalf of other users who may not have the resources to replace failed infrastructure. Other users
40 should be aware that access to their business or property could be disrupted at any time.

1 Emergency maintenance is defined as “road maintenance that requires immediate attention to restore
2 access and reduce the chance of personal injury, damage to equipment, inconvenience to road users
3 and further road damage”. Emergency repairs may proceed immediately without MNRF approval
4 provided the emergency works are limited in scope to only what is necessary to address essential public
5 safety concerns and restrict further environmental damage. All emergency actions will be reported to
6 MNRF as soon as practical and any further actions (e.g. Restoration, reconstruction, or abandonment)
7 will be subject to normal planning approvals.

8 Road Transfer and Decommissioning

9 Every road within the Existing Roads Use (ERU) layer is considered under the ownership of NFMC,
10 including associated liability of road ownership. There are instances where road infrastructure is owned
11 by a third party, despite appearing to be a part of the ERU (e.x. A bridge owned by MNRF on a road
12 owned by NFMC). NFMC plans on transferring the ownership and associated liability of some roads to
13 MNRF or other third parties. Road transfer can be driven due to business reasons, but mostly is planned
14 to meet strategic targets associated with roads density.

15 NFMC’s roads transfer strategy can be understood as a two-part process:

16 Part 1 – Road Intent: NFMC has developed a strategic level road intent plan. That plan is digitized on
17 supplemental map “MU966_2021_FMP_MAP_IndexRoadIntent_00”. This map shows NFMC’s long-term
18 road intent, whereby roads planned to be transferred are highlighted. This map is intended to provide
19 the public a complete picture of NFMC’s goals for road management. Part 2 – Road Transfer Targets
20 provides an operational forecast of roads planned to be transferred over the FMP term.

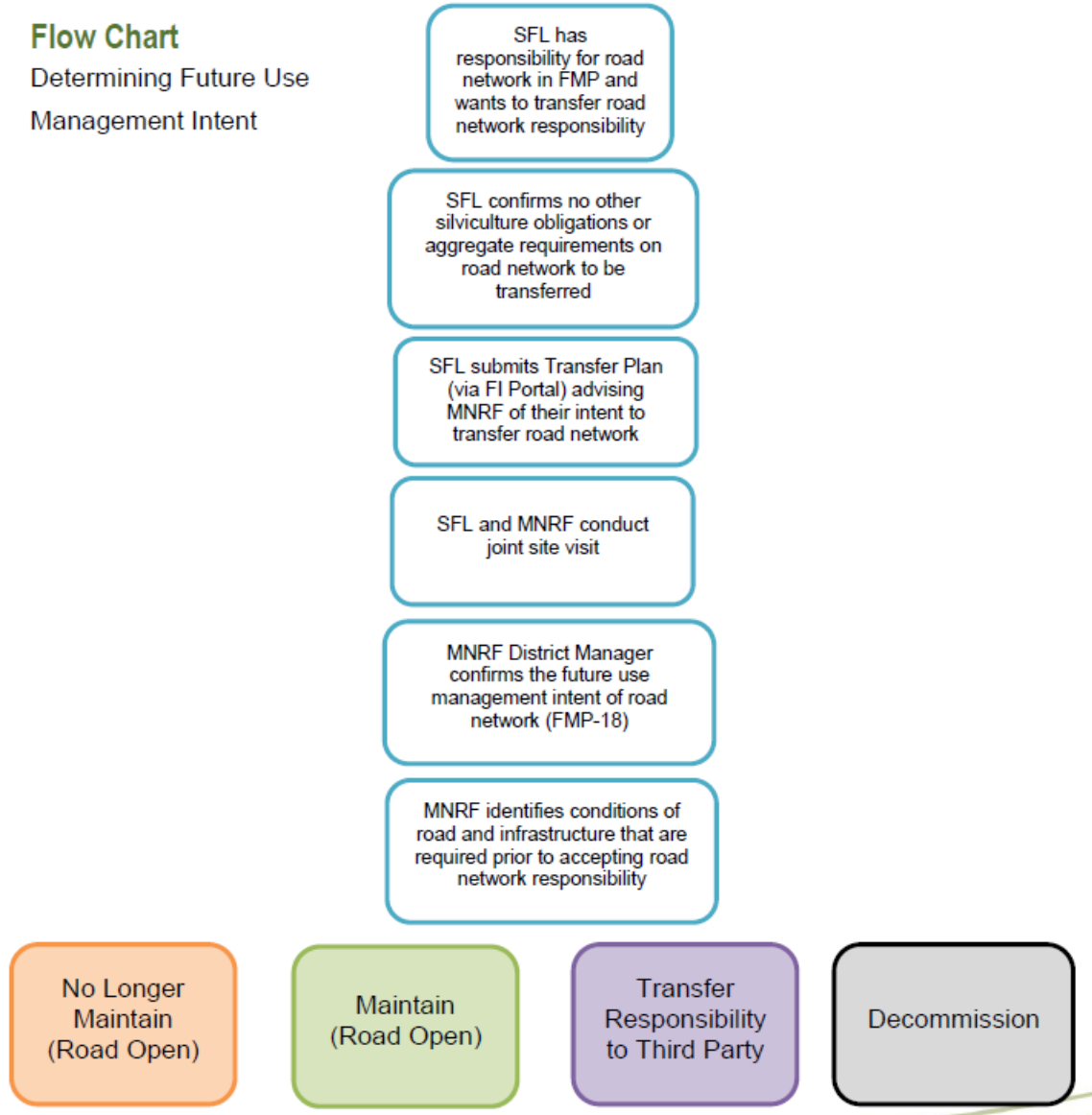
21 Part 2 – Road Transfer Targets: Part 1 provides an overview of NFMC’s strategic road intent. However
22 not all roads intended for transfer will be operationally targeted for transfer during the 2021 FMP. Part
23 2 identifies roads, road segments, and road networks planned for transfer within the term of the plan.
24 That plan is digitized on supplemental map “MU966_2021_FMP_MAP_IndexRoadDecomTargets_00”.

25 Roads identified in Part 2 are listed in Table FMP-18 as having a transfer year \leq 2031. The remaining
26 roads identified in Part 1 where the intent is to transfer, but are not planned for transfer within the term
27 of the plan are listed as a transfer year of 2041 in Table FMP-18. For roads in Table FMP-18 with a
28 transfer year \leq 2031, NFMC estimated the year roads will be transferred. That estimation is not
29 considered final, and any road intended for transfer identified in Part 1 or Part 2 should be considered
30 eligible to be transferred throughout the plan term.

31 Per direction in the “Transferring Forestry Road Responsibility” Implementation Bulletin (2019), NFMC
32 will work with MNRF to identify roads, road segments, or networks to be transferred through roads
33 transfer plans. The MNRF through inspections with NFMC will decide of roads are acceptable for
34 transfer or negotiate conditions for that transfer. The MNRF will confirm the future management intent
35 of roads identified in transfer plans. Figure 66 is taken directly from the “Transferring Forestry Road
36 Responsibility” Implementation Bulletin (2019) and shows the general process for roads transfer, and
37 the options for future management intent once roads are transferred.

Flow Chart

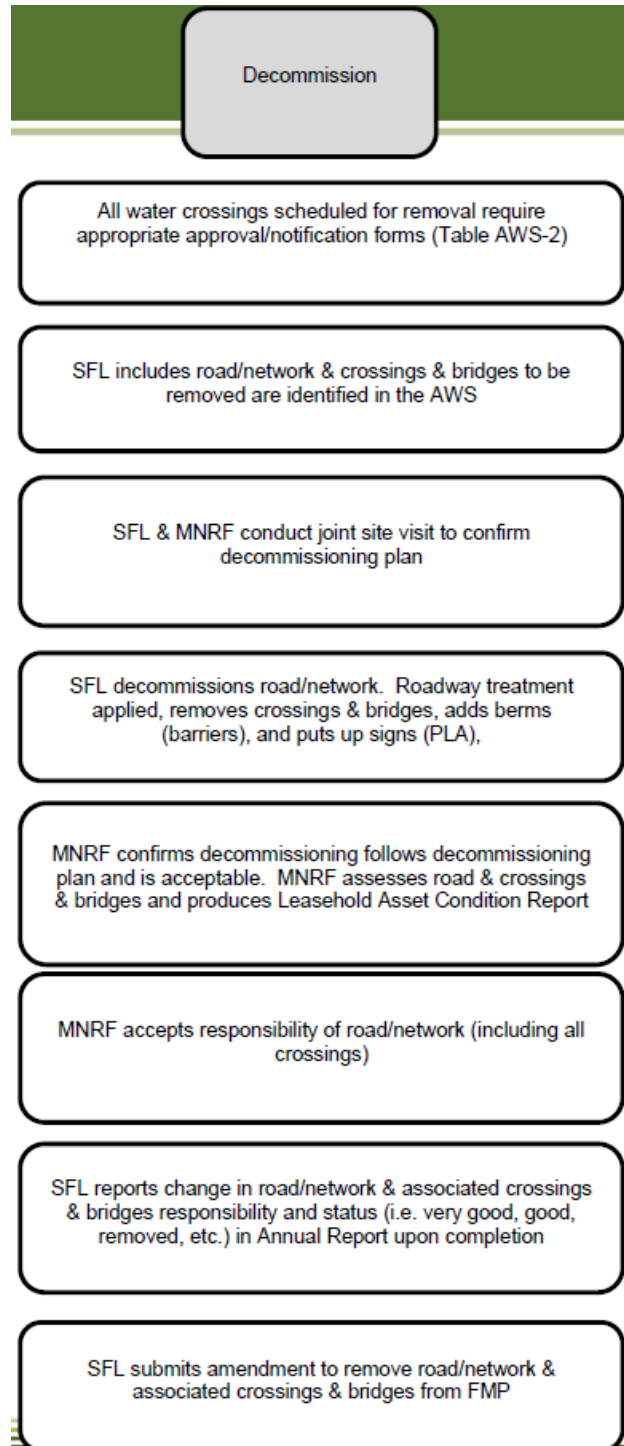
Determining Future Use Management Intent



1

2 *Figure 66: General Roads Transfer Process and Future Management Intents*

3 The MNRF has completed an initial review of roads intended for decommissioning and, in general,
 4 determined that all roads intended for transfer will likely be decommissioned. There are alternative
 5 options available, however, the MNRF’s initial assessment did not identify any roads the ministry
 6 intended to maintain, or transfer to a third party. Figure 67 as again taken directly from the
 7 “Transferring Forestry Road Responsibility” Implementation Bulletin (2019) and shows the general
 8 standards for roads decommissioning prior to acceptance by the MNRF as part of the roads transfer. As
 9 discussed, it is estimated that most of the roads intended for transfer will adhere to this process, or
 10 similar, were the future road management intent is to decommission the road prior to transfer.



1
2 *Figure 67: General Standards for Roads Decommissioning prior to Transfer*

3 *4.5.5.1 Conditions on Existing Roads and Landings*

4 When an existing road and/or landing is planned to be used for forest management purposes during the
5 period of the Plan and does not intersect an AOC, the General Conditions on Road Planning,
6 Construction, and Maintenance should be used.

1 Where an existing road and/or landing is planned to be used for forest management purposes during
2 the period of the Plan intersecting an area of concern, Table FMP-11 identifies if there are any
3 conditions on roads or landings.

4 *4.5.5.2 Road Information Products*

5 Road information are included within this plan and can be found within the layer titled “MU966_ERU00”

6 *4.5.6 Road Water Crossings*

7 The conditions and procedures in this section are applicable to all water crossings (i.e., temporary and
8 permanent) and all road categories (i.e., primary, branch, operational). For each new primary, branch or
9 operational road water crossing, the location, crossing structure and conditions on construction will be
10 finalized in the applicable AWS in accordance with the Protocol for the Review and Approval of Forestry
11 Water Crossings (the protocol).

12 The Ministry of Natural Resources and Forestry/Fisheries and Oceans Canada Protocol for the Review
13 and Approval of Forestry Water Crossings, 2017 (the Protocol) provides a risk-informed Proponent self-
14 screening approach for lower-risk water crossings that utilizes pre-determined and mandatory technical
15 water crossing standards to direct routine water crossing construction and decommissioning activities in
16 a manner that protects the productivity of Ontario’s Commercial, Recreational or Aboriginal (CRA)
17 fisheries or fish that support such a fishery. The water crossing standards represent minimum levels of
18 performance requirements that must be met by the proponent when constructing and decommissioning
19 water crossings using a proponent self-screening approval framework. The conditions and requirements
20 included in the general and specific water crossing standards have been deemed as the necessary
21 mitigation measures required to classify the water crossing project as not likely to result in serious harm
22 to CRA fisheries or fish that support such a fishery.

23 If a proponent determines that the requisite water crossing standards that apply to their specific project
24 can be implemented, they may proceed with their activity, so long as the water crossing standards
25 notification requirements are met, and forest management approval processes outlined in this section.

26 In cases where a Proponent determines that the requisite water crossing standards that apply to their
27 specific project cannot be implemented, a review and approval will be required by either MNRF and/or
28 DFO as per the Protocol.

29 The decision framework in the Protocol will be used to assist in determining crossings that require an
30 MNRF, and if necessary, a Department of Fisheries and Oceans (DFO) review. Any approved water
31 crossing standards from this Protocol that will be used during forest operations are documented in
32 Supplementary Documentation. In addition to the construction conditions, all applicable water crossing
33 standards will be documented in Tables AWS-1 and AWS-2 in the AWS by their water crossing standard
34 identifier. In instances where a water crossing standard does not exist, or an approved water crossing
35 standard cannot be met in its entirety, MNRF review is required. For more information about road
36 water crossings, refer to Sections 4.5.3 Area of Concern Crossings – Primary and Branch Roads and 4.5.4
37 Area of Concern Crossing – Operations Roads and the Protocol for the Review and Approval of Forestry
38 Water Crossings document included in the supplementary documentation.

1 There may be instances where water crossings approved in the AWS can utilize less intrusive structures
2 without the need for further review/approval by the MNRF. The following specifies the conditions that
3 would allow for a crossing structure substitute:

- 4 • Where a round closed-bottom culvert has been approved for construction, but site conditions
5 are not favourable for its construction, no further review and approval of the crossing location is
6 required if a snow fill/ice bridge, open bottom arch culvert, or clear span bridge is constructed in
7 its place. Snow and ice crossings may only be installed where applicable, arch culverts and
8 bridges require additional “engineering approval” from the MNRF.
- 9 • Where a snow fill and ice bridge has been approved for construction, but site conditions are not
10 favourable for its construction, no further review and approval is required if a clear span bridge
11 is constructed in its place, bridges require additional “engineering approval” from the MNRF;
12 and,
- 13 • Where an open bottom arch culvert has been approved for construction, but site conditions are
14 not favourable for its construction, no further review and approval is required if a clear span
15 bridge is constructed in its place, bridges require additional “engineering approval” from the
16 MNRF.
 - 17 • In situations where engineered structures are being used, per the Crown Bridge
18 Management Guidelines, an MNRF engineering review may be required subject to those
19 guidelines, unless structure is otherwise pre-approved.

20 General Standards for Water Crossings

- 21 • The submission, review and approval of water crossings built under authority of the CFSA will
22 comply with the requirements of the FMP and all other applicable legislation.
- 23 • Emergency repairs to existing crossings associated with assigned roads would be considered as
24 “emergency repair” without the necessity of a fish habitat review if the review is not
25 immediately available and if the new installation, upgrade, repair, or rehabilitation does not
26 change the location or footprint of the existing structure and occurs during permitted timing
27 window.
 - 28 ○ Emergency repairs outside the timing window will be considered on a case-by-case
29 basis. MNRF and NFMC will discuss the best solution weighing the environmental and
30 economic costs and risks of taking immediate action, or deferring action until the in-
31 water work timing window opens.
- 32 • Water crossing infrastructure sizes will be determined using GIS technology incorporating the
33 method used in the Ontario Flow Assessment Tool based on the location selected and indicated
34 on the Areas Selected for Operations maps.
- 35 • All permanent culvert crossings shall be sized to a minimum Q25 design flow standard. A
36 minimum culvert diameter size shall be 450mm for all water crossings, 300mm on all Cross
37 Culverts.
- 38 • All bridge crossings shall be sized to a minimum Q25 design flow standard or as amended in the
39 Crown Land Bridge Management Guideline.
- 40 • All temporary winter bridges that will be removed before the spring freshet are not required to
41 be designed for the 25-year flood (Q25).

- 1 • The implementation of water crossing standards must be overseen or carried out by individuals
- 2 who are trained and competent to:
- 3 o Understand the intent and objectives of the specification’s standards;
- 4 o Ensure that specification’s water crossing standards and appropriate mitigation
- 5 measures are satisfactorily applied; and
- 6 o Recognize when water crossing standards and appropriate mitigation measures have
- 7 not been satisfactorily implemented and understand the requirements to report and
- 8 correct any mistakes that have occurred.
- 9 • Per the Protocol; all water crossings >1,200mm will be reviewed and approved by the MNRF.
- 10 Requests for water crossings will be provided to MNRF Wawa for review and approval.

11 *Table 72: Water Crossing Guidelines for Water Crossings not meeting the criteria for proponent evaluation in The Ministry of*
 12 *Natural Resources and Forestry/Fisheries and Oceans Canada Protocol for the Review and Approval of Forestry Water Crossings*

Water Crossing Guidelines for Water Crossings not meeting the criteria for proponent evaluation in The Ministry of Natural Resources and Forestry/Fisheries and Oceans Canada Protocol for the Review and Approval of Forestry Water Crossings
<p>Section 4.5.6 Road Water Crossings provides standards and guidelines for water crossings which will follow The Ministry of Natural Resources and Forestry/Fisheries and Oceans Canada Protocol for the Review and Approval of Forestry Water Crossings, 2017 (the protocol).</p> <p>In general, it is expected that most water crossings proposed and installed throughout the duration of the FMP will meet standards for proponent evaluation in the protocol. However, there may be scenarios where the installation of a crossing structure smaller than its Q₂₅ equivalent provides a benefit. These scenarios include, but are not limited to:</p> <ul style="list-style-type: none"> • To provide short term access to small operational areas “trapped” behind waterways where installation of a Q₂₅ structure would be too costly to justify installation of the crossing. • To provide short term access to operational areas where the installation of a Q₂₅ crossing structure is not possible, or would cause undue environmental damage (e.x. Bedrock at crossing site will only allow installation of a smaller culvert, or clearing large boulders to make room for a larger pipe or bridge would cause significant site damage). • To provide short term access for management activities such as silviculture or road decommissioning. • To allow minimized disturbance should infrastructure need to be utilized within overlapping AOC’s to access operations areas where access is limited by terrain. <p>The general guidelines for installation of crossing infrastructure lesser than Q₂₅ is:</p> <ul style="list-style-type: none"> • Q₁₀ - installation and removal/rehabilitation within 2 years. • Q₅ - Must be removed by the following March 31st, or the spring freshet (whichever comes first) <p>Applications for the installation of Q₁₀ or Q₅ crossings will be made to the MNRF Wawa District for review and approval. The application will document the rationale for why the crossing structure is requested and provide a timeline for use (including removal).</p>

1 Additional water crossings standards are found in the Pic Forest Water Crossings Standards in the
 2 Supplementary Documentation.

3 **4.5.7 Forestry Aggregate Pits**

4 As stated in Section 1.3.6.6 in the FMPM (2017), by regulations under the *Aggregate Resources Act*
 5 (ARA), Forestry Aggregate Pits (FAP) are exempt from the requirement for an aggregate permit if the
 6 following criteria are met (Table 73).

7 *Table 73: Forestry Aggregate Pits Aggregate Resources Act Exemption Criteria*

Forestry Aggregate Pits Aggregate Resources Act Exemption Criteria
<ul style="list-style-type: none"> • An FMP for the management unit has been approved; • The aggregate is required for a forest access road in a management unit; • Aggregate is extracted: <ul style="list-style-type: none"> a. No closer than 1.5 meters above the established groundwater table; or b. Closer than 1.5 meters above the established groundwater table if: <ul style="list-style-type: none"> i. The proposed site is remote or isolated; and ii. The excavation limit of the site is not within: <ul style="list-style-type: none"> • 500 meters of a coldwater stream; • 1,000 meters of a water well, whether dug or drilled; and • 5,000 meters of a receptor. • Aggregate extraction will be completed within 10 years from the commencement of the pit; and • The pit is or has been established within: <ul style="list-style-type: none"> a. An approved new primary or branch road corridor in the FMP and AWS; b. An approved Operational Road Boundary (ORB) or harvest area in the FMP and in the AWS; or c. An approved aggregate extraction area in the FMP and in the AWS, that is located within 500 meters of an existing forest access road.

8 Previously operated forestry aggregate pits may be utilized for a ten-year period starting from the
 9 commencement of the aggregate pit.

10 The AWS prepared for the Pic Forest contains detailed information regarding the location and operating
 11 dates for each FAP. FAPs must remain within the ORB that was identified in the AWS at the time the site
 12 was established.

13 Aggregate permit holders will be notified before any harvesting operations occur within the immediate
 14 vicinity of the perimeter of the permit.

15 **4.5.7.1 Conditions on Forestry Aggregate Pits**

16 The extraction of aggregate from forestry aggregate pits for use on forest roads within the forest
 17 management unit will comply with the operational standards from this Plan as outlined below. Table 74
 18 Details operational standards which apply to the extraction of aggregate resources for forestry
 19 aggregate pits.

1 *Table 74: Operational Standards for Forestry Aggregate Pits*

Operational Standards for Forestry Aggregate Pits
<p>The following operational standards apply to the extraction of aggregate resources for forestry aggregate pits:</p> <ol style="list-style-type: none"> 1. Topsoil and overburden, where present, must be stripped and stored on site. 2. Aggregate material may be removed only within areas where access, harvest, or aggregate extraction has been planned and approved, with no removal occurring within 15 metres of the boundary of any planned area. 3. Aggregate material must not be removed from an area of concern or within 15 metres of the boundary of an area of concern, except: <ol style="list-style-type: none"> a. for a cultural heritage landscape or historic Aboriginal value, as defined in the Forest Management Guide for Cultural Heritage Values, if, <ol style="list-style-type: none"> i. the operational prescriptions and conditions for the area of concern of the FMP documents conditions on location, construction or use of the forestry aggregate pit, as per the advice of a qualified individual as defined by the Forest Management Guide for Cultural Heritage Values, and ii. the aggregate material is removed in accordance with such conditions; and b. for all other values, if, <ol style="list-style-type: none"> i. the operational prescriptions and conditions for the area of concern of the FMP documents conditions on location, construction or use of the forestry aggregate pit, and ii. the aggregate material is removed in accordance with such conditions. 4. Notwithstanding standard 3 above, aggregate material must not be removed from an area of concern or within 15 metres of the boundary of an area of concern for the following values, as defined in the Forest Management Guide for Cultural Heritage Values: <ol style="list-style-type: none"> a. archaeology site; b. cemetery; or c. archaeological potential area. 5. When operating within 15 metres of a proposed roadside ditch, no excavation is to take place below the elevation of the planned depth of the proposed ditch; all excavations must be immediately sloped to no steeper than a 2:1 (horizontal: vertical) angle. 6. During extraction, no undercutting of the working face is permitted and: <ol style="list-style-type: none"> a. the working face must be sloped at the angle of repose; or b. the vertical height of the working face must not be more than 1.5 metres above the maximum reach of the equipment. 7. All trees within 5 metres of the excavation face must be removed. 8. The maximum pit area must not exceed 3 ha. When a pit or a portion of a pit is rehabilitated, it is no longer part of the pit. 9. When the site is inactive, all pit faces must be sloped at the angle of repose. 10. Within the excavation area, no ponding is allowed and offsite drainage must be designed to prevent sediment from entering any water feature. 11. MNRF may direct that a forestry aggregate pit be rehabilitated where the responsibility for the road and associated forestry aggregate pit is being transferred back to MNRF. 12. Final rehabilitation must include: <ol style="list-style-type: none"> a. sloping of all pit faces to normally a minimum of 3:1 (horizontal:vertical); b. re-spreading of any topsoil and overburden that was stripped from the site; and

Operational Standards for Forestry Aggregate Pits
<p>c. mitigative measures, to the satisfaction of MNRF, to prevent erosion (e.g., establishment of vegetation).</p> <p>13. Existing or proposed forestry aggregate pits within areas of concern, or in the vicinity of features that are addressed by conditions on operations, as described in MNRF's forest management guide(s) relating to conserving biodiversity at the stand and site scales, must not be constructed or operated except in circumstances as identified in the conditions on operations in the FMP. This includes any restrictions on the construction of new forestry aggregate pits and timing of aggregate extraction, rehabilitation, or other associated operations in existing pits.</p> <p>14. Progressive rehabilitation of the site must be ongoing starting from the commencement of the forestry aggregate pit.</p> <p>15. If a forestry aggregate pit has not been active for a period of five years and the sustainable forest licensee confirms that future use of the pit is not required, final rehabilitation must be completed in accordance with standard 12 above within 12 months of the sustainable forest licensee's confirmation</p> <p style="padding-left: 40px;">a. Despite standard 15, if MNRF agrees that access to the pit that requires rehabilitation is not feasible within the 12-month period specified, MNRF and the sustainable forest licensee may agree, in writing, to a longer period.</p>

1

2 Forestry aggregate pits may be established within an aggregate extraction area that has been identified
 3 in the Plan. They will be documented on operations maps and in the Annual Report for the year that
 4 they were established and the following AWS. Aggregate extraction areas must be located within 500
 5 meters of an existing forestry access road. An amendment to the Plan is required to create additional
 6 Aggregate Extraction Areas within the plan.

7 If a new or existing forestry aggregate pit is planned to be used for forest management purposes during
 8 the FMP period and it does not intersect an AOC, the forestry aggregate pit must be operated in
 9 accordance with the Conditions on Regular Operations (4.2.2.2 Conditions).

10 If a forestry aggregate pit intersects an AOC, conditions on operations will be documented in FMP-11,
 11 and where practical, portrayed on the operations maps. Aggregate material must not be removed from
 12 an AOC or within 15 metres of the boundary of an AOC, except in accordance with the conditions
 13 described in FMP-11. The conditions on operations for FAPs must be informed in part by the
 14 *Endangered Species Act, 2007*, including any applicable habitat regulations and relevant policy direction.
 15 If a FAP intersects an AOC, FMP-11 identifies the conditions on operations. All existing FAPs will be
 16 identified in each AWS.

17 *4.5.7.2 Aggregate Extraction Areas Information Products*

18 Aggregate Extraction Area information products are contained within this plan and can be found in the
 19 layer titled "MU0966_PAG00"

20 *4.5.8 Wood Storage Yards*

21 Wood storage yards are areas where wood is stored for an intermediate term prior to being delivered to
 22 a mill. Wood storage yards are commonly used across the Pic Forest. Normally this practice takes place
 23 where wood harvested in the winter is stored on the side of an all season, graveled road, and hauled in

- 1 summer months. However, there are a variety of reasons wood may be intermediately stored in a wood
- 2 storage yard.
- 3 Wood storage yards will be accompanied by a “Concentration and/or Merchandising yard agreement”
- 4 issued from the MNRF wood measurement section.
- 5 The temporary storage of wood at landings, within Operational Road Boundaries (ORB’s) is not
- 6 considered a wood storage yard. However, if wood is planned to sit at a landing for an extended period
- 7 of time, the NFMCC will liaise with MNRF and a formal wood storage yard designation may be
- 8 implemented.
- 9 Table 75 details the operational standards for wood storage yards as established in Appendix V of the
- 10 2020 Forest Management Planning Manual.
- 11 *Table 75: Operational Standards for Wood Storage Yards*

Operational Standards for Wood Storage Yards
<p>The following operating standards apply to identified wood storage yards:</p> <ol style="list-style-type: none"> 1. Wood shall not be stockpiled on the corner of a road. 2. Wood shall not be stockpiled within the travelled portion of a road corridor. 3. If forestry aggregate pits are to be used for storage, they must be confirmed to be a forestry pit, not one granted to another licence holder or permittee under the Aggregate Resources Act. 4. The wood shall not be stockpiled within 30 metres of a waterbody or watercourse. 5. After use, the wood storage yard must be revegetated to a condition of its former state to the extent reasonably possible; 6. Debris will be managed as per the slash management section of the FMP and debris (e.g. Brush, slash, topsoil) shall not be deposited in ditches or on the shoulders of any road or below the high-water mark of any waterbody or watercourse; (see section: Debris Management (Slash Pile Management)) 7. Damage caused by the licence holder’s use of existing roads, water crossings or ditches (for access to the wood storage yards) may be subject to repair and/or rehabilitation at the expense of the licence holder; 8. For identified values and important ecological features within or adjacent to existing or proposed wood storage yards, operational prescriptions and conditions as described in MNRF’s forest management guide(s) relating to conserving biodiversity at the stand and site scales, must be applied in accordance with the FMP. <ol style="list-style-type: none"> a. This includes any restrictions on the construction of new wood storage yards, and the timing, use, revegetation or other associated operations in existing wood storage yards; 9. Conditions for wood movement and measurement for wood storage yards must be approved in writing by the Ministry’s Regional Supervisor, Wood Measurement Section, prior to use. Failure to comply with any conditions set out in this written approval is considered a failure to comply with the conditions set out in the approved FMP. The start date and end date of the use of the wood storage yard must be supplied to the Ministry so that these dates are included in the written approval.

1 *4.5.8.1 Wood Storage Yard Information Products*

2 Wood storage yard information products are contained within this plan and can be found in the layers.

3 *4.6 Expenditures*

4 The forecast of expenditures required to deliver renewal and maintenance and renewal support
5 activities during the ten-year FMP period are presented in FMP-19: Planned Expenditures. The planned
6 expenditures for renewal and maintenance activities are summarized by activity and funding source for
7 the two-year term with a total annual expenditure of \$1,538,110. The figures presented in FMP-19 were
8 determined by calculating the amount of treatment area by forest unit and silvicultural intensity for
9 each operating area planned for harvest during the FMP and then, as described in Section 4.2 above,
10 applying the most common treatment listed for the assigned SGR and its associated cost and
11 summarizing the results.

12 There are no Forestry Futures expenditures shown in FMP-19 because currently there are no approved
13 or pending FTF projects on the Pic Forest. However, during the implementation of the 2021-2031 FMP
14 it is expected there will be applications to the Forestry Futures Trust Fund to assist with the treatment of
15 those areas identified as silvicultural stratum "LOWPD".

16 *4.7 Monitoring and Assessment*

17 The following sections detail the NFMC and MNRF processes for monitoring and assessment of all forest
18 operations, renewal, infrastructure, species at risk, and forest fire preparedness.

19 *4.7.1 Forest Operations Inspections*

20 The following text describes NFMC's compliance strategy, for the ten-year Plan term, which has been
21 developed in accordance with the requirements of the MNRF's Forest Compliance Handbook. The
22 strategy will speak to the forest operations inspection process, the requirement for NFMC to produce
23 inspection reports and the processes for managing operational issues that may be identified through
24 compliance inspections. The compliance strategy describes the methods, intensity and frequency of
25 forest operations inspections, circumstances under which NFMC will conduct forest operations
26 inspections (e.g. Forest operations in, and adjacent to, areas of concern) on the Pic Forest, and the
27 submission of inspection reports to MNRF. An annual compliance component will be submitted each
28 year as part of the Annual Work Schedule. In addition, the strategy describes the MNRF district program
29 for auditing forest operations and conducting forest operations inspections. Furthermore, the strategy
30 describes how compliance performance on the forest will be communicated to the local citizens
31 committee (Pic Forest Public Consultation Committee) for their review.

32 *4.7.1.1 Compliance Goal*

33 The NFMC and the contractors working on their behalf are committed to operating in an
34 environmentally sensitive manner that maintains and, wherever feasible, enhances the long-term
35 sustainability of the Pic Forest. The Company and contractors are committed to:

- 36 • Recognizing the needs of other forest users;
- 37 • Maintaining healthy lands, waters and forests;
- 38 • Applying sustainable forestry practices.

1 All activities planned and implemented by NFMC will be in accordance with the approved 2021-2031
2 FMP and will meet or exceed all existing government regulations, policies and legislation. The NFMC is
3 committed to the highest level of quality in every area of operations and everyone operating on the
4 forest is responsible for monitoring and delivering on this commitment. The NFMC has a social
5 responsibility to the communities in which they operate to carry out their daily operations in a
6 responsible manner that will help contribute to the socio-economic base of these communities.

7 Regular compliance inspections are conducted to monitor harvesting, water crossing installations, road
8 construction and silviculture activities. The results of these inspections are reported to the MNRF. The
9 Forest Operations Inspection Program (FOIP) will ensure that due diligence is practised across the Forest
10 by “Trained and Capable” Company employees/contractors so that:

- 11 • Instances of non-compliance are reduced to the lowest possible number, while striving for zero;
- 12 • All instances of non-compliance are promptly noted, recorded and reported to the MNRF;
- 13 • Immediate corrective/preventative action is taken in the field;
- 14 • The effects of non-compliance are minimized and mitigated.
- 15 • Appropriate action is taken within the organization to prevent future occurrences similar in
16 nature.

17 *4.7.1.2 Background*

18 The purpose of the compliance strategy within the FMP and the overall context of the compliance
19 program as it applies to the Pic Forest is as follows:

- 20 • The Compliance Plan will provide education, guidance, monitoring and reporting procedures in
21 the implementation of the Pic Forest FMP to all operators on the unit. It will guide and direct all
22 company’s and contractors. It will be delivered in a cost effective, efficient and adaptive
23 manner that is consistent with current legislation and policy and is appropriate for the site and
24 operating conditions. It is a document that will guide forest operators on compliance
25 requirements and the results will be used to track trends for future operations or planning
26 adjustments and ongoing educational and training needs.

27 *4.7.1.3 Compliance Goals*

- 28 1. Sustainable forest management and resource protection:
 - 29 a. To monitor operations ensuring standards are followed to minimize impacts to the
30 environment.
 - 31 b. Track non-compliances allowing for adjustments to operating procedures and/or
32 methods to reduce re-occurrences.
 - 33 c. To monitor and evaluate the ongoing forest operations for impacts to the
34 environment and to ensure that operations take corrective actions when and where
35 possible.
- 36 2. Continuous improvement:
 - 37 a. By tracking results of operations, re-occurring issues can be addressed to reduce
38 compliance problems.
 - 39 b. Being certified to Forest Stewardship Council (FSC) standards, encourages striving
40 for higher standards and results on a continuous basis.
- 41 3. Maximizing efficiency of compliance activities:

- 1 a. Joint MNRF/company inspections will be encouraged in order to ensure consistency
2 of field observations and their reporting.
- 3 b. Looking at ways to minimize the time required for compliance by effective use of
4 time and resources while achieving positive results. This could include the use of
5 certified contractor inspectors to complete FOIP reports.
- 6 c. To conduct risk based planned compliance and monitoring activities in an effective
7 and efficient manner with consideration of costs and techniques without
8 compromising the environment or compliance with laws.
- 9 d. To ensure efficient use of MNRF staff and Operator resources by involving both in
10 mutually beneficial compliance monitoring or reporting opportunities.
- 11 4. Increasing compliance with legislation:
 - 12 a. Maintain contact with MNRF staff in order to stay current with any change to
13 legislation, planning and policies.
 - 14 b. Conduct all activities in a manner that will meet or exceed requirements and
15 standards.
- 16 5. Addressing historical compliance problems:
 - 17 a. Analyze and evaluate the past compliance problems and address the issues
18 identified in an efficient corrective manner.
 - 19 b. Encourage new approaches and innovations in resolving compliance issues.
 - 20 c. Joint MNRF/company reviews will help identify and resolve issues.
- 21 6. Human resources and training:
 - 22 a. Training will ensure that employees and contractors are adequately trained and fully
23 informed of performance requirements including legislation, procedures, plans and
24 policies.
 - 25 b. To adjust and deliver a training and education program based on annual compliance
26 assessments trends/analysis.
 - 27 c. To ensure company/contractor forest compliance staff, inspecting and reporting on
28 operations have Certified Forest Compliance Inspector status.

29 *4.7.1.4 Strategies and Actions*

30 NFMC has developed environmental and sustainable forest management policies. NFMC implements an
31 Environmental Management System (EMS) designed and structured to meet the requirements of the
32 ISO 14001 standards. As a component of the EMS, Standard Operating Procedures have been
33 developed to minimize impacts to the environment. All contractors that operate on the Pic Forest are to
34 operate using NFMC's adopted Standard Operating Procedures.

35 Prevention Measures:

- 36 1. The NFMC operations supervisor along with the Forester if available will meet the contractor for
37 a pre-operations meeting. Reviewing the maps, Area of Concern prescriptions, and any special
38 conditions for the block are discussed and identified. Before the contractor starts an operation,
39 they are fully aware of all prescriptions.

- 1 2. Contractors and their employees are trained to NFMC's adopted Environmental Management
2 System covering standard operating procedures for harvest, utilization, crossings, etc.

3 Approaches to Compliance Monitoring, Analysis, Reporting, and Documentation:

- 4 1. NFMC will monitor activities through field surveys which may include ocular or formal ground
5 survey, aerial inspections, or the use of aerial photography. The majority of surveys will be done
6 on the ground ocularly.
- 7 2. The NFMC will follow the FOIP program generated by the MNRF. Certified inspectors will
8 complete the FOIP reports from information gathered by the inspector. There may be
9 information gathered by others that may be used in the report and this will be noted in the
10 report.
- 11 3. Inspections will be carried out on a regular basis as operations progress by contractor or
12 company personnel. For operations that are short in duration i.e., crossing installation, the
13 inspection will take place after the work has been completed.
- 14 4. Will follow the reporting schedule outlined in the Annual Compliance Plan as per the Forest
15 Compliance Handbook (April 2010).

16 Corrective Action Practices:

- 17 1. If non-conformances are discovered, the operations will be halted immediately if still in the
18 area. Mitigation will be carried out immediately to stop or reduce any environmental concerns
19 if possible.
- 20 2. An incident will be reported to MNRF within 24 hours of discovery with a FOIP submitted within
21 5 working days.
- 22 3. The NFMC will appoint a person to investigate the incident and determine the root cause of the
23 problem.
- 24 4. Recommendations to prevent re-occurrence are made.

25 Requirements for Follow Up:

- 26 1. The root cause analysis is reviewed, and an appropriate action plan is developed and
27 implemented.

28 *4.7.1.5 Roles and Responsibilities*

29 The NFMC will oversee the Compliance Plan and co-ordinate the compliance program. It is the
30 responsibility of every forest worker on the Pic Forest to perform their job using proper harvesting,
31 water crossing, renewal and tending and road construction techniques. In addition to this responsibility,
32 forest workers are also required to promptly report any non-compliance situations that they become
33 aware of. Forest management activities carried out by NFMC and silvicultural contractors on the Pic
34 Forest will be subject to the same compliance objectives and strategies as outlined in this Compliance
35 Plan. There are a number of specific functions related to the preparation and implementation of the
36 Compliance Plan. Following are the roles and responsibilities for those functions:

- 37 1. Compliance Plan Preparation:
 - 38 a. The NFMC, Operations Manager will take the lead role and prepare the Compliance
39 Plan.

- 1 b. The MNRF will provide advice and information to the NFMC as required.
- 2 2. Inspectors:
- 3 a. The Annual Compliance Plan submitted with the AWS, prepared by the NFMC
- 4 Operations Manager, will identify individual compliance inspectors for compliance
- 5 monitoring on the Pic Forest. All compliance inspectors will be certified (i.e. Have
- 6 successfully attended and passed the Compliance Inspector Competency Certification
- 7 training course and certification is up to date).
- 8 3. Sign-off Responsibility on FOIP Reports:
- 9 a. The NFMC Operations Manager, will be the primary sign-off authority on FOIP Reports.
- 10 However, this job may be delegated to a compliance technician.
- 11 4. Responsibility for Prevention, Monitoring, and Reporting:
- 12 a. The responsibility for these compliance functions will be assigned to the supervisor of
- 13 the contracted company in charge of each operation or activity. However, the NFMC is
- 14 ultimately responsible for prevention, monitoring, and reporting.
- 15 5. Responsibility for Corrective Action and Follow-up:
- 16 a. Corrective action and follow-up will be assigned by the MNRF, to be undertaken by the
- 17 supervisor responsible for the activity involved.
- 18 6. Company Representative on Compliance Matters:
- 19 a. The NFMC Operations Manager or Forestry Operations Technical Specialist is the
- 20 contact for compliance matters.
- 21 7. Responsibility for Training:
- 22 a. Contractors working on behalf of the NFMC are independent and are fully responsible to
- 23 ensure that their employees are trained to the standards required to perform the forest
- 24 operation being conducted. However, NFMC will support in any means possible the
- 25 opportunities for contractor supervisors or workers to become compliance certified.

26 *4.7.1.6 Notification of the Status of an Operation*

27 For proper assessment and evaluation of compliance, MNRF must be made aware of the status of
28 operations. Notification of operational status is an information item to advise MNRF of operational
29 progress. For the Pic Forest, the MNRF supplied spread-sheet will be utilized for the notifications. The
30 spreadsheet will be a copy of the NFMC web-based notification system. As stated above, MNRF will be
31 given access to the web-based system.

32 The Pic Forest start up notification sheet will be sent to MNRF Technical Forestry Specialists weekly and
33 will indicate all ongoing operations. It will also serve as a start-up notification for a new activity if
34 submitted within the 5-day requirement. NFMC will contact the MNRF Technical Forestry Specialist by
35 email if there is a FOIP report submitted with an operational issue.

36 The reporting timelines below are minimums and must be followed for all operations. In cases where
37 blocks are being released to allow another activity such as site preparation, MNRF will be notified
38 through the FOIP system.

- 39 • Start-Up: The NFMC must provide notification to the MNRF prior to or within 5 working days of
40 the beginning of a new operation clearly stating the start up date.

- 1 • Suspended: The NFMC must provide notification (as per the compliance plan) to the MNRF prior
2 to or within 20 working days of suspending an operation or activity. A suspended operation is
3 one where the operational activities must be delayed and are not complete and therefore
4 cannot be assessed for some aspects of compliance. That notification must clearly describe the
5 operation being suspended, its location, and specify why the operation is being suspended and
6 when it is proposed to be restarted. Operations may not be suspended for more than the
7 balance of the period of the current AWS and one further AWS period.
- 8 • Release: A Release is where a Licensee wishes to provide MNRF a “Release to MNRF for
9 compliance audit” for any part of an operation’s Compliance Reporting Area. This release must
10 be in writing. A Release Notification is required no less than 10 working days prior to the
11 commencement of any new operation. A Release Notification must be clear and specific about
12 what is being released, the area being released and why the release is being provided. This may
13 be done where the Licensee wishes to:
- 14 ○ commence a new operation on that area such as Renewal (e.g. Mechanical site
15 preparation or slash pile burning);
 - 16 ○ to acknowledge harvest is finished but the wood has yet to be hauled;
 - 17 ○ To allow compliance to be assessed for that portion of the operation that is finished.

18 In this context, a “release” is a confirmation by the SFL holder that the activity(ies) being released are
19 finished on that portion of the area identified for release, is without operational issues, and is available
20 to MNRF for audit. It is possible to suspend a Harvest operation because it is not complete until the
21 wood is hauled and at the same time provide MNRF a Release Notice for the harvesting activities so that
22 site preparation can be undertaken.

23 The NFMC will notify MNRF by email if any operational issue is identified within a FOIP report or is
24 identified to NFMC. Should NFMC or its contractors identify any new value (nest, stream, etc.) the
25 NFMC will notify MNRF and work together to update the central values information system.

26 *4.7.1.7 Prevention, Avoidance, and Mitigation*

27 The NFMC will take action to prevent and avoid potential operational issues in a decisive, timely, and
28 appropriate manner in an effort to mitigate any loss or damage, or correct the situation to ensure a
29 compliant state.

30 The forest compliance strategy provides direction to company officials on what processes and/or
31 notifications are to be undertaken for various situations that might lead to non-compliance. The
32 following actions will be undertaken by the NFMC to prevent recurrence of the non-compliance:

- 33 • The NFMC will emphasize the prevention of potential undesirable activities or occurrences and
34 the mitigation of loss or damage as a result of these. Root cause analysis of an undesirable
35 activity or occurrence will be determined and an appropriate action will be assigned. Assigned
36 actions will be appropriate to the level of the non-compliance and will have the ability to adapt
37 to ensure the non-compliance will not become a recurring problem. Actions by NFMC staff will
38 be positive and will center on a learning approach;
- 39 • The NFMC is responsible to ensure that actions occur. The MNRF will verify the identified
40 operational issue; MNRF may then determine and assign a corrective action. In instances where
41 the Industry inspector determines a situation to be clearly non-compliant, the direction will be

1 that work will stop on that part of the operation and the inspector will submit a report of an
2 Operational Issue;

- 3 • Where any NFMC or contractor personnel, during ongoing monitoring of operations, identify a
4 situation they believe could be an Operational Issue(s), they will undertake one of the following
5 actions:
 - 6 ○ If they feel it is a violation of the approved plan or a threat to the environment, they will
7 immediately stop the operation and take the necessary steps to stop further possible
8 noncompliance and or harm.
 - 9 ○ They will report the situation to the Company's Operations Manager who will conduct a
10 formal compliance inspection or delegate to another Company official that is certified.
11 The Certified Inspector will determine if the situation is a violation of an approved plan
12 or a threat to the environment and what further action to take.
 - 13 ○ If the situation cannot be immediately corrected, the Company's Certified Inspector will
14 submit a report in FOIP that documents their findings and identifies an Operational
15 Issue. They will also identify the issue to the MNRF and other regulatory agencies as
16 appropriate.

17 *4.7.1.8 Compliance Reporting Areas*

18 Forest operations will be grouped into CRA for each operation type (access and harvest), based on the
19 characteristics of the operations and the operational complexities of the specific areas of the Forest that
20 are involved. The simplest operational division for the Pic Forest is defined as a 'block'. For the purpose
21 of forest compliance inspection reporting, the following categories will define the Compliance Reporting
22 Areas:

23 Renewal - Operations compliance inspection reports for all renewal activities (excluding FTG or
24 silvicultural effectiveness monitoring) e.g. Chemical and mechanical site preparation, slash burning,
25 aerial and direct seeding, planting, artificial regeneration will be grouped by activity type into a single
26 CRA. All operations will be inspected on an ongoing basis (sampling while the tree plant is ongoing, not
27 only at the end) to ensure compliance;

28 Harvest - Operational CRA's will generally be comprised of single harvest areas (i.e. A harvest block).
29 Where the harvest block exceeds 500 hectares, the site will be subdivided into CRA's less than 500
30 hectares and reported upon separately. CRA's will be identified in AWS if the areas are grouped or
31 subdivided;

32 Maintenance - Operations compliance inspection reports for all maintenance activities (e.g. Tending,
33 thinning, and pesticide application) will each be grouped by activity type into a single CRA;

34 Access - Operations compliance inspection reports for activities related to:

- 35 • Primary and branch road construction will be reported under an Access report.
- 36 • Operational roads are not included and are inspected as part of harvest operations.
- 37 • Road maintenance will be reported in an access report.
- 38 • Where a water crossing is involved on a primary, branch or operational road, it will be recorded
39 in an access report.
- 40 • Under the Access CRA's, water crossings should not be grouped into one report. Crossing
41 should have a mutually exclusive FOIP report.

1 *4.7.1.9 Monitoring Compliance of Forest Operations*

2 The timing and frequency of monitoring activities conducted during actual forest operations is described
3 within Section 4.7.1.6 Notification of the Status of an Operation to support the achievement of
4 compliance objectives developed from the FMP.

5 In addition to the timing and frequency of monitoring activities detailed above, the NFMC may opt to
6 modify its reporting requirements for the following unique situations:

- 7 • Seasonal site conditions or market situations may not permit the completion of harvesting
8 operations within a CRA or block. In this situation the Company may elect to release the
9 harvested portion for MNRF audit. This will permit renewal operations to commence within the
10 completed area. Further details will be laid out in the AWS so that they are clear to both the
11 MNRF and industry inspectors;
- 12 • For CRAs classed as high productivity upland mixed wood, the Company may choose to reduce
13 the CRA size so those areas blocks can be inspected and approved for renewal operations to
14 minimize potential competition through immediate start-up of site preparation immediately
15 after notification by MNRF. Further details will be laid out in the AWS so that they are clear to
16 both the MNRF and industry inspectors.

17

18 The general functions related to the compliance inspecting and reporting processes are detailed in
19 section 4.7.1.4 Strategies and Actions of the Compliance Plan. Detail concerning the identification of
20 inspectors and approvers and any other special considerations related to monitoring compliance of
21 forest operations is found in the annual Compliance Plan contained within the AWS.

22 *4.7.2 Exceptions*

23 The FMPM requires an exceptions monitoring program be prepared for any operational prescriptions
24 contained in a FMP for AOCs or SGRs that differ from specific direction provided in a forest management
25 guides. The exceptions monitoring program describes methods that will be used to monitor the
26 effectiveness of the operational prescription.

27 None of the operational prescriptions planned or SGRs for implementation under this FMP are
28 exceptions to the approved forest management guides, therefore an exceptions monitoring program is
29 not required.

30 There are scenarios in section “4.3.6.2.5 In field Application of Hardwood Utilization Strategy” which
31 may require exceptions monitoring to assess the regeneration within an area. If exceptions monitoring
32 is required, NFMC will work with MNRF Wawa District to assign an appropriate monitoring program and
33 implement the program into the AWS.

34 *4.7.3 Assessment of Regeneration*

35 Monitoring and assessment of regeneration is carried out to determine the effectiveness of the chosen
36 silvicultural treatment package in regenerating the forest to the regeneration standards defined in the
37 associated SGR and to determine if those efforts will contribute to the achievement of the desired
38 future forest condition outlined in the LTMD and captured in FMP-10. Assisted regeneration (i.e.
39 Plantations) is monitored for survival and stocking and then assessed for regeneration success at
40 strategic stages (i.e. Establishment or Performance) as defined in the SGR (i.e. FMP-4). Natural
41 regeneration such as Careful Logging Around Advanced Growth (CLAAG) treatments are monitored for

1 survival, stocking and/or tending prior to carrying out the Establishment survey. Establishment surveys
2 are conducted at a stage of regeneration that allows for additional treatment, if required, in order that
3 the regeneration standards found in FMP-4 are met. FMP-20 forecasts a summary of Establishment
4 surveys that will be carried out during this plan period. The table is broken into current plan and past
5 plans and categorized by harvest type, assigned SGR and SGR to be assessed. FMP-20 includes harvest
6 area from the 2017-2019 Contingency Plans for the Big Pic and Pic River Forests as well as any area that
7 has not regenerated from previous plans for the Big Pic or Pic River Forests.

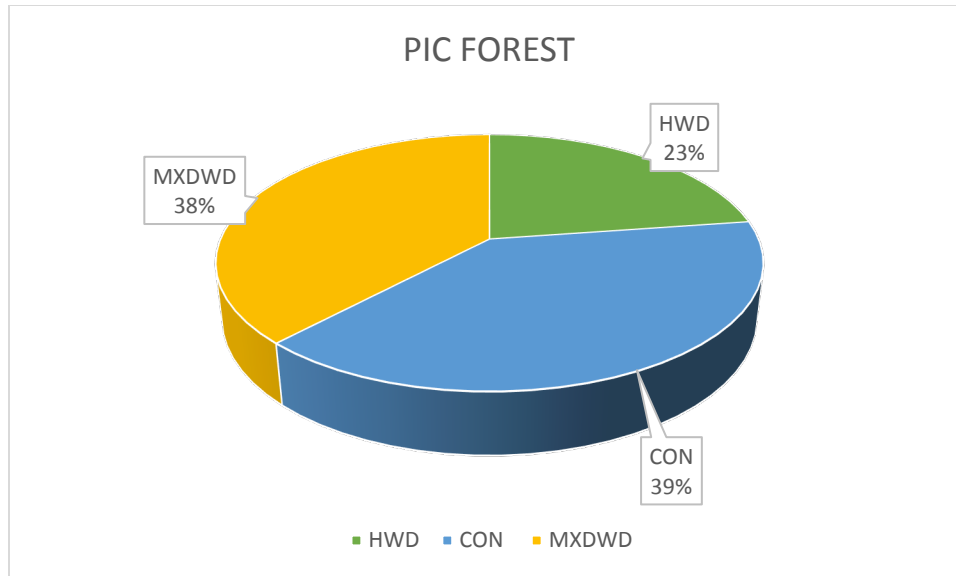
8 The monitoring carried out prior to the Establishment survey include plantation survival plots,
9 established on artificial regeneration sites, and competition surveys to determine if tending of the
10 plantation is required. Survival assessments are carried out in the first, second and third growing
11 seasons post planting. Typically, competition surveys are done one-to-two years after planting to
12 determine if the planted conifer trees require release from vegetative or propagative (i.e. Poplar, birch,
13 and cherry) competition.

14 The results of the formal regeneration assessments (i.e. Establishment) are used to update the forest
15 resource inventory. The survey methodology being used on the Pic Forest is a combination of:

- 16 • Visual;
- 17 • aerial ocular;
- 18 • large-scale photo interpretation, and
- 19 • ground surveys.

20 Advances in new technology such as satellite imagery or supplementary LIDAR aerial photography plus
21 artificial intelligence (i.e. Computer program) or drones may also be employed where feasible and
22 economical to determine regeneration success.

23 Visual surveys are normally done on small homogenous regeneration areas (i.e. PODOM or SBDOM), less
24 than 4 hectares in size, by an experienced regeneration surveyor or professional forester. Aerial ocular
25 surveys involve conducting regeneration assessments from a helicopter by an experienced regeneration
26 surveyor or professional forester. Large scale photo interpretation combines large scale aerial
27 photography and photo interpretation by an expert to create stand descriptions for each regenerated
28 area. Ground surveys utilize a plot-based system called the Modified Well-Spaced Free Growing
29 Assessment Methodology. A detailed description of the Modified Well-Spaced Free Growing
30 Assessment Methodology can be found in the Supplementary Documentation. Ground surveys are used
31 where the level of regeneration success to the desired forest unit cannot be easily determined using one
32 of the other methodologies. On the Pic Forest ground surveys are the preferred survey methodology
33 that will be used during the period of the FMP in conjunction with other survey methodologies. The
34 mixedwood nature of the Pic Forest, Figure 68 below, lends itself well to the formal ground survey
35 methodology. However, the use of the other regeneration survey techniques, because of new
36 technology, may be employed where it is deemed the new technique is proven to be a viable option.



1
2 *Figure 68: Proportional Composition of the Pic Forest*

3 MNRF staff, local PFPC members and Indigenous community members may, upon request, wish to
4 accompany NFMC staff or contractors involved in the regeneration monitoring and assessment program.

5 **4.7.4 Roads and Water Crossings**

6 Roads and water crossings associated with each road network that is the responsibility of the NFMC will
7 be monitored consistent with the conditions described in FMP-18.

8 The annual monitoring program will commence after the spring runoff. The monitoring program will
9 consist of a visual inspection of all primary and secondary roads contained within each network as well
10 as visual inspections of operational roads, where feasible. The inspection findings will be retained
11 internally and used to develop a workplan for remediation or removal, if required. The records may also
12 include areas that may require further monitoring throughout the year.

13 The NFMC will actively maintain all roads only when forest management activities are being carried out.
14 If an environmental and/or public safety risk is identified, the NFMC and the MNRF will jointly develop a
15 mitigative plan to address the situation. There is no obligation for the Company to maintain and/or
16 undertake any repair work that is not considered an environmental and/or safety risk. The Company is
17 not committed to undertake any repair work on behalf of other users.

18 Operational summer roads are roads used for the extraction of wood and silvicultural activities over a
19 short term. Annual Monitoring of these roads will be done during active operations only, inactive roads
20 will be assessed at least once every three years until they are returned to the crown.

21 Operational winter roads do not have any planned monitoring activities planned as these areas will have
22 likely been bladed/sheared or subgrade only roadbeds with temporary water crossing structures. There
23 will be no requirement to monitor these roads if there is no infrastructure left in place and these roads
24 will be renewed by natural means.

1 4.7.5 Species at Risk

2 There are currently no monitoring programs specifically developed for species at risk. Compliance with
3 area of concern prescriptions or conditions on regular operations that have been applied to address
4 species at risk will be monitored as part of regular compliance monitoring via the Forest Operations
5 Inspection Program (FOIP). All species at risk observed in the field by operations will report that sighting
6 to NFMC, NFMC will relay that report to the MNRF for possible follow up.

7 4.8 Fire Prevention and Preparedness

8 Any forest operation undertaken in Ontario must be done with careful consideration to the prevention
9 of forest fires. Forest fires can have a large impact on annual operations and sustainable wood supply.
10 Operators must be prepared to prevent accidental fire starts and safely take initial action to limit fire
11 spread, should a fire occur. The forest fire prevention and preparedness procedures described in this
12 section apply to all operators, including silvicultural contractors, during the FMP.

13 All operations have to comply with the Forest Fires Prevention Act (1990), Modifying Industrial
14 Operations Protocol (2011), Forest Fire Operations by Forest Industry-Business Practices (2009) and the
15 Crown Forest Sustainability Act (1994), Part B: Annual Operations. MNRF's Forest Compliance
16 Handbook (2014) provides additional guidance for the requirements on fire prevention and
17 preparedness. The fire prevention and preparedness strategy for Pic Forest incorporates guidance and
18 requirements of all these documents. Conditions are placed on forest operations through the AWS to
19 provide for fire prevention and preparedness.

20 The NFMC and its contractors are committed to exercising reasonable precaution to prevent initiation of
21 fires during their operations, as well as to take immediate action to minimize losses should fire occur on
22 or near its operations. The FMP fire prevention and preparedness strategy is implemented through
23 actions that (a) promote fire preventative measures for operators as well as other forest users, including
24 communication protocols, equipment standards and inspections, compliance monitoring compliance,
25 and increased fire prevention methods during high fire danger; (b) build forest worker awareness, and
26 (c) deliver fire preparedness training, as described in the following sections. Monitoring is conducted
27 through forest compliance monitoring procedures and equipment inspections. In the event of a fire, the
28 NFMC will co-operate fully with MNRF in all phases of fire suppression.

29 4.8.1 Promotion of Fire Prevention

30 During periods of fire danger, forest operations are restricted or suspended according to the MNRF
31 guidelines "*Modifying Industrial Operations Protocol*" (MIOP 2011). The protocol provides a consistent
32 methodology for modifying industrial activities by:

- 33 • Determining when and where forest operations should be modified depending on the fire
34 danger and the risk of the operations igniting a wildfire.
- 35 • Incorporating other prevention methods in daily operations to reduce the risk of fires escaping
36 within operating areas (i.e., fire suppression training, detection, and communications)

37 All operations are classified according to the risk of fire starts. Local MNRF fire management personnel
38 can assist with determining the level of fire prevention and suppression preparedness required for the
39 forest operations when requested.

1 Data from the MNRF weather station closest to each operation will be utilized to determine the need for
2 modification of operational activities in accordance with the fire risk. The weather stations on or
3 adjacent to the Pic Forest are:

- 4 • Manitouwadge MAN;
- 5 • Caramat CMT;
- 6 • Hillsport HST;
- 7 • Portage Lake PTL;

8 NFMC and its contractors are responsible for obtaining daily updates on fire intensity codes from the
9 weather stations and modifying their operations accordingly. Should the fire intensity codes not be
10 available in a timely manner, operators are required to contact the MNRF Sector Response Officer to
11 determine the appropriate operational modification to be put in place prior to commencing work.
12 Operations will be modified on site the following day according to the daily fire intensity code report
13 (available after 4:00 pm daily).

14 Bonfires left unattended and negligently discarded cigarettes and matches pose a fire hazard during fire
15 season. Lunch fires and smoking while walking or working are prohibited. In order to smoke, workers
16 must sit down. Usage of matches is not allowed, lighters must only be used. Employees must
17 thoroughly extinguish smoking material on non-flammable material i.e. Mineral soil or bare rock. During
18 extreme fire hazards, there may be further smoking restrictions as prescribed by supervisors.

19 *4.8.1.1 Communication*

20 During the fire season, MNRF and NFMC communicate frequently on information on fire conditions and
21 activity, as well as on information on firefighting operations in the Pic Forest. The MNRF will ensure that
22 NFMC is kept informed of fire hazard detection operations and results, contacts, prescribed burns (why
23 and what benefits they provide), and the general operations and location of firefighting crews within the
24 vicinity of Pic Forest. The NFMC will ensure that the information from MNRF is passed on to its
25 contractors working on the Pic Forest, enabling to take timely action for appropriate modification of
26 operational activities, planning escape routes and the suppression of forest fires. NFMC's responsibility
27 includes regularly notifying MNRF of the locations of operations and camps.

28 All fire occurrences are to be reported without undue delay. The NFMC and its contractors all carry
29 mobile communication units which can relay to a base station or directly to MNRF to report on fires.
30 Communication equipment may include 2-way radios, cellular phones or satellite technology.

31 When reporting a forest fire, location, size, values nearby, and any other pertinent information will be
32 given to the response officer.

33 Contact information for the NFMC and MNRF is updated annually in the Fire Plan as part of the AWS. An
34 updated emergency contact list will be also provided to Wawa & Greenstone Fire Management
35 Headquarters by April 1 of each year.

36 *4.8.1.2 Equipment Standards*

37 NFMC and its contractors are responsible that operations staff understand and uphold the requirements
38 for the fire equipment as outlined in the Modifying Industrial Operations Protocol, Section 1.2. Fire
39 Suppression Equipment. The minimum suppression equipment by operation required on site is

1 summarised in Table 76. The amount of available fire equipment (pack pumps, pumping units, fire hose,
 2 etc.) will be determined by the number of personnel, vehicles and heavy equipment on the work site.

3 The on-site presence of fire suppression equipment is not required for most non-mechanical operations
 4 such as timber cruising or regeneration surveying. However, some suppression equipment is required
 5 for labour-intensive operations such as hand tending, and tree planting.

6 *Table 76: Suppression Equipment Required by Operation (adapted from MOIP (2011)).*

Operations	Number of Machines	Number of Equipment Caches	Backpack Pumps*
Heavy equipment with tire chains or tracks, working in forest fuels.	1-5	0	1/machine
	6+	1	
OR**: Heavy equipment at work within a 10 km radius of each other (includes hot work).	1-9	0	1/machine or hot work operation.
	10+	1	
Tree plant, manual tending or other labour intensive operations		0	1 for every 4 workers to a maximum of 10/site.

* A serviceable pressurized water delivery system located on a machine can replace a backpack pump.

** Only one fire equipment cache will be required on site providing it is within 20 minutes (by ground transportation) of all equipment; if this is not possible a second cache will be necessary.

7

8 As a requirement of the Forest Fire Prevention Act, persons operating equipment or machinery during
 9 the fire season will ensure that it is checked daily for any accumulation of flammable material and that
 10 any accumulation is removed. When operations are a short shift, restricted or shutdown, a dedicated
 11 patrol of the area will be carried out for one hour after operations have ceased.

12 An updated table identifying fire suppression equipment on site and current rates will be provided to
 13 Wawa & Greenstone Fire Management Headquarters prior to April 1 of each year. To protect
 14 confidentiality, this table is not included in the AWS.

15 *4.8.1.3 Compliance Standards*

16 The implementation of fire prevention and preparedness measures is subject to periodic compliance
 17 inspections, either as a part of the NFMC’s Compliance Plan or during the regular forest operations
 18 inspections program. It is the responsibility of all contractors and their field supervisors to ensure that:

- 19 • Fire equipment is on site and in working order;
- 20 • Mechanical equipment is cleaned regularly;
- 21 • Employees are aware of prevention measures;
- 22 • Any industrial activity occurring in their work area without a work permit is reported;
- 23 • The possible ignition sources within their work area are inspected.

1 4.8.1.4 Fire Prevention Efforts During Periods of High Fire Danger

2 During periods of high fire danger, only operators meeting the “Trained and Capable” standard (MOIP,
3 2011) will be allowed to continue operations under the modified conditions:

- 4 • **P = Prevention measures:** Ensure operations are in compliance with the fire preparedness and
5 prevention plan.
- 6 • **SS = Short shift:** No operations between 12:00 and 19:00.
- 7 • **RS = Restricted Shift:** No operations between 08:00 and 22:00
- 8 • **SD = Shutdown:** No operations starting at 06:00 on the first day of the shutdown. Operations
9 suspended until either P, SS, or RS work modification is assigned.

10 4.8.2 Forest Worker Awareness

11 Once the AWS and its fire plan are approved by MNRF, the NFMC will meet with its contractors for the
12 presentation of the fire plan, including an explanation of fire prevention and reporting procedures. This
13 takes place during the regular operational communications meetings held between NFMC and its
14 contractors. NFMC will ensure that all contractors operating within the Pic Forest will have a copy of the
15 approved fire plan. The contractors are responsible for the distribution of this information to their
16 supervisors and staff.

17 4.8.3 Fire Preparedness Training

18 “Trained and Capable Operator” standard in MOIP (2011) requires that at least 25% of the forest
19 workers at any particular site have completed the SP-102 or higher standard training, that there is
20 effective communication system is in place, and that all other requirements of MIOIP are met. By
21 meeting these criteria, operations can take place under slightly higher fire danger conditions. If the 25%
22 requirements of workers trained to SP-102 or higher standard is not met, the status of the operation is
23 changed from “Trained and capable” to “Limited”, and the operation must be modified according to
24 reflect this status.

25 NFMC and its contractors will organize and participate in refresher training, as needed. The
26 opportunities for training to the SP-102 standards will be provided to the contractors and their
27 employees operating within Pic Forest. NFMC is responsible for compiling and managing a record of all
28 trained firefighters. The record is made available to MNRF upon request.

29 4.9 Comparison of Proposed Operations to the Long-Term Management Direction

30 The following section provides a comparison of the planned operations to the Pic Forest Long Term
31 Management Direction (LTMD). This comparison will assess the expected effects of the planned
32 operations on the achievement of the LTMD.

33 In order to assess the comparison of planned operations to the LTMD, the 10-year harvest schedule was
34 imported into, and enforced in the Strategic Forest Management Model (SFMM). As the Pic Forest
35 LTMD was first implemented in 2019, through the approval of a 2 year (2019-2021) Contingency Plan,
36 the Base Model Inventory (BMI) was indexed to 2021 to reflect the most accurate forest condition. It is
37 important to note that in the following section, tables where the X axis (horizontal axis) represents FMP
38 terms and compares the LTMD (run 229) to planned operations (run 503). The two runs occur on
39 slightly different timeframes, which are overlapped for clarity. Whereby the LTMD (run 229) was

1 generated strategically to occur beginning in 2019 and, as mentioned, the Planned Operations begin in
2 2021.

3 Results from the comparison were quite positive across all metrics. The following sections will discuss
4 the comparison across forest areas, age classes, volumes, renewal and maintenance, stand conditions,
5 and landscape targets. The LTMD SFMM run is titled run-229. Many of the graphs and Tables in section
6 3.6 Objectives and Indicators compare run 229 to other scoping runs. The planned operations run is
7 titled 503. Many of the graphs and tables in the following section will compare run 229 to 503.

8 As mentioned above, in general, the comparisons between run 229 and 503 are quite positive. There is
9 very rarely any deviation from the LTMD, and even less deviation that would be considered significant.
10 All deviations will be discussed below. In many cases run 503 (planned operations) out-performed run
11 229 (LTMD). Whereas targets would be achieved quicker when the strict term one harvest from the
12 planned operations is enforced.

13 SFMM is a linear optimization model, which, given the same targets, objective function and inputs, will
14 return the same optimal solution every time. Therefore, it is suspect that a defined term one harvest
15 created by non-spatial software could select a more optimal run than the solution presented in the
16 LTMD (run 229). As discussed in the following section, at the time of the proposed operations
17 comparison to the LTMD, there was one Forest Unit which was overallocated (BWDOM). Over
18 allocation of the BWDOM forest unit coupled with the under allocation of Spruce, Pine and Fir (SPF)
19 dominated forest units would not have solved in the original LTMD run 229 as the term 1 volume targets
20 would be violated. However, as planned operations were hand selected, and modeled volume is purely
21 a function of area, there is no need to enforce the term 1 volume target. As such, the model cut more
22 hardwood dominated stands than the LTMD run and converted at least a portion of them to
23 mixedwood/conifer dominated stands. The conversion of forest stands from hardwood/mixedwood to
24 more conifer dominated forest units is a defining theme in this Pic plan and positively contributes to
25 various targets. As such, enforcing a term 1 harvest where more BWDOM and less conifer was cut,
26 allowed run 503 to largely preform better than the LTMD (run 229).

27 Small changes have been made to the planned operations between the comparison to the LTMD and
28 plan implementation. A major driver of these changes were AOC additions, and reducing the planned
29 allocations to be equal to or less than the allow able harvest area. The comparison of the planned
30 operations to the LTMD was not re-run following these changes. It was determined that, strategically,
31 these small changes would have a null affect on the achievement of the LTMD.

32 4.9.1 Planned Harvest Operations

33 *4.9.1.1 Harvest Area for the Planned Operations*

34 As discussed in section 4.3 Harvest Operations the term 1 available harvest area in SFMM was used to
35 provide direction while spatially planning harvest areas.

36 Table 77 provides a comparison between the 10-year available harvest area generated through the
37 LTMD and the planned operations by Forest Unit and Age Class. The last column provides the difference
38 (expressed as a percentage) between the TLMD and planned operations. The column is additionally
39 formatted to highlight the adherence or deviation by colour coding. Whereas the redder the cell, the

1 greater the percent difference from the LTMD. In the last column of Table 77, percent difference is
 2 calculated by the following equation:

3 *Equation 1: Calculating Percent Difference used in Table 77, Table 78, Table 79, and Table 81*

4
$$\frac{LTMD\ 10\text{-year}\ Available\ Harvest\ Area\ (Ha) - Planned\ 10\text{-year}\ Harvest\ (Ha)}{LTMD\ 10\text{-year}\ Available\ Harvest\ Area\ (Ha) + Planned\ 10\text{-year}\ Harvest\ (Ha)}$$

5 As the Pic forest did not utilize a spatial model to forecast harvest allocations, it is expected that some
 6 age class substitution would occur as planned operations were developed. Although age class
 7 substitution was minimized as much as possible, there are circumstances where it was necessary to
 8 utilize some substitution. An example is the BWDOM forest unit. Where the strategic model only
 9 allocated 4 age classes. Whereas, for the purpose of applying higher level sound forestry practices,
 10 ~35% of the planned allocation of BWDOM are stands not within the strategically allocated Age Class's.

11 *Table 77: Comparison of 10-year LTMD harvest by Forest Unit and Age Class to Planned Operations*

Plan Forest Unit	LTMD 10-year Available Harvest Area (Ha)	Age Class	Planned 10-year Harvest (Ha)	Deviation of Planned Harvest areas from LTMD (Ha)	Difference between Planned Harvest areas from LTMD (%)
BFMIX	-	65	12	12	100%
	0	75	306	306	100%
	4	85	541	537	98%
	-	95	255	255	100%
	68	105	99	31	19%
	580	115	386	195	-20%
	698	125	433	265	-23%
	530	135	381	150	-16%
	384	145	254	130	-20%
	502	155	319	183	-22%
	278	165	81	198	-55%
	31	175	17	14	-29%

Plan Forest Unit	LTMD 10-year Available Harvest Area (Ha)	Age Class	Planned 10-year Harvest (Ha)	Deviation of Planned Harvest areas from LTMD (Ha)	Difference between Planned Harvest areas from LTMD (%)
BFMIX Subtotal:	3,077		3,083	6	0%
BWDOM	-	65	0	0	100%
	366	75	173	193	-36%
	189	85	181	7	-2%
	-	95	76	76	100%
	-	105	76	76	100%
	-	115	4	4	100%
	22	125	59	37	46%
	18	135	48	30	45%
	-	145	53	53	100%
	-	155	37	37	100%
	-	165	9	9	100%
-	175	-	-		
BWDOM Subtotal:	595		716	121	9%
HRMIX	34	65	402	369	85%
	188	75	519	330	47%
	927	85	1,083	156	8%
	1,197	95	1,389	192	7%
	1,885	105	1,780	106	-3%
	1,410	115	1,491	81	3%

Plan Forest Unit	LTMD 10-year Available Harvest Area (Ha)	Age Class	Planned 10-year Harvest (Ha)	Deviation of Planned Harvest areas from LTMD (Ha)	Difference between Planned Harvest areas from LTMD (%)
	2,141	125	2,093	-49	-1%
	3,374	135	3,165	-209	-3%
	1,945	145	1,794	-151	-4%
	4,152	155	3,651	-500	-6%
	411	165	289	-122	-17%
	-	175	-	-	
HRMIX Subtotal:	17,665		17,656	9	0%
OCLOW	-	65		-	
	-	75		-	
	-	85		-	
	-	95	6	6	100%
	-	105	3	3	100%
	-	115	19	19	100%
	-	125	40	40	100%
	-	135	75	75	100%
	310	145	354	44	7%
	451	155	290	-160	-22%
286	165	287	1	0%	
43	175	7	36	-72%	
OCLOW Subtotal:	1,090		1,080	10	0%
	5	65	573	569	98%
	2,895	75	2,648	-247	-4%

Plan Forest Unit	LTMD 10-year Available Harvest Area (Ha)	Age Class	Planned 10-year Harvest (Ha)	Deviation of Planned Harvest areas from LTMD (Ha)	Difference between Planned Harvest areas from LTMD (%)
HRDOM	8,100	85	7,184	-916	-6%
	-	95	839	839	100%
	-	105	212	212	100%
	1,893	115	1,548	-345	-10%
	1,370	125	1,330	-41	-2%
	2,393	135	2,418	24	1%
	1,289	145	1,145	-143	-6%
	1,737	155	1,671	-66	-2%
	-	165	108	108	100%
	-	175	-	-	
	HRDOM Subtotal:	19,683		19,676	7
CONMX	-	65	55	55	100%
	-	75	64	64	100%
	442	85	1,137	695	44%
	422	95	867	445	35%
	442	105	344	-98	-12%
	611	115	647	35	3%
	1,670	125	2,177	507	13%
	7,097	135	6,627	-470	-3%
	4,922	145	3,967	-955	-11%

Plan Forest Unit	LTMD 10-year Available Harvest Area (Ha)	Age Class	Planned 10-year Harvest (Ha)	Deviation of Planned Harvest areas from LTMD (Ha)	Difference between Planned Harvest areas from LTMD (%)
	5,319	155	4,288	-1,031	-11%
	110	165	354	244	53%
	31	175	29	2	-3%
CONMX Subtotal:	21,065		20,555	510	-1%
PJMIX	2	65	194	191	98%
	346	75	922	576	45%
	3,006	85	2,405	601	-11%
	1,558	95	1,528	30	-1%
	511	105	407	104	-11%
	343	115	250	93	-16%
	55	125	52	3	-3%
	282	135	281	0	0%
	114	145	114	0	0%
	52	155	5	47	-82%
	11	165		11	-100%
		-	175		-
PJMIX Subtotal:	6,279		6,157	122	-1%
	6	65	122	116	91%
	1,208	75	1,219	10	0%
	2,500	85	2,171	329	-7%

Plan Forest Unit	LTMD 10-year Available Harvest Area (Ha)	Age Class	Planned 10-year Harvest (Ha)	Deviation of Planned Harvest areas from LTMD (Ha)	Difference between Planned Harvest areas from LTMD (%)
PJDOM	1,298	95	1,386	88	3%
	349	105	316	33	-5%
	237	115	192	46	-11%
	124	125	200	76	24%
	824	135	759	65	-4%
	351	145	300	51	-8%
	244	155	149	95	-24%
	28	165	1	27	-93%
	-	175	-	-	
PJDOM Subtotal:	7,170		6,814	356	-3%
PODOM	1,587	65	928	659	-26%
	158	75	271	113	26%
	104	85	351	247	54%
	-	95	93	93	100%
	-	105	86	86	100%
	-	115	189	189	100%
	263	125	830	566	52%
	641	135	229	412	-47%
	311	145	61	250	-67%
	-	155	37	37	100%
-	165		-		

Plan Forest Unit	LTMD 10-year Available Harvest Area (Ha)	Age Class	Planned 10-year Harvest (Ha)	Deviation of Planned Harvest areas from LTMD (Ha)	Difference between Planned Harvest areas from LTMD (%)
	-	175		-	
PODOM Subtotal:	3,063		3,074	11	0%
SBLOW	-	65		-	
	-	75		-	
	-	85		-	
	-	95		-	
	-	105		-	
	-	115		-	
	938	125	880	58	-3%
	2,076	135	1,998	78	-2%
1,523	145	1,452	71	-2%	
433	155	574	142	14%	
-	165	39	39	100%	
-	175	16	16	100%	
SBLOW Subtotal:	4,970		4,959	11	0%
SBMIX	-	65		-	
	6	75	206	200	94%
	106	85	393	287	58%
	47	95	171	124	57%
	47	105	67	20	18%
	10	115	44	34	64%
	151	125	308	157	34%
	3,356	135	2,847	509	-8%
1,987	145	1,636	351	-10%	

Plan Forest Unit	LTMD 10-year Available Harvest Area (Ha)	Age Class	Planned 10-year Harvest (Ha)	Deviation of Planned Harvest areas from LTMD (Ha)	Difference between Planned Harvest areas from LTMD (%)
	2,178	155	1,345	-834	-24%
	510	165	336	-174	-21%
	54	175	14	-39	-57%
SBMIX Subtotal:	8,452		7,368	-1,084	-7%
SBDOM	-	65	-	-	
	-	75	16	16	100%
	-	85	36	36	100%
	-	95	302	302	100%
	178	105	235	57	14%
	63	115	378	315	71%
	85	125	429	344	67%
	4,281	135	5,693	1,412	14%
	3,733	145	2,976	757	-11%
	4,247	155	3,119	1,128	-15%
	1,325	165	790	535	-25%
249	175	148	101	-26%	
SBDOM Subtotal:	14,161		14,121	40	0%
Total:	107,271		105,259	-2,011	-1%

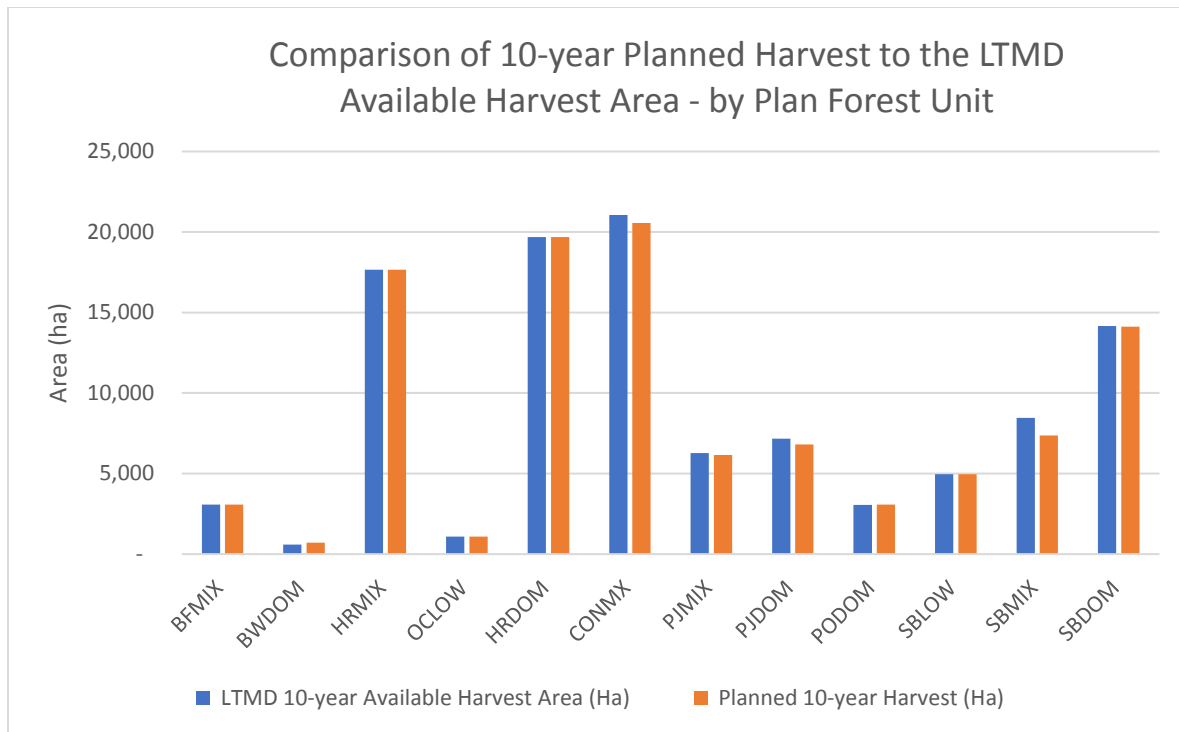
1
 2 If you do not consider age class substitution, planned operations are very close in total areas compared
 3 to the LTMD. Table 78 and Figure 69 display a comparison by forest unit between the proposed
 4 operations and the LTMD. Overall, the proposed operations plan 40ha less harvest than the LTMD. At

1 the time of the proposed operations comparison to the LTMD, there was one Forest Unit which was
 2 overallocated (BWDOM). These overallocations were reduced to equal to or below the LTMD AHA prior
 3 to draft plan and approval.

4 *Table 78: Comparison of 10-year LTMD harvest by Forest Unit to Planned Operations*

Plan Forest Unit	LTMD 10-year Available Harvest Area (Ha)	Planned 10-year Harvest (Ha)	Deviation of Planned Harvest areas from LTMD (Ha)	Difference between Planned Harvest areas from LTMD (%)
BFMIX	3,077	3,083	6	0%
BWDOM	595	716	121	9%
HRMIX	17,665	17,656	-9	0%
OLOW	1,090	1,080	-10	0%
HRDOM	19,683	19,676	-7	0%
CONMX	21,065	20,555	-510	-1%
PJMIX	6,279	6,157	-122	-1%
PJDOM	7,170	6,814	-356	-3%
PODOM	3,063	3,074	11	0%
SBLOW	4,970	4,959	-11	0%
SBMIX	8,452	7,368	-1,084	-7%
SBDOM	14,161	14,121	-40	0%

5



1

2 *Figure 69: Comparison of 10-year LTMD harvest by Forest Unit to Planned Operations*

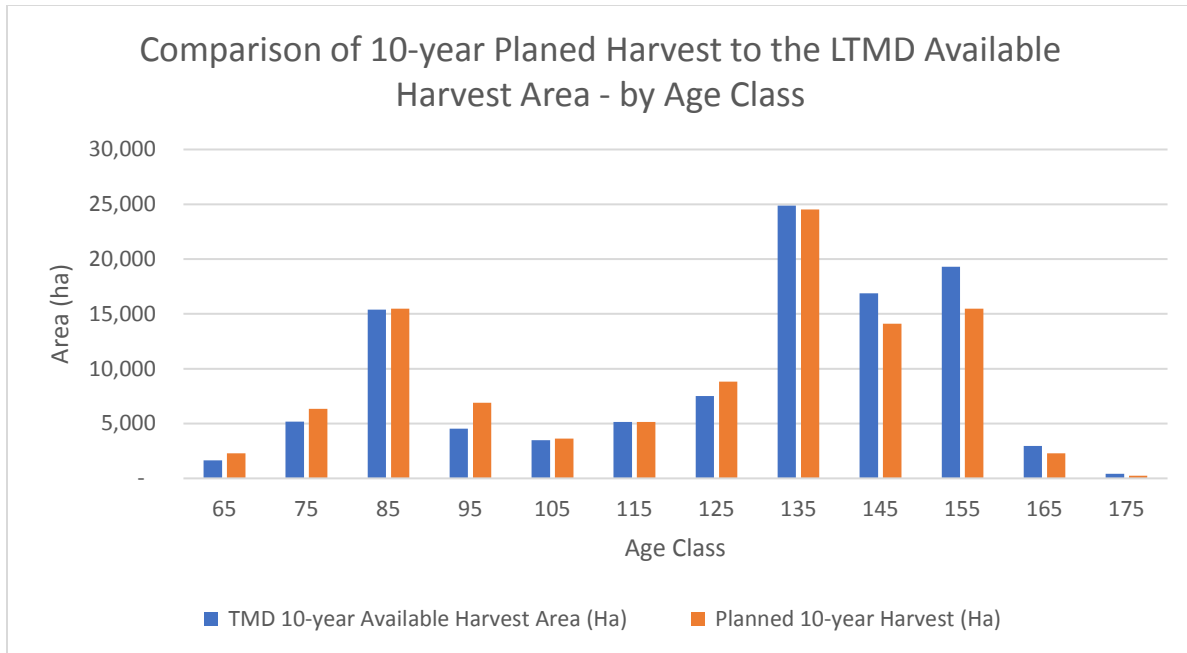
3 Table 79 and Figure 70 provide a comparison between the LTMD and planned operations by age class
 4 regardless of Forest Unit groupings. A staple concept in sustainable forest management is to adhere to
 5 the age class regulation, making sure to not avoid harvest of older age classes for younger. Table 79
 6 shows very little difference (expressed as a percentage) between the LTMD and planned operations.
 7 Figure 70 provides a graphical representation of the age class comparison. Although there is under
 8 allocation of some of the older age classes, there is very little substitution for younger age classes. The
 9 largest substitution is within 2 age classes, class 95 and 175 representing stands between 80-90 years
 10 and 170+ years old respectively. This is largely caused due to the implementation of the Northern
 11 Continuous Zone (discussed in detail in section 3.6.15.1 Northern Continuous Range) and additional
 12 patter objectives (discussed in more detail in section 3.6.13 Pattern) which on the Pic Forest favour
 13 larger continuous harvest patterns.

14 *Table 79: Comparison of 10-year LTMD harvest by Age Class to Planned Operations*

TMD 10-year Available Harvest Area (Ha)	Age Class	Planned 10-year Harvest (Ha)	Deviation of Planned Harvest areas from LTMD (Ha)	Percent Difference between Planned Harvest areas from LTMD (%)
1,633	65	2,287	653	17%

TMD 10-year Available Harvest Area (Ha)	Age Class	Planned 10-year Harvest (Ha)	Deviation of Planned Harvest areas from LTMD (Ha)	Percent Difference between Planned Harvest areas from LTMD (%)
5,168	75	6,343	1,176	10%
15,378	85	15,483	105	0%
4,523	95	6,911	2,388	21%
3,479	105	3,623	144	2%
5,149	115	5,147	-2	0%
7,518	125	8,830	1,312	8%
24,872	135	24,521	-351	-1%
16,870	145	14,106	-2,763	-9%
19,316	155	15,484	-3,832	-11%
2,958	165	2,293	-665	-13%
407	175	231	-176	-28%

1



1
2 *Figure 70: Comparison of 10-year LTMD harvest by Age Class to Planned Operations*

3 *4.9.1.2 Harvest Volume for the Planned Operations*

4 Table 81 and Figure 71 compare the forecast volume between the LTMD (run 229) and the planned
5 operations (run 503). The volumes forecast in the LTMD were generated from SFMM. SFMM
6 determines volumes by forest unit, age, and silvicultural intensity based on the average forest condition
7 for each variable. However, in Figure 71 and Table 81, planned operations volumes were determined by
8 the individual stand characteristics. This principle is explained below:

9 *As an example; imagine the average stand condition for SBDOM, age 100, on a Present*
10 *silvicultural intensity = Sb₉La₁ @ 100m³/ha would = 90m³Sb and 10m³La. Within the SFMM Model, every*
11 *SBDOM, age 100, on a Present silvicultural intensity would generate the exact same yield/ha.*

12 *However, when generating volumes based on individual stand characteristics, total volume is*
13 *proportionate to the interpreted stands composition, not the average condition. Table 80 provides more*
14 *detail regarding the difference between average and individual stand yields.*

15 *Table 80: Difference between SFMM generated yields and Individual Stand generated yields for the same stand*

The following columns show how yields for the same stand would be calculated using SFMM vs. Individual stand characteristics. The stand is SBDOM, age 100, on a Present silvicultural intensity = Sb ₇ Ce ₂ La ₁ - 1ha large	
SFMM Generated Yields	Individual stand characteristics Yields
Average Stand Condition = Sb ₉ La ₁ Therefore Yield = 90m ³ Sb + 10m ³ La	Individual stand characteristic = Sb ₇ Ce ₂ La ₁ Therefore Yield = 70m ³ Sb + 20m ³ Ce + 10m ³ La
The stands total volume remains unchanged between the two scenarios at 100m ³ . However, using individual stand characteristics allows operational planning to consider the implication of incidental species, in this case cedar, being present in the stand. Providing a more accurate account of planned harvest volume.	

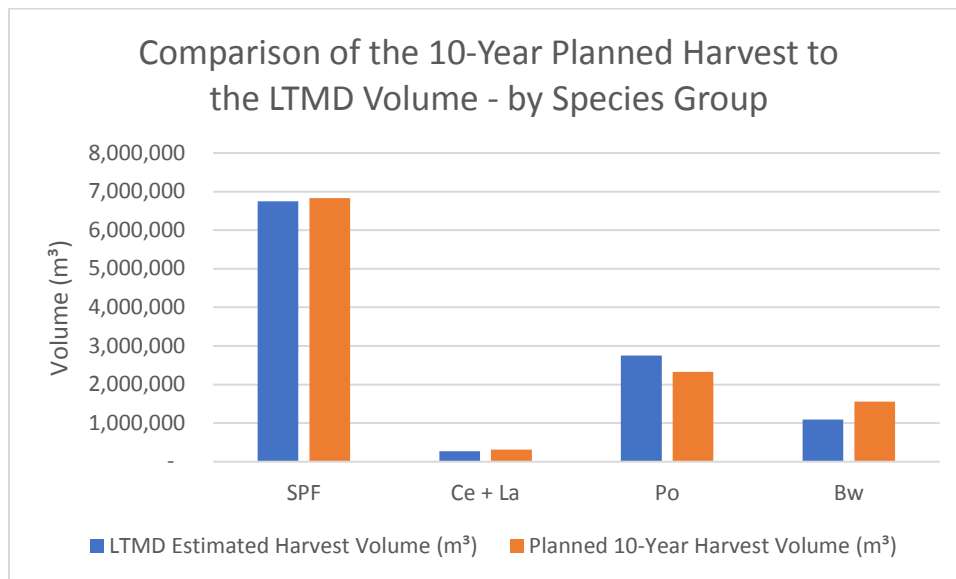
1

2 *Using individual stand characteristics to calculate volume generates more accurate values used*
 3 *for operational planning. At a landscape or strategic level this type of detail is not necessary and would*
 4 *cause undue complication. However, at planned operations, it is useful to be aware of these*
 5 *differences. Additionally, comparing average yields to individual stand characteristic yields produces*
 6 *some interesting insights into the pic forest which will be discussed below.*

7 *Table 81: Comparison of the 10-Year Planned Harvest to the LTMD Volume - by Species Group*

Species Group	LTMD Estimated Harvest Volume (m ³)	Planned 10-Year Harvest Volume (m ³)	Deviation of Planned Harvest from LTMD Volume (m ³)	Percent Difference between Planned Harvest areas from LTMD (%)
SPF	6,750,000	6,831,130	81,130	1%
Ce + La	271,000	308,979	37,979	13%
Po	2,748,000	2,324,618	-423,382	-17%
Bw	1,094,000	1,558,787	464,787	35%

8

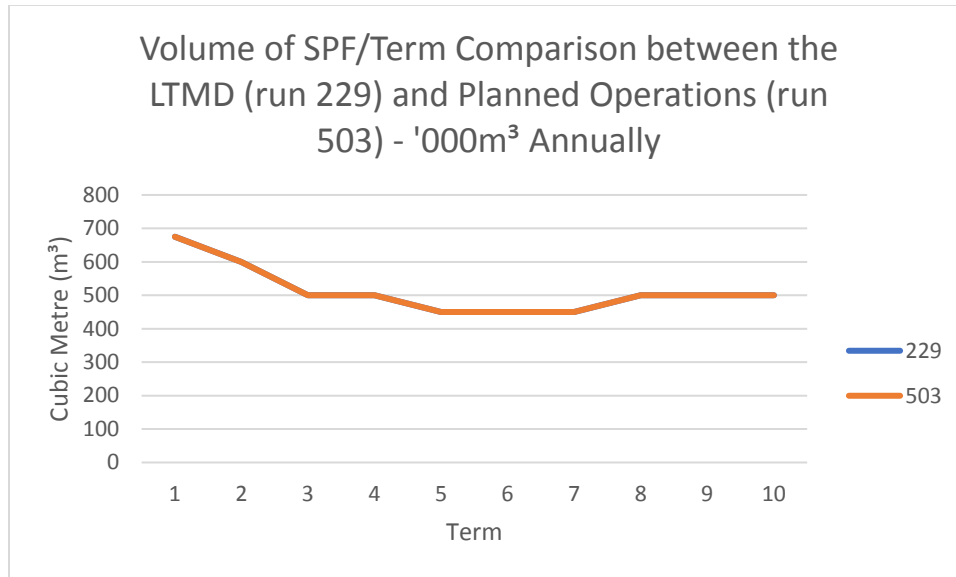


9

10 *Figure 71: Comparison of the 10-Year Planned Harvest to the LTMD Volume - by Species Group*

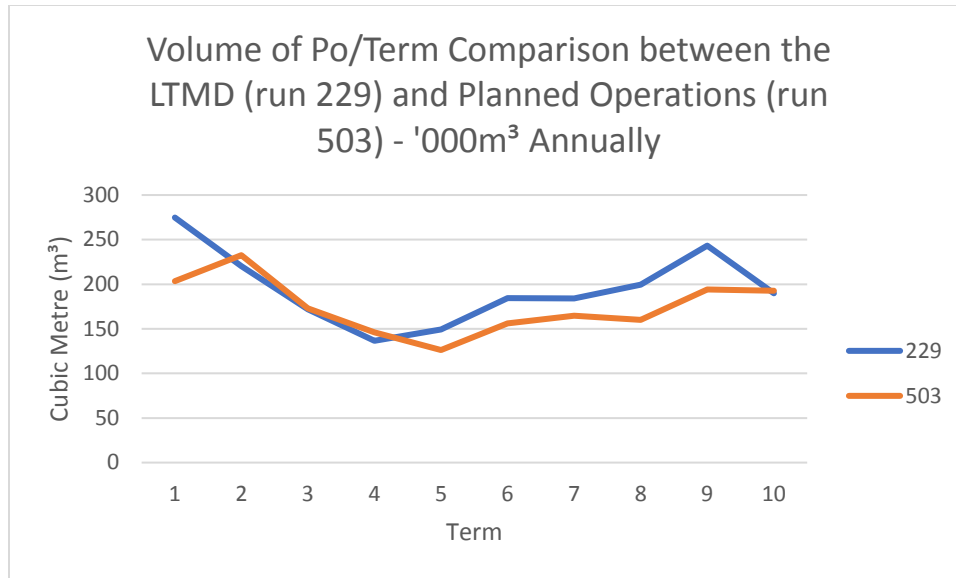
11 The planned allocation of SPF is within 1% of the LTMD forecast. In the LTMD run, there is a term 1
 12 harvest target of 675,000m³/SPF/yr. Considering the implementation of a 2-year contingency plan prior

1 to the 10-year FMP, it is quite remarkable that targeted volumes are still achieved. Figure 72 shows the
 2 volume of SPF/term between the LTMD (run 229) and planned operations (run 503). Based on modeled
 3 volumes (not calculated volumes as described above) Figure 72 shows that volumes between the two
 4 scenarios are identical.



5
 6 *Figure 72: Volume of SPF/Term Comparison between the LTMD (run 229) and Planned Operations (run 503) - '000m³ Annually*

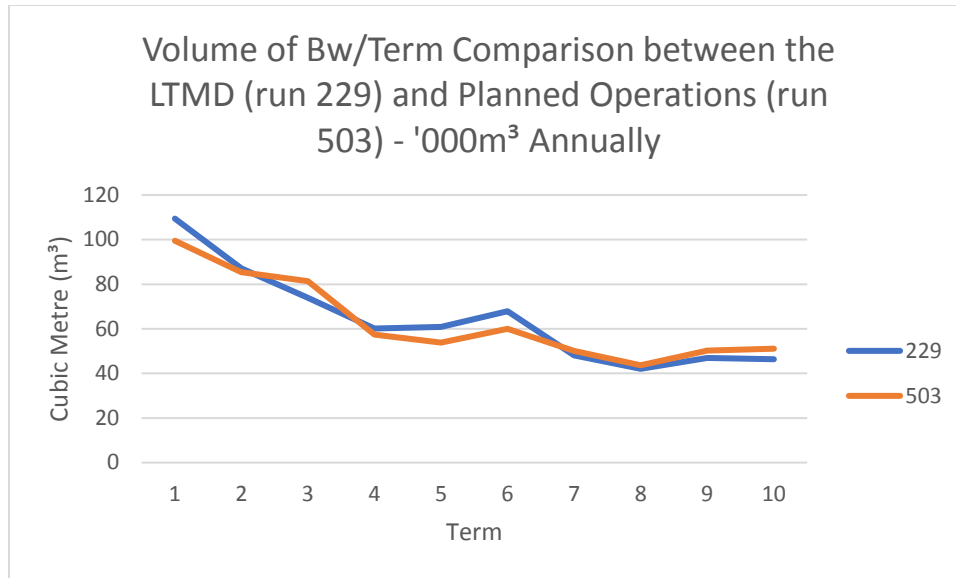
7 Figure 71 shows planned operations harvesting less Poplar (Po) volume than the LTMD forecast.
 8 Strategically, there was no volume targets set on Po as market demand for that species is low. Crown
 9 commitments for poplar veneer and biomass are met through harvesting of mixedwood stands
 10 predominantly for SPF. The Plan Forest Unit HRMIX is split into Analysis Units HRMXB and HRMXP,
 11 explained in more detail in section 2.1.3.1 Forest Units and Analysis Units. Planned operations selected
 12 less Poplar lading HRMXB than the model. Selecting less HRMXB is a function of harvest towards the
 13 more southern range of the forest which has a higher proportion of birch than the north. Specifically, as
 14 operations move towards the Coast of Lake Superior. When the planned operations are fed into the
 15 model, SFMM recognises the allocation of HRMXB opposed to HRMXP and therefore even in modeled
 16 volumes, there is a substantial term 1 drop, shown in Figure 73.



1
2 *Figure 73: Volume of Po/Term Comparison between the LTMD (run 229) and Planned Operations (run 503) - '000m³ Annually*

3 Figure 71 shows a 35% increase in the harvest of White Birch (Bw). As discussed in the paragraph above,
4 in planned operations, more of the analysis unit HRMXB was selected than in the LTMD. Strategically,
5 the model, given the option, will always elect to harvest the poplar leading analysis unit HRMXP, as the
6 harvest, and renewal rate are the same, but the harvest volume is significantly higher. However, as a
7 function of operational harvest planning, more HRMXB was selected. As there is significantly more
8 volume in HRMXP stands compared to HRMXB, the slight under allocation of poplar dominated forest
9 units does not result in significant volume losses. There is a disproportionate swap of volume when
10 HRMXB is allocated instead of HRMXP. Additionally, at the time of planned operations comparison to
11 the LTMD, the BWDOM forest unit was overallocated.

12 When reviewing results strictly from the model, run 503 (planned operations) shows a 9,000m³
13 decrease in the volume of Bw. This is caused because the average forest condition, specifically stocking,
14 of the HRMXB forest unit is very low. Most of this analysis unit occurs across the coast of Lake Superior
15 and is within Strategic Management Units deferred for 20 years. Therefore, the selected HRMXB forest
16 units are calculated at a higher volume (better stocked) when volumes are calculated on individual stand
17 characteristics (as shown in Figure 71) opposed to modeled outputs (shown below in Figure 74).



1
2 *Figure 74: Volume of Bw/Term Comparison between the LTMD (run 229) and Planned Operations (run 503) - '000m³ Annually*

3 One of the most interesting insights of volume comparisons between the planned operations and the
4 LTMD is the amount of Eastern White Cedar (Ce or Cedar) that appears in the operations planning
5 volumes which isn't present in the LTMD. Figure 71 shows a 13% increase in the forecast harvest of
6 Cedar and Larch/Tamarac (La). This could occur for two reasons; 1) planned operations just happened
7 to select stands which randomly have a higher proportion of Ce, or 2) the Pic Forest has a proportion of
8 Ce that appears when volumes are generated based on individual stand characteristics (as they are in
9 Figure 71) which is underrepresented in the forests units average condition. The Pic Forest Analysis unit
10 UPLCE was rolled up into the CONMX forest unit for operational planning and therefore, as UPLCE is not
11 operationally tracked as a unique forest unit, coupled with planned operations volumes generated
12 based on individual stand characteristics it is likely that scenario 2 is the cause of the spike in cedar
13 harvest. As described in the CRO Cedar Harvest it is unlikely any significant amount of cedar will be
14 commercially harvested.

15 **4.9.2 Renewal and Tending Operations**

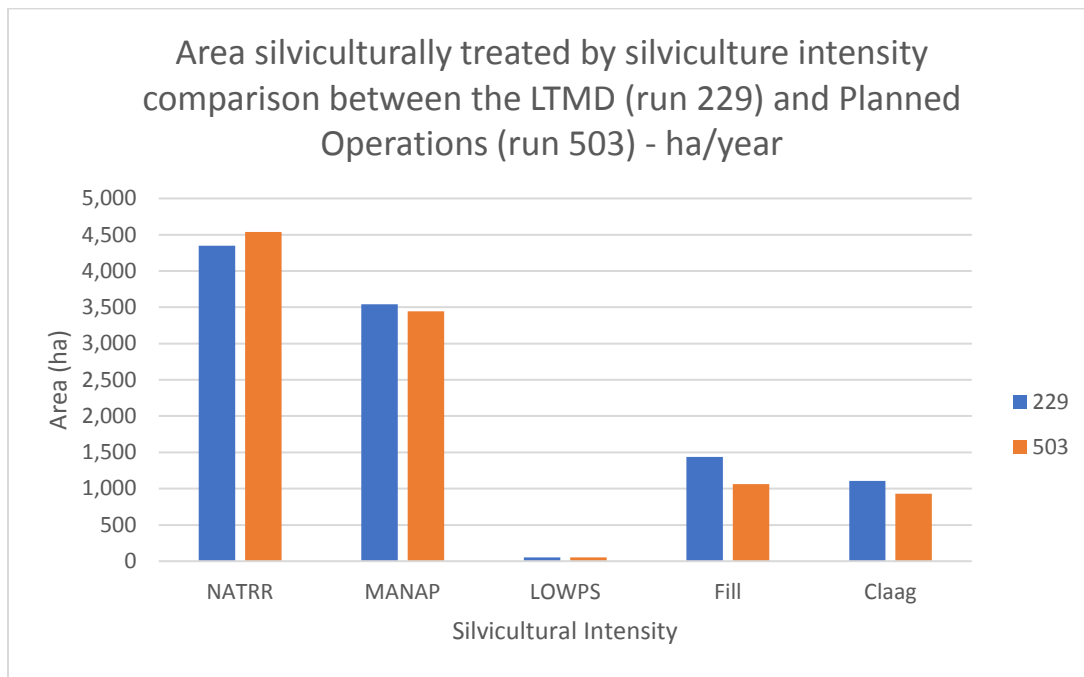
16 As the 2021 Pic Forest plan did not utilize a spatial model, Silvicultural Intensities (SI or RI) are not
17 assigned to planned harvest areas. As such, when planned operations are placed in the model as
18 defined term 1 harvest, the model will assign silvicultural treatments/intensities within the limits of
19 constraints within the model, adjusting to optimize achievement of targets into future terms.
20 Therefore, it is expected that there would be little variation between the LTMD and planned operations.

21 Table 82 and Figure 75 display the variation between the LTMD (run 229) and the planned operations
22 (run 503). There is minimal variation in the 2 largest silvicultural intensities (MANAP and NATRR). The SI
23 LOWPS is a defined placeholder for sites where silvicultural options are limited and shows little
24 variation, as expected. There is some variation in the FILL and CLAGG silvicultural treatment packages,
25 this is due to an under allocation of the SBMIX forest unit where FILL and CLAGG have defined
26 proportions in the model. Forest units which occur on wetter ecosites (i.e. SBLOW, and OCLOW) remain
27 largely regenerated through FILL or CLAGG treatments.

1 *Table 82: Area Silviculturally treated by silviculture intensity comparison between the LTMD (run 229) and Planned Operations*
 2 *(run 503) - ha/year*

Silvicultural Intensity	LTMD Estimated Harvest Volume (m ³)	Planned 10-Year Harvest Volume (m ³)	Percent Difference between Planned Harvest Areas from LTMD (%)
NATRR	4349	4540	2%
MANAP	3541	3446	-1%
LOWPS	51	54	3%
Fill	1436	1064	-15%
Claag	1108	931	-9%

3



4

5 *Figure 75: Area Silviculturally treated by silviculture intensity comparison between the LTMD (run 229) and Planned Operations*
 6 *(run 503) - ha/year*

7 **4.9.3 Future Forest Condition Comparison**

8 The following section compares the average condition of the planned operations to the average
 9 condition of the Pic Forest.

10 Some strategic spatial models allow individual stand ecosite, stocking, and composition to be
 11 incorporated into the model. In those cases, a comparison can be made between the average forest
 12 conditions of the LTMD forecast, and the planned operations. However, in SFMM, site class, stocking,
 13 and composition are averaged to develop yield intensities by forest unit, age class and renewal intensity.
 14 SFMM model inputs consider Management Unit (SMZ), Forest Unit, Age Class, Renewal Intensity and

1 area. Therefore, the model does not produce a specific index of site class, stocking and composition of
2 the LTMD solution.

3 Table 83 compares the forest composition condition of the planned operations to the same conditions
4 of the Pic Forest LTMD. The first section provides the area (ha) across all terms, by forest unit for the
5 LTMD (run 229). The second section provides the same information, but for the planned operations (run
6 503). The third section compares the differences (expressed as a percentage) between the two. The
7 results are also conditionally formatted to show areas of greatest deviance. There are not significant
8 differences between the LTMD and the planned operations. In other words, the change in forest
9 condition (e.x. Reduction in mixedwood and hardwood dominated forest) in the LTMD are matched by
10 the planned operations. The only significant variation is in the PRWMX analysis unit. Section 4.1.4.11
11 All Ages Red and White Pine Forest - Target 2.1.6 and Figure 86 detail that the area of Red and White
12 Pine Neary doubles in the planned operations run 503. However, as the minimum targeted level is
13 incredibly insignificant across the total landscape (1,128ha), doubling the area in the long run does not
14 cause question or concerns, as it results from so few stands succeeding to a Red and White Pine
15 condition.

1 Table 83: Comparison of All Forest by Forest Unit between the LTMD (run 229) and the planned operations (run 503)

Run 229 (LTMD) (ha)															
Term	BFMix	BwDom	HRMXB	HRMXP	OcLow	HRDOM	CONMX	PJMIX	PjDom	PoDom	PrwMx	SbLow	SbMix	SbDom	UplCe
T1	31,437	53,453	65,549	66,897	22,361	81,929	139,691	37,038	47,749	91,095	57	129,609	63,380	191,901	3,622
T2	30,546	53,041	63,657	58,798	23,527	69,836	127,627	41,558	49,800	107,998	6,467	128,443	69,539	189,125	3,391
T3	36,504	48,369	54,086	56,116	29,662	57,531	119,241	48,883	51,023	114,688	15,277	122,033	73,680	190,840	3,365
T4	38,161	35,249	51,510	55,907	31,925	50,085	119,510	52,891	51,443	117,117	20,501	119,695	76,458	195,864	3,274
T5	45,444	26,582	40,997	57,403	32,791	43,757	122,523	60,724	48,373	117,135	20,501	118,829	82,736	196,878	3,259
T6	48,256	21,126	35,250	62,201	35,352	38,070	123,029	69,321	41,301	113,256	22,096	116,268	88,226	200,916	3,262
T7	54,326	18,331	26,352	60,845	37,164	35,532	125,761	72,905	36,794	119,988	22,096	113,045	87,750	203,722	3,321
T8	54,477	17,288	24,592	66,292	39,066	37,037	115,657	73,084	36,495	119,051	22,096	111,142	91,762	206,526	3,363
T9	57,035	15,384	21,193	66,847	42,307	37,470	107,394	74,322	36,703	122,286	22,993	107,902	94,701	207,968	3,428
T10	55,950	13,271	18,590	66,159	45,956	37,534	109,055	78,244	37,788	114,435	24,774	104,253	103,056	205,423	3,444
T11	57,380	11,798	16,147	65,677	47,588	33,986	112,717	81,900	39,396	108,518	26,413	102,620	110,156	200,134	3,499
T12	60,669	11,719	14,423	70,163	51,163	34,068	109,175	82,387	40,774	102,251	26,413	99,045	110,403	201,746	3,531
T13	67,539	11,653	11,655	69,601	48,799	35,927	105,081	82,617	40,703	104,742	27,880	101,410	109,142	197,773	3,407
T14	72,679	11,901	11,017	70,833	51,806	33,761	104,487	85,711	39,825	100,306	27,880	98,403	110,881	195,020	3,422
T15	73,137	10,998	12,448	70,699	49,613	32,721	102,648	85,445	37,859	100,038	27,880	100,596	119,081	191,295	3,474
T16	76,073	9,553	11,817	69,048	50,689	32,574	97,468	88,494	34,320	101,752	27,880	99,520	123,913	191,295	3,533
Run 503 (planned operations) (ha)															
Term	BFMix	BwDom	HRMXB	HRMXP	OcLow	HRDOM	CONMX	PJMIX	PjDom	PoDom	PrwMx	SbLow	SbMix	SbDom	UplCe
T1	31,025	53,493	67,182	69,076	22,379	81,969	141,890	35,796	46,832	91,101	57	129,629	62,173	189,554	3,579
T2	29,606	56,971	61,269	64,010	26,611	75,449	126,560	40,991	49,489	102,782	5,406	125,234	69,413	186,090	3,429
T3	36,586	51,872	56,239	55,976	33,520	60,882	120,351	48,584	50,487	106,508	16,331	118,108	71,797	190,775	3,349
T4	37,066	39,734	53,628	55,497	35,009	48,366	117,894	54,153	50,877	112,725	24,366	116,607	75,974	194,492	3,230
T5	45,397	30,752	43,185	54,270	36,514	39,192	122,784	60,181	49,384	109,542	31,247	115,093	77,954	199,086	3,217
T6	47,640	25,671	36,384	59,035	39,468	33,057	121,347	68,913	42,622	104,911	37,236	112,139	84,181	201,974	3,220
T7	54,877	21,720	26,372	57,762	45,237	30,562	124,115	72,905	41,263	106,867	37,236	106,370	84,771	204,462	3,279
T8	55,527	19,704	23,971	62,534	46,265	32,077	113,607	72,729	43,581	105,438	37,236	105,342	91,066	205,401	3,319
T9	57,726	18,324	20,425	59,853	50,393	32,204	104,453	72,476	45,780	110,003	42,867	101,214	92,540	206,137	3,401
T10	57,934	16,234	17,664	59,694	53,693	32,201	102,973	75,584	46,743	106,505	43,077	97,914	100,836	203,312	3,434
T11	58,170	13,952	15,688	59,507	54,888	31,455	106,281	78,097	47,515	100,518	43,533	96,719	110,421	197,563	3,491
T12	59,870	13,751	14,657	65,786	55,167	32,896	99,118	76,548	47,106	97,221	43,533	96,440	112,140	200,020	3,543
T13	64,140	13,176	12,753	64,297	51,841	32,490	93,946	76,196	45,194	101,776	43,605	99,766	117,916	197,270	3,433
T14	69,333	13,108	11,606	70,302	49,752	32,201	96,152	78,428	42,850	99,228	43,605	100,857	110,100	196,869	3,406
T15	69,982	12,902	11,857	72,805	48,253	32,184	94,933	78,120	41,055	96,967	43,605	102,357	115,467	193,852	3,458
T16	72,541	11,964	11,014	70,996	49,802	32,695	89,971	81,267	37,174	98,644	43,605	100,807	118,597	195,201	3,518
Percent difference across terms by forest unit between rn 229 and 503 (%)															
Term	BFMix	BwDom	HRMXB	HRMXP	OcLow	HRDOM	CONMX	PJMIX	PjDom	PoDom	PrwMx	SbLow	SbMix	SbDom	UplCe
T1	- 1	0	1	2	0	0	1	- 2	- 1	0	-	0	- 1	- 1	- 1
T2	- 2	4	- 2	4	6	4	- 0	- 1	- 0	- 2	- 9	- 1	- 0	- 1	1
T3	0	3	2	0	6	3	0	0	- 1	- 4	3	- 2	- 1	- 0	0
T4	- 1	6	2	- 0	5	- 2	- 1	1	- 1	- 2	9	- 1	- 0	- 0	- 1
T5	- 0	7	3	- 3	5	- 6	0	- 0	1	- 3	21	- 2	- 3	1	- 1
T6	- 1	10	2	- 3	6	- 7	- 1	- 0	2	- 4	26	- 2	- 2	0	- 1
T7	1	8	0	- 3	10	- 8	- 1	0	6	- 6	26	- 3	- 2	0	- 1
T8	1	7	- 1	- 3	8	- 7	- 1	- 0	9	- 6	26	- 3	- 0	- 0	- 1
T9	1	9	- 2	- 6	9	- 8	- 1	- 1	11	- 5	30	- 3	- 1	- 0	0
T10	2	10	- 3	- 5	8	- 8	- 3	- 2	11	- 4	27	- 3	- 1	- 1	0
T11	1	8	- 1	- 5	7	- 4	- 3	- 2	9	- 4	24	- 3	0	- 1	0
T12	- 1	8	1	- 3	4	- 2	- 5	- 4	7	- 3	24	- 1	1	- 0	0
T13	- 3	6	4	- 4	3	- 5	- 6	- 4	5	- 1	22	- 1	4	- 0	0
T14	- 2	5	3	- 0	- 2	- 2	- 4	- 4	4	- 1	22	1	- 0	- 0	0
T15	- 2	8	- 2	1	- 1	- 1	- 4	- 4	4	- 2	22	1	- 2	1	0
T16	- 2	11	- 4	1	- 1	0	- 4	- 4	4	- 2	22	1	- 2	1	0

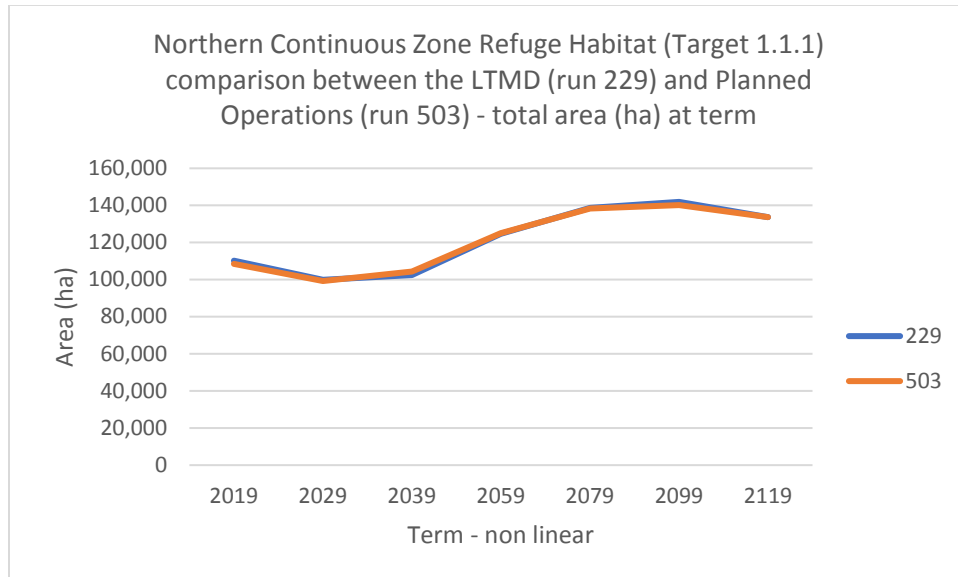
3 4.9.4 Assessment of Boreal Landscape Guide Indicators

4 The following section details the comparison of achievement of landscape guide targets between the
 5 LTMD (run 229) and planned operations (run 503)

6 The following three sections (4.9.4.1 Refuge – Target 1.1.1, 4.9.4.2 Winter Useable – Target 1.1.2, and
 7 4.9.4.3 Winter Preferred – Target 1.1.2) compare targets for caribou refuge, winter useable and winter
 8 preferred in the Northern Continuous Range. More detail can be obtained in section 3.6.15.1 Northern
 9 Continuous Range.

1 *4.9.4.1 Refuge – Target 1.1.1*

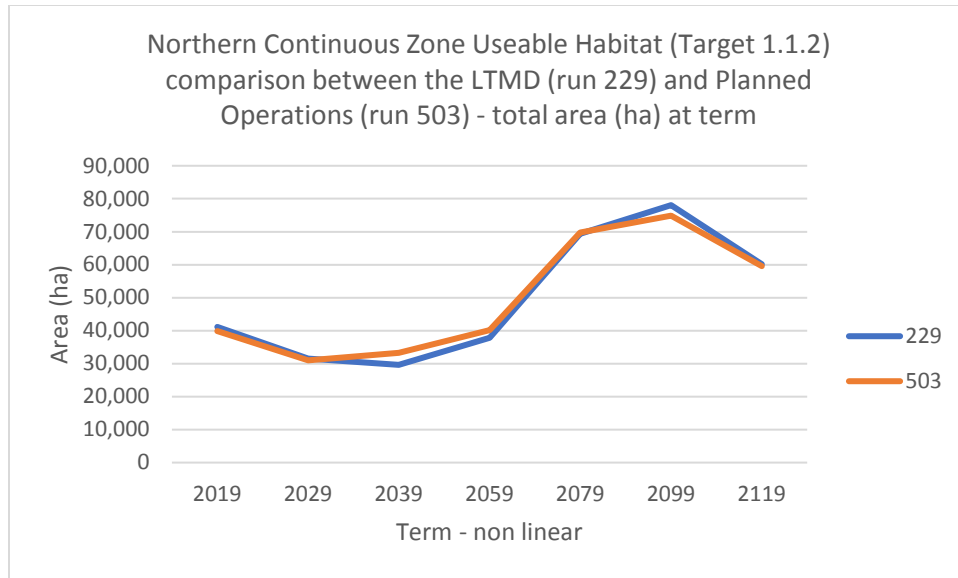
2 Figure 76 shows a comparison between the LTMD and planned operations. The planned operations very
 3 closely match the LTMD. This result is expected and is a function of defined harvest targets required for
 4 the implementation of the Dynamic Caribou Habitat Schedule (DCHS) in the Northern Continuous Zone.



5
 6 *Figure 76: Northern Continuous Zone Refuge Habitat (Target 1.1.1) comparison between the LTMD (run 229) and Planned*
 7 *Operations (run 503) - total area (ha) at term*

8 *4.9.4.2 Winter Useable – Target 1.1.2*

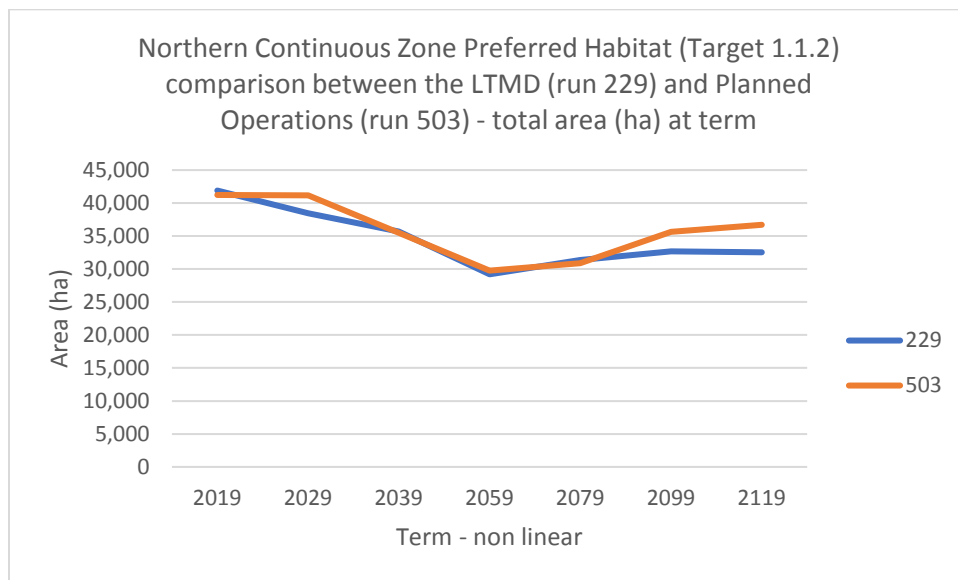
9 Figure 77 shows a comparison between the LTMD and planned operations. The planned operations very
 10 closely match the LTMD. This result is expected and is a function of defined harvest targets required for
 11 the implementation of the Dynamic Caribou Habitat Schedule (DCHS) in the Northern Continuous Zone.



1
 2 *Figure 77: Northern Continuous Zone Useable Habitat (Target 1.1.2) comparison between the LTMD (run 229) and Planned*
 3 *Operations (run 503) - total area (ha) at term*

4 *4.9.4.3 Winter Preferred – Target 1.1.2*

5 Figure 78 shows a comparison between the LTMD and planned operations. The planned operations very
 6 closely match the LTMD. This result is expected and is a function of defined harvest targets required for
 7 the implementation of the Dynamic Caribou Habitat Schedule (DCHS) in the Northern Continuous Zone.

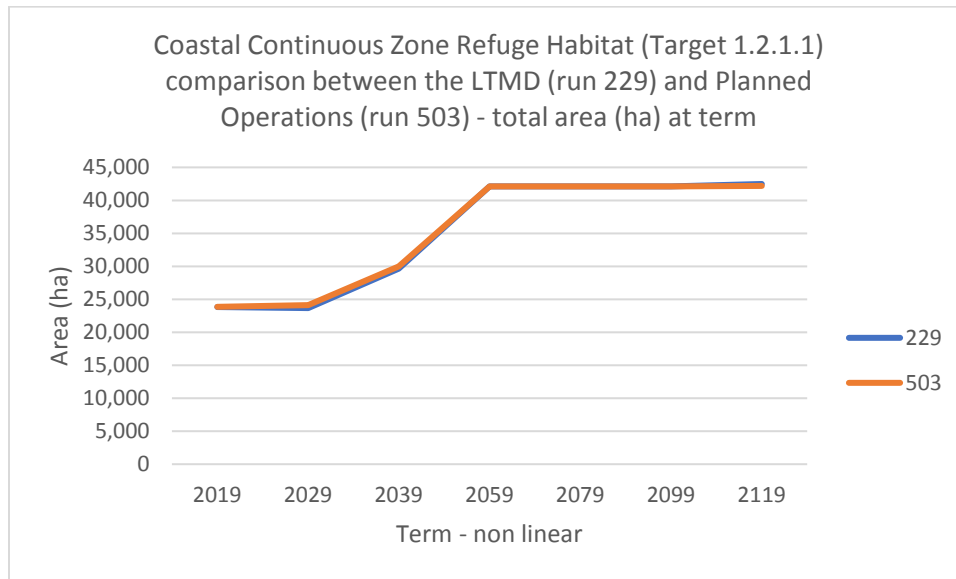


8
 9 *Figure 78: Northern Continuous Zone Preferred Habitat (Target 1.1.2) comparison between the LTMD (run 229) and Planned*
 10 *Operations (run 503) - total area (ha) at term*

11 *4.1.4.4 Coastal Refuge – Target 1.2.1.1*

12 Figure 79 shows a comparison between the LTMD and planned operations. The planned operations very
 13 closely match the LTMD. This result is expected and is a function of limited harvesting and harvest

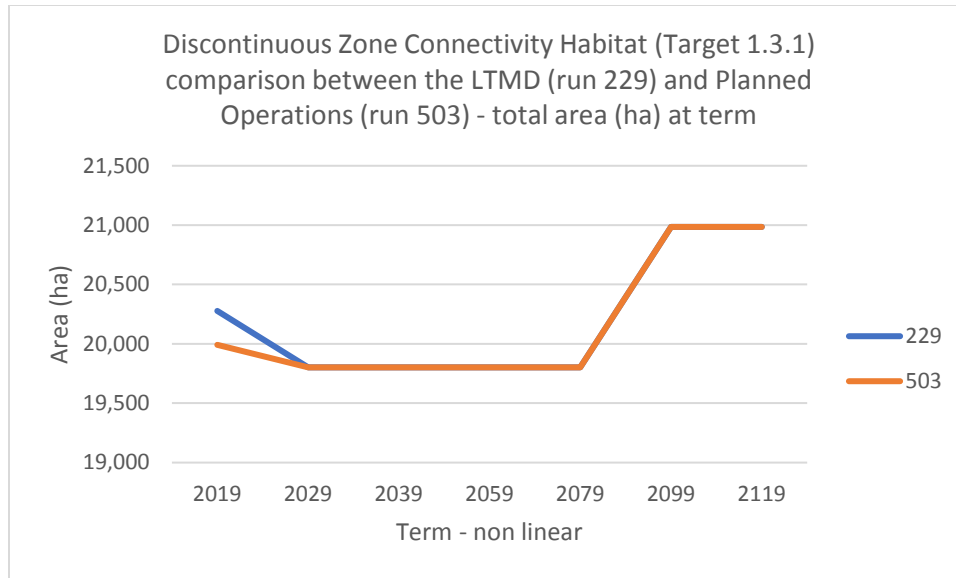
1 deferrals in the Coastal Continuous Zone. More details regarding the refuge target in the coastal
 2 continuous zone can be found in section 3.6.15.3 Coastal Continuous Zone – Objective 1.2.1.1.



3
 4 *Figure 79: Coastal Continuous Zone Refuge Habitat (Target 1.2.1.1) comparison between the LTMD (run 229) and Planned*
 5 *Operations (run 503) - total area (ha) at term*

6 *4.1.4.5 Discontinuous Zone Connectivity Habitat – Target 1.3.1*

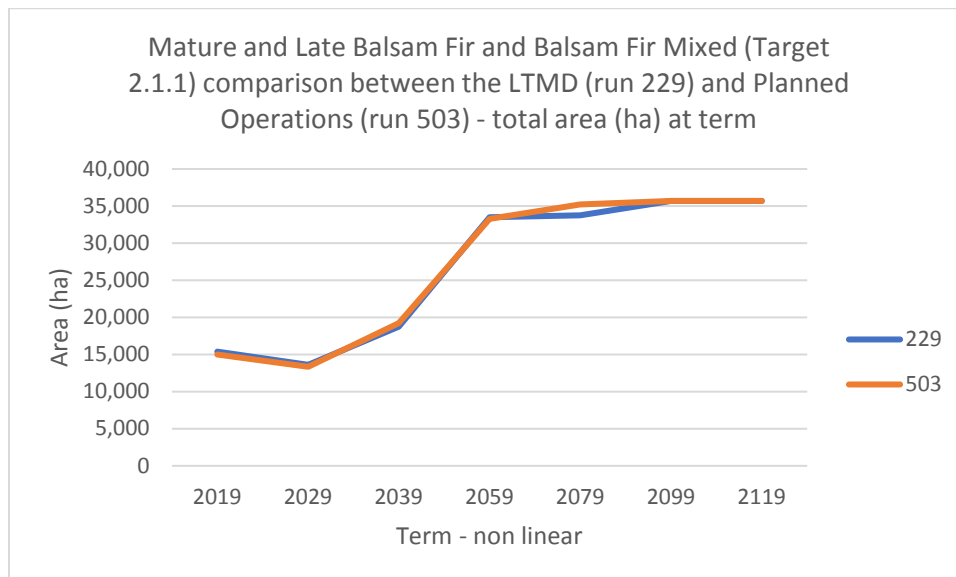
7 Figure 80 compares the online connectivity habitat within the discontinuous connectivity zone between
 8 the LTMD and planned operations. The planned operations very closely match the LTMD. This result is
 9 expected and is a function of defined harvest targets within the model. The variance at the beginning of
 10 term 1 is a result of the implementation of the 2-year (2019-2021) contingency plan. Whereby some of
 11 the scheduled harvest within the discontinuous connectivity zone had occurred in 2019-2021 and
 12 therefore showed as offline habitat in 2021-2031. The remainder of the scheduled harvest within the
 13 connectivity zone is planned to occur within the FMP (2021-2031) and culminates at the target level at
 14 the end of term 1.



1
 2 *Figure 80: Discontinuous Zone Connectivity Habitat (Target 1.3.1) comparison between the LTMD (run 229) and Planned*
 3 *Operations (run 503) - total area (ha) at term*

4 *4.1.4.6 Mature and Late Balsam Fir and Balsam Fir Mix – Target 2.1.1*

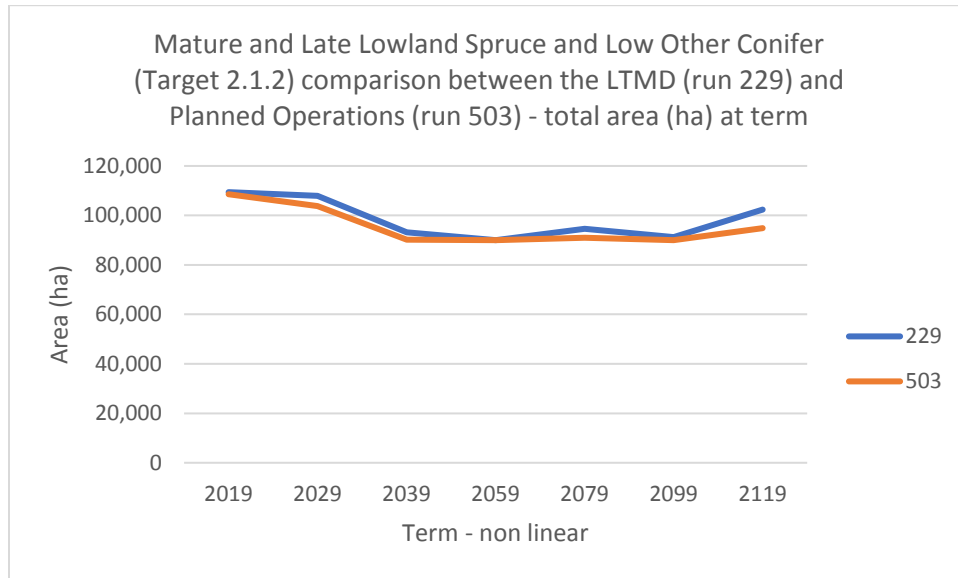
5 Figure 81 compares the area within the landscape class Mature and Late Balsam Fir and Balsam Fir Mix.
 6 The planned operations very closely match the LTMD, increasing slightly in 2079. The amount of area in
 7 this landscape increases very quickly in the sort term through succession within AOC’s and conservation
 8 reserves. Area begins to level off at 2059 when succession starts to breakup the old and mature fir into
 9 younger age late successional forest. For more information on this target see section 3.6.5 Mature and
 10 Late Balsam Fir and Balsam Fir Mixed – Objective 2.1.1.



11
 12 *Figure 81: Mature and Late Balsam Fir and Balsam Fir Mixed (Target 2.1.1) comparison between the LTMD (run 229) and*
 13 *Planned Operations (run 503) - total area (ha) at term*

1 *4.1.4.7 Mature and Late Lowland Spruce and Low Other Conifer - Target 2.1.2*

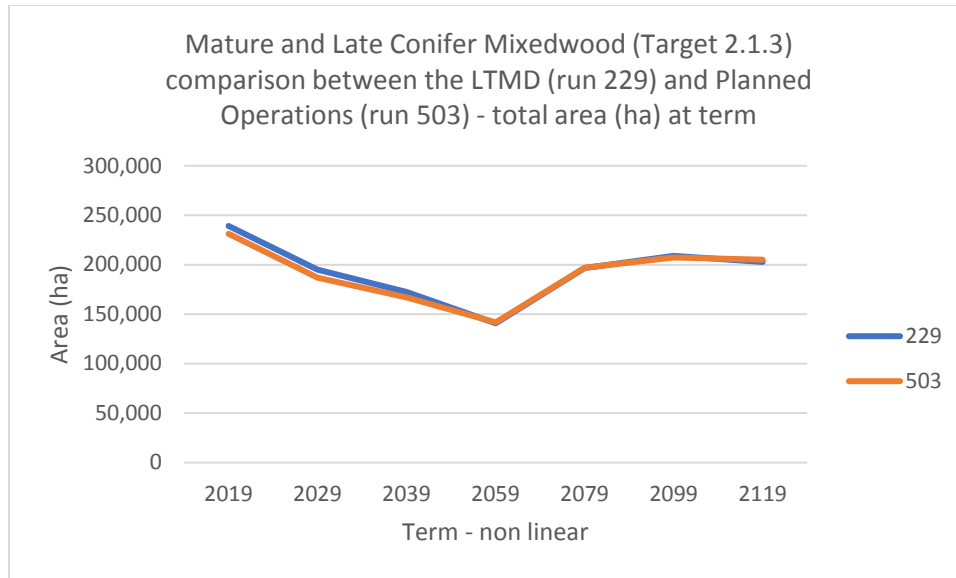
2 Figure 82 compares the area within the landscape class Mature and Late Lowland Spruce and Low Other
 3 Conifer. The planned operations very closely match the LTMD. The planned operations run (503)
 4 retains slightly less area in this landscape class across all terms, the targeted minimum area of
 5 142,853ha is never reached. Future strategic modeling and revision of targets will confirm progress
 6 towards desirable levels.



7
 8 *Figure 82: Mature and Late Lowland Spruce and Low Other Conifer (Target 2.1.2) comparison between the LTMD (run 229) and*
 9 *Planned Operations (run 503) - total area (ha) at term*

10 *4.1.4.8 Mature and Late Conifer Mixedwood - Target 2.1.3*

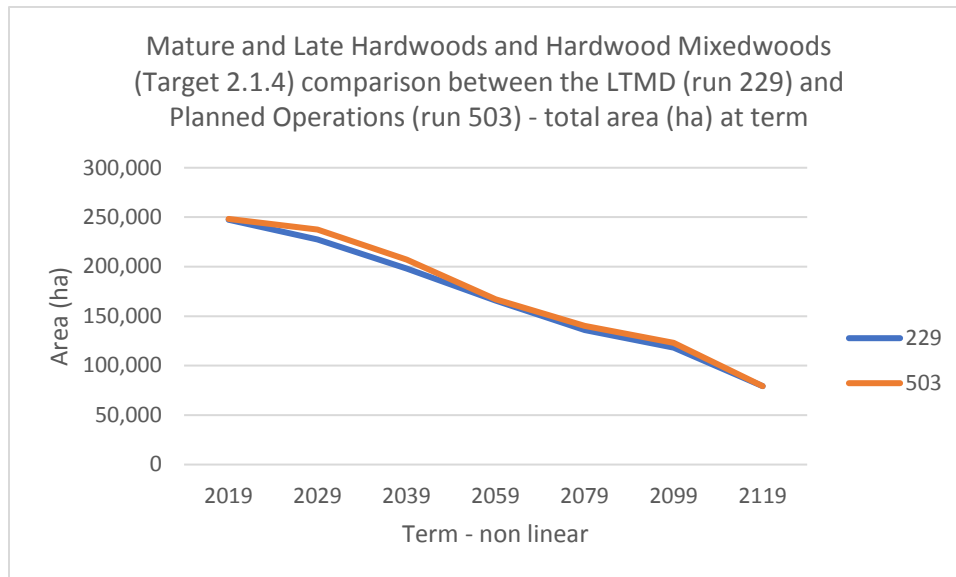
11 Figure 83 compares the area within the landscape class Mature and Late Conifer Mixedwood. The
 12 planned operations very closely match the LTMD. In general The planned operations run (503) retains
 13 slightly less area in this landscape class across all terms, however the target is still achieved in the long
 14 term.



1
 2 *Figure 83: Mature and Late Conifer Mixedwood (Target 2.1.3) comparison between the LTMD (run 229) and Planned Operations*
 3 *(run 503) - total area (ha) at term*

4 *4.1.4.9 Mature and Late Hardwoods and Hardwood Mixedwoods - Target 2.1.4*

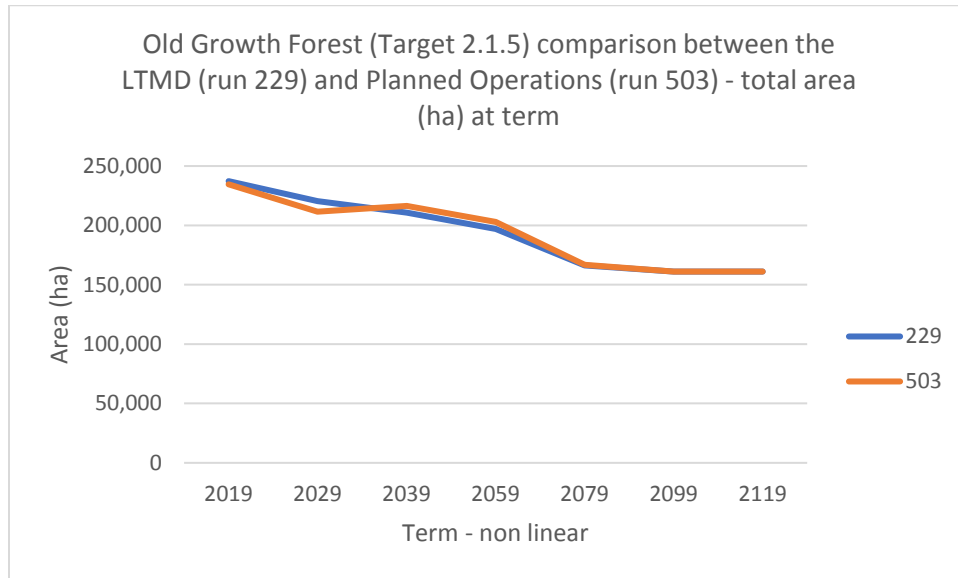
5 Figure 84 compares the area within the landscape class Mature and Late Hardwoods and Hardwood
 6 Mixedwoods. The planned operations very closely match the LTMD. In general, the planned operations
 7 retain slightly more are area in this landscape class than the LTMD, however the target is still achieved in
 8 the long term.



9
 10 *Figure 84: Mature and Late Hardwoods and Hardwood Mixedwoods (Target 2.1.4) comparison between the LTMD (run 229) and*
 11 *Planned Operations (run 503) - total area (ha) at term*

1 *4.1.4.10 Old Growth Forest - Target 2.1.5*

2 Figure 85 compares the area within the Old Growth Forest. The planned operations very closely match
 3 the LTMD. Strategic targets are still achieved in the short medium and long term.

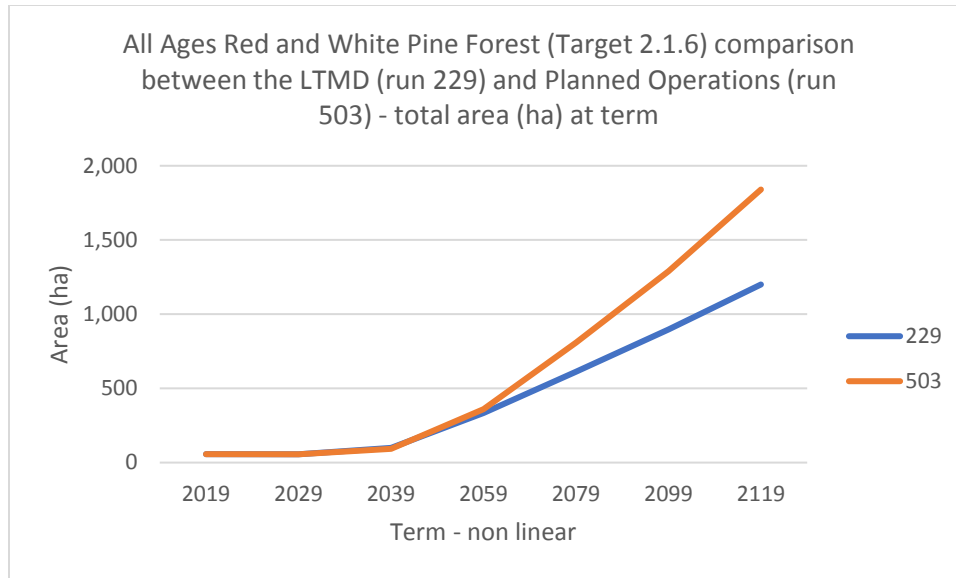


4

5 *Figure 85: Old Growth Forest (Target 2.1.5) comparison between the LTMD (run 229) and Planned Operations (run 503) - total*
 6 *area (ha) at term*

7 *4.1.4.11 All Ages Red and White Pine Forest - Target 2.1.6*

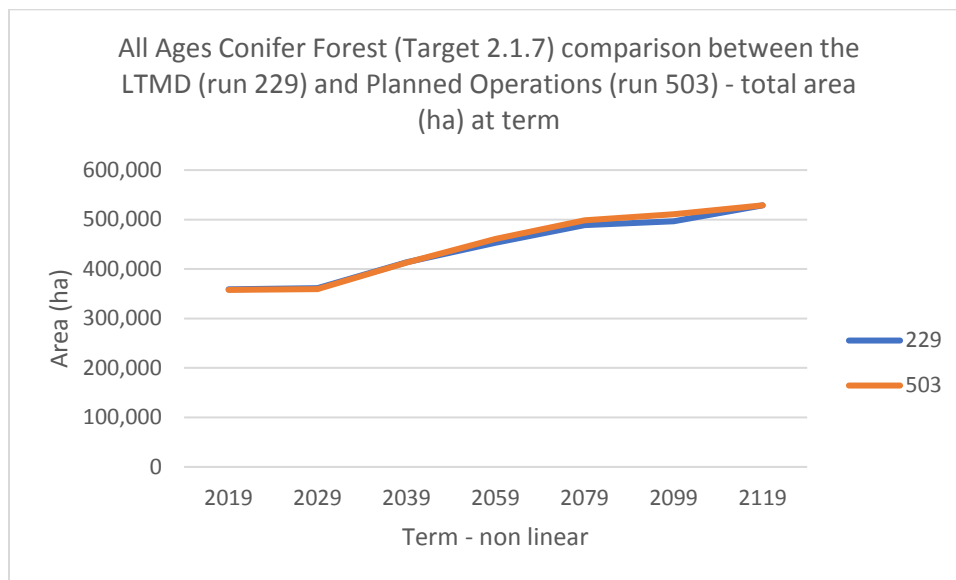
8 Figure 86 compares the area within the All Ages Red and White Pine Forest. Although when measured
 9 at 10, 20 and, 100 year intervals strategic targets are still only achieved in the long term, the area of Red
 10 and White Pine Neary doubles in the planned operations run 503. However, as the minimum targeted
 11 level is incredibly insignificant across the total landscape (1,128ha), doubling the area in the long run
 12 does not cause question or concerns, as it results from so few stands succeeding to a Red and White
 13 Pine condition.



1
 2 *Figure 86: All Ages Red and White Pine Forest (Target 2.1.6) comparison between the LTMD (run 229) and Planned Operations*
 3 *(run 503) - total area (ha) at term*

4 *4.1.4.12 All Ages Conifer Forest - Target 2.1.7*

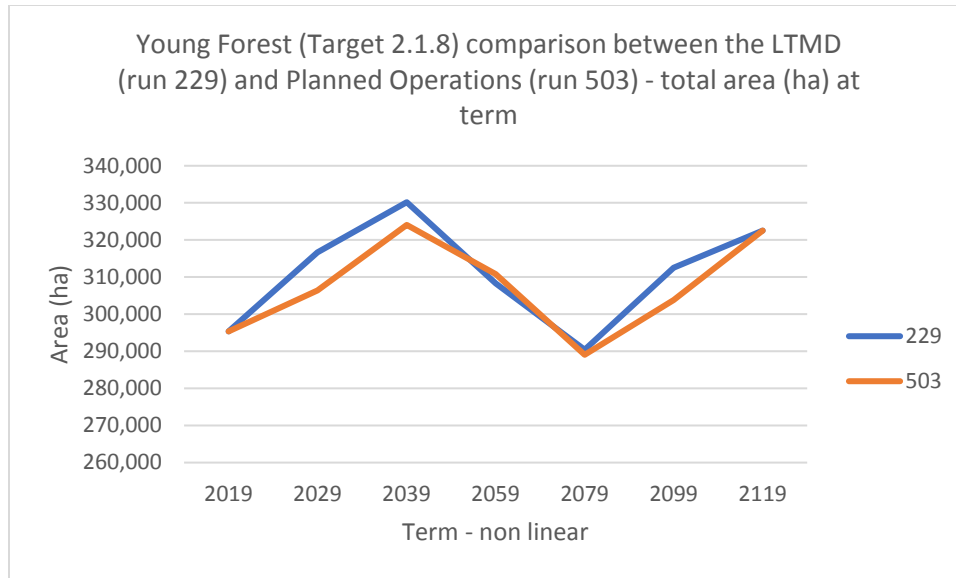
5 Figure 87 compares the area within the All Ages Conifer Forest. The planned operations very closely
 6 match the LTMD. In general, the planned operations retain slightly more are area in this landscape class
 7 than the LTMD, however the target is still achieved in the long term.



8
 9 *Figure 87: All Ages Conifer Forest (Target 2.1.7) comparison between the LTMD (run 229) and Planned Operations (run 503) -*
 10 *total area (ha) at term*

11 *4.1.4.13 Young Forest - Target 2.1.8*

12 Figure 88 compares the area within Young Forest. The planned operations follow a similar pattern to
 13 the LTMD. Regardless of deviations, targets are still achieved in the short, medium, and long term.



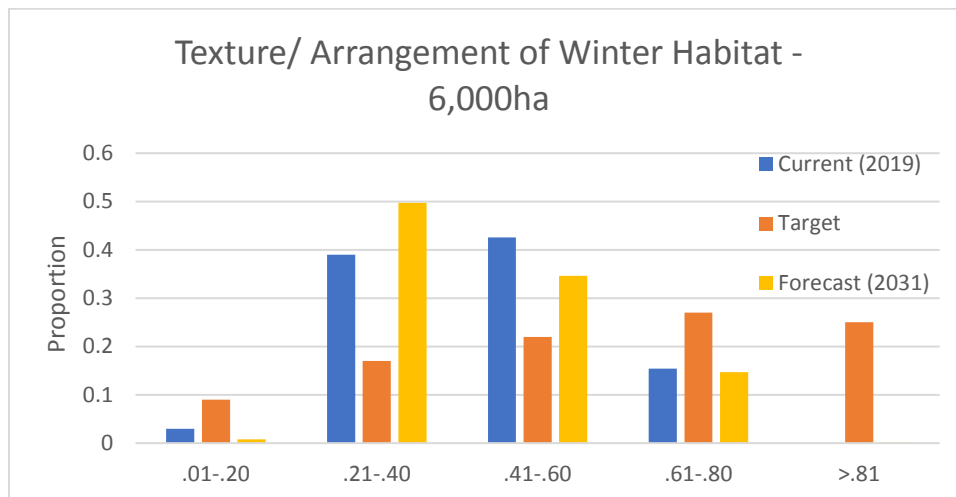
1
2 *Figure 88: Young Forest (Target 2.1.8) comparison between the LTMD (run 229) and Planned Operations (run 503) - total area*
3 *(ha) at term*

4 4.9.5 Pattern Indicators

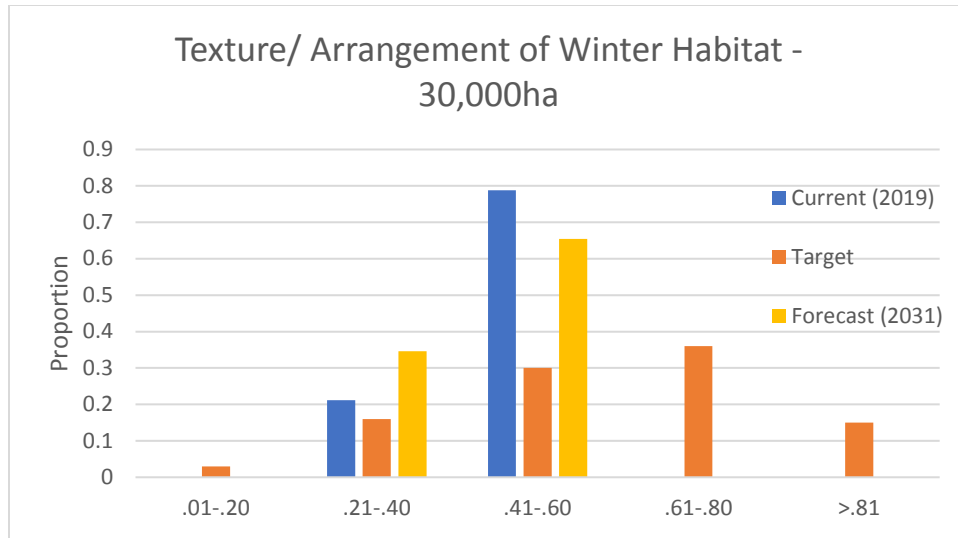
5 The following section compares the planned operations to the LTMD for the objectives and indicators
6 which are passed on pattern. More detailed information on these objectives can be found in section
7 3.6.13 Pattern.

8 *4.9.5.1 Texture and Arrangement of Caribou Winter Habitat – Target 1.1.3*

9 Figure 89 and Figure 90 provide the forecast of the texture and arrangement of Caribou winter habitat
10 at the end of the FMP (2031) compared to plan start, including the target composition. Figure 89 and
11 Figure 90 provide a forecast at 2 temporal scales, 6,000 and 30,000ha.



12
13 *Figure 89: Texture/ Arrangement of Winter Habitat - 6,000ha*

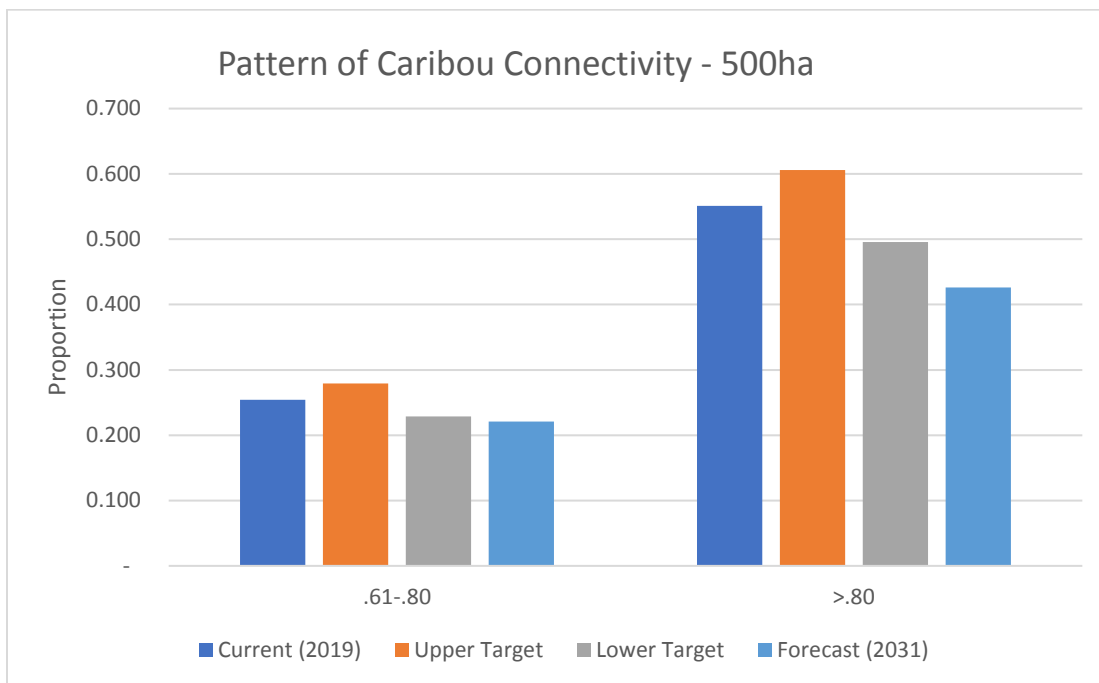


1

2 *Figure 90: Texture/ Arrangement of Winter Habitat - 30,000ha*

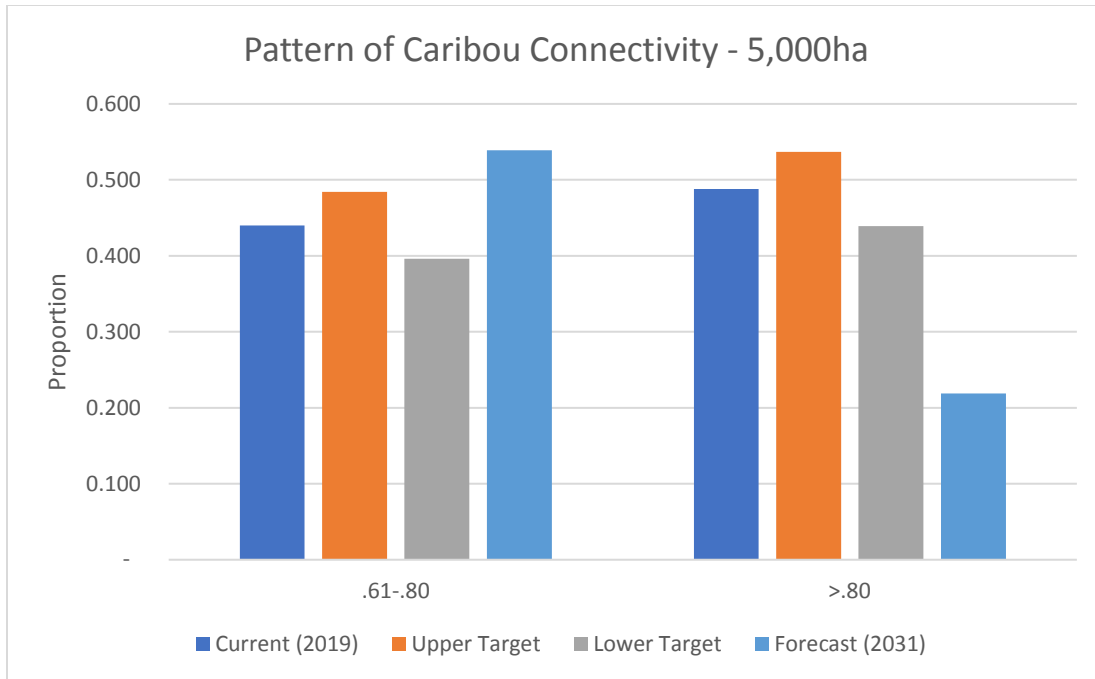
3 *4.9.5.2 Pattern of Caribou Connectivity – Target 1.3.2*

4 Figure 91 and Figure 92 provide the forecast of the texture and arrangement of habitat supporting
 5 Caribou Connectivity within the Discontinuous Zone (zone of caribou connectivity) at the end of the FMP
 6 (2031) compared to plan start, including the target proportions. Figure 91 and Figure 92 provide a
 7 forecast at 2 temporal scales, 500 and 5,000ha.



8

9 *Figure 91: Support Caribou Habitat Connectivity (Proportion of Mature and Old Forest) - 500ha*

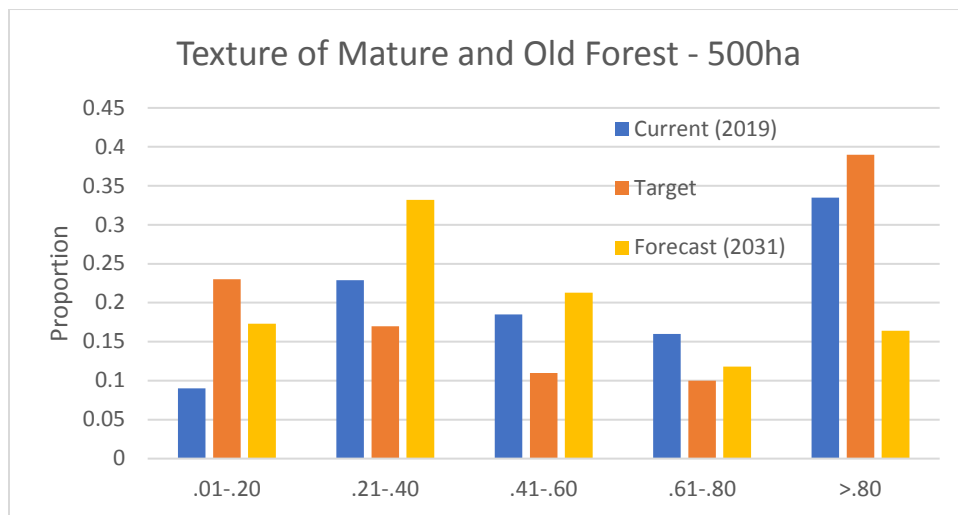


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2
3
4
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6
7

Figure 92: Support Caribou Habitat Connectivity (Proportion of Mature and Old Forest) - 5,000ha

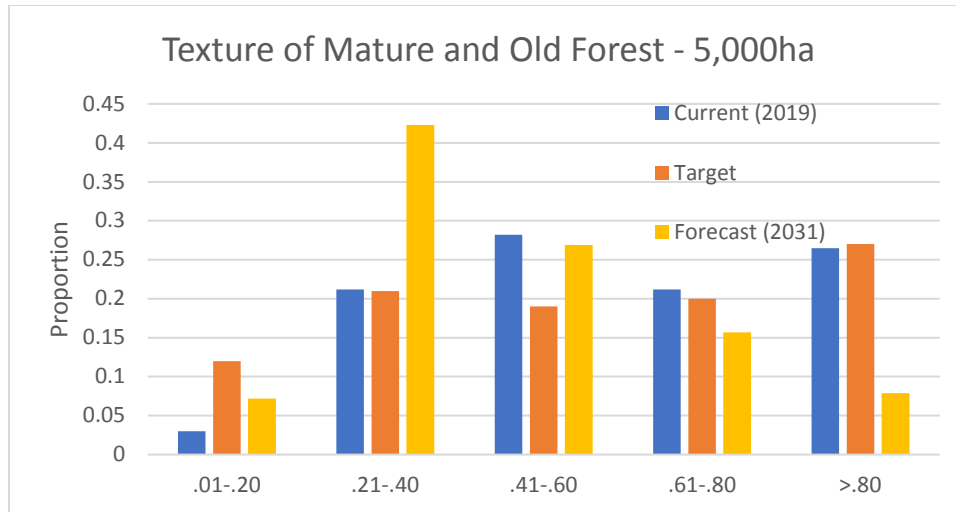
4.9.5.3 Texture of Mature and Old Forest – Target 3.1.1

Figure 93 and Figure 94 provide the forecast of the texture and arrangement of Mature and Old Forest at the end of the FMP (2031) compared to plan start, including the target composition. Figure 93 and Figure 94 provide a forecast at 2 temporal scales, 500 and 5,000ha.



8
9

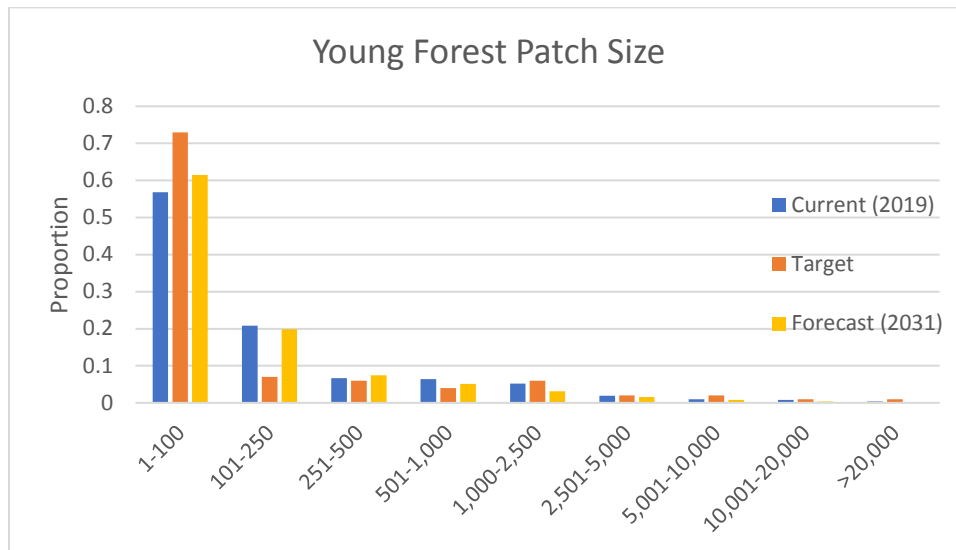
Figure 93: Texture of Mature and Old Forest - 500ha



1
2 *Figure 94: Texture of Mature and Old Forest - 5,000ha*

3 *4.9.5.4 Young Forest Patch Size – target 3.1.2*

4 Figure 95 provides the forecast of the patch size proportions of young forest at the end of the FMP
5 (2031) compared to plan start, including the target composition.



6
7 *Figure 95: Young Forest Patch Size*

8 **5.0 Determination of Sustainability**

9 The following section will provide a determination of sustainability which will consider the collective
10 achievement of objectives and will conclude that on balance, objectives are being achieved and progress
11 is being made toward the desired forest and benefits.

12 **5.1 Assessment of Sustainable Objective Achievement**

13 The Pic Forest Management Plan contains plan objectives designed to protect or enhance the ecological,
14 economic, and social values delivered from managed forests. Some objectives within the FMP were

1 developed through consultation with public or First Nations & Métis communities through processes like
 2 the Desired Forest and Benefits Meetings. Many of the plan objectives are prescribed through policy
 3 manuals such as the Boreal Landscape Guide, or Caribou Conservation Plan. Lastly, some objectives
 4 were collectively developed by the Planning Team.

5 Each objective is evaluated via an indicator. Objectives are often be designed to convey intent, or an
 6 overall desired service or function (e.x. Wetland ecosystems filtering and providing clean water).
 7 However, intent can be particularly difficult to measure, so indicators are developed as a proxy
 8 measurement to support the achievement of an objective. Indicators are included in Table FMP-10 and
 9 strive to provide an exact criterion to be measured, often at some given point in time (e.x. Harvest is
 10 measured and reported annually).

11 **5.1.1 Woodland Caribou Indicators**

12 The plan contains 5 primary indicators directly related to the enhancement or perpetuity of the boreal
 13 woodland caribou population across the Pic Forrest. Table 84 and Table 85 provide an overview of the
 14 woodland caribou indicators achievement. You can see that across all 5 indicators progress through
 15 implementation of the planned operations progress is made toward the desired forest and habitat
 16 conditions. Some objectives are not reached until the long term (100 years).

17 *Table 84: Woodland Caribou Indicators Matrix*

Target Number	Quick description and reference to FMP
1.1.1	Amount of caribou refuge habitat within the Northern Continuous Zone. FMP 4.9.4.1 Refuge – Target 1.1.1
1.1.2 (a)	Amount of caribou winter useable habitat within the Northern Continuous Zone. FMP section 4.9.4.2 Winter Useable – Target 1.1.2
1.1.2 (b)	Amount of caribou winter preferred habitat within the Northern Continuous Zone. FMP section 4.9.4.3 Winter Preferred – Target 1.1.2
1.2.1.1	Amount of caribou refuge habitat within the Coastal Continuous Zone. FMP section 4.1.4.4 Coastal Refuge – Target 1.2.1.1
1.3.1	Amount of connectivity habitat within the Zone of Connectivity. FMP section 4.1.4.5 Discontinuous Zone Connectivity Habitat – Target 1.3.1

18

1 *Table 85: Woodland Caribou Indicators Achievement*

Percent		Term										
Target	Case	1	2	3	4	5	6	7	8	9	10	11
1.1.1	LTMD	83%	75%	77%	83%	93%	100%	100%	100%	100%	100%	100%
	Operations	81%	74%	78%	84%	94%	100%	100%	100%	100%	100%	100%
1.1.2 (a)	LTMD	87%	67%	63%	70%	80%	100%	99%	92%	88%	100%	100%
	Operations	85%	66%	71%	76%	85%	100%	99%	93%	92%	100%	100%
1.1.2 (b)	LTMD	87%	80%	75%	61%	61%	63%	66%	69%	68%	76%	68%
	Operations	86%	86%	74%	62%	62%	63%	65%	69%	74%	81%	77%
1.2.1.1	LTMD	54%	54%	68%	77%	96%	96%	96%	96%	96%	96%	97%
	Operations	54%	55%	68%	78%	96%	96%	96%	96%	96%	96%	96%
1.3.1	LTMD	100%	98%	98%	98%	98%	98%	98%	100%	100%	100%	100%
	Operations	99%	98%	98%	98%	98%	98%	98%	100%	100%	100%	100%

2
3 **5.1.2 Landscape Class Indicators**

4 The plan contains 8 primary indicators directly connected to Landscape Classes as directed by the Forest
5 Management Guide for Boreal Landscapes. When compared to the LTMD, planned operations almost
6 never significantly deviate from target achievement. There are only 2 objectives where the natural range
7 of variation is failed to be achieved or maintained over the long term of the plan. They are described
8 below:

- 9 1. Mature and Late Balsam Fir and Balsam Fir Mix
 - 10 a. This grouping is defined as Balsam Fir leading forest units. At plan start, the Pic Forest is
11 within the expected natural range of variation (within target range). However, by term
12 5 (50 years into the future) falls outside of the target range and never recovers. This is
13 exclusively a cause of forest successional rules and application of Area of Concern (AOC)
14 no harvest reserves. As a late successional species, Balsam Fir appears in many stands
15 as they naturally succeed to later stage forest stands. Within the model, there are many
16 forest units which, at least in part, succeed to Balsam Fir leading at some age.
17 Additionally, application of AOC harvest reserves defines a proportion of the forest
18 where harvesting (forest manipulation) activates cannot occur. This causes a situation
19 where forest within AOC’s succeeds without intervention into a larger and larger
20 proportion of Balsam Fir leading old successional stands. This target will be re-assessed
21 every plan term. There is possibilities that our successional assumptions in the model
22 are not 100% accurate, or that natural disturbances will “re-set” no harvest reserves to
23 younger age classes. In either case, the strategic grown of Balsam Fir forest beyond its
24 target level may be delayed more than 50 years, or may never occur.
- 25 2. Mature and Late Lowland Spruce and Low Other Conifer
 - 26 a. This grouping is lowland ecosites containing mostly black spruce and cedar/larch. This
27 landscape class is below its natural range of variation at plan start and continues to
28 decline. The lower limit target for the Pic Forest for this landscape class is 152,853ha
29 (shown in Table 21). The common denominator for this landscape class is that these
30 sites occur on lowland (wet) ecosites. The analysis task team discovered that regardless

1 of tree cover, there are not enough lowland ecosites on the Pic Forest to meet the lower
 2 limit for this class. Therefore, the underachievement of this landscape class target is
 3 generally accepted as an error in the baseline predictive model. More information can
 4 be seen in section 3.6.6 Mature and Late Lowland Spruce and Low Other Conifer –
 5 Objective 2.1.2. Additionally, the application of the Dynamic Caribou Habitat Schedule
 6 in the Northern Continuous Caribou Zone inhibits the maintenance of the eligible low
 7 conifer forest stands. This target will be re-assessed every plan term. It is expected that
 8 by the next plan term, a new (more realistic) target range will be implemented into the
 9 strategic assessments.

10 Table 86 and Table 87 provide an overview of the Landscape Classes indicators achievement.

11 *Table 86: Landscape Class Indicators Matrix*

Target Number	Quick description and reference to FMP
2.1.1	Amount of Mature and Late Balsam Fir and Balsam Fir Mix. FMP section 4.1.4.6 Mature and Late Balsam Fir and Balsam Fir Mix – Target 2.1.1
2.1.2	Amount of Mature and Late Lowland Spruce and Low Other Conifer. FMP section 4.1.4.7 Mature and Late Lowland Spruce and Low Other Conifer - Target 2.1.2
2.1.3	Amount of Mature and Late Conifer Mixedwood. Section 4.1.4.8 Mature and Late Conifer Mixedwood - Target 2.1.3
2.1.4	Amount of Mature and Late Hardwoods and Hardwood Mixedwoods. FMP section 4.1.4.9 Mature and Late Hardwoods and Hardwood Mixedwoods - Target 2.1.4
2.1.5	Amount of Old Growth Forest. FMP section 4.1.4.10 Old Growth Forest - Target 2.1.5
2.1.7	Amount of All Ages Conifer Forest. FMP section 4.1.4.12 All Ages Conifer Forest - Target 2.1.7
2.1.6	Amount of All Ages Red and White Pine Forest. FMP section 4.1.4.11 All Ages Red and White Pine Forest - Target 2.1.6
2.1.8	Amount of Young Forest. FMP section 4.1.4.13 Young Forest - Target 2.1.8

12

13 *Table 87: Landscape Class Indicators Achievement*

Percent		Ten										
Target	Case	1	2	3	4	5	6	7	8	9	10	11
2.1.1	LTMD	100%	100%	100%	100%	57%	54%	57%	59%	54%	54%	54%
	Operations	100%	100%	100%	100%	58%	54%	55%	56%	54%	54%	54%
2.1.2	LTMD	72%	71%	61%	59%	59%	59%	62%	60%	60%	65%	67%
	Operations	71%	68%	59%	59%	59%	59%	60%	59%	59%	61%	62%
2.1.3	LTMD	100%	97%	85%	78%	70%	79%	97%	100%	100%	100%	100%
	Operations	100%	93%	83%	75%	70%	80%	98%	100%	100%	100%	100%
2.1.4	LTMD	32%	35%	40%	45%	48%	53%	58%	61%	67%	82%	100%
	Operations	32%	33%	38%	42%	47%	52%	57%	61%	64%	79%	100%
2.1.5	LTMD	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Operations	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
2.1.7	LTMD	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Operations	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
2.1.6	LTMD	69%	69%	79%	84%	87%	92%	94%	95%	95%	99%	100%
	Operations	69%	69%	79%	84%	89%	93%	96%	97%	98%	100%	100%
2.1.8	LTMD	100%	100%	98%	100%	100%	100%	100%	100%	100%	100%	100%
	Operations	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

1

2 Some Landscape class indicators have additional pattern targets. These targets can be found in section
3 4.9.5 of the FMP.

4 **5.2 Assessment of Spatial Sustainability**

5 The Pic Forest FMP includes targets to assess and monitor spatial targets. Many important concepts in
6 landscape ecology (e.g., fragmentation, edge effect, corridors and connectivity, metapopulation
7 dynamics, reverse size) are related to pattern as well as amount of area. Numerous studies identified
8 differences in landscape patterns resulting from forest harvest when compared to fire disturbances.
9 Results vary depending on scale of measurement and spatial proximity rules for defining “disturbances”.
10 Differences in opinion exist about the importance of landscape pattern biodiversity conservation.
11 Whereas there is not yet a definite answer on whether the primary importance of habitat is its amount,
12 regardless of arrangement, or a factor of amount by arrangement. Therefore, although operations are
13 designed to move toward spatial means, the primary goal at this early stage in spatial planning is to
14 begin a record to documenting spatial arrangement for future use.

15 Pattern objectives are related in many ways to habitat provided for wildlife persisting in both interior
16 forest environments, and forest edge environments. Results are often outcomes of different forest
17 management actions such as having large or small areas. Pattern and connectivity objectives mean
18 different things to different species and are designed to provide habitat requirements for a wide range
19 of species.

20 The assessments in section 4.9.5 Pattern Indicators provides a summary of how implementation of the
21 planned operations will influence pattern objectives. At this stage, without the use of long term spatial
22 modeling, it has been agreed by professionals (foresters and biologists) that operations should yield a
23 outcome improving the spatial arrangement of habitat across the forest (in very general terms, creating
24 larger forest disturbance patterns). These objectives will be re-assessed every plan term to confirm this

1 assumption. It is expected that future plans will implement spatial modeling and will therefore provide
2 a more long-term assessment of spatial arrangement through time.

3 5.3 Assessment of Social and Economic Sustainability

4 The FMP contains a social and economic assessment in section 3.7.5 Social and Economic Assessment to
5 determine what, if any, impacts the LTMD and implementation of the FMP would have on forest sector
6 and other forest based industries.

7 An assessment of harvest and forecast volume deliveries and silvicultural expenditures between the
8 LTMD and Planned Operations shows very little variation. Therefore, the expected benefits to economic
9 stability across the region should be observed through the implementation of the FMP, subject to the
10 risks present with not achieving the full plan implementation.

11 5.4 Risks to Sustainability

12 Section 3.7.6 Risk Assessment was completed as part of the development of the LTMD. The risk
13 assessment considered the following:

- 14 • Forest cover and diversity
- 15 • Economic
- 16 • Social
- 17 • Silviculture

18 There are always risks associated with not fully achieving the proposed LTMD that could impact the
19 future forest condition and the benefits from the forest. Some of these risks are inherent or obvious
20 (i.e. Economic) while others are less tangible or easy to define (e.g. Wildlife habitat). Some of these
21 risks may have an immediate impact and some risks may have long term or little to no impact.

22 The planned operations were created to provide the most optimal “harvesting chance” and therefore,
23 the greatest likelihood that the Planned Operations may be fully achieved. However, risks evolve and
24 change as time progresses, some of the risks identified in the assessment may not be as obstructive in
25 the future as they are today. There may also be unknow-unknowns whereas future risks are unknow to
26 us, or will only occur in the future. In the very late planning stages of this FMP, the world Covid-19
27 pandemic gripped the country and at the time was a previously unknow risk which very obviously had an
28 affect on the forest industry.

29 Overall, the risks to sustainability appear to be manageable. The benefits from plan implementation
30 should be observed as operations progress over the next 10-years. These targets and risks will be re-
31 assessed every plan term. It is expected that future management plans will include more flexible and
32 nimble policies which will allow for even greater risk mitigation. This type of change will be particularly
33 useful when facing seemingly existential risks such as climate change, or world population and
34 food/water supply chain risks.

35 5.5 Conclusion

36 Based on the assent of objective achievement and comparison to the LTMD, the Pic Forest FMP is
37 progressing toward the desired forest conditions. Plan implementation is forecast to yield numerous
38 economic and social benefits to the region and forest industry, and risks to the plan completion seem to

1 be manageable. All the conditions and assumptions within the plan are in agreement with provincial
2 policy's and the Crown Forest Sustainability Act.

3 The implementation of the Pic Forest FMP provides for the sustainability of the Crown Forest.

4 6.0 Documentation

5 The following sections detail the other documentation submitted with the FMP.

6 6.1 Supplementary Documentation

7 Supplementary documentation is included within this FMP. The following is located within the
8 supplementary documentation file titled "MU966_2021_FMP_TXT_SUPDOC"

9 6.2 Other Documentation

10 There is no other documentation submitted with this FMP.

11 7.0 Forest Management Plan Summary

12 A forest management plan summary is included within this FMP, is located within the file titled
13 "MU966_2021_FMP_TXT_Sum"

14 8.0 Forest Management Plan Tables

15 This Plan contains FMP Tables FMP-1 to FMP-20 and are included in the file
16 "MU966_2021_FMP_TBL_TABLES".