Timiskaming Forest
2021-2031
Forest Management Plan

Plan Text

FOREST MANAGEMENT PLAN
for the
TIMISKAMING FOREST

MNRF Kirkland Lake and Timmins District, Northeast Region
Timiskaming Forest Alliance Inc.

for the 10-year period from April 1st, 2021, to March 31st, 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 Forest Information Manual.

[R.P.F. Seal]

Aaron Palmer, R.P.F.
Plan Author
Timiskaming Forest Alliance Inc.

Date

Submitted by:

Yves Vivier, R.P.F.
General Manager
Timiskaming Forest Alliance Inc.

Date

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 the forest management plan has been prepared using the applicable forest management guides. In this forest management 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:

Mike Mazzetti,
MNRF Kirkland Lake District Manager

Date

Mike Mazzetti — Date
A/MNRF Timmins District Manager

Paul Bernier, R.P.F. — Date
A/MNRF Regional Resources Manager

Approved by:

Andy Lock — Date
A/MNRF Northeast Regional Director

The signed approval pages are available at the Kirkland Lake District Office and the office of Timiskaming Forest Alliance Inc.

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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.

Laurie Nuhn, R.P.F.	Management Forester	2.2, 6.1.5, 6.1.10
Name	Job Title	Sections prepared
Signature	Date	

Bertha Cormier	Resource Liaison Specialist	6.1.3, 6.1.4
Name	Job Title	Sections prepared
Signature	Date	

Derrick Romain	Regional Planning Biologist	6.1.17
Name	Job Title	Sections prepared
Signature	Date	

Samuel Nsiah, R.P.F.	Regional Planning Forester	3.7.5
Name	Job Title	Sections prepared
Signature	Date	

Leah Marinigh	KL District Biologist	2.1.4.1 & 2.1.4.2
Name	Job Title	Sections prepared

Signature	Date

John Burak	TFAI Operations Manager	6.1.16
Name	Job Title	Sections prepared

Signature	Date

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All silvicultural treatments in the silvicultural ground rules which are exceptions to the recommendations in the silvicultural guides, and all operational prescriptions for areas of concern which are exceptions to the specific direction or recommendations (standards and guidelines) in the applicable forest management guides, are provided in this list of exceptions. There are no exceptions documented in this Forest Management Plan.

Description of Exception	Specific Section of Plan

FOREST MANAGEMENT PLAN

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PLANNING TEAM MEMBERS

Aaron Palmer, R.P.F., Plan Author
Mike Liukko, R.P.F., Project Manager
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Leah Marinigh, Management Biologist, Kirkland Lake District
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Bertha Cormier, Resource Liaison Officer
Bruce Jewitt, Kirkland Lake Local Citizen Committee Representative
Cathy Yandeau, Matachewan First Nation Representative
Sarah Janson, Wahgoshig First Nation Representative
Jaime Hennessey, Beaverhouse Aboriginal Community Representative
Tim Harvey, Mattagami First Nation Representative
Robin Koistinen, Temagami First Nation and Teme-Augama Ansihnabai (TAA) Representative
Tara Dantouze, Timiskaming First Nation
Ashley Taylor, Atikameksheng Anishnawbek Representative
Ross Assinewe – Sagamok Anishinawbek Representative
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Chad Anderson	A/ Resource Management Supervisor
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Andrea Ellis Nsiah	A/ District Planner
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Natalie Dulude, R.P.F.	Management Forester

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Derrick Romain	Regional Planning Biologist
Kim Mahon	Regional Planning Biologist
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Todd Copeland	Species at Risk Specialist
Justin Standeven	Regional Planner
Robert Fournier	Regional GIS Officer
Renee Bellini	Cultural Heritage Specialist
Gordon Kayahara	Forest Science Specialist
Alex Howard	Regional Lands Specialist
Derek Seim	Regional Aggregates Specialist
Paul Glassford	Senior Advisor, Forest Environmental Assessment, Forest Management Planning Section
TBD	EFR Fire Science Specialist
Edward Morris	Ontario Parks Planner/Zone Ecologist
Catherine Daniels	North East Regional Land Use Geologist
James Antler	Policy Advisor, Tourism Policy & Development
Lindsey Russell, R.P.F	Forest Science Specialist

LOCAL CITIZEN'S COMMITTEE MEMBERS

Kirkland Lake Local Citizens Committee

LCC Member & Alternate	Affiliation
Bruce Jewitt (Chair)	General Public – Southern Half
Bill Smith	Naturalists
Dave Allen	Anglers & Hunters – East
Tom Monahan	General Public – Northern Half
Tom Woollings	Local Business
Paula Mangotich	Municipalities
Urs Brunner	Tourism Industry
Garrett Pechinger, Jacob Mazzetti (Alt)	Forest Industry
Jimi Mauer	Beaverhouse Aboriginal Community
Cathy Yandeau	Matachewan First Nation
Mike Guimond	Golden Corridor Snowdrifters
Dave Featherstone	Anglers & Hunters (West)
Jerry Mikovitch	Town of Englehart Council

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Name and Position	Role and Responsibility
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Laurie Nuhn, R.P.F. - Kirkland Lake District Management Forester	Operational Review, Preliminary Review
Gail Ballak, R.P.F. - Timmins District Management Forester	Operational Review, Preliminary Review
Natalie Dulude R.P.F. – Timmins District Management Forester	Operational Review, Preliminary Review
Derrick Romain - Regional Planning Biologist	Operational/Advisory Review, Preliminary Review
Kim Mahon - Regional Planning Biologist	Operational/Advisory Review, Preliminary Review
Leah Marinigh - Kirkland Lake District Management Biologist	Operational Review, Preliminary Review
Tarryn Adams - Timmins District Management Biologist	Operational Review, Preliminary Review
Ashley Elliott - Kirkland Lake District Fish & Wildlife Technical Specialist	Operational Review
Barb Burkhardt - Timmins District Fish & Wildlife Technical Specialist	Operational Review

Name and Position	Role and Responsibility
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Geoffrey St. Cyr - Kirkland Lake District Lands & Water Technical Specialist	Operational Review
LeeAnn Lepage - Timmins District Lands & Water Technical Specialist	Operational Review
Rick Gordon – A/ Kirkland Lake District Planner	Operational/Advisory Review
Andrea Ellis Nsiah – Timmins A/ District Planner	Operational/Advisory Review
Craig Fuller - Kirkland Lake District Integrated Resource Management Technical Specialist	Operational Review
Derek Farrer - Timmins District Integrated Resource Management Technical Specialist	Operational Review
Justin Rowberry – Timmins District Aggregate Technical Specialist	Operational Review
Michael Pratt – Kirkland Lake District Aggregate Technical Specialist	Operational Review
Amanda Rantala – Timmins District GIS Data Technician	Operational Review
Karl Labrosse – Timmins District GIS Data Technician	Operational Review
Christale Barrette – A/ GIS Data Technician	Operational Review
TBD - Park Superintendent	Operational Review
Justin Standeven, Regional Planning Coordinator	Operational/Advisory Review
Bertha Cormier - Kirkland Lake District Resource Liaison Specialist	Operational/Advisory Review
Andrea Ellis Nsiah – A/ Timmins District Resource Liaison Specialist	Operational/Advisory Review
Ed Morris - Senior Regional Parks Planner	Operational/Advisory Review
Mark Austin, R.P.F., Forest Management Planning Specialist	Advisory Review
Krish Homagain - Regional Analyst	Operational/Advisory Review, Preliminary Review
Alex Howard, Regional Lands Specialist	Advisory Review
Derek Seim, Regional Aggregates Specialist	Advisory Review
Heather Farrer,R.P.F., Forest Industry Liaison Officer	Advisory Review

Name and Position	Role and Responsibility
TBD - EFR Fire Science Specialist	Advisory Review
Robert Fournier - Regional GIS Officer	Advisory Review
Gordon Kayahara, R.P.F., Regional Forest Science	Advisory Review
TBD - Regional Forest Operations Specialist	Operational/Advisory Review

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LIST OF SUPPLEMENTARY DOCUMENTATION

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- MU280_2021_FMP_TXT_SuppDoc.pdf

  List of Supplementary Documentation

  6.1.1 Analysis Package (see file MU280_2021_FMP_TXT_AnPack.pdf)
  6.1.2 Summary of Historic Forest Condition
  6.1.3 First Nation and Métis Background Information Report(s)
  6.1.4 Summary of First Nation and Métis involvement
  6.1.5 Social and Economic Description
  6.1.6 Monitoring Programs for Exceptions
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  6.1.8 Roads Supplementary Documentation
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  6.1.10 Summary of Public Consultation
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  6.1.12 Final List of Required Alterations
  6.1.13 Planning Team's Terms of Reference
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1.0 INTRODUCTION

The purpose of this forest management plan is to provide direction for the strategic management of the Timiskaming Forest and to outline specific forest management operations for the ten-year planning period of 2021 to 2031. The Timiskaming Forest Management Unit is primarily located within the Kirkland Lake and Timmins administrative districts of the Ministry of Natural Resources and Forestry. These two districts are located within the administrative Northeast Regional boundaries of Ontario. Small portions of the management unit extend into the Cochrane District (Walker Township) and Sudbury District (Haentschel, Howey). The Kirkland Lake District leads the administration for all Crown forest management activities within the Timiskaming Forest. The Kirkland Lake and Timmins Districts are two of nine administrative districts found within the Northeast Region (Figure 1).

In 1994, the Ministry of Natural Resources and Forestry (MNRF) in Kirkland Lake District entered into discussions with the local forest industry with the intent of encouraging those traditional competitors to pursue a partnership for the purpose of establishing a Sustainable Forest License (SFL). On April 1st, 1998, the SFL (No. 542247) was issued to Timiskaming Forest Alliance Inc. (TFAI), which is a legally incorporated company in the Province of Ontario (Ontario Incorporation No. 1182365). When established, TFAI was a true forest industry consortium ranging from small independent logging operators to large forest products producers, and these traditional competitors are now shareholders of the company. Today, TFAI includes a First Nation shareholder, and there are provisions for others to join the corporation if desired. The company conducts the everyday affairs of the SFL on behalf of the shareholders and its primary goal is to ensure the long-term health and sustainability of the Timiskaming Forest. The following is the Corporate Vision of the Timiskaming Forest Alliance Inc. as detailed in the companies Forest Policy Statement dated November 1st, 1999:

> "An Alliance of forest based companies striving to maximize benefits to the community by ensuring the future of the forest and their respective businesses"

The management responsibilities of the MNRF for the management unit consists of reviewing and approving all forest management activities prepared by the SFL holder. This includes the preparation and implementation of forest management plans, annual work schedule, annual reports, compliance plans and any associated audit requirements (e.g. independent forest audits). In addition to reviewing and approving all forest management activities, MNRF focuses on information management, providing forest policy and forest management compliance. In the case of the consortium of forest industry players, the main advantage of operating and managing the forest under this form of license is optimizing the sustainability of all resources in an effective and cost-efficient manner. Since its establishment in 1996, TFAI has developed an exemplary record of forest management planning, compliance monitoring and silviculture on the Timiskaming Forest. The 2004-2009 Independent Forest Audit for the Timiskaming Forest, recognized that "overall, quality of management of the Timiskaming Forest was very high". The report states that the

Timiskaming Forest was an exception to the economic recession which began in 2007, and stated that this is attributed "to several factors including good operational management, sound governance, and the fact that most of the mills to which the company supplies wood have remained operational during the economic downturn". TFAI has also demonstrated a strong commitment to the Timiskaming Region, its people and communities through its strong focus on local issues and efforts in promoting a vital forest-based economy and culture. Furthermore, TFAI's successful involvement in working with First Nations, other interest groups and forest-users has been recognized and continues.

On the effective date of the SFL, there were three separate Forest Management Plans (FMP's) governing three former Crown Management Units (CMU's) (Elk Lake, Watabeag and Timiskaming) that together, formed the original SFL area. On April 1st, 2001 the Timiskaming Forest Management Plan (2001-2021) was implemented and the management of the landbase as one defined forest area commenced.

In 2002, TFAI entered into discussions with MNRF with the intent of pursuing amalgamation of the ShiningTree Forest Management Unit into the Timiskaming Forest Management Unit. The recent history of the ShiningTree Forest was very comparable to that of the Timiskaming Forest, with both forest estates having a similar ecology as well as many shareholding companies in common. Prior to April 1st, 1997, the ShiningTree Forest was a Crown managed area administered by the Gogama Area office of MNRF's Timmins District. The management of the ShiningTree Forest became the responsibility of ShiningTree Forest Inc., (STFI) a company comprised of traditional operators on the former Crown Management Unit, similar in nature to those shareholders of TFAI. The SFL license (No. 542321) was issued to the company on April 1st, 1998 and on January 1st of that same year, STFI entered in a contract with E.B. Eddy Forest Products (later to become Domtar Inc. and now Eacom Timber Corp.) as agent of the licensee, for the purposes of managing the SFL on its behalf. On September 1st, 2003, the contract arrangement with Domtar Inc. was transferred to TFAI, who became the new agent of STFI for the purposes of managing the SFL. On April 1st, 2006 the amalgamated licensed area of the former Timiskaming and ShiningTree Forests was finalized concurrent with the approval of the 2006-2026 Timiskaming Forest Management plan and is referred today as the Timiskaming Forest. There have been no boundary changes to the management unit since 2006. Finally, in 2010, TFAI entered into a contractual arrangement with its employees who had formed a management company named First Resource Management Group Inc. (FRMG). FRMG now acts as agent to the licensee, TFAI for the purpose of managing the SFL on its behalf.

TFAI has a presence within and adjacent to the Timiskaming Forest, with offices in Kirkland Lake and Temiskaming Shores respectively (Figure 2). The SFL is a twenty-year license renewable every five years in conjunction with the completion of a sustainable forest management plan and subject to the results of an independent forest audit. The TFAI is responsible for all aspects of forest management from long-term strategic planning to annual implementation and reporting. The TFAI is responsible for the production of all forest management plans as well as implementing all aspects of access, harvest, renewal and

maintenance on the management unit. The Townships which fall within the Timiskaming Forest are depicted in Figure 3.

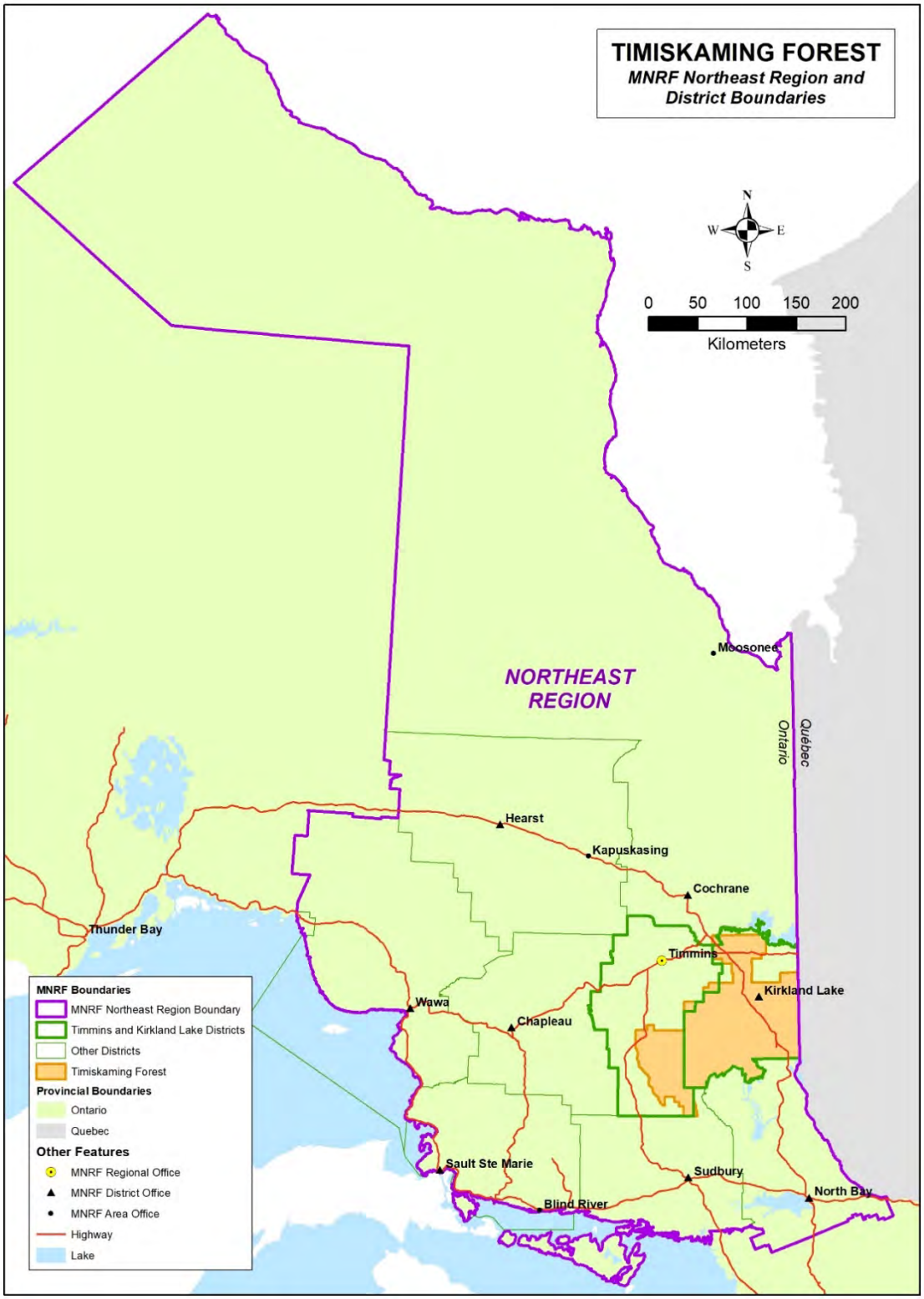

Figure 1. Northeast Administrative Region and Kirkland Lake and Timmins Administrative Districts.

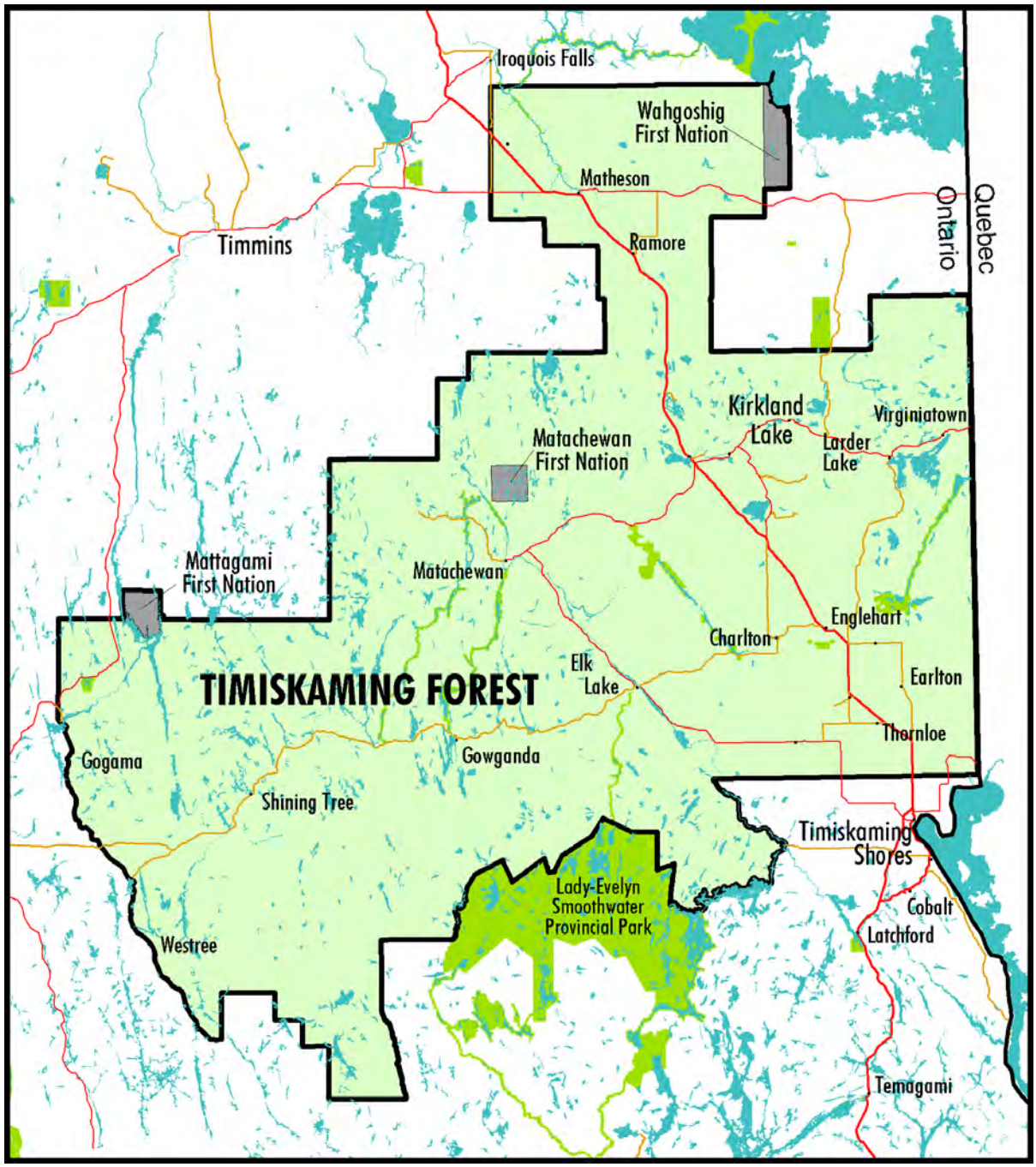

Figure 2. Timiskaming Forest Management Unit

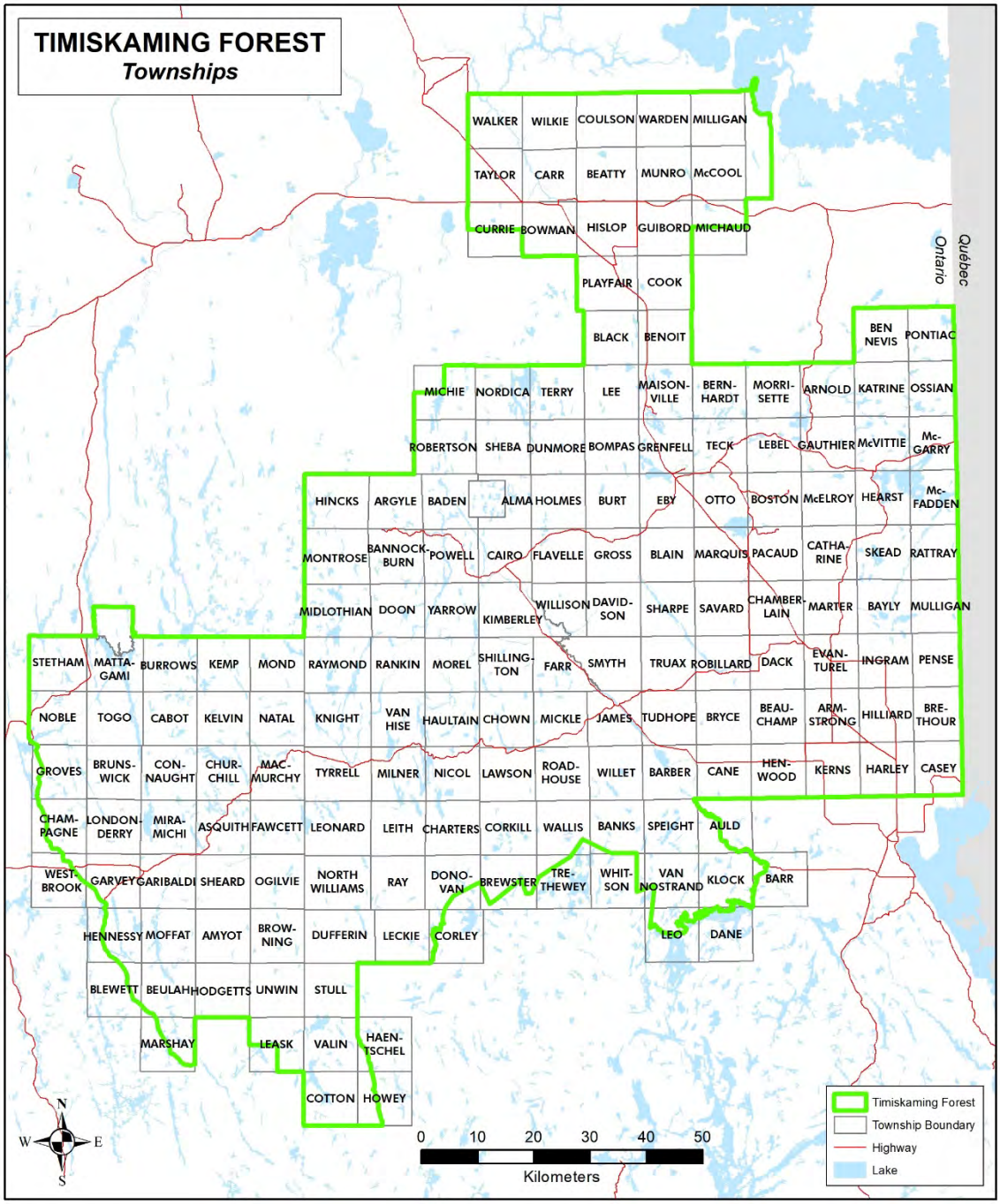

Figure 3. The Townships of the Timiskaming Forest

Section 6.1.16 of the Supplementary Documentation contains the Terms of Reference, which guided the planning team in the preparation of this forest management plan. Section 6.1.17 of the Supplementary Documentation contains a brief description of how MNRF's Statement of Environmental Values (SEV) under the *Environmental Bill of Rights, 1993*, as amended

from time to time, has been considered in the development of the plan in the form of the SEV consideration document.

2.0 MANAGEMENT UNIT DESCRIPTION

2.1. Forest Description

2.1.1. Historic Forest Condition

Forests are dynamic and in a constant state of change due to natural and human-induced causes, particularly in the temperate and boreal regions where natural disturbances are common and industrial activity has been in place for over a century. The Timiskaming Forest is an obvious example of this change over time, largely as a result of expanding human settlement, the development of railways, mineral exploration and mining, and early logging practices that preceded modern forestry.

A summary of the historic forest condition is included in the Supplementary Documentation, section 6.1.2.

2.1.2. Current Forest Condition

A description of the current forest condition is the basis for planning for the use and management of forest ecosystems. In order to establish long-term strategic direction for creating the desired future forest condition, an accurate description of the current forest is required. The current forest condition must be described in a manner that allows it to be compared to the desired future forest condition. Forest sustainability is then re-evaluated at each ten-year interval, when the management plan is renewed.

Table FMP-1, available in Section 9.0 provides a summary of the land types by ownership and indicates the overall status of the present landbase of the Timiskaming Forest. A significant part of the landbase is comprised of private land which is not managed under this forest management plan. Additionally, any Crown timber on private land is managed by the MNRF Kirkland Lake and Timmins Districts under the *Management of Crown Trees on Patent Land* program and not through this forest management plan.

Figure 4 through Figure 6 demonstrate this information graphically.

The development of the Timiskaming Forest is best described within the context of three separate prehistoric and historic influences. First, was the final glaciation of the area approximately 10,000 years ago (the Laurentide of Wisconsinan age) and the subsequent deposition of overburden that developed into the present day soils. Second, is the extensive fire history of the area, characterized by large catastrophic disturbances affecting significant portions of the management unit. The three fires that have had the largest influence on the Timiskaming Forest are the Matheson fire in 1916, Haileybury fire in 1922 and Gogama Fire of 1941. Finally, the effect of human development of the area, beginning in the late 1800's and continuing today has influenced the forest cover of the management unit. Agricultural

and forestry activities, as well as human settlement are the most easily recognizable modern influences on the landbase today. Detailed information on the historic forest condition of the Timiskaming Forest is available at the SFL holder office as part of additional documentation available in the support of FMP development. This information is made available to help contextualize today's forest condition but more importantly, it ensures the retention of historical information through the development of forest management plans.

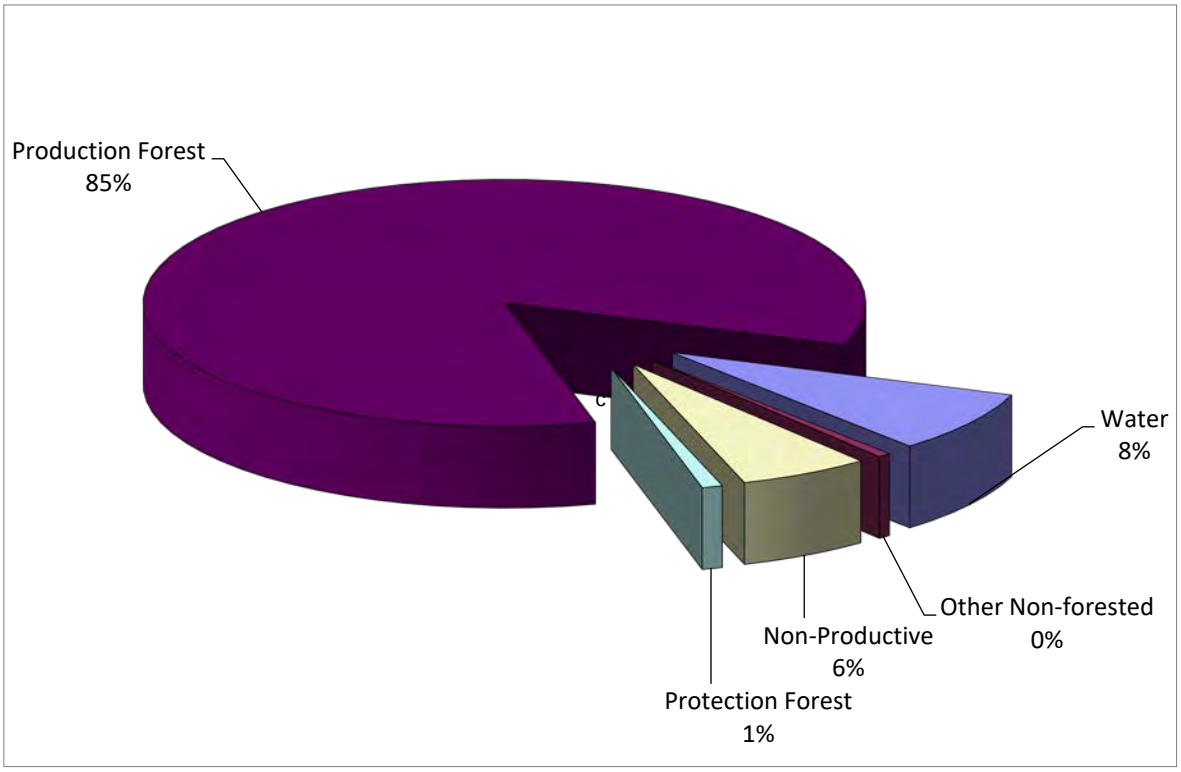

Figure 4. Management Unit Land Summary of Crown Managed Forest on the Timiskaming Forest.

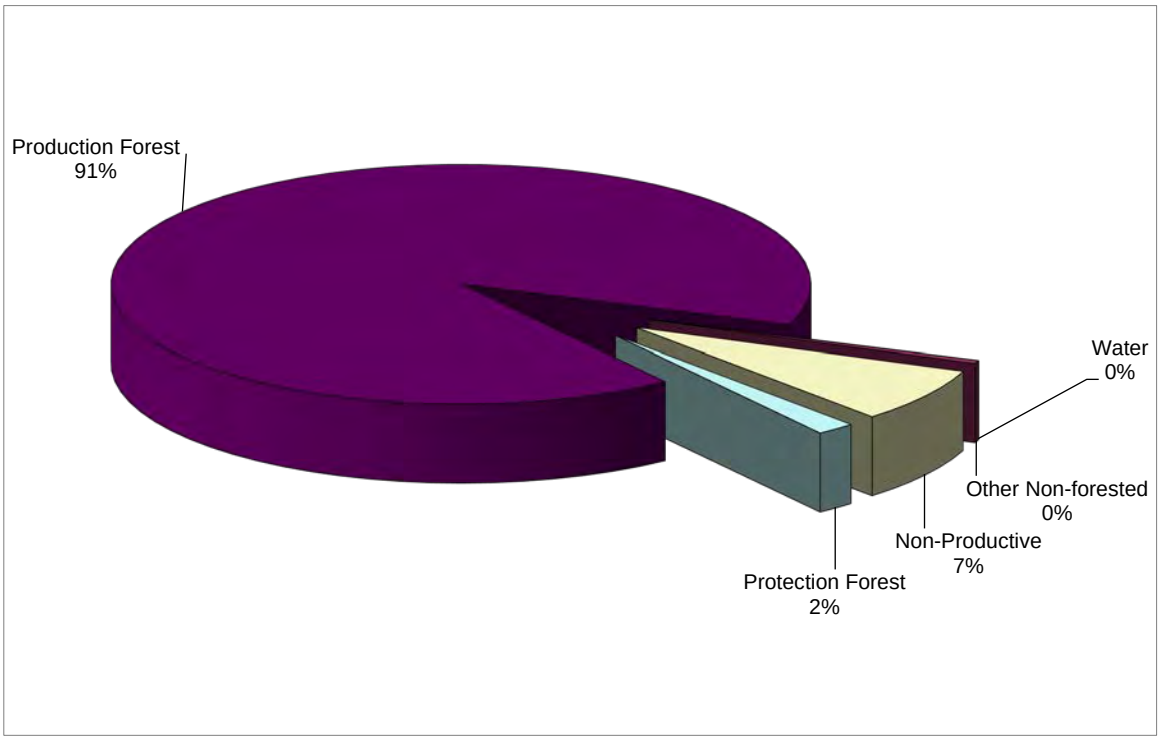

Figure 5. Management Unit Land Summary of Other Crown Forest on the Timiskaming Forest.

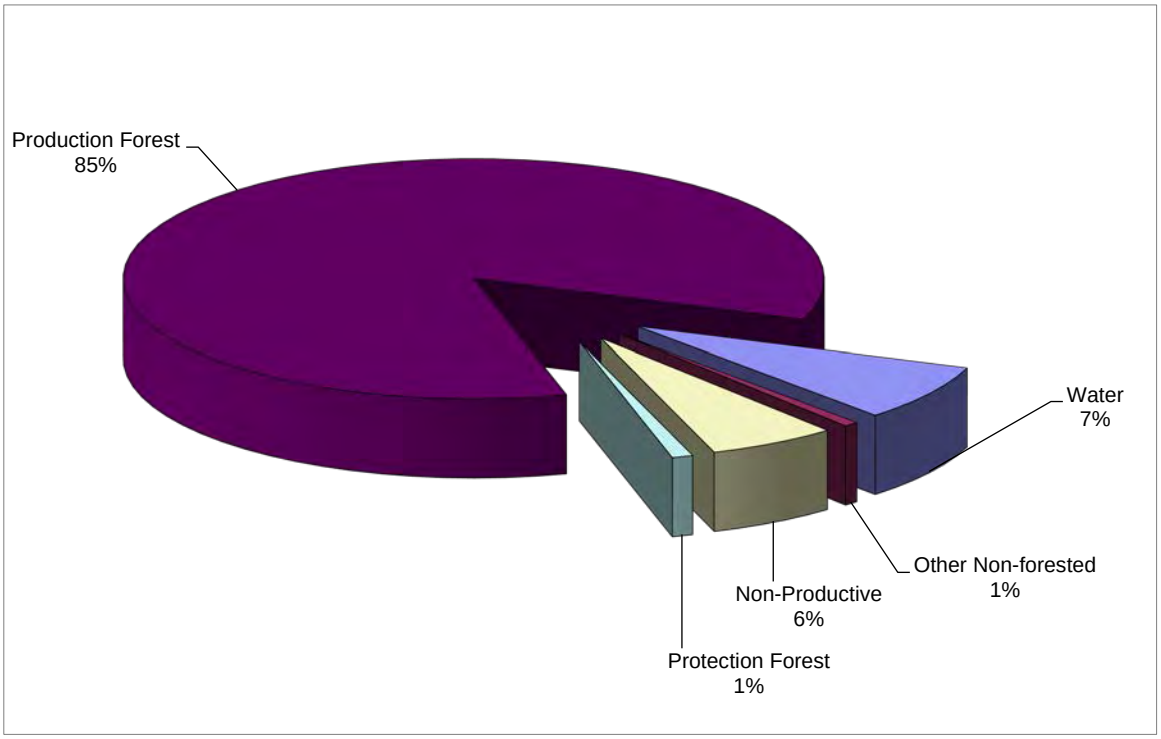

Figure 6. Management Unit Land Summary of all Crown Land Forest on the Timiskaming Forest.

In order to classify and describe ecosystems in Ontario, Ecological Land Classification (ELC) systems are used. Ecosystems can be defined and characterized on the basis of common features such as bedrock geology or climatic features, which set them apart from other units. Ecosystem classification delineates areas of similar ecology at different scales, often within a nested or hierarchical framework. The following is a description of the ELC hierarchy and the components which apply to the Timiskaming Forest.

Ecozones are the highest level of ecosystem classification in Ontario. Ecozones represent a very large area of land and water characterized by a distinctive bedrock domain that differs in origin and chemistry from the bedrock domain immediately adjacent to it. The characteristic bedrock domain, in concert with long-term continental climatic patterns, has a major influence on the ecosystem processes and biota occurring there. Nested within these Ecozones are Ecoregions. An Ecoregion is a unique area of land and water defined by a characteristic range and pattern in climatic variables, including temperature, precipitation, and humidity.

Within Ecoregions are Ecodistricts, which are areas of land and water that are defined by a characteristic set of physiographic features, including bedrock and/or surficial geology and topography. These physiographic features determine successional pathways, patterns of species association, and the habitats that may develop. Local climatic patterns, such as lake effect snowfall areas, may also characterize ecodistricts.

The management unit lies within two ecoregions: Ecoregion 3E – Lake Abitibi Ecoregion and Ecoregion 4E – Lake Temagami Ecoregion. These two Ecoregions lie within the Ontario Shield Ecozone and share common precambrian bedrock geology (Figure 7). The Lake Abitibi Ecoregion makes up the majority of the management unit (75%) while the Lake Temagami Ecoregion comprises 25% of the landbase. A description of the climate, geology, land cover, fire cycles, water, flora & fauna and land use for Region 3E and 4E can be found in *The Ecosystems of Ontario, Part 1: Ecozones and Ecoregions (2009)*.

As shown in Figure 7, the Timiskaming Forest falls within Ecodistricts 3E-1 (Claybelt), 3E-5 (Foleyet) and 3E-6 (Kirkland Lake) as part of Ecoregion 3E (Lake Abitibi Ecoregion). The forest also falls within Ecodistricts 4E-3 (Mississagi), 4E-4 (Temagami) and 4E-5 (New Liskeard) as part of Ecoregion 4E (Lake Temagami Ecoregion). A description of the geology, landcover and vegetation and land use can be found in *The Ecosystems of Ontario, Part 2: Ecodistricts (2018).*

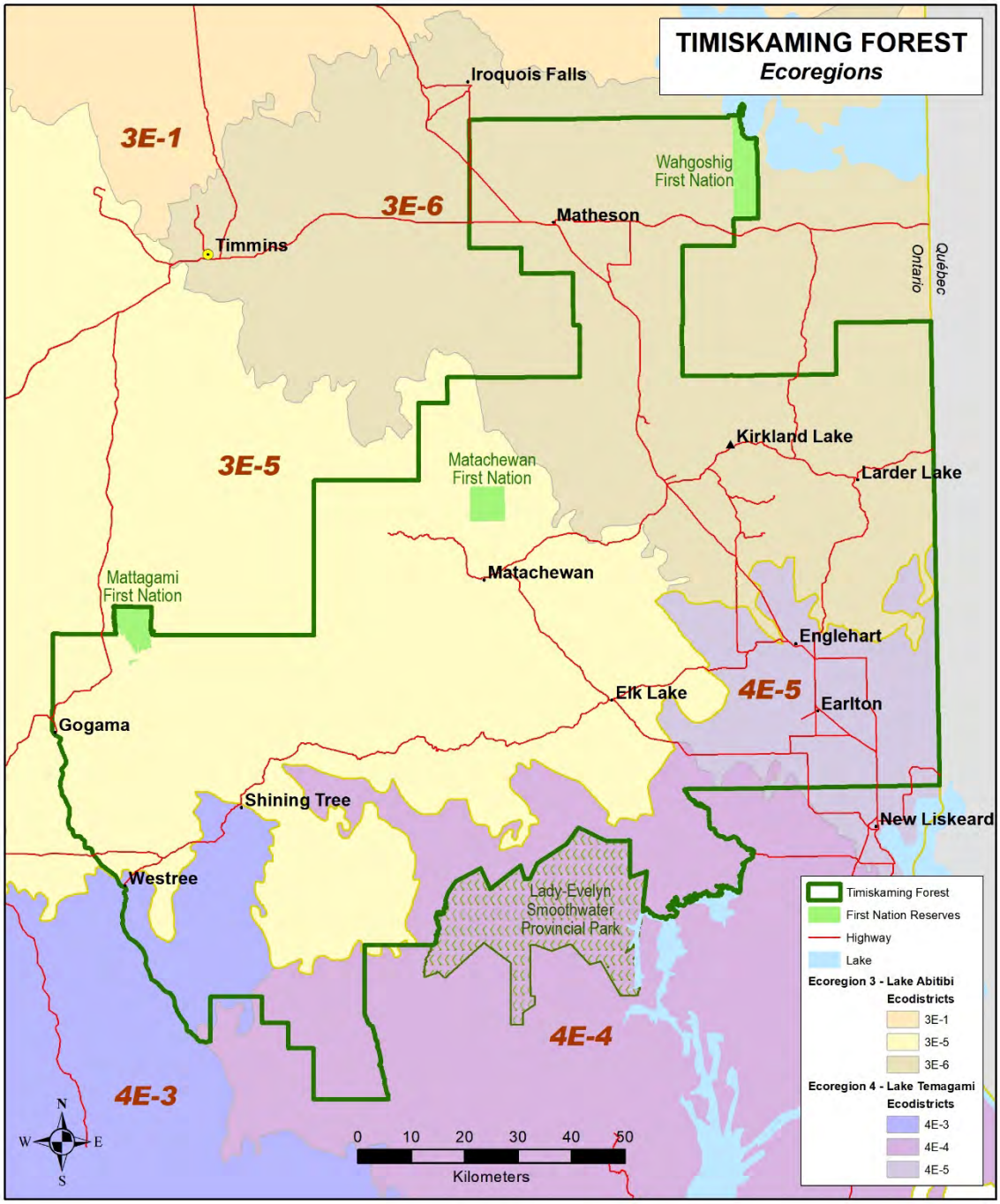

Figure 7. Ecoregions of the Timiskaming Forest.

The Timiskaming Forest is divided north-south by Highway 11, which services (directly or via other highways) a number of communities within the FMU boundary. This corridor provides access to large areas of patent land and extensive road networks, particularly in the southeast portion of the unit north of New Liskeard, and the area surrounding Matheson. Approximately 18% of the management unit area consists of patent land. The distribution of private land presents challenges in both the management of the forest and the achievement of landscape-level objectives due to fragmentation. The potential development of large landscape patches, for instance, is constrained by the dispersion of private land. Allocations of harvest areas are also constrained to some extent in the Crown-patent land matrix. Given this interface, a procedure for operating adjacent to private land is provided in Module 13 of the Implementation Toolkit.

The implications of geology, site and soil condition on management assumptions, strategies and decisions are considerable. A wide range of landforms, site and soil conditions intersect the Timiskaming Forest. As an example, in ecodistrict 3E-6 a substantial area of the unit has an extensive clay deposit which limits the road building material and timing of operations. Due to the sensitivity of these soils in this area and the little Claybelt located in the southern portion of the unit, timing of operations has been limited to winter. An important management consideration in the assignment of allocations is the proportion of area found on these sensitive sites. In other words, an equal representation of area on these sites must be allocated to avoid only harvesting in the winter months. In other ecodistricts such as 4E-4 and portions of 3E-5, operational constraints are mostly related to topography. The rougher terrain encountered in this part of the unit limits the operability of certain stands and the location of roads. In addition to the challenging terrain are the numerous watercourses which intersect the landscape and considerably limit operability. Strategies utilized in operating in these conditions include minimizing road construction required to access operational blocks, increasing the size of harvest areas and limiting the effects from restrictions brought on by other resource users.

A description of the most common tree species found on the Timiskaming Forest, and a description of the associated site types is provided below.

Poplar species (i.e. trembling aspen and balsam poplar) is evenly distributed throughout the management unit. The northern portion of ecodistrict 3E-6 has supported pure stands of high quality aspen. These stands originated from large wildfires (approximately 100 years ago during the Matheson fire of 1916) and historically provided veneer recoveries between 20 to 25%, with some exceptional stands providing up to 40% veneer. The stands tend to occupy the fresh clay-loam soils that are herb rich and have abundant tall woody shrubs. Much of the aspen is best suited to products such as oriented strand board and veneer production. Noticeable decline in the quality of the aspen has occurred within the past 25 years. Stand maturity coupled with site quality and continuous infestations from forest tent caterpillar are possible factors contributing to its vigor. A reduction in the veneer recovery as well as visual evidence of stands “breaking up” is apparent. This is consistent with the average age of this portion of the forest (over 100 years) and the fact that nutrient rich sites support high quality,

fast-growing stands but also characteristically are subject to rapid decline. It is possible that the conifer component of the post Matheson fire forest has been reduced due to the removal of the seed source of conifer from the fire. Balsam poplar does grow in association with aspen on these moist, clay sites. As you move south into the 3E ecoregion the aspen is usually found on upland glacial till areas characterized by moist sandy to coarse loamy soils. Generally, the quality of the aspen in this portion of the management unit is low to medium. The poorer quality soils (in comparison to the clay belt areas) do not provide the optimum sites for this species. The aspen stands in these areas are more mixed in species composition and characteristically include jack pine, black spruce, white spruce and balsam fir associations. Along the Highway 101, 11 and 624 corridors as well as in the vicinity of the agricultural areas, a significant historical level of high-grading occurred to provide aspen veneer to a facility in Kirkland Lake as well as to provide conifer for mining timbers. This has led to both the conversion of previous conifer sites to low quality aspen stands as well as a reduction in stand quality on these sites.

Black spruce is found scattered in small patches throughout the unit with concentrations in Dufferin, North Williams, Milligan, Cook, Lee, Terry, Michie, Wallis, Champagne and Warden Townships (Figure 3). Generally, black spruce is found in pure stands on the low lying moist to wet organic soils types. On upland glacial tills and fresh clay/silt sites, black spruce usually grows as a mixed stand in association with jack pine, poplar, balsam fir and white birch. More of the high valued sawlog material is found on these sites while the lower value spruce pulpwood stands occupy the organic sites.

White spruce grows well on the uplands fresh loamy soils and usually associates with poplar, balsam fir, jack pine, and birch in a mixedwood condition. The species usually occupies a minor component of the upland mixed-wood sites but can contribute a large proportion of a stands total volume. Generally the species is found in FEC site types 6a, b and c as well as in site types 7a and b. Much of the upland black and white spruce stands were historically balsam fir stands which were converted to low stocked stands after the spruce budworm infestation of the mid 1970's to early 1980's.

The jack pine working group stands are an import component of the management unit and occupy both the esker and sand terraces of the northeast portion of the unit (Munro Esker-Milligan McCool, Warden and Munro Townships) as well as the sand morainal sites. These sites are also found throughout the unit but are concentrated west of the Little Claybelt, to the western boundary of the management unit and north of Lady Evelyn Lake. Much of the jack pine grows in relatively pure stands and is a direct result of large historical wildfires. Due to the effectiveness of fire suppression in the recent past, most pure jack pine stands that are 55 years of age or younger are the result of silvicultural treatments or natural regeneration after harvesting. Jack pine also associates with white birch, balsam fir and poplar. On the fresher, loamy sites jack pine associates with spruce and poplar.

White birch is found throughout the unit, usually scattered and in association with other species. White birch has historically not been a commercially valuable species on the

Timiskaming Forest. Some limited sawlog and veneer harvesting has occurred as well as local fuelwood harvesting, but since the species is primarily low-quality and fire origin in nature the species was underutilized. Today, facilities of oriented strand board have modernized to utilize non-traditional species such as white birch. Pure white birch stands are not common, however those that do exist are fire origin coppice stands with very little conifer component. As well, there are some relatively old, low volume decadent stands on the management unit. These stands were likely either the product of an earlier spruce budworm infestation or were logged for the commercial conifer volume at an earlier time.

Prior to the spruce budworm infestations of the mid 1970's the balsam fir working group occupied a significant proportion of the management unit. After the infestation ran its course, the former balsam fir stands were reclassified during re-inventory exercises as poorly stocked or barren and scattered spruce and white birch stands. Balsam fir stands are the product of fire suppression and tend to occupy productive site types. Balsam fir is commonly associated with all of the major boreal conifer and hardwood species, often occupying the understory of stands due to its shade tolerance.

White and red pine stands historically occupied more area on the management unit than the present time, although it is unclear to what level they existed. Clearly in the south, and in sections of the central area of the management unit, both of the species, particularly white pine, were commercially important at the turn of the century and up to the 1940's. Historically there was no attempt to manage the species and as a result, areas harvested were converted to non white/red pine stands, likely dominated by hardwoods and/or balsam fir. Although a minimal amount of data exists, it appears to be a trend that shows many of the present yellow birch stands were once dominated by white pine. Yellow birch is commonly associated with white pine and this shade intolerant species thrived once the pine overstory was removed. Local knowledge has shown that the yellow birch stands have remnant white pine and many old stumps from previous logging. Section 6.1.15 of the Supplementary Documentation contains the *Conservation Strategy for White and Red Pine Management on the Timiskaming Forest* and describes the status of white pine on the management unit.

White cedar grows primarily in moist lowland areas but is also found on upland sites. It can survive on a wide range of organic and mineral soils but does not perform well in very wet or very dry conditions. The cedar found on upland sites occurs primarily as scattered clumps or individuals in mixedwood conditions. In lowland conditions, it will form pure stands or intermix with black spruce and larch.

Larch stands occur almost exclusively on the wettest sites and this species grows in pure stands or in association with black spruce and cedar. Larch out-performs many of the boreal conifers on an upland site, where a natural seed source exists. Typically, larch will form part of a minor component in stands dominated by other species on the Timiskaming Forest.

Hard maple stands occupy very little area on the unit and are most often found scattered in suitable microclimates associated with other Great Lakes-St. Lawrence Forest species such

as white and red pine, yellow birch and white spruce. The majority of the pure tracts of hard maple are found on the south-west portion of the unit specifically around Welcome Lake.

Similar to hard maple, yellow birch will grow on a wide range of soils but grows best on well drained loams or moderately well drained sandy loams. Yellow birch grows poorly on wet sites but often occurs in these areas due to a lack of competition from other species. Yellow birch is most often found on glacial till over bedrock with a sandy loam texture.

Finally, soft maple is also found more often than not scattered as unmapped small pockets or as a component of other working groups. Soft maple thrives on a wider variety of soil types, textures and moisture regime. In the majority of the cases, soft maple will occur on sands, loamy sand glacial till, and occasionally organic terrain.

Section 2.0 of the Analysis Package (Section 6.1.1 of the Supplementary Documentation) describes the development of the planning inventory and the manner in which it was updated and forecasted.

2.1.3. Forest Classification

2.1.3.1. Forest Units and Analysis Units

A forest unit is an aggregation of forest stands used for the purposes of forest management that have similar species composition, develop in a similar manner (both naturally and in response to silvicultural treatments), and are managed under the same silvicultural system. For each forest unit, the natural development of the forest over time can be predicted and expressed graphically using forest development information in the form of yield curves.

Forest unit classification applies to the entire productive forest landbase of the management unit, not just the portion of the production forest area, which is available for timber production. They are also the unit of measure with respect to setting targets and reporting levels of achievement for harvesting and renewal, as well as comparing levels of achievement from one planning period to the next.

The number of forest units, and their general definitions were for the most part, unchanged from the 2011-2021 FMP. This provides an advantage for analysing long-term trends by having the same number and general definition from one plan to the next. This also maintains reasonable consistency with the 2011 FMP forest units. As with the previous FMPs, the regionally endorsed standard forest units (SFU) were used as the foundation for the plan forest units (PLANFU).

The SFU and PLANFU definitions are generally aligned to the units of classification from the *Forest Management Guide for Boreal Landscapes* (Landscape Guide). Analysis Units (AU) are also generally aligned with the Landscape Guide, but are used specifically for

modeling purposes as they can be divided to more accurately project forest development. These units, which compatible with the Ontario Landscape Tool are described hereafter as Landscape Guide Forest Units (LGFU) to indicate they are sourced from the Landscape Guide.

A comparison of the Regional Standard Forest Units (SFU), Analysis Units (AU), Landscape Guide Forest Units (LGFU) and the Planned Forest units used for the 2021 FMP are provided in Table 1. The definition queries for the SFU, LGFU and AU used in this FMP are from the "Suggested NER Boreal SFU" matrix dated December 17, 2018.

Table 1. Comparison of Forest Classification types

AU	SFU	LGFU	PLANFU	PLANFU Description	Provincial Forest Type
PR1	PR1	PR1	PR1	Red Pine Plantations	Red & White Pine (PWR)
PW1	PW1	PRW	PWR_H	White and red pine – high stocking	Red & White Pine (PWR)
PRW	PRW		PWR_L	White and red pine – low stocking	Red & White Pine (PWR)
LH1	LH1	LH1	OH1	Other Hardwoods	Tolerant & Other Hardwood (TOL)
TH1	TH1				
SBOG	SBOG	SBOG	SBOG	Spruce Bog	Conifer Lowland (MCL)
SB1	SB1	SB1	SB1	Lowland Black Spruce	Conifer Lowland (MCL)
PJ1	PJ1	PJ1	PJ1	Jack Pine Pure	Jack Pine (PJK)
LC1	LC1	LC1	LC1	Lowland Conifer	Conifer Lowland (MCL)
PJ2	PJ2	PJ2	PJ2	Jack Pine Mixed	Conifer Upland (MCU)
SP1	SP1	SP1	SP1	Upland Spruce	Conifer Upland (MCU)
SF1	SF1	SF1	SF1	Spruce-Fir	Conifer Upland (MCU)

AU	SFU	LGFU	PLANFU	PLANFU Description	Provincial Forest Type
PO1	PO1	PO1	PO1	Poplar	Poplar (POP)
BW1	BW1	BW1	BW1	White Birch	White Birch (BWT)
MH1	MW1	MW1	MW1	Poplar and Birch with Jack Pine	Mixedwood (MIX)
MC1					
MH2	MW2	MW2	MW2	Poplar and Birch with Spruce	Mixedwood (MIX)
MC2					

The PLANFUs link to landscape classes and regional standard forest units in order to develop and track indicators of biodiversity at the landscape and site scales in accordance with the Landscape Guide. A matrix showing the relationship between LGFU, PLANFU and Landscape Classes is shown in Table 2.

Table 2. Forest unit and Landscape Class relationship matrix.

PLANFU	LGFU	Landscape Class				
		Presapling	Sapling	Immature	Mature	Late
PR1	PR1	**(P)** - 0	**(S)** - 15	**(IOP)** - 40	**(IOP)** - 80	**(IOP)** - 130
PWR_H	PRW	**(P)** - 0	**(S)** - 15	**(IC)** - 40	**(MOM)** - 80	**(MOM)** - 130
PWR_L						
OH1	LH1	**(P)** - 0	**(S)** – 10	**(IOHIM)** - 30	**(IOHIM)** - 70	**(IOHIM)** - 100
SB1	SB1	**(P)** - 0	**(S)** - 20	**(IC)** - 40	**(MOLC)** - 80	**(MOLC)** - 120
LC1	LC1	**(P)** - 0	**(S)** - 20	**(IC)** - 40	**(MOLC)** - 80	**(MOLC)** - 120
PJ1	PJ1	**(P)** - 0	**(S)** - 10	**(IOP)** - 30	**(IOP)** - 70	**(IOP)** - 110
PJ2	PJ2	**(P)** - 0	**(S)** - 10	**(IC)** - 30	**(MOC)** - 70	**(MOC)** - 110
SP1	SP1	**(P)** - 0	**(S)** - 15	**(IC)** - 40	**(MOC)** - 80	**(MOC)** - 110
SF1	SF1	**(P)** - 0	**(S)** - 15	**(IC)** - 40	**(MOC)** - 80	**(MOC)** - 110
PO1	PO1	**(P)** - 0	**(S)** - 10	**(IOHIM)** - 30	**(IOHIM)** - 60	**(IOHIM)** - 90
BW1	BW1	**(P)** - 0	**(S)** - 10	**(IOHIM)** - 30	**(IOHIM)** - 60	**(IOHIM)** - 90

PLANFU	LGFU	Landscape Class				
		Presapling	**Sapling**	**Immature**	**Mature**	**Late**
MW1	MW1	**(P)** - 0	**(S)** - 10	**(IOHIM)** - 30	**(MOM)** - 70	**(MOM)** - 100
MW2	MW2	**(P)** - 0	**(S)** - 10	**(IOHIM)** - 30	**(MOM)** - 70	**(MOM)** - 100
	(P) – Pre-sapling **(S)** – Sapling **(IOP)** – Immature and Older Pine **(IC)** – Immature Conifer **(IOHIM)** – Immature and Older Hardwood and Immature Mixedwood **(MOM)** – Mature and Older Mixedwood **(MOC)** – Mature and Older Conifer **(MOLC)** – Mature and Older Lowland Conifer					

A total of fifteen PLANFUs were developed for use in the 2021-2031 Timiskaming Forest FMP. A description of each PLANFU their relationship to the SFUs, along with associated ecosite information is provided in Table FMP-2.

As noted in section 3.1.4 of the Analysis Package, modifications were made to the Standard Forest Unit SQLs in the development of the Plan Forest Units. Although there are benefits associated with directly applying the Landscape Guide (i.e. OLT) queries to the Planning Composite Inventory (PCI) to develop the PLANFUs, the adjustments were made to ensure the Base Model Inventory (BMI) best depicts the current condition of the Timiskaming Forest. The relationship in area between the final PLANFU and LGFU) areas for all ownerships is compared in Figure 8. A graph showing the total area by PLANFU which lies within ownership codes 1, 5 and 7 (Crown Managed land, Provincial Parks and Conservation Reserves respectively) is shown in Figure 9.

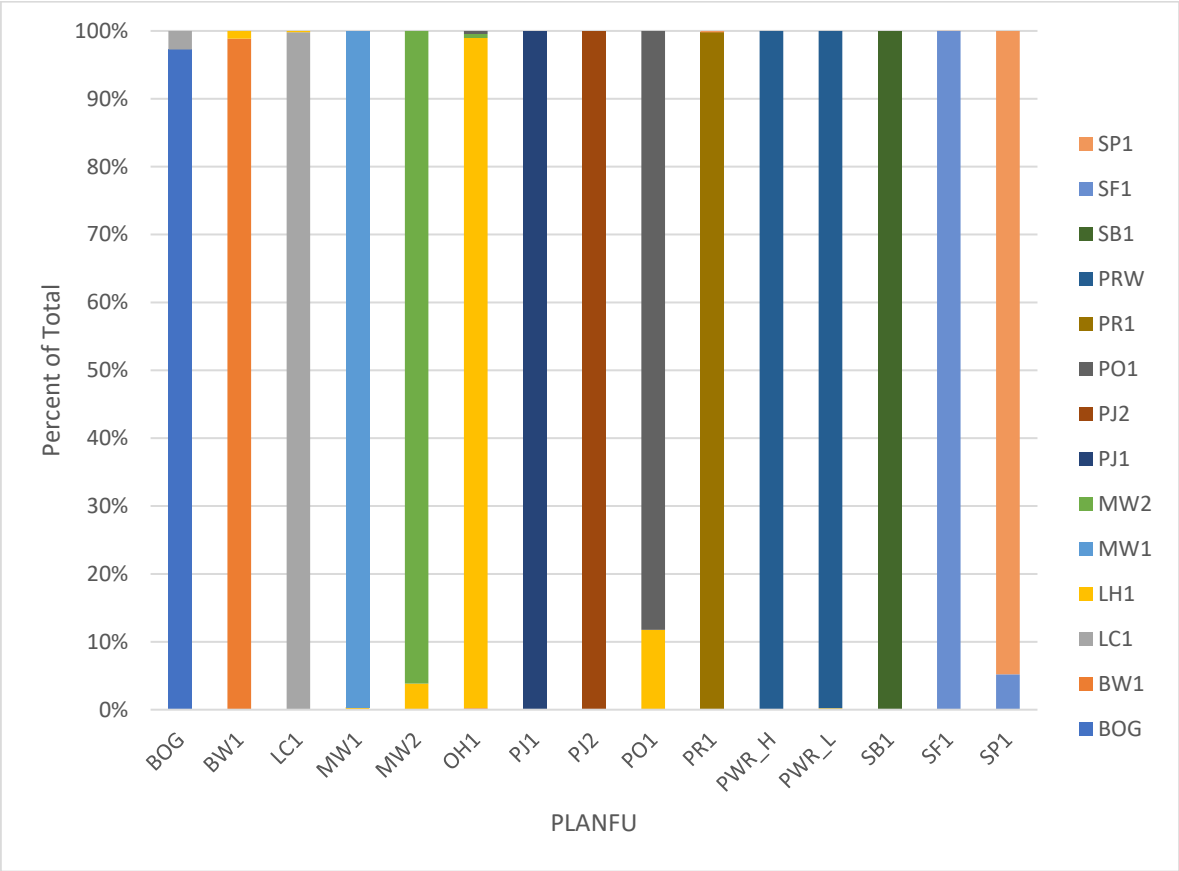

Figure 8. Comparison of Plan Forest Units and Landscape Guide Forest Unit area

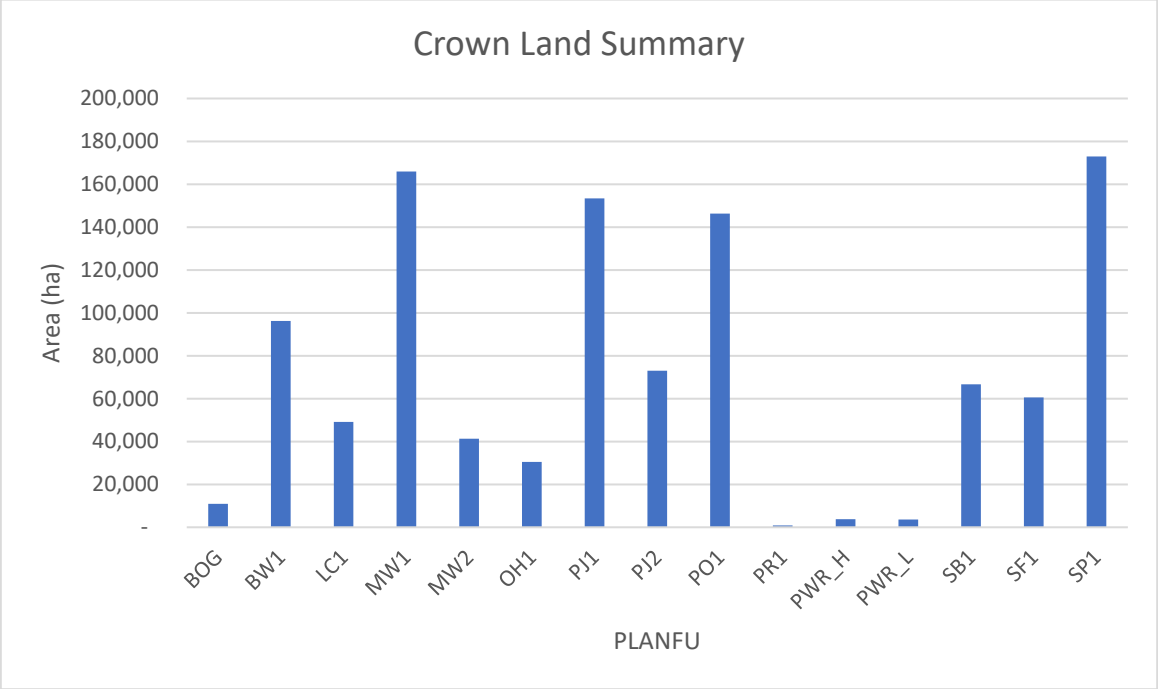

Figure 9. Total Crown Land area in the Timiskaming Forest by PLANFU

Analysis units were not used to classify the forest for the FMP as the Plan Forest Units (PLANFU) provided an adequate level of classification. However, they were used in the development of natural succession rules and yield curves. A discussion on how analysis units were used for both purposes is found in the Analysis Package, sections 4.5 and 4.8 respectively.

A summary of the managed Crown productive forest by forest unit for the Timiskaming Forest is found in Table FMP-3. Productive forest is made up of both protection forest and production forest. Protection forest includes areas that meet the definition for forest stands, but are either inaccessible (e.g. islands) or unproductive due to shallow or wet soils (e.g. Site Class 4). As shown in Table FMP-3, there are 10,904 hectares of protection forest within the management unit.

Production forest includes both managed Crown forest available for timber production (1,003,220 hectares) and unavailable area (569 hectares). Unavailable area includes stands which were confirmed as a peninsula or island (i.e. where MGMTCON1 = PENA or ISLD), after a case-by-case review. The total managed Crown productive forest land area on the Timiskaming Forest is 1,014,693 hectares.

The age-class distribution of crown productive forest by forest unit is provided in Figures 10 through 25, with a total for all forest units shown in Figure **25**.

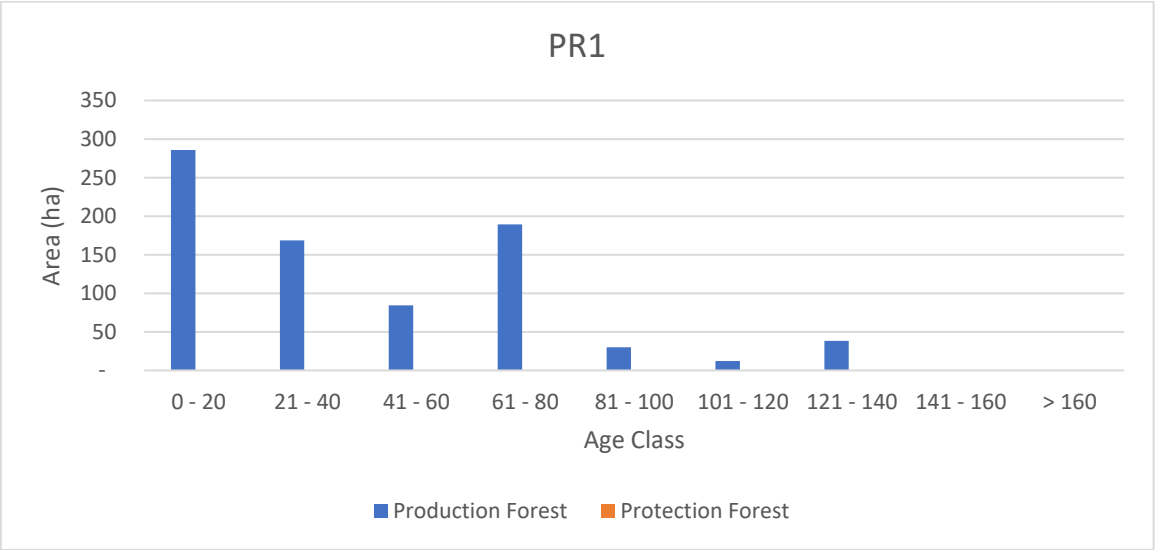

Figure 10. Summary of Productive Forest for the PR1 Forest Unit.

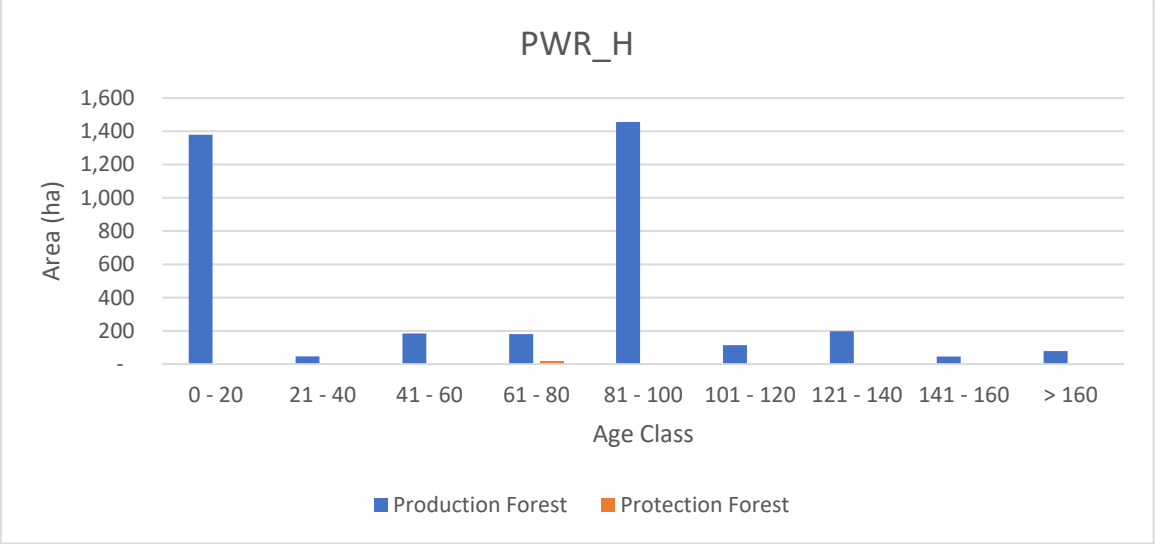

Figure 11. Summary of Productive Forest for the PWR_H Forest Unit.

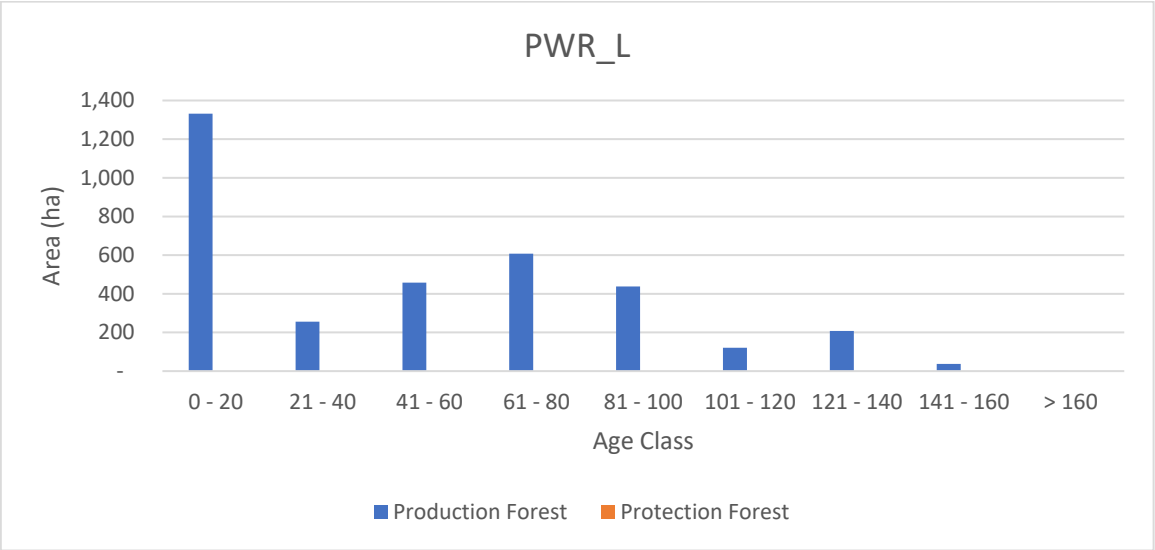

Figure 12. Summary of Productive Forest for the PWR_L Forest Unit.

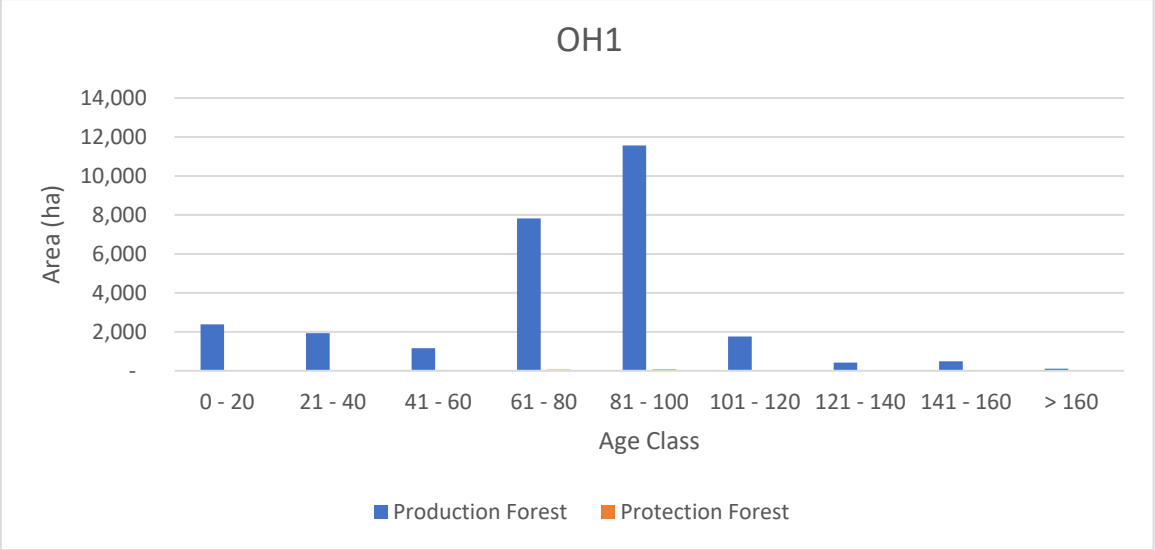

Figure 13. Summary of Productive Forest for the OH1 Forest Unit.

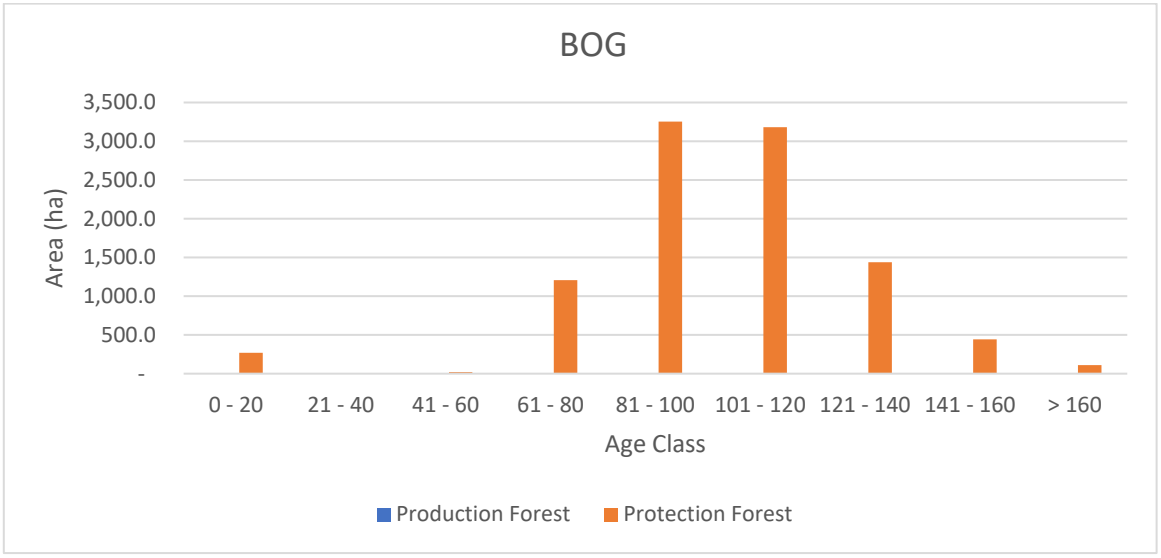

Figure 14. Summary of Productive Forest for the BOG Forest Unit

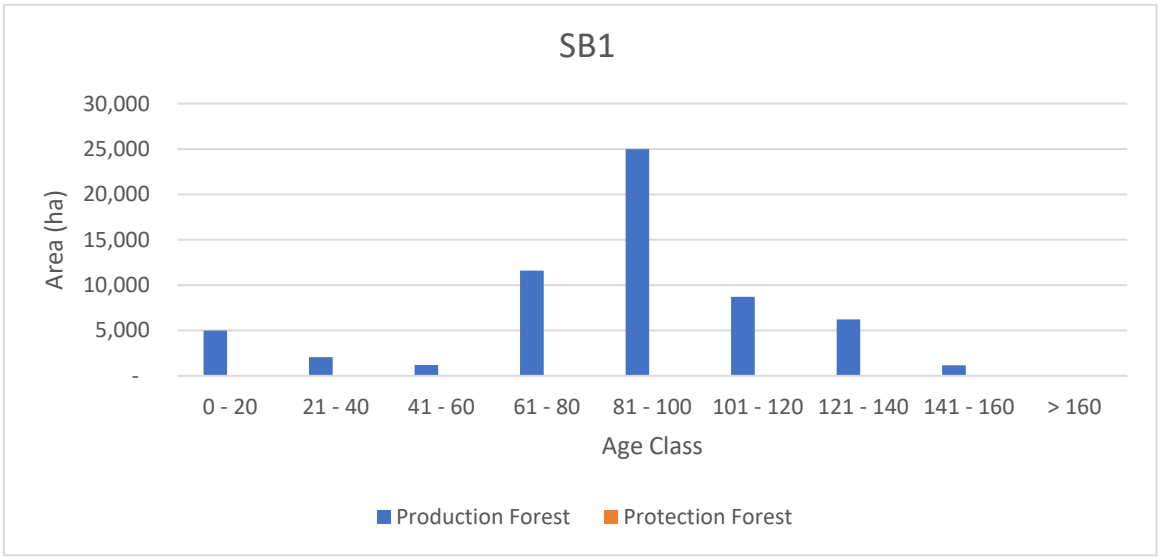

Figure 15. Summary of Productive Forest for the SB1 Forest Unit.

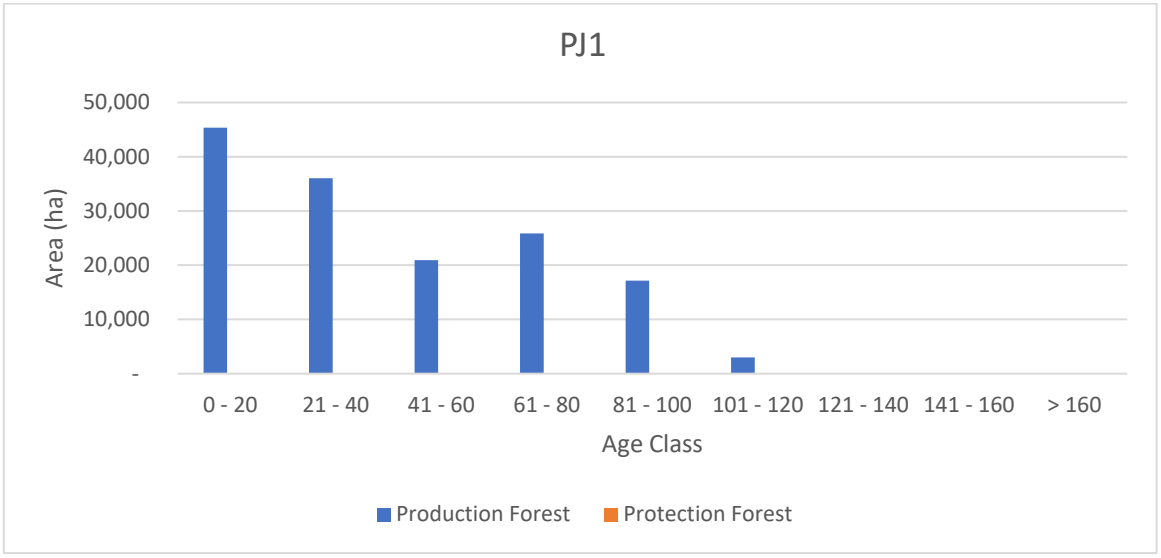

Figure 16. Summary of Productive Forest for the PJ1 Forest Unit.

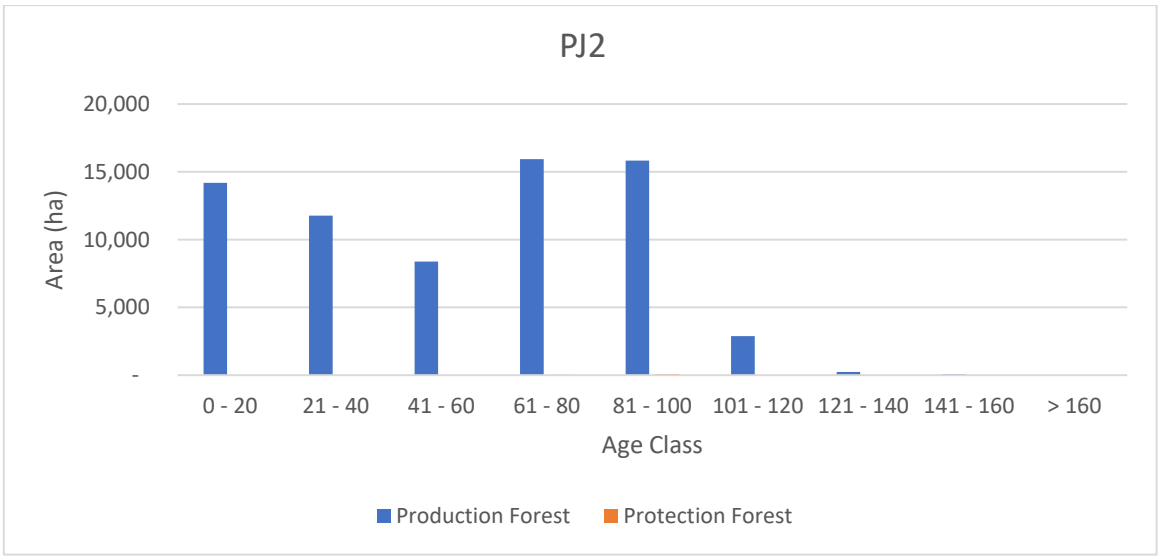

Figure 17. Summary of Productive Forest for the PJ2 Forest Unit.

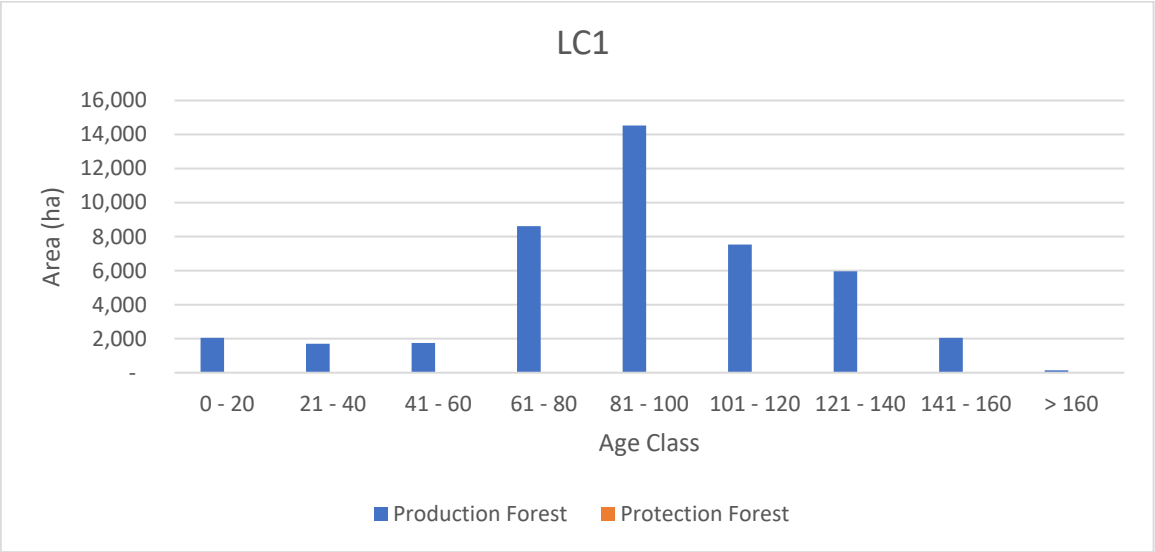

Figure 18. Summary of Productive Forest for the LC1 Forest Unit.

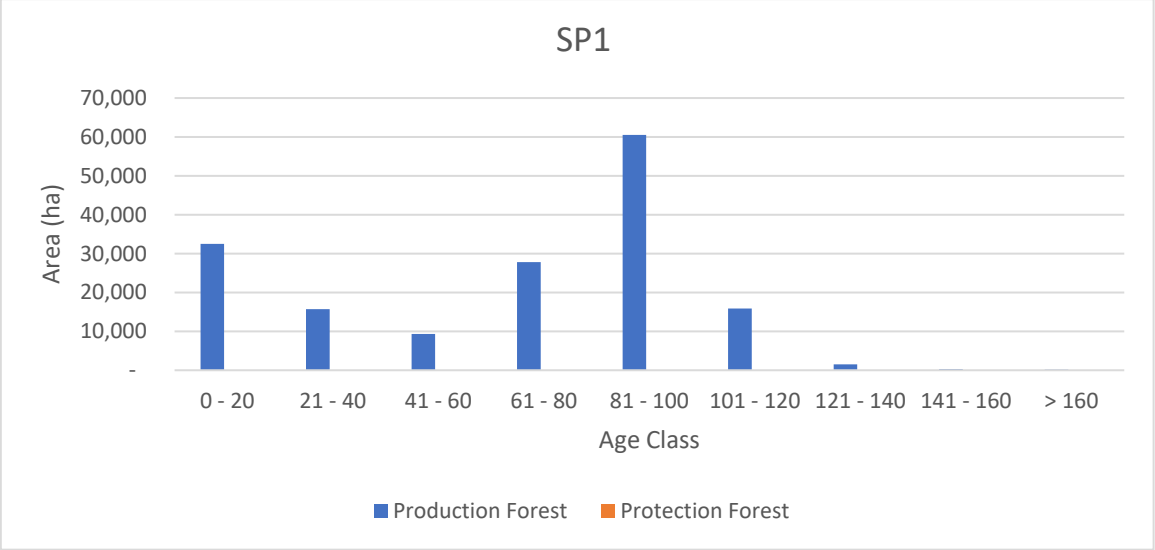

Figure 19. Summary of Productive Forest for the SP1 Forest Unit.

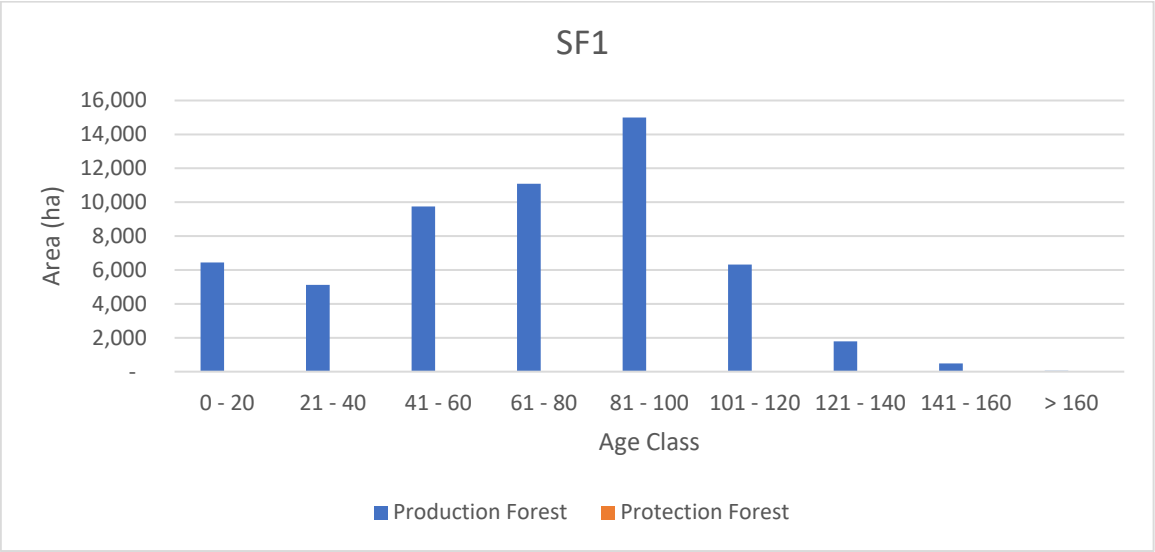

Figure 20. Summary of Productive Forest for the SF1 Forest Unit.

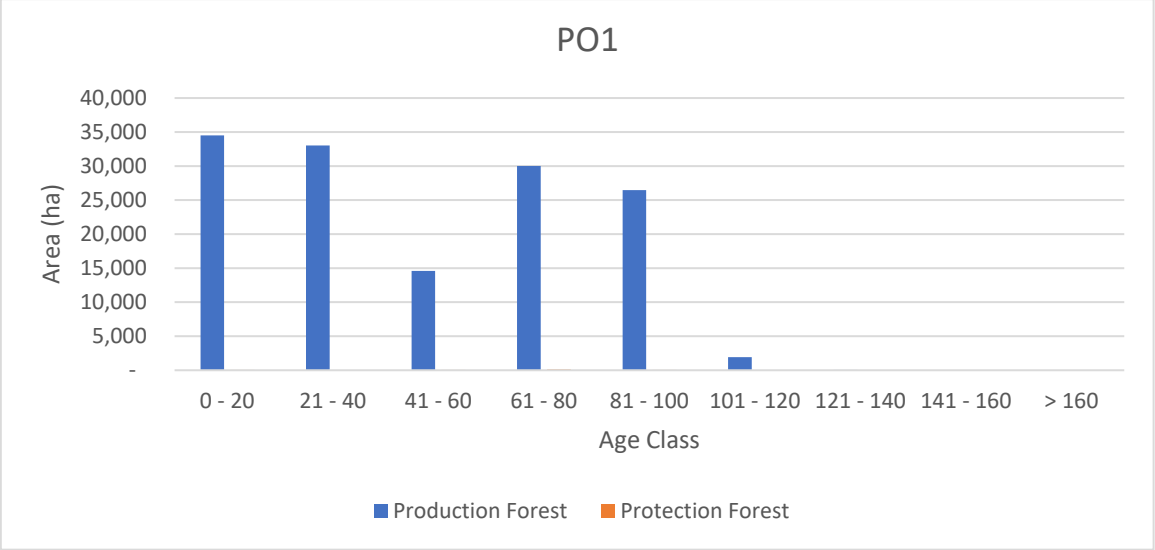

Figure 21. Summary of Productive Forest for the PO1 Forest Unit.

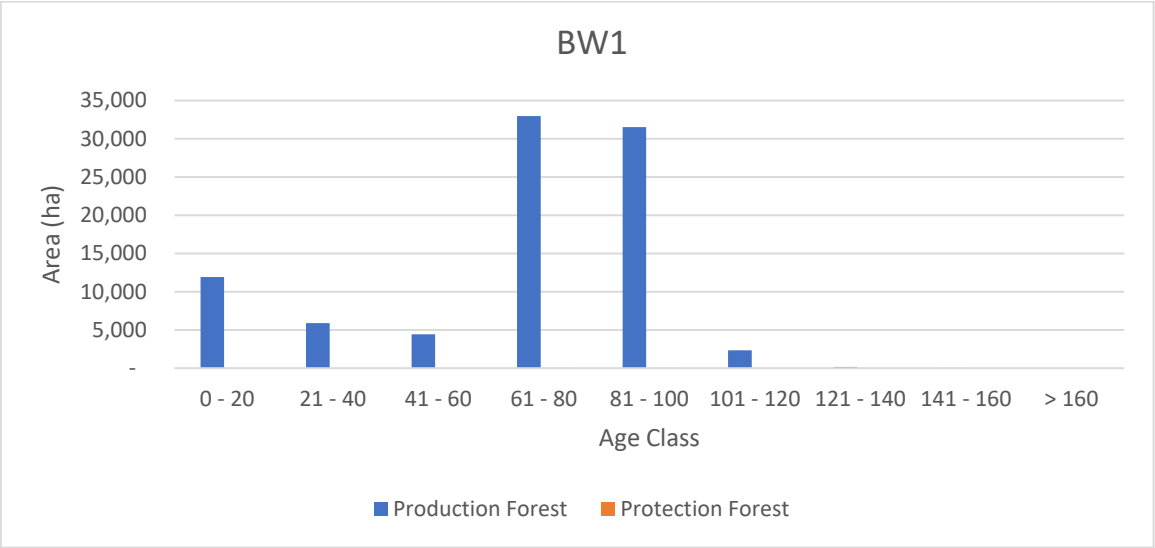

Figure 22. Summary of Productive Forest for the BW1 Forest Unit.

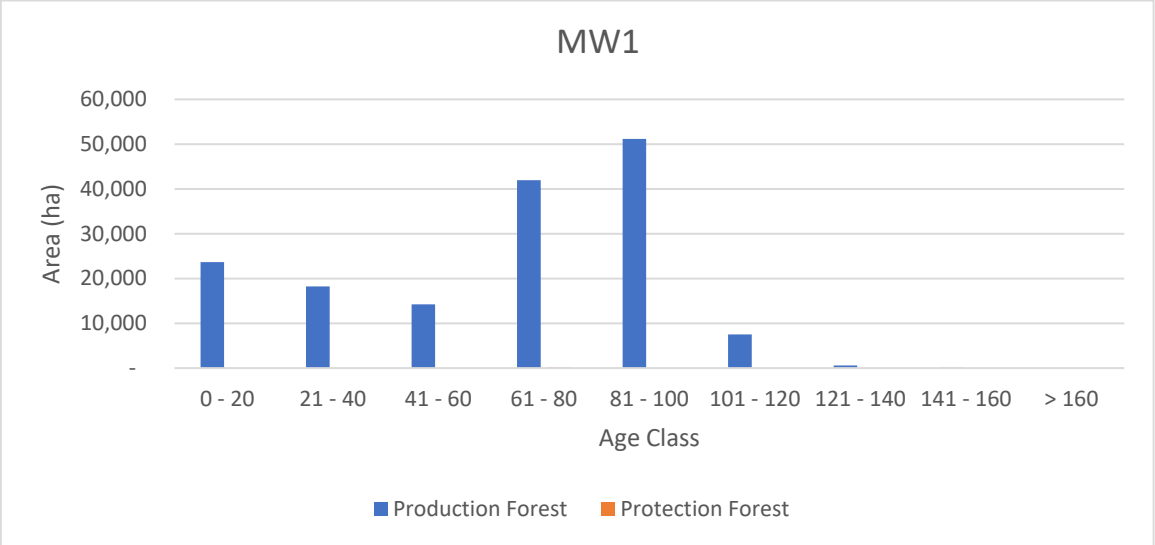

Figure 23. Summary of Productive Forest for the MW1 Forest Unit.

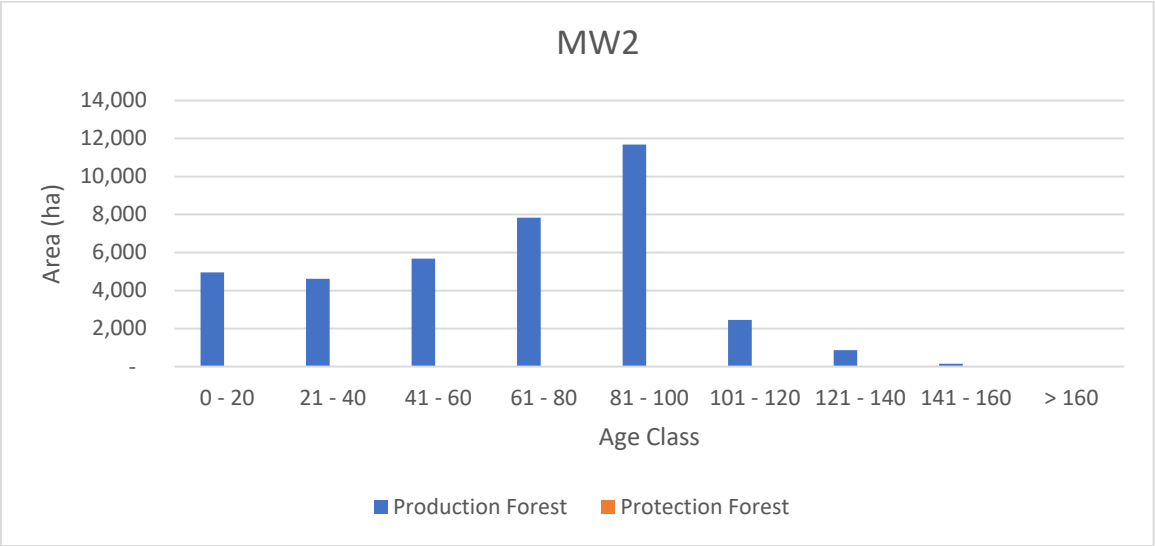

Figure 24. Summary of Productive Forest for the MW2 Forest Unit.

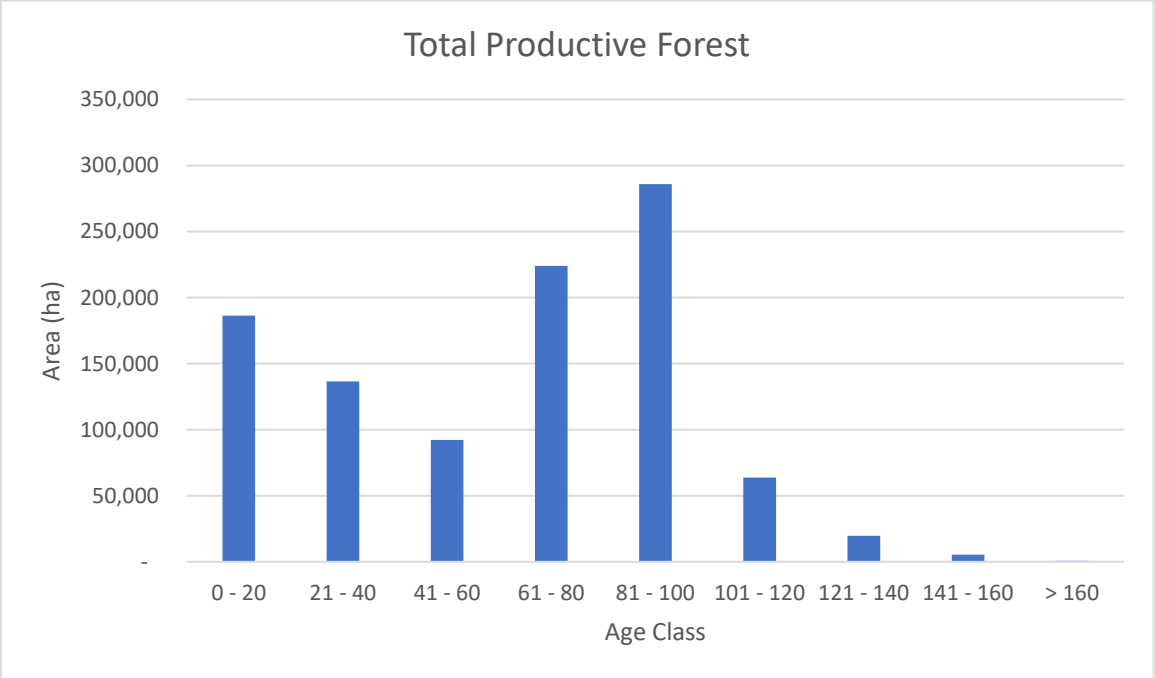

Figure 25. Age-class distribution of total managed crown productive forest

A number of trends are discernible from the data shown. The majority of the productive forest area falls within the 81-100 year age class (28%), while 22% is found in the 61-80 age class. Depending on the species, this could be interpreted as being a slightly immature to mature forest. However, approximately 32% of the productive forest falls within the 0-20 and 21-40 age classes combined. Primarily, the age class structure of the forest has been determined by relatively few, but large forest fires that burned in the earlier part of the 20th

century (refer to Figure 26), followed by an effective fire prevention and suppression program since the 1940's. As well, the forest management history on the unit dates back to the early 1900's, and as such, has influenced the age class structure of the current forest.

Generally, the age class distribution of the forest shows relatively large areas in the 0-20 and 21-40 age classes (representing the recent harvesting history) with less area in the 41-60 year age classes. This is especially true for forest units such as PJ1 and PO1, which include species of commercial importance. As well, the trend clearly shows a disproportionate amount of area in the 61-80 and 81-100 year age classes. This reflects the history of the large, stand creating fires, that occurred during this period. Recent forest management direction has included the "oldest first" allocation method, whereby the older age classes of a particular forest unit are targeted for harvest. This practice has contributed to the large amount of area in the younger age classes with a resulting reduction in the older forest areas. It should be noted that the North Bay 72 Fire which originated in Lady Evelyn Smoothwater Provincial Park in 2018 also contributes 12,588 ha into the 0-20 year age class.

In summary, the forest as it exists today is generally not in a natural state due primarily to the following:

- The effective fire suppression and prevention activities since the 1940's. Due to these efforts, the natural fire cycle has been interrupted and forest harvesting has replaced fire as the primary disturbance, and subsequent renewal mechanism on the land base.

- The harvesting that has occurred in the past 50 years has been driven by the "oldest first" method of allocation. This has led to a reduction in the older age classes with the subsequent increase in younger aged forest (e.g. PJ1, PJ2). As well, the methods of harvesting, combined with the lack of a historical renewal program has led to sites that were once relatively pure in species composition to become mixedwood in nature. This is evident in MW1 representing the largest area compared to all other forest units.

There are however, some exceptions to the above factors. The age class structure for SF1 is dependent on a non-fire disturbance agent (i.e. spruce budworm infestations), and the distribution reflects both the last extensive budworm infestation in the 1970's and early 1980's (i.e. 41-60 age class) and, to a lesser extent, the conversion of some non-balsam fir dominated forest unit stands due to the lack of effective renewal on these sites. In addition, area continues to accumulate in older SF1 age classes due to low levels of harvesting, which is a result of the uneconomical condition of many SF1 stands. The SB1 and LC1 forest units include stands that are situated on the wetter, more "fire-resistant" sites that support black spruce, cedar and larch. Similarly, OH1 includes black ash which also prefers wet, lowland sites. These forest units show age class distributions with more area in the older age classes, reflecting their ability to survive forest fires more effectively.

Prior to 1988 harvesting was concentrated in larger blocks, which progressed over time as access was developed. Beginning in 1988, the MNR introduced the *Timber Management Guidelines for the Provision of Moose Habitat*, which brought about a change in the harvest pattern. Harvest blocks were tailored to be between 80 and 130 hectares in size and were spatially and temporally separated from neighboring disturbances. Although beneficial to moose, and other edge dependent species, this "patchwork" disturbance regime quickly increased forest fragmentation, which was not evident in a naturally disturbed forest. Therefore, in 2001 the MNR introduced the *Forest Management Guide for Natural Disturbance Pattern Emulation*. The purpose of this guide is to provide direction on managing forest landscapes to resemble more closely the landscapes recently created naturally by fire (0-20 years old) with respect to the location and size of disturbances. Through the application of this guide over time, a more natural landscape than those developed with the application of many of the species-specific wildlife habitat guidelines will be created. The NDPE guide has since been replaced with the Landscape Guide (LG) and Stand and Site Guide (SSG), which provides comprehensive direction based on the latest scientific research on forest management. The objective of the Landscape Guide is to maintain or enhance natural landscape structure, composition and patterns that provide for the long term health of the forest ecosystem. The purpose of the Stand and Site Guide is to provide direction to forest managers in planning and implementing harvest, renewal, tending and road use and construction operations as part of an FMP.

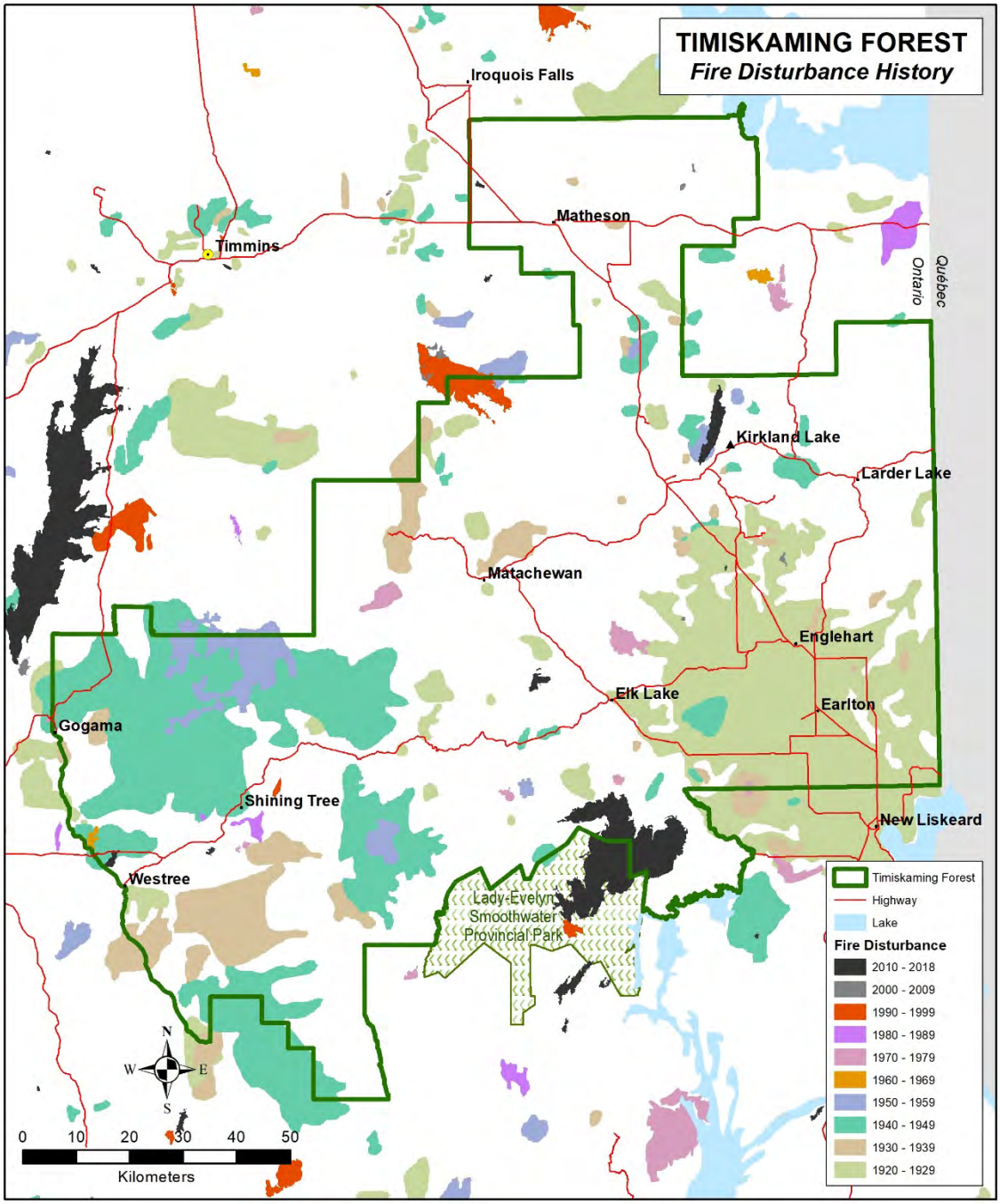

Figure 26. Fire Disturbance History of the Timiskaming Forest.

The breakdown of the productive managed Crown forest by forest unit is shown in Figure 27. A discussion on each forest unit is provided below.

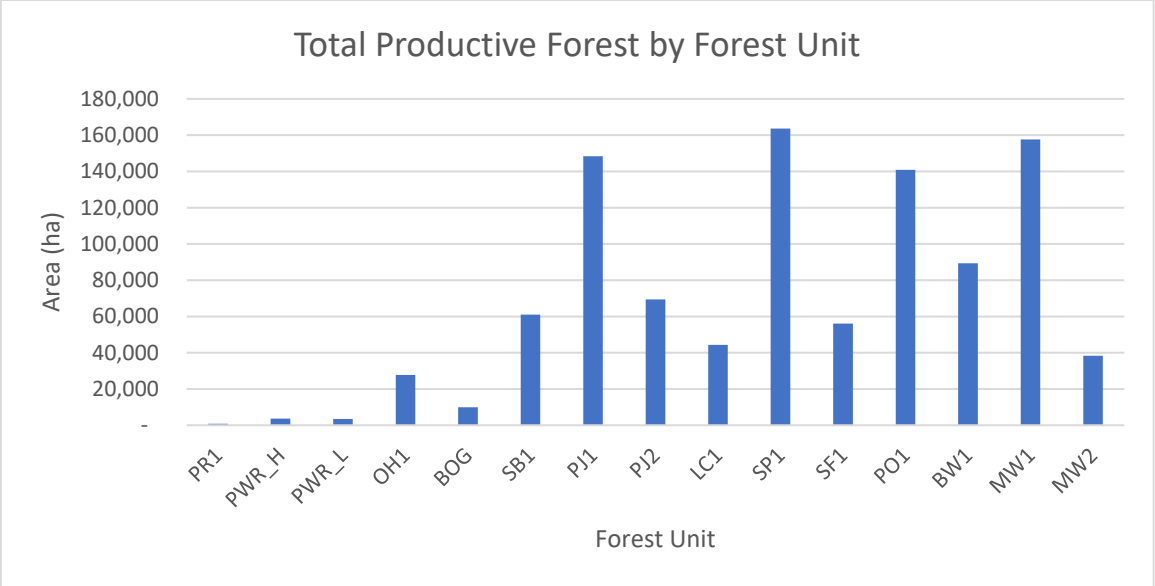

Figure 27. Total Productive Managed Crown Forest by Forest Unit

The intolerant hardwood forest units (i.e. BW1 and PO1) account for 23% of the managed Crown productive forest area.

The next largest grouping of forest units is the two upland spruce forest units (SF1 and SP1) which account for 22% of the area.

The two jack pine forest units (i.e., PJ1 and PJ2) account for 21% of the managed Crown productive forest area.

The two mixedwood forest units (i.e., MW1 and MW2) account for 19% of the managed Crown productive land base. These two forest units are becoming increasingly important both economically and ecologically.

The three lowland spruce forest units (SBOG, LC1 and SB1), account for 11% of the managed Crown productive land base.

Finally, the four Great Lakes-St. Lawrence transitional forest units (PWR_H, PWR_L, PR1 and OH1) account for less than 4% of the managed Crown productive landbase.

The management implications of the current forest condition on the development of the FMP are discussed below:

- The current age class structure of the primary forest units is heavily weighted towards the 81-100 year age classes, with substantial area also within the 0-20 year age class. This is the result of fire history in the early part of the twentieth century, followed by an effective fire prevention and suppression program as well as past timber harvesting activities. The management implications of an unbalanced age-class structure on plan development create difficulties for the planning team in moving towards the desired forest condition in a shorter period of time. This is due to the variation between age classes and correspondingly, the available habitat that is currently on the landbase. This will limit the planning team's management options in the short and medium term, or until the age-class irregularities have been normalized.

- It is important to retain those ecosystems that are less common on the management unit, particularly the transitional Great Lakes-St. Lawrence ecosystems. These are often incidental in nature and found in small concentrations too small to have been captured through the eFRI. The management implications will include identifying these incidental species (i.e. Pw and Pr) at the operational level to ensure the long-term viability of these species is retained on the management unit, as per management objective 2, indicator 2.11.

- Past forest management activities have followed the principles of the Timber Management Guidelines for the Provision of Moose Habitat and have resulted in a more fragmented landscape pattern than is desirable on the forest. For the past 20 years, efforts have been made for a more natural disturbance pattern on the landscape. This has included a desire to create larger sized contiguous disturbance areas, which emulate the pattern resulting from a forest fire. However, the management unit landscape continues to experience the effects of fragmentation due to past forest management practices. Given the years of fragmentation, and the public perception of large planned harvest areas, the management implications include the difficulty in moving towards objective achievement, while being consistent with the science-based forest disturbance template, as directed by the Landscape Guide.

- Older poplar stands in the northern portion of the unit that were created from the Matheson fire of 1916 have shown signs of rapid decline for 25 years. Over the past 25 years, consideration has been given to the utilization of these areas before the commercial value of these stands, particularly for veneer production, is completely diminished. Some of the original area remains, where required for age diversity, but the majority of the decline poplar has been harvested. The fluctuation in area of the primary poplar-dominated forest unit (PO1) has management implications for the FMP. This includes difficulty in finding a balance between landscape class (i.e. IOHIM) and poplar volume achievement over the time horizon.

- Certain areas within the Timiskaming Forest have been high graded in the past for veneer and mining timbers. These areas (primarily in and around the highway, railway and waterway corridor areas) must be given consideration, both in the harvest

allocation and subsequent regeneration activities to recapture their productive capacity. The management implications relative to plan development include a desire to ensure the long-term viability of the tree species present on the Timiskaming Forest. This is demonstrated through management strategies such as the *Conservation Strategy for White and Red Pine Management on the Timiskaming Forest* (Supplementary Documentation 6.1.15), and its associated management objective indicator (see 2.11 in FMP-10).

- Due to fire history, 102,480 ha within the former ShiningTree Forest (i.e. Timmins District) is in the 61-80 year age class and as such many stands are now eligible and desirable for harvesting. This represents the management implications relative to plan development include allocations being focused in this area, and the associated construction of new roads for long-term access.

2.1.3.2. Forest Landscape Classes

Forest landscape classes for the 2021 FMP have been defined based on the direction in Landscape Guide. The objective of the Landscape Guide is to direct forest management activities to maintain or enhance natural landscape structure, composition and patterns that provide for the long-term health of forest ecosystems in an efficient and effective manner.

Based on this principle, the planning team incorporated the Landscape Guide Region 3E – Science and Information Package for determining target levels for the landscape forest composition and structure indicator (landscape classes, forest unit groupings) and age (including overmature) as well as the landscape pattern indicator. The following selected landscape classes (LC) were used in the FMP:

- Immature and older Pine (IOP)
- Mature and older upland Conifer (MOC)
- Immature and older hardwood and immature mixedwood (IOHIM)
- Mature and older mixedwood (MOM)
- Mature and older lowland conifer (MOLC)

The distribution of landscape classes is portrayed on the landscape pattern map MU280_2021_FMP_MAP_LandPat_00.pdf.
In addition to the landscape classes described above, the planning team also used the Region 3E forest unit groupings as landscape indicators of forest composition and structure (as shown in Table 2). The following forest types have been incorporated in the Timiskaming FMP.

- Old Growth Forest (seral stage by forest unit)
- Young forest (<36 years of age – total forest)
- Forest Unit Groupings

  - Pine conifer (total area of PJ1 and PJ2 – all ages)
  - Upland conifer (total area of SP1 and SF1 – all ages)
  - Lowland conifer (total area of SB1 and LC1 – all ages)
- Red and White Pine Forest (total area of PWR_H, PWR_L and PR1).

In addition to the landscape indicators for forest composition and structure described above, the following two indicators were used to measure landscape pattern:

- Texture of the mature and old forest
- Young forest patch size

For a full discussion of how the Landscape Guide indicators have been incorporated into the FMP, see Section 3.3 of the Analysis Package. The Landscape Guide driven management objectives and indicators are listed in Table FMP-11 (see objectives 1 and 2).

The Landscape Guide provides direction on the desirable levels for each landscape indicator. These desirable levels are derived at the ecoregional level using the Boreal Forest Landscape Disturbance Simulator (BFOLDS) tool which outputs a (simulated) range of natural variation (SRNV) which is then apportioned by management unit. For non-spatial indicators (i.e. composition and structure), the desirable levels represent the inter-quartile range (IQR) of the SRNV. The IQR represents the middle 50 percent of SRNV values, which falls between the lower (25th percentile) and upper (75th percentile) quartiles.

A comparison of plan start levels (2021) to the SRNV parameters for all landscape indicators are shown in Figure 28 through to Figure 34.

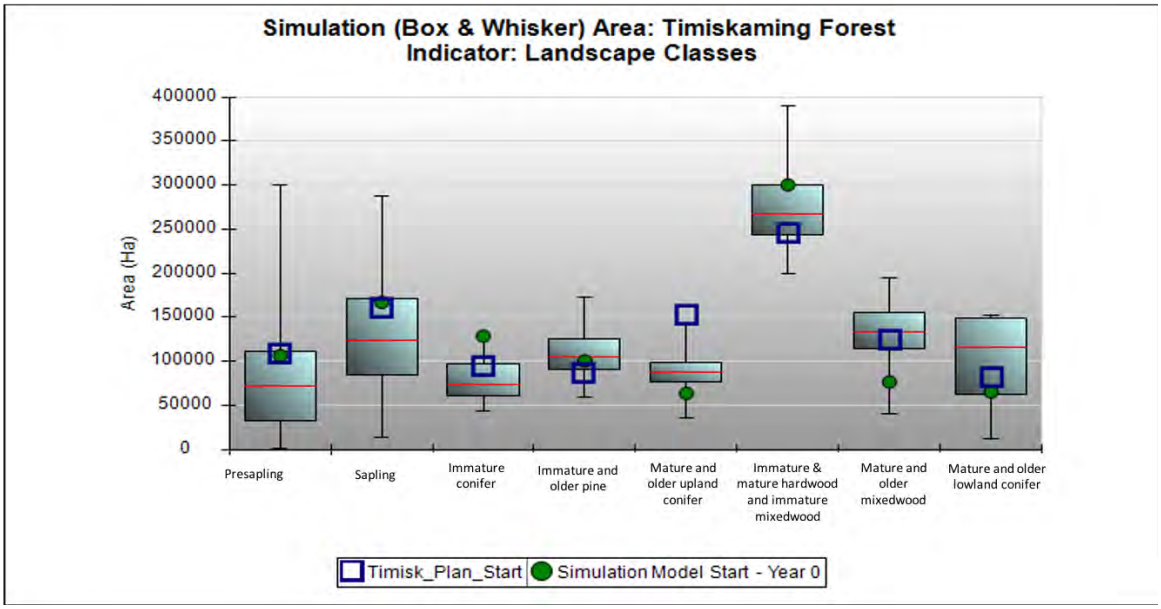

Figure 28. Comparison of plan start SRNV achievement levels by Landscape Class

The plan start SRNV achievement for each landscape class is shown in Figure 28. The plan start level is shown as a blue hollow square, the IQR is shown as a grey-shaded square and the full SRNV is shown as the black max/min lines. Of the landscape classes listed above, IOP and MOC fall outside of the IQR, while the remaining classes are showing within the IQR. This presents a challenge in that it constrains the amount of area that can be harvested in those forest units belonging to landscape classes that are starting below the desirable levels (i.e. IOP) or just above this level (i.e. IOHIM). Conversely, where there is an abundance of mature and old forest (i.e. MOC) a harvest level that is higher than historic amounts is required to meet the desired levels within the planning horizon. The goal of showing movement towards the IQR was emphasized during the development of the FMP, which is further discussed in section 3.6.

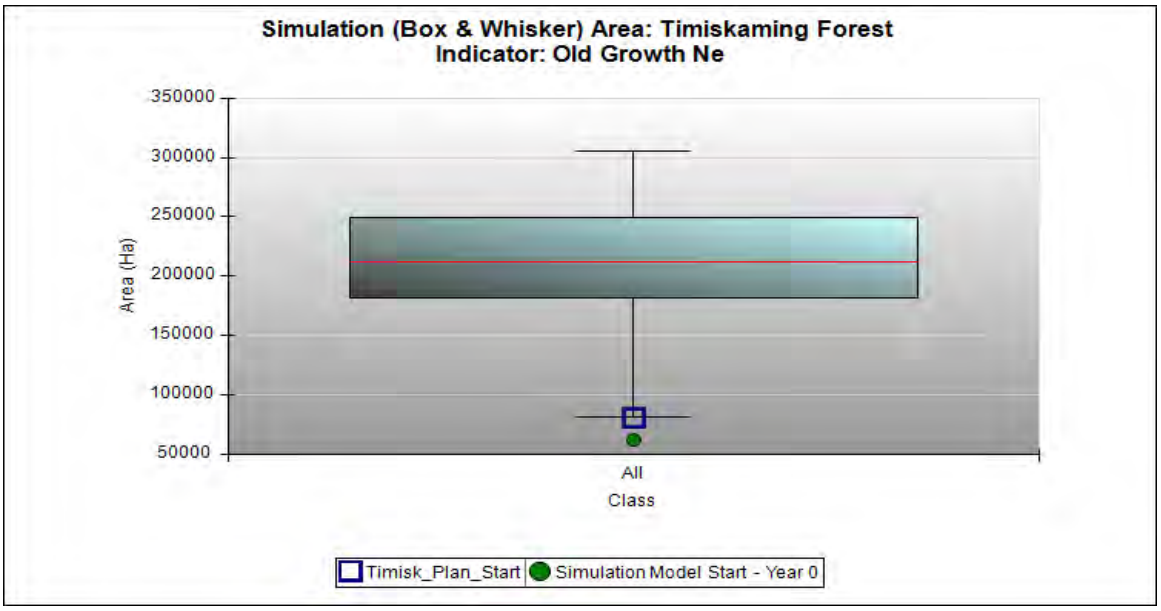

Figure 29. Comparison of plan start SRNV achievement levels for Old Growth Forest

The plan start area for old growth forest is below the IQR, as shown in Figure 29. As such, emphasis was placed during the development of the FMP to move toward the IQR.

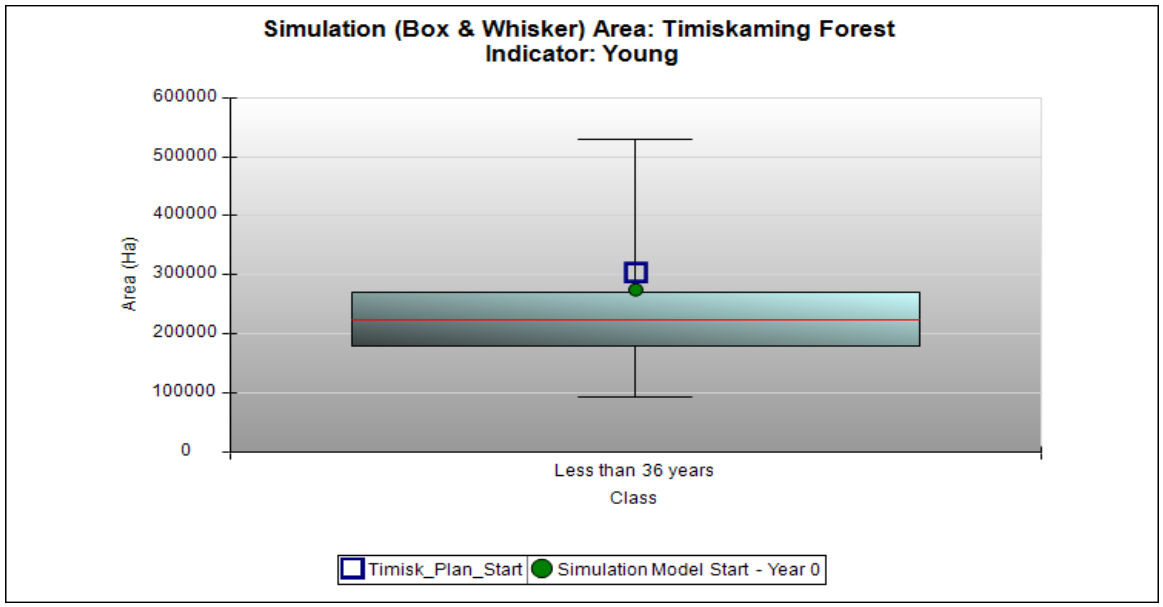

Figure 30. Comparison of plan start SRNV achievement levels for Young Forest

The plan start area for young forest is above the IQR, as shown in Figure 30. Although the deviation from the IQR is minor, the levels of young forest represent a slight overachievement, which was considered during the development of the FMP.

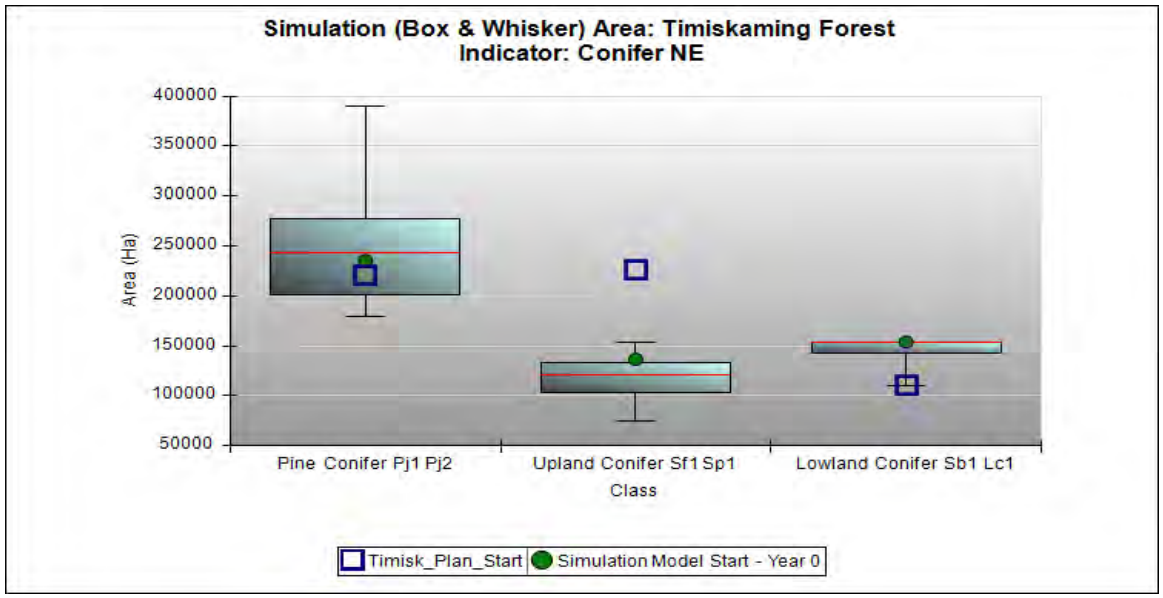

Figure 31. Comparison of plan start SRNV achievement levels for the conifer forest groupings

As observed in Figure 31, the plan start area for Pine Conifer is within the IQR, while Upland Conifer and Lowland Conifer show an overachievement and underachievement

respectively. Upon seeing the starting levels for these groupings well outside the IQR, it was deduced that this is likely the result of a difference between the 2021 eFRI and the previous FRI. Specifically, the IQR developed for each landscape indicator is based on the BFOLDS output, which was run on the 1986 inventory used in the 2011 and previous FMPs. A comparison between the 2011 and 2011 PLANFU area based on forest unit queries shows an increase of SP1 and a reduction of SB1 (See Figure 5 in the Analysis Package). This trend is consistent with the over and underachievement of upland and lowland conifer shown in Figure 31. As such, this change in inventory has to be considered when looking at the start point for these forest unit groupings. Overall, the limitations associated with relatively high and low start levels were considered during the development of the FMP.

These desirable levels are derived at the ecoregional level using the Boreal Forest Landscape Disturbance Simulator (BFOLDS) tool which outputs a (simulated) range of natural variation (SRNV) which is then apportioned by management unit.

The Red and White Pine indicator is not provided in the OLT output for Landscape Guide Region 3E. However, given the presence of these species on the landbase and to complement the *Conservation Strategy for White and Red Pine Management on the Timiskaming Forest* (Supp Doc 6.1.15) it was decided that the area of red and white pine forest would be measured as a landscape indicator. The goal is to increase the area of red and white pine dominated stands on the forest from the current level of 0.7% to the historic level of 2.12% over time. A desirable level and target has also been carried forward from previous FMPs, which is to achieve 10,000 ha of red and white pine forest on the Timiskaming Forest.

In addition to the structure and composition indicators described above, the Landscape Guide also provides direction regarding landscape patterns. The texture of the mature and old forest and young forest patch size are coarse filter indicators used to characterize landscape patterns for the 2021 FMP.

Mature and old forest texture is measured at two scales; 500 and 5,000 hectares. For each scale, 500 or 5,000 ha hexagons overlay the forest and a determination is made for each hexagon based on whether it is forested (i.e., 50% or greater of the hexagon contains forest) and the proportion of the forested area that is mature or old. Histograms are generated to represent the relative amount of mature and old forest in each hexagon. For these spatial indicators, the mean of the SRNV represents the desirable level.
Figure 32 and Figure 33 portray the plan-start mature and old forest texture levels at the 500 and 5,000 hectare scales compared to the mean SRNV.

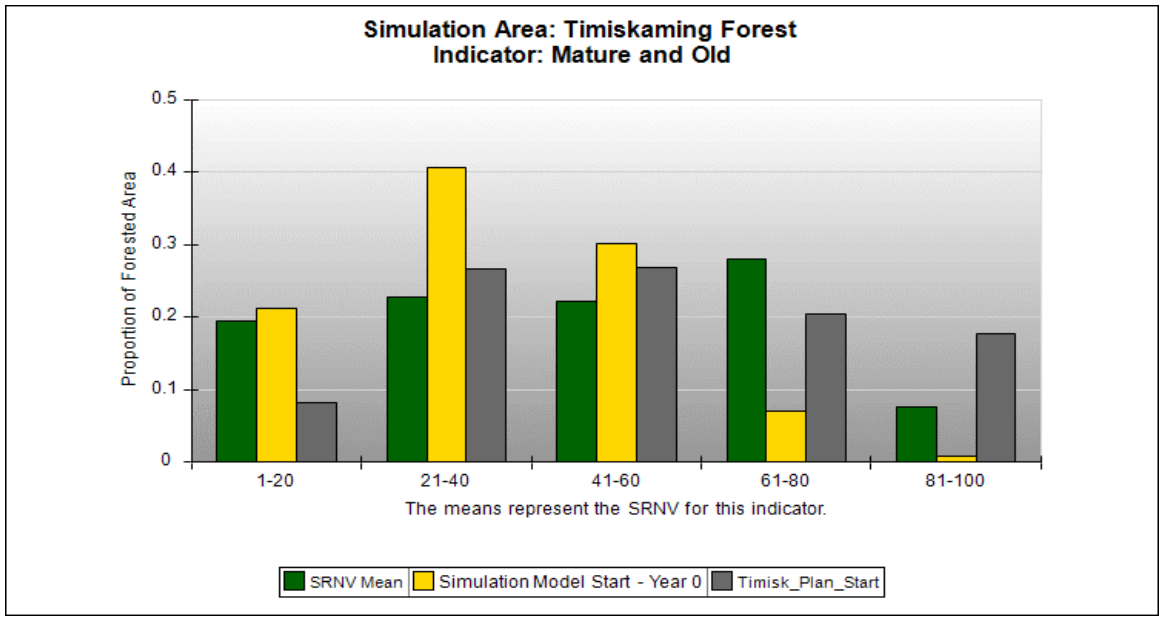

Figure 32. Comparison of plan start SRNV achievement levels for the Mature and Old Forest texture indicator (500 ha scale).

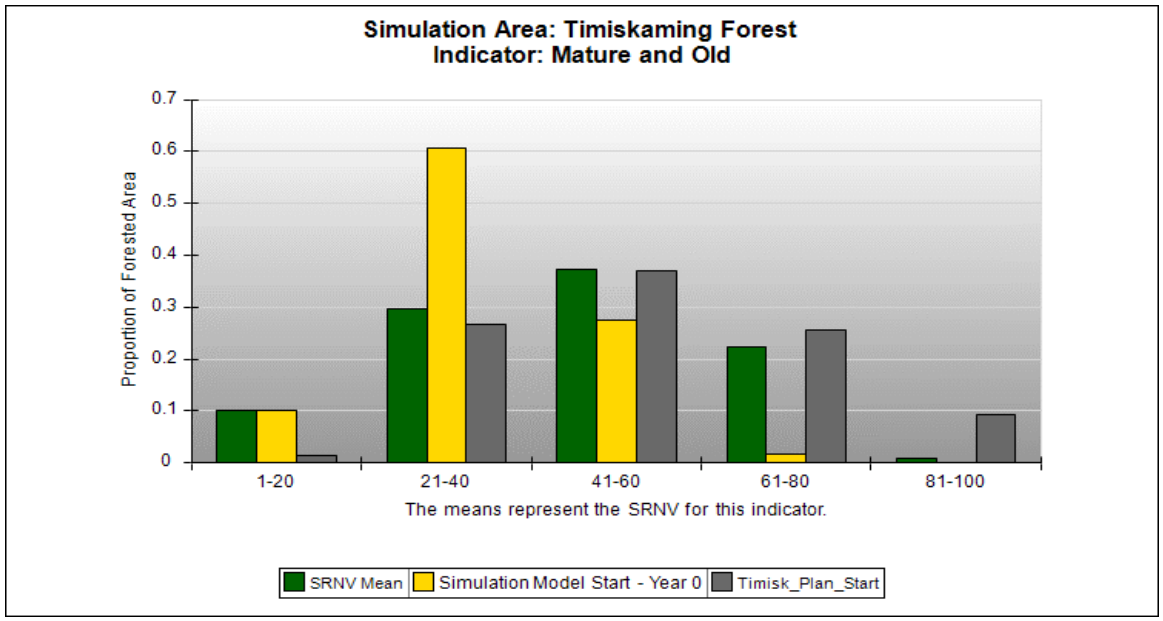

Figure 33. Comparison of plan start SRNV achievement levels for the Mature and Old Forest texture indicator (5,000 ha scale).

For both scales there is significantly more area in the 21-40 proportion classes at plan start than for the mean SRNV and significantly less area in the 61-80 and >80 proportion classes at plan start compared to the mean SRNV. The plan start condition has been heavily influenced by past harvest activities under different policies to ensure smaller disturbances leading to a higher proportion of hexagons in the three smaller proportion classes. The

challenge for the current FMP will be employing strategies to maintain and/or create dense mature and old forest patches (i.e., 61-80 and >80 proportion classes) into the future.

Similar to the mature and old forest matrix, young forest is measured using a texture technique. However, this is done at a finer texture, with 15 hectare hexagons overlaying the forest and a determination being made for each hexagon based on whether it is forested (i.e., 50% or greater of the hexagon contains forest) and the proportion of the forested area that is young (<36 years old). Young hexagons that are adjacent to each other are counted as the same patch. A frequency distribution of young forest patch sizes is created in nine size classes. Figure 34 portrays the frequency distribution of young forest patch at plan start compared to the mean SRNV.

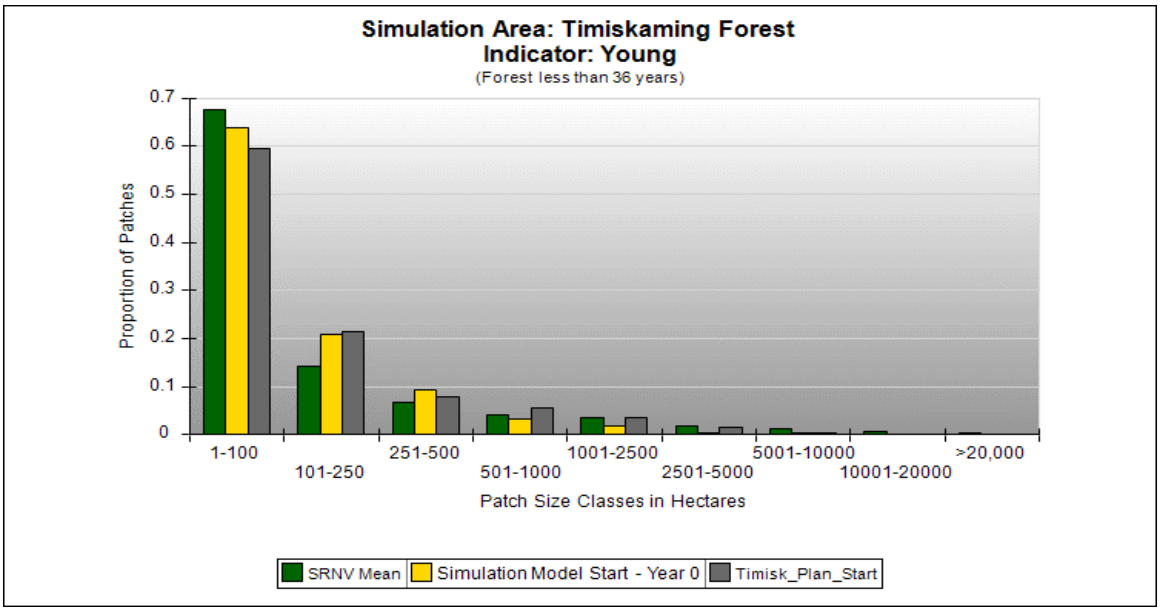

Figure 34. Comparison of plan start SRNV achievement levels for the Young Forest by patch size class texture indicator.

The plan start condition has more young forest in the medium patch size classes (i.e., 101-250, 251-500, 501-1000 and 1,001-2,500 hectare classes) than the mean SRNV. The plan start condition has less young forest in the 1-100 hectare class as well as the larger classes (2,501-5,000, 5,000-10,000, 10,000-20,000 and >20,000). Again, the current condition has been influenced by past forest policies and management practices that limited the amount of larger disturbances in many cases, although attempts have been made to limit very small disturbances to maintain operational feasibility. The challenge for the current FMP will be employing strategies to maintain and/or create young forest patches in the medium size classes listed above into the future.

The plan-start conditions for each of the landscape classes have management implications on the development of the FMP. Landscape classes are highest in the hierarchy of

biodiversity objective achievement in accordance with the direction in the Landscape Guide. Therefore, movement towards the desirable level for each indicator is a high priority. Harvest and renewal levels that are prescribed in the long-term management direction are, therefore, highly dependent on achieving the desirable levels for the landscape class indicators.

2.1.3.3. Other Forest Classifications

The Landscape Guide provides direction on the emulation of natural disturbances and landscape patterns, which is considered a coarse filter approach to habitat management. Although this approach provides habitat for a very broad range of wildlife and facilitates ecosystem processes, a fine filter may be required for species whose needs are not captured by the coarse filter.

Moose is one species which requires special consideration at both the landscape (i.e. coarse filter) and stand and site (i.e. fine filter) scales. Moose are habitat generalists and can use a broad range of forest conditions to meet their needs, though some habitats are preferred over others and habitat preferences change during the year. To achieve forest conditions in a managed forest that are similar to the conditions moose prefer and would encounter in a natural forest ecosystem, the Planning Team established Moose Emphasis Areas (MEAs) for the 2021 FMP.

MEAs act as operational management zones and were developed following the direction in the Stand and Site Guide. In preparation of the LTMD, an exercise was completed to determine core areas that were relatively roadless and that were identified as being suitable areas for emphasizing moose habitat. Areas suitable for habitat are characterized by wetlands, including moose aquatic feeding areas (MAFAs), productive areas with nutrient-rich sites predominating, and areas where habitat modelling suggests a high probability of achieving at least moderately high moose densities.

Additionally, the Planning Team considered the direction in the Stand and Site Guide that MEAs should generally be >2,000ha, and preferably >10,000ha; include renewal and tending practices to have regard for availability and abundance of moose browse over short & long term; adopt road use management strategies consistent with moose management objectives, and comprise of 10-15% of the productive forest. MEAs were focused on crown land because the intent is to maintain or create moose habitat through management.

As a result of this process, 41 candidate areas were identified on the Timiskaming Forest during FMP preparation. The candidate areas were presented at the Stage 3 - Proposed Operations Information Centres for public viewing. During the development of the draft plan, the Ontario Landscape Tool (OLT) was used to evaluate the habitat within each MEA to assess composition. Of these 41 candidate areas, 13 of the were identified as “Excellent” candidates. These were areas that were ranked highest in suitability to support the

improvement of moose habitat, and also included areas proposed for harvest. A comparison of the presence of habitat at plan start (2021) to after 10 years of projected harvest (2031) was completed to determine alignment with the habitat objectives. Achievement of habitat objectives, the Crown Land Use Policy Atlas, forestry operations, along with Indigenous Traditional Ecological Knowledge and local knowledge were considered when finalizing MEAs.

Through this process, a total of 13 MEAs were selected on the Timiskaming Forest, as illustrated on the map MU280_2021_FMPDP_MAP_MEA_00.pdf and described in Supp Doc 6.1.17.

2.1.4. Forest Resources

2.1.4.1. Inventories and Information for Species at Risk

A Species at Risk (SAR) is any naturally occurring plant or animal that is in danger of extinction or disappearing from a given area (natural range, geopolitical area). The SAR list in Canada is determined at the federal level based on the recommendations of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The Committee on the Status of Species at Risk in Ontario (COSSARO) assesses and monitors all species of concern in Ontario. The Committee is responsible for making recommendations to the Ministry of the Environment, Conservation and Parks (MECP) regarding listing or delisting of species or amendments to the SAR list for Ontario. Once a species has been listed, legislation is enacted under the Endangered Species Act in order to conserve or create habitat for this species. The species' designation gives them priority in the forest management planning process if they are identified in a given management unit. Species at risk are classified according to the following classifications:

- **Extirpated:** A native species no longer present in the wild.
- **Endangered:** A native species threatened with imminent extinction or extirpation in the area.
- **Threatened:** A native species at risk of becoming endangered if steps are not taken to address threatening it.
- **Special Concern:** A native species that is not endangered or threatened but may become endangered or threatened due to a combination of biological characteristics and identified threats.

Species designated as Threatened and Endangered under the ESA are afforded habitat and species protection, however S.22.1 of O.Reg 242/08 was amended to Crown Forest operations taking place before June 30, 2021 to fall under this exemption. AOC prescriptions and Conditions on Regular Operations have been developed into the plan to ensure protection of SAR within the forest. Habitat supply is maintained at natural levels by

striving in the FMP to ensure all forest types and age classes are represented across the landscape in approximately natural amounts.

MNRF undertakes a variety of values surveys to increase knowledge and distribution of SAR across the land base, and contains local information on known SAR occurrences and their habitats The Natural Heritage Information Center (NHIC) contains information on the location of individual occurrences and habitat of species that are classified as a SAR in Ontario. The Lands Information Ontario (LIO) contains element occurrence data on species listed as Special Concern on the SAR in Ontario list. A SAR species handbook and accompanying identification card have been developed by TFAI which identifies SAR species and provides steps to follow when a SAR is observed. All operators are required to have access to these documents while working (as part of the SFL's Environmental Health and Safety system). This requirement is presented at the start-up operators meeting each spring. If new species are listed in the regulations of the Ontario ESA during implementation of the 2021 – 2031 Timiskaming FMP, and if these species could be affected by forest management activities, or if habitat regulations are developed under the ESA and these regulations would apply, the FMP amendment process will be used, as required, to amend the FMP so that it complies with the law.

Table 3. Species at Risk confirmed or with reasonable potential to occur in Timiskaming Forest

Common name	Scientific name	Species at Risk in Ontario status	Confirmed on Timiskaming Forest	Area of Concern Prescription (FMP-11)
Bald Eagle	*Haliaeetus leucocephalus*	Special Concern	✔	✔
Common Nighthawk	*Chordeiles minor*	Special Concern	✔	✘
Eastern Whip-poor-will	*Antrostomus vociferous*	Threatened	✔	✔
Short-eared Owl	*Asio flammeus*	Special Concern	✔	✔
Barn Swallow	*Hirundo rustica*	Threatened	✔	✔
Black Tern	*Chilidonias niger*	Special Concern	✔	✘
Canada Warbler	*Cardellina canadensis*	Special Concern	✔	✘
Eastern Wood-pewee	*Contopus virens*	Special Concern	✔	✘

Common name	Scientific name	Species at Risk in Ontario status	Confirmed on Timiskaming Forest	Area of Concern Prescription (FMP-11)
Wood Thrush	*Hylocichla mustelina*	Special Concern	✔	✘
Bank Swallow	*Riparia*	Threatened	✔	✔
Chimney Swift	*Chaetura pelagica*	Threatened	✔	✔
Eastern small-footed Bat	*Myotis leibii*	Endangered	✔	✔
Little Brown Myotis	*Myotis lucifugus*	Endangered	✔	✔
Northern Myotis	*Myotis septentrionalis*	Endangered	✔	✔
Peregrine Falcon	*Falco peregrinus*	Special Concern	✔	✔
Evening Grosbeak	*Coccothraustes vespertinus*	Special Concern	✔	✘
Horned Grebe	*Podiceps auritus*	Special Concern	✔	✘
Lake sturgeon (Great Lakes – Upper St-Lawrence Population)	*Acipenser fulvescens*	Endangered	✔	✘
Monarch butterfly	*Danaus plexippus*	Special Concern	✔	✘
Olive-sided Flycatcher	*Contopus cooperi*	Special Concern	✔	✘
Rusty blackbird	*Euphagus carolinus*	Special Concern	✔	✘
Snapping Turtle	*Chelydra serpentina*	Special Concern	✔	✘
Yellow-banded Bumblebee	*Bombus terricola*	Special Concern	✔	✘
Yellow rail	*Coturnicops noveboracensis*	Special Concern	✔	✘

Common name	Scientific name	Species at Risk in Ontario status	Confirmed on Timiskaming Forest	Area of Concern Prescription (FMP-11)
Hickorynut Mussel	*Obovaria olivaria*	Endangered	✓	✗
Eastern Meadowlark	*Sturnella magna*	Threatened	✓	✗
Bridle Shiner	*Notropus bifrenatus*	Special Concern	✓	✗
Blandings Turtle	*Emydoidea bladningii*	Threatened	✓	✓
Bobolink	*Dolichonyx oryzivorus*	Threatened	✓	✗
Golden Eagle	*Aquila chrysaetos*	Endangered	✓	✗
Tri-coloured Bat	*Perimyotis subflavus*	Endangered	✓	✓

2.1.4.1.1 Species at Risk with Area of Concern prescriptions confirmed on Timiskaming Forest

The habitat of the following SAR known to occur within the Timiskaming Forest will be provided or protected through the use of AOC prescriptions identified in FMP-11. These species are briefly described in the sections below. For further information on any species please see the SAR in Ontario list accessed at www.ontario.ca/page/species-risk-ontario.

2.1.4.1.1.1 Bald Eagle (Special Concern)

Bald Eagles nest in a variety of habitats and forest types, almost always near a major lake or river where they do most of their hunting. They usually nest in large trees such as pine and poplar. During the winter, Bald Eagles sometimes congregate near open water or in places where carcasses might be found. Current Bald Eagle populations are impacted by the continued development of shoreline habitat and pollution. Typically, bald eagle nests are extra-large, up to 3 meters wide located within or below the canopy of live trees, usually large and often super canopy poplars, on the shores of larger lakes. The AOC prescription can be found in FMP-11 (BE).

2.1.4.1.1.2 Eastern Whip-Poor-Will (Threatened)

The Eastern Whip-poor-will is usually found in areas with a mix of open and forested areas, such as savannahs, open woodlands or openings in more mature, deciduous, coniferous and mixed forests. It forages in these open areas and uses forested areas for roosting (resting

and sleeping) and nesting. It lays its eggs directly on the forest floor, where its colouring means it will easily remain undetected by visual predators. Although there is some uncertainty surrounding the decline of the Eastern Whip-poor-will, the main threat to the species is likely habitat loss and degradation. The AOC prescription can be found in FMP-11 (WPW).

2.1.4.1.1.3 Short-Eared Owl (Special Concern)

The Short-eared Owl lives in open areas such as grasslands, marshes and tundra where it nests on the ground and hunts for small mammals, especially voles. The creation of new grasslands with the clearing of forests for farmland may have initially benefited the species, but as agricultural methods became more intensive with the mowing of fields during the nesting season and overgrazing by livestock, these areas became unsuitable for this owl. Other threats include loss of marshes. The AOC prescription can be found in FMP-11 (GN2).

2.1.4.1.1.4 Barn Swallow (Threatened)

Barn Swallows often live in close association with humans, building their cup-shaped mud nests almost exclusively on human-made structures such as open barns, under bridges and in culverts. The species is attracted to open structures that include ledges where they can build their nests, which are often re-used from year to year. They prefer unpainted, rough-cut wood, since the mud does not adhere as well to smooth surfaces. The AOC prescription can be found in FMP-11 (BSN).

2.1.4.1.1.5 Bank Swallow (Threatened)

Bank swallows nest in burrows in natural and human-made settings where there are vertical faces in silt and sand deposits. Many nests are on banks of rivers and lakes, but they are also found in active sand and gravel pits or former ones where the banks remain suitable. Many factors have contributed to the decline in population, including loss of breeding and foraging habitat, destruction of nesting habitat, widespread pesticide use (that has reduced the populations of insects they eat), impacts of climate change and collision with vehicles. Although activities at sand and gravel pits may contribute to the loss of some nests, the fact that a large number of bank swallow colonies in Ontario are located in sand and gravel pits suggests they also provide important nesting habitat. The AOC prescription can be found in FMP-11 (BS).

2.1.4.1.1.6 Chimney Swift (Threatened)

Before European settlement Chimney Swifts mainly nested on cave walls and in hollow trees or tree cavities in old growth forests. Today, they are more likely to be found in and around urban settlements where they nest and roost (rest or sleep) in chimneys and other

built structures. They also tend to stay close to water as this is where the flying insects they eat congregate. Chimney Swifts are one of many bird species that feed on flying insects and are declining. The AOC prescription can be found in FMP-11 (CS)

2.1.4.1.1.7 Eastern small-footed Bat (Endangered)

In the spring and summer, eastern small-footed bats will roost in a variety of habitats, including in or under rocks, in rock outcrops, in buildings, under bridges, or in caves, mines, or hollow trees. These bats often change their roosting locations every day. At night, they hunt for insects to eat, including beetles, mosquitos, moths, and flies. In the winter, these bats hibernate, most often in caves and abandoned mines. The AOC prescription can be found in FMP-11 (BR and BM).

2.1.4.1.1.8 Little Brown Myotis (Endangered)

Bats are nocturnal. During the day they roost in trees and buildings. Little brown bats hibernate from October or November to March or April, most often in caves or abandoned mines that are humid and remain above freezing. The AOC prescription can be found in FMP-11 (BR and BM).

2.1.4.1.1.9 Northern Myotis (Endangered)

Northern Myotis, also known as Northern Long-eared Bats, are associated with Boreal forests, choosing to roost under loose bark and in the cavities of trees. These bats hibernate from October or November to March or April, most often in caves or abandoned mines. The AOC prescription can be found in FMP-11 (BR and BM).

2.1.4.1.1.10 Peregrine Falcon (Special Concern)

Peregrine Falcons usually nest on tall, steep cliff ledges close to large bodies of water. In the 1950s, peregrine numbers began to drop, and by the mid 1960s, the falcon had disappeared from Ontario. Eventually, it was discovered that the pesticide DDT was responsible for the birds' decline. Today, the Peregrine Falcon faces many of the same threats facing other species at risk: habitat loss and destruction, disturbance and persecution by people, and environmental contaminants. The AOC prescription can be found in FMP-11 (PF).

2.1.4.1.1.11 Blanding's Turtle (Threatened)

Blanding's Turtles live in shallow water, usually in large wetlands and shallow lakes with lots of water plants. It is not unusual, though, to find them hundreds of metres from the nearest water body, especially while they are searching for a mate or traveling to a nesting site. Blanding's Turtles hibernate in the mud at the bottom of permanent water bodies from late October until the end of April. The most significant threats to the Blanding's Turtle are

loss or fragmenting of habitat, motor vehicles, and raccoons and foxes that prey on eggs. The AOC prescription can be found in FMP-11 (BLTU)

2.1.4.1.1.12 Tri-coloured Bat (Endangered)

During the summer, the Tri-colored Bat is found in a variety of forested habitats. It forms day roosts and maternity colonies in older forest and occasionally in barns or other structures. They forage over water and along streams in the forest. They overwinter in caves where they typically roost by themselves rather than part of a group. The AOC prescription can be found in FMP-11 (BR and BM).

2.1.4.1.2 Species at Risk (Threatened and Endangered) without Area of Concern prescriptions, confirmed on Timiskaming Forest

2.1.4.1.2.1 Hickorynut Mussel (Endangered)

Hickorynuts live on the sandy beds in large, wide, deep rivers – usually more than two or three meters deep – with a moderate to strong current. In Canada, the fish host of the Hickorynut is the Lake Sturgeon. Presence of the fish host is one of the key features determining whether a body of water can support a healthy Hickorynut population. Hickorynut Mussel would be protected with existing Lakes and Rivers AOC's written into the plan, and therefore did not require the development of a specific AOC.

2.1.4.1.2.2 Lake sturgeon (Endangered)

Lake sturgeon (Great Lakes – Upper Se Lawrence populations) lives almost exclusively in freshwater lakes and rivers with soft bottoms of mud, sand or gravel. They are usually found at depths of five to 20 metres. They spawn in relatively shallow, fast-flowing water (usually below waterfalls, rapids, or dams) with gravel and boulders at the bottom. However, they will spawn in deeper water where habitat is available. They also are known to spawn on open shoals in large rivers with strong currents. With improvements in water quality and the strict regulation or elimination of commercial and recreational fishing of Lake Sturgeon in Ontario, habitat fragmentation and regulated water flows from dams are the greatest threats to the species. Lake Sturgeon would be protected with existing Lakes and Rivers AOC's written into the plan, and therefore did not require the development of an AOC.

2.1.4.1.2.3 Eastern Meadowlark (Endangered)

Eastern Meadowlarks breed primarily in moderately tall grasslands, such as pastures and hayfields, but are also found in alfalfa fields, weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields, or other open areas. Eastern Meadowlark numbers are shrinking due to changes in land use and the loss of suitable habitat that has

resulted from development, changes in farming practices, over-grazing of pasturelands by livestock, grassland fragmentation, reforestation and the use of pesticides. As this species spends the majority of its time in open fields, it is not directly affected by forestry operations and no AOC was developed for this plan.

2.1.4.1.2.4 Bobolink (Threatened)

Historically, Bobolinks lived in North American tallgrass prairie and other open meadows. With the clearing of native prairies, Bobolinks moved to living in hayfields. Bobolinks often build their small nests on the ground in dense grasses. Mowing of hay during the breeding period may inadvertently kill and disturb nesting adults and young birds and destroy eggs and nests. In addition, the quality of Bobolink nesting habitat has likely declined over time due to modern hay production practices such as earlier maturing seed mixtures and shorter crop rotation cycles. As this species spends the majority of its time in open fields, it is not directly affected by forestry operations and no AOC was developed for this plan.

2.1.4.1.2.5 Golden Eagle (Endangered)

Golden Eagles nest in remote, undisturbed areas, usually building their nests on ledges on a steep cliff or riverbank, but they will also use large trees if needed. Golden Eagles are very sensitive to disturbance near their nests and could abandon them if harassed or kept away from the eggs or young too long. There are no confirmed nests of Golden Eagle within the Timiskaming Forest, and only rare sightings that may be from their migration route. No AOC has been developed for this plan as it is currently not required.

2.1.4.1.3 Species at Risk (Special Concern) without Area of Concern prescriptions, confirmed on Timiskaming Forest

The other provincially listed species at risk known to occur on the Timiskaming Forest are described in the sections below. The source of this information is the SAR in Ontario list accessed here: www.ontario.ca/page/species-risk-ontario. Special Concern species do not receive species or habitat protection under the Endangered Species Act and thus do not have an AOC prescription. Habitat for these SAR will be provided through the following mechanisms:

- In some areas, a coarse filter landscape approach will be used, to maintain natural amounts of area within the appropriate landscape classes (e.g., mature and older conifer).
- The Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales (Stand and Site Guide) direction and guidelines for protecting flowing waters, rivers and streams are applied to all permanent rivers and streams.

- The Stand and Site Guide enables some harvesting to shore under appropriate conditions, which also provides habitat for certain species.
- Wildlife trees are retained where appropriate within harvest blocks as per Stand and Site Guide direction.
- Conditions on Regular Operations (Section 6.1.16, Module 9) also provide habitat protection, including minimizing impacts to wetland habitats.
- Forest industry workers receive SAR awareness training and are encouraged to report sightings.

2.1.4.1.3.1 Common Nighthawk (Special Concern)

Traditional Common Nighthawk habitat consists of open areas with little to no ground vegetation, such as logged or burned-over areas, forest clearings, rock barrens, peat bogs, lakeshores, and mine tailings. Although the species also nests in cultivated fields, orchards, urban parks, mine tailings and along gravel roads and railways, they tend to occupy natural sites. The widespread decline of Common Nighthawk includes habitat degradation resulting from fire suppression, land use changes in the Boreal forest and an increase in intensive agriculture.

2.1.4.1.3.2 Black Tern (Special Concern)

Black Terns build floating nests in loose colonies in shallow marshes, especially in cattails. Threats include the draining and altering of wetlands, water pollution and human disturbance at nesting colonies – especially boat traffic, which can swamp the terns' floating nests. Riparian zones and wetlands that may be used by the birds are protected through the application of riparian and water quality reserves as per the Stand and Site Guide.

2.1.4.1.3.3 Canada Warbler (Special Concern)

The Canada Warbler breeds in a range of deciduous and coniferous, usually wet forest types, all with a well- developed, dense shrub layer. Dense shrub and understory vegetation help conceal Canada Warbler nests that are usually located on or near the ground on mossy logs or roots, along stream banks or on hummocks. A reduction in forests with a well-developed shrub-layer has likely impacted Canada Warblers throughout their breeding range.

2.1.4.1.3.4 Eastern Wood-Pewee (Special Concern)

The eastern wood-pewee lives in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It is most abundant in intermediate-age mature forest stands with little understory vegetation. Possible threats to the eastern wood-pewee are poorly known but may include: loss and degrading of habitat due to urban development and/or changes in how forests are managed; reductions in the availability of the flying insects they

eat, the cause of which is not known; and loss of eggs and fledgling birds from increasing numbers of predators such as blue jays and red squirrels.

2.1.4.1.3.5 Wood Thrush (Special Concern)

The wood thrush lives in mature deciduous and mixed (conifer-deciduous) forests. They seek moist stands of trees with well-developed undergrowth and tall trees for singing perches. These birds prefer large forests but will also use smaller stands of trees. They build their nests in living saplings, trees or shrubs, usually in sugar maple or American beech. Major threats to the wood thrush appear to be: the loss or breaking up of the bird's forest habitat from urban, suburban and cottage development; and parasitic behavior from brown-headed cowbirds, which lay their eggs in the nests of the wood thrush (and other birds), and whose young are fed by the host thrush at the expense of their own young. Loss and the breaking up of forests in the bird's winter habitat may also be a threat to the wood thrush.

2.1.4.1.3.6 Evening Grosbeak (Special Concern)

During the breeding season, the Evening Grosbeak is generally found in open, mature mixed-wood forests dominated by fir species, White Spruce and/or Trembling Aspen. Outside the breeding season, the species depends mostly on seed crops from tree species in the Boreal forest such as firs and spruces. It is also attracted to ornamental trees that have seeds or fruit and may visit bird feeders. Potential threats to the Evening Grosbeak include habitat loss and degradation from forestry practices, chemical measures to control Spruce Budworm populations and climate change impacts.

2.1.4.1.3.7 Horned Grebe (Special Concern)

Horned Grebe usually nests in small ponds, marshes and shallow bays that contain areas of open water and emergent vegetation. Nests are usually located within a few metres of open water. This vegetation provides adults with nest materials, concealment, and protection for their young. It is expected that populations are threatened by the permanent loss of wetlands to agriculture and development.

2.1.4.1.3.8 Monarch butterfly (Special Concern)

Throughout their life cycle, Monarchs use three different types of habitat. Only the caterpillars feed on milkweed plants and are confined to meadows and open areas where milkweed grows. Adult butterflies can be found in more diverse habitats where they feed on nectar from a variety of wildflowers. The largest threat to Ontario Monarchs is habitat loss and fragmentation at overwintering sites in central Mexico where forests are being logged and converted into agricultural fields and pastures.

2.1.4.1.3.9 Olive-Sided Flycatcher (Special Concern)

The Olive-sided flycatcher is most often found along natural forest edges and openings. It will use forests that have been logged or burned, if there are ample tall snags and trees to use for foraging perches. Olive-sided flycatchers' breeding habitat usually consists of coniferous or mixed forest adjacent to rivers or wetlands. In Ontario, Olive-sided flycatchers commonly nest in conifers such as White and Black Spruce, Jack Pine and Balsam Fir. There is some evidence to suggest that individuals breeding in managed forests have lower nest success compared to those breeding in natural forest stands.

2.1.4.1.3.10 Rusty blackbird (Special Concern)

The Rusty Blackbird breeds in habitats that are dominated by coniferous forest with wetlands nearby including bogs, marshes and beaver ponds. During the winter, it is found in wet woodlands, swamps, and pond edges and often forages in agricultural lands. Threats to its breeding habitat in Ontario include the negative impacts of climate change and industrial landscape-level activities on forest and wetland habitats.

2.1.4.1.3.11 Snapping Turtle (Special Concern)

Snapping Turtles spend most of their lives in water. They prefer shallow waters so they can hide under the soft mud and leaf litter, with only their noses exposed to the surface to breathe. During the nesting season, from early to mid summer, females travel overland in search of a suitable nesting site, usually gravelly or sandy areas along streams. Snapping Turtles often take advantage of built structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits.

2.1.4.1.3.12 Yellow banded Bumblebee (Special Concern)

Yellow-banded Bumble Bee is a forage and habitat generalist, able to use a variety of nectaring plants and environmental conditions. It can be found in mixed woodlands, particularly for nesting and overwintering, as well as a variety of open habitat such as native grasslands, farmlands and urban areas. Nest sites are often underground in abandoned rodent burrows or decomposing logs. Suspected threats to the Yellow-banded Bumble Bee include a combination of factors such as the introduction of pathogens from managed bee colonies, pesticide use, climate change, and habitat loss.

2.1.4.1.3.13 Yellow rail (Special Concern)

Yellow rails are secretive birds and live deep in the reeds, sedges, and marshes of shallow wetlands, where they nest on the ground. The marshy areas used by Yellow Rails have an overlying dry mat of dead vegetation that is used to make roofs for nests. The Yellow Rail has not benefited from wetlands restoration for waterfowl, as it prefers shallow marshes rather than open waters.

2.1.4.1.3.14 Bridle Shiner (Special Concern)

Bridle Shiners prefer clear, unpolluted streams, rivers and lakes which have an abundance of aquatic vegetation. These vegetated areas provide suitable spawning habitat and places to feed and hide from predators. Bridle Shiners prefer warm water habitats where the bottom is either sand, silt or organic debris, which is necessary for the establishment of aquatic vegetation. Bridle Shiners are sensitive to sediment and chemical runoff into the water from agricultural lands, and the resulting decrease in water clarity and quality.

2.1.4.2. Fish and Wildlife Inventories

The Timiskaming Forest covers a large geographic area and is endowed with a rich abundance of natural resources. This natural wealth provides valuable ecological services to the region as well as recreational and other opportunities that attract a variety of users who derive benefits from resources that are directly or indirectly dependent on forest cover. Five Wildlife Management Units (WMU) intersect the forest: 27, 28, 29, 40 and 41. As well as three Fisheries Management Zones (FMZ): 8,10 and 11.

The MNRF undertakes field monitoring of many fish and wildlife species and their habitat. Data is used for many purposes including the allocation of fish and wildlife for consumptive use and the monitoring of relative change in wildlife populations in a variety of habitats over time. In addition, specific wildlife values including nests and moose aquatic feeding areas, which are monitored as part of the forest management planning process to identify these features on the landscape. The Lands Information Ontario (LIO) data layers are maintained by the MNRF and contain information on fish and wildlife species and their habitats. These layers also contain thermal regime characteristics of lakes that may help determine the likelihood of fish species present in cases where no species data are available.

Research projects designed to test the effects and effectiveness of the management approaches used to provide for fish and wildlife are undertaken by the MNRF. The MNRF may work alone or in collaboration with university researchers, the forest industry, the Canadian Wildlife Service, Bird Studies Canada, and others.

2.1.4.2.1 Providing Habitat for Fish and Wildlife

Forest management activities could potentially affect the quality and quantity of fish and wildlife. Fish and fish habitat may be affected by introducing sediments or logging debris into watercourses, removing adjacent forest that provides cover, altering food and nutrients for aquatic communities, increasing water temperature after harvest of shoreline forest or obstruction of fish passage from poor installation or maintenance of crossings and increase fishing pressure on sensitive water bodies through access, among other potential effects.

Forest management activities could also potentially affect the quality and quantity of terrestrial species and their habitat primarily through the loss or alteration of habitat. However, the Timiskaming FMP was developed according to the principals and guidelines of the Crown Forest Sustainability Act (CFSA), the Forest Management Guide of Boreal Landscapes, the Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales and the Environmental Guidelines for Access Roads and Water Crossings. All of which provide direction to eliminate or mitigate negative effects of forestry to fish and wildlife.

There are hundreds of species of vertebrates and many thousands of species of invertebrates in the Boreal forest. Among the vertebrates are many with conflicting habitat requirements; some prefer young forest while others prefer older forest; some prefer conifer while others prefer hardwood forest types. In the context of an FMP, it would be impossible to provide for all of them on a species-by-species basis. Therefore, following provincial direction, the Planning Team used a variety of complimentary means to provide habitat for wildlife in the Timiskaming FMP, including
:

- Emulating natural disturbance patterns and residual structure in harvested stands (coarse filter)
    - Forest Landscape Classes
    - Harvest Operations
- Renewing harvested areas promptly to provide forest cover types that function as essential habitat (coarse filter)
    - Objectives and Indicators
    - Silvicultural Ground Rules
- Managing the habitat condition and ensuring that there is adequate mature and old forest, even with harvesting taking place, to provide habitat through time for species that use this habitat (coarse filter)
    - Forest Landscape Classes
- Applying AOC prescriptions to protect special or sensitive sites (fine filter)

It is thought that, by emulating natural disturbance patterns and residual structure in harvested stands, renewing sites appropriately, and taking precautions around water, the needs of most species will be addressed over the long term (coarse filter management). Additional species-specific measures (fine filter management) are undertaken for wildlife that are sensitive (e.g., great blue heron and birds of prey) or of particular local or public interest, such as moose, black bear, and species at risk.

2.1.4.2.2 Fisheries Resources

The Timiskaming Forest has a mixture of cold and cool water lakes and streams, and the fish communities within the forest reflect this. Common natural-occurring cool water fish species within the Timiskaming Forest include Walleye, Northern Pike, Yellow Perch, and White Sucker. Common naturally-occurring cold water species include Brook Trout, Lake

Trout, Lake Whitefish, Cisco, and Burbot. Various species of Darters, Dave and Shiners are present in streams, lakes and ponds through the forest. Smallmouth Bass and Brown Bullhead, are now a common fish species through the forest due to range expansion from unauthorized stocking events. When species specific data is absent, thermal regime is used to predict species that are likely to occur in these water systems. There are 166 stocked lakes within the Timiskaming Forest, stocked with Brook Trout, Lake Trout, Rainbow Trout, Aurora Trout and Splake. The MNRF conducts lake and stream surveys to identify the health of fisheries and stocking success. Broad-scale monitoring is also conducted on lakes within the Timiskaming Forest to obtain comprehensive community scale data on fisheries. Two Area of Concern prescriptions have been developed to mitigate impacts to self-sustaining lake trout lakes (see TL-1 and TL-2 in Table FMP-11), which include measures to mitigate the development of unauthorized access to these lakes.

2.1.4.2.3 Wildlife Resources

The Timiskaming Forest provides habitat for a variety of fauna. Those of particular interest for recreational and economic benefit include moose, black bear, wolf, marten, beaver, fisher, lynx and other furbearers, grouse, ducks and other game birds. The landscape is also habitat for a large diversity of other mammals, reptiles, amphibians, birds, insects and plants that provide ecological, recreational, economic and cultural benefits.

Moose are found predominantly in the Boreal Forest Region, though they also live in the Great Lakes-St. Lawrence Region. The Timiskaming Forest provides early and late winter habitat, moose aquatic feedings areas and special sites such as calving areas and mineral licks. The MNRF conducts Moose Aerial Inventories of the WMU's for long-term population monitoring which is then used to determine the amount of sustainable harvest. Forest management activities can have both positive and negative effects on moose habitat. Because of these potential effects and their importance as game animals, moose are managed as a fine filter species in this FMP. Moose habitat is discussed in detail in Supplementary Documentation 6.1.17.

Black bear is a relatively long-lived species with low reproductive potential and a high sensitivity to changes in adult mortality. They primarily utilize forest where they are best able to meet their needs for cover, food and security from predators. Bear populations are naturally affected by variation in their food supplies. Forest management can also affect bears by the construction of forest access roads that present new opportunities for bear hunters and harvesting and silviculture that influence the supply of habitat and food. The Timiskaming Forest contains Bear Management Areas (BMAs) that are licensed to black bear hunting outfitters. The MNRF collects data on both resident and non-resident hunting activity and harvest for each of the spring and fall seasons through mandatory reporting. The MNRF is also conducting a long-term population monitoring study using barbed wire hair traps to refine and update black bear population estimates within each WMU.

The Timiskaming forest contains trap lines that are licensed to trappers that harvest furbearing animals such as beaver, otter, marten, fisher, mink, weasel, lynx, coyote and wolves. The MNRF works with trappers to protect these wildlife populations and habitat by setting quotas, collecting harvest information and reducing human and wildlife conflicts. Habitat for most of the furbearers found in the Timiskaming forest is provided using the coarse filter/landscape class management approach.

MNRF's LIO database documents all occurrences of Herons and Birds of Prey nesting sites. This data is continually updated based on MNRF aerial stick nest surveys and ground truthing by MNRF and forest industry. AOC prescriptions have been developed based on guidance in the Stand and Site Guide to protect known nesting sites of various species, along with those found during operations.

2.1.4.3. Values Information

The collection and mapping of natural resource information has occurred for many decades. However, the formal collection and mapping of values information began with the publication of the Timber Management Planning Manual in 1985. Values recorded were primarily fish and wildlife based (i.e. brook trout creeks, stick nests and moose aquatic feeding areas) but also included cultural and life science values information. Prior to this time values information was collected randomly and not well coordinated in relation to forest planning. Today, values collection, mapping and classification are an integral part of forest management planning.

Currently, a series of values maps have been updated for the production of this FMP using survey data, ground truthing, and input from the general public and forest industry. Input and verification of the information into the Land Information Ontario (LIO) System is an MNRF responsibility. However, the forest industry plays a vital role in reporting values information during plan implementation. Accurate values information is critical to the development and implementation of the forest management plan. Inaccurate, incomplete or a lack of values information results in a deficient operational plan that is difficult to implement.

Values information is organized to portray similar types of values on one map. The Values Maps are included in digital format as part of the FMP (e.g. MU280_2021_FMP_MAP_ValWild_00.pdf). Sensitive values information is not shown on maps but known to the planning team and has been considered during operational planning.

As detailed in Section 2.1.2, there is currently relatively little amounts of old forest on the management unit due primarily to past forest fires and subsequent logging history. The white pine forest unit grouping of stands contain small communities of overmature (old growth) red and white pine forest, scattered and found in a band along the southern portion of the unit. Management of white and red pine stands will follow the *Conservation Strategy for White and Red Pine Management on the Timiskaming Forest*, which is available in Section

6.1.15 of the Supplementary Documentation. The goal of increasing the presence of white and red pine on the Timiskaming forest is also reflected in management objective 2, developed by the planning team.

The Timiskaming Forest management unit contains a wide array of forest resource values. There has been a long history of use of the units' resources, many of which are dependent upon forest cover and forest cover manipulation, and are significant in the local, regional and provincial context. Primary access into the majority of the management unit is established, and as a result, the pursuit of many traditional recreational pastimes has grown.

Resource-based Tourism

There are 30 established resource-based tourism operators (RBT) currently registered within the Timiskaming Forest. A few lakes are used as daily fly-in lakes by local outfitters, especially in the west part of the management unit. However, most tourism establishments can be classified as roadside facilities.

This forest management plan is committed to maintaining the viability of the tourism industry by protecting tourism values in the forest management planning process through the application of MNRF's approved forest management guide(s) that addresses forestry and resource-based tourism, and the use of Resource Stewardship Agreement (RSAs) as one method of protecting and sustaining these values. It should be noted that RSAs do not bind or limit the Minister's right to make land use decisions for Crown land in Ontario.

As part of the RSA process, discussions occurred with tourism operators where their interests were potentially impacted by forest operations during the 2021 FMP. These discussions resulted in area of concern prescriptions to modify forest management activity in order to protect values and interests of these businesses.

A Resource-Based Tourism values map has been included in the FMP to identify values which are important to tourism businesses (see map MU280_2021_FMP_MAP_ValRBT_00.pdf). The SFL holder continues to work closely with resource-based tourism operators ensuring both parties coordinate their efforts in making certain both economies continue to coexist and maintain their long-term viability.

CLUPA does identify a list of lakes that are designated tourism lakes within Timmins District and these have an associated area of concern prescription applied to sustain the land-use designation (see DTL-1 and DTL-2 AOC prescriptions in Table FMP-11). Land-based access restrictions in CLUPA have been reflected in these AOCs. There are also lakes that have been identified for potential remote tourism opportunities, but do not presently have resource-based tourism operations established on them.

Mineral, Aggregate and Quarry Areas

Although not dependent on forest cover for its existence, mining plays an important role in the economic development of the Timiskaming Forest. Mining history dates back to the late 1800's with the discovery of gold and silver in the Kirkland Lake and Elk Lake areas. Mineral exploration activity continues to play an integral part in the makeup of the Timiskaming Forest. Aggregate and quarry areas also form part of the landscape that has implications to the management of the Timiskaming Forest.

Mineral exploration activity tends to be facilitated by improved access and removal of trees. Since consultation of Aggregate Resources Act (ARA) site applications occurs prior to permit issuance, mitigation for silvicultural investments (e.g. plantations) can be arranged. Rehabilitation of forestry aggregate pits can return the area to productive forest, as well as aesthetics. Forestry operations may include some disturbance of aggregate bearing landform features and have the potential to damage claim posts and survey lines; however, through liaising with mineral exploration companies, efforts are made to identify and preserve claim posts. The active and inactive aggregate permit areas are depicted on the land values map (see MU280_2021_FMP_MAP_ValLand_00.pdf).

Crown land recreation and cottaging

Camping, cottaging, hiking, berry picking and snowmobiling are all examples of land-uses within the Timiskaming Forest that depend on forest cover. There are no quantifiable estimates on the number of user days these types of activities generate from the Timiskaming Forest MU, but the total would be considered noteworthy. These Crown land recreation activities all have implications on the development of the forest management plan. Development of procedures and prescriptions in the forest management plan ensures that all activities can coexists and occur simultaneously during plan implementation. Examples include the RECTRAIL AOC, which addresses snowmobiling, canoe-routes, portage trails and ski trails. In addition, there are multiple AOCs developed jointly with Cottage associations to minimize impacts of forest management on values associated with cottaging (e.g. see PLCA AOC).

Trapping (commercial fur)

Trapping of furbearing animals has a long history in the area dating as far back as the 17th century. There is little population data available on commercial furbearers specific to the Timiskaming Forest. Although beaver remains the mainstay, other species such as marten, fisher, mink, otter, fox, muskrat and lynx remain important. Secondary species include squirrel, weasel, wolf and coyote. Currently there are approximately 125 traplines that are wholly, or in part, situated on the Timiskaming Forest. These traplines are managed through Kirkland Lake, Timmins, North Bay, Sudbury and Cochrane Districts.

Private land

The Timiskaming Forest is comprised of 271,042 hectares of private land, which occupies 18% of the management unit. The implications of private land on forest management planning are not unnoticed. Many parcels of private land surround small, but forested Crown land which presents administrative difficulties during plan implementation. Also, private land contributes significantly to the fragmentation of the forest by nature of its administration (i.e. different owners with multiple objectives), and therefore objectives established on adjacent Crown land often are minimized as a result of activities taking place on adjacent private land.

The total area designated as conservation reserves within the Timiskaming Forest, is 45,966 ha while the total area in parks equals 18,420 ha (both totals do not include water but include non-forested area). Most parks and conservation reserves are established to allow for the protection of unique landscape features (e.g. Meteor Lake Outwash Fans Conservation Reserve). Forest management activities are prohibited within the boundaries of parks and conservation reserves. However, forest management activities can occur adjacent to a park and protected areas. Forest management activities planned adjacent to parks and protected areas have the potential to negatively impact parks and protected area values, which is why an AOC for parks and protected areas was developed to prevent, minimize and mitigate these potential impacts (see PC AOC in Table FMP-11). Any use of existing access prior to the establishment of the parks or conservation reserves is allowed for the purpose of conducting forest management activities.

There are 15 Provincial Parks and 20 Conservation Reserves adjacent to or within the boundaries of the Timiskaming Forest. A list of these Provincial Parks and Conservation Reserves is provided in Table 7 in section 2.2.3.2.1). Those within the boundary of the Timiskaming Forest directly contribute to the achievement of management objectives (i.e. landscape classes, overmature forest, etc.).

The CLUPA describes other land use intents that have implications for forest management activities on the management unit and those are reflected in the relevant AOC prescriptions. Of particular uniqueness, is the area within CLUPA area G1808, which has a management direction to enhance townsite values and reduce the risk of fire near the community of Gogama. Specific details on the planned harvest areas within G1808 are found in Section 4.3.1.

CLUPA area G1807 (Burwash Lake area) is also unique in the province in that it is the only general use area, rather than enhanced management area, with the land use intent being for lake trout management. This area has a concentration of naturally reproducing lake trout lakes. The TL-1 AOC prescription, with its limits on conditions on roads within 1 km of the lakes has implications for accessing the area for forest management purposes.

The Timiskaming Forest has a well-established road network in the east and southern portion of the unit, with a combination of provincial highways, municipal roads, and forest access roads providing access to the majority of the management unit, while primary road networks continue to be developed in the western portion of the unit. Major highway access is provided by Highway 11, 65, 66, 560, 560A, 661 and 144 which enables access to a large portion of the Timiskaming Forest. There are 140 existing primary forest access roads on the Timiskaming Forest. There are 38 new primary roads scheduled to be built and another 21 will be extended during this planning term. Section 4.5 includes detailed information related to roads on the Timiskaming Forest. A values map which portrays the roads that are the responsibility of the sustainable forest licensee is included with the FMP (see map MU280_2028_FMP_MAP_ValLand_00.pdf). In addition, the Areas Selected for Operations maps show the Primary and Branch road corridors planned to be built within the 2021-2031 FMP, as well as any scheduled road decommissioning.

2.2. Social and Economic Description

Overall forest management contains the provisions to maintain all three pillars of sustainability: environmental, social and economic. Through the forest management planning process, we want to ensure that the decisions made have been assessed against all three of these. It is important to extract what the impacts on local, regional and provincial economies are, as well as assess our impact on local communities and land users.

To perform this assessment, many different factors have been taken into consideration, as detailed in this section. Community demographic profiles (from Federal census surveys), targeted forest user surveys, baseline socioeconomic profiles, as well as modelling the impacts of the different management alternatives using the Socio-Economic Impact Model (SEIM) are used together to portray the impact that the harvesting level will have on society and the economy.

2.2.1. Overview of Social and Economic Context

The following communities derive substantial social and economic benefits (e.g., employment, municipal taxes etc.) from the management of the Timiskaming Forest. These communities are home to not only forest industry workers, but also include all businesses which thrive economically due to the income of forest based employees. The socioeconomic profiles detailed within this FMP provide baseline information, which may be impacted by the long-term management direction approved for this forest.

2.2.2. Demographic Profiles

Each community impacted by the forestry industry on the Timiskaming Forest that is located within the province of Ontario had a demographic profile generated for it for the purposes of this forest management plan. The basis of this information is the 2016 Statistics Canada

Census of Population and gives us a snap-shot view of the state of the communities in 2016. Census data looks at areas such as household income, population, age, employment, education, and occupation (based on broad categories). The community summaries below use the term 'participation rate' to help show their workforce. 'Participation rate', according to Census Canada is defined as "a measure of the total labour force relative to the size of the working-age population. In other words, it is the share of the working-age population that is working or looking for work".

2.2.2.1. Local Communities

The following communities (identified by census district) derive substantial social and economic benefits (e.g. employment, municipal taxes) from the management of the Timiskaming Forest:

- Cochrane
- Englehart
- Espanola
- Township of James
- Kirkland Lake
- Matachewan
- Nairn & Hyman (includes Nairn Centre)
- Sudbury Unorganized North part (includes Gogama)
- Temagami
- Timmins

The following First Nation and Metis communities (identified by census district) are in or adjacent to the management unit and whose interests or traditional uses may be affected by forest management activities include:

- Wahgoshig First Nation (Abitibi 70)
- Matachewan First Nation (Matachewan 72)
- Mattagami First Nation (Mattagami 71)
- Sagamok Anishnawbek
- Wahnapitae First Nation (Wahnapitae 11)
- Atikameksheng Anishnawbek (Whitefish 6)

The above communities have demographic profiles included in Supplementary Documentation 6.1.5

Table 4 and Table 5 below is a summary of the communities listed above, looking at the broader categories of population, household trends, education, language, labour force, as well as community diversity. The following communities, as highlighted above, receive

significant amounts of product from the Timiskaming Forest, and are therefore discussed in more detail.

Located along Highway 11, **Cochrane** is poised to take wood from both a western wood basket (Abitibi River and Gordon Cosens forests), as well as from the Timiskaming to the south. The town has a population of 5,321, which has remained relatively stable since the 2011 census, of which 52.3% of community members are bilingual, speaking both English and French. The community employment rate is 88.5%, with the participation rate of the inhabitants being 63.6%, with a majority of people working in the trades and sales (at 26.6% and 25.8%, respectively).

There are three facilities taking wood or wood products from the Timiskaming Forest, including a RYAM sawmill, Rockshield Engineered Wood Products ULC veneer mill, and Cochrane Power Corporation (biofiber). Although the facilities in Cochrane take only a small portion of wood from the Timiskaming Forest, it should be noted that Rockshield Engineered Wood Products ULC does hold a wood commitment from the forest, and had been reliant on the Timiskaming Forest for 23.7% of its wood volume in the past 10 years.

The **Township of James** is located in the centre of the Timiskaming Forest, and is home to the town of Elk Lake, which hosts a population of 420 people. As with Cochrane, this community's population has remained relatively consistent in the past 5 years, seeing a mere 1% decrease since the census in 2011. The participation rate in James is 48.7%, with age trends in the town showing that most of the population is greater than 50 years of age. Most of the population is employed in the trades (40.6%) and in processing (21.9%).

James is home to the EACOM Timber Corporation Elk Lake sawmill facility, which has relied on the Timiskaming Forest for 84.9% of it's timber in the past 10 years.

Englehart, like Cochrane above, is located along the Highway 11 corridor and was founded due to its location along the Ontario Northland Railroad line. The population in Englehart has dropped 2.63% since 2011, with 1,479 people calling this town home. The employment rate in Englehart is 88.6%, with the participation rate being only 54.3%. There is a wider range of occupations reported in Englehart, with Trades, Sales, Finance and Heath composing the top 4 categories.

Englehart is home to the Georgia Pacific North Woods L.P. oriented strand board mill, which has relied on the Timiskaming Forest for 39.5% of it's operating volume in the past 10 years.

The town of **Espanola**, located west of Sudbury, has a population of 4,996, which has dropped by nearly 7% since the 2011 census. The employment rate in Espanola is 92.6%, with the participation rate being just shy of 60% of that, with a broad range of occupation categories being highly represented in the town, including Management, Finance, Health, Sales, Trades and Processing.

Espanola is home to the Domtar Inc. pulp facility, which has taken a mere 1.2% of it's operating wood from the Timiskaming Forest in the past 10 years.

Kirkland Lake has the highest population of any of the municipalities located on the Timiskaming Forest, with 7,981 persons living within its boundaries. The population of the town decreased 1.87% since the 2011 census. The employment rate in Kirkland Lake is 91.9%, with the participation rate being 55.8%. The top 3 occupational sectors of Kirkland Lake are sales, trades and finance (at 25.7%, 17.1% and 15.6% respectively). Kirkland Lake is known for being primarily a mining town, with an abundance of gold deposits being the precursor for the town's placement in the early 1900's.

The Rosko Forestry Operations Inc. sawmill and Northland Power Inc. (biofiber) both are located within Kirkland Lake, and have both been dependent on the Timiskaming Forest for 9.4% and 99.5% of their operating fiber (respectively) in the past 10 years.

The community of **Nairn and Hyman** has seen a drastic drop in population (28.3%) in the past 5 years, with the town being home to 342 people. That being said, the rate of low income in the community is the lowest of any summarized in this part of the text, with a percentage of 5.9%. The employment rate in Nairn is 88.6%, with the participation rate being 61.4%, which is again high compared to some of the other communities. A majority of the residents of Nairn work in either the trades (40%) or in sales (20%).

Nairn and Hyman are home to the EACOM Timber Corporation Nairn Centre sawmill, which has had a 2.1% dependency ration on the Timiskaming Forest for the past 10 years.

The city of **Timmins** is located on the Mattagami River, northwest of the Timiskaming Forest. The city's population is 41,788 and has experienced a 3.19% drop in population since the 2011 census. Like Kirkland Lake above, this city has a high level of mining activity occurring within its borders. The employment rate in Timmins is 92.2%, with the participation rate being 65.2%, with Sales, Trades and Finance (27.3%, 20.4% and 14.9% respectively) being the primary occupations within the city limits.

Timmins is the location of the EACOM Timber Corporation McChesney sawmill, which has been dependent on the Timiskaming Forest for 12% of its operating fibre in the past 10 years.

Table 4. Demographic profile of cities, towns, townships, and municipalities (census subdivisions) impacted by wood flow from the Timiskaming Forest.

Community		Cochrane	Township of James	Englehart	Espanola	Kirkland Lake
Population	Total Population	5,321	420	1,479	4,996	7,981
	Population percentage change (2011 to 2016)	-0.36	-0.94	-2.63	-6.86	-1.87
Labour	Total Labour Force	2,735	185	660	2,310	3,650
	Employment Rate	88.5%	100%	88.6%	92.6%	91.9%
Average Individual Income	Female	$34,143	$33,858	$32,702	$31,642	$33,366
	Male	$53,730	$50,821	$59,292	$46,883	$58,183
Average Household Total Income		$79,714	$64,213	$75,705	$77,869	$70,183
Community Diversity & Heritage	Canadian Born	97.6%	96.6%	96.2%	97.5%	96.4%
	Foreign Born	2.4%	3.4%	3.8%	2.5%	3.6%
	Canadian Citizen	99.2%	100%	99.3%	99.2%	99%
	Indigenous Identity	19.9%	14.9%	8.4%	11.6%	9.9%
Official Language	English	42.9%	67.9%	89.9%	78.6%	69.6%
	French	4.7%	2.4%		0.3%	0.9%
	English and French	52.3%	29.8%	10.1%	21%	29.4%
	Other	0.2%			0.1%	0.1%
Highest Educational Accomplishment	No certificate, diploma or degree	29.5%	33.8%	22%	25.7%	30.1%
	High school diploma or equivalent	27.5%	32.4%	33.5%	29.2%	26.6%
	Postsecondary certificate, diploma or degree	43%	33.8%	44.4%	45.1%	43.3%

Table 5. Demographic profile of cities, towns, townships, and municipalities (census subdivisions) impacted by wood flow from the Timiskaming Forest (continued)

Community		Nairn & Hyman	Timmins
Population	Total Population	342	41,788
	Population percentage change (2011 to 2016)	-28.3	-3.19
Labour	Total Labour Force	175	22,250
	Employment Rate	88.6%	92.2%
Average Individual Income	Female	$30,483	$35,525
	Male	$58,196	$57,609
Average Household Total Income		$95,716	$89,143
Community Diversity & Heritage	Canadian Born	95.4%	96.6%
	Foreign Born	4.6%	3.4%
	Canadian Citizen	97%	99%
	Indigenous Identity	9.2%	11.4%
Official Language	English	82.4%	47.1%
	French		2%
	English and French	17.6%	50.8%
	Other		0.1%
Highest Educational Accomplishment	No certificate, diploma or degree	22.2%	26.8%
	High school diploma or equivalent	35.2%	28.1%
	Postsecondary certificate, diploma or degree	42.7%	45.1%

2.2.2.2. First Nations and Métis Communities

The Timiskaming Forest is an important resource for local Indigenous communities. It is essential to the Indigenous way of life, providing a source of traditional foods and medicines, and a place where First Nation and Metis peoples conduct cultural practices. Indigenous peoples also participate in the forest economy. Because of the importance of the forest to First Nation and Metis peoples and the potential for impacts to result from forest management practices, local Indigenous communities are invited to participate in the forest management planning process. The communities located in and adjacent to the Timiskaming Forest have been identified as:

- Atikmeksheng Anishnawbek
- Beaverhouse Aboriginal Community
- Matachewan First Nation
- Mattagami First Nation
- Sagamok Anishnawbek
- Temagami First Nation/Teme-Augama Anishnabai
- Timiskaming First Nation
- Wahgoshig First Nation (Abitibi 70)
- Wahnapitae First Nation
- Metis Nation of Ontario Region 3

In discussions occurring as part of the FMP development process, the planning team encountered an issue in trying to quantify the 'value' (in the monetary sense) of what Indigenous community members use from the forest. Some parameters of impact could be broadly measured (i.e. cost of gas required to go further from the community to hunt and collect medicines due to harvesting activities), but the 'value' of time, non-timber forest products (like medicines), youth education, and tradition cannot be measured, therefore their overall impact may seem minimized through the forest management planning process without an economic set of numbers to assess. Some of these impacts may be mitigated through the operational planning stages of the Timiskaming FMP, but communities feel that the traditional and spiritual pillars of the forest should also be considered when discussing sustainability.

The following demographic summaries were compiled from census data collected by Statistics Canada as part of the 2016 census. These brief descriptions are intended to provide an overview of the Indigenous communities situated directly within the Timiskaming Forest. Each community listed above has an opportunity to provide more detailed information about its relationship with the forest through the preparation of a Background Information Report, which can be found in Supplementary Documentation Section 6.1.3

Matachewan First Nation is located approximately 40 kilometers west of Kirkland Lake. The community had a total registered population 851 members in 2016, with 61 of those members living on reserve. The number of on reserve members has decreased 26.51% since

the 2011 census. The employment rate for the community was 100%, with the participation rate also being high at 70%. The two reported occupational areas were in Primary facilities (mining, forestry) at 60%, and 40% of the community being employed in Finance.

Mattagami First Nation is located 113 kilometers west of Kirkland Lake, and has a registered population of 581 persons, with 190 of these being on reserve residents. This on reserve population has remained relatively consistent with the 2011 census results, with a mere 1.55% decrease. The employment rate for the community is 73.3%, with a participation rate of 50%. Mattagami First Nation occupations are grouped into 4 main categories; Management (33.3%), Finance (22.2%), Health (22.2%) and Trades (22.2%).

Both Matachewan and Mattagami First Nations are members of the Wabun Tribal Council.

Located on the south shore of Lake Abitibi, **Wahgoshig First Nation** (Abitibi 70) is home to 144 of the 371 registered band members. This is the only community detailed in this Socio-Economic Description that has seen a population increase since the 2011 census, with the community growing 14.29% since the last survey. This community has an employment rate of 80%, with a high participation rate of 68.2%. The two main occupation categories of Wahgoshig community members are Sales and Trades (both at 28.6%), followed by Management, Finance and Health (all at 14.3%).

The **Métis community** does not have a land base but it asserts a territory that overlaps with the Timiskaming Forest. The Metis lifestyle includes many connections to the forest environment and its resources, for social, cultural and economic purposes. The local Metis community continues to rely on access to the forest resources for commercial and traditional purposes. For the Timiskaming Forest management planning process, the Metis community was represented by Metis Nation of Ontario Region 3.

2.2.3. Description of the Industrial and Non-Industrial uses of the Forest

The following section provides descriptions of industrial and non-industrial uses of the Timiskaming Forest, including Forestry and Wood Products, Recreation and Tourism, Mining, Aggregate and Hydro Generation, Traplines, Baitfish and other.

2.2.3.1. Timber

The Timiskaming Forest is under Sustainable Forest Licence (SFL) number 542247 and has been managed by Timiskaming Forest Alliance Inc. (TFAI) since 1998. TFAI is a cooperative SFL, with the following companies having shares and participating in the management of the forest:

- EACOM Timber Corporation
- Georgia Pacific North Woods L.P.
- Greg Woollings

- Paiement & Sons
- Cheminis Lumber Inc.
- Rockshield Engineered Wood Products ULC

The chosen management strategy for the 2021-2031 FMP allows for the annual harvest area of 10,233 hectares. TFAI is entitled to harvest and utilize this area annually, while meeting any wood supply agreements issued by the Crown for this landbase.

2.2.3.1.1. Wood Supply Commitments

In Ontario, wood supply commitments between the Crown and a forest resource processing facility can be in the form of Sustainable Forest Licences, Wood Supply Agreements, Ministerial Commitments, and shareholder or other business to business agreements. The Sustainable Forest License document states that the forest resources harvested are to go to the following existing processing facilities: Cheminis Lumber Inc. (Larder Lake), EACOM Timber Corporation (Elk Lake), Liskeard Lumber Limited (Elk Lake), and Norbord Industries Inc. (Cochrane).

The forest resource license holder for the Timiskaming Forest is Timiskaming Forest Alliance Inc., who regulates the flow of timber through its shareholders agreement. The SFL can also issue overlapping licenses, as well as the Crown can issue licenses for Crown wood on patented properties. From 2007-2018, 182 commercial FRL's were issued on the Timiskaming Forest. The number of personal use FRL's (e.g., firewood) issued on the MU during the period from 2007- 2018 was 3,982.

The wood supply agreements in force on the Timiskaming Forest (as of the 2017-2018 year) are as follows:

1) To make wood fibre available to **GP North Woods LP** in Englehart, Ontario. The target volumes (m3/year) are:

Poplar (non-veneer quality) - 298,000
White Birch (non-veneer quality) - 74,000

2) To make wood fibre available to **Rockshield Engineered Wood Products ULC** in Cochrane, Ontario. The target volumes (m3/year) are:

Aspen (veneer quality) - 44,000

The volumes associated with the facilities below are categorized as "Other Recognized Utilization – WSCP[1] Offer"

1) To make wood fibre available to **Columbia Forest Products Ltd.** in Rutherglen, Ontario. The target volumes (m3/year) are:

White Birch (merchantable) - 669

2) To make wood fibre available to **KD Quality Pellets Ltd**. in New Liskeard, Ontario. The target volumes (m3/year) are:

Tolerant Hardwood (non-veneer, non-sawlog) - 2,000
Aspen (unmerchantable) - 10,000

Note that these do not include any commitments which may be made through shareholder or other business to business agreements. The SFL shareholders (as listed above) have their own wood supply and harvesting commitments with Timiskaming Forest Alliance Inc.

2.2.3.1.2. Destination of Sawmill Residues

It is important to recognize that communities receiving chips or by-products are also benefiting, although indirectly, from the roundwood flowing from the Timiskaming Forest. In general, mills receive roundwood from more than one management unit; therefore, the by-products mills produce and ship cannot be wholly attributed to the wood processed from the Timiskaming Forest.

The following facilities have bought sawmill residues from Timiskaming wood processing facilities (from 2007-2018):

- Chips – Domtar Inc. (Espanola, Chapleau), Resolute FP Canada Inc. (Iroquois Falls, now closed), Northland Power Inc. (Cochrane), Tembec Industries (Temiscaming, QC), Panolam Industries Inc. (Huntsville), Reliable (Bradford), GP North Woods LP (Englehart), 1793082 Ontario Ltd. (New Liskeard), Grant Transport (New Liskeard)

- Sawdust – Flakeboard Company Ltd. (Sault Ste. Marie), Panolam Industries Inc. (Huntsville), Rentec (Wawa), Northland Power Inc. (Cochrane), Uniboard Canada Inc. (Val-d'Or, QC), Reliable (Brantford), Leis Wood Products (Cobalt), McFeeter's (Hamilton), Driest (Brampton), 1793082 Ontario Ltd. (New Liskeard)

[1] Provincial Wood Supply Competitive Process

- Shavings - Flakeboard Company Ltd. (Sault Ste. Marie), Panolam Industries Inc. (Huntsville), Northland Power Inc. (Cochrane), Millson Forestry Service Inc. (Timmins), Leis Wood Products (Cobalt), McFeeter's (Hamilton), Driest (Brampton), 1402135 Ontario Ltd. (Caledon East), John Wilson (New Liskeard), Spot Sales, Bio-North Clean Fuels

- Bark – Tembec (Kapuskasing, Chapleau and Temiskaming (QC)), Gro-Bark Ltd. (Waterloo) Grower's Choice (Kitchener), Herman's Contracting (Schomberg), TC Forest Products (Mount Albert), Northland Power Inc. (Cochrane) All Treats (Arthur), AV Terrace Bay Inc. (Terrace Bay), GP North Woods LP (Englehart), McFeeter's (Hamilton)

- Hog Fuel – Northland Power Inc. (Cochrane)

- Other Fibres – Panolam Industries Inc. (Huntsville), Gro-Bark Ltd. (Waterloo), Grant Transport (New Liskeard), Leis Wood Products (Cobalt), Spot Sales (Ontario), Tembec Industries (Temiskaming, QC), Cochrane Power Corporation (Cochrane), Millson Forestry Service Inc. (Timmins), 1793082 Ontario Ltd. (New Liskeard)

2.2.3.1.3. Forest Industry Profiles

The volumes (m3) of wood utilized by all mills that received wood from the Timiskaming Forest from 2007-2017 are found in the Annual Reports. Within Ontario, the mills that receive the most substantial amount of wood (>50,000 m3/year average) from the Timiskaming Forest include EACOM Timber Corporation (Ostrum & Elk Lake) and GP North Woods LP (Englehart). The location of production facilities in and near the Timiskaming Forest is shown in Figure 35.

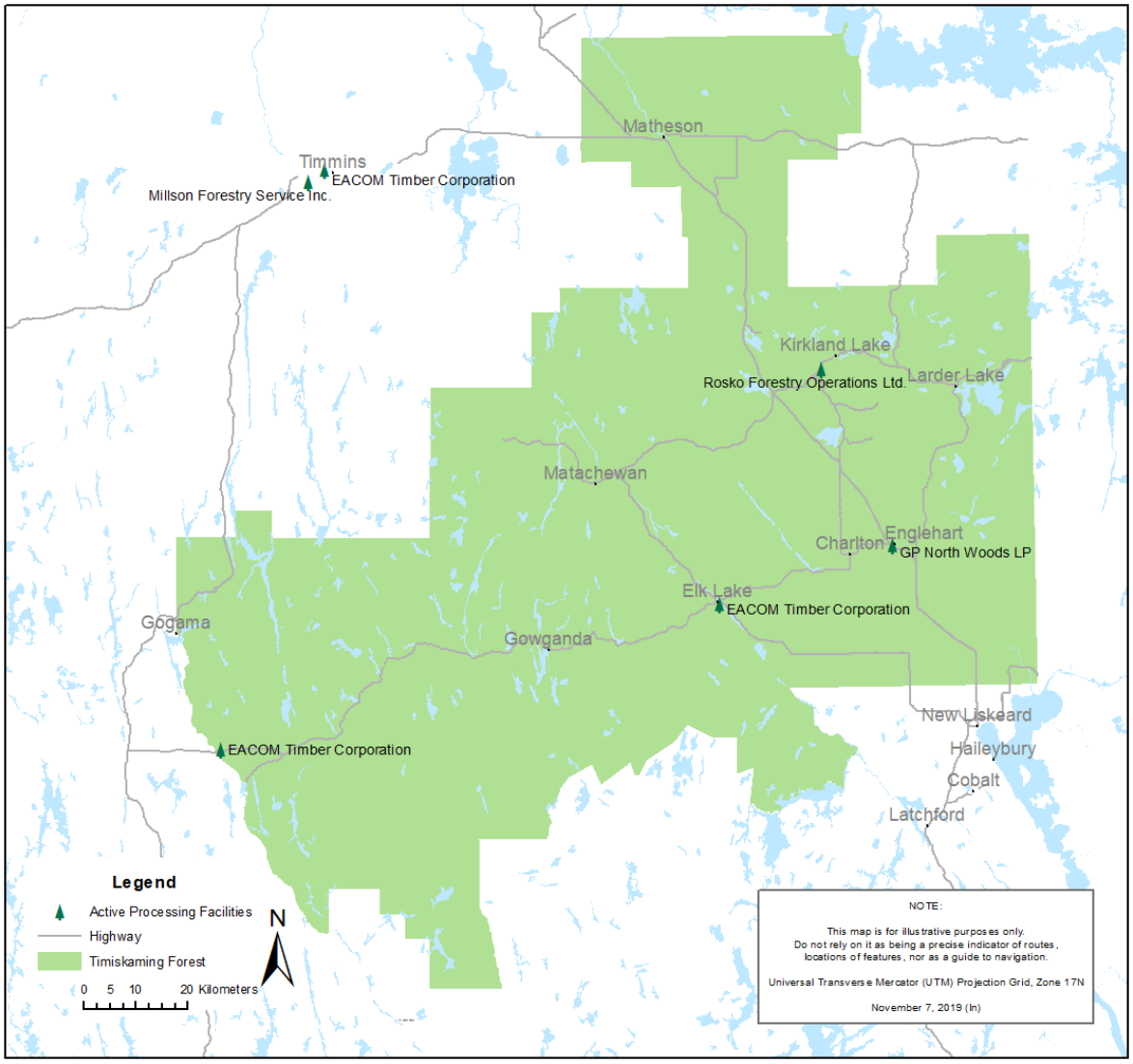

Figure 35. Active processing facilities located within and surrounding the Timiskaming Forest as of November, 2019

2.2.3.1.4. Forest Industry Closures

In December of 2014, Resolute FP in Iroquois Falls announced it's permanent closure. Although this mill was not located directly on the Timiskaming Forest, this mill was a viable destination for pulpwood fibres from the forest, and was receiving wood through the 2011-2012 operating year.

Although not officially declared 'closed', the Cheminis Lumber sawmill facility in Larder Lake has been inactive since the start of the 2016-2021 Phase II FMP for the forest. This mill, when running, consumed 135,886 m3 of wood from the Timiskaming Forest through the Phase I term of the 2011-2021 FMP, taking assorted and oversized species from the unit.

The KD Quality Pellets Ltd in New Liskeard is also listed as closed.

2.2.3.1.5. Payments towards Forest Renewal

The provincial government benefits from forest operations through the collection of Crown dues. Table 6 provides funds provided to the Forest Renewal Trust (FRT) and Forest Forestry Futures Trust (FFT), which is used to fund Forestry Futures Trust (FFT).

Table 6. Ten-year summary of actual harvest volume, value of stumpage, and the average stumpage paid through payments to the Forest Renewal Trust and Forestry Futures Trust.

Operating Year	Actual Harvest Volume (m^3)	Total Stumpage	Payments to Forest Renewal Trust	Payments to the Forestry Futures Trust	Average Crown Timber Charges per m^3
2007-08	1,334,664	$3,323,631	$3,323,275	$1,834,785	$6.35
2008-09	983,424	$1,902,243	$1,652,358	$1,179,945	$4.81
2009-10	832,090	$1,141,549	$914,578	$1,509,599	$4.29
2010-11	736,635	$1,607,456	$1,444,043	$1,060,366	$5.58
2011-12	1,269,303	$2,845,494	$3,356,614	$1,609,799	$6.15
2012-13	1,017,392	$2,364,640	$2,653,158	$1,437,552	$6.35
2013-14	920,192	$2,137,325	$2,696,640	$1,145,773	$6.50
2014-15	930,821	$2,072,563	$2,646,252	$1,142,774	$6.30
2015-16	717,003	$1,894,590	$2,072,270	$575,538	$6.34
2016-17	1,100,027	$3,803,174	$3,274,990	$1,247,765	$7.57

2.2.3.2 Recreation and Tourism

2.2.3.2.1. Provincial Parks and Conservation Reserves

Provincial Parks and Conservation Reserves, although classified as Crown Land, are removed from forest management activities and are deemed ‘protected’ in the planning inventory. These areas are designated and managed under the Provincial Parks and Conservation Reserves Act (2006), and through the Crown Land Use Policy Atlas (CLUPA).

The Timiskaming Forest is home to 15 Provincial Parks and 20 Conservation Reserves, as seen in Figure 36 below. The forest areas set aside in Provincial Parks and Conservation Reserves within the management unit accounts for 65,472 hectares or 5.2% of the total Timiskaming Forest Crown land. A total of 20.8% is set aside in Provincial Parks and Conservation Reserves within and directly adjacent to the Timiskaming Forest. Table 6 below provides a list of the Provincial Parks and Conservation Reserves within and surrounding the Timiskaming Forest Management Unit.

Although unavailable for active forest management through the planning of the 2021-2031 Timiskaming Forest Management Plan, the areas that are set aside in protected forest assists the planning team in developing and reaching landscape level targets in regard to items such as wildlife habitat, landscape patch size, and old growth targets. The distribution and quantity of protected areas assists the Forest in maintaining diverse ecosystems, natural and cultural heritage areas, and recreation opportunity for both Ontarians and those travelling from afar.

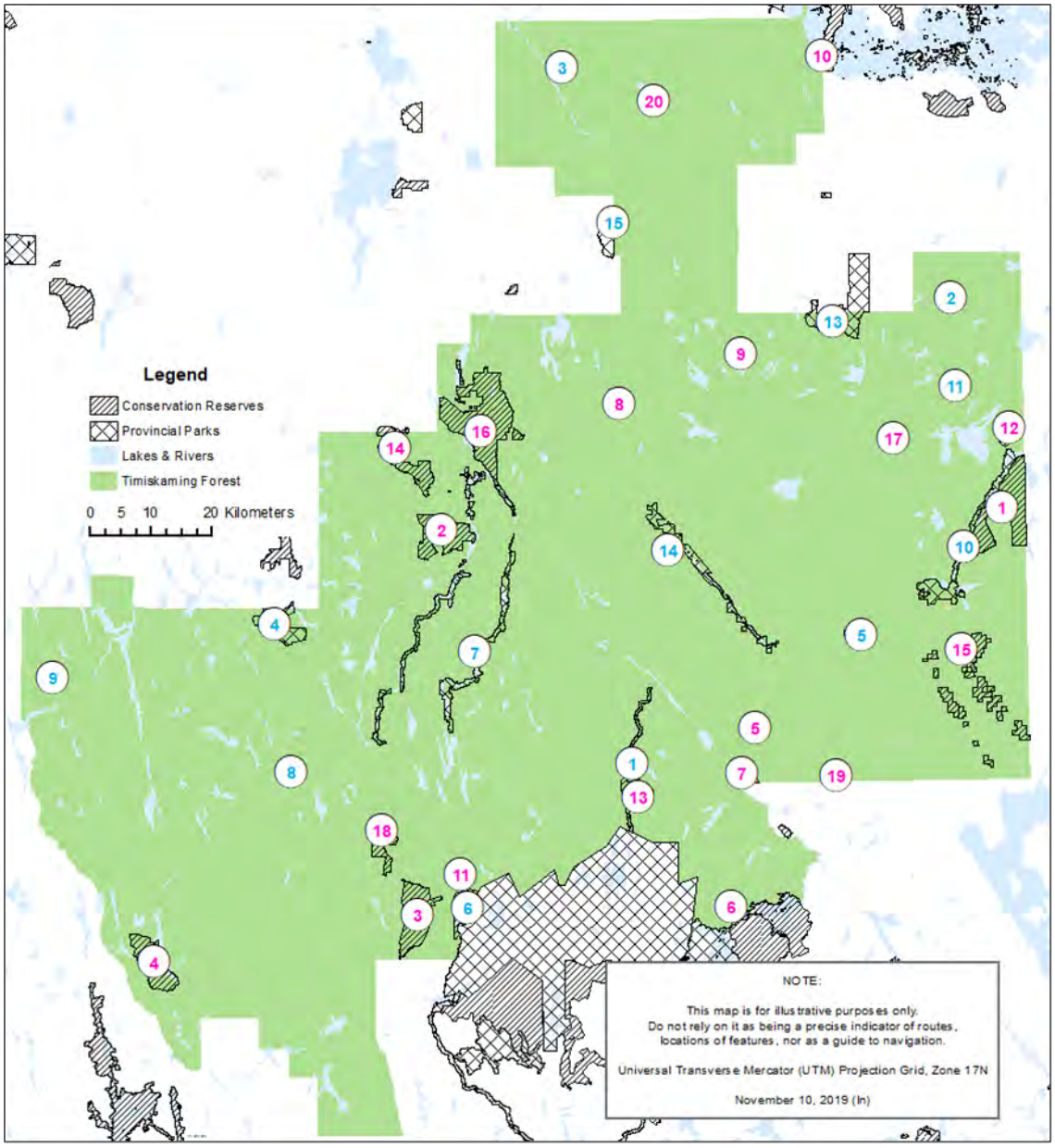

Figure 36. Provincial Parks and Conservation Reserves within and surrounding the Timiskaming Forest Management Unit.

Table 7. Provincial Parks and Conservation Reserves within and surrounding the Timiskaming Forest Management Unit.

	Provincial Parks		Conservation Reserves
1	Makobe-Grays River	1	East Larder River Bedrock Conifer
2	Pushkin Hills	2	Mistinikon Lake Uplands
3	Shallow River	3	Brace Creek Outwash Plain
4	Grassy River-Mond Lake Lowlands and Ferris Lake Uplands	4	Meteor Lake Outwash Fens
5	Kap-Kig-Iwan	5	Bryce and Cane Township Wetland Lacustrine
6	Lady Evelyn-Smoothwater	6	East Lady Evelyn Lake
7	West Montreal River	7	Big Spring Lake Bedrock
8	MacMurchy Township End Moraine	8	Dunmore Township Balsam Fir Outwash Deposit
9	La Motte Lake	9	Maisonville Bernhardt Muskeg Maple Moraine
10	Larder River Waterway	10	McDougal Point Peninsula
11	Gem Lake Maple Bedrock	11	Smith Lake
12	Obabika River	12	McGarry Township Forest
13	Esker Lakes	13	Makobe Grays Ice Margin
14	Englehart River Fine Sand Plain and Waterway	14	Whitefish River
15	Wildgoose Outwash Deposit	15	Blance River
		16	Whitefish Lakes
		17	South Grassy Lake
		18	Wapus Creek
		19	Henwood Township Forest and Wetland
		20	Shallow River Poplar Outwash

2.2.3.2.2. Recreational Trails

The Timiskaming Forest, although large, contains smaller ‘centers’ of population, with much of the forest remaining rather remote in regard to road infrastructure and development. That said, in being an approximate 6 hour drive from Toronto, the forest does see a large amount of tourism, some of which is directly related to the amount of trails found on the forest.

According to information housed in the Land Information Ontario (LIO) system, there are 1,921 kilometers of recreational trails located across the Timiskaming Forest. A brief summary of these trails is as follows:

- The Ontario Federation of Snowmobile Clubs (OFSC) has just under 1,000 kilometers of trails that transect the Timiskaming Forest. Of note, the A trail connects the Kirkland Lake – Elk Lake – New Liskeard areas, and the C trail, located in the western portion of the unit, connects the Sudbury area with Timmins.

- With its proximity to the Temagami area, the Timiskaming Forest is also another hotbed of traditional and modern canoe routes, some of which are maintained and located within provincial parks and conservation reserves. The forest contains approximately 900 kilometers of canoe routes and associated portages, closely associated with the major waterways located on the unit.

- There are almost 40 kilometers of snowshoe/ski/hiking trails located across the Timiskaming Forest, most of which are located close to the municipalities which maintain them. Many of these trails are used year-round by recreationalists. Please note that the 40 kilometers noted above does not include any trails within provincial parks or conservation reserves located on the unit.

Resource-based Tourism Values, including trail systems (canoe route, cross-country ski trail, hiking trail, snowmobile trail, snowshoe trail, portage trail, and camp site) are shown on the Resource Uses Values Map (see file MU280_2021_FMPDP_MAP_ValRec_00.PDF).

2.2.3.2.3. Tourism Operators

In June 2018, a survey was sent out to all 30 registered (through the Ministry of Heritage, Sport, Tourism and Culture) tourist operators located on the Timiskaming Forest, with 10 of these surveys being returned. Of these surveys, 9 out of 10 resorts are drive-in facilities, with an average of 36 beds, and 5 employees (seasonal, full time, part time). It should also be noted that 7 out of the 10 survey respondents are also making ongoing enhancements to their camps to increase the quality of their customer experiences.

The various activities offered by the tourism operators in the area include hunting, angling, snowmobiling, canoeing/kayaking, and ATVing. Most of these tourism operators operate in the spring, summer, and fall seasons, with three operators having winter access as well. The majority of clients coming to recreate in the Timiskaming Forest are from outside Northern Ontario, with some lodges being heavily reliant on tourists visiting from the United States.

During ongoing discussions with tourism operators, common themes of concern include (but are not limited to):

- The maintenance of remoteness and the impact of operations on the visual and sound quality of the resort
- Operating costs
- Wildlife tag allocations
- Shorter/less predictable seasons

In previous plans, there has been direct conflict with tourism operators, as areas that are prime for the remote feel listed above are also generally the areas of eligible age for forest operations. The planning team and Local Citizens Committee identified these concerns early and are focused on mitigating and/or minimizing any impacts on resource- based tourism from forest management activities.

2.2.3.2. Anglers and Hunters

2.2.3.2.1. Recreational Anglers

In the province of Ontario, fisheries are managed within administrative areas, called Fisheries Management Zones (FMZ), which are used to monitor aquatic resources. There are three FMZ's located on the Timiskaming Forest, including zones 8, 10, and 11.

The inland lakes found across the Timiskaming Forest vary in species, with the most sought after species being lake trout, northern pike, walleye and smallmouth bass.

The economic benefits of recreational fishing to the Timiskaming Forest landbase communities include direct expenditures on consumable goods and services (e.g., food, accommodation, transportation, supplies) and major purchases and investments (e.g., boats, motors, fishing equipment, camping gear).

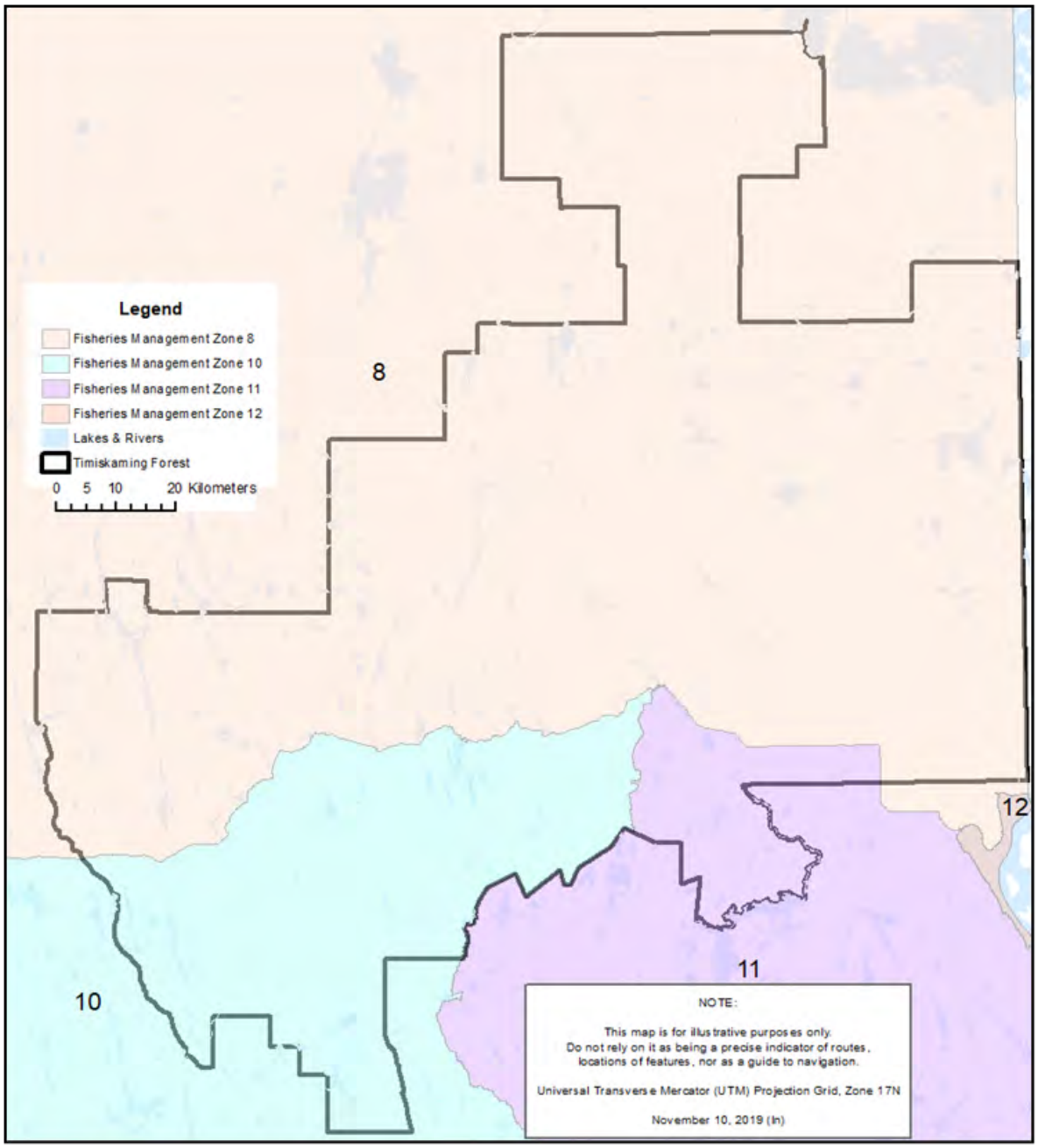

Figure 37. The Timiskaming Forest Management Unit overlaid against the Fisheries Management Zones (FMZs) that intersect its boundary.

2.2.3.2.2. Recreational Hunters

Ontario manages recreational hunting within administrative areas called Wildlife Management Units (WMU). Each WMU has distinctive hunting regulations for what game

can be hunted, when the open season dates range, and the permitted methods of hunting. The Timiskaming Forest Management Unit overlaps 6 WMUs (see Figure 38 below).

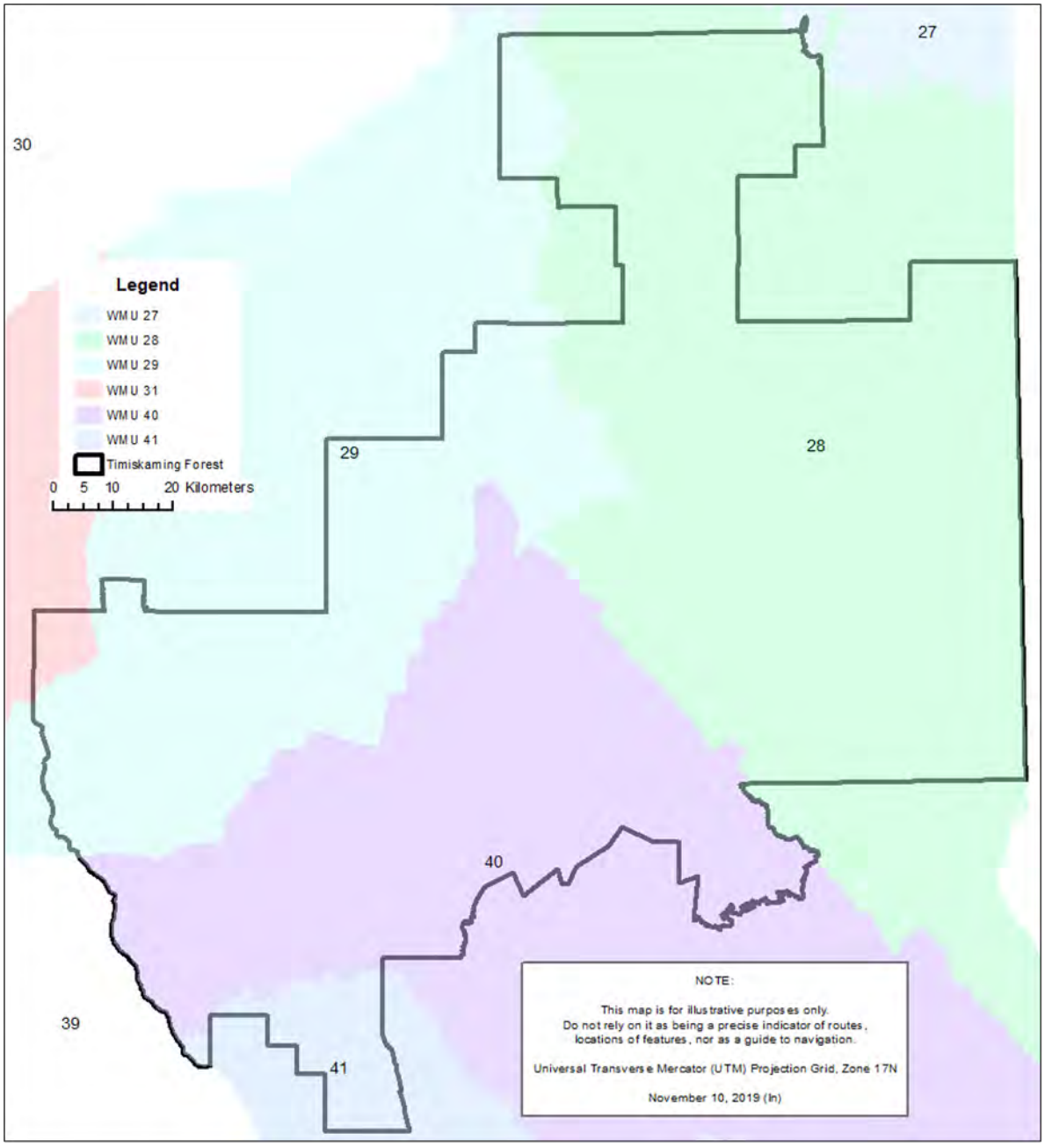

Figure 38. The Timiskaming Forest Management Unit overlaid against the Wildlife Management Units (WMU) that intersect its boundary.

The economic benefits of hunting are extremely difficult to quantify for the Timiskaming Forest, as local businesses (i.e. restaurants, gas stations, grocery stores etc.) where hunters

are gathering supplies are not tracked. Any non-resident (i.e. out of province or out of country) hunting could be tracked through tourism operators, but that is only a small portion of the game that is harvested by non-local Ontarians. That said, the Province tracks the number of tags and licenses issues for popular game species, as shown in the tables below. Please note, that these license/tag distributions are for the entire WMU depicted, and will show an overestimation of the tags issued solely for the Timiskaming unit.

Table 8. Resident and non-resident bear tag reported harvest numbers from 2015-2019

WMU	Year	Resident Reported Harvest	Non-Resident Reported Harvest	Total Reported Harvest
28	2015	316	144	460
	2016	264	177	441
	2017	238	153	391
	2018	246	151	397
	2019	140	96	236
29	2015	159	80	239
	2016	106	87	193
	2017	80	63	143
	2018	81	70	152
	2019	52	54	106
40	2015	63	82	145
	2016	109	90	199
	2017	56	52	108
	2018	93	67	160
	2019	43	29	72

2.2.3.3. Commercial Trappers

There are approximately 125 Trapline Areas that lie within or intersect the Timiskaming Forest. These large areas are managed by local trappers who harvest furbearers for commercial purposes. The Values Maps for the Forest includes trapline boundaries (see file: MU280_2021_FMP_MAP_ValTrap_00.pdf). Traplines are managed by primary trapline holders, and can also have helpers or secondary trappers on the line. According to the Trapline Operators Survey, sent July 2019, the main trap species for the forest are beaver, lynx, marten/fisher/otter, and wolf/coyote.

According to the survey respondents, most have had their trapping businesses affected by the recent fluctuations in the market for pelts. Many commented that the price that they receive at market do not come close to covering the cost of the trapping that they do, although most also commented that by holding the trapline, it is their responsibility to manage the

populations of the line, no matter the cost. The price of furs was also the largest driver of change for the trapline operators, with 36% of respondents stating their business has had to adapt to the new (lower) prices.

Although many respondents commented that forestry activities (clearcuts, timing of harvest, lack of meaningful notification to trappers) were a hindrance to their operation, most trappers (69%) use pick-up trucks to access their traplines, where they can subsequently use snowmobiles (89%) and ATV's (69%) to further access from there. This suggests that forestry roads are critical in maintaining access to the more remote traplines across the forest, and that direct communication with trapline operators about road and harvest operations would greatly reduce much of the frustration seen from this interest group.

Table 9 shows the fur sales and revenue from Kirkland Lake and Timmins Districts using 2018 auction results.

Table 9. Fur sales and revenue from Kirkland Lake and Timmins Districts using 2018 auction results.

	Average Price per	Kirkland Lake		Timmins	
Species	**Pelt**	**Sold**	**Revenue**	**Sold**	**Revenue**
Beaver	$15.75	1230	$19,372.50	954	$15,025.50
Black Bear	$168.60	5	$843.00	1	$168.60
Coloured Fox	$25.30	98	$2,479.40	54	$1,366.20
Coyote	$47.52	54	$2,566.08	9	$427.68
Fisher	$50.20	142	$7,128.40	98	$4,919.60
Lynx	$88.22	74	$6,528.28	47	$4,146.34
Marten	$56.18	317	$17,809.06	409	$22,977.62
Mink	$12.30	50	$615.00	126	$1,549.80
Muskrat	$4.45	226	$1,005.70	317	$1,410.65
Otter	$29.21	55	$1,606.55	49	$1,431.29
Raccoon	$6.50	29	$188.50	10	$65.00
Red Squirrel	$0.81	54	$43.74	130	$105.30
Skunk	$7.88	5	$39.40	1	$7.88
Timber Wolf	$83.81	11	$921.91	10	$838.10
Weasel	$3.19	160	$510.40	146	$465.74
Total			$61,657.92		$54,905.30

2.2.3.4. Commercial Bear Management Areas

There are currently 109 Bear Management Areas (BMA's), either located entirely within or with a section in the Timiskaming Forest. In June 2018, a survey was sent to all BMA holders across the unit, of which 11 were returned and summarized below.

According to survey information, the majority of clients that to take part in the black bear hunting season are from the United States. Survey respondents indicated that they receive an average of 17 clients per season, with an average of 31 days spent hunting for a 68% success rate. Many of these areas are managed by tourist operators who receive revenue from hunting packages, lodging rentals, meal costs, and transportation fees. Many outfitters are planning on increasing their efforts in upcoming years, either through better advertising of their hunts, better use of their BMA area, and/or the natural increase of hunters coming with the spring bear hunt being back in effect.

2.2.3.5. Commercial Baitfish Areas

In June 2018, a survey was sent out to all registered baitfish harvesters and dealers within the Timiskaming Forest. Of the 7 surveys returned, the respondents indicated that they, on average, harvest 200 dozen baitfish which are 'sold' directly by them to anglers. Despite this, the generated income from the sale of these baitfish cannot be averaged or calculated, as the survey respondents are primarily resource-based tourism operators who include baitfish in their accommodation packages.

2.2.3.6. Mining, Aggregate and Hydro Generation

2.2.3.6.1 Mining and Exploration Activity

Alamos Gold Inc. operates the **Young-Davidson** facility, which is located in Matachewan. This facility, situated on a site previously mined in the 1930's-1950's, began their open pit work in September of 2012 (completed in June 2014), and began their underground mining in October of 2013. In 2018, approximately 180,000 ounces of gold was produced by the facility, and as of 2018, the reserve life is estimated to be 13 years. The Young-Davidson mine is one of Alamos Gold's flagship facilities, and boasts using new technology and enhancements as their key to success.

One of Kirkland Lake Gold Limited's mining facilities is located in Kirkland Lake, the **Macassa** mine. This underground facility is ever expanding, with a fourth shaft undergoing construction as of November 2019. At the year end of 2018, over 240,000 ounces of gold was produced at the Macassa site. This site is also central to well developed infrastructure including provincial highways, a railway system and an airport. The proximity to the town of Kirkland Lake also allows for staff to have housing and amenities close by.

Located approximately 9 kilometers east of Matheson along Highway 101, McEwan Mining Incorporated's **Black Fox Complex** is located along the Destor-Porcupine fault, nicknamed the Golden Highway. This mine began as an open pit in May 2009, with its underground operations beginning in October of 2011. Between these two mining methods, the Black Fox Complex produced a total of 49,000 ounces of gold.

The Timiskaming Forest is located in a hotbed of mineral exploration activity, with much of the forest being held in staked mining claims. In order to reduce the level of impact on mineral operations, mining claim holders are notified on an annual basis of forest management activities and are strongly encouraged to inform the forest industry of any enhancements made to their claim.

2.2.3.6.2. Aggregates

There are several aggregate permit holders within the Timiskaming Management Unit. While no revenue or employment information was provided regarding aggregate permits, many aggregate permit holders directly benefit from roads which are built for forestry operations and provide access. There is a total of 102 active aggregate permits held by private individuals within the Forest.

Of the pits held across the forest, 26 are held by shareholders of TFAI, 7 are held by mining companies, and 8 are held by municipalities. The rest of the pits are held by contracting companies, who do construction across the forest.

2.2.3.6.3. Hydro

There are four water power generation stations located within the Timiskaming Forest. These facilities feed into the Hydro One power grid, and are located along major water ways across the Timiskaming Forest.

The **Black River Generating Station** is located along the Black River in Playfair Township, just south of Matheson. This facility, built in 1986, has one generation turbine, and is classified as a 'run of river' plant, which does not store water to generate electricity, but rather produces electricity with the natural flow of the waterbody.

Located on the Montreal River, the **Upper Chutes Generating Station** is another run of river facility that was built in 1923. This facility contains 2 turbines and has a production average of 15.5 megawatts.

The **Charlton Dam Generating Station**, located in the town of Charlton along the Englehart River, was constructed in 1986. This is a base load plant, whereby water is stored behind the dam, and electricity generation is controlled. This facility contains 2 turbines, and has a production average of 3.43 megawatts.

The Misema River is home to the **Misema River Generating Station,** which, built in 2003, is home to a single turbine, which produces 14 megawatts. This facility is another base load plant, holding water to generate electricity.

While not a power generation facility, the **Minisinakwa River dam,** which is operated by MNRF is part of the Mattagami river system.

Normal forest renewal and tending operations are permitted adjacent to hydro operations. However, there are potential safety factors associated with cutting close to power lines, for both forestry and hydro company employees, due to blowdown and unknown hazards. Working directly with Hydro companies to develop site specific harvesting conditions close to hydro lines will provide additional safety for all parties involved.

2.3. First Nation and Métis Background Information Report

At the request of all First Nation & Métis communities , the Background Information Reports are not included in the FMP, but will remain at the offices of the MNRF and/or TFAI.

3.0 DEVELOPMENT OF THE LONG-TERM MANAGEMENT DIRECTION

3.1. Introduction

The long-term management direction (LTMD) is the part of the forest management planning process where the planning team develops the strategic-level direction for the forest. The components involved in the development of the LTMD consist of the following:

- gathering background information
- identifying the current forest condition
- establishing a base model
- assembling desired forest and benefits
- developing management objectives
- proposing and endorsing a long-term management direction

The long-term management direction is consistent with legislation and policy, has considered direction in forest management guides, it achieves a balance of social, economic and environmental considerations and provides for the sustainability of the Crown forest on the management unit.

3.2. Management Considerations

Management considerations are developed from an evaluation of changes to the forest condition (e.g. significant natural disturbance) or social, economic or environmental concerns that affect the development of the LTMD. The management considerations for the 2021 FMP were derived from multiple sources including insights gained during the implementation of the 2011 FMP, new science and policy direction, consultation with First Nation and Métis communities and topics raised by the LCC. These insights, including updated perspectives and deficiencies within the current FMP were identified at the Desired Forest and Benefits meetings (see section 3.4) are discussed in detail below.

3.2.1. First Nation and Métis Interests

First Nation and Métis communities continue to have concerns regarding their involvement in the forest management planning process. The issues range from inadequate funding and expertise to participate in the FMP process to concerns regarding the lack of economic benefits that could be available to First Nation and Métis communities. Several First Nation communities have expressed concerns regarding harvesting in the vicinity of their reserves. However, members of at least two communities have also expressed an interest in developing long-term business relationships with the forest industry, with the objective of providing economic development opportunities. Many of the issues identified are land-claim based and

therefore beyond the scope of a forest management plan. Section 3.4 describes a number of First Nation community objectives that attempt to address issues brought forward by the communities.

As part of an effort to increase the participation of First Nation and Métis communities from levels in previous planning efforts, an Indigenous Task Team (ITT) was established. The aim of the ITT is to support Indigenous consultation at each stage of plan preparation and provide a general discussion body for Indigenous matters pertaining to the planning process. The results from past planning efforts to improve communication with the local First Nation and Métis communities led to a refinement of the approach attempted in the development of this forest management plan. The ITT was assembled on numerous occasions to assist the planning team in identifying the desired forest and benefits, summarizing and confirming those benefits, developing management objectives and improving the communication and participation of all community members. This assisted the planning team in confirming and incorporating First Nation and Métis community input into the development of the 2021 FMP.

3.2.2. Enhanced Forest Resource Inventory

A new, enhanced FRI (eFRI) was used in the development of the 2021 FMP. This inventory effectively replaces the 1986 inventory used to develop previous plans, including the 2011 FMP, and presents a more recent snapshot of the forest, with additional information useful for forest management planning. The eFRI is based on digital airborne imagery which was captured in 2008 and 2009. The photo interpretation of the imagery took place over several years and the eFRI layer was made available on the Lands Information Ontario (LIO) warehouse on September 21, 2016. The eFRI was used as the basis for developing the Planning Composite Inventory (PCI) and Base Model Inventory (BMI). More information on the eFRI, and comparisons to the 2011 inventory can be found in sections 2 and 3 of the Analysis Package. Coupled with high-resolution imagery, the eFRI provided the Planning Team with a significantly improved starting point for developing the 2011 FMP, in both strategic and operational planning stages.

3.2.3. Existing and Future Access Planning

Historically, forest access has been in direct conflict with a number of resource stakeholders. During the development of the 2001, 2006 and 2011 FMPs, forest access related concerns had an influence on the final plan results. The access issues on the forest have been well documented since 1994 and continue to influence management decisions. Concerns remain with those seeking the use of forest access roads for economic and recreation activities and those wishing to reduce the overall use and road prevalence on the forest. Additionally, there are continued concerns with access controls designed to protect remote-based tourism operations and identified tourism lakes. Finally, the decommissioning of forest access roads (culverts and bridges removal) for other recreational users has generated stakeholder concerns. In the development of the LTMD,

road density targets and long-term access planning were incorporated as a means to reduce the number of roads on the management unit, while ensuring sufficient roads remain available for multi-stakeholder use. Maps portraying existing roads, selected primary road corridors and access restrictions are portrayed on the Index Map (see MU280_2021_FMPDP_MAP_Index_00.pdf).

3.2.4. Timing of Forest Management Operations

There are several resource-based related activities that occur on the Timiskaming Forest at any given time. In the past, forest operations avoided contentious areas due to potential conflicts with other users of the forest. Today, forest operations are increasingly found to be in direct conflict with other users and stakeholders. Forest practitioners continue to work with these stakeholders to lessen the impacts of forest operations. In an effort to address either the economic, social or environmental concerns from other users, forest operations are often rescheduled outside of the peak of the season (most often summer). Consequently, this means operating in these areas in the winter months, when normally they would be considered summer operating conditions. During the 2011 to 2021 FMP, TFAI significantly increased its communication and information sharing to improve the coordination of forest operations with the snowmobile clubs. The Areas of Concern which pertain to timing restrictions were reviewed and updated during the development of the 2021 FMP.

3.2.5. Climate Change

Climate change was an important consideration during the development of the FMP. Forest management inherently provides an important role in potential mitigation of climate change through the sequestration of carbon in the accumulation of biomass and wood products. The planning team's approach to addressing climate change, however, was to focus on management activities, above and beyond regular forestry practices that will enhance the resiliency of the forest to a changing climate. This involved the development of a management objective to consider emerging climate change science and policy initiatives during plan development and implementation. The associated target includes implementing MNRF's Seed Transfer Policy, allowing for seedling production to be sourced from identified seed zones in anticipation of a future changed climate.

At the time the 2021 FMP was under preparation, multiple studies from peer-reviewed scientific journals have concluded that 97% of all publishing climate scientists agree that the climate warming trend over the past 100 years is likely due to anthropogenic causes. Internationally, scientific organizations (academic, government, scientific associations, academies and societies) are publicly on-record endorsing this position. Scientific consensus is clear that a continued anthropogenic increase of greenhouse gases will have serious social and economic consequences for the world's population and will result in changes in the existing terrestrial, aquatic and atmospheric systems that humans rely upon. While global surface temperatures are known to be generally rising, predicting

climate change and its impacts on ecological systems, particularly at a local level remains very difficult and therefore has become a focus scientific study. The projected impacts of different climate change scenarios on forest health are being studied and include forest fire frequency and intensity, invasive species, forest pests and diseases, variability in precipitation (i.e. drought vs. increased rainfall), soil and species (flora and fauna). Climate change (vs weather) implies large scale impacts and therefore our perspective in forest management planning must not only be local in scope, but extend to large-scale ecological-systems. Local forest management planning initiatives intended to address forest diversity and health and future forest resiliency to a changing climate must be based on scientific principles and rigour and contribute to the larger scientific knowledgebase. A well-meaning, but mis-informed local initiative (i.e. a silo approach) will rely on luck for success and perhaps more importantly, its failure will contribute nothing to our understanding of climate change.

Forest management efforts on the Timiskaming forest will be coordinated, monitored and evaluated to contribute to larger scientific data sets and knowledge.

It is likely that during the 10-year term of the plan, advances in climate science will lead to new avenues of study and forest policy change. Local managers may be compelled to assess forest health in new, and perhaps unanticipated, ways. New technology advancements in remote sensing will undoubtedly be a large part of future forest change monitoring and assessment. Specific management practices such as silviculture treatments, species selection and modification of rotation cycles may evolve to enhance forest carbon stocks and ensure a resilient forest. These same practices, including the location, size and orientation of future harvest areas and renewal treatments will also likely contribute significantly to northern forest community resilience, particularly in the context of forest fire. Area of concern planning, current and future wildlife habitat and protected area planning all will require constant change as knowledge is implemented in forest management plans. Forest management policy, planning and operational implementation, therefore, will have to become flexible and able to incorporate up to date information from climate science as well as be informed by Indigenous knowledge systems. It is anticipated that policy makers and forest managers will collaborate with municipalities and First Nations and Métis when developing action plans to address projected future impacts of more frequent and severe weather events such as forest fires or ice storms.

3.2.6. North Bay 72 Fire

In July 2018, dry conditions lead to a severe forest fire starting in Lady Evelyn Smoothwater Provincial Park, which expanded into the Timiskaming Forest. This fire, identified as “North Bay 72” burned a gross area of approximately 28,000 hectares in total. Of this area, 12,588 ha hectares are classified as Crown productive forest within the Timiskaming Forest. This included blocks which were approved for harvesting in the 2011-

2021 FMP. Salvage operations took place within the fire perimeter in order to utilize as much remaining standing timber as possible. Due to the large size and severity of the fire, a large amount of area has shifted into the 0-20 year age class, which has had an influence on the age-class structure of the forest, and the spatial distribution of harvesting and road construction planned for the 10-years of the FMP.

3.2.7. New Regulated Manuals

On July 1, 2020 new provincial legislation and regulation related to forest management came into effect. This included new versions of the Forest Management Planning Manual (FMPM), Forest Information Manual (FIM), Forest Operations and Silviculture Manual (FOSM) and Scaling Manual (SM). As this change occurred during FMP preparation, the Planning Team adjusted the planning schedule to reflect the new FMPM requirements, particularly regarding public and First Nation and Metis consultation, in order to achieve FMP implementation by April 1, 2021.

3.3. Base Model

Assumptions are used in the development of the base model inventory and base model. These assumptions are associated with the land base (including land use decisions), forest dynamics (including forest succession, growth and yield and post renewal forest succession), available silvicultural options and biological limits. The planning team has documented the management assumptions in the Analysis Package located in Section 6.1.1 of the Supplementary Documentation. Specifically, details on the base model inventory and the base model can be found in Section 4.0 of the Analysis Package.

3.3.1. Analysis of Silvicultural Activities

Past silvicultural activities were analyzed by a Registered Professional Forester for the development of the trend analysis for the 2016 IFA and the 2017-2018 Year 7 Annual Report. This involved a review of planned compared to actual renewal activities and expenditures, and their past performance (which is further discussed in section 3.3.2). The following recommendation from the Year 7 Annual Report relates to silvicultural activities:

It is recommended that the forest managers build on the current work done in the 2011 FMP by adding additional actual silvicultural treatment information and incorporate this information into the existing Clearcut Post Renewal Forest Succession rules analysis in order to evaluate, guide and support the planning team's development of post renewal forest successional pathways.

This recommendation was considered in the development of post-harvest renewal succession rules, which is discussed in further detail in section 3.3.2 below.

3.3.2. Analysis of Past Silvicultural Performance

An analysis of past silvicultural performance was conducted by a Registered Professional Forester to support the development of post-harvest renewal transition rules. The post-renewal response was calculated by forest unit, Silvicultural Ground Rule (SGR) treatment type from Free-to-Grow data from 2001 and 2017. The resulting response pathways were reviewed jointly by TFAI and MNRF Regional and District staff. These results were compared with the pathways used in the 2011 FMP along with MNRF Silvicultural Effectiveness Monitoring (SEM) data to provide insight into the success of silviculture treatments applied over the previous plan periods. Where no survey data existed for a given SGR, post-harvest renewal transition rules were assigned based on reviewing the rulesets from the 2011 plan, adjacent forest management units, MNRF Technical Report TR-005[2], along with professional judgement. The final transition rules are presented in Table FMP-5.

3.4. Desired Forest and Benefits

The Planning Team, the Kirkland Lake and Timmins Local Citizens Committees (LCC), as well as representatives from Métis and First Nation communities were involved in the development of the desired forest and benefits for the 2021-2031 Timiskaming FMP. The desired forest and benefits are the combination of forest structure, composition, and goods and services which are desired from the forest to achieve a balance of social, economic, and environmental objectives over time.

Three Desired Forest & Benefits meetings were to held to support the development of the 2021 FMP. The first was held on April 5, 2019 in Timmins with representatives from the Métis Nation of Ontario and Métis community councils with interests on the Timiskaming Forest. A second meeting was held with representatives from the Kirkland Lake and Timmins LCCs and the planning team in Elk Lake on April 6, 2019. A third meeting was held with representatives from First Nation communities in Elk Lake on April 16, 2019. These meetings were held to provide participants with background information on the forest and to develop a list of desired forest and benefits. In an effort to identify which 2011-2021 TF management plan objectives were considered relevant and/or which required modification, an overview of current objectives and achievement to date was presented at the meetings.

The discussions held at these meetings, and resulting desired forest and benefits identified were categorized and summarized. Between July and October 2019, four meetings were held jointly with the Consultation and Communications Task Team (CCTT) and Indigenous Task Team (ITT) to develop management objectives based on the comments made at the Desired Forest & Benefits meetings. The joint CTT-ITT group considered all inputs from the meetings, and while some material transformed into plan objectives or

[2] *Post-renewal forest succession: Suggested pathways for northeast standard forest units (2016).*

confirmed exiting ones, not all of the inputs could be considered in the objective suite. Some were determined to be outside the scope of forest management planning, and therefore were not considered in development of FMP objectives. The objectives were confirmed at the last of the four meetings; which was held on October 16, 2019. Indicators and targets were assigned to the objectives, and tabulated in FMP-11 as per the 2017 FMPM.

All of the desired forest and benefits meetings served to define new or confirm existing plan objectives, indicators of sustainability, and associated desired levels. The meetings also presented the opportunity for participating members to understand other opinions, and expectations for the FMP. The result was an appreciation of the range, and often conflicting, perspectives of the participants and an enhanced appreciation of the complexity in attaining a balanced achievement of objectives.

In Section 6.1.14 of the Supplementary Documentation the summary of public consultation documents the participation in the desired forest and benefits process.

3.5. Strategic Management Zones

Strategic Management Zones (SMZs) are geographical areas within a management unit that provide spatial context when preparing the LTMD or planning proposed operations. The 2017 FMPM requires the identification of management zones for all forest management plans during LTMD preparation. This requirement is challenging to implement on the Timiskaming Forest, particularly with regards to management objectives. Harvest areas are well distributed, markets for both conifer and hardwood remain viable, and the forest is well accessed. As such, the Modeling and Analysis Task Team identified the claybelt section of the forest as a unique strategic management zone (see Figure 39). This area was chosen based on the unique cull factor which accompanies all harvest approvals for blocks within this area, along with the intensive silviculture which has been applied to this area as part of the Forestry Futures Trust – Shallow River Renewal Projects.

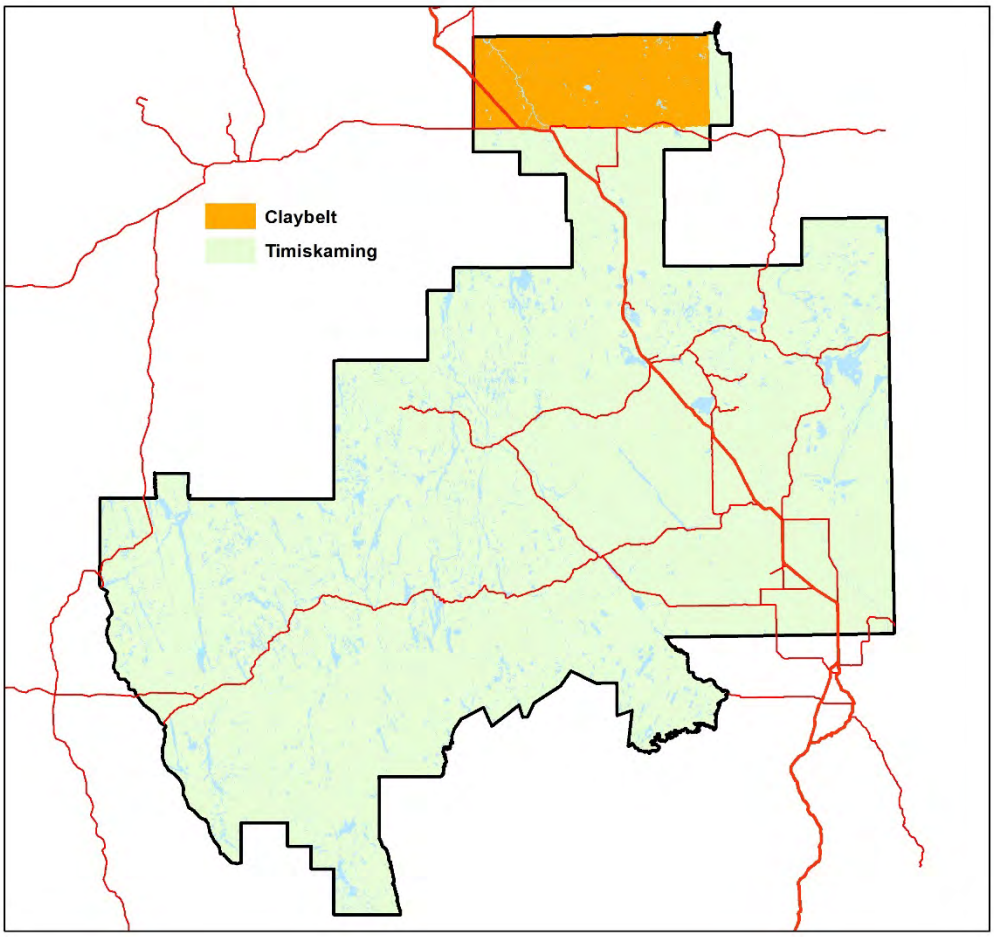

Figure 39. Strategic Management Zone Map

3.6. Objectives and Indicators

This section will describe the suite of management objectives including the associated indicators and the timeline for indicator assessment. For each indicator, the planning team has developed desirable levels and targets by considering the background information, management guide direction, desired forest and benefits meeting results and the results of scoping analysis. For each objective grouping the management objectives, associated indicators, desirable levels and targets, and the timing of assessment is described in detail below and summarized in Table FMP-10.

The primary goal of a forest management plan is to achieve a healthy, sustainable forest ecosystem, which is vital to the well-being of forest based, and non-forest based, Ontario communities.

The CFSA directs that all management objectives, and their associated indicators developed for a forest management plan be compatible with one of four primary objective groupings. These groupings are as follows;

a) Crown forest diversity objectives, including consideration for the conservation of natural landscape patterns, forest structure and composition, habitat for animal life and, the abundance and distribution of forest ecosystems,
b) Social and economic objectives, including harvest levels and a recognition that healthy forest ecosystems are vital to the well-being of Ontario communities
c) The provision of forest cover for those values that are dependent on the Crown forest
d) Silviculture objectives for the harvest, renewal and maintenance of the Crown forest

For each individual grouping there are one or more related objectives, with associated indicators, desirable levels and targets. As shown above, forest management objectives are developed for benefits or outcomes that can be achieved by manipulating forest cover. The associated indicators for achieving these types of objectives will involve silvicultural methods for harvest, renewal and tending since these are the processes by which forest cover is manipulated. For each indicator, there are associated desirable levels and targets, measured either qualitatively or quantitatively with an associated timeline for assessment. The desirable level reflects the planning team's interpretation of the ideal condition without consideration for any other objective. Target establishment, on the other hand, reflects the necessity for balancing contrasting management objectives. This may result in targets that differ from the desired levels. The planning team developed targets using input from the local citizen's committee, First Nation and Métis community members and the planning team at the desired forest and benefits meetings. The target levels were supported by scoping analysis results using the Remsoft ® Spatial Planning System strategic model (hereafter referred to as the Remsoft model). Target levels considered background information and relevant forest management guides including the Landscape Guide and Stand and Site Guide. Sections 4.0, 5.0, 6.0 of the Analysis Package describe in detail the inputs, results and conclusions for the development of management objectives and scoping investigations.

CFSA Objective Grouping: Crown forest diversity – Natural landscape pattern and distribution of forest ecosystems.

The forest diversity objective grouping for this FMP will be consistent with the overall goal for diversity on the Timiskaming Forest. This goal is as follows:

> *"To manage the inherent forest diversity of the Timiskaming Forest within a range consistent with natural processes and the desired future forest condition"*

The forest diversity objectives are assessed based on a series of indicators evaluating landscape pattern, forest structure, composition and abundance; amount and distribution of area by forest type and age.

Management Objective 1: To provide for a distribution of disturbance patches that more closely resembles the expected size, composition and age produced by wildfire.

The following indicators were used in the assessment of achievement for this objective.

Indicators:

1. Young Forest Patch Size Frequency Distribution
    a. *Desirable Levels*: achieve the SRNV mean value (based on Landscape Guide Region 3E)
    b. *Target Levels:* demonstrate movement towards the SRNV mean value
    c. *Timing of Assessment:* during the development and completion of the LTMD and upon completion of operational planning.

2. Texture of the Mature and Older Forest Matrix (500 ha and 5,000 ha scales)
    a. *Desirable Levels*: achieve the SRNV mean value (based on Landscape Guide Region 3E milestones for the Timiskaming Forest)
    b. *Target Levels:* demonstrate movement towards the SRNV mean value
    c. *Timing of Assessment:* during the development and completion of the LTMD and upon completion of operational planning.

Management Objective 2: To promote balanced age class structure for all forest units resembling expected natural conditions.

The following indicator was used in the assessment of achievement for this objective.

Indicator:

1. Area by landscape classes, forest unit groupings, young forest (< 36 yrs of age), old growth, and red and white pine.
    a. *Desirable Levels*: achieve and maintain levels within the IQR, consistent with the Landscape Guide Region 3E milestones for the Timiskaming

Forest. For the red and white pine indicator, the desirable level is the historic level of white and red pine.

b. Target Levels: demonstrate movement towards the SRNV (increase, decrease or maintain)

c. Timing of Assessment: assessment completed during the development and completion of the LTMD and upon completion of operational planning.

CFSA Objective Categories:

i) Crown forest diversity – Habitat for animal life and
ii) Provision of forest cover for values dependent on the Crown Forest

Management Objective 3: To provide forest conditions that are similar to the conditions moose prefer and would encounter in a natural forest ecosystem, and consider the provision of moose emphasis areas (MEAs) on the Timiskaming Forest. The identification of suitable habitat will be informed and validated by Traditional Indigenous knowledge.

The following indicators were used in the assessment of achievement for this objective.

Indicators:

1. Area of Timiskaming Forest managed as Moose Emphasis Areas
    a. Desirable Level: At least 10-15% of the productive forest area is to be managed as MEAs > 2,000 ha in area with a preference for areas greater than 10,000 ha.
    b. Target Level: If MEAs are delineated on the forest, then 10-15% of the productive forest area is to be managed as MEAs > 2,000 ha in area with a preference for areas greater than 10,000 ha.
    c. Timing of Assessment: Draft Plan

2. Structure and composition of individual Moose Emphasis Areas: browse-producing habitat.
    a. Desirable Level: 5-30% of each selected MEA is browse-producing habitat
    b. Target Level: 5-30% of each selected MEA is browse-producing habitat
    c. Timing of Assessment: Draft Plan

3. Structure and composition of individual Moose Emphasis Areas: mature conifer-dominated habitat.
    a. Desirable Level: 15-35% of each selected MEA is mature conifer-dominated forest
    b. Target Level: 15-35% of each selected MEA is mature conifer-dominated forest
    c. Timing of Assessment: Draft Plan

4. Structure and composition of individual Moose Emphasis Areas: hardwood/mixedwood dominated habitat.
    a. *Desirable Level*: 20-55% of each selected MEA is hardwood or mixedwood dominated forest
    b. *Target Level:* 20-55% of each selected MEA is hardwood or mixedwood dominated forest
    c. *Timing of Assessment:* Draft Plan

5. Road density within individual Moose Emphasis Areas (km/km^2)
    a. *Desirable Level*: Kilometers of SFL responsible branch or operational roads accessible by 4x4 truck per square kilometer of Crown Land with no net increase within individual MEAs.
    b. *Target Level:* Kilometers of SFL responsible branch or operational roads accessible by 4x4 truck per square kilometer of Crown Land with no net increase within individual MEAs.
    c. *Timing of Assessment:* Year 10 Annual Report

CFSA Objective Grouping:

i) Social and economic - community well-being
ii) Provision of forest cover for values dependent on the Crown Forest

Management Objective 4: To minimize productive forest area lost by forest management activities.

The following indicator was used in the assessment of achievement for this objective.

Indicator:

1. Kilometres of roads[1] per square kilometre of Crown forest.
    a. *Desirable Level: No increase from 2009 benchmark level (derived from roads updated to the 2008-2009 AR as referenced in the 2011 FMP) of* 0.3889 *km/km^2.*
    b. *Target Level: Density does not exceed a 15% increase over the 2009 benchmark level per 10-years of road construction.*
    c. *Timing of Assessment: Annual Reports*

[1] Road density indicator calculated based on the following: Area (km2) is derived from Managed Crown area (FMP-1). Roads (km) query includes the following: Drivable by 4 wheel drive vehicle, responsibility is not Municipal, LRB, SLB, MTO, Private or Other and accessibility is not "not passable", "historic" or "unknown".

Note: The calculation of road density will reflect both roads constructed, and those no longer passable based on the criteria in footnote 1 below.

Although criteria are in place for determining when a road is no longer a road, there is no joint MNRF-SFL program for assessing roads with the intent of removing those which no longer meet the definition of a road. The benchmark assessment described above should not include roads that no longer meet the road definition, and as such a program and timeline will need to be developed, during plan implementation, for removing these features from the equation. This type of program was recommended in the Water Crossing Inventory Instruction Manual (2004), as stated below (from page 4 of this manual).

> *As it is often common practice to retain all roads on maps even though many roads may have been decommissioned, are overgrown or have degenerated and are no longer travelable it is likely that field crews will encounter some roads that "no longer exist". This information should be provided to persons responsible for maintaining road database information. It is recommended that criteria and a process be developed to remove "roads that no longer exist" from the current road database. Consideration should be given to transferring this edited information to a "retired road" map product. Refer to the FRWCI Task Team Report, MNR, 2003 for additional information.*

CFSA Objective Grouping: Silviculture

Management Objective 5: To enhance the growth, yield and commercial value of selected forest stands on the Timiskaming Forest while retaining the genetic diversity of those species artificially regenerated.

The following indicator was used in the assessment of achievement for this objective.

Indicator:

1. Plant tree seedlings (including tree improved stocked) at levels required to retain genetic diversity and maintain predictable and sustainable wood supply.
    a. *Desirable Level*: plant an annual average of between 5.0 and 5.5 million seedlings over a 10 year period
    b. *Target Level:* plant an annual average of between 5.0 and 5.5 million seedlings over a 10 year period
    c. *Timing of Assessment:* 5 year and 10 Year Annual Report

CFSA Objective Grouping: Silviculture

Management Objective 6: To regenerate harvested area to standards set in the SGR's, using a combination of natural and artificial methods that will increase future harvest levels in a cost-effective manner and ensure long-term forest health.

The following indicators were used in the assessment of achievement for this objective.

Indicators:

1. Percent of harvested forest area assessed as free-growing
    a. *Desirable Level*: regenerate all harvested area according to standards in the SGRs (FMP-4)
    b. *Target Level:* greater than 80% of the area assessed as free-growing within 10 years of harvest
    c. *Timing of Assessment:* 5 year and 10 Year Annual Report

2. Introduce prescribed burning as a site-preparation tool.
    a. *Desirable Level*: Work with MNRF to explore options to introduce prescribed burning as a site-preparation tool.
    b. *Target Level:* Work with MNRF to explore options to introduce prescribed burning as a site-preparation tool.
    c. *Timing of Assessment:* 5 year and 10 Year Annual Report

CFSA Objective Grouping: Silviculture

Management Objective 7: Investigate and implement opportunities to reduce the application of herbicides.

The following indicators were used in the assessment of achievement for this objective.

Indicators:

1. Reduce the area applied with herbicides for the control of competing vegetation.
    a. *Desirable Level:* Achieve 39,911 hectares of aerial herbicide application over the 10-year plan.
    b. *Target Level:* Achieve 35,919 hectares of aerial herbicide application over the 10-year plan (10% reduction from Desirable Level).
    c. *Timing of Assessment:* Documented yearly in each Annual Report

2. Implement an integrated vegetation management program on the Timiskaming Forest.

    a. *Desirable Level*: Apply non-chemical methods of tending to 3,992 hectares over the 10-year plan.
    b. *Target Level:* Apply non-chemical methods of tending to 3,992 hectares

over the 10-year plan.

c. *Timing of Assessment:* Documented yearly in each Annual Report

Note: This program will be used to create a commitment to alternative non-chemical methods of tending and measure their efficiency on the Timiskaming Forest. The desirable level and target of alternative non-chemical methods of tending represents 10% target reduction identified in Indicator 7.1 above, to ensure silvicultural success is still occurring across the unit.

CFSA Objective Grouping:

i) Provision of forest cover for values dependent on the Crown Forests
ii) Social and economic – healthy forest ecosystems

Management Objective 8: To identify and mitigate management impacts on all known fish and wildlife habitat, recreational, commercial, non-timber forest resource, and other values on the Timiskaming Forest Management Unit.

The following indicators were used in the assessment of achievement for this objective.

Indicators:

1. Compliance with prescriptions for the protection of natural resource features, land uses or values dependent on forest cover.
    a. *Desirable Level*: No non-compliances
    b. *Target Level:* No non-compliances resulting in administrative penalties
    c. *Timing of Assessment:* 5 year and 10 Year Annual Report

2. Compliance with prescriptions for the protection of resource-based tourism values.
    a. *Desirable Level*: No non-compliances
    b. *Target Level:* No non-compliances resulting in administrative penalties
    c. *Timing of Assessment:* 5 year and 10 Year Annual Report

3. Compliance with management practices that prevent, minimize or mitigate site damage.
    a. *Desirable Level*: No non-compliances
    b. *Target Level:* No non-compliances resulting in administrative penalties
    c. *Timing of Assessment:* 5 year and 10 Year Annual Report

4. Compliance with prescriptions for the protection of species at risk
    a. *Desirable Level*: No non-compliances
    b. *Target Level:* No non-compliances resulting in administrative penalties
    c. *Timing of Assessment:* 5 year and 10 Year Annual Report

5. Compliance with prescriptions relating to road use management strategies.

a. *Desirable Level*: No non-compliances
b. *Target Level:* No non-compliances resulting in administrative penalties
c. *Timing of Assessment:* 5 year and 10 Year Annual Report

6. Compliance in forest operations inspections (% of inspections in non-compliance, by category, as determined by MNRF)
    a. *Desirable Level*: No non-compliances
    b. *Target Level:* No non-compliances resulting in administrative penalties
    c. *Timing of Assessment:* 5 year and 10 Year Annual Report

CFSA Objective Grouping:

i) Provision of forest cover for values dependent on the Crown Forests
ii) Social and economic – healthy forest ecosystems

Management Objective 9: To protect known Cultural Heritage values and identify and evaluate areas where high potential exists for Cultural Heritage Values within the Timiskaming Forest.

The following indicators were used in the assessment of achievement for this objective.

Indicator:

1. Compliance with prescriptions for the protection of known Cultural Heritage values and demonstration that information on all areas that have received a Stage 1-4 archeological assessment is being maintained.
    a. *Desirable Level*: no non-compliances and records of archeological assessment are maintained
    b. *Target Level:* no non-compliances resulting in administrative penalties and records of archeological assessment are maintained
    c. *Timing of Assessment:* 5-year and 10-year Annual Reports

2. Compliance with prescriptions for the protection of Indigenous and Métis values identified during the current or past forest management planning process or subsequently by First Nation representatives
    a. *Desirable Level: no non-compliances*
    b. *Target Level: no non-compliances resulting in administrative penalties*
    c. *Timing of Assessment: 5-year and 10-year Annual Reports*

CFSA Objective Grouping: Social and Economic – harvest levels and community well-being.

Management Objective 10: To manage the forest resources of the Timiskaming Forest to provide an ecologically sustainable and predictable wood supply.

The following indicators were used in the assessment of achievement for this objective.

Indicators:

1. Long-term projected available harvest area by forest unit.
    a. *Desirable Levels*: to have sufficient harvest area by forest unit to support the harvesting volume targets
    b. *Target Levels:* to minimize the fluctuation in harvest area (ha) from previous 10 year term (+/- 20%)
    c. *Timing of Assessment:* development and completion of the LTMD

2. Long-term projected available harvest volume by species group.
    a. *Desirable Levels*: through the review of background information, it was determined that the following volume by species group would be desirable;
        - Spruce/Pine/Fir – 936,560 m^3/yr
        - Cedar – 2,000 m^3/yr
        - Other Conifer – 12,281 m^3/yr
        - White and Red Pine – 6,314 m^3/yr
        - Poplar – 561,958 m^3/yr
        - White Birch – 184,426 m^3/yr
        - Other Hardwood – 9,054 m^3/yr

    b. *Target Levels:* through the review of background information and scoping analysis results, the following targets were set in the model for the SPF and Po species groups. Other species group volumes were reviewed during model runs, but no constraint was included in the model
        - Spruce/Pine/Fir – 736,400 m^3/yr
        - Poplar – 360,500 m^3/yr

    c. *Timing of Assessment:* during the development and completion of the LTMD

3. Planned harvest area by forest unit
    a. *Desirable Levels*: planned harvest is equal to 100% of the available harvest area for each forest unit
    b. *Target Levels:* planned harvest is equal to 100% of the available harvest area for each forest unit
    c. *Timing of Assessment:* Draft Plan and Final Plan

4. Planned harvest volume by species group
    a. *Desirable Levels*: to have the planned harvest volume equal to 100% of the available harvest volume.
    b. *Target Levels:* to have the planned harvest volume equal to 100% of the available harvest volume
    c. *Timing of Assessment:* Draft Plan and Final Plan

5. Actual harvest area by forest unit
    a. *Desirable Levels*: to achieve 100 percent of the planned harvest area over the planning period
    b. *Target Levels:* to achieve 90 percent of the planned harvest area over the planning period
    c. *Timing of Assessment:* 5-year and 10-year Annual Reports

6. Actual harvest volume by species group
    a. *Desirable Levels*: to achieve or exceed planned volumes for each species group
    b. *Target Levels:* to achieve or exceed planned volumes for each species group
    c. *Timing of Assessment:* 5-year and 10-year Annual Reports

CFSA Objective Grouping: Social and Economic – harvest levels and community well-being.

Management Objective 11: To provide an ecologically sustainable wood supply so that First Nation and Métis communities, local communities and individuals depending upon the forest industry for employment and stability continue to benefit from forest management activities on the Timiskaming Forest.

The following indicator was used in the assessment of achievement for this objective.

Indicators:

1. Percent of planned volume utilized by mill including sawmills in First Nation and Métis communities
    a. *Desirable Level*: to achieve or exceed 100% of planned volume by mill
    a. *Target Level:* to achieve 90% of planned volume utilized by mill
    b. *Timing of Assessment:* 5-year and 10-year Annual Reports

CFSA Objective Grouping: Social and Economic – harvest levels and community well-being.

Management Objective 12: To promote and support the utilization of biofibre on the Timiskaming Forest in an ecological and sustainable manner.

The following indicator was used in the assessment of achievement for this objective.

Indicator:

1. Percent of planned biofibre volume utilized by species group
    a. *Desirable Levels*: to achieve 100% utilization of planned biofibre volume
    b. *Target Levels:* to progressively move towards a 10% utilization of planned biofibre volume

c. Timing of Assessment: 5-year and 10-year Annual Reports

CFSA Objective Grouping:

i) Social and economic – community well-being.
ii) Provision of forest cover for values dependent on the Crown Forests

Management Objective 13: Provide opportunities and support to local First Nation and Métis communities for increased and meaningful participation in forest management planning and implementation.

The following indicator was used in the assessment of achievement for this objective.

Indicators:

1. Opportunities for involvement provided to, and involvement of, First Nation and Métis communities in plan development and implementation.
   a. Desirable Level: Provide opportunities for First Nation and Métis communities to be involved in the evaluation of forest management activities (i.e. comparisons of pre and post operations) each AWS year.
   b. Target Level: Provide opportunities for First Nation and Métis communities to be involved in the evaluation of forest management activities (i.e. comparisons of pre and post operations) each AWS year.
   c. Timing of Assessment: 5-year and 10-year Annual Reports

CFSA Objective Grouping:

i) Social and economic – community well-being.
ii) Provision of forest cover for values dependent on the Crown Forests

Management Objective 14: Improve the mutual exchange of information between the local First Nation and Métis communities, local forest industry and MNRF on such matters as values protection, education and training and to ensure that traditional ecological knowledge is incorporated into forest management planning and operations.

The following indicators were used in the assessment of achievement for this objective.

1. TFAI will extend the offer to meet annually (as a minimum) with each local First Nation and Métis community to discuss and report on matters that are of interest to the community, including how traditional ecological knowledge has been utilized in forest management planning and operations. This meeting will be in addition to any other regularly scheduled meetings (i.e. AWS presentation).
   a. Desirable Level: Annually meet with participating First Nation and Métis communities
   b. Target Level: Annually meet with participating First Nation and Métis

communities
   c. *Timing of Assessment:* 5-year and 10-year Annual Reports

2. Provide opportunities for First Nation and Métis entrepreneurs to participate in relevant FMP training sessions.
   a. *Desirable Level*: Provide opportunities for First Nation and Métis entrepreneurs to participate in relevant FMP training sessions
   b. *Target Level:* Provide opportunities for First Nation and Métis entrepreneurs to participate in relevant FMP training sessions
   c. *Timing of Assessment:* 5-year and 10-year Annual Reports

CFSA Objective Grouping: Social and Economic – harvest levels and community well-being.

Management Objective 15: TFAI to explore mentorship and extension services such as forest-based employment and economic opportunities to interested local First Nation/Métis communities/entrepreneurs.

The following indicator was used in the assessment of achievement for this objective.

Indicator:

1. Number of employment, or economic opportunities and benefits provided through forest management planning and operations provided to First Nation and Métis communities/entrepreneurs.
   a. *Desirable Level*:
      i. Encourage First Nation and Métis communities and business entrepreneurs to open discussions with TFAI for long-term silvicultural economic opportunities.
      ii. TFAI will disseminate information to its shareholders, First Nation and Métis communities in support of any harvesting opportunity negotiations that may be available on the Timiskaming Forest.
   b. *Target Levels:* (see desirable levels)
   c. *Timing of Assessment:* 5-year and 10-year Annual Reports

Objective Grouping:

i) Social and economic – community well-being.
ii) Provision of forest cover for values dependent on the Crown Forests

Management Objective 16: To engage First Nation and Métis communities and local communities in the development and implementation of the forest management plan.

The following indicators were used in the assessment of achievement for this objective.

Indicators:

1. Local citizens committee's self-evaluation of its effectiveness in plan development.
    a. Desirable Level: LCC's satisfaction in the participation of the FMP development as documented in the self-evaluation.
    b. Target Level: LCC's satisfaction in the participation of the FMP development as documented in the self-evaluation.
    c. Timing of Assessment: Draft Plan

2. Engagement sessions conducted during the development and implementation of the FMP
    a. *Desirable Level:* Opportunities for LCC, First Nation and Métis field tours based on areas of interest.
    b. *Target Level:* Opportunities for LCC, First Nation and Métis field tours based on areas of interest.
    c. *Timing of Assessment:* 5-year and 10-year Annual Reports

3. Opportunities for involvement provided to, and involvement of, First Nation and Métis communities for increased participation in the forest management planning process
    a. *Desirable Level:* Full participation from First Nation and Métis community representatives on the Indigenous Task Team.
    b. *Target Level:* Full participation from First Nation and Métis community representatives on the Indigenous Task Team.
    c. *Timing of Assessment:* Draft Plan

Objective Grouping:

i) Social and economic – community well-being.
ii) Provision of forest cover for values dependent on the Crown Forests

Management Objective 17: To coordinate forest management activities such that benefits to all Crown land users are maximized while conflicts resulting from forest operations are minimized.

The following indicator was used in the assessment of achievement for this objective.

Indicator:

1. Demonstrate the continual involvement in working with stakeholders of the Timiskaming Forest.
    a. Desirable Level: Minimize the occurrence of conflicts between Crown land users resulting from forest operations.
    b. Target Level:

i. TFAI to continue providing information to, and offering to meet with tourist outfitters, trappers, Bear Management Area operators, etc. at the time of Annual Work Schedule (AWS) approval to further inform these stakeholders of upcoming annual scheduled activities.

ii. TFAI to continue playing an active role on the LCC providing updated information on current forest management and policies as well as providing opportunities for field tours aimed at continually educating members on forest management activities.

c. Timing of Assessment: 5-year and 10-year Annual Reports

Objective Grouping:

i) Crown forest diversity – forest structure and composition, and distribution of forest ecosystems
ii) Provision of forest cover for values dependent on the Crown forest

Management Objective 18: To consider emerging climate change science and policy initiatives applicable to forest management on the Timiskaming during plan development and implementation.

The following indicator was used in the assessment of achievement for this objective.

Indicator:

1. Evaluate and select strategies for climate change adaptation informed by Indigenous knowledge systems that will be incorporated during FMP implementation.
   a. *Desirable Level:* Implement MNRF's Seed Transfer Policy allowing seed for seedling production to be sourced from identified seed zones in anticipation of a future changed climate.
   b. Target Level: Implement MNRF's Seed Transfer Policy allowing seed for seedling production to be sourced from identified seed zones in anticipation of a future changed climate.
   c. Timing of Assessment: 5-year and 10-year Annual Reports

Objective Grouping:

i) Social and economic – community well-being
ii) Provision of forest cover for values dependent on the Crown forest.

Management Objective 19: To consider techniques to reduce fire susceptibility through the development of Fire Management Zones on the Timiskaming Forest.

The following indicators were used in the assessment of achievement for this objective.

Indicator:

1. Develop fire management zones during the preparation of the FMP.
    a. *Desirable Level*: Through operational planning, design fire management zones to reflect the desire to reduce fire susceptibility.
    b. *Target Level*: Through operational planning, design fire management zones to reflect the desire to reduce fire susceptibility.
    c. *Timing of Assessment:* 5-year and 10-year Annual Reports

Management Objective 20: To incorporate Traditional Ecological Knowledge in the forest management plan and associated annual work schedules.

The following indicator was used in the assessment of achievement for this objective.

Indicator:

1. Document and report on the incorporation of Traditional Ecological Knowledge (TEK) in the forest management plan and associated annual work schedules, as it relates to the protection of moose habitat outside of moose emphasis areas.
    a. *Desirable Level*: Discuss and report on the incorporation of TEK into the FMP and AWS.
    b. *Target Level*: Discuss and report on the incorporation of TEK into the FMP and AWS.
    c. *Timing of Assessment:* Annual Reports and/or the Protection of Identified First Nation and Metis Values.

Note: Discussions with the First Nation and Metis communities that occur during plan implementation will take into account TEK in regards to local moose population areas, areas used by the community for hunting, and the planning of silvicultural activities adjacent to First Nation communities. This information is to be reported on annually, through the annual report and/or the Report of the Protection of Identified First Nation and Metis Values and will be used to assist in the planning moose habitat in the 2031-2041 FMP.

3.7. Long-Term Management Direction

As described earlier, the Remsoft model was used as the primary analysis tool for the strategic planning of this FMP. This computer model simulates the Timiskaming Forest condition through time by projecting changes to the forest structure, composition and age for 160 years into the future. The model also evaluates forested areas, for their contribution to forest diversity and timber production. The Remsoft model was used to determine the levels of forest management activities required to manage forest cover to balance the achievement levels for all of the management objectives. The Remsoft model was also used in the development of achievable targets in the proposed long-term management

direction. The model outputs include a description of the forest condition for the Crown productive forest, available harvest area by forest unit and available harvest volume by species group.

The planning team also utilized the Ontario Landscape Tool (OLT), which is a GIS-based landscape structured language (LSL) spatial model. This tool was used to evaluate and establish target levels for the development of this plan and for completing the spatial assessments that were conducted during the development of the LTMD. Detailed information on the development of inputs and the use of the Remsoft model for the preparation of the FMP can be found in in Section 4.0 of the Analysis Package which is located in Section 6.1.1 of the Supplementary Documentation.

The following describes the projected forest structure and the types and levels of activities required to manage the forest cover to balance the achievement of management objectives.

Projected forest condition for the Crown productive forest

Table FMP-6 shows how the projected forest condition for the Crown productive forest, depicted as the area (ha) by forest unit and age class, changes over the next 100 years. The projected forest condition for each forest unit is discussed below.

As shown in Table FMP-6 and in Figure 40, the white birch (BW1) forest unit shows a reduction over the 100 year period of approximately 69% or 66,052 ha. This occurrence is due to the current age-class structure succeeding on the forest as well as the post-renewal succession rules. As shown in FMP-5, when treated extensively, BW1 only regenerates to BW1 15% of the time, with PO1 resulting 75% of the time. This declining trend is consistent with the 2011 FMP which has shown the anticipated decline in wood supply for white birch. Contrary to the white birch, the poplar (PO1) forest unit is projected to increase by 90% over its current levels in the 100-year horizon (See Figure 41). Consistent with the trend seen in the 2011 FMP, the poplar forest unit is projected to increase despite the anticipated decline in wood supply in the next 70 years. The increase in PO1 was necessary to achieve the landscape guide milestones for Immature and Older Hardwood and Immature Mixedwood (IOHIM) towards the latter terms in the time horizon.

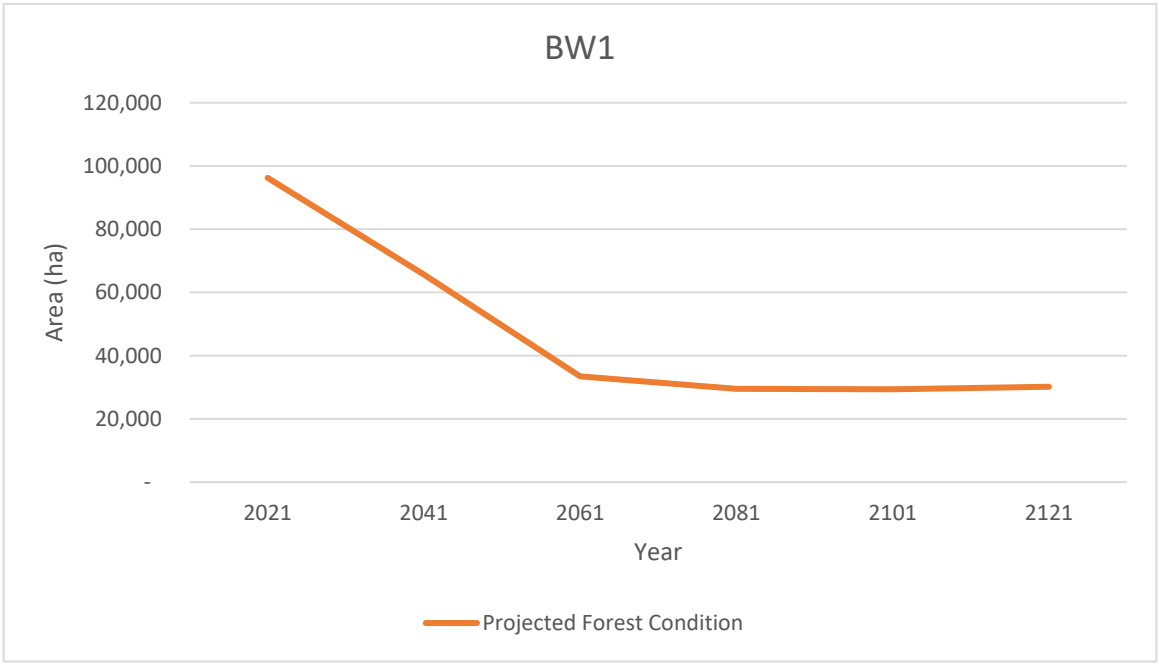

Figure 40. Projected forest condition for BW1

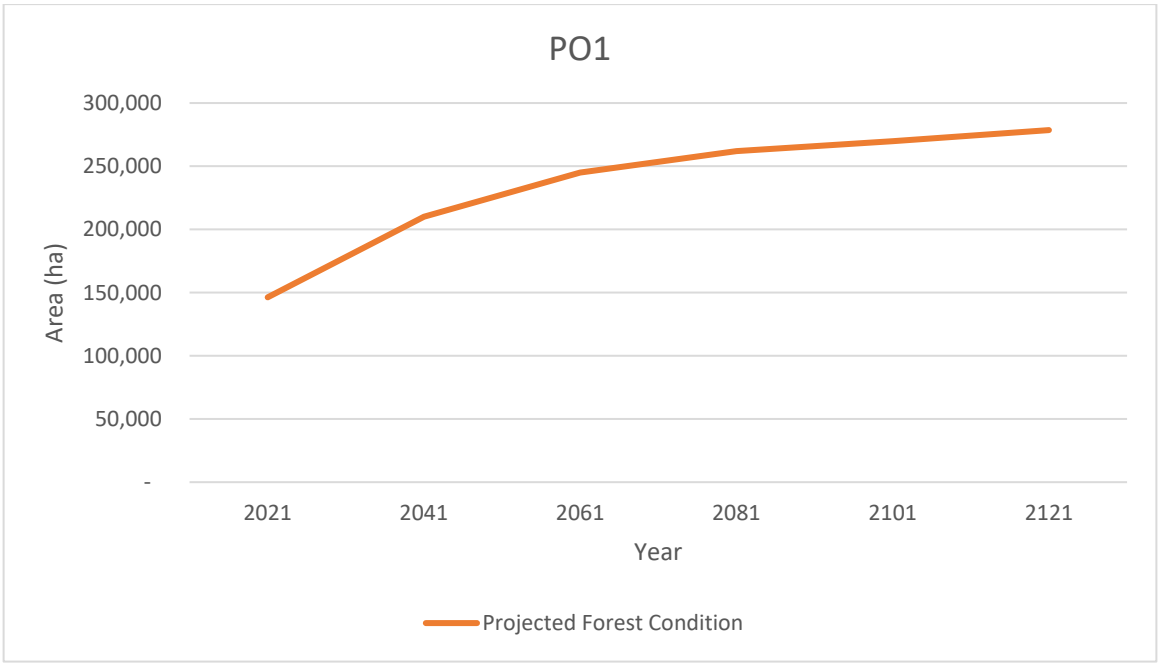

Figure 41. Projected Forest Condition for PO1

As shown in Figure 42, the MW1 forest unit shows a decline of 68% in area over the next 100 years. This decrease is a result of harvesting, post-harvest renewal transition (whereby MW1 stands are converted to other forest units through planting, seeding or natural regeneration) and natural succession. Conversely, the MW2 forest unit shows an increase

of 163% over the next 100 years (see Figure 43). This increase can be attributed to area regenerating back to MW2 after silvicultural treatments (planting or natural regeneration) has been applied. In addition, if left undisturbed, 90% of MW2 area will remain in the same forest unit after the threshold for succession (age class 115).

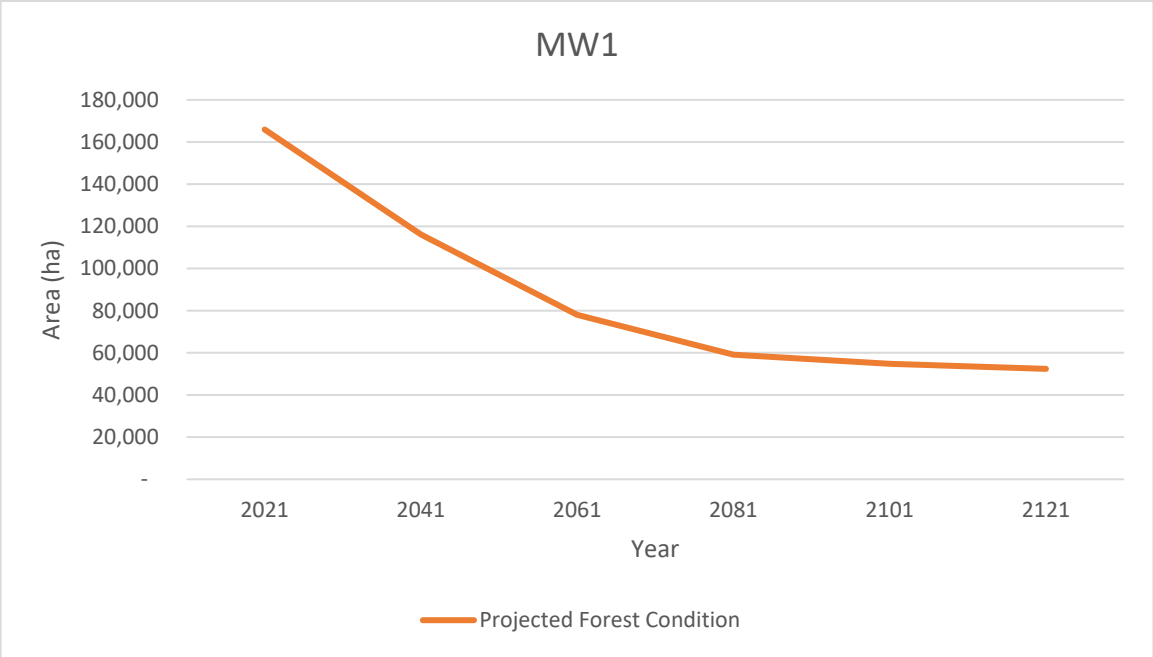

Figure 42. Projected forest condition for MW1

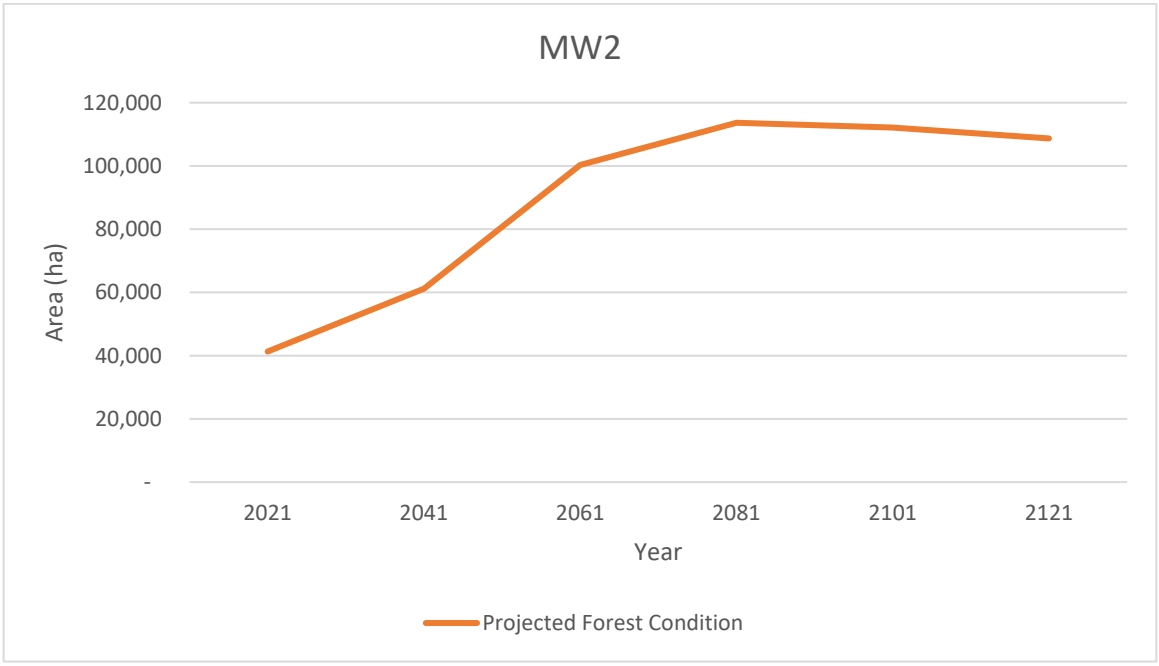

Figure 43. Projected forest condition for MW2

The tolerant hardwood forest unit (OH1) shows a 10% decline in area over the 100 year time horizon (Figure 44). It should be noted that despite the decline, which is relatively minor, the transitional hardwood species will remain on the unit over the next 100 years.

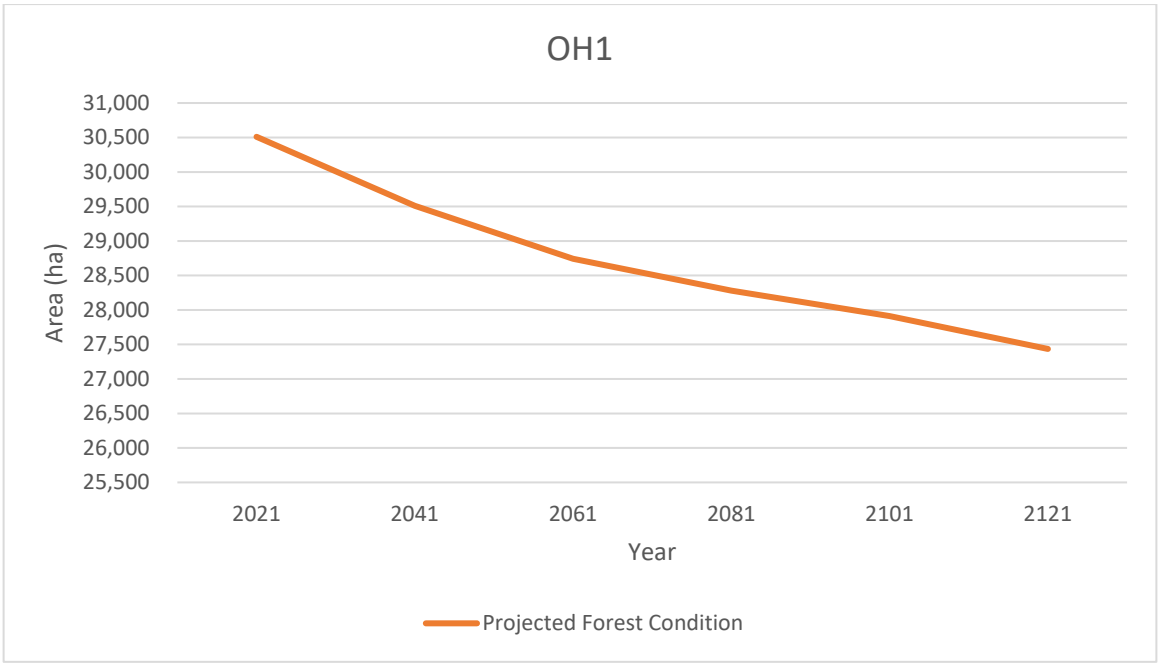

Figure 44. Projected forest condition for OH1

The dominant jack pine forest units (PJ1 and PJ2) are projected to vary within the next 100 years (See Figure 45 and Figure 46). The PJ1 forest unit shows an increase of 25% over the time horizon, with the greatest rate of increase occurring over the next 60 years. This increase is a result of harvesting and post-harvest renewal transition whereby PJ1 stands remain in the same forest unit after planting, seeding or to a lesser extent, natural regeneration. The PJ2 forest unit is projected to be relatively stable over the next 100 years, with an overall increase of 4% by the end of the time horizon. Similar to PJ1, stands will enter or remain as PJ2 through post-harvest renewal transition. Natural succession will also contribute to PJ2 area over time as 93% of PJ1 area will transition to PJ2 after the threshold for succession (age class 145).

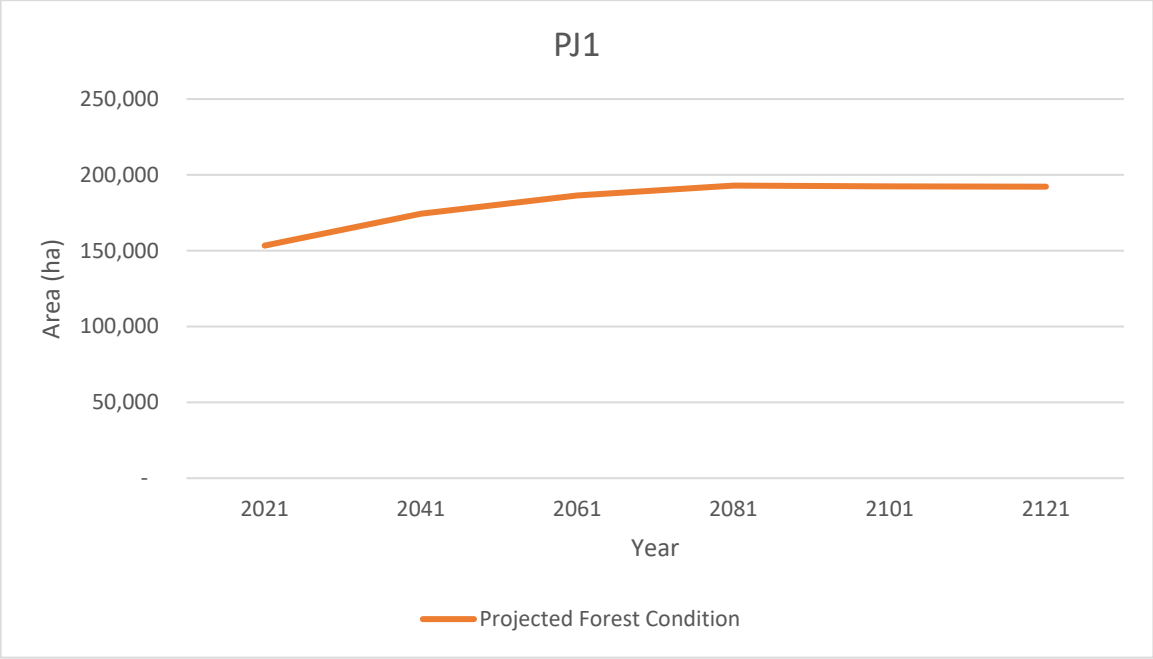

Figure 45. Projected forest condition for PJ1

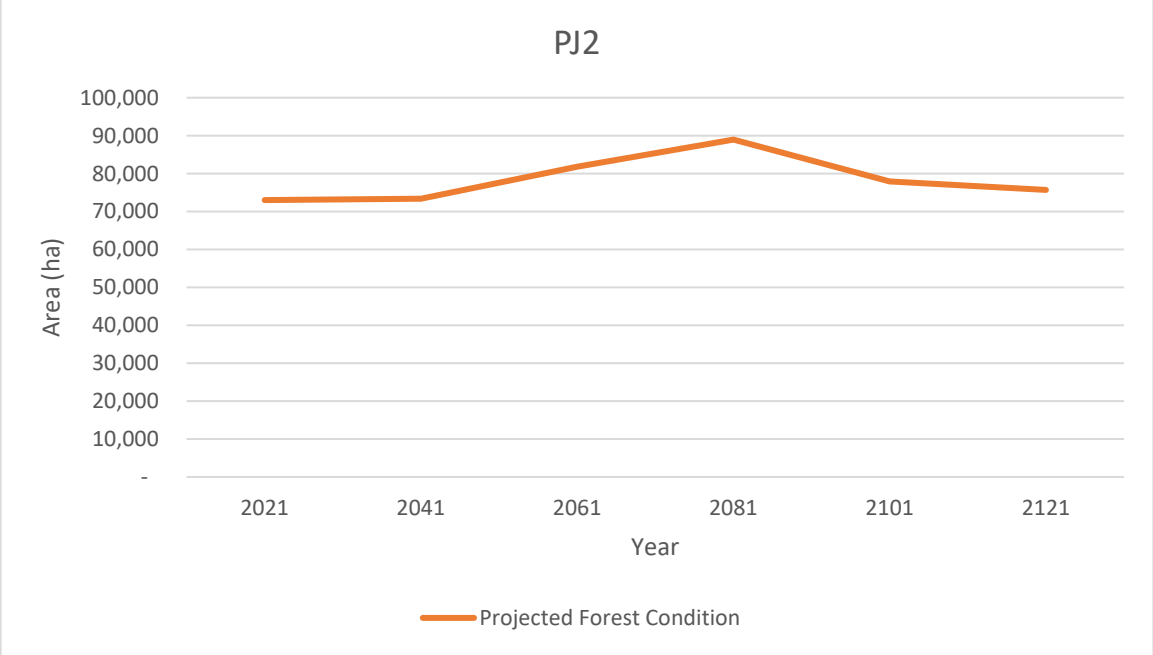

Figure 46. Projected forest condition for PJ2

The forest condition for PR1 and PWR_L is projected to increase over the next 100 years by 44% and 37% respectively (see Figure 47 and Figure 48). This is a result of the harvest and subsequent renewal transition of other forest units into PWR_L and PR1, as there is no harvest planned for these forest units over the time horizon. Natural succession also contributes to the increase of PWR_L over time as 100% of stands remain in PWR_L after the threshold for succession (age class 185).

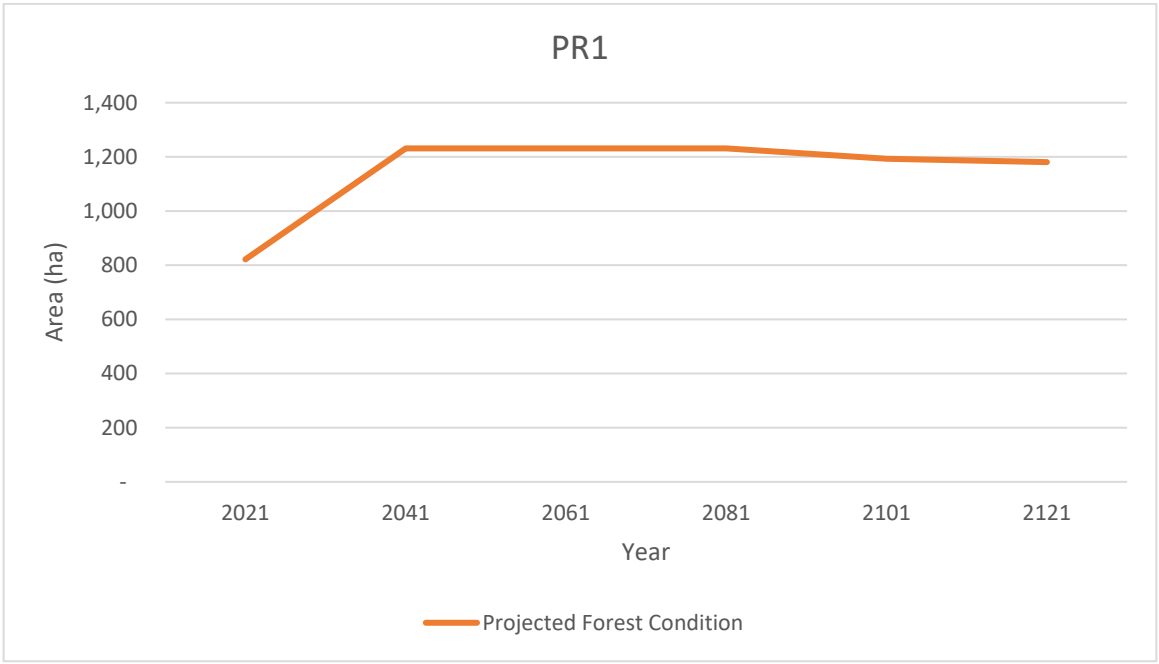

Figure 47. Projected forest condition for PR1

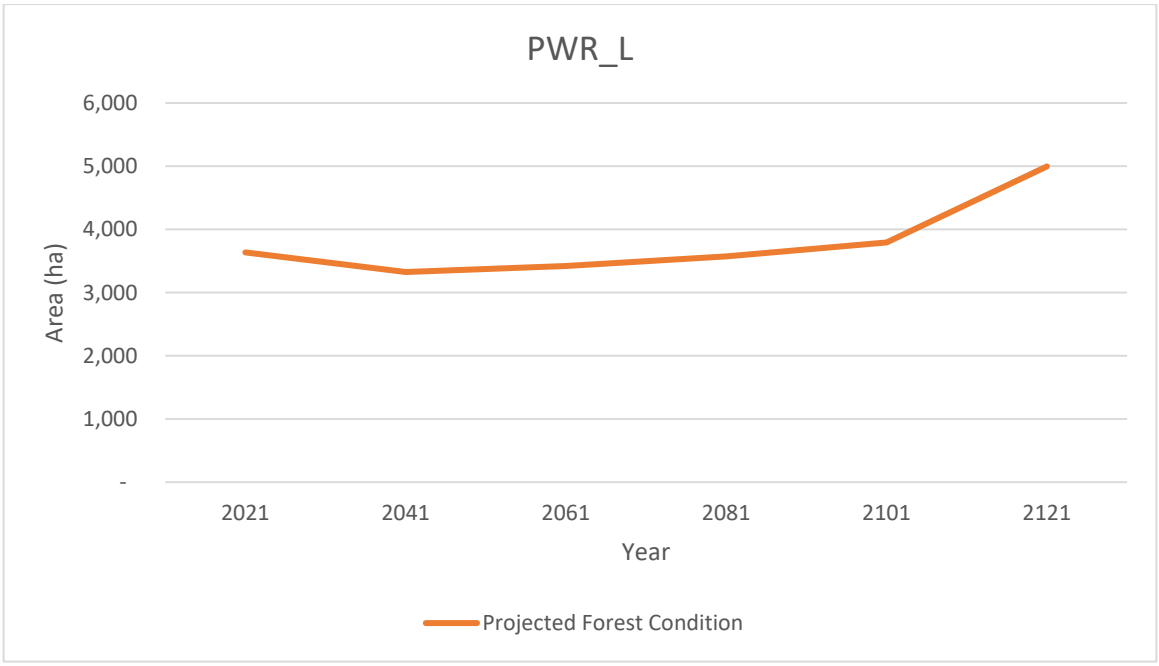

Figure 48. Projected forest condition for PWR_L

The PWR_H forest unit is projected to decline by 47% over the next 100 years (see Figure 49). Similar to PR1 and PWR_L, there is no harvest area within the PWR_H forest unit over the time horizon in the LTMD. However, PWR_H stands can originate from planting white or red pine in stands belonging to other forest units. This will contribute to the

PWR_H levels over time, but there is not enough area moving into PWR_H to maintain or increase this forest unit across the time horizon. This is despite the natural succession rules which show 100% of PWR_H stands will remain in the same forest unit after the threshold for succession (age class 185). While a declining trend is shown, the presence of PWR_H will remain on the landbase well into the future.

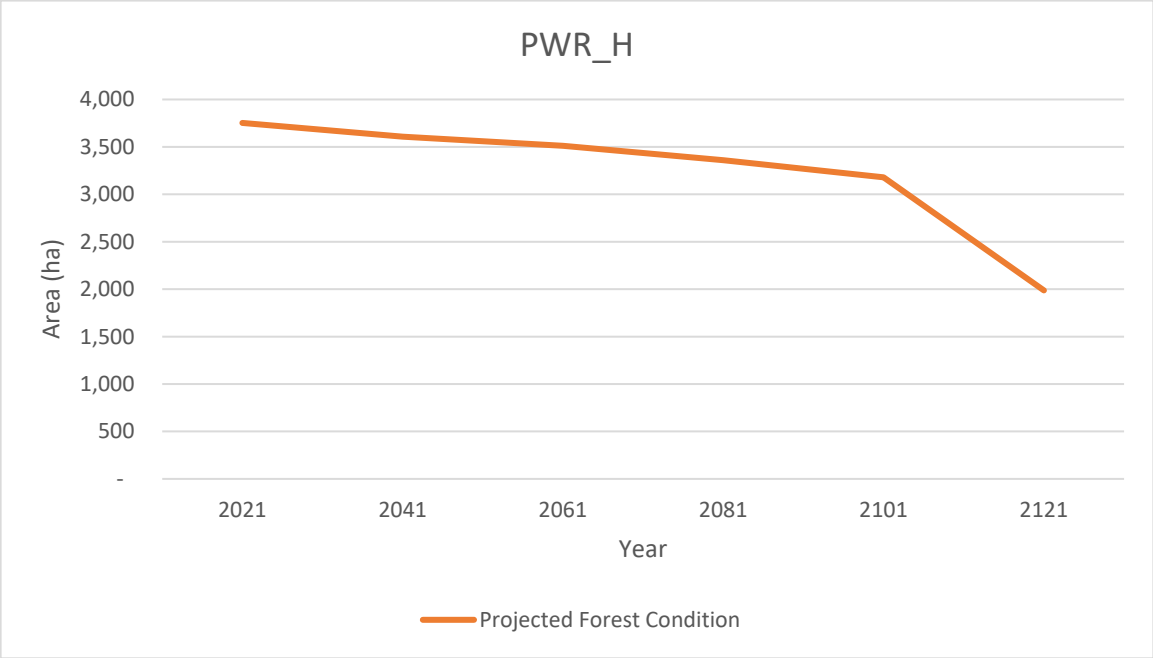

Figure 49. Projected forest condition for PWR_H

As shown in Figure 50, the area of SP1 is projected to decline by 50% over the next 100 years. This trend is directly linked to the Landscape Guide directional statement (as calibrated by the Modeling and Analysis Task Team) to reduce the Mature and Older Conifer level to be within the IQR. This is despite the area entering SP1 resulting from harvesting, post-harvest renewal transitions and natural succession. Conversely, the area of SF1 is showing an increase of 33% over the time horizon. The LTMD includes a very small amount of SF1 available for harvest over the next 100 years. However, area will continue to accumulate in SF1 through the natural succession of stands into this forest unit and through post-harvest renewal transition to SF1 from other forest units.

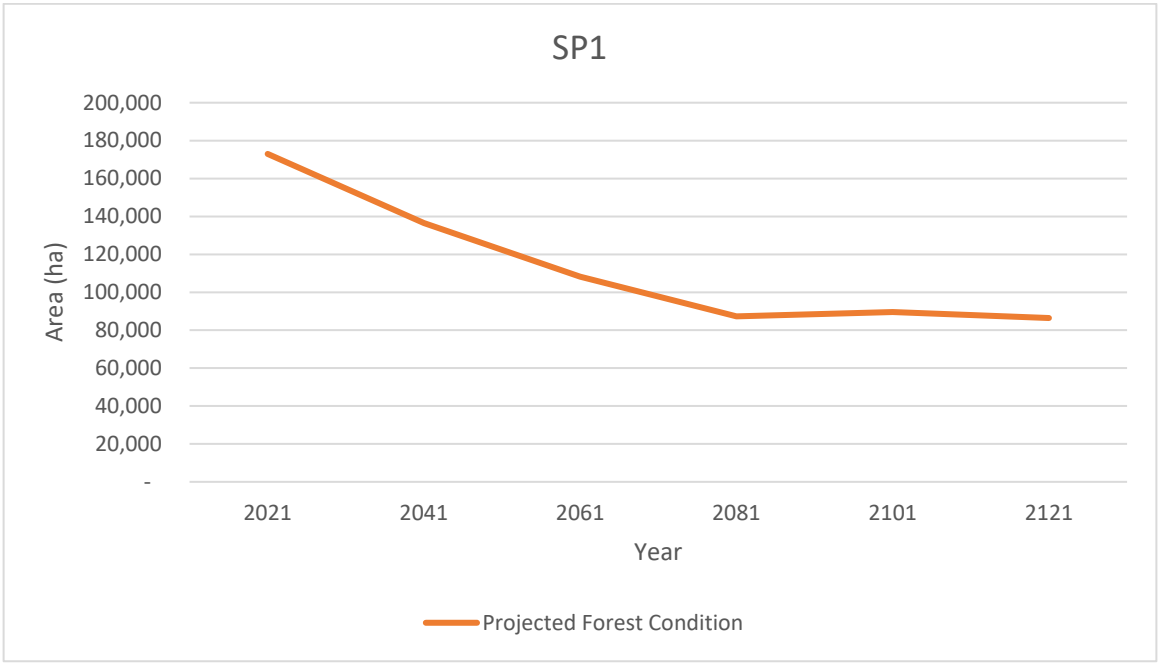

Figure 50. Projected forest condition for SP1

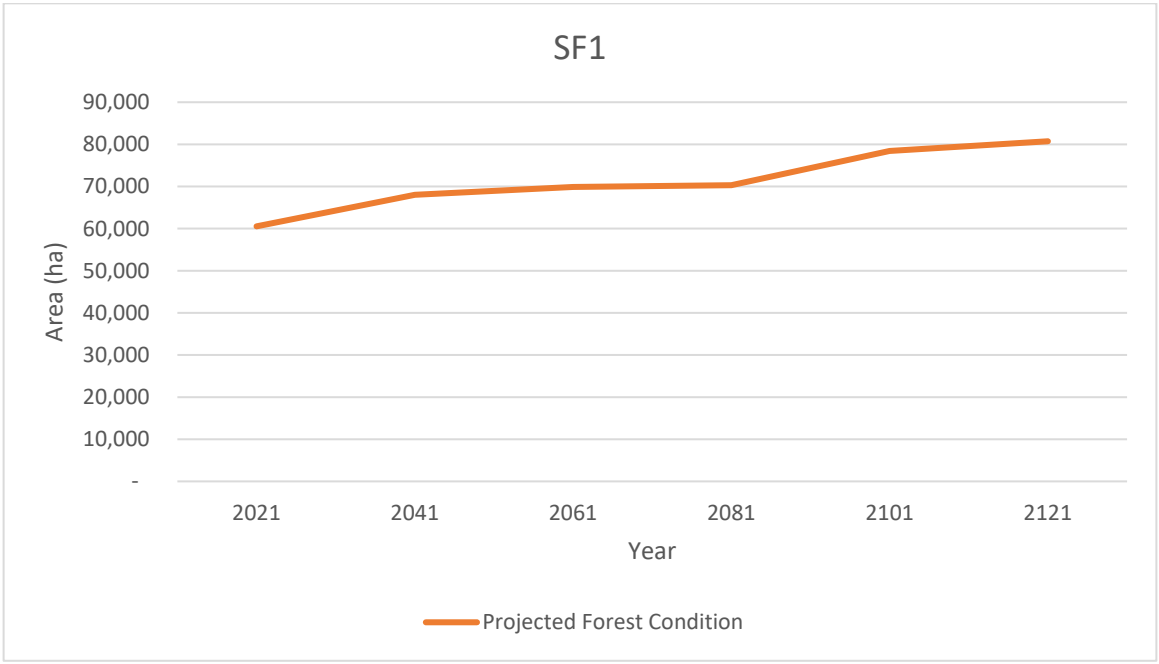

Figure 51. Projected forest condition for SF1

As shown in Figure 52, the area within SB1 is expected to decrease by 42% over the next 100 years. This trend is expected as the post-harvest renewal transition shows a seeding or fill-plant treatment applied to SB1 will only result in SB1 60% of the time, with the remainder transitioning into other forest units. Also of note, is that 29% of SB1 stands will, if left undisturbed, transition to LC1 through natural succession. The projection for LC1 shows the opposite trend, with an increase of 69% shown over the time horizon. This can be attributed to the harvest and post-renewal transition proportions for LC1, which shows 100% and 90% remain within the forest unit when treated natural regeneration and seeding respectively.

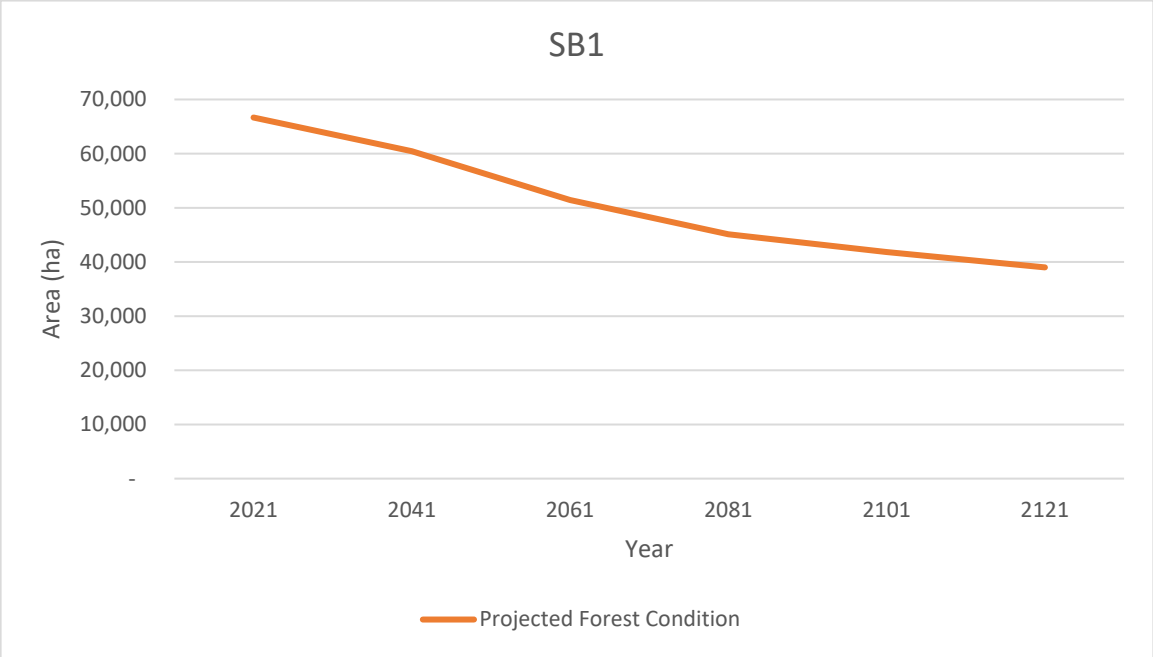

Figure 52. Projected forest condition for SB1

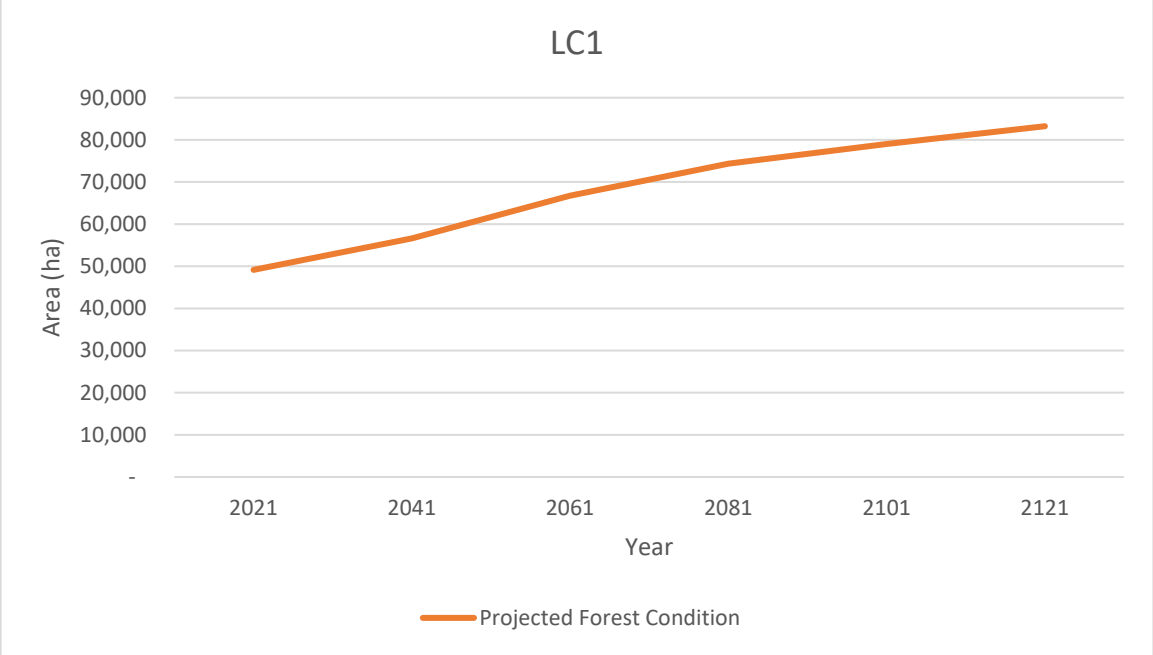

Figure 53. Projected forest condition for LC1

Projected Habitat for Selected Wildlife Species

Table FMP-7 and this section of the FMP predate the current direction regarding wildlife habitat management. Wildlife habitat is no longer tracked as outlined in FMP-7. The current direction is outlined in the Landscape Guide which indicates that wildlife habitat is assessed and tracked through the use of the boreal Landscape Guide indicators, with the associated milestones that provide direction for achievement through time. These milestones and an assessment of their achievement is discussed in section 3.7.3.

Projected available harvest volume by species group

Table FMP-9 describes the projected available harvest volume by species group. In addition to the total available harvest volume, Table FMP-9 also includes the available volume by the applicable product group (i.e. Sawlog, Pulp, OSB and Veneer).

Figure 54 to Figure 59 portray a comparison of the wood supply projections for the 2021 Timiskaming FMP with the historical forecast of Crown supply (pre-2006), the 2006 and 2011 FMP wood supply projections, the actual historical wood utilization from 1990 to 2008 and the Ontario Forest Accord Advisory Board (OFAAB) benchmark harvest levels, as identified in the Regional Wood Supply Strategies, for individual species groups. Figure 54 suggests that the total 2021 FMP projected available harvest volume is higher than projected in the 2006 and 2011 FMPs, while being within the upper and lower range of the Historical (Forecast) Crown supply from 1990 to 2008. The difference between the harvest volume projections from the 2006, 2011 and 2021 FMP's is the period of time projected before the lowest point of the wood supply occurs. This point is often referred to as the

bottom of the dip. The 2006 and 2011 FMP's, projected the start of a decline in harvest volume towards a future dip to start in the 2021 FMP term. However, the 2021 projections show a general, but slight declining trend will occur starting from 2031 and continue to the bottom of the dip in 2091, then will increase towards the end of the time horizon.

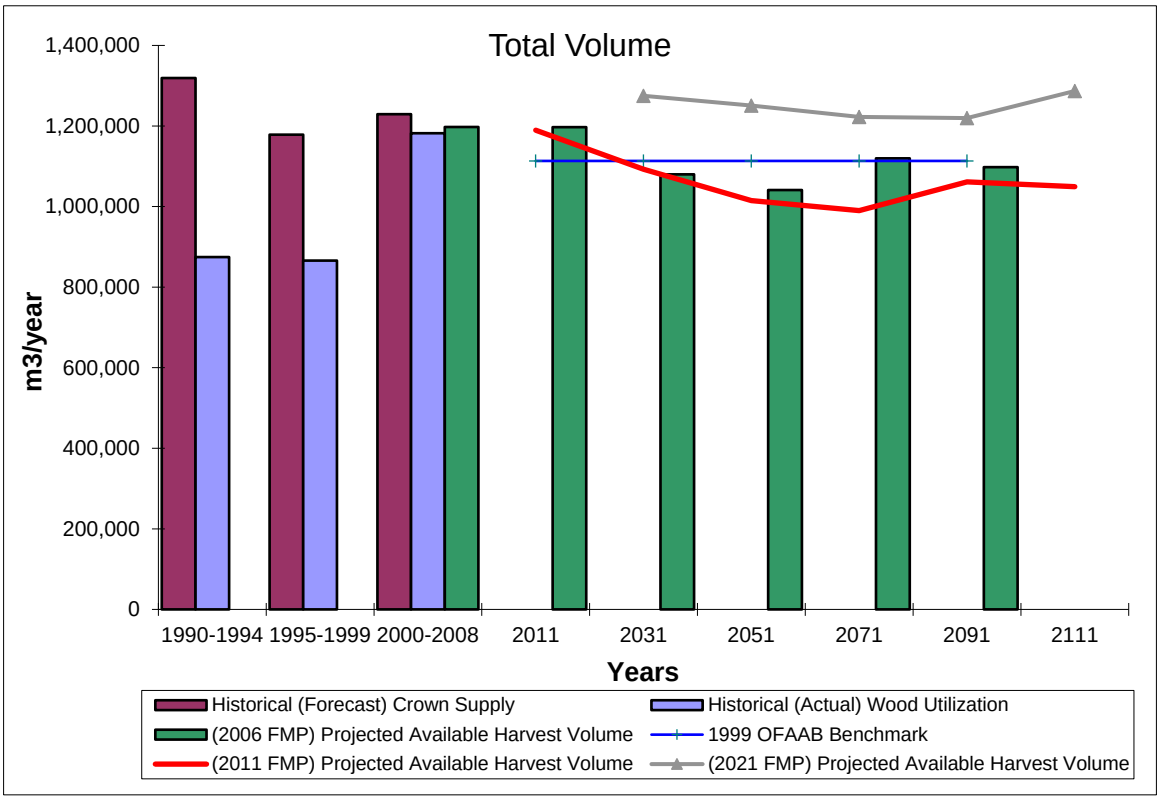

Figure 54. Total Projected Available Harvest Volumes

During scoping analysis, the impact of achieving landscape classes on the long-term wood supply for different species groups was investigated. Of particular note was the relationship between the Immature and Older Hardwood and Immature Mixedwood (IOHIM) landscape class and projected poplar volume, as poplar is the main driver for IOHIM. It was found that the achievement of this landscape class was highly constraining to poplar volume. The selected management alternative model run (which later became the LTMD), was developed to achieve a trade-off between the two management objectives, and shows the poplar volumes and IOHIM levels gradually increasing over time. In the approved LTMD, the poplar volume increases over time, achieving the OFAAB levels at 2101, and continues to climb until the end of the planning horizon.

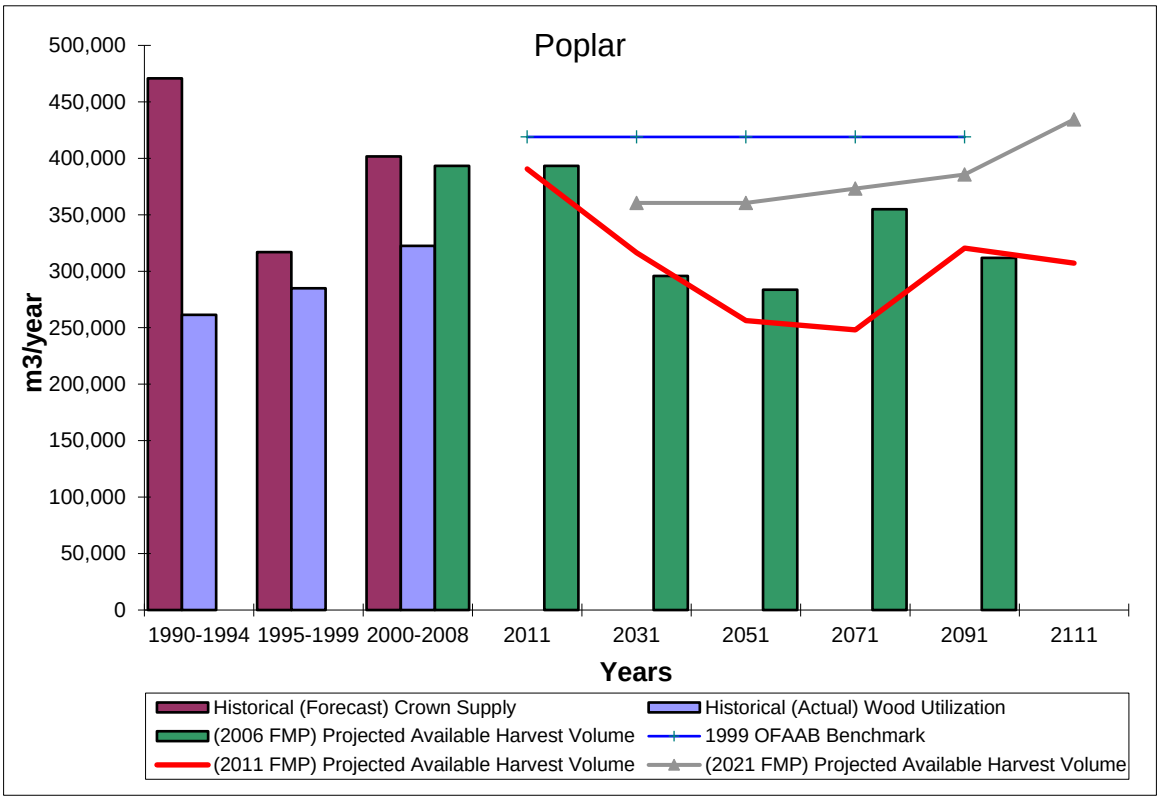

Figure 55. Poplar Projected Available Harvest Volumes

Another observation made during scoping analysis was the relationship between the Mature and Older Mixedwood (MOM) landscape class and the projected white birch volume, as white birch is the main driver for achieving this landscape indicator. When volume targets were prioritized in a modeled scenario, MOM levels dropped well below the IQR and therefore was deemed unacceptable. The planning team decided to keep the MOM at the minimum IQR level for the LTMD, and resulted in a negative impact to Bw volume. This impact is visible in the projected Bw volume, which shows an overall decline over the 150-year time horizon. This impact to harvest volume illustrates the required trade-offs in objective achievement demanded by the FMP process and is part in parcel to developing a balanced management strategy for the LTMD.

When compared to 2006 and 2011 projections, the white birch available harvest volume trends are consistent to those projected in the 2021 FMP. The 2021 FMP trend is more similar to that shown in the 2006 FMP, with an increase in white birch volume in the latter part of the next 100 years. This is different from the 2011 FMP which indicated that the levels would continue on a declining trend. Looking out to the full 150-year time horizon, the 2021 projection shows an overall declining trend. However, it is notable that this does include an oscillation after 2091, with 89,309 m3 available in 2161.

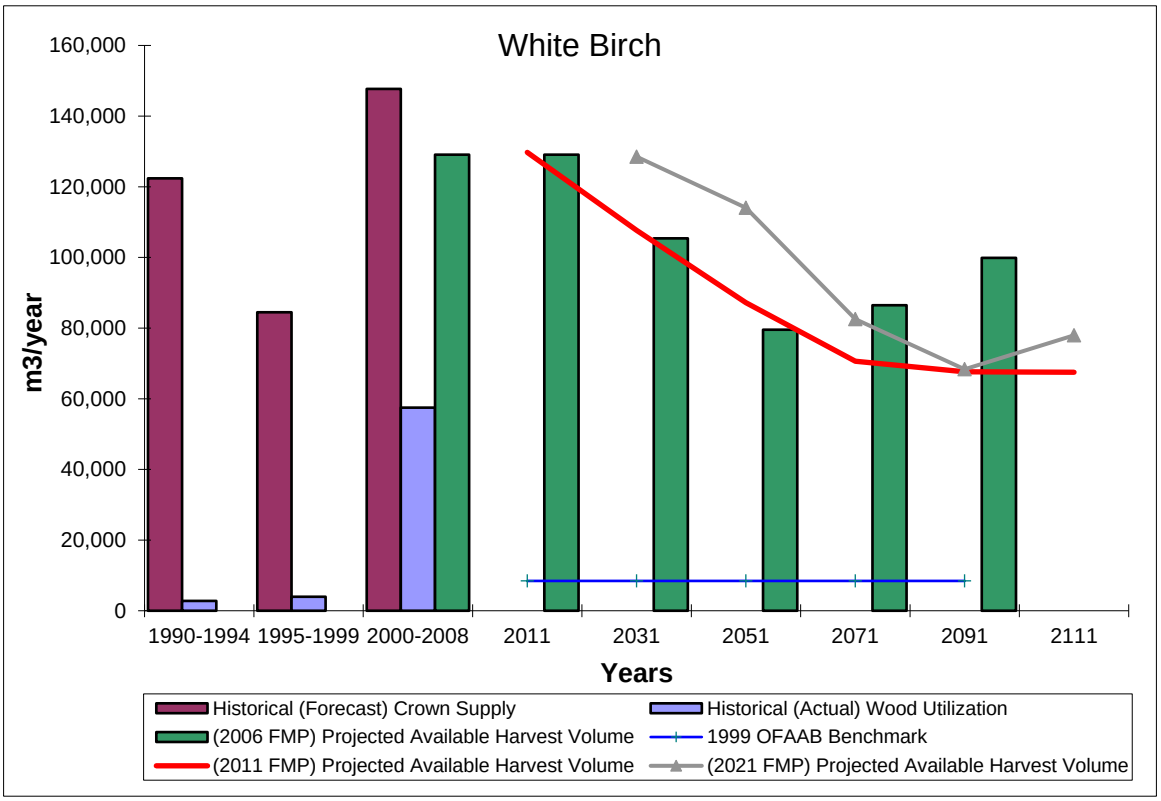

Figure 56. White Birch Projected Available Harvest Volumes

Figure 57 demonstrates the projected available volume of white and red pine over time. Unlike the 2006 and 2011 FMPs, the available volume of these species is projected to decline. The observed decline is due to the LTMD not requiring the allocated area (and by extension, renewal) of any red or white pine leading forest units (i.e. PWR_H, PWR_L or PR1) to balance the achievement of management objectives. However, red and white pine volume will remain available on the landbase towards the end of the time horizon, with the lowest FMP term being 2091 where it shows an available volume of 1,140 m3.

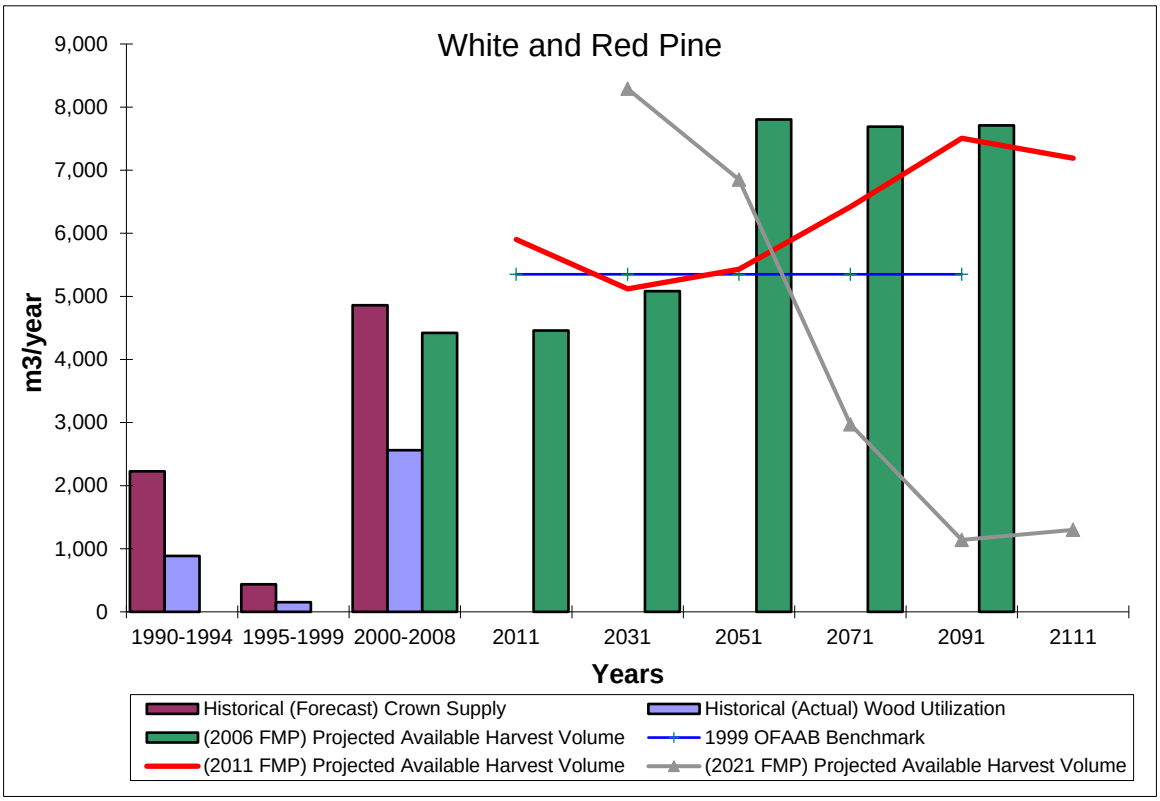

Figure 57. White and Red Pine Projected Available Harvest Volumes.

Figure 58 shows a declining trend to 2091with regards to the projected volumes for cedar. Following this declining period, an inflection point is reached and the available volume rebounds from between 60,000 m3 and 101,000 m3 for the remainder of the time horizon. The cedar available harvest volume is much higher compared to the trend shown in the 2011 FMP. However, the 2021 projection is similar in trend to the 2006 FMP in that a dip occurs between the early and later terms. This is consistent with the low levels in the 0-20 through 40-60 LC1 age-class structure as shown in Figure 18. The increase of volume available towards 2111 can be attributed to the forest management activities which are anticipated to maintain this species over time.

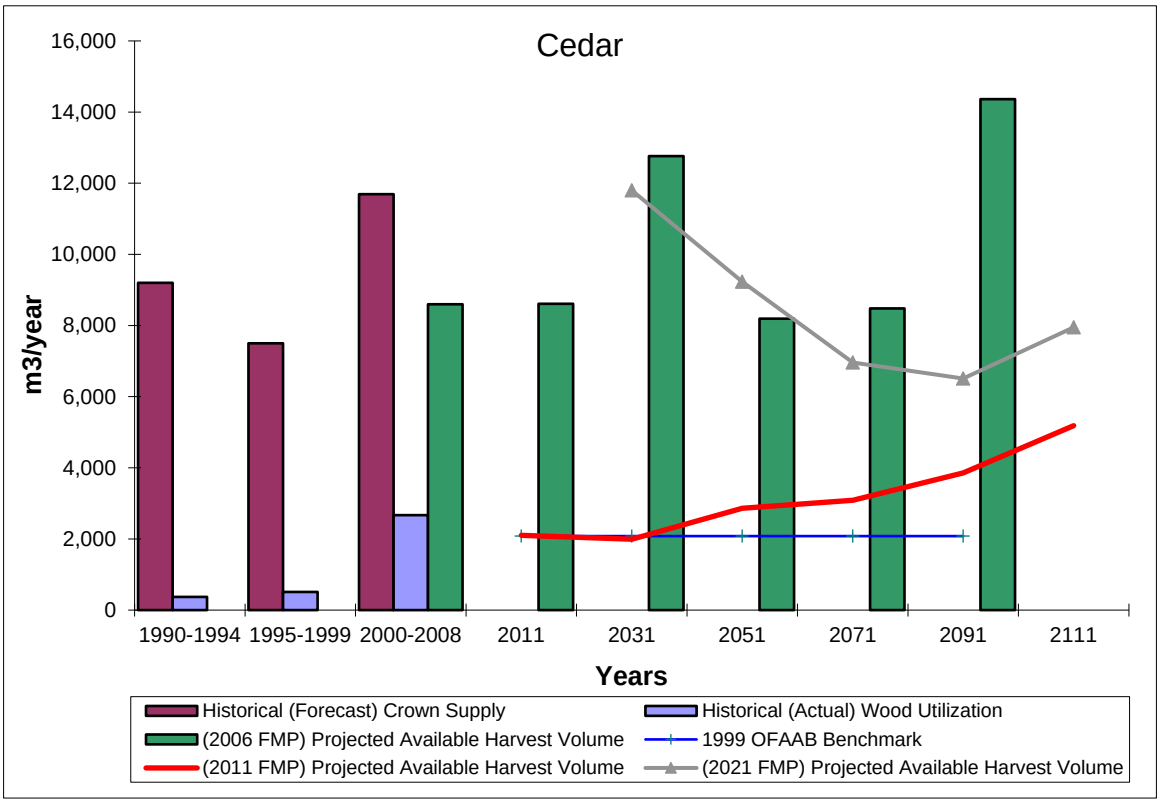

Figure 58. Cedar Projected Available Harvest Volumes.

Consistent with the projection trend in the 2006 and 2011 FMPs, the projected available harvest volumes for SPF remains stable as shown in Figure 59. Of note, the volumes are higher than the previous two FMPs, with a stable volume of 736,400 m3 per year. This increase is not surprising as actual volumes reported during the 2011 FMP showed conifer volumes were underestimated, especially in mixedwood stands, which is now captured in the eFRI. In terms of the stability in volume over time, the existing age class structure of those forest species (i.e. spruce, pine and fir) in combination with the fact that biologically, volumes of spruce and pine are less susceptible to rapid decline have contributed to the long term maintenance of the projected SPF species group volumes. Another contributor to maintaining a predictable wood supply for SPF include the amalgamation of complementary landbases that somewhat mitigated previous age-class imbalances.

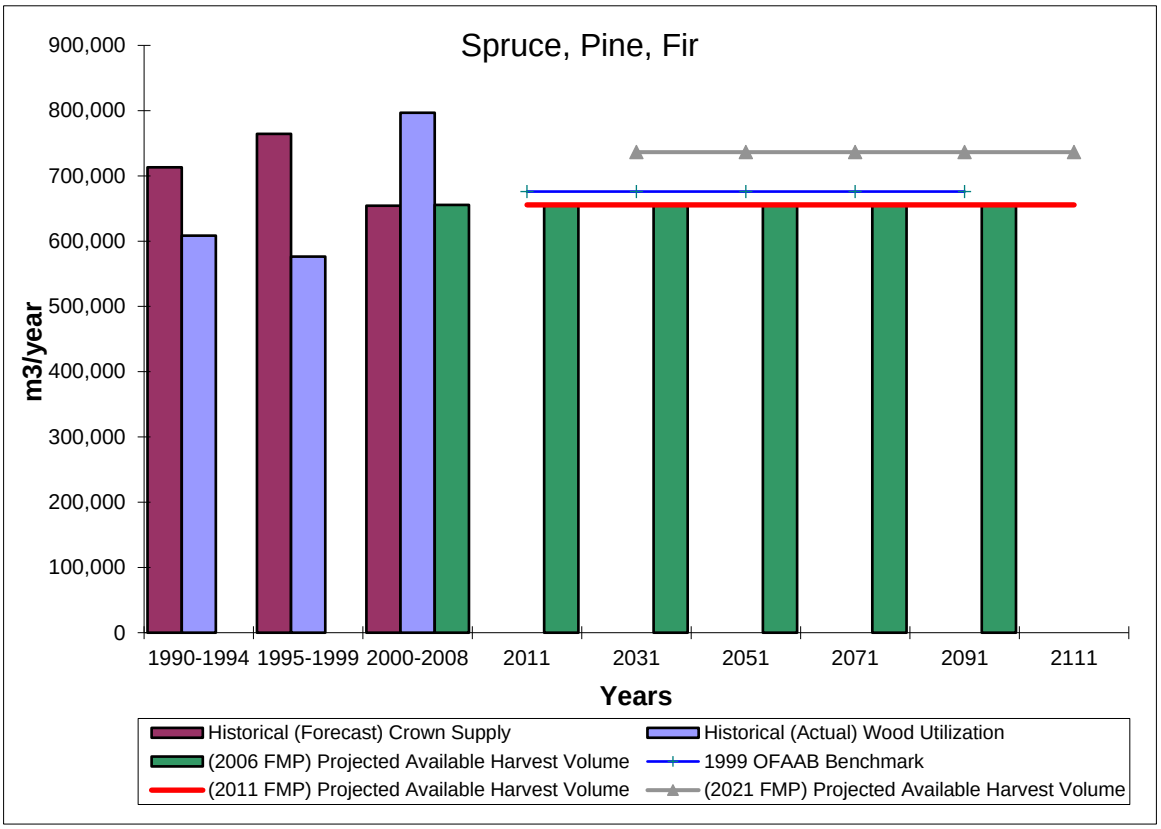

Figure 59. SPF Projected Available Harvest Volumes.

On the whole, the strategy in the 2021 FMP aligns with past projections, with the differences identified above. The current forest condition, as captured in the new eFRI, is more accurate that previous inventories and is likely playing the largest role in the trend of projected available harvest volume between 2021 and 2151. Despite the modest decline trend over the next 5 terms shown in Figure 54, the overall improvement in the projected total volume levels, will have positive social and economic impacts. The projected harvest volumes were balanced with the landscape guide indicators to ensure the ecological sustainability of the forest was also maintained over the long term. The Socio-Economic Assessment, found in section 3.7.5 describes the wood supply benefits for the communities residing on the Timiskaming Forest.

3.7.1. Available Harvest Area

The area projected for harvest for the first ten-year term of the plan is called the available harvest area (AHA). Projections and assessment of AHA is an important component of the long-term management direction. The AHA has an associated available harvest volume (AHV) as described in the previous section. A separate AHA is specified for each forest unit, and is presented in Table FMP-8 and shown graphically in Figure 61. In addition, Figure 63 portrays a comparison of the historical projected and actual harvested area (1991-2006), with the AHA projections for the 2006, 2011 and 2021 FMPs.

The 40-year harvest area is shown on the digital map file "MU280_2021_FMP_MAP_40YrProjection_00".

As shown in FMP-8, there is a 17% projected reduction in the total AHA between 2021 and 2091. After this point however, there is an increasing trend towards the end of the time horizon, with the 2061 AHA projected at 109,145 ha (a 5% overall increase from the 2021 level). As shown in Table FMP-8, this fluctuation varies greatly between forest units. The reduction in AHA, with the lowest point seen in 2091, and associated volume is strongly influenced by the age-class structure of the forest. As shown in Figure 63, the 2006 FMP long-term AHA projections were higher than those from the 2011 FMP, particularly in the latter terms (2071 to 2121). The 2021 FMP projection starts higher in the early terms, but declines to 2091 then increases to 2021, where it is positioned between the two previous FMP projections. The 2021 FMP AHA projection is influenced by the FMP process requirement to balance the achievement of all strategic objectives. It should be noted that the 2021 projections are a result of modeling built on the recent and improved eFRI, whereas the previous two FMPs were developed using the 1986 FRI, which should be taken into account when comparisons are made. A predictable and sustainable AHA, driven by a sustainable harvest volume over time, was cited as a high priority at the LCC Desired Forest & Benefits meeting and is reflected in management objective #10. This objective is being achieved as part of a balanced management approach which carefully considered all management objectives, including ecological objectives driven by the Stand and Site Guide. Implications of this projection are described in detail in the Social and Economic Assessment available in Section 3.7.5.

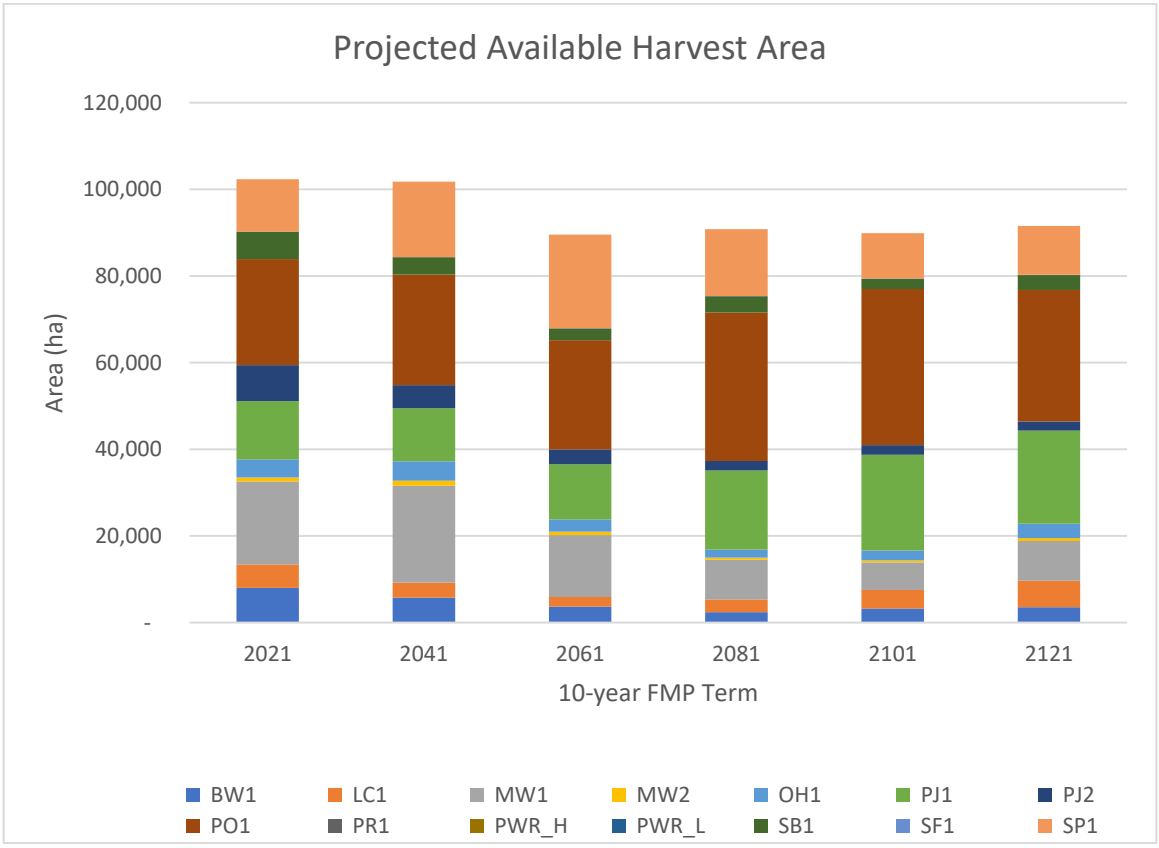

Figure 60. Projected Available Harvest Area by 10-year FMP Term

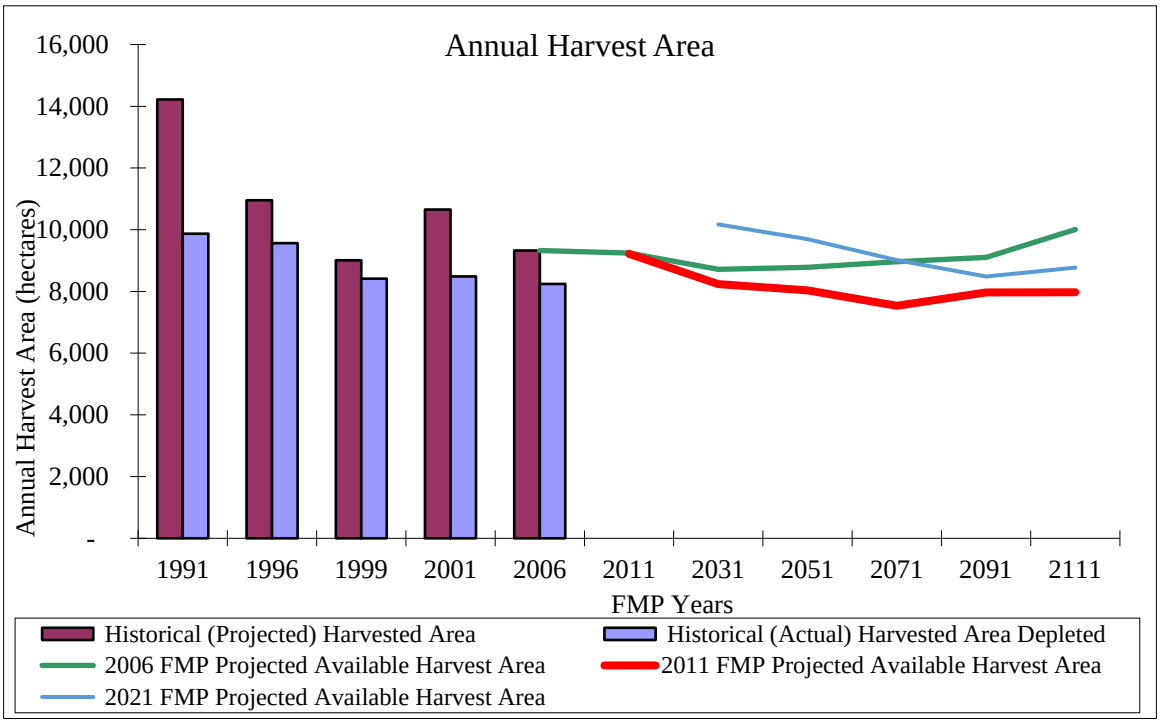

Figure 61. Comparison of Total Actual and Projected Available Harvest Area

3.7.2. Selection of Areas for Harvest

To begin implementation of the long-term management direction, areas are selected for harvest for the 10-year plan (2021-2031) using defined selection criteria. This section contains a description of the criteria used for the selection of harvest areas. Also discussed are the effects of the harvest area selection criteria on the long-term management direction. Finally, this section contains a description of the criteria used for the selection of areas for renewal and tending activities.

At the First Nation, Métis and LCC Desired Forest & Benefits meetings, maps showing areas eligible for harvest were presented. Subsequently, the proposed, optional and contingency harvest areas, along with the selection criteria for eligibility, were displayed at the Stage 3 information centres.

The following criteria were used to identify areas selected for harvest for the 10-year plan. These are listed in order of priority.

1. All allocated stands/blocks must be no less than 10-years younger than the lower operability age limit by 2021. This is based on the premise that stands can achieve an operable age, at the very minimum, by year 10 of the FMP. The operability limits by forest unit and rationale can be found in the Analysis Package, section 4.7.2. In

addition to age, the total merchantable volume as well as the total volume per hectare must make the area economically feasible for harvest operations.

2. Stands/block must be economically accessible. The number of water crossings, proximity to a gravel source, topography, drainage (i.e. summer vs. winter access) and the total length of access road construction will determine economic accessibility. Stands in the vicinity of areas where recent investment into road infrastructure has occurred, or was planned (i.e. corridors) were prioritized.

3. Allocations are to be configured in such a manner to ensure residual retention at the 500 hectare scale. This involved running the Evaluate Forest Residual Tool (EFRT) to assess the level of residual forest across the landbase.

4. Stands are to be selected that best match forest-modeling results (available harvest area by forest unit and age class). The Spatial Analyst component of the Remsoft model was used to assist in selecting the forest unit-age class candidates in the LTMD.

5. Select stands/blocks that do not impact on known values. The location of other values such as natural heritage areas, stick nest sites and tourism establishments all impact on the stands selected.

6. Consideration of private land access limitations to Crown forest.

7. Consideration for a balance of winter and summer operating areas.

Areas were allocated based on the available harvest area by forest unit age-class combinations, as concluded in the development of the long-term management direction. All the above criteria influenced the selected allocations. Some criteria factored more prominently than others depending on the circumstance. The total ten-year allocated area does not exceed the sustainable available harvest area by forest unit.

The Landscape Guide and the Stand and Site Guide provide direction on spatial patterns for disturbance and mature and old forest patches. Selected harvest areas contribute to these spatial textures by the creation of young forest patches either alone or in combination with pre-existing patches (.e. if within a threshold, separation distance multiple patches may combine to create a single larger patch). The guideline direction is to create a mosaic of young and mature and old forest patches consisting of many small sizes to increasingly fewer larger sizes. Some very large patches are part of the ecological balance and are created over successive plans. The distribution of patches is evaluated with the OLT, and the results are presented in 3.7.3 (see objectives 1 and 2).

There are a number of factors that can limit the selection of specific areas for harvest. The geographic location of the age-class area by forest unit, the distribution and configuration of non-harvest reserves (AOC's) and the forested/non-forested lands that are not available

for harvest are spatial constraints that limit the flexibility to allocate the AHA from the model. For example, non-forested land and private land are not available for harvest, yet their spatial distribution affects the assemblage of harvest area.

Challenges are also faced with the spatial arrangement of private land, water bodies, provincial parks and conservation reserves adjacent to, or within, the management unit boundary, increasing the complexity in meeting the modeled harvest plan from the LTMD.

As a first step, the Remsoft model was used to select harvest areas to meet the modeled LTMD outputs. Blocks were carefully reviewed by TFAI and further refinements were made to ensure the blocks would be operable based on size, configuration, terrain, road access requirements and stand condition (based on eFRI imagery). This resulted in some level of age-class substitution within each forest units, however significant efforts were made to remain above or very close to the lower age-class limits for each forest unit.

Finally, the FMP process demands that public input have an influence on the allocation process. Consultation with First Nation and Métis communities, local cottage associations, resource-based tourism operators, private landowners and other resource stakeholders have all lead to adjustments to the proposed harvest allocations. Harvest areas are portrayed in a series of Areas Selected for Operations Maps, which are available in digital format with this FMP (example file name: MU280_2021_FMP_MAP_Ops54530_00.pdf).

3.7.3. Assessment of Objective Achievement

The achievement of management objectives was assessed relative to the long-term management direction of the 2021 Timiskaming Forest management plan. For each management objective and associated indicator(s), where the specified timing of the assessment is during plan preparation, the objective achievement is explicitly detailed in this section. Table FMP-10 summarizes the projected objective achievement relative to desirable and target levels.

Many objectives are assessed subsequent to the implementation of the forest management plan. The objectives will be tracked and assessed in the year-5 and year-10 annual reports in anticipation of the development of the next FMP.

Management Objective 1: To provide for a distribution of disturbance patches that more closely resembles the expected size, composition and age produced by wildfire.

The natural disturbance pattern template for the 3E Region is expressed as a percent of the frequency distribution, by size class, in hectares. Existing forest disturbances were measured at the start of the planning period (2021) and then the 2021 allocations were projected to the end of the 10-year planning period. The results are then compared to the natural disturbance template for the 3E Region provided in the Landscape Guide. Note:

small changes in land ownership on the Timiskaming Forest occurred between the Plan-Start (as part of LTMD development) and the Plan-End Assessment at Draft Plan. However, these are considered inconsequential to the overall trends and analysis of Landscape Guide milestone achievements.

Indicator: Young Forest Patch Size Frequency Distribution. This objective is satisfied by moving closer to the distribution of patch sizes as defined by the Landscape Guide Ecoregion 3E science package.

The young forest patch size is a structure-based indicator used to characterize landscape pattern. Although young forest patch size is related to the texture of the mature and older forest in both structure (the amount and distribution of young forest patches can affect the texture of the forest matrix) and function (e.g. interior preferring wildlife species vs. edge preferring wildlife species), they are often the result of different scales of forest management planning (e.g. harvesting vs. maintaining). Managing pattern involves the distribution (concentration or dispersal) of young and mature forest across the landscape.

Assessment: The landscape guide sets out a total of 9 size classes for the young forest patches. Movement towards the template was not achieved from the 10-year allocation based on the harvest block selection criteria discussed above in combination with the existing spatial configuration (i.e. age, size and distribution across the landbase) of all forest younger than 36 years of age; a legacy of the implementation of previous forest management plans directed by previous management policies. As shown in Figure 62, there is an increase or decrease in each size class, away from the desirable and target levels. It should be noted that the level of each size class was influenced by operational planning, which included adjustments for residual, viewscape management and area of concern planning. The ability to address the largest patch area size classes is heavily influenced by social pressure and constraints from other forest stakeholder values.

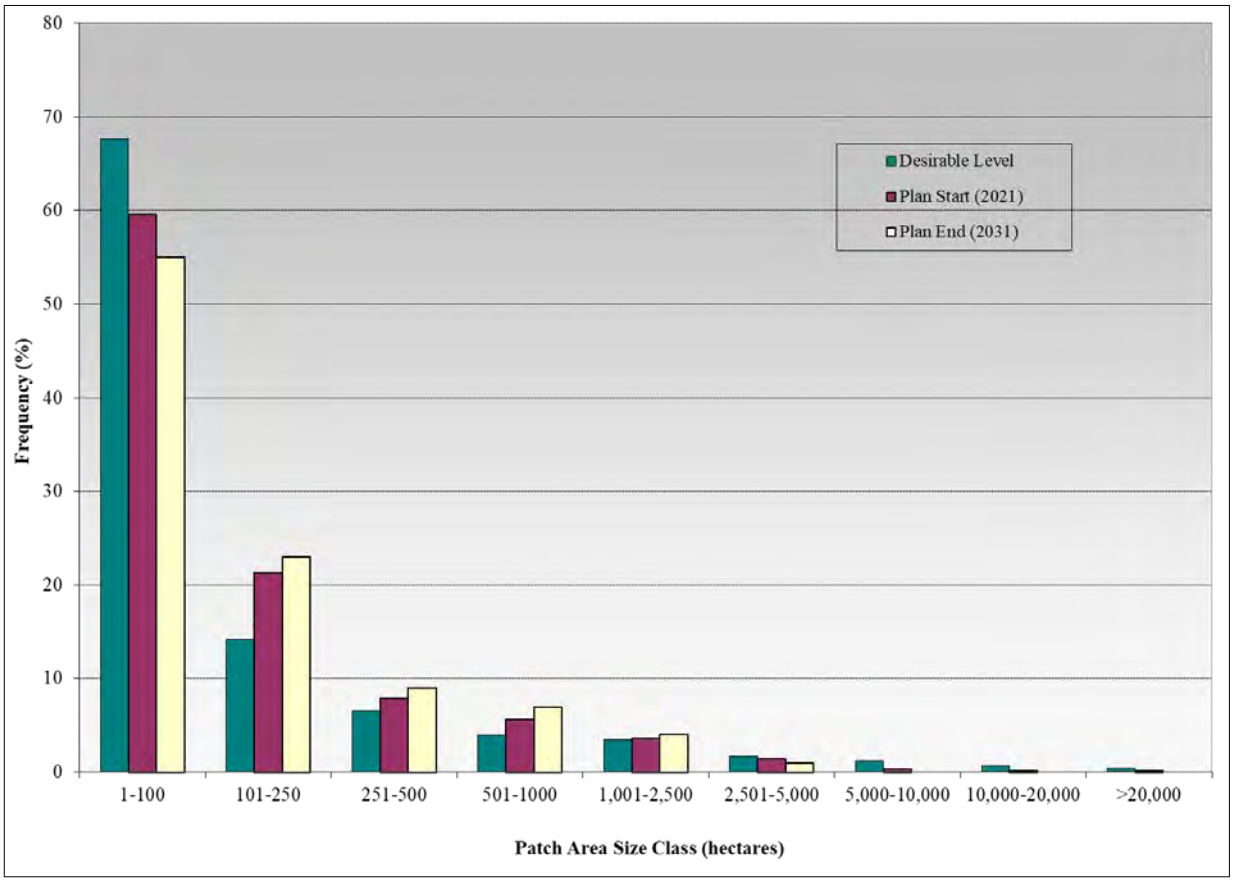

Figure 62. Comparison of the frequency of young forest patch sizes with the desirable level, plan start (2021) and plan end (2031) achievement levels

Indicator: Texture of the Mature and Older Forest Matrix (500 ha and 5,000 ha scales). This objective is also satisfied by moving closer to the mature and older forest matrix as defined by the Landscape Guide for Ecoregion 3E science package. The mature and older forest texture is a structure-based indicator used to characterize landscape pattern. The texture of the mature and older forest is measured using a landscape signature (500 ha or 5,000 ha) approach for each landscape class. This signature is a five-class frequency histogram of the landscape that shows how much of the landscape contains areas in which the mature and older forest is a minor, medium or a majority component.

Assessment: This indicator describes the achievement levels at the 500 and 5,000 hectare signatures. Overall achievement was realized in both the 500 and 5,000 hectare signatures. More specifically, for the 500 ha scale, movement towards the desirable level was achieved for three of the five class frequencies. Similarly, movement towards three size frequencies was achieved for the 5,000 ha scale. This does not include the 0.21-0.40 frequency which did move in the direction toward the desirable level (increase), but resulted in an overachievement. The results of the comparison are shown in Figure 63 and Figure 64**.**

There appears to be two main factors affecting the achievement levels of the texture of mature and older forest in both signatures. Influx of mature and older forest over time resulting from an unbalanced age class structure appears to be compounded by the presence of Provincial Parks and Conservation Reserve where large concentrations of mature and older forest are retained on the landbase, and remain out of the scope of the FMP or from any forest management intervention. In addition, the influence of past fire disturbances not only manipulated the age class structure but also contributed to the configuration of the existing mature and older forest on the landscape. An example of this occurrence would be the old ShiningTree MU portion of the Timiskaming Forest where large fires in the 1940's have changed the temporal-spatial landscape and essentially created an unbalanced texture pattern. Bring the Timiskaming Forest into the Lansdcape Guide target area will require significant time but it should be noted however, that the overall achievement for this indicator has improved since the same assessment was conducted for the 2011 FMP.

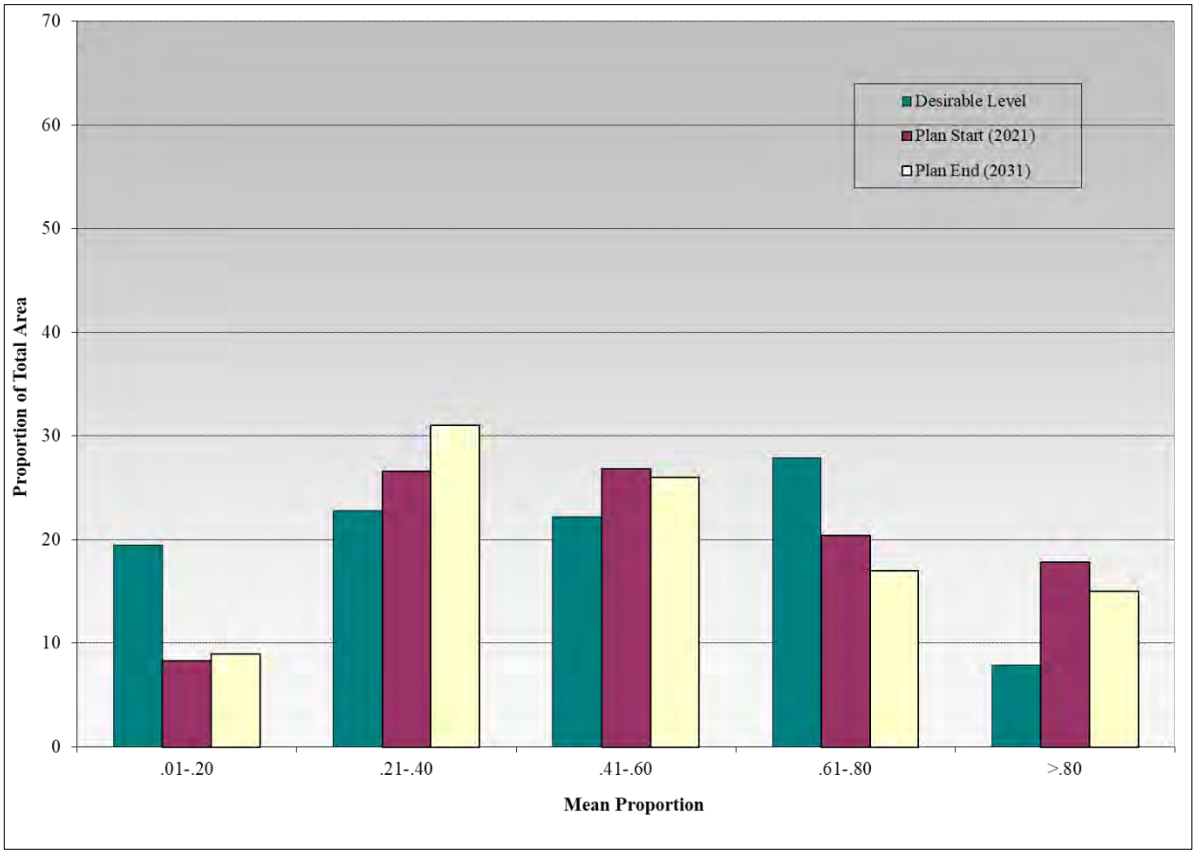

Figure 63. Comparison of the total area in mature and older forest for the 500 ha signature with the desirable level, plan start (2021) and plan end (2031) achievement levels.

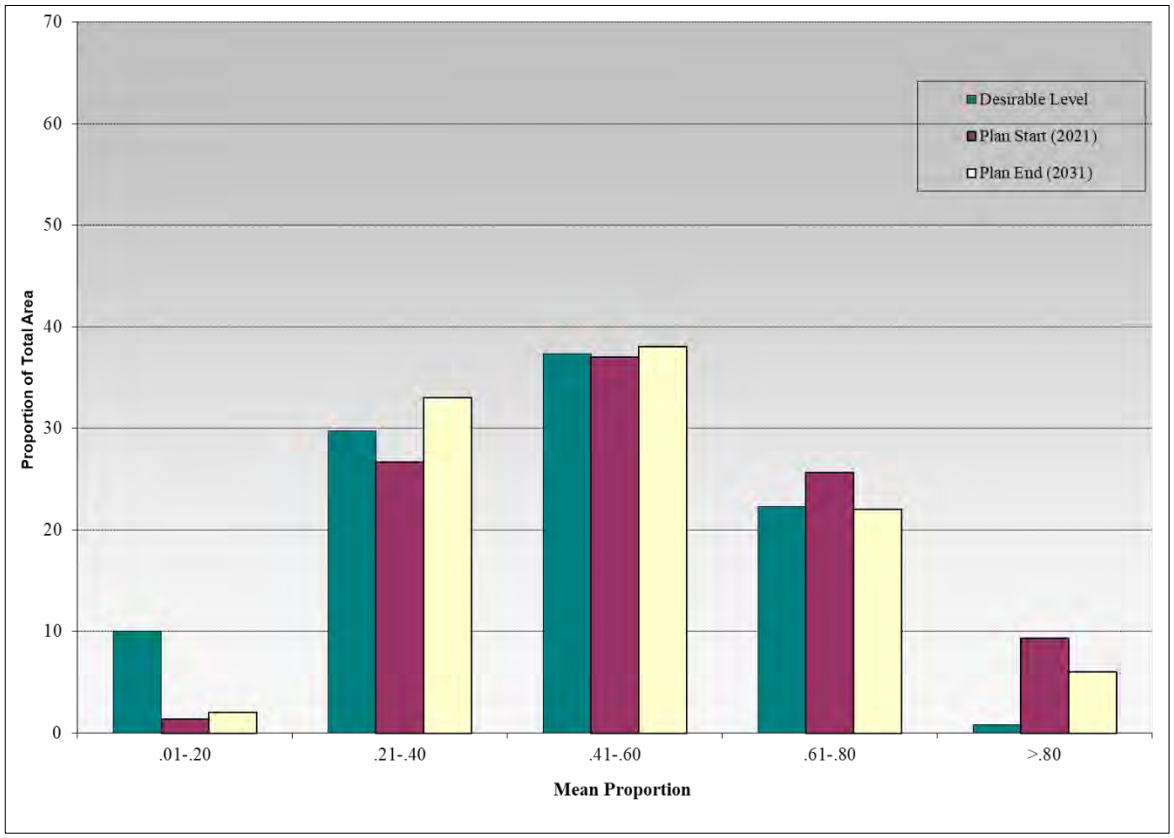

Figure 64. Comparison of the total area in mature and older forest for the 5,000 ha signature with the desirable level, plan start (2021) and plan end (2031) achievement levels.

Management Objective 2: To promote a balanced age class structure for all forest units resembling expected natural conditions.

Indicator: Area by landscape classes, forest unit groupings, young forest (<36 years of age), old growth and red and white pine. The objective is satisfied by achieving the levels within the IQR for each indicator, with the target level success defined as movement towards the SRNV. The desirable level and target relate to the milestones/directional statements prescribed in the science package of the Landscape Guide Ecoregion 3E, as calibrated by the Modeling and Analysis Task Team (see section 6.1 in the Analysis Package). For the red and white pine indicator, the desirable level is the historic level of white and red pine.

Assessment: The achievement of desirable and target levels for each individual landscape class are presented in Figure 65. Of the five landscape classes, three have achieved the desirable level and are within the IQR. The remaining two (MOLC and IOHIM) show a slight movement away from the IQR and the plan start levels, however the IOHIM plan-end level remains within the SRNV. Many tradeoffs were carefully considered in order to balance the achievements relative to other indicators and it was concluded that a positive movement of the IOP and MOLC and a decrease in the MOC, IOHIM and MOM and was

the most balanced outcome. Also considered was the need to contend with the interaction between the landscape classes and forest unit groupings when attempting to balance the LTMD. As indicated in the previous management objective, a significant shift in mature conifer forest has taken place as a result of the unbalanced age class structure.

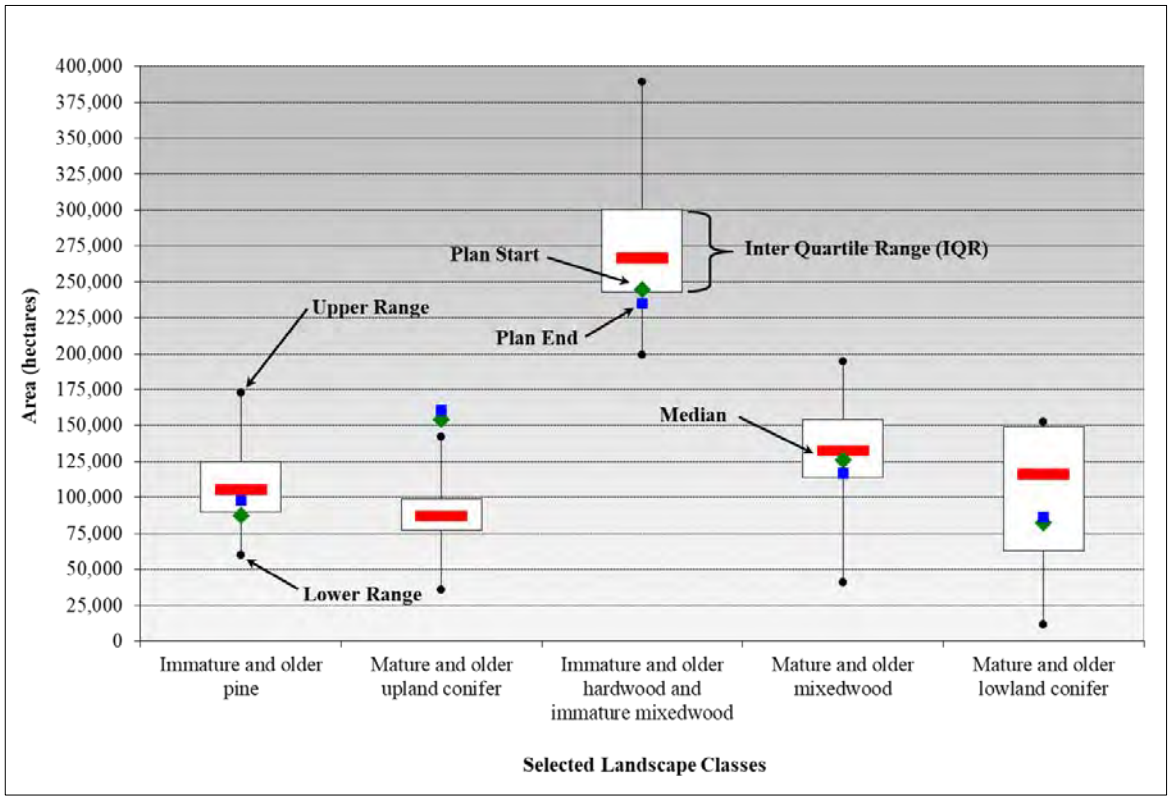

Figure 65. Comparison of landscape class SRNV with plan start (2021) and plan end (2031)

Figure 66 portrays the plan start levels and plan end achievement levels for each forest unit grouping. Virtually no movement is observed between the plan start and end, which is illustrated by the overlap of both measures in the graph (i.e. the blue squares overlap the green diamonds). In terms of achievement levels, Pine Conifer remains within the IQR, the Upland Conifer shows an overachievement, and the Lowland Conifer shows an underachievement. As discussed in section 2.1.3.2, the achievement of the latter two forest unit groups are influenced by difference in the inventory used to set the target levels, and the one being assessed.

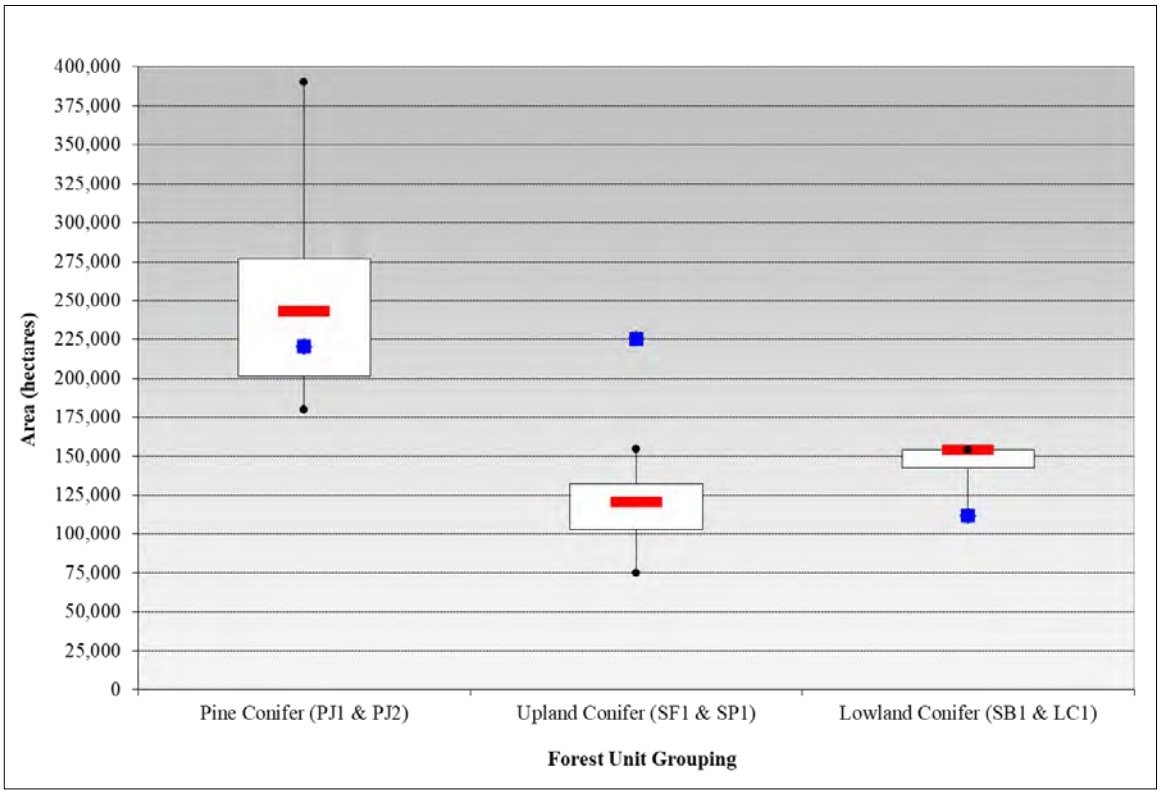

Figure 66. Comparison of the forest unit groupings SRNV with plan start at 2021 (green diamond) and plan end at 2031 (blue square).

As a final measure for this indicator, the plan start and plan end achievement levels for total young forest and total mature and older forest were examined. As portrayed in Figure 67, the young forest levels are projected to increase from plan start levels, moving away from the IQR while remaining in the SRNV. The old growth level is projected to increase by 84,844 ha between plan start and plan end, bringing it much closer to the minimum IQR. This indicates a large proportion of the forest which will move into the old growth category over the next 10 years. As predicted in previous FMP's, the unbalanced age class structure resulting from historical disturbances (both natural and industrial) is expected to take over a 100 years to be readjusted to the point where it is consistent with expected natural levels. This overall direction, which involved the balancing of multiple other indicators, the achievement levels of the young and old growth forest are realistic and acceptable.

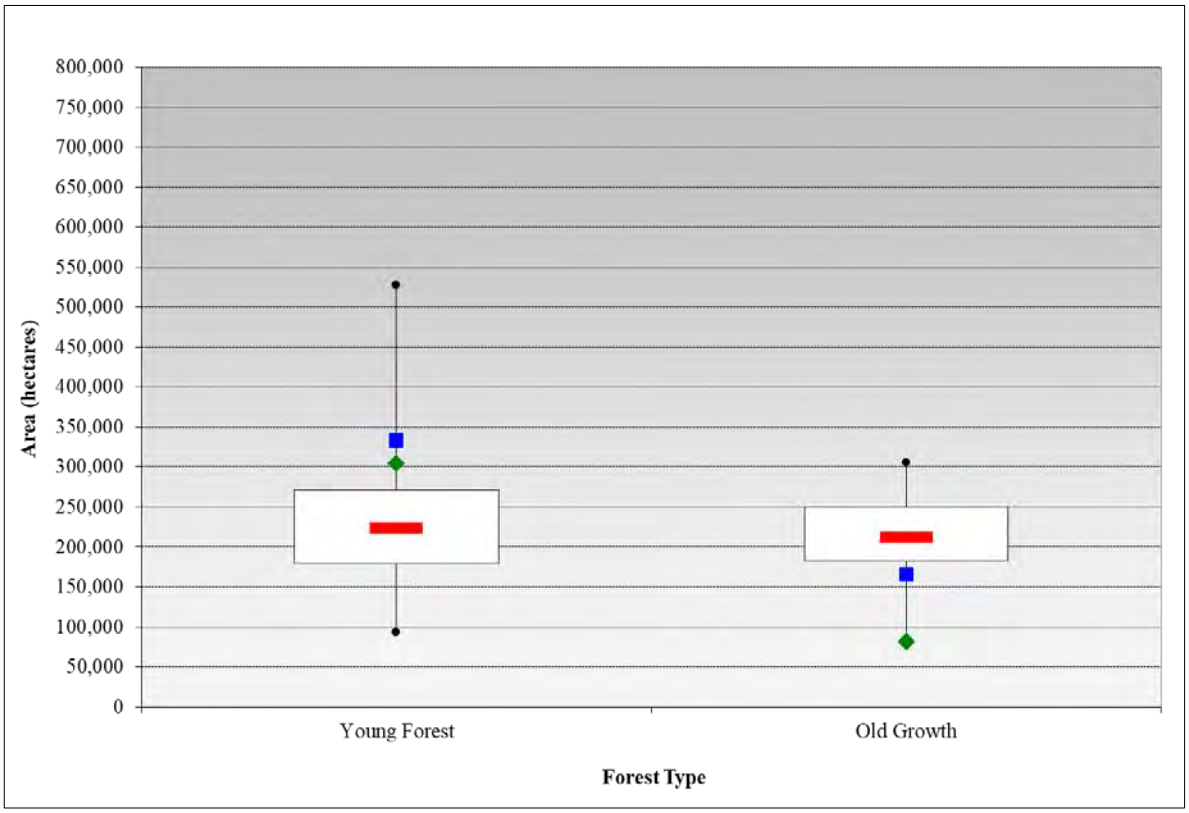

Figure 67. Comparison of the young forest and mature and old forest SRNV with plan start at 2021 (green diamond) and plan end at 2031 (blue square).

The total area of white and red pine on the landbase (i.e. PR1, PWR_L and PWR_H forest units) occupies 8,212 ha of the Crown Productive Forest. The level of red and white pine is projected to be maintained at 8,212 ha in 2031, but shows a slight drop to 8,164 in 2041 (1% decline) and stays at this level until the end of the time horizon. This suggests that the desirable level is not being met based on the current projection, however the decline is considered minimal and the presence of white and red pine will remain on the landbase over the long term.

Management Objective 3: To provide forest conditions that are similar to the conditions moose prefer and would encounter in a natural forest ecosystem, and consider the provision of moose emphasis areas (MEAs) on the Timiskaming Forest. The identification of suitable habitat will be informed and validated by Traditional Indigenous knowledge.

The following indicators were used in the assessment of achievement for this objective.

Indicators:

1. Area of Timiskaming Forest managed as Moose Emphasis Areas
    a. *Desirable Level:* At least 10-15% of the productive forest area is to be managed as MEAs > 2,000 ha in area with a preference for areas greater

than 10,000 ha.

b. Target Level: If MEAs are delineated on the forest, then 10-15% of the productive forest area is to be managed as MEAs > 2,000 ha in area with a preference for areas greater than 10,000 ha.

c. Timing of Assessment: Draft Plan

Assessment: Achieved – Area of productive forest within MEAs is 14.9%.

2. Structure and composition of individual Moose Emphasis Areas: browse-producing habitat.
   a. Desirable Level: 5-30% of each selected MEA is browse-producing habitat
   b. Target Level: 5-30% of each selected MEA is browse-producing habitat
   c. Timing of Assessment: Draft Plan

   Assessment: Achieved for all MEAs except for #28 (32%)

3. Structure and composition of individual Moose Emphasis Areas: mature conifer-dominated habitat.
   a. Desirable Level: 15-35% of each selected MEA is mature conifer-dominated forest.
   b. Target Level: 15-35% of each selected MEA is mature conifer-dominated forest
   c. Timing of Assessment: Draft Plan

   Assessment: Achieved for all MEAs except for #14 (47%), #15 (37%) and #36 (35%).

4. Structure and composition of individual Moose Emphasis Areas: hardwood/mixedwood dominated habitat.
   a. Desirable Level: 20-55% of each selected MEA is hardwood or mixedwood dominated forest
   b. Target Level: 20-55% of each selected MEA is hardwood or mixedwood dominated forest
   c. Timing of Assessment: Draft Plan

   Assessment: Achieved for all MEAs

Management Objective 10: To manage the forest resources of the Timiskaming Forest to provide an ecologically sustainable and predictable wood supply.

Indicator 1: The objective is satisfied in part by demonstrating that the projected available harvest area supports the harvesting volume targets (desirable level) and does

not deviate more than 20% from the previous 10 year term (2011-2021). The available area in the latter terms does not support the volume target levels for the following FU's; BW1, PO1, OH1, PWR_L.

Assessment: The available area supports the volume targets for the SPF and Po species groups (see indicator below). Compared to the 2011-2021 FMP, there is a 13% increase in total AHA for the 2021-2031 FMP term. Therefore, the desirable levels and targets have been met.

Indicator 2: The objective is satisfied in part by demonstrating that the long-term projected available harvest volume by species group meet desirable and target levels.

Assessment: The achievement of the desirable level (volumes which are desired) and target (as input into the model) is illustrated in Figure 68 to Figure 74. Although desirable levels were not met for SPF and Po, the target volumes were met in all terms. The white birch desirable level for volume was not achieved, however the Proposed Operations and LTMD both meet the generally desired threshold of 50,000m3 per year. The desirable level for Cedar and Other Conifer was met in all terms. The Other Hardwood volume was not met in any term, however the actual harvest volumes are expected to be minimal, consistent with previous FMPs. The Red and White Pine desirable volume levels were achieved in T1 to T4, but decline below the desirable level for the remainder of the time horizon, a trend that is consistent with the decline of the PWR_H forest unit over time (as shown in Figure 49).

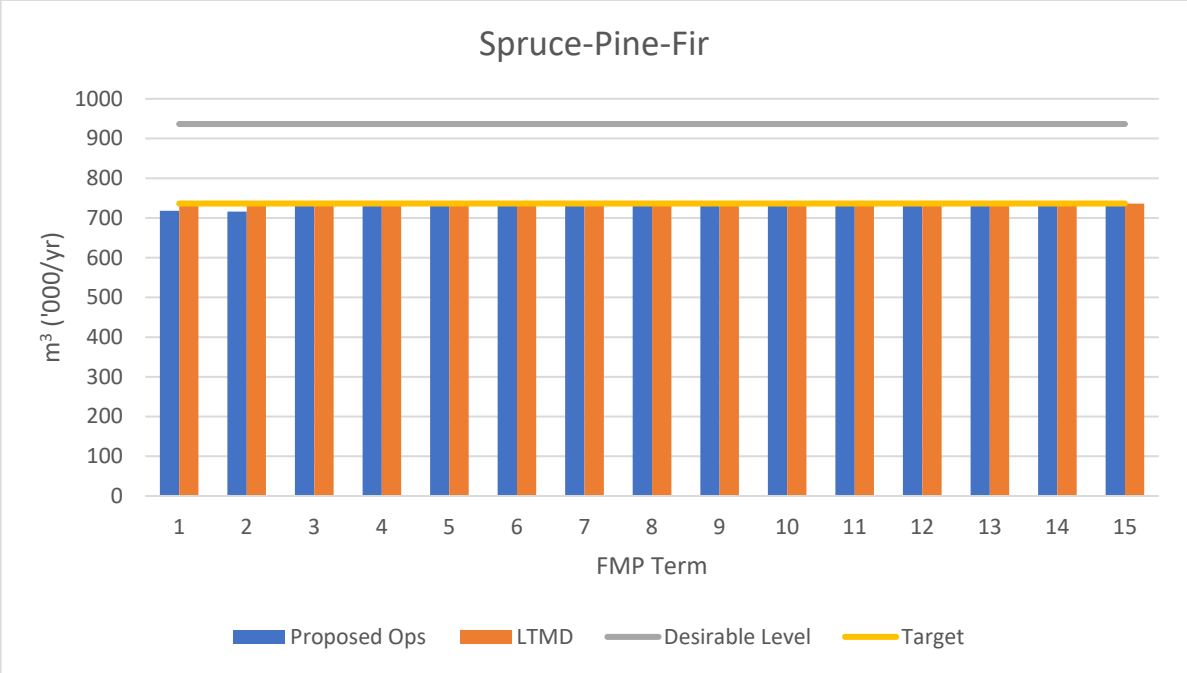

Figure 68. Projected volume achievement for Spruce-Pine-Fir

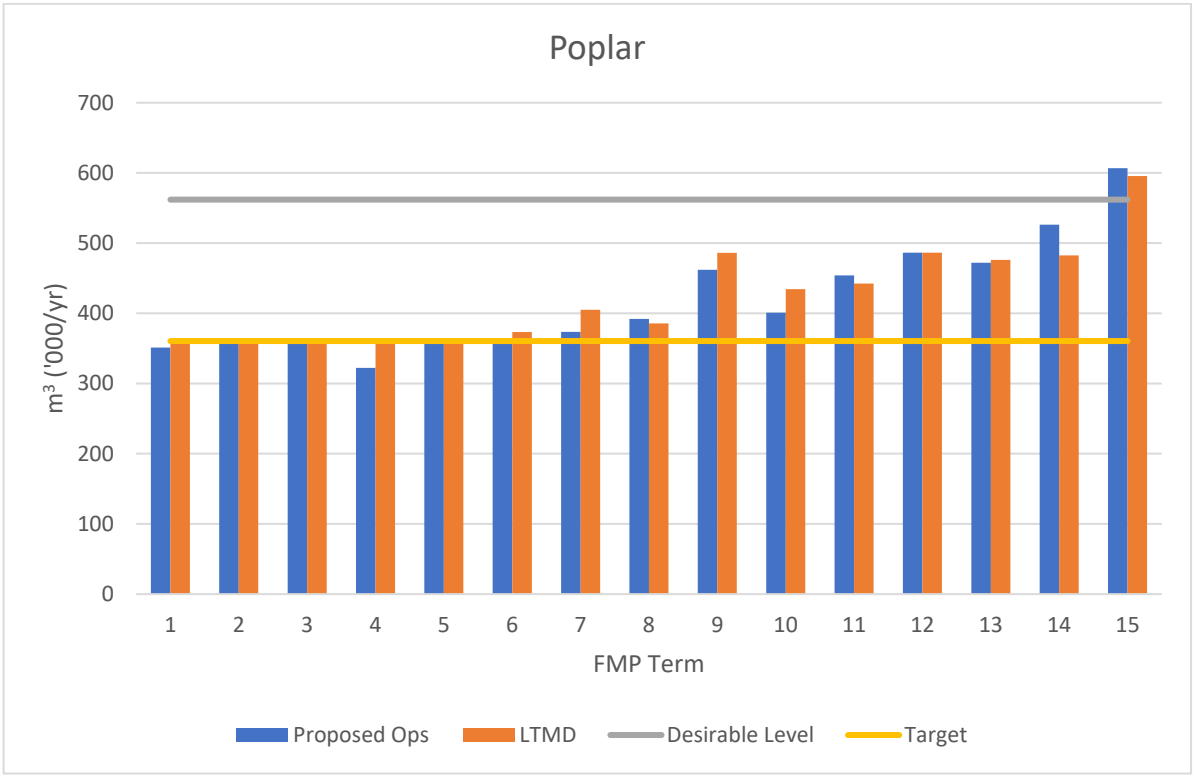

Figure 69. Projected volume achievement for Poplar

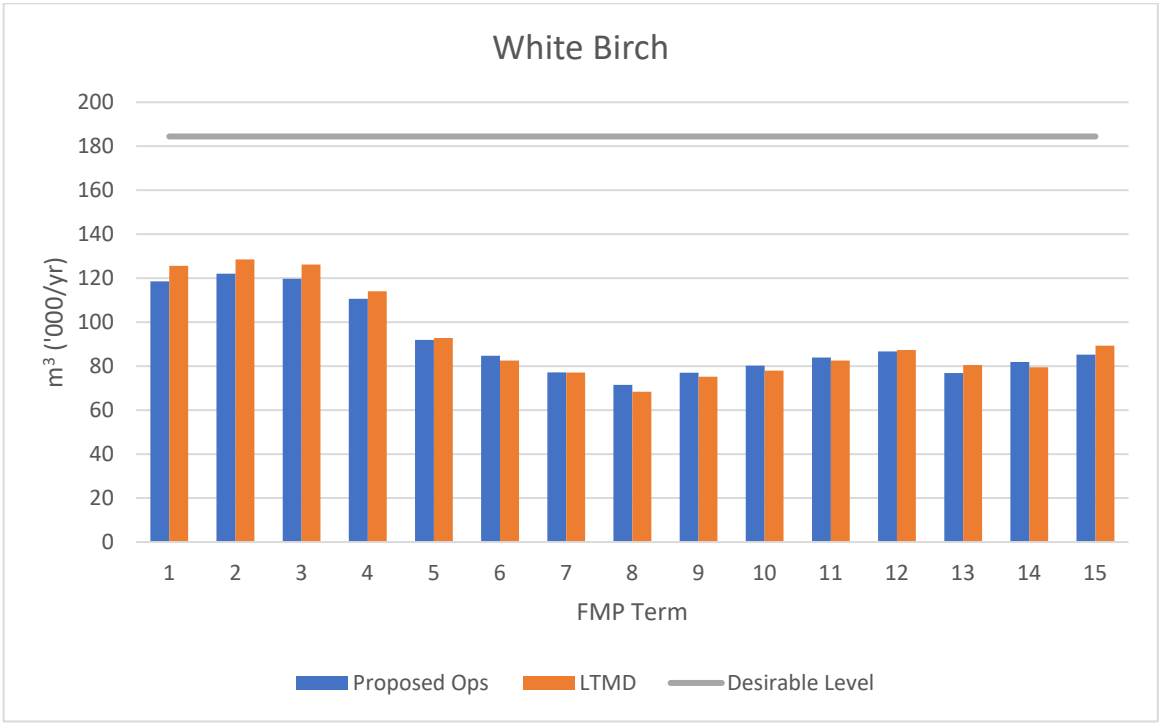

Figure 70. Projected volume achievement for White Birch

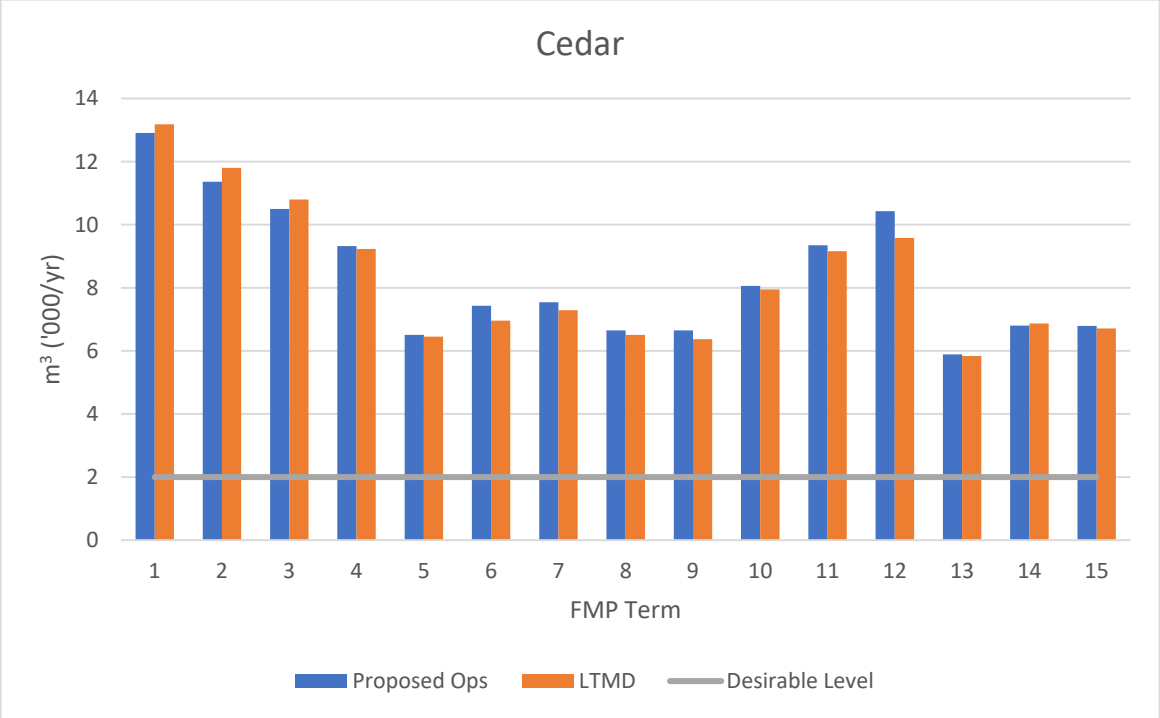

Figure 71. Projected volume achievement for Cedar

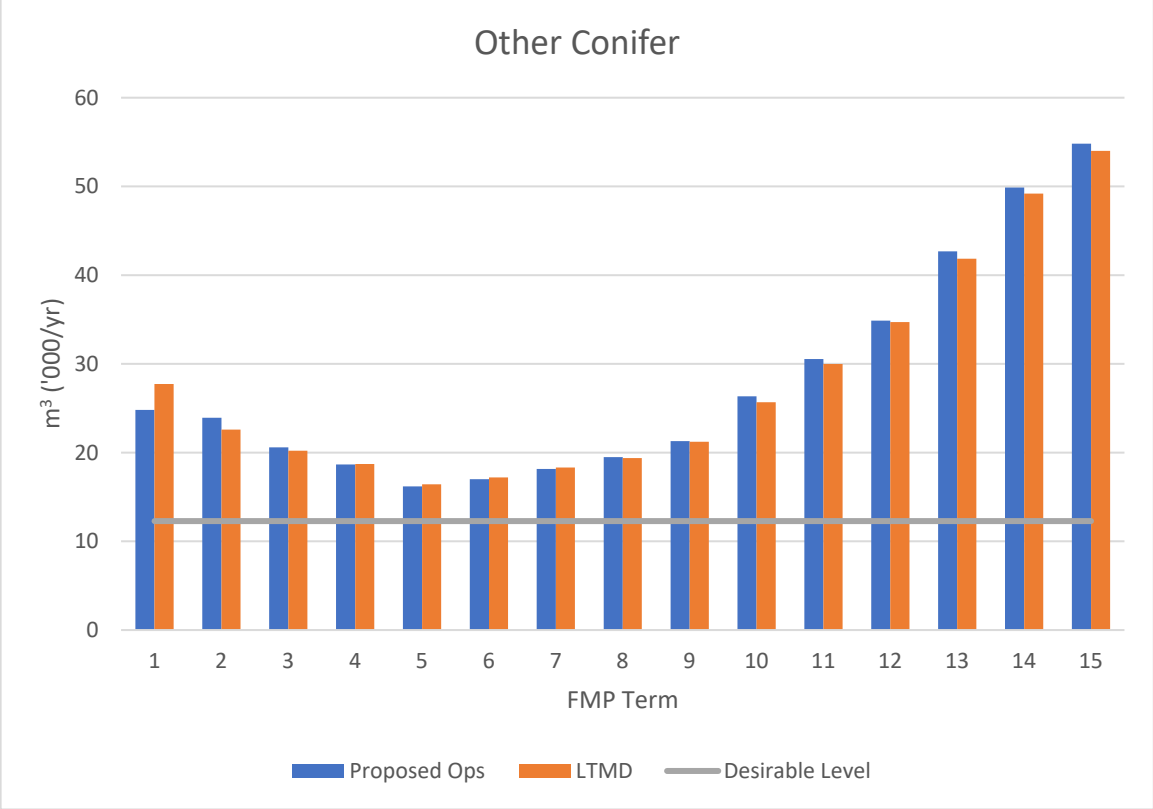

Figure 72. Projected volume achievement for Other Conifer

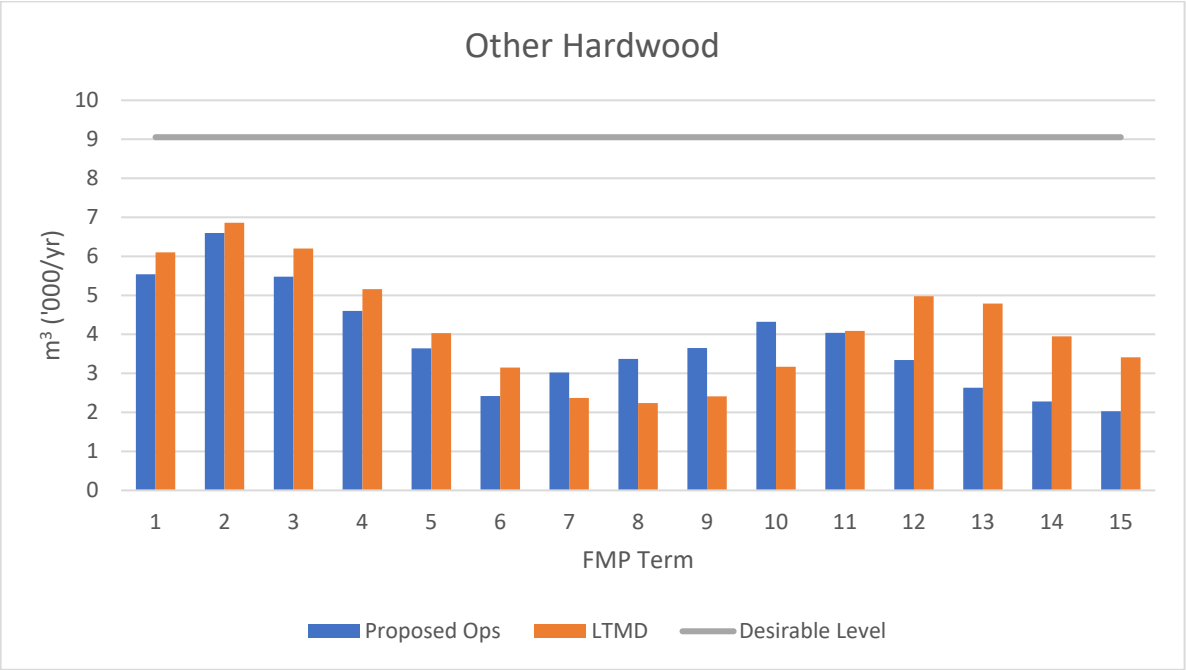

Figure 73. Projected volume achievement for Other Hardwood

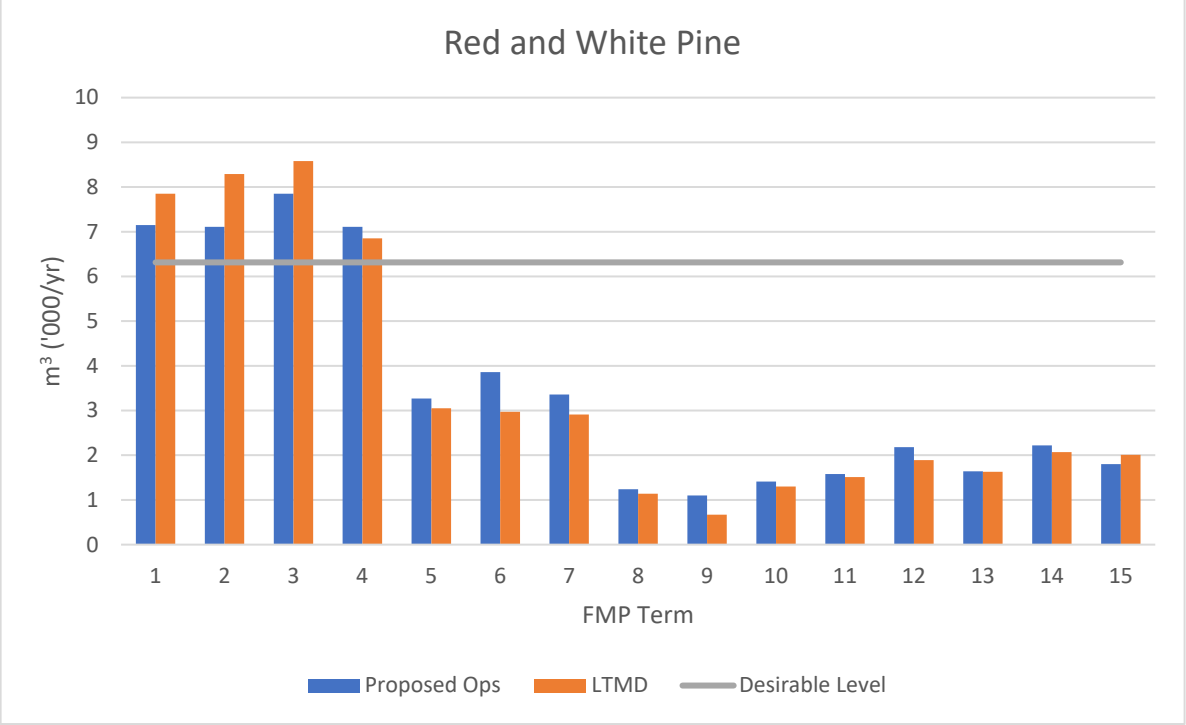

Figure 74. Projected volume achievement for Red and White Pine

Indicator 3: Planned harvest area by forest unit.

a. *Desirable Level*: planned harvest is equal to 100% of the available harvest area for each forest unit.

b. *Target Level*: planned harvest is equal to 100% of the available harvest area for each forest unit.

Assessment: The planned harvest area has achieved 100% of the available harvest area for seven forest units (BW1, LC1, MW1, OH1, PJ2, SB1 and SP1). The achievement was 99.9% for MW2, PJ1, PO1 and 98.5% for SF1.

Indicator 4: Planned harvest volume by species group.

a. *Desirable Level*: to have the planned harvest volume equal to 100% of the available harvest volume by species group.

b. *Target Level*: to have the planned harvest volume equal to 100% of the available harvest volume.

Assessment: The planned harvest volume has achieved between 91% and 98% of available volume by species group, as shown in Figure 75.

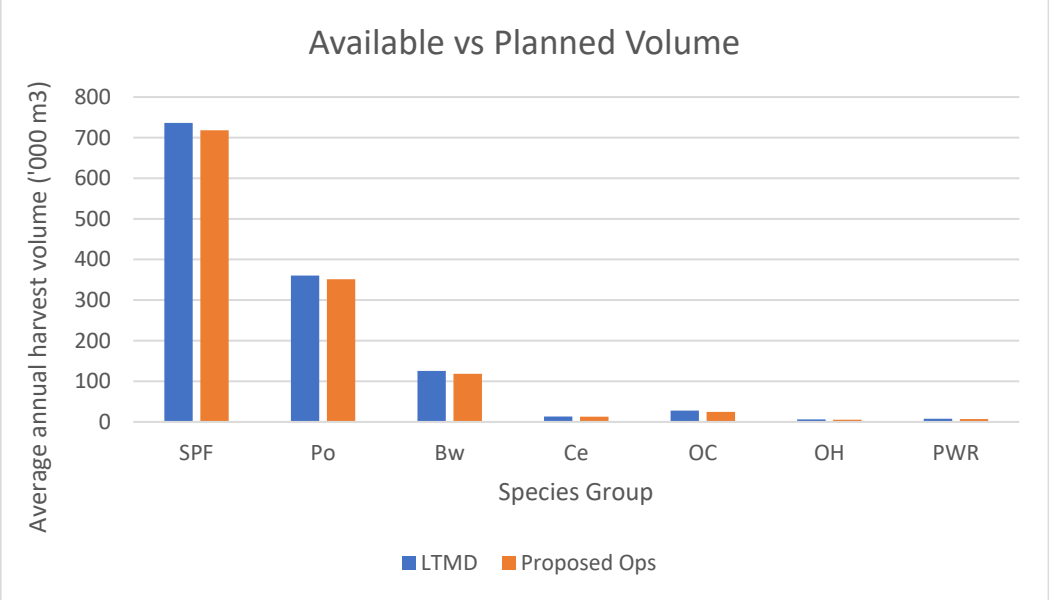

Figure 75. Comparison of available and planned average annual harvest volume by species group.

Management Objective 16: To engage First Nation and Métis communities and local communities in the development and implementation of the forest management plan.

Indicator: The objective is satisfied by demonstrating that the LCC was satisfied with their participation in FMP development as documented in the self-evaluation.

Assessment: The LCC has provided support thus far to the long-term management direction for the 2021 Timiskaming Forest management plan. A presentation of the draft forest management plan was made to the LCC on October 6, 2020 and the LCC's provided a statement of agreement or disagreement, as well as self-evaluation assessment.

Indicator: The objective is satisfied by demonstrating opportunities for involvement were provided to, and the resulting involvement of, First Nation and Métis communities for increased participation in the forest management planning process.

Assessment: To date during the FMP process, 90% of First Nation and Métis members of the Indigenous Task Team have participated in Indigenous Task Team meetings.

Based on this assessment of modeled objective achievement, spatial assessments and the forecasted social and economic impacts, a balance of management objectives has been achieved through time and progress is being made towards the desired forest and benefits.

3.7.4. Spatial Assessment of Projected Harvest Areas

The distribution of the available harvest area during the first four FMP terms is a new FMPM requirement intended to monitor AHA projections by zone over time. Although two Strategic Management Zones were identified to satisfy FMPM requirements, harvest levels weren't constrained between zones, as discussed in section 3.5. However, there were several factors that impact the spatial distribution of harvest areas across the forest.

Historically, wood has been harvested across the entire management unit. The processing facilities that source wood from the Timiskaming Forest are distributed throughout the Northeast Region. This includes EACOM sawmills in Timmins, Ostrum, Elk Lake and Nairn Centre, Georgia Pacific in Englehart, and Rockshield in Cochrane. This distribution of mills requires that wood be harvested throughout the entire forest. Given the well-dispersed location of multiple processing facilities, wood deliveries to individual mills can fluctuate in response to changes in market demand.

3.7.5. Social and Economic Assessment

There are social and economic impacts expected from the implementation of the long-term management direction. The following assessment describes the expected social and economic impacts of implementing the LTMD, specifically the impacts it may have on forest-sector employment and other forest-based industries. It assesses how timber

volume and silvicultural expenditures affect the communities identified in the socio-economic description as well as the potential effects of forestry on non-timber values located within the Timiskaming Forest. The social and economic assessment is supported by the socio-economic description in Section 2.2 that describes the level of dependency of other resource-based industries on the Timiskaming Forest.

The Timiskaming Forest contributes greatly to the economic and social benefits of local communities. As described in Section 2.2, a total of 17 communities are directly impacted by forest-based industries (i.e. forest products facilities, harvesting and silviculture). In addition, there are Indigenous communities within or adjacent to the Timiskaming Forest and whom interests and traditional uses may be affected by forest management activities.

No social economic model was used in this assessment. Instead, a qualitative assessment has been completed comparing the harvest levels and silvicultural spending forecasted for this FMP compared to the 2011 FMP achievement levels. An assessment of how forest management activities may impact other forest-based industries was also conducted.

Background

The Timiskaming Forest, managed as a sustainable forest license by the Timiskaming Forest Alliance Inc., is currently owned by the following shareholders, which consists of 4 forest product producers and 3 independent logging operators;

Forest Product Producers

- Cheminis Lumber Inc.
- Eacom Timber Corp.
- GP Northwoods LP
- Rockshield Engineered Wood Products ULC

Independent Logging Contractors

- Rosko Forestry Operations Ltd.
- W. Paiement and Sons Ltd.
- Greg Woolings

There are 17 communities in Ontario that have the potential to be directly impacted by the forest management activities taking place on the Timiskaming Forest. Much of the potential impact is due to employment resulting from timber harvesting, processing and silvicultural work, as well as the taxes and stumpage revenues that business transactions associated with the forest industry inject into the communities and government. Also included in the social economic description are seven Indigenous communities with interests and/or traditional uses on the Timiskaming forest.

The communities described in the social economic description include municipalities; Cochrane, Englehart, Espanola, Gauthier, Hudson, James, Iroquois Falls, Larder Lake, , Sudbury Unorganized, North Part, Sudbury, (Greater Sudbury), Timmins, and West Nipissing and First Nations; Wahgoshig (Abitibi 70), Mattachewan 72, Mattagami 71, Sagamok Anishnawbek (Indian Band) Wahnapitae (Indian Band).

Timber Volume Assessment

Figure 76 demonstrates the volume comparison over time as forecasted in the 2011 and 2021 LTMD, for three major species groups; SPF, Po and Bw. Projected harvest volumes for the first 10 years of the LTMD are expected to be higher for SPF compared to those projected for this species group in the 2011 LTMD. In addition, Po is expected to be higher over the time horizon in comparison to the 2011 LTMD, with Bw showing a similar trajectory. The projected volumes for SPF and Po suggest a potential increase in the economic and social benefits derived from the Timiskaming Forest as it applies to the harvesting of forest resources.

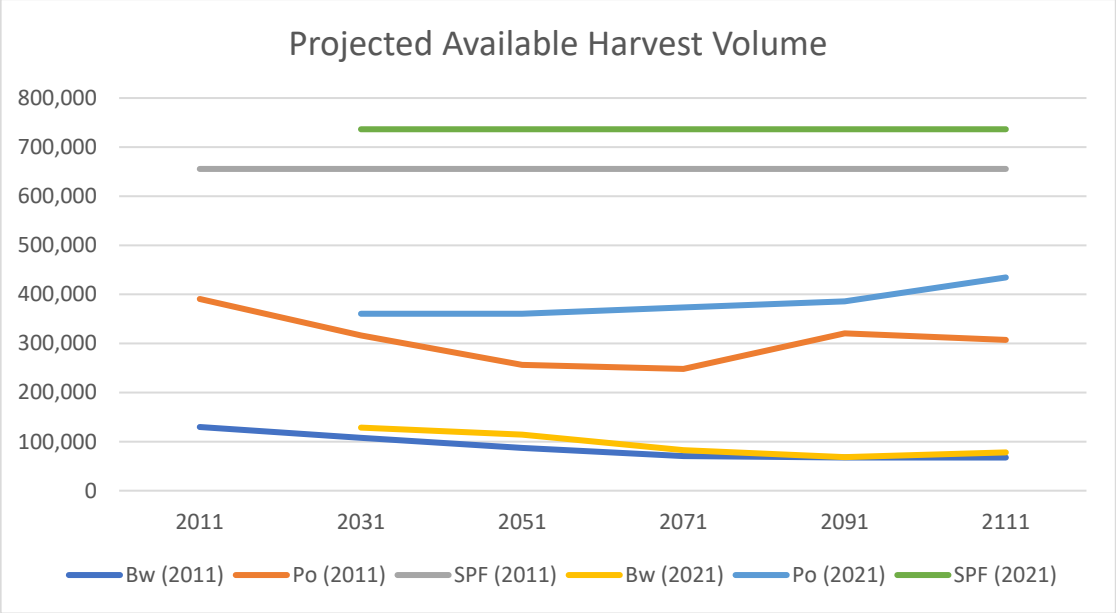

Figure 76. Comparison of volume as projected in the 2011 and 2021 LTMD

Silviculture

As shown in Table 10, projected silviculture expenditures are down 7% from 2011 FMP levels. Comparatively, a 35% reduction in seedling requirements is projected between the 2011 and the 2021 LTMD. However, it may not be realistic to assume that the economic benefits received from the projected reductions of silviculture expenditures will be felt to the extent portrayed in the table above. Actual silvicultural expenditures since

the start of the 2011 FMP have totaled an annual average of approximately $3,006,426. The difference can also be attributed to adjustments made within the strategic model to improve the predicted accuracy of silvicultural spending and included modifications to renewal rates (based on comprehensive review of silvicultural cost by FU and intensity), modifications to renewal costs, and modifications to the rates of trees planted per hectare. As such, it is expected that the amount spent on silviculture during the FMP will not deviate substantially from the modeled expenditures.

Table 10. Comparison of projected annual silvicultural expenditures ($) and the number of seedlings between the 2011 and 2021 LTMD.

	2011 FMP	2021 FMP	Difference	% change
Projected annual Silvicultural expenditures ($)	3,567,014	3,320,500	- 246,514	- 7
No. of Seedlings	5,376,886	3,500,000	-1,876,886	-35

Non-Timber Impact Assessment

The following describes the potential impacts that forest management practices may have on the non-timber values identified in the social economic description.

Commercial Tourism

Commercial tourism may or may not be adversely affected from forest management activities. Forest management activities could disturb the aesthetics as well as the perceived remoteness associated with some tourism operations. Conversely, other tourism operations rely on access and prefer the creation of new road networks to maintain or expand their tourism capabilities.

Table FMP-10 has a specific objective addressing the density of roads on the Timiskaming Forest. Road location will continue to raise concerns for some users of the resources and benefit others. Ongoing public consultation, the development of AOC prescriptions and potential development of RSA's will help to mitigate issues surrounding access. In addition to those considerations, direction from the Crown Land Use Policy Atlas (CLUPA), viewscape management zones, and the timing of operations are other tools that contribute when developing AOC's to support resource tourism.

Hunting Opportunities

Generally, access affects hunting as does the conservation and creation of habitat through forest management practices. The creation of access through forest management activities often opens new areas for hunting enthusiasts. However, added pressures on wild game in these areas are often the resulting downfall.

Species include common game species such as Moose, Bear and Ruffed Grouse.
Additional planning of moose habitat consistent with the proposed SSG approaches will also contribute to the overall FMP objectives related to the maintenance of preferred habitat for moose through the application of Moose Emphasis Areas on the landscape.

Fishing Opportunities

Through sound forest management practices, guided by the new stand and site guide, minimal to no negative effects on fish habitat is expected. However, the creation of access has the potential to increase the pressures on the resources. FMP objectives and associated indicators indicate a target of non-conformances supported by a series of prescriptions for the protection of natural resource features including the Lake Trout Lake area of concern, land uses or values dependent on forest cover.

Cottages and camping

Access and harvesting operations maybe perceived as negative when in close proximity to cottages or camping areas. Any existing land use direction outlined in the CLUPA will be reflected into the prescriptions for areas of recreation such as cottages and camping.

Snowmobile

Similar to the previous non-timber benefits, public reaction to forest management activities may vary. Newly created access allows for the expansion of opportunities, while others seek remote experiences and view these activities as a negative. The development of AOC prescriptions will be used to mitigate issues raised.

Mining and Aggregates

Although the use of forest roads by the mining industry, is generally seen as positive, harvesting activity in surveyed/staked areas may potentially have adverse effects on specific mining/exploration areas. Ongoing annual notification to mining claim holders regarding annual work schedules as well as notices of all stages of public consultation has helped to minimize potential negative effects in the past and is expected to continue into the future.

Forest management activities are generally seen as a positive development for the aggregates industry as increased and improved access contributes to the expansion and exploration of new aggregate areas.

Trap Lines

Forest management activities manipulate forest cover which in turn provides for specific wildlife habitat in a given area. Harvesting along shorelines has benefits for such species as the beaver and a variety of song birds. The harvesting of mature forest areas temporarily reduces the potential for other target animals such as pine marten but increases access for beaver trapping. Public consultation efforts are expected to improve communication between the trap line users and the forest management company to allow co-existence.

Baitfish Operations

Baitfish operators have the potential to benefit from forest management activities such as the development of new road networks. Through the application of AOC prescriptions, the protection of fishing habitat will be attained.

Bear Management Areas

The creation of new road networks is often a positive development for bear management area (BMA) holders. It allows BMA operators to access new baiting sites and hunting opportunities. However, forest management activities can conflict with BMA holder annual operations and ongoing communications for the coordination of activities is essential.

3.7.6. Risk Assessment

There are risks that some plan objectives may not be fully achieved during the implementation of the FMP. Objectives that are not fully met will impact the future forest condition and desired benefits. Benefits associated with social, economic and/or environmental values can be impacted if plan objectives are not fully implemented. The following describes the potential risks associated with implementation of the LTMD.

As experienced during the last FMP, the Great Recession of 2007 to 2009 had a remarkable impact on FMP's. During this period, the level of utilization had seen historically low harvest levels, especially in some forest types and planned harvest blocks located furthest from mills. Global markets, economies and international trades have a direct effect on the successful implementation of this FMP. A number of scoping scenarios evaluated the historical harvest levels and its related implications to objective achievement.

Climate change could also pose a potential risk to the implementation of the Timiskaming FMP. The health and condition of the forest affected by severe climate events could have implications in the achievement levels. Larger and more frequent wildfires such as the North Bay 72 fire in 2018, weather patterns (e.g., strong winds, wet autumn conditions, late freeze-up or early winter thaws) may pose a risk to achieving objectives in the FMP. The FMP uses an adaptive management approach by monitoring the implementation of the FMP, which influences current achievement levels but subsequent planning decisions.

Currently, the only access limitation is associated with access into areas near Lady Evelyn Lake. The Klock Road, built as part of the 2006 FMP, included a bridge across the Montreal River, which was subsequently removed in 2012. Any eligible wood in that area will not be accessible in this 10-year plan. The remaining portions of the management unit are either well accessed or there are no current restrictions on access.

Some First Nation and Métis communities and members of the public are concerned with the use of herbicide as a silviculture tool used to control vegetative competition. Despite the regulation of the use of herbicides in forestry by the Ministry of Environment, Conservation and Parks, and Health Canada, opposition to the use of herbicide persists. Ongoing efforts to reduce the use of herbicide on the management unit will continue. That said, without the use of herbicides or comparable alternatives, FMP objectives such as the achievement of the future forest conditions could be at risk.

Spatial pattern objectives are directly influenced by actual harvest levels. Although historical harvest levels are reasonable, some of the marginal forest stands that would require an intervention to improve their health and condition are often overlooked for economic reasons. Reduced harvest levels will increase the amount of area in these marginal forest stand condition on the management unit and reduce the opportunities to meet spatial pattern objectives.

The overall risks of successfully implementing the FMP are mitigated by the selection of a well-balanced management strategy. The management strategy is then supported by monitoring the FMP to ensure the planning team adapts to the changing economic environment, societal needs and the everchanging and unpredictable climate.

4.0 PLANNED OPERATIONS

4.1. Introduction

Section 4.0 describes the planned operations for the 2021-2031 FMP. The following details the prescriptions for harvest, renewal and tending operations, roads planning for primary, branch and operational roads, use management strategies, revenues and expenditures related to operations, monitoring and assessment of operations, and finally compares the proposed operations to the LTMD.

To assist in the implementation of the FMP, a document titled *Implementation Toolkit for the Forest Management Plan* hereafter referred to as the *Implementation Toolkit* (IT) was prepared and available in Section 6.1.20 of the Supplementary Documentation. The Toolkit includes a series of modules that describe the operational procedures and conditions on implementing forest management activities.

4.2. Prescriptions for Operations

Prescriptions for operations have been prepared for those areas selected for harvest, renewal and tending operations during this 10-year plan. Prescriptions were also prepared for those areas selected for contingency areas. In the event that contingency area is required during plan implementation, all AOC operational planning will have been completed. This will simplify the preparation and approval of any contingency area required during plan implementation.

4.2.1. Operational Prescriptions and Conditions for Areas of Concern

Operational prescriptions and conditions for all areas of concern (AOC) developed by the planning team are documented in Table FMP-11. This table includes operational prescriptions relating to harvest, renewal and tending activities, and conditions roads, landings and aggregate pits. AOC's related to natural features such as bird nests, streams or lakes were developed consistent with specific direction in *MNR's Forest Management Guides Relating to Conserving Biodiversity at the Stand and Site Scales* (also known as the Stand and Site Guide, hereafter referred to as the SSG). These operational prescription tables include the following information;

- AOC identifier
- Description of Natural Resource Feature, Land Use or Value
- Group AOC
- Operational Prescription
- Source supporting the development of the prescription
- Exception
- Road Crossings and Landings
    - Primary or Branch Road Crossing / Landing Condition
    - Operational Road / Landing Condition

- Conditions on Forest Aggregate Pits
- Public comments

In specific situations, references to Implementation Toolkit Modules are included to describe conditions and procedures related to forest operations. Often, due to the complex nature of some prescriptions, these are further described in detail in the Modules and are intended to be referenced for field implementation. These prescriptions describe operational practices available to the forestry operations personnel who play a vital role in the successful implementation of the forest management plan.

Section 6.1.13 of the Supplementary Documentation includes the required information for any operational prescriptions developed by the planning team where non-science-based information is utilized and where an environmental analysis was conducted. These supplementary documents also reference any input received from the public, First Nation or Métis communities during the development of the FMP. Also, any objections to the prescriptions and associated responses are documented.

There are no operational prescriptions for an area of concern that differs from the specific direction or recommendation (standards or guidelines) in a forest management guide in this Forest Management Plan. Therefore, exceptions are not required and none are identified in Table FMP-11.

4.2.1.1. Operational Prescriptions for Areas of Concern Information Products

Information products associated with operational prescriptions for AOCs include both the AOC identifier and the AOC type. The AOCs applied to the planned operations are shown on the Areas Selected for Operations Maps and are included in the AOC information products (e.g. MU280_21AOC012.SHP

The bridging blocks from the 2011 FMP are identified on the Areas Selected for Operations Maps, specifically made for bridging blocks (e.g. MU280_2021_FMPDP_MAP_Ops46523_02.pdf). The operational prescriptions and conditions for areas of concern from the 2011 FMP will apply to these blocks.

4.2.2. Prescriptions for Harvest, Renewal and Tending Areas

4.2.2.1. Silvicultural Ground Rules

Silviculture ground rules, (SGR) are prescriptions for the harvest, renewal, and tending operations developed for all forest unit–ecosite combinations present on the management unit. The prescriptions are presented in Table FMP-4 and will apply to all operations, including naturally depleted areas that are salvaged, for the 10-year period of the FMP.

The SGRs reflect the silvicultural options in the base model (see Section 3.3) with the renewal standards associated with each SGR associated with the modeled developmental information and renewal costs. Likewise, the associated species compositions, average stocking, and site class assumptions associated with each yield/intensity curve (i.e., stratum) are consistent with model assumptions.

The development of the SGRs was also influenced by the analysis of silvicultural activities and past performance (see Sections 3.3.1 and 3.3.2). Considerable experience has been gained during the implementation of past plans, providing important insight into treatment costs, effectiveness and outcomes. This important information, unique to the Timiskaming Forest, provided a foundation for the model assumptions for post-renewal succession (Table FMP-5) and the prescribed treatment packages shown in Table FMP-4.

The preferred SGR's shown in Table 11 serve as the preliminary prescription for harvest, renewal and tending operations since FMP-4 may have more than one preferred prescription per forest unit (e.g., for each silvicultural intensity). Prescriptions for all possible site conditions have been documented and therefore it is recognized that certain treatments will be rarely selected for use. Table FMP-4 presents the entire suite of acceptable silvicultural treatment combinations that are available for implementation. However, as indicated in Table FMP-4, the most common treatment package(s) in each SGR will be the most likely treatment. This information represents the best estimate of proposed operations at the time of plan preparation, and will not limit the selection of any other acceptable silviculture treatments in the SGRs at the time of implementation of operations. Individual stands portrayed on the Areas Selected for Operation Maps identify the preferred SGR at the time of plan preparation. The information products for harvest, renewal and tending operations will serve as the stand list. None of the proposed silvicultural treatment combinations proposed in Table FMP-4 present an exception to the applicable silvicultural guides.

Table 11. Preferred Silvicultural Ground Rules

Forest Unit	Silvicultural System	Harvest Method	Logging Method	SGR Code	SIP	Regeneration	Tending
BW1	Clearcut	Conventional	Full Tree	BW1_EXT_PO1	None	Natural	None
LC1	Clearcut	Conventional (CLAAG)	Full Tree	LC1_EXT_LC1	None	Natural	None
MW1	Clearcut	Conventional	Full Tree	MW1_EXT_PO1	None	Natural	None
MW2	Clearcut	Conventional	Full Tree	MW2_EXT_PO1	None	Natural	None
OH1	Clearcut	Conventional	Tree Length	OH1_EXT_OH1	None	Natural	None
PJ1	Clearcut	Conventional	Full Tree	PJ1_INT1_PJ1	Mechanical	Plant	Aerial Chemical
PJ2	Clearcut	Conventional	Full Tree	PJ2_INT1_PJ1	Mechanical	Plant	Aerial Chemical
PO1	Clearcut	Conventional	Full Tree	PO1_EXT_PO1	None	Natural	None
PR1	Clearcut	Conventional	Full Tree	PR1_INT1_PR1	Mechanical	Plant	Aerial Chemical
PWR_H	Shelterwood	Uniform Shelterwood	Tree Length	PWR_H_FIRST_PWR_H	Mechanical	Plant (Fill)	Ground Chemical
PWR_L	Clearcut	Conventional (With Standards)	Full Tree	PWR_L_INT1A_PR1	Mechanical	Planting	Ground Chemical
SB1	Clearcut	Conventional (CLAAG)	Full Tree	SB1_EXT_SB1	None	Natural	None
SF1	Clearcut	Conventional	Full Tree	SF1_INT1_SP1	Mechanical	Planting	Aerial Chemical
SP1	Clearcut	Conventional	Full Tree	SP1_INT1B_SP1	Mechanical	Plant	Aerial Chemical

A complete range of the most common and acceptable alternative silvicultural treatments have been developed for each forest unit and ecosite combination likely to be encountered on the Timiskaming Forest. These SGR's were developed using pertinent silvicultural guides and local knowledge to ensure their effectiveness. The use of forest ecosystem classification (ecosites) provides information on tree species composition, understory vegetation and the soil, and allows for the uniform application of the silvicultural systems within the specific forest unit types. The ecosite is the fundamental element in determining post-harvest succession and provides a link between the silvicultural treatments available for an individual and/or group ecosite(s).

Within certain forest unit/ecosite combinations, the selection of the harvest and logging method provides for the preferred regeneration method (e.g. seed tree, natural vegetative). Certain SGRs have identified restrictions associated with the timing of activities (e.g. harvest on frozen ground or use high-floatation equipment during frost free season). For SGRs under the clearcut silvicultural system, only single-pass harvesting will be employed, while SGRs under the shelterwood silvicultural system will employ multi-pass harvesting. Full tree is the main logging method for most forest units, with the exception of the SGRs applied to OH1 and PWR_H forest units for which tree-length is listed as the most common logging method. In addition, the cut-to-length logging method is included as an acceptable alternative logging method for many SGRs in Table FMP-4.

In the development of the SGR's all possible site preparation, regeneration and tending combinations were considered within the limits of the silvicultural guide recommendations. Site preparation options include, either in combination or individually, mechanical, chemical and prescribed burning treatments. Slash management of conifer and hardwood roadside slash is carried out on all harvest areas in order to maintain the area available for regeneration. In specific circumstances, slash material at roadside may be utilized for the production of biofibre. It is expected that the management of slash piles will continue for the period of the management plan as long as it continues to prove economically feasible. Regeneration options include planting, seeding, conifer cone scattering and natural regeneration. Tending treatments include chemical, manual and pre-commercial thinning.

Table FMP-4 provides recommendations for logging methods and sets out general parameters to guide forest operators when deciding on the appropriate logging methods to be used. As an example, the MW2_EXT_PO1 SGR directs that you do not use Careful Logging Around Advance Growth (CLAAG) where balsam fir is predominant in the understory (i.e. balsam fir must be <20%). In certain instances for example, the retention of higher than normal advance regeneration species will be considered acceptable where it meets the criteria identified in other management objectives. An example of such a circumstance is the retention of white pine advance growth where natural variation within the stand would facilitate establishment of PWR_H forest units.

In those forest units (e.g. MW1, MW2, BW1) where components of OH1, PWR_L, PWR_H have not been delineated by the eFRI (e.g. concentration of White Pine within a MW2 stand), these portions of the stand will be delineated and managed by applying silvicultural treatments that will promote its presence on the forest (refer to the Conservation Strategy for White Pine in Section 6.1.15 of the Supplementary Documentation) where it is ecologically and economically feasible to execute. In an effort to take full advantage of silvicultural opportunities at the sub-stand level (i.e. lowland area within a stand or pockets of white and red pine not delineated by the eFRI), small amounts of any other target tree species may be planted where site conditions are appropriate.

In consideration for cedar, in all SGRs for LC1, along with SB1_EXT_SB1, SF1_BASIC2_SP1 and SF1_EXT_SF1, single cedar trees will generally be left standing and cedar clumps or concentrations will be managed to create an average of 50% shading in openings using methods such as Reserve Shelterwood or Group Selection, which are described below.

Reserve Shelterwood

The objective is to provide an average of 50% shade by uniformly removing undesirable species and cedar trees in a range of size and quality so that after harvest, the same proportion of size and quality classes remain as occurred in the original stand. A modification of the Reserve Shelterwood method is harvesting in alternating narrow strips up to half a tree-length (5m to 7m) wide, with trees left after the first cut to be retained for at least 50% of the rotation age.

Group Selection

The objective is to retain group openings harvested which do not exceed half the average tree height and are distributed uniformly throughout a stand. The openings are not to exceed more than 20% of stand area in each cutting cycle, which is likely to be more than 30 years.

In situations where the presence of balsam fir is abundant, efforts will be made to discourage the renewal of balsam fir and minimize damage to residual Cedar. Many low-stocked cedar stands were once black spruce dominated stands that were subjected to high-grading. In these situations, the re-establishment of black spruce as the target species will be considered.

SGRs are directly linked to the post-renewal succession rule sets identified in the Remsoft model of which the inputs are detailed in Section 4.0 of the Analysis Package found in Section 6.1.1 of the Supplementary Documentation. Similarly, the regeneration standards found in Table FMP-4 correlate directly with the requirements needed to achieve the indicated future forest condition. Regeneration standards are based on local experience and outcomes from past management practices on the Timiskaming Forest, and were developed with input from the MNRF Regional Forested Ecosystems Science Specialist.

The SGR's are the basis for the development of silvicultural strategies. Each silvicultural treatment package for each forest unit and silvicultural intensity is represented by a yield curve that is used to predict the development of a forest stand over time. Each combination of silvicultural treatments with a similar expected outcome is intended to direct forest development over time towards the desired future forest condition. An individual silvicultural treatment combination can therefore be considered as a unique silvicultural strategy. Each silvicultural ground rule and associated available silvicultural treatment combinations has development information corresponding to relevant yield curve information in the Remsoft model.

For each forest unit managed under the clearcut silvicultural system, a range of silvicultural treatment packages have been developed that may be subdivided into the following five silvicultural intensities:

- **Extensive** – These are treatments that generally rely upon natural regeneration following harvest. They may or may not specify careful logging around advanced growth (CLAAG), depending on the forest unit. The natural regeneration of MW1 forest unit on selected sites will benefit from a CLAAG treatment where advanced conifer component will be maintained. They also include modified clearcut techniques such as group seed trees for black spruce. Extensive treatments are most suitable for forest units whose major species possess the capacity to regenerate naturally (e.g. pure poplar stands). Typically, they only require modified harvest practices and the completion of regeneration surveys. Extensive treatment

packages have been developed for all forest units except PWR_H and PR1, which require artificial regeneration to achieve the desired future forest conditions.

- **Basic 1** – These are treatments associated with supplementary artificial seeding to assist natural regeneration. Basic 1 treatments may also include site preparation or tending. Basic 1 treatment packages have been developed for BW1, LC1, MW1, PJ1, PJ2, SB1 and SP1 forest units.

- **Basic 2** - These are treatments associated with fill-planting, as a way to assist natural regeneration. Basic 2 treatments may also include site preparation or tending. They will be applied to those forest units where the likelihood of success is high. Basic 2 treatment packages have been developed for LC1, MW1, MW2, PJ1, PJ2, SB1, SF1 and SP1 forest units.

- **Intensive 1** – These artificial regeneration treatments characteristically include classical site preparation, planting and tending techniques. They always involve planting nursery stock and usually include some form of site preparation (e.g., mechanical, chemical, prescribed burning or combinations) and tending (aerial or ground chemical application). In some cases, more than one tending application may be necessary to achieve free-growing status. Intensive treatments may be applied to portions of previously treated areas that fail to respond adequately to an extensive or basic treatment. Intensive 1 treatment packages have been developed for BW1, MW1, MW2, PJ1, PJ2, PO1, PR1, PWR_L, SF1 and SP1 forest units

- **Intensive 2** – This category represents a pre-commercial thinning treatment, applied after regeneration and tending treatments have taken place. Intensive 2 treatment packages have been developed for the PJ1 and PJ2 forest units, which generally respond well to pre-commercial thinning.

- **Elite** – These are considered the highest cost artificial regeneration treatments due to the initial investment required for tree improvement seed production. They always involve planting tree-improved nursery stock and usually include some form of site preparation (e.g., mechanical, chemical, prescribed burning, or combinations) and tending (aerial or ground chemical application). In some cases, more than one tending application may be necessary to achieve free-growing status. Elite treatments will be applied to richer sites and take advantage of geographic aspect when considerations of treatment combinations are finalized. Elite treatments may be applied to portions of previously treated areas that fail to respond adequately to extensive or basic treatments. Elite treatment packages have been developed for BW1, MW1, MW2, PJ1, PJ2, PO1, SF1, SP1 forest units.

4.2.2.2. Conditions on Regular Operations

Section 6.1.20 of the Supplementary Documentation contains specific modules found in the *Implementation Toolkit* that document the conditions and procedures on regular

operations that have been developed through the application of the SSG. As described in Section 4.2.1, in some specific situations, operational prescriptions for AOC's are referenced in these Modules as they address the operational practices available to forestry operations personnel. Conditions on regular operations as well as any operational prescriptions for AOC's referenced in Table FMP-11 apply for the entire management unit. The following Modules are available in the *Implementation Toolkit* and are intended to be used as field implementation references/guides;

- Primary, Branch and Operational Road Conditions and Procedures
- Forest Aggregate Pit Conditions and Procedures
- Water Crossing Planning, Design and Installation Conditions and Procedures
- Conditions and Procedures for Road and Water Crossing Decommissioning
- Road and Water Crossing Monitoring for Assigned Roads Identified in FMP
- Procedure for Dealing with Identified Road and Water Crossing Hazards
- Conditions of Regular Operations within Residual Forest Cover
- Conditions of Regular Operations within AOC's
- Standard Operating Conditions for Soil and Water Conservation
- Standard Operating Conditions for Salvage and Biofibre Harvest
- Changes to Operations Protocol
- TFAI Line Marking Reference Manual
- Assessing Potential Impact of Forest Management Operations on Nesting Birds
- Forest Workers Field Guide for Determining Stream Permanency
- Fire Prevention and Preparedness
- Timiskaming Forest Aerial Herbicide Application Program
- Licensing & Wood Measurement

The *Implementation Toolkit* also includes an introduction and glossary which describes the intents of the Toolkit and the terminology used for the purposes of plan implementation.

4.3. Harvest Operations

4.3.1. Harvest Areas

Table FMP-12 shows the available harvest area and the planned (selected) harvest area for the ten-year FMP. These areas were selected based in part on public comments received on the preferred and optional harvest areas during the review of the LTMD and subsequently operational planning.

The approved sustainable available harvest area of 102,327 hectares was calculated during the development of the LTMD. The ten-year total planned harvest area is 102,275 hectares, leaving 53 hectares of allocation difference. Every attempt was made to allocate to the available harvest levels for each forest unit by each age class with those considerations described in Section 3.7.2. At the same time, it was challenging to achieve the desired

AHA age class structure within the 10-year planned harvest area for a number of reasons. Of particular note is the substitution of younger age classes, particularly in the MW1, PJ1, PO1 and SP1 forest units, and to a lesser extent in BW1, OH1 and SB1. No significant effects on utilization and volume recovery are anticipated since most of these areas occur within larger blocks of mature stands and are certainly operable within this context (e.g., 61-80 year-old poplar, 61-80 year old jack pine and 81-100 year old spruce). Furthermore, it's logical to allocate these stands if the larger disturbance areas can create an economically viable block, while contributing to specific Landscape Guide size class requirements and overall forest diversity objectives. In some instances, the failure to allocate such stands may actually fragment the forest and be contrary to the higher level emulation of natural disturbance patterns and achievement of landscape patterns direction. Also, in cases where allocating stands outside the desired age-classes was necessary due to the constraints described below, efforts were made allocate area within the upper 10 years of the 20-year age class that precedes the age-class range in the model solution. There are also instances where the substitution to older age classes is required (e.g., BW1, OH1, PJ1 and PJ2). These stands are similarly operable within the context of larger blocks and will present few challenges in terms of utilization, volume recovery or the implementation of silvicultural treatment packages. Every attempt was made to attain the AHA and the desired age-class targets for each forest unit, however a number of factors confound these objectives, often in a synergistic fashion. They are listed as follows:

a) AHA age-class targets are determined from a non-spatial wood supply model while harvest allocations are restricted by spatial limitations and operational factors,
b) Objectives for moving towards the disturbance template (see Section 3.6.3) require spatial consideration of harvest block size and frequency configurations that best meet the template rather than non-spatial AHA age-class distribution targets,
c) Residual retention requirements from the SSG by disturbance requires that a greater amount of area is operationally encountered to achieve the same AHA levels,
d) Allocation to the AHA for 11 individual forest units has the effect of reducing average block size and fragmenting the forest,
e) It is particularly difficult to achieve the target AHA age-class structure when allocating smaller forest units. For example, the AHA for MW2 is 909 ha, and the SF1 AHA is only 14 ha.
f) There are fewer available options for stand selection with smaller forest units and larger stand size relative to the AHA,
g) It is challenging to spatially design operationally feasible blocks (which is one of the selection criteria) and adhering to the modeled allocation outputs since candidate stands in mature and over-mature age classes are often widely scattered, small and poorly accessed in the case of LC1 and SB1,
h) Significant portions of the Timiskaming Forest has been historically disturbed and fragmented, making it difficult to find operationally feasible aggregations of eligible stands for many forest units,
i) Where concentrations of mature stands do exist, they are often interspersed with stands belonging to younger age-classes, making it difficult to plan harvest block configurations without age-class substitution,

j) Lack of local access and seasonal restrictions constrained the selection of stands to meet the target age-class structure for many forest units,
k) Stands/block must be economically accessible. The number of water crossings, proximity to a gravel source, topography, drainage (i.e. summer vs. winter access) and the total length of access road construction will determine economic accessibility.

In consideration of the above factors and their accumulating effects, variations in the proposed planned harvest area by forest unit and age class were deemed to be acceptable through the confirmation of the proposed operations scenario. The proposed allocations were modeled using the Remsoft model and the results were assessed to be well within the limits of sustainability and consistent in moving towards achieving the desired future forest condition and the objective achievement identified in the LTMD. Section 4.9 provides details of this analysis and its associated results.

The required area of stand level residual was determined using the direction and standards from the SSG. The SSG residual stand structure requirements have been met for all planned harvest areas. Implementation of residual planning is consistent with the achievement of biodiversity objectives. Residual is defined explicitly in Section 8.1 of Module 8 of the *Implementation Toolkit*.

Two types of residual forest condition are needed to address the achievement of biodiversity needs. In those cases where overall calculated residual achievements fell short, operational planning has identified additional mapped residual (hereinafter referenced as *Patched Residual*). Patched Residual is left unharvested so that any point within a planned clearcut harvest area will have at least 25 ha of mapped residual forest within a 500 ha circle about that point. The other type of residual (referenced hereafter as Point Residual) will be established during implementation of the harvest by ensuring that any point within a new clearcut harvest area will have at least 0.5 ha of residual within a 50 ha circle about that point.. Conditions and procedures on the application of these two types of residuals are available in Module 8 of the *Implementation Toolkit*.

In order to improve operational planning, areas which exhibited a 17% or greater slope were excluded from the allocated harvested area, given the anticipated terrain constraints. These areas do not contribute to the planned harvest area, but may be harvested if operationally feasible. Since these areas were not planned for harvest, they were considered Residual as part of the Residual Tool analysis. As such, these areas have been assigned the label “Flexible Residual” on the Areas Selected for Operations Maps, with the standard Residual Patches resulting from the analysis labeled “Fixed Residual”.

The approval of the forest management plan does not represent an agreement to make harvest areas available to a particular licensee. The final assignment of TFAI’s approved harvest area to TFAI shareholders is external to the FMP and is governed by a shareholders agreement process. All wood supply directives and agreements by MNRF to individual shareholding companies are presumed as addressed by the TFAI shareholder agreement as

long as the individual shareholders remain signatories. However, this does not mean that Ministry commitments or directives are eliminated. Ministerial volume commitments and directives originate outside of the FMP process but are documented in the approved TFAI business plan and reflected in the Company's shareholders agreement.

There are no harvest related silvicultural trial areas planned for the 2021-2031 FMP. An insect pest management program is being developed by MNRF to control a spruce budworm infestation in the Northeast Region. Amendments to this FMP may occur as a result of this infestation.

Locations where fuelwood can be obtained will be identified in each Annual Work Schedule.

Harvesting Considerations within CLUPA Policy Area G1808

A portion of harvest block Noble 170 falls within the Crown Land Use Policy Atlas (CLUPA) policy report G1808 – The Community of Gogama. Commercial timber harvesting is permitted within this area; however, operations must enhance townsite values and reduce the risk of fire. The stands within these blocks are of eligible age and condition for harvesting during the 2021-2031 FMP. The composition of these stands includes LC1, MW1, PO1, SB1 and SP1 forest units. Operations in the block will follow the approved SGRs for these forest units, as detailed in FMP-4. The most common harvest treatment includes conventional, full tree logging, with CLAAG applied to the lowland forest units (SB1 and LC1).

The specific silvicultural treatments applied will be based on a post-harvest site assessment. Silvicultural treatments will utilize the most common or acceptable alternative treatments, as listed in FMP-4 for the applicable forest unit and SGR. Full-tree logging is the preferred logging method for Noble 170. Slash management will be implemented on the harvest blocks where this logging method is utilized. This may include piling, burning (with exception of pure poplar piles) and/or slash removal (where economically viable. Slash management will be aimed at reducing the area covered in slash piles as a result of full tree logging operations, while increasing the area available for regeneration and reducing the fire hazard.

While full-tree logging with slash piling is preferred, Cut-to-Length logging may be employed as an alternative to full-tree logging within this portion of Noble 170. This method provides for the management of slash via the distribution of tops, limbs and branches across the harvested area. Should Cut-to-Length logging be used, mechanical site preparation will be promptly applied to minimize fire risk.

A result of discussions with Gogama area citizens and organizations, and the Regional Director Issue Resolution decision, operations within G1808 were adjusted. This included:

- the removal of harvest block Noble 176

- the application of a 1,000 m viewscape analysis and a 90 metre shoreline reserve on Minisinakwa Lake
- a timing restriction on Noble 170 and the application of the RECTRAIL-1 AOC on the portion of the snowmobile trail which transects this block.
- Protection of the attenuation zone and aquifers that provide water to the community of Gogama.

The above adjustments made to forest operations will serve to enhance townsite values in the vicinity of Gogama. This included considerations for the tourism and recreation objectives of the town, through the application of viewscape management techniques to address aesthetics concerns and timing restrictions to minimize conflict with snowmobile trail usage. In addition, water source and quality was protected by removing operations which may impact the aquifer and attenuation zone which service the community of Gogama. The resulting forest operations will ensure these townsite values are protected, while reducing the fire risk in the Gogama area through the harvest and regeneration of forest stands to a healthy vigorous condition.

4.3.2. Completion of On-going Harvest Operations from Previous Plan

A total of 19,402 hectares of bridging area has been included in the FMP. The area by forest unit is provided in below. The location of bridging areas are identified on the bridging operations maps, as identified by "02" in the filename (e.g. MU280_2021_FMP_MAP_Ops46523_02.pdf). The bridging areas will be available for harvest for the duration of the 2021-2031 FMP.

Table 12. Bridging area by forest unit

PLANFU	Sum of HARV_HA
BW1	1,858.4
LC1	266.9
MW1	1,922.9
MW2	2,402.2
OH1	72.0
PJ1	1,983.9
PJ2	1,017.0
PO1	4,180.8
PR1	6.2
PWR_H	171.6
PWR_L	417.1
SB1	2,745.8
SF1	239.2
SP1	2,118.2
Grand Total	**19,402.1**

As described in Section 4.2.1.1, some areas identified as bridging will be included in the 2021-2022 AWS.

No second-pass harvest opportunities have been identified in this FMP.

4.3.3. Harvest Volume

Table FMP-13 describes the available harvest volume, and an estimate of the planned net merchantable volume and undersize and defect that may be available for bioproducts for the planned harvest area, for the ten-year period. The method used to estimate the volume for the planned harvest area is based on information supported in the Modelling Inventory Support Tool (MIST). MIST includes yield calculations for both Plonski and Empirical (Penner) yield curves which were used to calculate and aggregate individual stand volumes by species. These volumes are then used to generate a total volume by species for each stand selected during the allocation process.

As shown in Table FMP-13, differences exist between the available harvest volume and the planned harvest volume. Planned volume (net merchantable) is less then available volume for conifer (28% less) and hardwood (23% less). The Timiskaming Forest is the product of large historic fire disturbances that have created relatively large even-aged sections within the forest. The aspatial model outputs provide a landscape level harvest area/age-class prescription that assumes every stand is accessible and available to harvest and therefore often cannot operationally align when allocating harvest areas. The end-result, as described previously, is a level of age-class substitution. The volume difference can be partially attributed to the allocation of younger stands which, while of operable age, are in age-classes that do not exactly match the model. Younger stands will have relatively less volume compared to more mature stands, which the model will prioritize in order to maximize volume while trying to meet ecological indicators. Age-class substitution was required based on the factors described in section 4.3.1, which resulted in the planned volume being lower than available volume for conifer and hardwood.

Undersized and defect volumes, also known as unmerchantable volume, represent all of the volume that is not merchantable by the minimum utilization standards defined in the Scaling Manual. In general, this includes components of the tree that have not traditionally been utilized (i.e. stem tops (below minimum diameter limit), defect or cull, branches, leaves, twigs and bark).

Net merchantable volume factors were developed using individual tree biomass equations based on Alemdag (1983, 1984). The individual tree biomass equations relate mensurational variables for the average tree (i.e. diameter at breast height (DBH) and tree height) to oven-dry mass for each biomass component. Biomass components predicted using these equations include: whole tree, stem wood, branches, twigs and leaves, and bark.

Average tree values (DBH, Height) were selected using normal yield tables for site class two and an average harvest age for each species (generally reflect mid-point of the

operability range). Stem biomass predictions (Stem wood and bark) were further divided into merchantable (bole) and unmerchantable (top) sections using Honer's equation of stem form using top diameter limits and stump height limits from the minimum utilization standards defined in the Scaling Manual.

Net merchantable volume factors are calculated using the predicted oven-dry weight of tree components relative to the merchantable stem wood component.

Since not all of the predicted biomass associated with each tree is recoverable due to site, variability and operational factors etc, net-down factors were applied to the volume factors.

1. In order to account for post-harvest residual stand structure requirements, operational losses at the stump as well as inaccessible stem volume a net-down of 30% has been applied.

2. An additional 30% net-down has also applied to account for roadside operational recovery losses in biofibre operations within the collection, grinding and loading operations. This 30% operational net down is equivalent to recovery information observed in trials and biofibre operations in various jurisdictions.

3. Further to these net-downs, volumes from branches, twigs and leaves for tree species typically managed under shelterwood and selection silviculture systems have not been included due to the predominance of cut-to-length harvesting method for these sites.

The finalized results have been discussed with FP innovations, and some members of industry with experience in biofibre operations. The results approximate the unmerchantable volume recovery information from biofibre operations. As more experience is gained with operations in Ontario and more information is available volume estimates will be adjusted as well to reflect the most current knowledge.

4.3.4. Wood Utilization

Utilized and unutilized planned harvest volume is summarized by species and product in Table FMP-14. Estimates of non-utilized species were derived from past experience and knowledge of which species are retained for silvicultural or wildlife habitat reasons (e.g. Merchantable Volumes Left Unharvested) vs. non-utilized species from the area of planned harvest. Generally, a 2% reduction for all conifer and poplar was made for use for snags, habitat and utilization trends. Pw and Pr volumes were reduced consistent with the Conservation Strategy. A 15% reduction for white birch was made for snags and habitat as well as historical utilization trends and when used for the purposes of silviculture (i.e. shade for Pw and Sw). Fifty percent of all Other Hardwood (Oh) products are shown as unutilized.

A total combined conifer and hardwood volume of 9,684,874 m^3 is forecast for utilization (based on realized volume) during the ten-year planning term, while it is estimated that 96,533 m^3 from the area of planned harvest will not be utilized (i.e. biofibre). Included in these estimates is the total volume of undersize and defect volume. It is estimated that approximately 5% of the 10-year planned harvest of undersize and defect volume will be utilized. Utilization of biofibre material on the Timiskaming Forest has begun however, at a very small scale. It is expected to increase over the implementation of this FMP and future FMP's will refine estimates as utilization increases.

The following assumptions were used to produce this table:

- A 15% veneer recovery factor was applied to the total poplar volume.
- Pulp volumes represent 10% of the roundwood black spruce volumes.
- Sawlog volumes are 100% of the jack pine, white spruce and balsam fir and 90% of the black spruce volumes.
- For white birch, a 5% recovery factor was applied to veneer recovery volumes and 10% applied towards the sawlog. As well, the remaining 85% OSB recovery factor was applied.

Table FMP-14A has been included to address the surplus and shortfalls volume expected during FMP implementation. The table shows adjusted volumes from FMP-14 and was developed to show the expected realized planned harvest volume and wood utilization. Table FMP-15 reflects the appropriate modifications completed on Table FMP-14A.

Wood Utilization by Mill

Table FMP-15 shows the forecast of wood utilization by mill for the 10-year term of the plan. The commitment types are based on the SFL which authorizes the harvest of timber from the forest and is determined by the application of the MNRF approved TFAI business plan which states that the TFAI will attempt to meet traditional volumes from the licence area to the facility. The calculation of this breakdown for each mill originates from the relative allotment of harvest volume in the TFAI shareholders agreement as well as a projection of independent shareholder harvest volume deliveries based on recent history. In addition, delivery of volume to non-TFAI shareholder mills is predicted based on TFAI business plan direction and historical movement of wood from the area. Although the approval of a forest management plan is not an agreement to make areas available for harvest to a particular licensee or supply wood to a particular mill, Table FMP-15 forecasts the Timiskaming Forest contribution towards meeting the wood supply requirements of the various companies. It also identifies any wood supply commitments applicable to the Forest. TFAI will address these wood supply requirements and commitments to various companies through the TFAI shareholder's agreement or negotiated memorandum of agreement with respective commitment holders. Based on current and recent history, net merchantable volume types are expected to be fully utilized by those processing facilities identified in Table FMP-15. However, if an underutilization of the available harvest

volume occurs, objectives related to economic outlooks, social elements and forest diversity aspects of the forest may not move towards targets at the rate predicted in the LTMD.

4.3.5. Salvage

Presently no salvage operations are planned during the period of this FMP. However, if any occurrences of damage to the forest resulting from natural disturbances such as windstorms, wildfires or insects, there may be opportunities for salvage operations in the future. Should potential salvage opportunities arise during the implementation of this FMP, approvals for these areas will occur according to MNRF policy requirements.

4.3.6. Contingency Area and Volume

Unforeseen circumstances such as blowdown, wildfire, insect damage or disease may cause some of the planned harvest area to become unavailable for harvest during the ten-year period of the FMP. In order to accommodate such circumstances, contingency areas for harvest have been identified. The contingency area is intended as replacement area for lost harvest opportunities planned for in the FMP. Often the current contingency areas are later proposed as regular harvest areas in the subsequent 10-year FMP. The contingency areas are identified and portrayed on the Areas Selected for Operations Maps. The area and volume of the contingency area is summarized in Table FMP-16 and represents approximately two-years of harvest operations. A total of 18,932 hectares has been selected for contingency with an associated total volume of 2,161,717 m^3. This represents approximately 12% of the 10-year planned harvest volume (based on the total volume in Table FMP-13). In general, contingency areas were selected for the proximity to existing roads, planned road corridors or adjacent to proposed allocations to provide operational flexibility.

It should be noted that all AOC operational planning in contingency blocks was completed and subjected to consultation during the development of this FMP to expedite an approval process should the area be required.

4.4. Renewal and Tending Operations

4.4.1. Renewal and Tending Areas

The types and levels of planned renewal and tending operations for the 10-year term of this plan are summarized below, and shown in Table FMP-17. The levels projected are based on the modeled long-term management direction but are further updated to include the outstanding projected silvicultural activities required to complete the renewal of pre-2021 FMP harvest areas to free-growing status.

Renewal and tending levels have been determined in part by using the clearcut area renewed by forest unit and silvicultural intensity results from the LTMD. The proportion

of area renewed by forest unit and silvicultural intensity resulting from the LTMD was applied to the area planned for harvest for each forest unit, which is the basis for the planned ten-year period of renewal and tending operations. These figures are then adjusted by projecting the planned silvicultural program for the 2021 and 2022 operating years, based on proposed operations in the existing plan. The remaining eight years of the FMP are based on the planned renewal and tending operations projected in the long-term management direction. Finally, the analysis of renewal and tending is used to adjust the planned levels consistent with results of the analysis. The analysis considered recommendations from the ten-year annual report, the trend analysis results and any relevant independent forest audit recommendations. The past harvest levels, old forest units and related silvicultural ground rules, and unplanned depletion areas from natural disturbances, all account for the difference between renewal projections derived from the LTMD and planned levels for the ten-year period. Associated expenditures of the planned renewal and tending operations are consistent with the projections from the LTMD. These planned expenditures in support of the renewal and tending operations for the next 10 year period are detailed in Table FMP-20 and described in detail in Section 4.6.

All areas scheduled for renewal and tending operations for the ten-year period are portrayed in the Renewal and Tending overview map (MU280_2021_FMP_MAP_EligibleRenewalTending_00.pdf). The areas identified include: all areas selected for normal harvest; all bridging areas; areas previously harvested or scheduled for harvest during the term of the current or previous forest management plan(s) and not yet renewed; areas of natural disturbances which require renewal (i.e. they are eligible for renewal and under SFL responsibility to renew); and areas which require tending.

There are no areas managed using the clearcut silvicultural system under a planned two-pass, and therefore no objectives are defined to address the silvicultural liabilities in achieving the LTMD.

A total area of 49,300 ha is planned to be naturally regenerated during the ten-year period. A total of 11,228 ha of aerial seeding is scheduled over the ten-year planning period, while a total of 27,705 ha is planned to be planted for the ten-year period. A total of 31,797 ha of mechanical site preparation and 4,700 ha of aerial chemical site preparation is planned for the ten-year period. Finally, a chemical aerial tending program of 38,124 ha, a mechanical tending program of 1,000 ha and a manual tending program of 1,000 is anticipated for the 10-year period. A pre-commercial thinning program of 5,000 ha, along with a slash pile burn program to occur on 1,300 ha is anticipated for the ten-year planning period.

On those sites which support desirable advanced regeneration, careful logging will occur to protect this regeneration and reduce the requirement for tree planting and subsequent tending treatments. Careful logging efforts will be directed towards lowland black spruce sites, lowland cedar sites as well as upland sites that sustain both advanced spruce and pine regeneration. Where sufficient advanced regeneration is not left on the site to meet

minimum stocking standards, the site stocking will be augmented using an artificial regeneration treatment, referenced in Table FMP-17 as a supplemental treatment or refill plant.

Several vegetation management techniques will be employed to ensure the achievement of the desired future forest condition set out in the LTMD. These include careful logging to reduce the need for planting stock (and subsequent tending) as well as site preparation methods to minimize the seed bank production of competitive species. Aerial and ground tending activities are carried out to control competing vegetation that threatens the establishment of the desired species. Aerial chemical site preparation allows for effective preparation of a site for planting while maintaining any advanced conifer regeneration on the site. Only herbicides approved for use in Ontario will be utilized. Each Annual Work Schedule (AWS) will contain an aerial tending project summary for MNRF and MECP approval. TFAI continues to investigate economically viable alternatives to the aerial application of herbicides for the control of competing vegetation and ensures that the decision process that has led to the application of herbicide is documented, transparent and available for review. Any alternatives will need to be economically feasible and generate results that support the short and long-term objectives of the long-term management direction. Silviculture standards and best management practices relating to Moose Emphasis Areas are located in Supplementary Documentation 6.1.7.

4.4.2. Renewal Support

Renewal support includes activities such as tree seed collection, planting stock production and tree improvement operations, which will be carried out on the management unit. The majority of cones will be collected from harvested trees during scheduled harvesting operations identified in the AWS. Cones will be collected from seed zone 24 and 25. A total projected cone collection program of 203 hectolitres (hl) per year for jack pine, 10 hectolitres (hl) per year for white pine and 10 hectolitres (hl) per year for red pine is scheduled. In addition, black and white spruce cone collection targets of 15 hl per year are planned. Seed collection for white spruce, white pine and red pine will be targeted for a bumper crop year that can be expected to occur during the planning period. Although there is a very limited scheduled harvest of white pine on the unit, should an acceptable cone crop occur, the company will harvest selected trees in order to have seed in the seed bank for use for renewal support. Generally, the number of trees harvested for cones will be small and all attempts will be made to utilize the tree. The white pine seed will originate from seed zone 24 and 25, and be maintained in inventory organized by the township it was collected from. Refer to the Conservation Strategy for White Pine Management available in Section 6.1.15 of the Supplementary Documentation for more details on the seed management requirements. Seedlings will be grown and procured from local nurseries. Depending on the stock type requirements for a particular year, stock type will vary between white pine, red pine, white spruce, black spruce and jack pine grown as overwinter container stock as first choice or spring and fall current, where deemed needed. There could also be a current container stock grown if needed for white and red pine.

Additionally, TFAI will continue their involvement as a member of the Northeast Seed Management Association (NESMA) and will be utilizing improved seed (1st generation) for jack pine and black spruce nursery stock production. TFAI will participate in future advance generation improved seed partnership initiatives. Currently, tree improved stock (1st generation) is available for black spruce and jack pine.

As part of the support to the renewal program, it is also expected that the tree improvement program will generate 7.6 million seedlings for both jack pine and black spruce for the ten-year term of this FMP. As with any stock type, a detailed record of the geographic location is recorded using TFAI's geographical information system. The genetic gain has been measured and incorporated in yield curve development, which is discussed in Section 4.8 of the Analysis Package (Supplementary Documentation 6.1.1).

4.5. Roads

4.5.1. Primary and Branch Roads

The Primary and Branch roads that are required to provide access to and within the areas selected for harvest, renewal and tending operations for the ten-year period are detailed on the Areas Selected for Operations maps. Documentation of the environmental analysis of the alternative corridors for each new Primary road corridor, including the rationale for the selected corridor and the associated use management strategy, is documented in Section 6.1.9 of the Supplementary Documentation.

Three additional Primary road corridors were identified by the planning team following the Review of Proposed Operations (Stage 3). The Foot Lake Road was approved as a branch road corridor in the 2011 plan and has been carried forward as primary road corridor to facilitate wood transport from north to south via the Penassi Lake Road. Pearl road was included in the LTMD set of corridors, but was re-added as 10-year primary road corridor in the draft plan to added to provide a link between the Soucie Lake Road and Hwy 66 via Lac Louise Road. The Silver Claim Lake Road corridor was added to a section of the existing Silver Claim Lake Road.

A total of 20 branch road corridors have been carried forward from the 2011 plan, although some adjustments have been made on some corridors as part of operational planning. Note: the Hollywood Mine Cutoff Road was shown as a primary road in the 2011 FMP.

- Bernhardt Lake Road
- Hedman Mine Branch Road 6
- Hennessey Road Branch 11
- Hennessey Road Branch 12
- Highway #573 Branch Road 1

- Highway 65 West Branch 1
- Hill`s Lake Side Road 1
- Hollywood Mine Cutoff
- Low Creek Road Extension
- Manridge Mine Road Branch 3
- North Skead-Bayly Extension
- Shallow River Road Branch 1
- Shallow River Road Branch 3
- South EMU Road Branch 11
- South EMU Road Branch 7
- South EMU Side Road 15
- Spear Lake Road Branch 6
- Spear Lake Road Branch 8
- Watabeag Road Branch 27
- Wendigo Lake Branch Road

Table FMP-18 documents all planned new Primary and Branch road construction and references the use management strategies for each road or associated road network. For primary roads, a total of 606.3 km is planned for construction over the 10-year FMP, with 82.3 km planned for the next FMP (i.e. 20-year corridors). A total of 568.5 km of branch road is planned for construction during the 10-year FMP. The length of existing Primary and Branch road to be maintained during the ten-year period of the forest management plan is also detailed in Table FMP-18. Planned Primary and Branch road construction is shown on the Areas Selected for Operations Maps.

For the purpose of road planning and forest management, the SFL holder, in collaboration with the MNRF, developed a road network strategy indicating forest access roads that may be of interest to the SFL holder for the purposes of resource extraction. This strategy resulted in the definition of road networks based on commonalities of an existing road system and its intended uses. Primary forest access roads were first used to define the general extent of each road network. Other criteria such as existing use management strategies, types of operations, geographic locations also contributed to defining road networks. In general, existing use management strategies are available for individual Primary roads and/or individual road networks. As for Branch corridors, the selected corridors will normally assume the existing use management strategy from the associated road or road network unless otherwise indicated.

The following Primary roads currently have and will retain the access restriction provisions as described in the use management strategy in Section 6.1.8.1 or 6.1.8.2 of the Supplementary Documentation; Duncan Creek Road, Everett Lake Road, Silver Claim Lake Road and Lundy Road, Welcome Lake Road, Lampman Twp Road and Beaumont. Cotton Road and Opikinimika Lake Road are the only access restrictions planned for Branch Roads during the 10-year term. The intended year of transfer for all roads, including Primary and Branch roads is identified in Table FMP-18.

An exception to the restriction on new branch roads within 400 m (as part of the DTL-2 AOC prescription) has been approved by MNRF for the Hennessy Road Branch Road 11 near Deschenes Lake. The corridor includes an existing road bed within 400 metres of Deschenes Lake. This road is currently not drivable, but is eligible for upgrading using the existing road bed.

As described in section 6.1.17 (MEA Supp Doc) some branch roads built during the 2021-2031 FMP may be decommissioned in an effort to reduce access to a given operational sector within an MEA.

Conditions and procedures on Primary and Branch roads or landings are available in Module 2 of the Implementation Toolkit (located in Section 6.1.20 of the Supplementary Documentation). These conditions on regular operations are consistent with the SSG.

4.5.2. Operational Roads

Operational roads are roads within operational road boundaries (ORB), other than Primary or Branch roads that provide short-term access for harvest, renewal and tending operations. Operational roads are normally not maintained after they are no longer required for forest management purposes, and occasionally may be site prepared and regenerated as required, consistent with the FMP objectives and use management strategies. They are used to access harvest blocks and are built for shorter-term use for harvest and subsequent renewal operations. These roads may be un-surfaced or thinly surfaced. Culverts and/or bridges may be removed following operations.

For each harvest block identified on the Areas Selected for Operations Maps, an Operational Road Boundary (ORB) has been established and required for accessing this area. Each use management strategy for individual ORBs is recorded in Table FMP-18, and consistent with the harvest block identifier and cross-referenced with the UMS. If necessary, as a result of unforeseen circumstances and in recognition of the data used for the establishment of ORB's, the configuration and refinement of ORB's will be updated for the AWS.

Similar to Branch road corridors, use management strategies for operational roads inherit the use management strategy of the associated road or road network they originate from. A road network ID is assigned to an operational road after it has been constructed as a single ORB may connect to more than one road network. The use management strategies for each road network are found in Section 6.1.8.2 of the Supplementary Documentation, which also includes a summary of public comments.

Conditions and procedures on Operational roads are available in Module 2 in the Implementation Toolkit (located in Section 6.1.20 of the Supplementary Documentation). These conditions on regular operations are consistent with SSG.

4.5.3. Area of Concern Crossings – Primary and Branch Roads

Where a Primary or Branch road, or an associated landing, is proposed to cross an AOC, the conditions and public comments received are listed in FMP-11. .

For each new primary or branch road water crossing to be constructed, the location, crossing structure and conditions on construction will be finalized in the applicable AWSs in accordance with the Ministry of Natural Resources and Forestry/Fisheries and Oceans Canada Protocol for the Review and Approval of Forestry Water Crossings.

4.5.4. Area of Concern Crossings – Operational Roads

Where an Operational road, or an associated landing, is proposed to cross an AOC, the conditions and public comments received are listed in FMP-11. The location and conditions for Operational roads will be finalized during implementation.

For each new operational road water crossing to be constructed, the location, crossing structure and conditions on construction will be finalized in the applicable AWSs in accordance with the Ministry of Natural Resources and Forestry/Fisheries and Oceans Canada Protocol for the Review and Approval of Forestry Water Crossings.

4.5.5. Existing Roads

Part or all of existing roads within road networks and the associated use management strategies that are required by the licensee are documented in Section 6.1.8.2 of the Supplementary Documentation. Existing roads planned for use during the 10-year term are listed in Table FMP-18 with the associated kilometres. Section 6.1.8.2 of the Supplementary Documentation details any new or revised use management strategies and the rationale for the change.

Table FMP-18 also documents the expected year anticipated to transfer responsibility from the SFL to MNRF for any existing or new road segments (including associated infrastructure) or road networks as per the MNRF *Implementation Bulletin - Transferring Forestry Road Responsibility (2019).*

Monitoring and maintenance strategies identified in the individual road use management strategy define the SFL's responsibility for monitoring and maintenance on designated road segments consistent with the existing infrastructure condition description (see Existing Infrastructure Condition description in individual road UMS).

There are some existing primary, branch and operational roads identified in Table FMP-18 that are the responsibility of another party (MNRF, OTH). Since these roads are under the jurisdiction of another party, it is the responsibility of the SFL to develop suitable arrangements for use of the road (i.e. maintenance and monitoring). Any arrangement

details will be provided to the District MNRF. Following use of the road for forest operations, the road will be left in as good as or better condition than it was prior to operations. These roads have been included in Table FMP-18 as they could be eligible for provincial roads funding.

The following are general principles applicable to any existing roads or segments or road networks that are the responsibility of the SFL. For detailed information regarding an existing road or road network, refer to individual use management strategies available in Section 6.1.8.2 of the Supplementary Documentation.

Maintenance

The SFL will regularly maintain assigned roads in a network during periods of active harvesting. At other times, roads will not be maintained except as to not place the public at undue risk and/or minimize the potential for environmental damage. In the event of failing infrastructure on roads, or road networks that are the responsibility of the Crown during active operations, the SFL will complete necessary improvements in order to continue operations. Remedial work performed will satisfy conditions and procedures in Module 4 of the *Implementation Toolkit* found in Section 6.1.20 of the Supplementary Documentation.

Monitoring

Road infrastructure (road and water crossings deemed eligible for transfer) to be monitored at a level deemed acceptable by the SFL (i.e. at their discretion to meet 'duty of care'). Generally, operations will be limited to monitoring and risk reduction. The SFL will periodically monitor its assigned roads and water crossings using its stream crossing inspection program to ensure the potential for environmental damage is minimized and the public are not placed at undue risk. It is recognized that if a road or water crossing is not used for industrial use for a prolonged period, its condition will gradually decline and it may require significant upgrading in order to re-establish safe operating conditions for industrial traffic. The SFL would undertake this reconstruction at its expense in order to meet its needs.

In those cases where a Shareholder SFL representative travels an unassigned portion of drivable segments of a road network, any deficiencies or hazards will be provided to the appropriate MNRF District. Similarly, where MNRF staff travel roads or road networks that are the SFL's responsibility as indicated in Table FMP-18, and note any deficiencies or hazards, these would be notified to the SFL.

Access Provisions / Restrictions

There are no access provisions or restrictions unless specifically identified in individual UMSs. Where a road has been transferred from the SFL to MNRF or a third party, the road use management strategy, and associated conditions may change depending on the new road tenure and intent.

Decommissioning

Crossings that fail will be physically removed prior to transfer if subsequent access beyond it is not required. Crossings that are the responsibility of the SFL may be replaced at the discretion of the SFL if required to access future allocations. Road and water crossings may not be restored in a timely manner if damaged or destroyed by unplanned events (e.g. major storm). There is no obligation on the Crown or the SFL to undertake this repair work on behalf of other users who may not have the resources to replace failed infrastructure and they must recognize that access to their business or property could be disrupted at any time.

Substandard or failed crossings that are SFL responsible may be repaired if required for accessing operations in the FMP/AWS or where a hazard exists (as per Module 7 of the Implementation Toolkit). The SFL may accommodate requests to repair/replace crossings that are the responsibility of the MNRF or OTH party where it will be used to access forest operations and is economically practical and/or operationally feasible. In support of this objective, removals by the SFL will be based on the availability of funding through the Provincial Road Construction and Maintenance Funding and/or other MNRF funding sources to address these issues.

Table FMP-11 documents if there are conditions on the road and/or landing that is planned to be used for forest management purposes during the period of the forest management plan, and the road and/or landing that intersects an area of concern for a value. Any conditions on regular operations for existing roads and/or landings are detailed in Module 2 of the Implementation Toolkit.

A forest-wide review of existing roads was conducted to determine which roads should be included in the existing road use layer. Roads included in this layer are those that may be required for use during 2021-2031 or are proposed for transfer in 2021 (those that were previously proposed for transfer in 2011), or are proposed for transfer in 2031 (those that were previously proposed for transfer in 2016 or 2021). Operational roads that exist within a proposed ORB were not included unless they were also proposed for transfer on or before 2031. New operational roads built during the 2021 FMP will inherit the UMS of the road it is connected to post-construction.

The existing roads including network responsibility and intent to transfer are identified on the Road Responsibility map (MU280_2021_FMP_MAP_RoadResponsibility_00.pdf). Existing road information is included in the Existing Road Use Management Strategy Inventory layer (see MU280_21ERU00.shp).

4.5.6. Road Water Crossings

The water crossing standards to be implemented, as described in the *Ministry of Natural Resources and Forestry/Fisheries and Oceans Canada Protocol for the Review and Approval of Forestry Water Crossings* are found in the Implementation Toolkit, Modules 4 and 5. Existing water crossings are identified in the Existing Road Water Crossing

Inventory layer (see the information product: MU280_21WXI00.shp).

4.5.7. Forestry Aggregate Pits

Forestry aggregate pits (FAP) are exempt from the requirement for an aggregate permit regulated under the Aggregate Resources Act. Forestry aggregate pits must remain within the primary and branch road corridor, area of operations or operational road boundary or aggregate extraction area that are identified in the FMP and associated AWS, as revised from time to time.

The extraction of aggregate from forestry aggregate pits for use on forest access roads on the management unit will comply with the exemption criteria as outlined in Module 3 of the *Implementation Toolkit*. This section also details the operational standards and conditions of forestry aggregate pits. Conditions on forestry aggregate pits intersecting an area of concern for a value are identified in Table FMP-11. Conditions on forestry aggregate pits not intersecting an area of concern for values, including operating standards and guidelines are detailed in Module 3 of the *Implementation Toolkit*.

Forestry Aggregate Pits scheduled to be used will be identified annually in the AWS.

Aggregate extraction areas (AEA) are areas within which a FAP will be established, and located within 500 metres of an existing forest access road. AEA's are identified on the Areas selected for Operations Maps.

4.5.8. Wood Storage Yards

Wood holding yards will be identified and portrayed in the FMP. The operational standards for wood holding yards are described in Module 18 of the Implementation Toolkit.

4.6. Expenditures

Table FMP-19 summarizes the planned expenditures by activity and funding source for the 10-year term of the plan. The forest renewal trust fund levels used in the calculation to project the required renewal and maintenance activities are $4.50 per m3 for SPF, $0.50 per m3 for poplar and birch, $8.00 per m3 for white/red pine and $6.00 per m3 for upland (hard maple/yellow birch) and lowland (black ash) hardwoods. These rates are based on actual cost of implementing the silviculture programs on the Timiskaming Forest for the past 20 years. They reflect the funding required to carrying out the LTMD on this forest. These rates are also consistent with the values modeled in the Remsoft model. The calculation of expenditures is based on the renewal activities required to carry out the defined long-term management direction for the first eight years of the FMP term and the last two years of the current forest management plan. Essentially, the planned expenditures reflect the needs to implement the planned renewal and tending activities detailed in Table FMP-17.

4.7. Monitoring and Assessment

4.7.1. Forest Operations Inspections

The goal of the Compliance Strategy is "to encourage and ensure forest operation compliance with legislative and regulatory requirements which contribute to the sustainable management of the Timiskaming Forest in a cost effective and efficient manner".

4.7.1.1. Background

The compliance strategy will guide and direct all companies, overlapping licensees, shareholders, and contracted activities. The Timiskaming Forest Alliance Inc. continues to develop and improve on its policies related to forest management and the environment. The central theme of these policy statements embodies TFAI's "corporate commitment to forest sustainability". The compliance strategy for the Timiskaming Forest will be to voluntarily achieve higher than expected standards with regards to work practices of all shareholder companies. Individual shareholder companies have developed corporate policy statements on Forest Management, Health and Safety, and the Environment. The framework of all these policy statements is a commitment that responsible work practices are essential in maintaining a successful, sustainable, fully integrated forest products company. A key component of each respective policy statement is incorporated under the TFAI umbrella policy statement.

The underlying principle that drives the compliance program is that "all roads, in relation to the administration of the Timiskaming Forest lead to the Forest Management Plan". Every component of the compliance program must be rooted in the existing FMP to be deemed a valid compliance function.

Through a review of historical, present and anticipated compliance issues, an overall reduction in non-compliant occurrences has been observed. The frequency of MNRF spot checks has also corresponded with the reporting frequency of forest industry inspectors. The review suggests that the operational issues are being reported by both groups.

Since its inception on April 1st 1998, the Timiskaming Forest Alliance Inc. has continued to build on its reputation for effectively implementing the forest operations inspection program on the Timiskaming Forest. All the key components developed in the 2001 Timiskaming FMP compliance strategies and annual compliance plans were implemented consistent with its goal of continuous improvement. These components were revisited and improved during the development and implementation of the 2006, 2011 Timiskaming FMPs and this process will continue with the 2021 FMP. The compliance history of its shareholder companies would be described as excellent with the results of both the 2004 and 2009 Independent Forest Audit supporting this assertion. However, in keeping with the TFAI's goal of continuous improvement, a review of its past, present and anticipated future compliance issues are listed below:

- Use of private land boundaries as a harvest block boundary: Numerous errors were identified related to ownership descriptions and boundary locations on FRI maps currently available for the Timiskaming Forest (i.e. Crown versus Private).

- Due to the nature of the Timiskaming Forest there is a potential for either incidental site disturbance or a bypass of inoperable areas when operations are undertaken. Operating where natural regeneration is the preferred renewal option requires that the company continually modify operations and adjust schedules to avoid impacts to sites.

- TFAI continues to develop and maintain open communications with the tourism industry to improve understanding between parties and enhance the credibility of the planning process.

- Recent expansions and modification to existing mills has provided for a gradual increase in the use of underutilized species, however, due to hauling distances in some parts of the management unit, they continue to be uneconomical to utilize. Improvements to road infrastructure may help provide opportunity to process and utilize these underutilized species.

- Lack of proper road planning has lead to an extensive road infrastructure on the on the former Timiskaming Forest (Kirkland Lake District). As a result, complex issues have arisen from conflicting resource use of forest access roads and the restriction of access to other users. It is anticipated that problems may arise from roads deteriorating within these networks of roads that do not routinely see regular maintenance, unless used for forest operations. In cooperation with the MNRF, TFAI must continue to be cognizant of the access concerns of all resource users.

- Values can be missed or not mapped accurately during values acquisition and verification. TFAI, through normal operations, will assist in identifying new values as encountered or verify those documented by MNRF. TFAI will continually support transfer of this information to the MNRF in an effort to document and protect values on Crown lands.

- While modified harvesting within AOC's is a prescription that has been undertaken on the Timiskaming Forest for the past two FMP terms, there is an ongoing need to develop a cost effective and efficient method of implementing these prescriptions on the Timiskaming Forest while ensuring water quality is protected.

- It is expected that from time to time specific timber products will be affected by economic conditions. These situations are cause for concern as the demand for timber from active resource processing facilities is sustained however, not all species are marketable during the time of harvest.

- There continues to be ongoing changes in forest management policy and regulatory regimes, many of which introduce overlapping standards and associated procedures. TFAI in cooperation with MNRF must improve the efficiency of review and approval process and improve operational planning and communication with operators while ensuring legislative requirements are met.

4.7.1.2. Compliance Objectives

Resource protection

- To put the forest ecosystem's well-being as a priority in compliance planning and implementation.

- To ensure that forest operations will not impair or negatively affect forest sustainability.

- To continuously evaluate the impact of forest operations on the natural environment and take all necessary corrective action to mitigate impacts and avoid future impacts.

- To contribute to the protection of the forest against fire, disease and insects through prevention and remedial action.

Overcoming historical compliance problems

- To actively monitor forest operations and undertake analysis and evaluation of results and take corrective action as required.

- To proactively overcome compliance problems.

Continuous improvement

- To develop operating benchmarks (calibration) in forest operations to measure continuous improvement and performance.

- To develop and implement an action plan to remedy compliance problems.

- To develop and contribute to a compliance database with the MNRF to assist in performance evaluation.

Education and Communications

- To maintain and develop new methods that ensures continued open and productive communications between the licensee(s) and the MNRF regarding compliance of forest operations.

- To ensure compliance reporting reflects the nature and complexity of forest operations in a thorough and timely manner.

- To develop and implement methods that ensure MNRF is continually apprised of the current status of operations.

4.7.1.3. Strategies and Actions

Strategies have been developed to meet objectives noted above. These strategies will generally remain in effect for the 10-year term of the compliance strategy and will be reviewed at the Year Five Annual Report to ensure on-going relevancy and continuity with stated objectives.

Strategy 1: Resource Protection

- To ensure that AOC planning is completed for all known values that might be impacted by forest operations and that the resultant prescriptions are implemented;

- To incorporate new values as they are identified, and conduct any necessary FMP amendments, revision or changes to operations in order to improve resource protection;

- To designate harvest areas by season to minimize site disturbance;

- To use sound work planning and work practices to assist the MNRF in protecting the forest against fire, insects and disease.

Actions:

TFAI will continue to use the electronic data transfer and web-based posting of operational maps as a means to ensure immediate availability of new or altered operating conditions to forest workers.

All AOC prescription boundaries are located and marked in the field by trained and competent individuals knowledgeable in the layout and locating of any special conditions of harvest blocks.

Ensure that operating staff of shareholder companies are familiar with both the FMP and various guidelines used to prepare AOC prescriptions.

TFAI will assist government agencies to identify and monitor insect and disease occurrences.

A comprehensive fire plan, including the minimum standards for fire equipment and trained personnel, will be prepared. This shall enable member shareholder companies to modify their harvesting operations during times of high to extreme fire danger ratings and reflects the forest industry protocol between the forest industry and the MNRF fire services branch. Training will be offered when required to maintain TFAI's trained and capable status. Requirements for fire prevention will be addressed through the Fire Prevention and Preparedness Plan described in Section 4.8.

Through its Forest Operations Group, TFAI will develop an environmental management strategy for its forest management operations while remaining consistent with the principles in the forest management plan.

Strategy 2: Overcoming Historical Compliance Problems

- To monitor forest operations on a regular basis with the intent of identifying potential compliance problems before they occur;

- To identify any recurring compliance problems and to implement a strategy to improve compliance in these areas;

Actions:

TFAI and its shareholder companies will conduct Forest Operations Inspections in accordance with MNRF standards and the Compliance Handbook on all company operations. Inspectors are required to submit at least one full report for each active block. Required reports are determined as follows:

- When each harvest operation (e.g. block or group of blocks as identified in the forest inspection schedule) is completed including hauling activities and operational roads that are constructed inside a harvest block or roads associated with a contiguous group of blocks that have a single FMP harvest block identifier (e.g. Black 170), reporting the completion of an operation or activity will be submitted to MNRF within 20 working days.

- When each forest access operation is completed, reporting of any road construction outside of the harvest block and/or all water installations and aggregate activities will form part of the "Completed Access" FOIP report. Ongoing maintenance will continue as required after the initial construction is complete and any physical removal work shall be documented in the final harvest FOIP under Operational Road activity to be submitted to MNRF within 10 working days of completion of an operation or activity.

- When each forest Primary and Branch access operation is completed, access reports will detail forest operations associated with the construction of any Primary or Branch roads identified within the FMP. It is understood that access reports will

be filed as soon as all road construction activity is completed into the harvest block and/or all water crossing have been completed and submitted to MNRF within 10 working days of completion of an operation or activity.

- When a renewal and maintenance program is completed, a report will be provided to MNRF within 20 business days of completion of the operation. If an issue has been identified, the required reporting timeline is 10 business days.

The following operation types will be used when reporting:

- **Start-up** – Must be submitted as soon as activity commences and is completed. Notices are considered reports and can be used by MNRF to conduct verification inspections. (i.e. considered as a release). Once advised by the shareholder representative the notice is tracked by TFAI. A summary is submitted weekly to MNRF. Required notices are as follows:

    - Start-up of Forest Operations (harvest, access, renewal or maintenance)
    - Completed Access
    - Completed Harvest (i.e. felling, skidding, hauling, slash piling)
    - Completed Renewal or Maintenance
    - Suspended Forest Operations

- **Suspended Operations** - Prepared if suspension of operations is expected to exceed 20 working days (i.e. one month). Area can be released when full report documenting progress at time of suspension is completed.

- **Completed** - Full report on completion of all forest operations for each individual block identified in the Compliance Plan. For Compliance Reporting Area (CRA), a full report at mid-point in operation for larger harvest blocks when harvest area reaches 500 hectares.

- FOIP will be used to record compliance inspections. This database can then be analyzed to determine compliance trends. Should recurring problems be identified, specific action plans will be developed to prevent the operational issues from reoccurring. Alternatively, where trends confirm that operations routinely have been meet or exceeded, or monitoring and reporting requirements and audits of operations confirm continuous improvement in work practices, then a decrease in reporting frequency would also be considered. Either condition could result in revisions to the Annual Compliance Schedule.

- Each operating year and prior to the preparation of the next compliance schedule, TFAI and MNRF will meet to identify and discuss compliance problems encountered during the previous operating year for submission into the Annual Compliance Schedule. Trends will be identified and highlighted as priorities for

the Forest Operations Inspection program in the subsequent annual compliance schedule.

Strategy 3: Continuous Improvement

- To develop an action plan designed to remedy recurring operational issues.
- Development of a compliance database in order to assist in performance evaluation
- To complete all requirements of compliance in a cost-effective manner
- Ensure the cooperation and therefore the best use of TFAI, Shareholder company and MNRF staff
- To conduct operations in a manner that meets or exceeds environmental standards.
- To encourage full utilization of the forest resources. Forest resources must be used efficiently through the minimization of waste and the production of high-quality products.

Actions:

All identified instances of operational issues will be reviewed with the appropriate operating personnel with the goal of "continuous improvement". Results will be documented and updated to review and correct trends with the *TFAI Forest Operations Group* and will facilitate communication across the license area and ensure consistent work practices.

As part of the principles of the self-compliance program, shareholder company staff will conduct routine inspections which allow MNRF staff to concentrate on core business areas. Inspections can be performed as part of the shareholder company representative's daily routine reducing transportation and other administrative costs.

A representative of the SFL may accompany MNRF inspectors during the course of their verification inspections on the Timiskaming Forest of non-compliance Forest Operation Inspection (FOIP) Reports.

Use of the MNRF's electronic reporting and analysis system as originally intended will reduce the administration workload associated with compliance monitoring and reporting. Reliance on the qualifications of certified inspectors and existing internal reports will reduce reporting requirements in FOIP.

Maintain open communication with MNRF staff in order to stay current with changes in government policies, procedures and rules.

As it strives to improve its self-compliance role on the SFL, the *TFAI Forest Operations Group* will continue to meet on a regular basis to provide both peer support and establish a venue to transfer new and acquired knowledge between its member companies.

Strategy 4: Education and Communications

- To educate and train shareholder in order to maximize compliance with the FMP and CFSA.

- To encourage shareholder companies to report instances of operational issues, and create a work environment that ensures that no one shareholder or its employees are penalized unnecessarily for reporting.

- To communicate and report all instances of operational issues as per the timing requirements outlined in the Forest Compliance Handbook, to ensure that environmental protection and worker and public safety are not compromised.

- To educate and train representatives of the SFL, shareholder company employees and their third-party representatives regarding work techniques that maximize compliance with the FMP, CFSA, Fisheries Act and other provincial and federal regulations, policies and guidelines.

Actions:

Joint MNRF/TFAI on site meetings will be conducted to assist in the calibration of new plan prescriptions where stand level prescriptions can be adjusted to meet the spirit and intent of guides.

All potential operational issues will be investigated during the course of routine forest operation inspections and reviewed with the appropriate operating personnel with the goal of "continuous improvement". True to the goal of the compliance strategy, TFAI will investigate the occurrence, mitigate the problems and develop techniques to avoid reoccurrence.

All instances of operational issues will be reported to the District Forest Compliance Contact for verification.

All SFL representatives and shareholder company employees will be trained in proper work techniques through internal training programs, to ensure compliance with all government regulations and TFAI standards. Changes in government regulations and TFAI standards will be communicated to shareholder companies at regular shareholder meetings or as required in the course of normal business.

All shareholder company work practices will be monitored through the normal workplace inspection process. All identified instances of operational issues will be investigated and reviewed with the appropriate operating personnel with the goal of continuous improvement.

Forest operations inspections (FOIP reports) will be completed by certified inspectors who have attended and passed the MNRF Provincially approved Forest Operations Compliance Inspection Certification Program.

4.7.1.4. Roles and Responsibilities

There are a number of specific functions related to the preparation and implementation of the compliance strategy. The following are the roles and responsibilities for those functions:

1. Compliance Strategy – TFAI will take the lead role in preparing the compliance strategy. The MNRF will also provide advice and information to TFAI as required.

2. Company Inspector - Forest industry employee/worker who has attended and successfully completed an approved forest operations compliance inspection training and certification program and all requirements for maintaining certification. Based on the compliance history and self-monitoring experience of each shareholder company, a combination of the following seven alternatives may be employed:

    a. Compliance inspections for harvest and access will be carried out by an employee of the shareholder company (i.e. dedicated position/experienced foreman) who currently is responsible for the operations of the designated block. This individual will be qualified to Ministry compliance standards.

    b. Compliance inspections by a Contract Forest Inspector. This individual shall be qualified to Ministry compliance standards and must be certified.

    c. Other company personnel such as harvest foremen for the third-party contractors on the individual shareholders operations which will be involved in daily operations monitoring and take part in some inspections and reporting. This individual will be qualified to Ministry compliance standards.

    d. Periodic spot checks and advice will be provided by Licensee Representative to ensure a consistent approach between shareholder companies.

    e. A Licensee Representative will carry out compliance inspections for all renewal and maintenance activities.

f. Sign-off responsibility on Inspection Reports – The supervisor in charge of each operation will be responsible for their compliance functions. Ultimately the sign-off on FOIP Inspection Reports will be by a representative of the Licensee.

g. Operational Issues are generated by the Company inspectors within FOIP reports. Where additional "corrective action" is required, it will be assigned by the MNRF. Shareholder company representatives responsible for the operation or activity will undertake the corrective action. The operational issue will be tracked by the Licensee Representative until resolved.

3. The Licensee will conduct follow-ups.

4. A representative of the Licensee will lead compliance matters.

5. Responsibility for Training – Training will be conducted by a variety of Licensee Representative, Shareholder Company, MNRF and outside personnel to address specific circumstances

6. Timiskaming Forest Alliance Inc. will ensure the implementation of the compliance plan. Any changes to the roles and responsibilities occurring on a year over year basis will be communicated to the lead District, if required.

7. Forest Management activities carried out by third party operators on the Timiskaming Forest will be subject to the same objectives and strategies as those of the Timiskaming Forest Alliance Inc. operations.

4.7.1.5. Notification of the Status of an Operation

A status report of forest operations will be prepared and used by TFAI to document operations. A summary of this report will be sent weekly via email to the identified District Forest Compliance Contact(s), and will be designed to meet the requirement to notify:

a. At start-up of a harvest, access, renewal and maintenance, and protection operations

b. When each forest operation (e.g. specific FMP block) is completed and,

c. When each forest operation (e.g. specific FMP block) is suspended and,

d. At any other time as specified in or directed by the forest management plan.

These notices will serve as the requirement to advise MNRF when harvest operations are completed sufficiently to be released for inspection prior to the commencement of a renewal operation (Release Notice).

4.7.1.6. Prevention, Avoidance and Mitigation

Emphasis will be on prevention of undesirable activities or occurrences and mitigation of any loss or damage. The root cause of an undesirable activity or event will be determined and appropriate action prescribed. Action will be consistent with the potential for non-conformance to legislation and the ability to adapt so that operational issues do not become a recurring problem. This positive action will be delivered by forest industry staff and will focus on learning and adapting.

Ensuring that action occurs will be the responsibility of the SFL. In areas with high values, the Ministry of Natural Resources and Forestry will verify the identified Operational Issue. MNRF may then determine and assign Corrective Action as appropriate. In instances where the Industry inspector determines a situation to be clearly non-compliant, the direction will be that work will stop on that part of the operation and the inspector will submit a report of an Operational Issue.

In the event that any operating personnel identify a possible operational issue during on-going monitoring of operations, the person will undertake one of the following actions to meet legislative requirements:

a. In the event that the operational issue is in violation of an approved plan or a threat to the environment, the person will immediately stop the activity and take the necessary steps to stop further operational issues. The occurrence will be immediately reported to the licensee Operations Program Manager, MNRF and MECP (as required) will be notified within 24 hours of the incident;

b. In the event that the operational issue is not in violation of an approved plan or a threat to the environment, the member company and foreman will take the necessary preventive action to remedy the operational issues and report to the Operations Program Manager.

c. Prior to conducting any remedial action within areas of concern, water bodies, water crossings etc., the MNRF will be contacted for advice, assistance and approval of remedial action.

In all cases the *Operational Issues* function, which forms part of the FOIP report system, will document decisions related to the remedial plans and subsequent work related to the occurrence.

4.7.1.7. Compliance Reporting Area(s)

Compliance Reporting Area(s) (CRA) are areas of land described for the purposes of forest compliance reporting and for which a forest operations compliance inspection report will be submitted.

CRA's will be identified according to the block numbers as identified on Areas Selected for Operations Maps. In all areas where proposed harvest blocks exceed 500 hectares, these blocks will be broken down into CRA's of less than 500 hectares. Each CRA will be reported on separately in FOIP.

Renewal and maintenance will be reported at the completion of the activity (e.g. site preparation). A final inspection report for the entire program will be entered into FOIP within 20 working days of the completion of the last site.

4.7.1.8. Monitoring Compliance of Forest Operations

The responsibility for the monitoring and prevention of operational issues on forest operations will remain with a representative of the Licensee and/or field staff of the shareholder companies. These functions will be carried out as part of their regular duties.

The Annual Plan of Action provides inspectors on each forest operation with information on known values, operating prescriptions and the expected timing and frequency of inspections.

The onsite supervisors, for whom the activity is to be undertaken, will carry out regular monitoring of operations as set out in internal policies and procedures. Shareholder Inspectors will continue to make operators aware of sensitive issues or concerns (e.g. eagle nest, timing restrictions) prior to the commencement of operations. Where shareholder companies have established a proven compliance record for forest operations, alternative methods of inspections (e.g. remote sensing versus ground inspections) will be pursued in each year, in order to improve cost effectiveness and efficiencies.

Sign off responsibilities for Operational Issue Reports is the responsibility of the Licensee representative. The Licensee will assign follow-up actions and remedial work related to Operational Issues or non-compliant occurrences to the shareholder company.

4.7.1.9. MNRF District Program

The MNRF Districts will follow provincial direction when monitoring forest operations such as access, harvest, renewal, and maintenance on the Timiskaming Forest. This direction includes the MNRF *Forest Compliance Handbook* (2014) and the approved Ministry of Natural Resources and Forestry/Fisheries and Oceans Canada *Protocol for the Review and Approval of Forestry Water Crossings* (2017). Penalty records for the Forest will be based on using *Policy and Procedure FOR 07 06 01 Remedy and Enforcement Overview and FOR 07 06 06 Administrative Penalties –Determining Amounts and Application.*

The roles and responsibilities of each District are outlined in the *Inter-District Protocol between Kirkland Lake and Timmins Districts for the Timiskaming Forest*. Kirkland Lake

District will be the lead for compliance on the Timiskaming Forest. This includes tracking all MNRF compliance tasks for the entire Forest, ensuring that forest compliance is administered consistently across the Forest, and that customer service levels to clients are maintained.

Each District will have a compliance and monitoring program based on their own staffing levels and priorities; however, they will regularly liaise with and provide Kirkland Lake with all required information. This includes, for example, setting priorities in the District Annual Compliance Operating Plan (ACOP), submission and approval of Forest Operations Inspection Program (FOIP) reports, notification of operational issues, establishing compliance committee teams and determining remedies, as well as providing copies of all notices, penalties and warnings.

The individual MNRF District staff roles, and competencies are updated annually in the respective District ACOP. The Districts will use a risk-based approach to develop monitoring priorities and targets across the full range of forestry operations that occur (i.e. no longer attempt an "audit" of 10% of operations), These priorities will be identified in the forestry portion of the District ACOP.

District staff will monitor forest operations through regular area inspections, aerial imagery, analysis of annual and other reports, and when required, individual inspections. Compliance and monitoring efforts for water crossings using a water-crossing standard will focus compliance with the requirements set out in the applicable water crossing standard and determining if the selected water crossing standards are appropriate for the actual site conditions at the crossing. The MNRF's web-based FOIP will be used to document inspections, compliance and task issues associated with operational issues, and if required, to track that remedial actions have been completed.

4.7.1.10 Communication to LCC

The Terms of Reference for the LCC does not contain specific commitments regarding the involvement of committee members in forest operations inspections, and MNRF District monitoring of forest operations on the Timiskaming Forest. Committee members are, however, provided with compliance performance summaries during the Annual Report presentation each year. Compliance monitoring may also be discussed, when requested, during regular LCC meetings. LCC members are also invited to attend and participate in Independent Forest Audits.

4.7.2. Exceptions

The FMPM requires an exceptions monitoring program be prepared for any operational prescriptions contained in an FMP for areas of concern or silvicultural ground rules that differ from specific direction provided in a forest management guide. The exceptions monitoring program describes methods that will be used to monitor the effectiveness of the operational prescriptions.

None of the operational prescriptions planned or silvicultural ground rules for implementation under this FMP are exceptions to approved forest management guides, therefore an exceptions monitoring program is not required.

4.7.3. Assessment of Regeneration

A summary of the area, which will be assessed for the determination of free-growing achievement by forest unit, has been provided in Table FMP-20. TFAI schedules an assessment on all areas that were currently regenerated (either naturally or artificially) a minimum of five years after harvest operations are completed. A total of 102,295 ha is planned for assessment during the ten-year period. This is an estimation of the area to be assessed by forest unit based on the following criteria;

- All areas currently treated and scheduled to be assessed within the course of plan implementation (actual)
- All areas remaining in the previous FMP that will be treated and eligible (forecast)
- All areas scheduled to be harvested during plan implementation and expected to be eligible to be assessed within the course of plan implementation (forecast)

This forecast also includes the assessment of natural disturbance areas originating from various recent blowdown and fire events.

Effectiveness monitoring is used to determine if management activities are producing the expected results. Effectiveness monitoring enables the forest manager to determine whether the current forest units are being changed to the desired forest units in the proportion described in the FMP. It also permits the forest manager to examine whether certain treatments are meeting expectations and, if they are not, to investigate why they were not successful as expected and make appropriate modifications in the future. An example of the analysis resulting from silvicultural effectiveness monitoring efforts taking place can be reviewed in Section 4.7.1 of the Analysis Package found in Section 6.1.1 of the Supplementary Documentation. This type of analysis provides practitioners the information needed to confirm silvicultural treatments over time. These results are used to adjust yield expectations and post-renewal succession in the development of FMP objectives.

Section 6.1.7 of the Supplementary Documentation includes a detailed monitoring plan for assessment of the regeneration program. It includes the overall program objectives, the methodologies used for assessment, a description of the timing and duration of assessments, documentation and reporting requirements and LCC roles and opportunities with the silvicultural effectiveness monitoring program.

A silvicultural exception monitoring program is not required for this FMP, as none of the proposed silvicultural treatments are exceptions to the recommendations identified in the silvicultural guides.

4.7.4. Roads and Water Crossings

A description of the monitoring program for SFL-responsible roads and water crossings to be carried out during the 10-year period is provided in Module 6 of the *Implementation*

Toolkit. This module includes the methods to be used to inspect the physical condition of roads and water crossings, and the frequency of the inspections to determine if there are environmental or public safety concerns.

A map of roads or road networks that are the responsibility of the SFL describing those segments that will be monitored is available on the Road Responsibility Map (See MU280_2021_FMP_MAP_RoadResponsibility_00.pdf).

4.7.5. Species at Risk

A Handbook describing Species at Risk is provided to all Shareholders and posted on the TFAI website for all workers on the Forest. This document outlines the reporting requirement when Species at Risk are sighted. Compliance with AOC prescriptions or Conditions on Regular Operations that have been applied to protect Species at Risk will be monitored as a part of the regular compliance monitoring through the Forest Operations Inspection Program (Section 4.7.1).

4.8. Fire Prevention and Preparedness

Module 16 of the *Implementation Toolkit* in Section 6.1.20 of the Supplementary Documentation includes the Timiskaming Forest Fire Prevention and Preparedness Measures. These measures are to be implemented by the shareholders of the Timiskaming Forest Alliance Inc. for the ten-year period. They describe how the SFL intends on preventing the start of wildfires, and how forest workers will be prepared to take immediate action to suppress small fires. The measures also include details on business practices and guidelines for modifying industrial operations, which were developed for fire prevention, preparedness and suppression purposes. Described in the Fire Prevention and Preparedness Measures is;

a. a description of communication plans, equipment standards and inspections, monitoring compliance and how prevention efforts will increase during periods of high fire danger;
b. a description of how forest workers will be made aware of fire prevention plans and initiatives;
c. a description of how forest workers will be trained to take part in fire suppression

4.8.1. Promoting Fire Prevention and Fire Prevention Efforts during Periods of High Fire Danger on the Timiskaming Forest

4.8.1.1. Promoting Fire Prevention on the Timiskaming Forest

The Fire Prevention and Preparedness Measures will be governed by the general principles outlined in the AFFES Policy FM 2.15, Forest Operations by Forest Industry Business Practices. This protocol has been developed with the understanding that the Forest Industry is a partner in forest fire management with a vested interest in fire prevention and effective fire suppression. The TFAI will work closely with the Ministry of Natural Resources and Forestry and its member shareholder companies to facilitate a comprehensive and effective Forest Fire Prevention and Preparedness Plan. Shareholders will be encouraged to continue building upon their existing fire prevention measures to minimize risks and increase efficiencies. A comprehensive fire plan including the minimum standards for fire equipment and 25% trained personnel will enable member shareholder companies to modify their harvesting operations during times of high to extreme fire danger ratings. Training opportunities will be offered on a regular basis. Equipment and trained personnel lists will be maintained by TFAI and provided as required.

Fire Prevention Rules and Regulations for forest operators on the Timiskaming Forest have been prepared and will be available to forest workers as part of the *Implementation Toolkit* in Module 16 in Section 6.1.3 of the Supplementary Documentation. These rules and regulations will be in place during the fire season.

4.8.1.2. Communication

MNRF is notified of completion through submission of the weekly status report prepared as part of the Annual Compliance Plan requirements. The Forest Notification and Timber Volume Tracking System (NTV) also provides MNRF designates with Fire shut down and restart status. TFAI provides fire staff with access to maps that can be utilized in the event of a wildfire. These maps are posted on the Timiskaming Forest website at www.timfor.com and include details that would support overall protection of the resources in a fire situation. Insets provided on the map include; field ready GPS maps with grid overlay, harvest block size and available water sources locations, proposed road locations, stand listing with estimated volumes by species, closest primary road location in relation to the block, known values requiring additional protection and/or consideration and a relief map of area indicating terrain in and around the block. This web-based information is part of the SFL's response to providing operations information to other resource users and partners on the Timiskaming Forest.

An updated list of emergency contacts for fire hazard reporting is also developed and submitted to Fire Management prior to the commencement of each fire season as part of the Annual Work Schedule submission. In addition, shareholders are capable of communicating in the field with 2-way FM frequency radios, usually monitoring the Common Logging Radio Channel. Further to this capability, cellular phones cover a large portion of the Timiskaming Forest landbase. Many contractors also now provide satellite phones or In Reach Units to front line supervisors when operations take place in remote locations.

4.8.1.3. Equipment Standards

As a minimum, Shareholders will maintain the required suppression equipment required by operations as specified in Table 1 of the *Modifying Industrial Operations Protocol*. Vehicles normally licensed for highway travel are not considered heavy equipment (e.g. pickup, haul or gravel trucks) when determining the required suppression equipment on the operation.

4.8.1.4. Inspections

Shareholder operators will remain responsible for routinely assessing the fire hazard situation on each site as operations progress, contacting Timmins Fire Indices Hotline for Fire Intensity Codes, determining the level of response to a fire hazard and notifying TFAI of fire status of operations for each harvest block using the Forest Notification and Timber Volume Tracking System (NTV) Contractor fire-ready capabilities continue to improve over time. Although the reporting arrangements may adjust to meet an ever-changing business environment, both Shareholder and primary forestry contractor capabilities related to the forest fire prevention and preparedness are updated and provided as required during the term of the plan.

TFAI silvicultural operations are generally deemed as low risk with the exception of Mechanical Site Preparation. However, TFAI contractors are responsible for assessing fire hazard situation on each site, contacting the Hotline for Fire Intensity Codes, determining level of response to fire hazard and notifying the company of current operating conditions.

Companies will ensure sufficient staff and equipment is available on site for each particular harvest block in order to meet or exceed the limits specified in the *Modifying Industrial Operations Protocol*. Certified inspectors will ensure that Forest Operations Inspection Program (FOIP) reports are used to document the final compliance status of fire prevention and preparedness on operations during the fire season.

4.8.1.5. Monitoring Compliance with the Forest Fires Prevention Act

Refer to Module 16 of the *Implementation Toolkit* for Fire Prevention Rules and Regulations for forest operators on the Timiskaming Forest. These rules and regulations will be in place during the fire season with operational modifications made as specified in the *Modifying Industrial Operations Protocol*. Module 16 details operating and patrol requirements in response to site and equipment risk as well as fire intensity. Companies will ensure that forest operations adhere to fire prevention measures as part of conditions on normal operations through the following actions;

- Training to determine operational risk and fire danger under the *Modifying Industrial Operations Protocol* will be carried out periodically to ensure forest worker competency in the use of decision tables provided.

- In addition, the TFAI and its shareholder company employees may patrol work areas on weekends. If tourists are encountered, they will be advised of the extremely hazardous conditions. Refer to Module 16 of the *Implementation Toolkit* for fire suppression measures to be carried out by the shareholders and their contractors.

- In the event of High Fire Hazards, shareholders will ensure that operators are aware of rising hazards and remind them to check that all fire suppression equipment is in working order and on site. Once the Fire Hazard has reached the high hazard designation then additional precautions will be put in place consistent with the *Modifying Industrial Operations Protocol*. During high hazard each shareholder company will be required to patrol the work area after all workers have left the site.

- In the event of Extreme Fire Hazards each shareholder company will be required to patrol the work area for at least one (1) hour after all workers have left the site. In addition, the TFAI and its shareholder company employees may patrol work areas on weekends. If tourists are encountered, they will be advised of the extremely hazardous conditions. Fire suppression measures to be carried out by the shareholders and their contractors are detailed in Module 16 of the TFAI *Implementation Toolkit*.

4.8.1.6. Fire Prevention Efforts during Periods of High Fire Danger

During periods of high fire danger all operations on the Timiskaming Forest will follow the *Modifying Industrial Operations Protocol*. These guidelines allow for forest operators to become "trained and capable" with respect to fire suppression. With this designation an operator can continue to operate under slightly higher fire danger conditions.

TFAI will be the primary contact for the MNRF and its member shareholder companies. All situations and inquiries will be handled out of the TFAI offices in New Liskeard or Kirkland Lake, ON. In the event of a fire or a high fire danger rating, TFAI will relay these conditions to the MNRF and its member shareholder companies as required to ensure a safe and effective response. During preparation of the AWS, a list of TFAI and Shareholder primary contacts for all the member shareholder companies will be provided.

4.8.1.7. Forest Workers Awareness of Fire Prevention Plans and Initiatives

The AWS will indicate which companies have sufficient staff and fire suppression equipment available to be deemed "Trained and Capable" as well as provide an itemized list of fire suppression equipment that will be available and maintained on areas where operations are occurring. As well, Module 16 of the *Implementation Toolkit* provides specific direction to forest workers on the fire prevention rules and regulations for operations on the Timiskaming Forest. These conditions and procedures will be posted on the Timiskaming Forest website www.timfor.com and will include details that will support overall protection of the resources in a fire situation.

4.8.1.8. Forest Workers Fire Suppression Training Initiatives

TFAI shareholders are encouraged, prior to commencement of operations, to train their contractors according to MNRF forest fire, prevention and suppression policies. During periods of high fire danger, all operations on the Timiskaming Forest will follow the *Modifying Industrial Operations Protocol*.

- In order to be certified as "trained and capable", a minimum of 25% of the workers on a particular site must have completed the MNRF SP-102 training course. TFAI currently holds a training agreement with the MNRF to provide for the initial SP102 Firefighting Training for Forest Workers. TFAI will recognize staff trained at the SP-102 level for three (3) seasons following the point at which the course was taken. Re-certification of the forest industry employee competency will be carried out every three years as required

- Additionally, TFAI has participated in the train-the-trainer sessions related to implementation of the decision keys based on the *Modifying Industrial Operations Protocol*. The SFL has actively delivered training to forest workers on determination of operational risk and fire danger and this will continue on an as-needed basis over the term of the FMP.

4.9. Comparison of Proposed Operations to the Long-Term Management Direction

A comparison of proposed harvest, renewal and tending levels to the Long-Term Management Direction (LTMD) is required to determine whether the implementation of the proposed operations as planned will result in the achievement of progress towards meeting the objectives in the LTMD. This assessment compares the planned harvest operations detailed in Table FMP-11, renewal and tending operations detailed in Table FMP-17, the stand conditions of the planned harvest areas to the eligible harvest areas and examines the effect of the age-class distribution and the projected harvest volume of the planned harvest area on the achievement of the LTMD.

A comparison between the actual planned forest management operations for the ten-year term of the plan was modeled against the LTMD results using the Remsoft model. For this model run, allocated areas that have a harvest level of 50% or 0% (e.g. AOCs) are not considered operable for harvest in later terms. For this purpose, an additional theme has been defined in the model to exclude these areas from the operable landbase. This theme contains three attributes: Areas that have harvest level of 0 or 50 are tagged with "LOCK0" and "LOCK50" attributes, respectively. Other areas are tagged with a "NOLOCK" attribute. Allocated areas have been hard-wired into the model using the "LPSCHEDULE" section. Clearcut action (aCC) has been excluded from period one (i.e. 2021-2031) to avoid extra harvest in this period. Targets in the "Optimize" section have been slightly adjusted compared to the Selected Management Alternative (SMA) version so that a feasible solution gets generated for the model.

Harvest and volume levels, renewal program, forest diversity levels, forest composition and age class distribution have all been examined to confirm that the planned operations are consistent with the LTMD.

The proposed operation scenario results indicate that it can represent the LTMD in Term 1 (ten-year term) and progress towards the desired future forest condition. Analyzing the results of this scenario demonstrates that planned forest management operations (harvest, renewal and tending) are contributing to the achievement of forest management objectives such as those related to forest condition (species and age), renewal and tending levels. Planned operations were shown to be consistent with the LTMD in moving towards the desired future forest condition.

<u>Annual Harvest Area</u>

The total annual harvest area of the proposed operations is well within the expected level of variation projected in the LTMD. Harvest area is one of the projected elements used to confirm that the proposed operations are consistent with the LTMD and supports progress towards the desired future forest condition. Figure 77 details the difference in harvest area distribution between the LTMD and the proposed operations from term to term projected to a 150-year horizon. When selecting stands for harvest, every attempt was made to select

those stands which the area by age class best represents the AHA by FU and age class. However, in some cases allocating to the exact available harvest area and age-class combination is not possible. Most often, the primary cause of age-class substitution is mainly due to establishing the economical spatial configuration of harvest blocks not addressed through non-spatial modeling. Section 4.3 describes the rationale for the substitution present in Table FMP-12 and associated rationale.

Given that the total annual harvest area of planned operations does not differ widely from the LTMD, variations in annual harvest area for individual forest units between the LTMD scenario and the Proposed Operations is minimal.

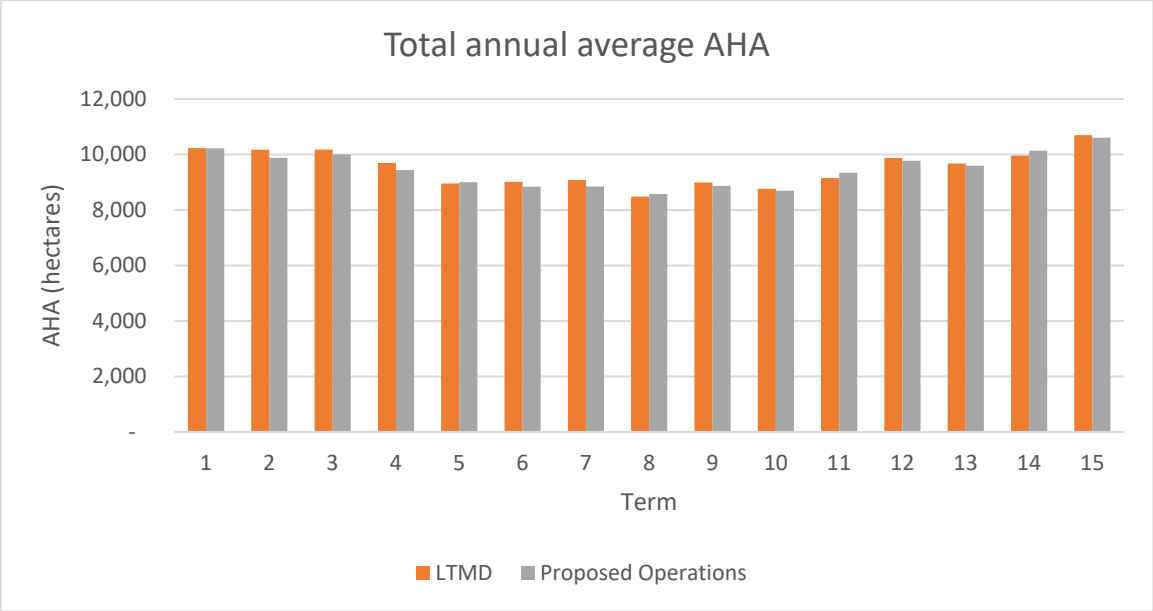

Figure 77. Comparison of annual average harvest areas between the LTMD (orange) and Proposed Operations (gray).

Harvest Volumes

Figure 78 through to Figure 85 portray a comparison of the projected volumes in the Proposed Operations scenario results (in grey) to that of the LTMD scenario (in orange). Results show that planned levels of operations have insignificant deviation from the projections in the LTMD. During the allocation process, stands that match the average stand condition in the Remsoft model are often not allocated due to access, operability or other conflicting spatial objectives and residual target achievement requirements. These small differences between projected and planned volumes are consistent with the variation in sites, and therefore stand volumes found on the Timiskaming Forest. The sites in the northern section are established on clay soils which tend to be productive, high yielding

sites for hardwoods, while the areas in the east, west and southern portions of the unit are sand to sandy-loam sites which are less productive. There is very little variation in the total annual average harvest volumes. Expectedly, this trend is repeated for each species group. The most notable differences exist in the smaller species groups, such as Other Hardwood and Red and White Pine. This is due to OH1 being a smaller forest unit, therefore volumes the limitations in the spatial configuration of harvest allocations will have a disproportionally higher influence on the harvest levels. In terms of Red and White Pine, volumes are derived from forest units other than PR1, PWR_L and PWR_H, but the influence of the spatial configuration of harvest allocations will similarly have an impact. there is However, in all cases, the variation is insignificant.

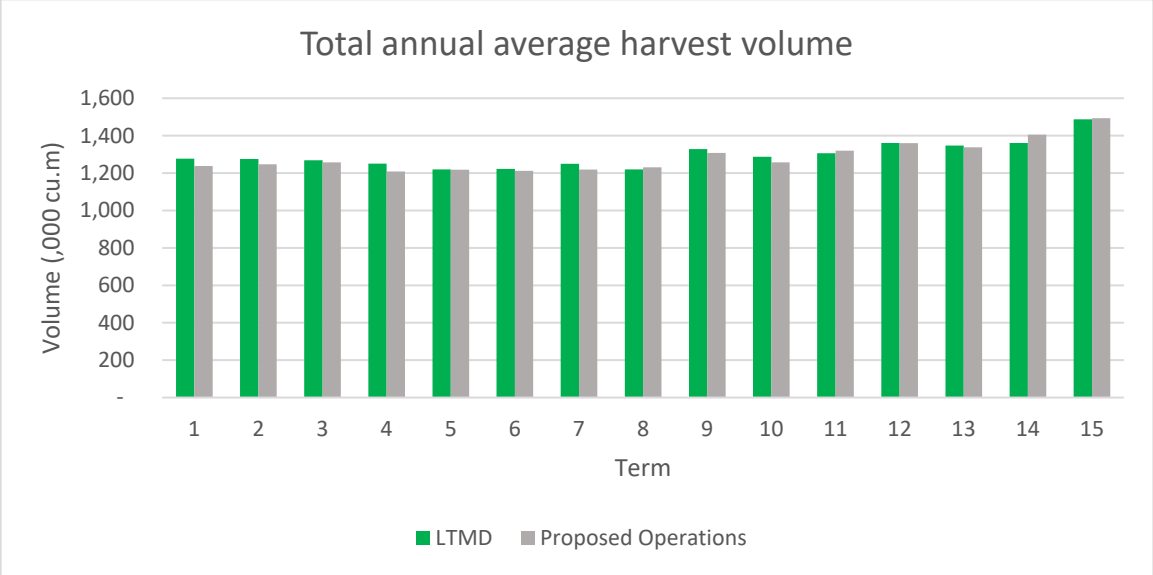

Figure 78. Comparison of total annual average harvest volume between the LTMD (orange) and Proposed Operations (grey).

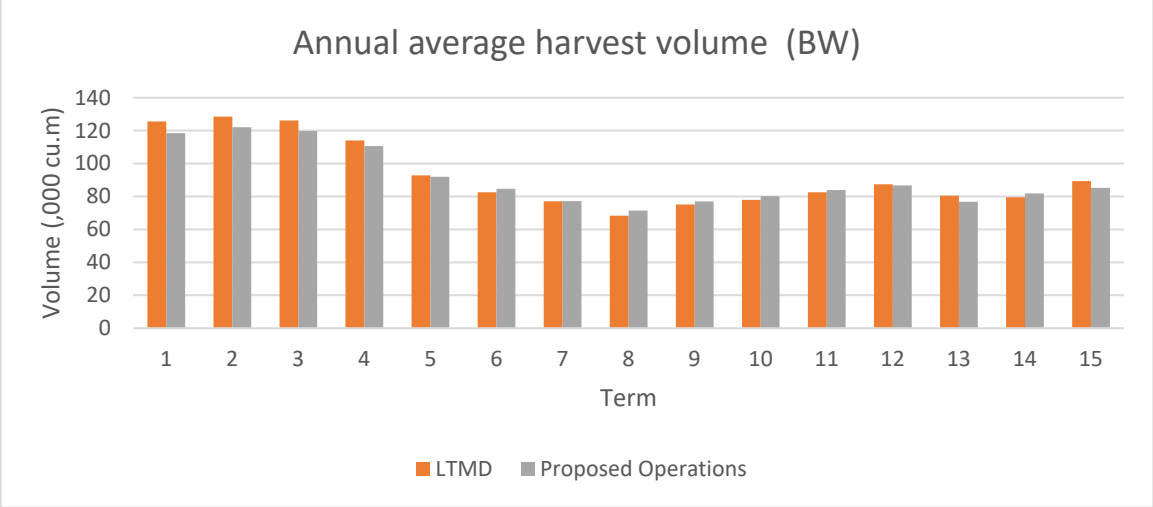

Figure 79. Comparison of White Birch Species Group annual average harvest volume between the LTMD (orange) and Proposed Operations (grey).

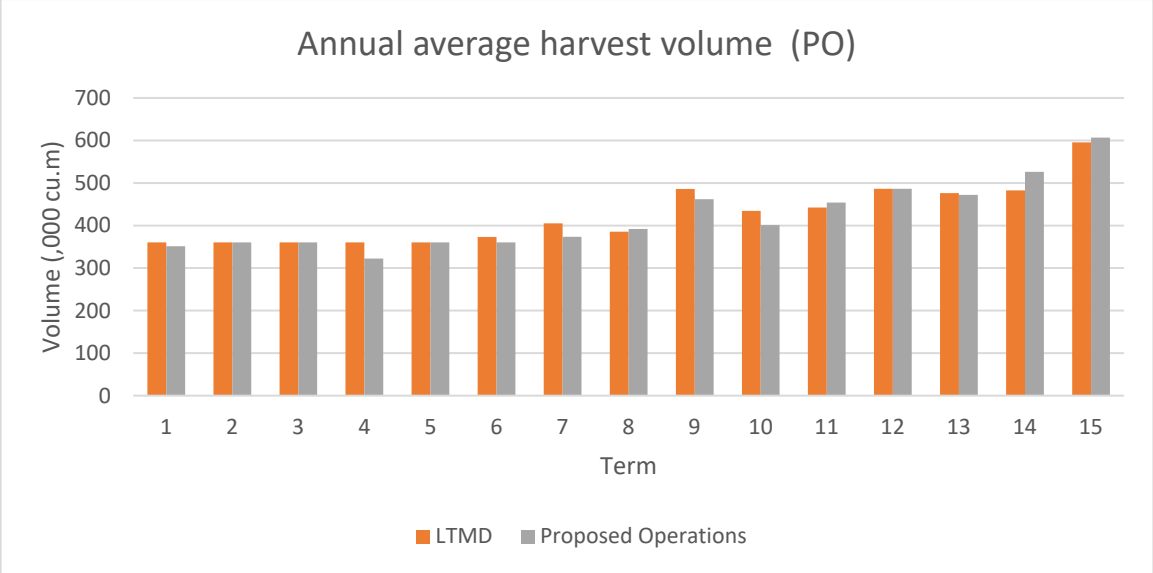

Figure 80. Comparison of Poplar Species Group annual average harvest volume between the LTMD (orange) and Proposed Operations (grey).

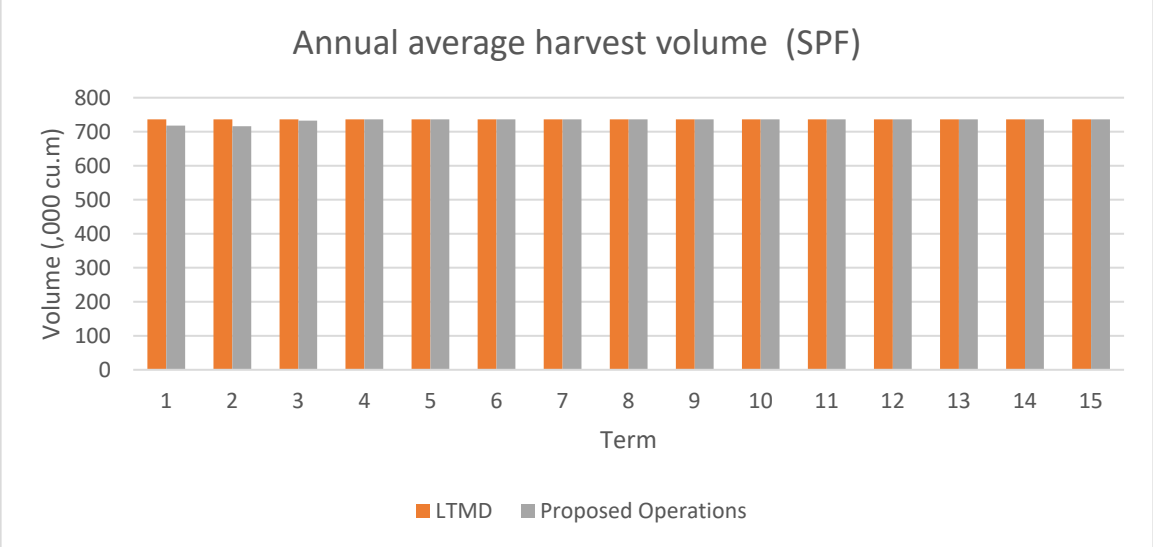

Figure 81. Comparison of Spruce/pine/Fir Species Group annual average harvest volume between the LTMD (orange) and Proposed Operations (grey).

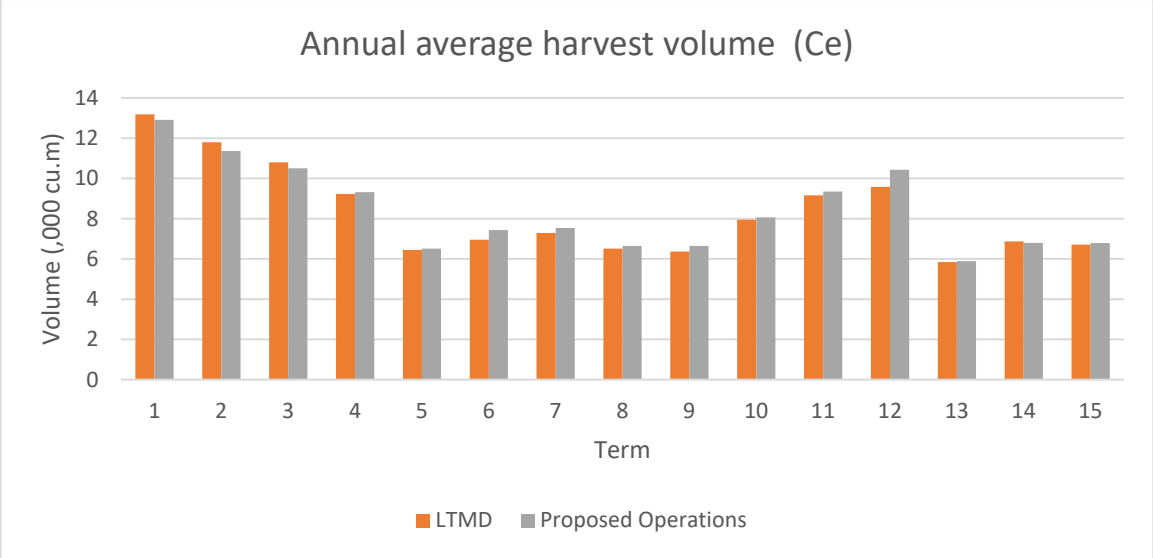

Figure 82. Comparison of Cedar Species Group annual average harvest volume between the LTMD (orange) and Proposed Operations (grey).

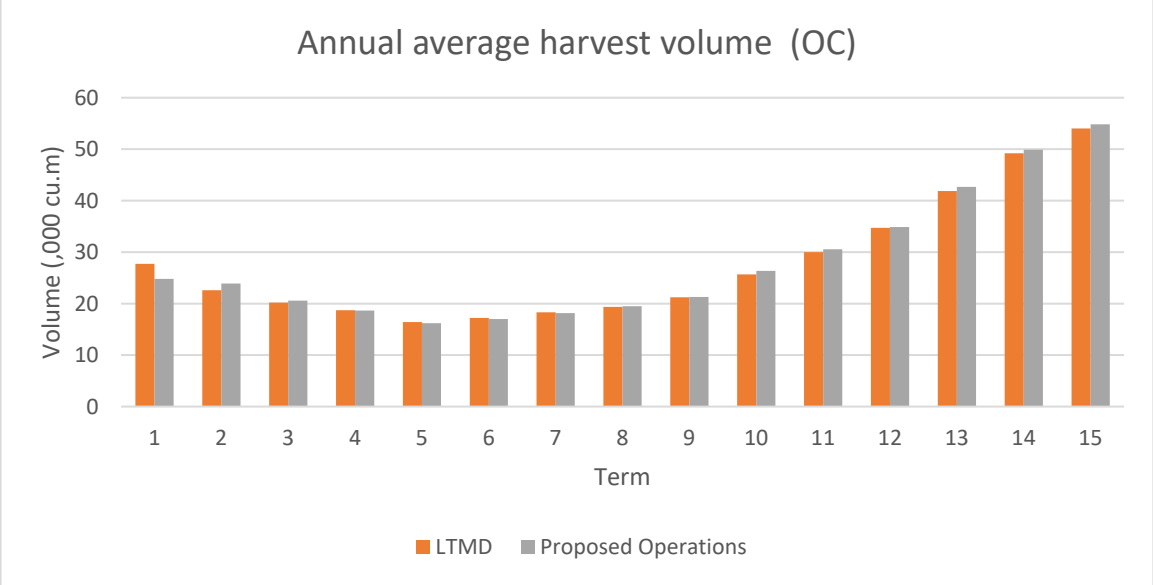

Figure 83. Comparison of Other Conifer Species Group annual average harvest volume between the LTMD (orange) and Proposed Operations (grey).

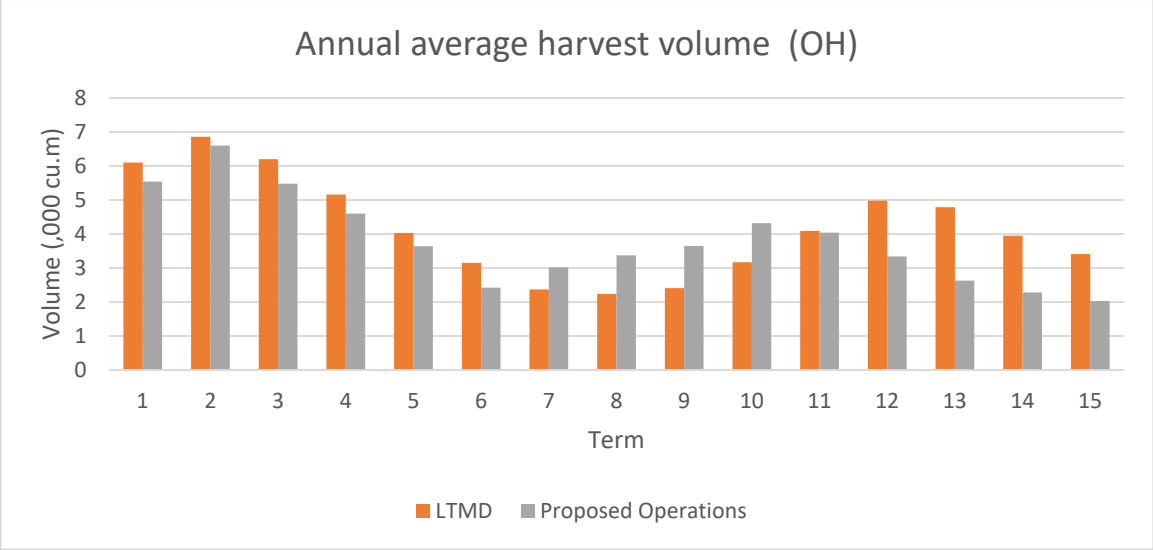

Figure 84. Comparison of Other Hardwood Species Group annual average harvest volume between the LTMD (orange) and Proposed Operations (grey).

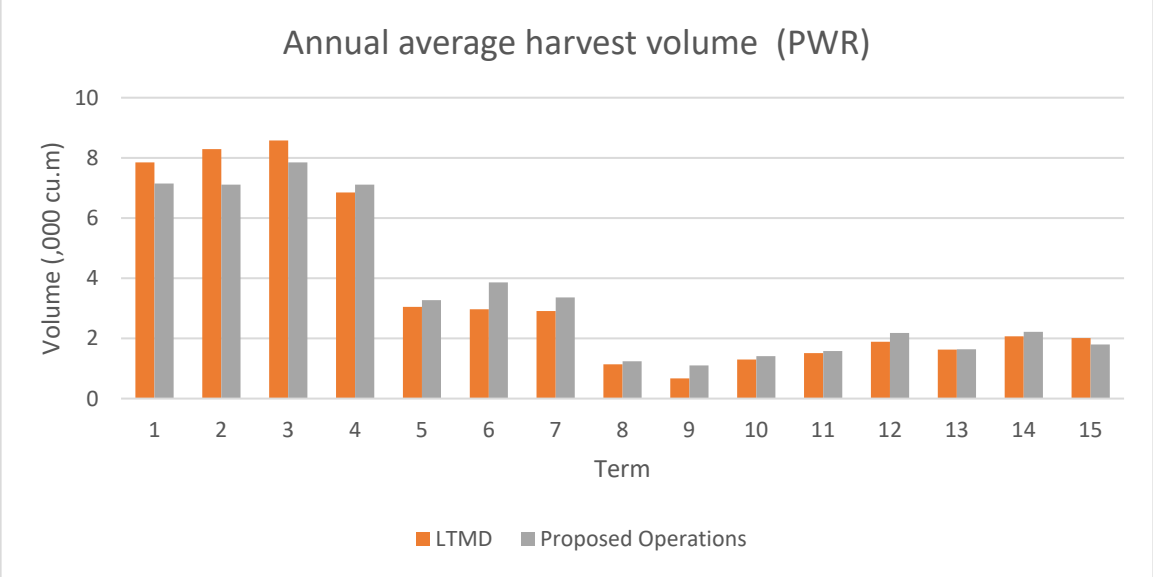

Figure 85. Comparison of Red and White Pine Species Group annual average harvest volume between the LTMD (orange) and Proposed Operations (grey).

Area by Forest Type and Age

The area of forest units and age-class distribution over time is one of importance in achieving movement towards the management objectives of the LTMD. Figure 86 through Figure 99 compare the amount of area by forest unit between the LTMD and Proposed Operations over the next 100 years. As shown, either a very small difference, or no difference (as shown where the two overlap) is observed for all forest units. Since there is no significant variation between the LTMD and the proposed operations scenario, this confirms that the proposed harvest allocations are consistent with the expected outcome of the future forest condition as described in the LTMD.

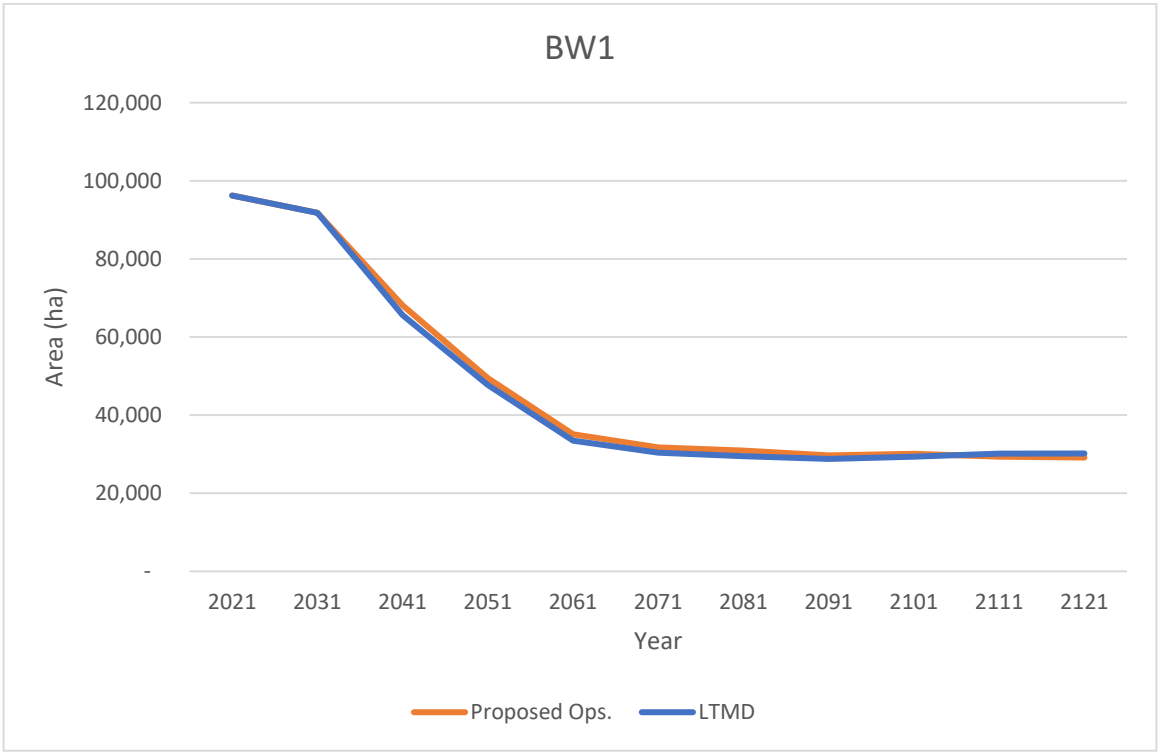

Figure 86. Comparison of All Area for the BW1 Forest unit between the LTMD (blue) and Proposed Operations (orange).

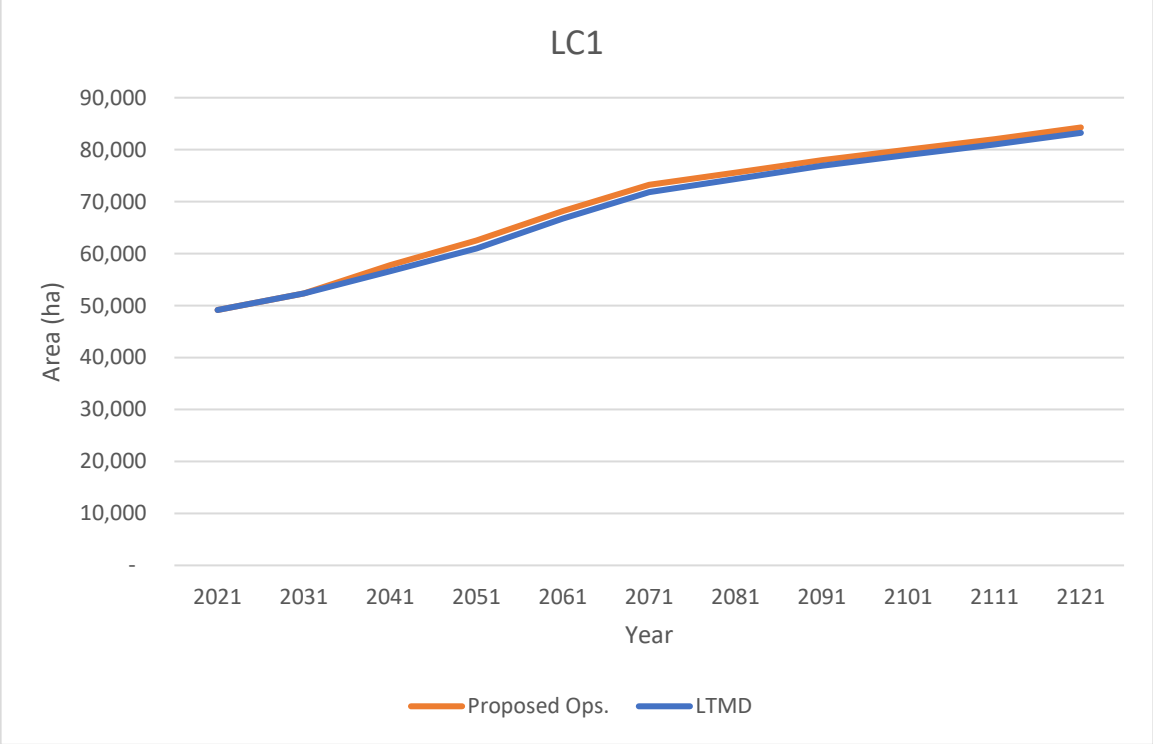

Figure 87. Comparison of All Area for the LC1 Forest unit between the LTMD (blue) and Proposed Operations (orange).

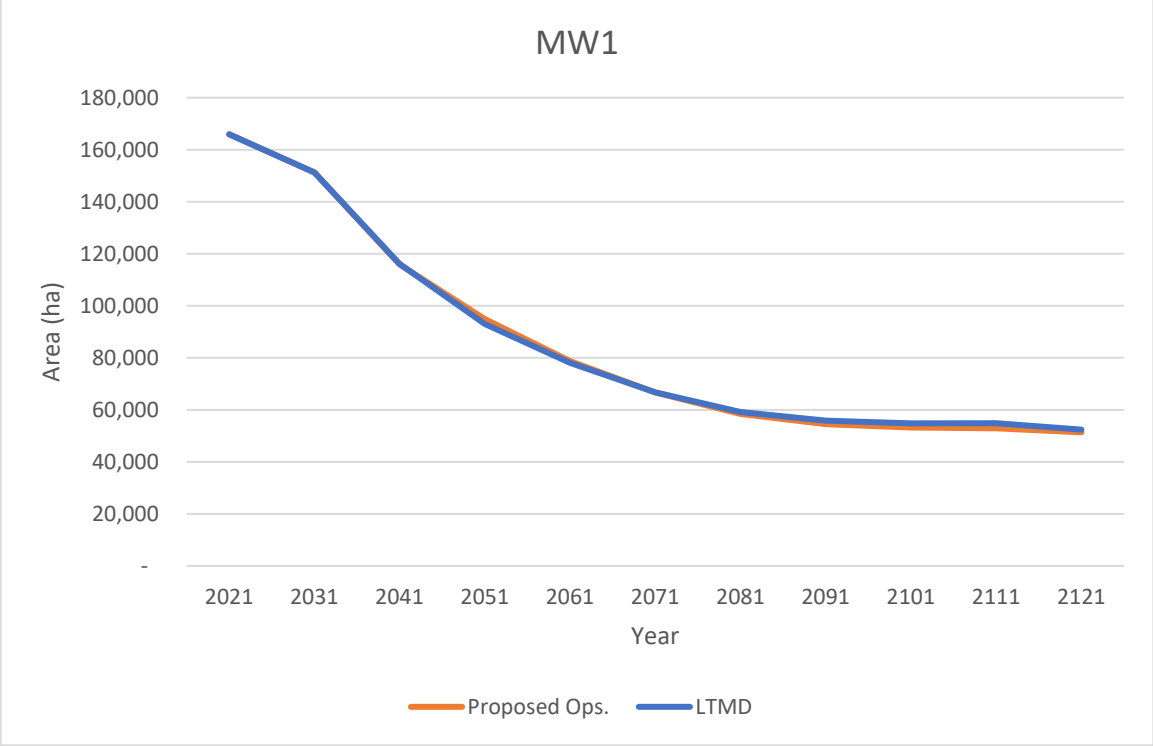

Figure 88. Comparison of All Area for the MW1 Forest unit between the LTMD (blue) and Proposed Operations (orange).

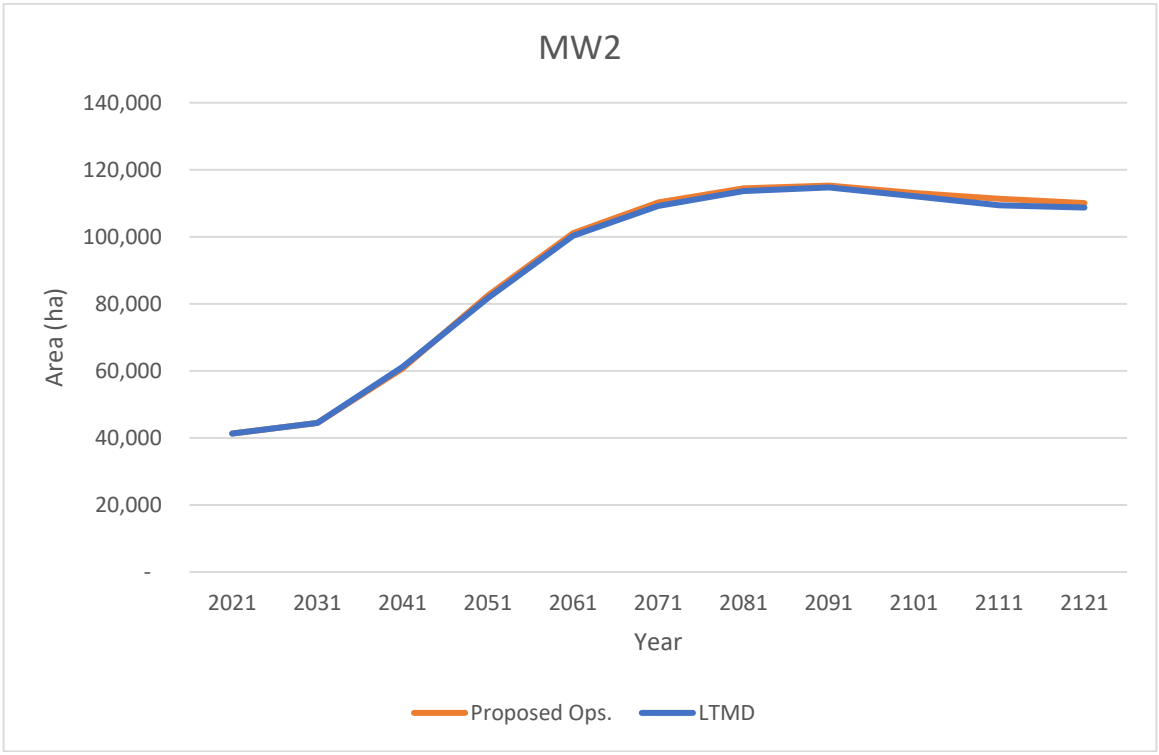

Figure 89. Comparison of All Area for the MW2 Forest unit between the LTMD (blue) and Proposed Operations (orange).

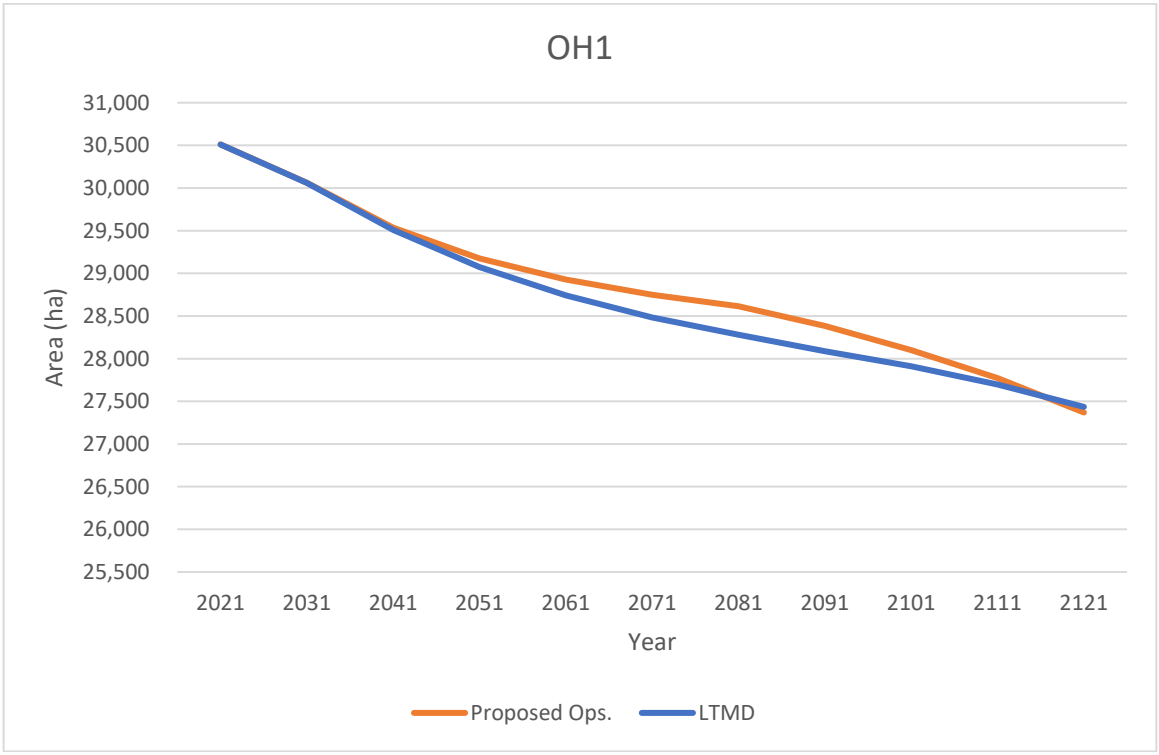

Figure 90. Comparison of All Area for the OH1 Forest unit between the LTMD (blue) and Proposed Operations (orange).

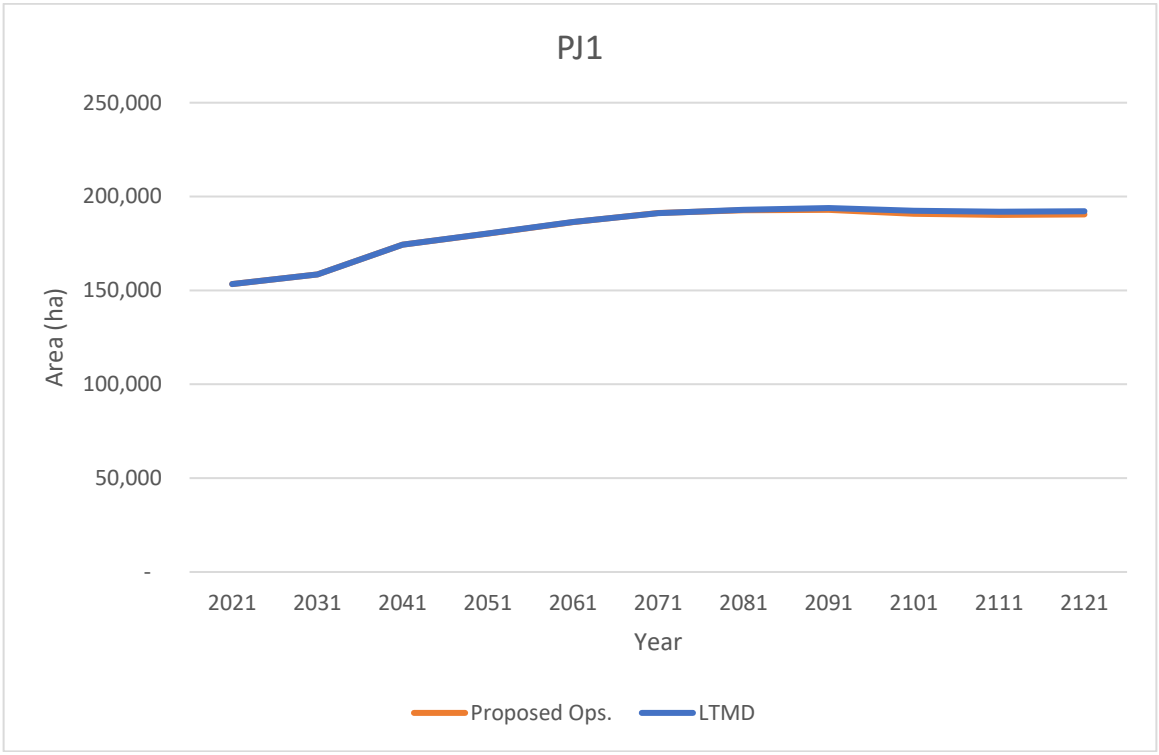

Figure 91. Comparison of All Area for the PJ1 Forest unit between the LTMD (blue) and Proposed Operations (orange).

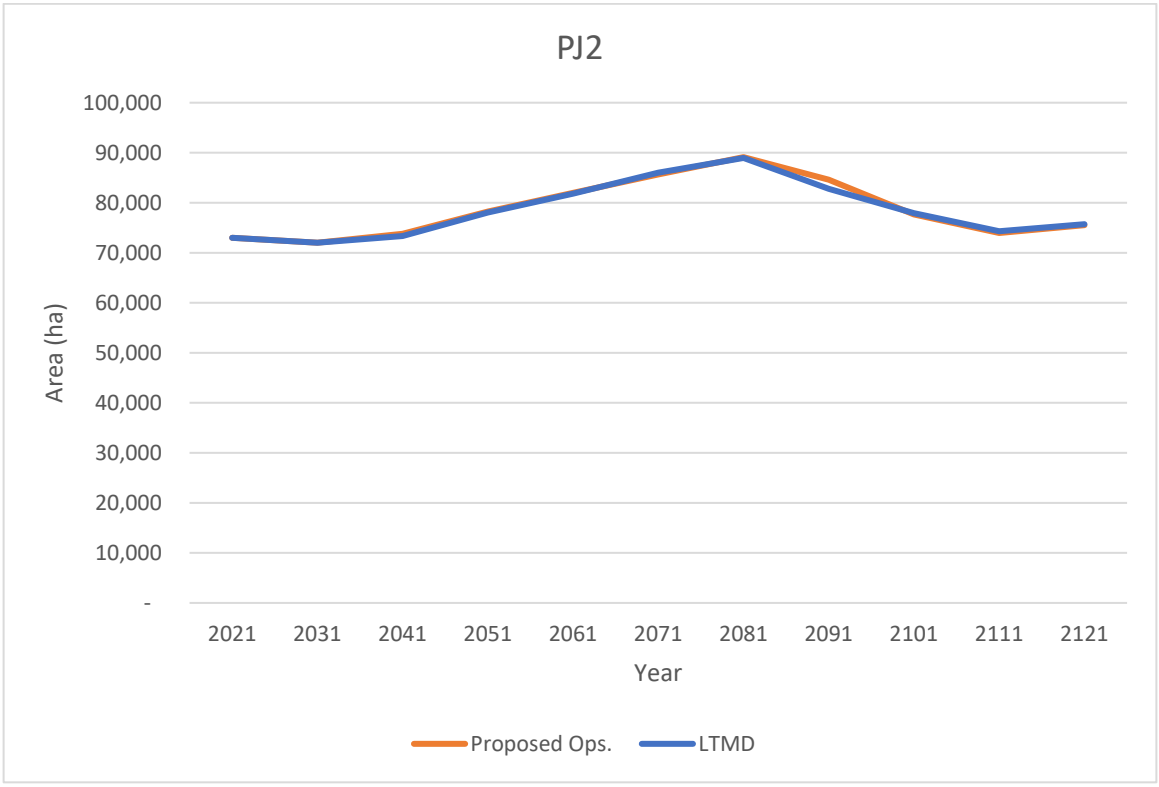

Figure 92. Comparison of All Area for the PJ2 Forest unit between the LTMD (blue) and Proposed Operations (orange).

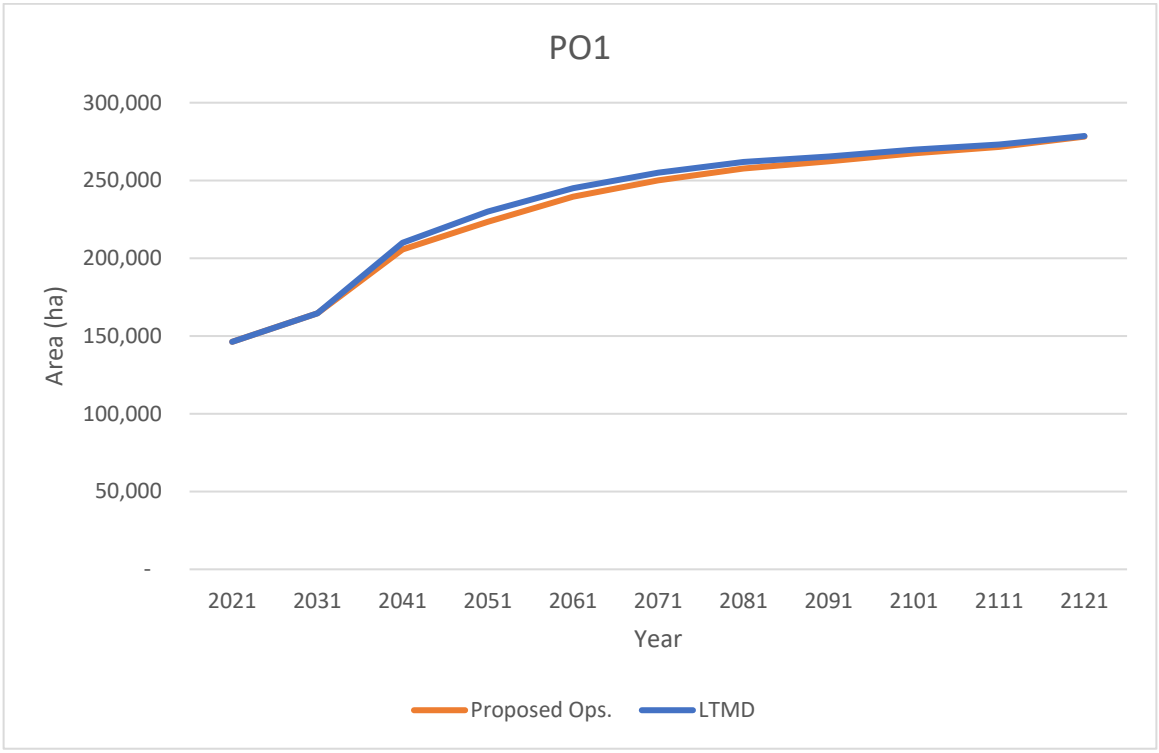

Figure 93. Comparison of All Area for the PO1 Forest unit between the LTMD (blue) and Proposed Operations (orange).

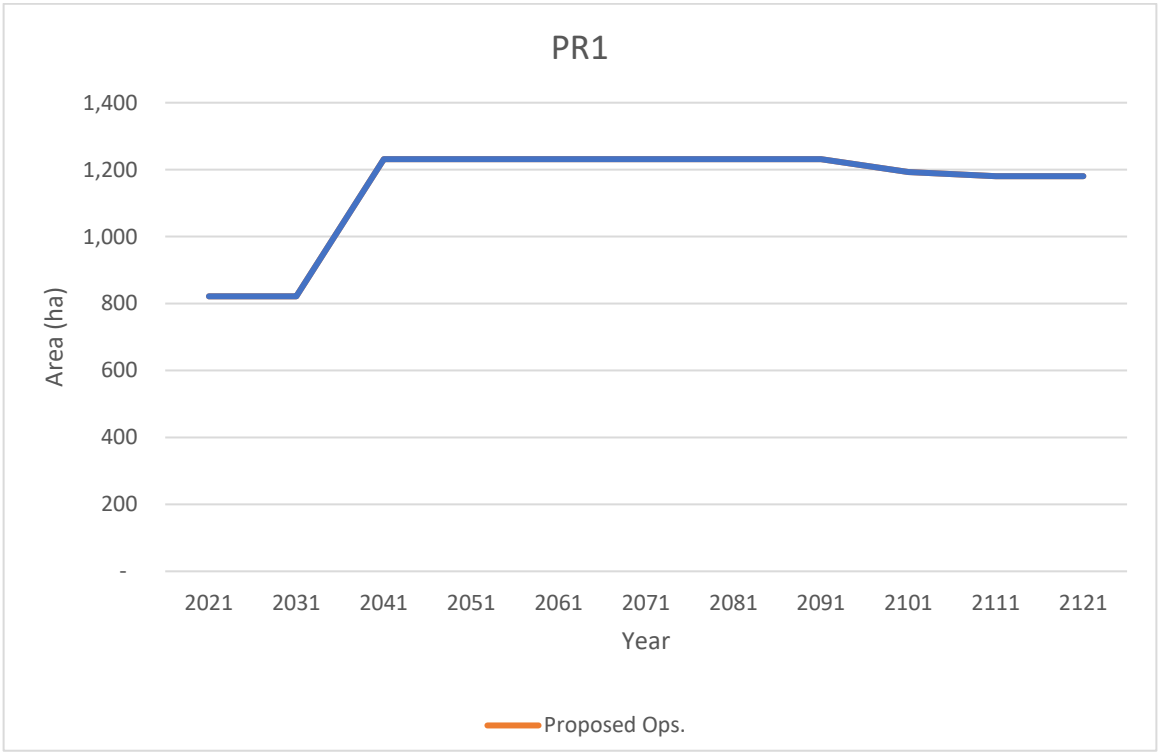

Figure 94. Comparison of All Area for the PR1 Forest unit between the LTMD (blue) and Proposed Operations (orange).

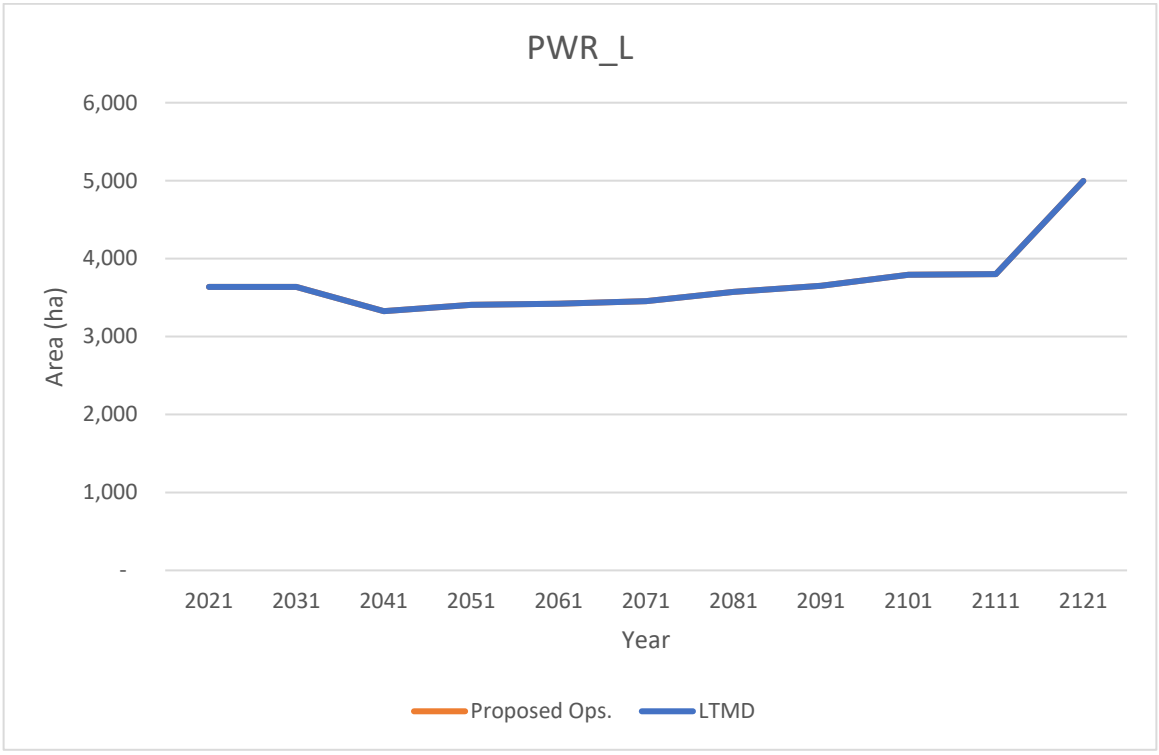

Figure 95. Comparison of All Area for the PWR_L Forest unit between the LTMD (blue) and Proposed Operations (orange).

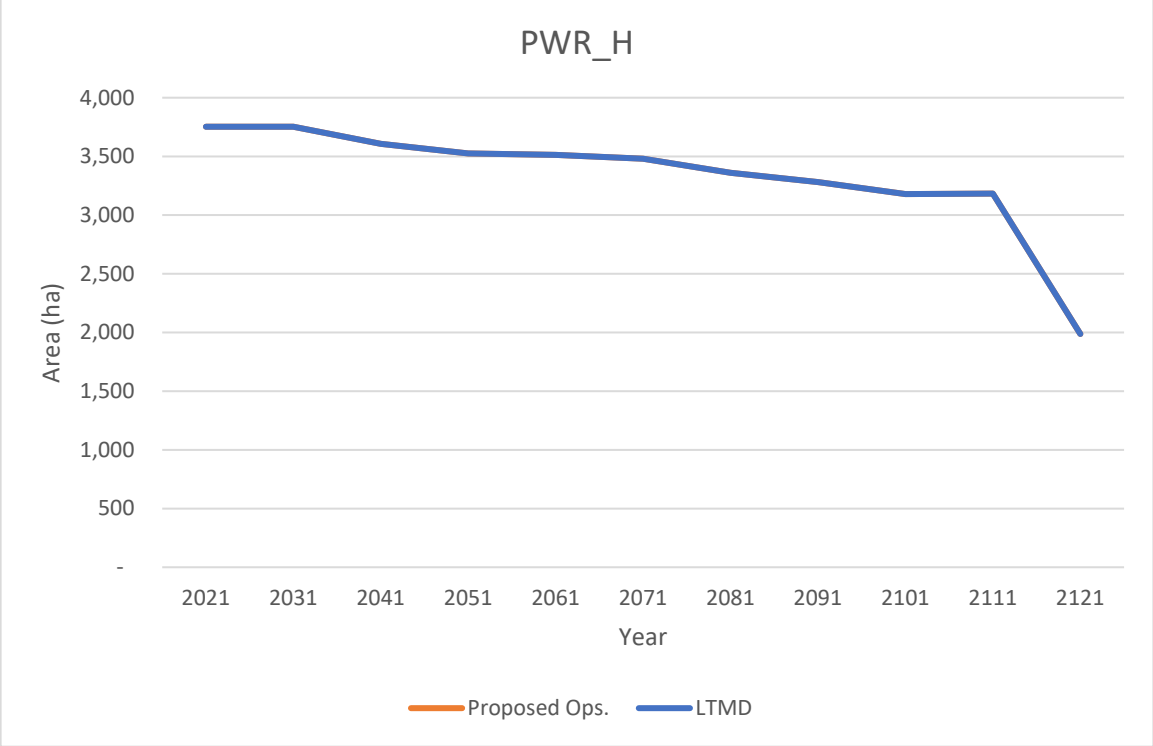

Figure 96. Comparison of All Area for the PWR_H Forest unit between the LTMD (blue) and Proposed Operations (orange).

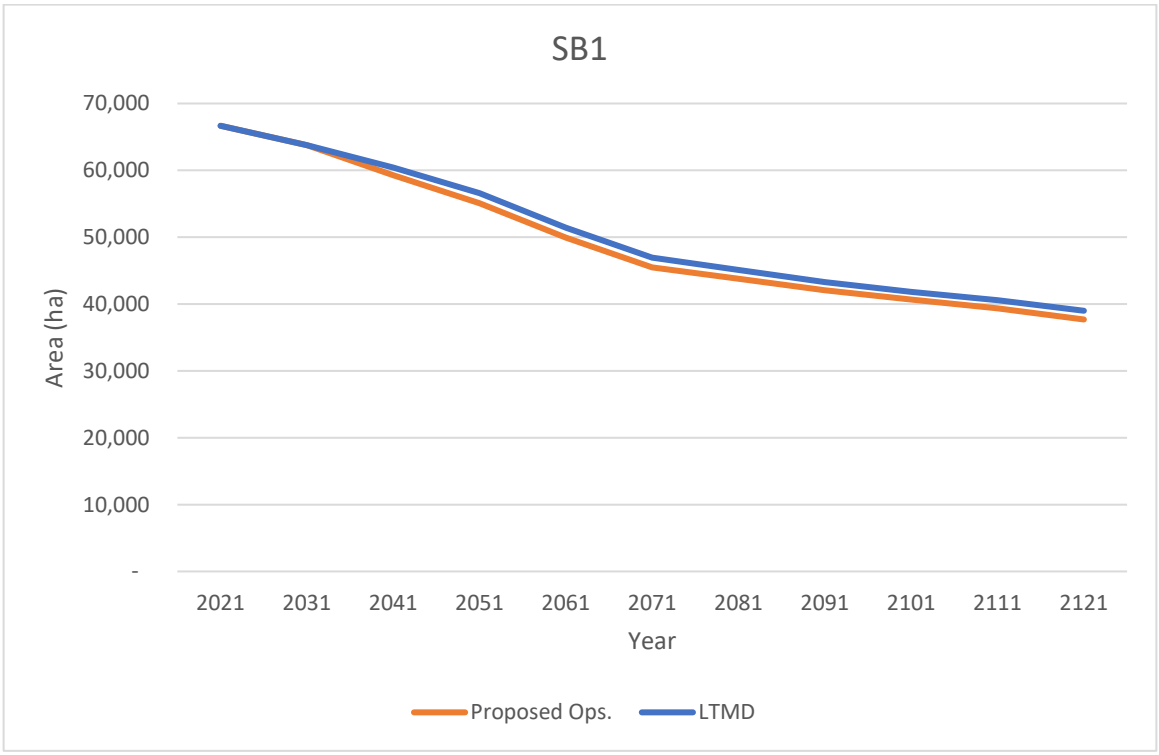

Figure 97. Comparison of All Area for the SB1 Forest unit between the LTMD (blue) and Proposed Operations (orange).

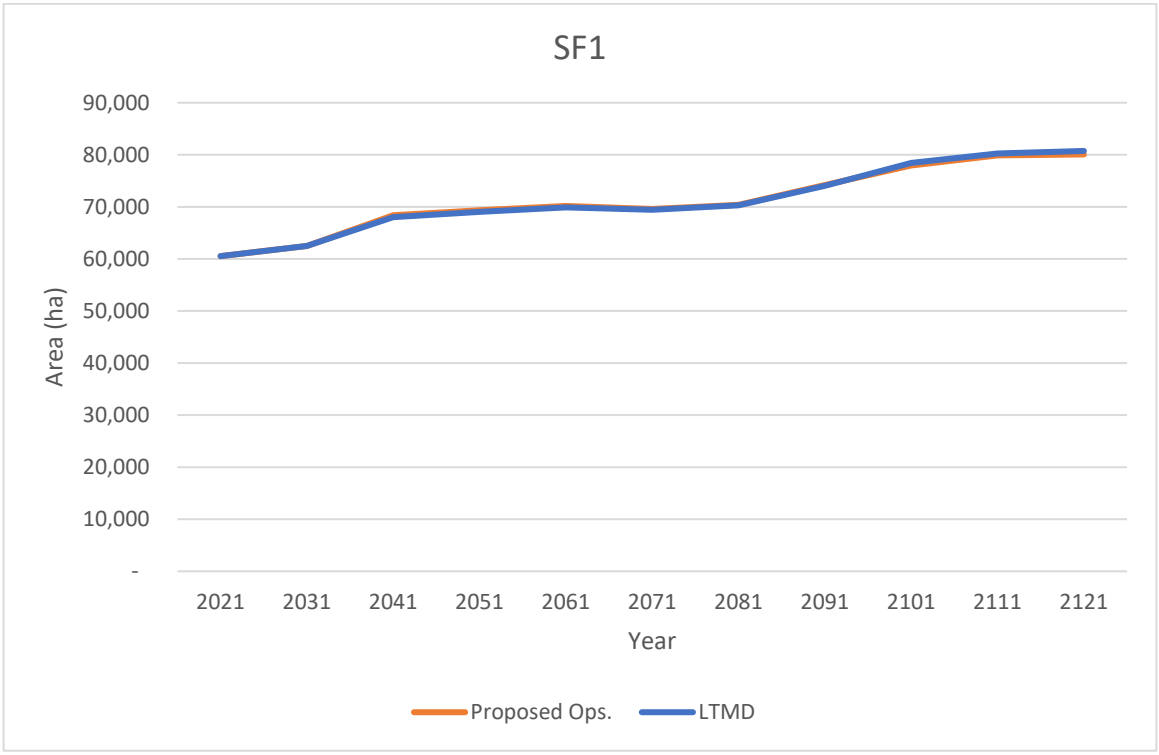

Figure 98. Comparison of All Area for the SF1 Forest unit between the LTMD (blue) and Proposed Operations (orange).

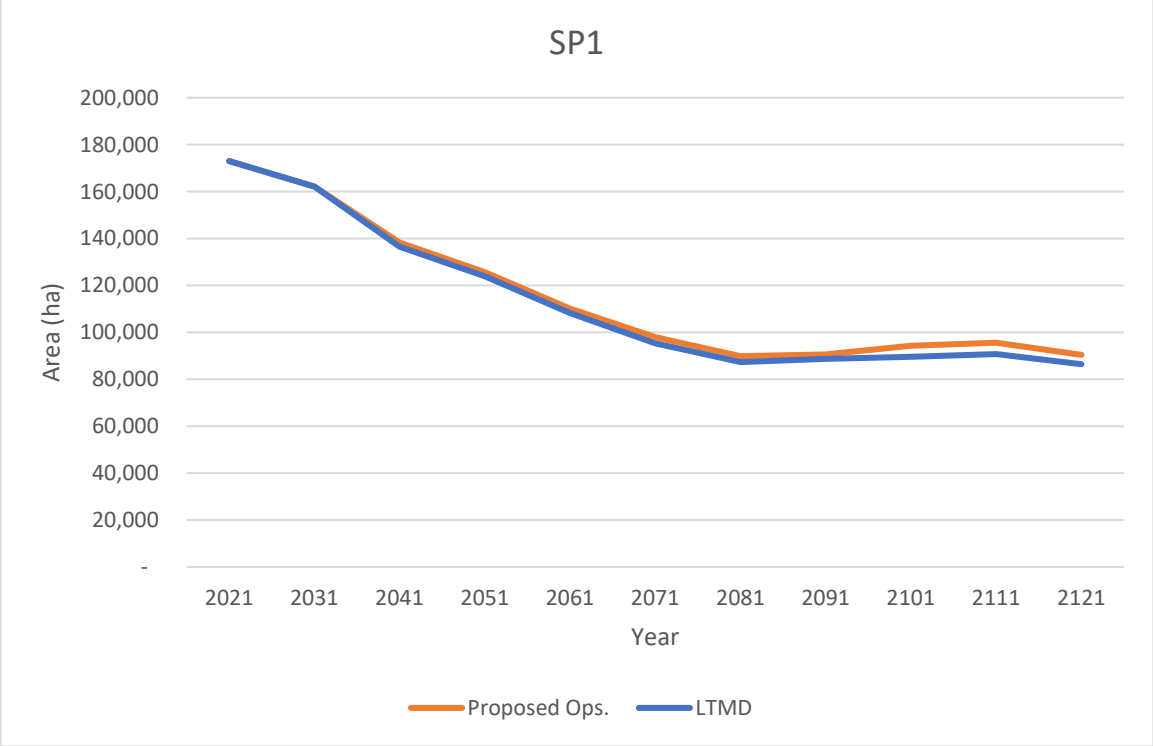

Figure 99. Comparison of All Area for the SP1 Forest unit between the LTMD (blue) and Proposed Operations (orange).

Renewal and Tending

The planned renewal and tending program for the ten-year period is described in Section 4.4, and presented in Table FMP-17. Figure 100 and Figure 101 compare the expected revenues and expenditures between the LTMD (orange) and Proposed Operations (grey) scenarios. Table 13 and Table 14 compare the renewal intensities by forest unit between the LTMD and Proposed Operations scenarios respectively.

There are no significant variations in the achievement of renewal intensities between the LTMD projections and the proposed operations scenario when comparing Table 13 and Table 14. Supporting these results is the expected revenues and expenditures between the LTMD and proposed operation scenarios shown in Figure 100 and Figure 101, respectively. A comparison of the overall renewal program between the LTMD and the proposed operations scenario demonstrates little differences in renewal program and therefore confirms that the proposed operations are consistent with the objectives developed to move towards the desired future forest condition. The results shown in Table 15 demonstrate that the Proposed Operations are aligned with the LTMD with regards to the overall renewal and tending program needed to achieve management objectives over the 10-year term.

Table 13. Projections of the Renewal Program (in hectares) for the LTMD

PLANFU	BASIC1	BASIC2	EXTEN	INT1	INT1A	Total
BW1	-	-	785.6	-	-	785.6
LC1	-	-	534.9	-	-	534.9
MW1	-	-	1,859.2	-	-	1,859.2
MW2	-	-	90.0	-	-	90.0
OH1	-	-	410.6	-	-	410.6
PJ1	325.8	-	195.5	781.8	-	1,303.1
PJ2	203.4	-	122.1	488.2	-	813.7
PO1	-	-	2,376.7	-	-	2,376.7
SB1	-	-	615.9	-	-	615.9
SF1	-	0.1	0.2	1.0	-	1.3
SP1	355.9	177.9	296.6	-	355.9	1,186.3
Total	885.1	178.1	7,287.1	1,271.1	355.9	9,977.3

Table 14. Projections of the Renewal Program (in hectares) for the Proposed Operations

PLANFU	BASIC1	BASIC2	EXTEN	INT1	INT1A	Total
BW1			785.8			785.8
LC1	1.2		533.6			534.7
MW1			1,858.8			1,858.8
MW2			90.0			90.0
OH1			410.7			410.7
PJ1	325.9		195.5	782.1		1,303.5
PJ2	203.4		122.0	488.1		813.5
PO1			2,375.1			2,375.1
SB1			616.1			616.1
SF1		0.1	0.2	1.0		1.3
SP1	355.8	177.9	296.5		355.8	1,186.0
Total	886.2	178.0	7,284.1	1,271.2	355.8	9,975.3

Table 15. Comparison of the Overall Renewal Program (in hectares) between the LTMD and the Proposed Operations

	Total Ha/yr	BASIC1	BASIC2	EXTEN	INT1	INT1A
LTMD	9,977.3	8.87%	1.78%	73.04%	12.74%	3.57%
Proposed Ops	9,975.3	8.88%	1.78%	73.02%	12.74%	3.57%

In terms of revenues and expenditures, there is no difference between the renewal expenditures in the LTMD compared with the Proposed Operations, as shown in Figure 100. Although slight differences exist between the LTMD and Proposed Operations for planned revenues, the trends are sound. Based on the balance of expenditures and revenues, the projections show that the Proposed Operations, and specifically the

implementation of the regeneration program, will enable movement towards the desired future forest condition.

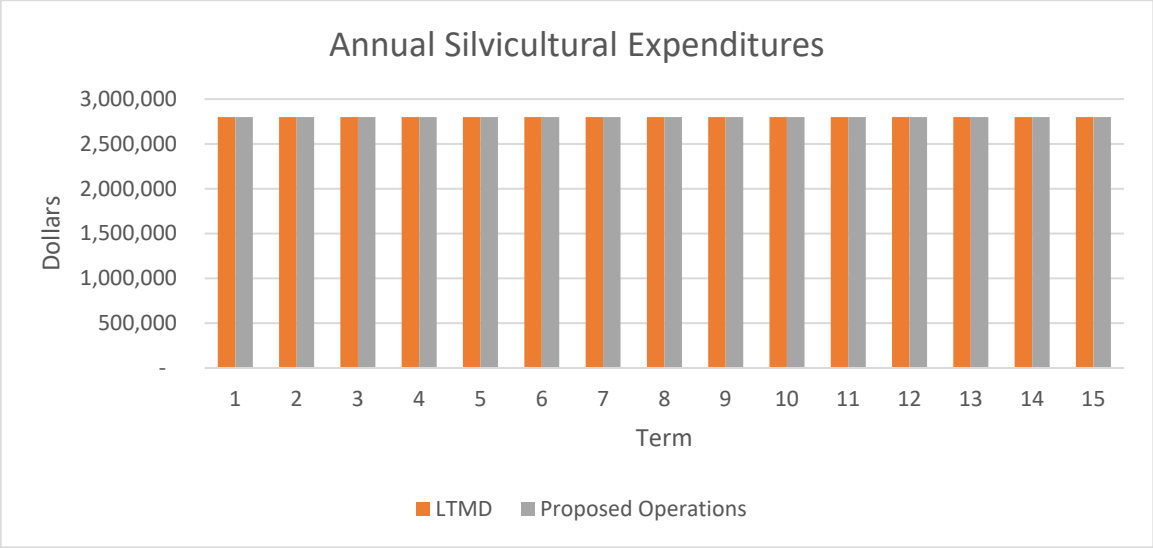

Figure 100. Comparison of Expenditures between the LTMD (orange) and Proposed Operations (grey).

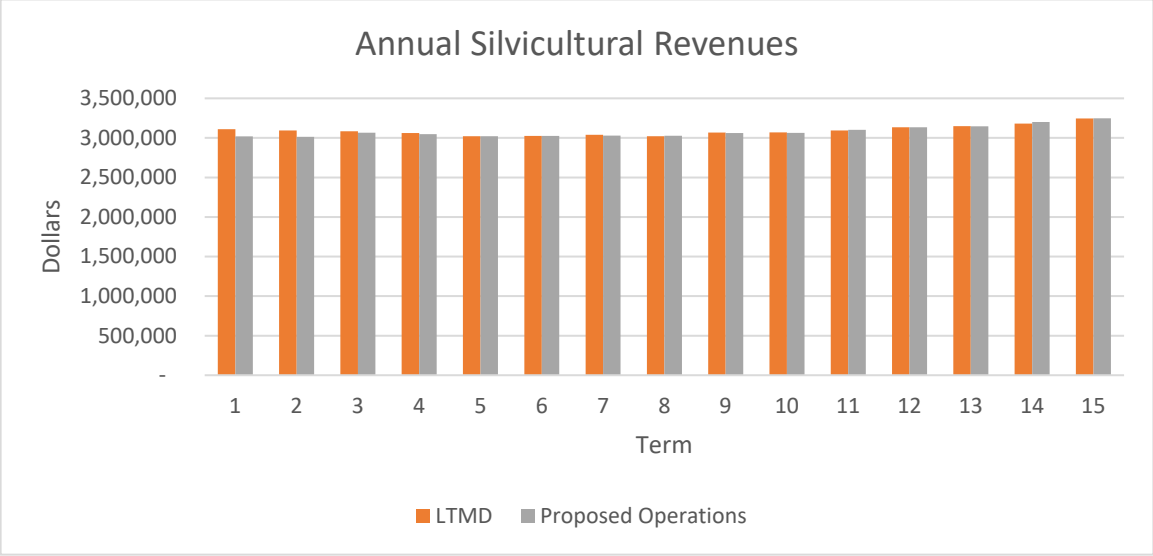

Figure 101. Comparison of Revenues between the LTMD (orange) and Proposed Operations (grey).

As shown in the results described in this section, there are no significant deviations from the projections in the LTMD as a result of proposed operations. Despite minor variation in the distribution of the available harvest area, little to no effects are observed on the achievement of the LTMD. In consideration of the assessment of objective achievement discussed in Section 3.7.3, and this assessment of the expected effects of proposed types and levels of harvest, renewal and tending operations of the confirmed LTMD, the

proposed operations for the 10-year term of this FMP are consistent with the identified desired levels and contributes to the objectives of the long-term management direction.

5.0 DETERMINATION OF SUSTAINABILITY

5.1. Assessment of Objective Achievement

The determination of sustainability considers the collective assessment of objective achievement (using the results of the assessment of objective achievement in Section 3.7.3 and Table FMP-10), the spatial assessment, the social and economic assessment and prescriptions for the protection of values. The determination of sustainability aims to conclude whether the forest management plan provides for the sustainability of the Crown forest, specifically the long-term Crown forest health that provides for ecosystem complexity while providing for the needs of the people of Ontario. It also assesses whether, on balance, the objectives are being achieved and progress is being made towards the desired forest and benefits.

The assessment of objective achievement is detailed in Section 3.7.3 and summarized in Table FMP-10. As described in this section, these assessments were based on the extent to which the established desirable levels for each indicator have been satisfied. The indicators assessed have either been achieved and/or maintained, or progress has been made but desirable levels were not achieved in consideration of other objectives. The vast majority of the objectives assessed were within and/or moving towards the desirable levels and targets. In those cases where the target levels were not achieved, the deviation was mainly due to limitations resulting from the current forest age-class imbalance, in combination with conflicting achievement levels with another objective. The assessment concluded that the difference between the achievement levels and desirable levels was not substantial. The majority of the desirable levels and targets not achieved were as a result of the efforts to balance multiple objectives in the context of the legacy forest condition resulting from past policy direction. Section 3.7.3 provides rationale for those management objectives for which targets and or desirable levels were not achieved. There were a number of positive achievements noted in the assessment of objective achievement:

- Incorporating Landscape Guide for Ecoregion 3E spatial indicators and overall achievement in demonstrating movement towards SRNV for both measures of the Texture of the Mature and Older Forest at the 500 ha and 5,000 ha scales
- Achievement of desirable levels for three of five Landscape Classes
- Demonstration of movement towards the Old Growth desirable level
- Increases in wood supply were realized, and the wood supply outlook for SPF is positive, with Po volume targets being achieved over the time horizon.

5.2. Spatial Assessment of Sustainability

This plan reviewed three spatial objectives (with associated desirable levels and targets) affected either by the configuration of harvest areas or by the frequency distribution of forest disturbances, which are used as measures of spatial objective assessment;

- Young Forest Patch Size
- Mature and Older Forest at the 500 ha and 5,000 ha signatures

Although the planned harvest blocks did not show movement towards the desired young forest patch size, movement towards three size frequencies in both the 500 ha and 5,000 ha signatures was observed. The challenge in achieving movement in all size classes is largely due to the time required to implement a range of disturbance sizes on a landbase that has been fragmented from implementation of a variety of past policies (e.g. Moose guidelines) and past forest related activities (i.e. fire suppression, mining, private land, harvesting) on the management unit.

The young forest patch size is a structure-based indicator used to characterize landscape pattern. Although young forest patch size is related to the texture of the mature and older forest in both structure (the amount and distribution of young forest patches can affect the texture of the forest matrix) and function (e.g. wildlife species preferring interior vs. wildlife species preferring edge), both are often the result of different scales of forest management planning (e.g. harvesting vs. maintaining). Managing pattern involves the distribution (concentration or dispersal) of young and mature forest across the landscape. Improvement in each individual size class was not achieved due to the temporal-spatial configuration (i.e. age, size and distribution) of all forest younger than 36 years of age; again, the result of the implementation of previous forest management policies.

Also described in Section 3.6.3, the mature and older forest texture is a structure-based indicator used to characterize landscape pattern. The overall movement towards the desirable levels detailed in the Landscape Guide 3E simulated range of natural variation was achieved but none have achieved the desirable levels. Similar challenges are also faced with the spatial arrangement of private land, provincial parks, water bodies and any other spatial policy-based context.

5.3. Social and Economic Assessment

The social and economic impacts of implementing the planned operations are described in Section 3.7.5.

5.4. Risk Assessment

There are risks that certain plan objectives will not be fully achieved during the implementation of the FMP. It is acknowledged that not fully achieving these objectives can impact the future forest condition and desired benefits and as a result, may impact social, economic or environmental values.

In addition to those identified in section 3.7.5, there are certain risks relating to the implementation of the FMP. A primary source of risk is uncertain market conditions for

wood fibre. For the past several planning cycles, the level of utilization has been high, however harvest levels are continually dependent on market demand. If there is a downturn in the market, and a subsequent reduction in harvest, this will have social and economic implications (e.g. impacts to employment, stumpage revenues and taxes). In addition, a low harvest rate will lessen the chance of achieving the desired levels of habitat for wildlife. A lack of forest disturbances that are favourable for mature and old forest may lead to a reduction of young forest and early successional forest types and species such as jack pine, poplar, and birch.

There are also risks associated with the spatial distribution of harvest across the forest. An even spatial distribution is important for wood supply sustainability and achievement of landscape composition and texture objectives. However, the achievement of a well dispersed harvest pattern could also be limited by a downturn in the market, or a change in demand for a particular species.

The overall risks to successfully implementing the forest management are mitigated with a well-balanced strategy, driven by an adaptive management process. A mid-term evaluation will indicate progress towards objectives and highlight any adjustments needed to best achieve the objectives by the end of the plan.

5.5. Conclusion

On balance, the plan objectives are being met and progress is being made towards the desired forest and benefits. The determination of sustainability for the forest management plan has been achieved as confirmed by the results of the assessment of objective achievement, the spatial assessment, the social and economic assessment and the presence of prescriptions for the protection of values. The forest management plan continues to have regard for plant life, animal life, water, soil, air, and social and economic values, including recreational values and heritage values.

6.0 DOCUMENTATION

6.1. Supplementary Documentation

As part of the forest management plan a series of supplementary documents are included as a separate file in the main directory of the electronic FMP as per the Forest Information Manual, 2020 (see MU280_2021_FMP_TXT_SuppDoc.pdf). These documents summarize the information used, and the documentation and analyses made in the planning process. Note that Section 6.1.1 – Analysis Package is available in a separate file in the main directory of the electronic FMP, as per the Forest Information Manual, 2020 (see MU280_2021_FMP_TXT_AnPack.pdf).

The following is a list of the Supplementary Documents included in the forest management plan.

- 6.1.1 Analysis Package (see file MU280_2021_FMP_TXT_AnPack.pdf)
- 6.1.2 Summary of Historic Forest Condition
- 6.1.3 First Nation and Métis Background Information Report(s)
- 6.1.4 Summary of First Nation and Métis involvement
- 6.1.5 Social and Economic Description
- 6.1.6 Monitoring Program for Exceptions
- 6.1.7 Monitoring Program for Success of Silvicultural Activities
- 6.1.8 Roads Supplementary Documentation
  - 6.1.8.1 Primary Road Corridors
  - 6.1.8.2 Existing Roads
- 6.1.9 Area of Concern Supplementary Documentation
- 6.1.10 Summary of Public Consultation
- 6.1.11 Local Citizens Committee Report
- 6.1.12 Final List of Required Alterations
- 6.1.13 Planning Team’s Terms of Reference
- 6.1.14 MNRF’s Statement of Environmental Values
- 6.1.15 Conservation Strategy for the Red and White Pine
- 6.1.16 Implementation Toolkit
- 6.1.17 Moose Emphasis Areas Supplementary Documentation
- 6.1.18 Climate Change Supplementary Documentation

6.2. Other Documentation

Other documentation of information which, because of its sensitive nature, will not be incorporated in the plan, includes the public correspondence related to the development of the plan, the Report on the Protection of Identified First Nation and Metis Values, planning and task team meeting minutes are retained at the Kirkland Lake District office, as the lead district.

7.0 FOREST MANAGEMENT PLAN SUMMARY

The Forest Management Plan Summary is included as a separate file in the main directory of the electronic FMP as per the Forest Information Manual, 2020. See the file: MU280_2021_FMP_TXT_Sum.pdf.

8.0 FOREST MANAGEMENT PLAN TABLES

Forest Management Plan tables are included as a separate file in the main directory of the electronic FMP as per the Forest Information Manual, 2020. See the file: MU280_2021_FMP_TBL_Tables.pdf.