Summary of the Proposed Long-Term

Management Direction

2021-2031 Forest Management Plan

Mazinaw-Lanark Forest (MU 140)

July 28, 2020

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TABLE OF CONTENTS

Appendix A: Forest Management Plan Tables
  FMP-8   Projected Available Harvest Area by Forest Unit
  FMP-9   Projected Available Harvest Volume by Species Group and Broad Size Group
  FMP-10   Assessment of Objective Achievement

Appendix B: Comment Sheet

Appendix C: Summary Map of Harvest Allocations and Primary Road Corridors

1.0 INTRODUCTION

The Long-Term Management Direction (LTMD) for the Mazinaw-Lanark Forest provides direction for the levels of access, harvest, renewal and tending activities required to achieve the desired forest and benefits. In the development of the proposed LTMD, management objectives were identified, social and economic assessment was completed and analytical models and tools regarding forest regulation, wildlife habitat supply and landscape management were used. A proposed LTMD was developed that balances the achievement of all management objectives over time, resulting in the planned level of forest harvest for the ten-year period 2021-2031 of this Forest Management Plan (new FMP).

The LTMD provides a means of assessing forest sustainability through the measurement and monitoring of indicators that have been developed for each management objective. It is expected that a balanced achievement of the quantitative and qualitative environmental, social and economic objectives, will result in the desired long-term future forest condition and benefits.

This document summarizes the proposed LTMD for the new FMP. The desired forest and benefits, management objectives, indicators of objective achievement, and associated desirable levels are summarized in this document. The extent to which management objectives have been met and a preliminary determination of sustainability, including the preliminary spatial analysis and social and economic assessment, are also summarized in this document.

New primary road corridors proposed for the 2021-2041 period are also referenced in this report.

2.0 DESIRED FOREST AND BENEFITS

The Planning Team, including Indigenous representatives, and the Local Citizens' Committee (LCC) held a Desired Forest and Benefits meeting for all members plus additional invitees. Desired forest and benefits refer to the forest structure, composition, and the goods and services, which are desired from the forest to achieve a balance of social, economic and environmental needs. The LTMD for the management unit is developed to achieve the desired forest and benefits (OMNRF. March 2017. Forest Management Planning Manual). Break-out sessions were held to review the 2011-2021 FMP (current FMP) and to discuss changes based on s o c i a l, economic and environmental objectives. Plan objectives, including appropriate indicators and desirable levels and targets, were discussed at other planning team (PT) and LCC meetings. Desirable level refers to the measurable amount for an indicator, expressed as a specific number, a range or a trend, used in the assessment o f sustainability (OMNRF. March 2017. Forest Management Planning Manual). This information was later shared with the LCC.

3.0 PLAN OBJECTIVES, INDICATORS AND DESIRABLE LEVELS

The list of desired forest and benefits, past management plans, Ministry of Natural Resources and Forestry (MNRF) sources of direction (including Figure A-3 from the *Forest Management Planning Manual, 2017*) and forest management guides were used to develop plan objectives, indicators of objective achievement, desirable levels and target levels for the new FMP. A total of 14 management objectives, with 26 indicators of objective achievement, were developed for the proposed LTMD for this plan.

A management objective was developed for each desired forest and benefit indicator (or group of related indicators) identified for the plan. A desirable level and the timeframe for achievement were also developed for each indicator. The establishment of a target for each management objective reflects the necessity to balance conflicting management objectives, and targets may be the same as the desirable level or differ from desirable levels due to management challenges.

The management challenges the planning team addressed during the development of the LTMD included the following:

Area Available for Forest Management

The Mazinaw-Lanark forest has 37% of the total landbase held within reserve area and therefore is not available for forest management. This means that the planning team's ability to move towards landscape guide indicators including forest classes, old-growth, White and Red pine forest and young forest is limited to 63% of the forest. The amount of area in reserve will grow over time as new reserves are identified during operations, up to 46%, further limiting the area available for management.

Age Class

The forest has significantly higher amounts of mature and old forest than would be expected if large scale natural disturbances such as forest fire could take place. Based on current harvest levels and utilization, the planning team was limited in what options were available to change the forest over time towards a natural age distribution.

Maintenance of Red Oak

Succession of existing pure Red oak stands back to younger Red oak stands does not occur without natural disturbance or harvesting/silvicultural treatment. Given the low silvicultural success rate in pure oak stands and the low natural succession rate for pure oak stands, this forest type is difficult to maintain on the landbase over time. However, the species commonly associates in other forest types, such as tolerant hardwood or white pine stands, meaning the presence of oak in a less pure state is maintained on the landscape.

Management Actions Required to Meet Landscape Guide Targets

A long-term and concerted commitment to achieving landscape guide targets is required by both the MNRF and the SFL company. However, several limitations exist that make it difficult to meet the targets even in the long term; the bias toward older age class structures, the large amount of reserved forests, bypass rates, limited clearcut utilization and silvicultural success. Silvicultural

success and clearcut utilization should be increased during the course of the plan to offset the factors outside of the SFL's control. This includes eliminating barriers on the use of viable silviculture options, such prescribed burning or herbicide to increase the success of silvicultural operations.

In accordance with management objectives, it is desirable that the FMP projects forest management activities that will create a future forest landscape with a composition and structure that is similar to those created by natural processes. The science packages developed and reviewed periodically by MNRF to support the Forest Management Guide for the Great Lakes and St. Lawrence Landscapes (MNRF 2010) is considered the best available science and includes information for many of the natural landscape related indicators. The PT relied on the science packages for the calculation of desirable levels for many of the management indicators.

Management objectives, indicators, and the timing of assessment for each indicator are documented in Table FMP-10 (Appendix A).

4.0   PROPOSED LONG-TERM MANAGEMENT DIRECTION (LTMD)

The proposed LTMD represents a balance in the achievement of management objectives. A process of iterative analyses was conducted to balance the achievement of management objectives while developing a proposed LTMD. Results or findings of strategic investigative analyses were used to guide the balancing of indicator achievement. The desirable levels for indicators were included in strategic planning investigations and were used in the development of the proposed LTMD, to balance environmental, social and economic objectives over the long-term.

The Strategic Forest Management Model (SFMM) was used as the primary analysis tool for the strategic analysis. This tool is used to track the entire forest land base through time, and produce projections of changes to the forest structure and composition for 100 years into the future in response to different types of forest management activities including harvest, silviculture and fire suppression. SFMM allows for the evaluation of forested areas and their contribution to forest diversity, old forest conditions, wildlife habitat and timber production through time.

Modelling inputs and key results summaries are documented in FMP Supplementary Documentation 6.1 Analysis Package. Modelling outputs from the Proposed LTMD, showing how the forest is expected to develop over time in terms of forest composition and structure, and the projected types and levels of activities required to achieve management objectives are provided in forest management plan tables in Appendix A. These outputs include:

(a) Projected available harvest area by forest unit (Table FMP-8);
(b) Projected harvest volume by species group and broad size group (Table FMP-9); and
(c) Assessment of objective achievement (Table FMP-10).

The proposed LTMD was reviewed by the Planning Team and it was agreed reached that the proposed LTMD is sustainable in the long-term and provides a balance of objective achievement. The proposed LTMD was presented to the LCC on May 4th, 2020 for discussion and comment. The preliminary preferred and optional harvest maps were available for inspection and comment at this time with no significant issues identified by the committee. Indigenous consultation opportunities for the proposed LTMD have been offered to the identified communities. An LTMD presentation to the Algonquins of Ontario was presented on May 28th, 2020.

4.1   Selection of Preferred and Optional Harvest Areas

A set of criteria was developed in order to identify the areas that could reasonably be harvested during the new FMP period. The Available Harvest Area (AHA) by forest unit (which was derived from the SFMM outputs for the proposed LTMD) was the primary criterion for the selection of "preferred harvest areas". Some areas in excess of the proposed LTMD available harvest area are identified because during operational planning, which is the next stage in plan development, area of concern prescriptions will be applied and reduce the area mapped. The Ministry of Natural Resources and Forestry's *Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales (MNRF, 2010)* and the *Forest Management Guide for the Great Lakes and St. Lawrence Landscapes (MNRF 2010)* provided additional direction.

All other harvest areas eligible for harvest in the new FMP, that are not identified as "preferred harvest areas", are considered to be "optional harvest areas" for the next 10-year period.

Based on these eligibility and selection criteria, a total of 24,220 hectares of preferred harvest area were identified for the ten-year plan period. The AHA by Forest Unit (23,862 ha) is documented in Appendix A – Table FMP-8 (projected available harvest area over a 100-year planning horizon).

Planned allocations by forest unit will be refined and balanced prior to the Public Consultation Stage Three: First Information Centre, after reserves associated with the Area of Concern (AOC) planning process are confirmed. Some optional areas may be added, and some preferred areas may be dropped as operational planning moves forward.
After the reserve areas have been confirmed, planned harvest allocations will be refined and adjusted so that no forest units exceed their 10-year AHA levels.

The preferred areas for harvest for the 10-year plan period have been portrayed on a summary map (Appendix C). The summary map also includes optional harvest areas during the ten-year plan period.

4.2 Available Harvest Volume

The projected Available Harvest Area for the 10-year period from the new FMP is projected to yield a total volume of 1,744,610 cubic metres.

The volume by species group for new FMP is comprised of:

Total 10-yr Volume by Species Group (m3)	
PWR	511,030
SPF	94,500
OC	113,180
PO	342,330
BW	63,290
TOL	620,280

1,744,610   Cubic Metres TOTAL

The projected Available Harvest Volume by Species Group and Broad Size Group is documented in Appendix A – Table FMP-9 (projected harvest volumes over a 100-year planning horizon).

5.0   PRELIMINARY DETERMINATION OF SUSTAINABILITY

At this stage of plan development, the overall determination of sustainability is based on the collective assessment of objective achievement, the spatial assessment, the social and economic assessment and risk assessment. Prescriptions for the protection of forest values and the forest environment are also important factors of sustainability but this occurs at the next stage of plan development.

The assessment of the objective achievement was based on the extent to which the established desirable levels for each indicator were satisfied in short, medium and long-term. Rationale has been provided for levels that are not consistent with desirable levels. A favourable determination of sustainability allows for the conclusion of forest sustainability and documents how the forest management plan has regard for environmental, social, and economic values. A summary of the components considered during the determination of sustainability are described in the following subsections.

5.1   Assessment of Management Objective Achievement

The new FMP objectives, indicators, desirable levels and targets were established to address the *Crown Forest Sustainability Act* objective categories and the outcomes of the Desired Forest and Benefits Meeting (DFBM) meeting. The Assessment of Objective Achievement is documented in Table FMP-10 for each indicator that can be assessed at this time through strategic modelling or preliminary operational planning (during spatial component of strategic planning). The assessment of objective achievement was based on the extent to which the established desirable levels for each indicator were satisfied during the established timelines. Plan objectives that have been developed for this plan can be categorized as follows based on the timing of assessment:

Assessed During Plan Preparation and Plan Implementation (26 indicators):

Forest Diversity - Natural Landscape Patterns		
1.	To move towards a more natural forest landscape pattern and distribution	3 Indicators
Forest Diversity - Forest Structure and Composition		
2.	To move towards a more natural forest landscape structure and composition	5 Indicators
3.	Increase knowledge and understanding of tree genetic material that may be better adapted to future climates in the Mazinaw-Lanark Forest	1 Indicator
Forest Diversity and Provision of Forest Cover		
4.	To maintain wildlife habitat for forest-dependent provincially and locally featured species	1 Indicator
5.	To maintain wildlife habitat for forest-dependent species at risk with known occurrences on the Mazinaw-Lanark Forest	1 Indicator
Silviculture		
6.	To ensure the successful renewal of harvested stands (naturally or artificially) to the most silviculturally appropriate species and tended until management standards or Free To Grow/Establishment is met, using the most appropriate and cost-effective methods to achieve	3 Indicators
7.	Maintain Red Oak across the Landscape	1 Indicator
Social and Economic		
8.	Continually improve forest management operations	3 Indicators
9.	To provide the levels of access to adequately carry out forest operations	1 Indicator
10.	Provide a sustainable, continuous and predictable wood supply from the forest that will meet the current recognized industrial demand of the forest	3 Indicators
11.	Harvest a sustainable and continuous wood supply from the forest that will meet the current recognized industrial demand of the forest	2 Indicators
12.	To minimize loss of Crown productive forest to infrastructure development thereby maintaining harvest levels and related community well-being.	1 Indicator
13.	To provide opportunities for First Nation and Metis involvement in forest management planning	1 Indicator
14.	To encourage and support the participation of the Local Citizens Committee in the development of the Forest Management Plan	1 Indicator

FMP Objectives First Assessed During Development of Proposed LTMD (12 <u>indicators</u>):

Forest Diversity - Natural Landscape Patterns		
1.	To move towards a more natural forest landscape pattern and distribution	3 Indicators
Forest Diversity - Forest Structure and Composition		
2.	To move towards a more natural forest landscape structure and composition	4 Indicators
Forest Diversity and Provision of Forest Cover		
4.	To maintain wildlife habitat for forest-dependent provincially and locally featured species	1 Indicator
Silviculture		
7.	Maintain Red Oak across the Landscape	1 Indicator
Social and Economic		
10.	Provide a sustainable, continuous and predictable wood supply from the forest that will meet the current recognized industrial demand of the forest	3 Indicators

FMP Objectives First Assessed at Draft Plan Stage (4 <u>indicators</u>):

Social and Economic		
5.	To maintain wildlife habitat for forest-dependent species at risk with known occurrences on the Mazinaw-Lanark Forest	1 Indicator
9.	To provide the levels of access to adequately carry out forest operations	1 Indicator
13.	To provide opportunities for First Nation and Metis involvement in forest management planning	1 Indicator
14.	To encourage and support the participation of the Local Citizens Committee in the development of the Forest Management Plan	1 Indicator

FMP Objectives First Assessed After Plan Implementation (10 indicators):

	Forest Diversity - Forest Structure and Composition	
3.	Increase knowledge and understanding of tree genetic material that may be better adapted to future climates in the Mazinaw-Lanark Forest	1 Indicator
	Silviculture	
6.	To ensure the successful renewal of harvested stands (naturally or artificially) to the most silviculturally appropriate species and tended until management standards or Free To Grow/Establishment is met, using the most appropriate and cost-effective methods to achieve	3 Indicators
	Social and Economic	
8.	Continually improve forest management operations	3 Indicators
11.	Harvest a sustainable and continuous wood supply from the forest that will meet the current recognized industrial demand of the forest	2 Indicators
12.	To minimize loss of Crown productive forest to infrastructure development thereby maintaining harvest levels and related community well-being.	1 Indicator

Of the total 26 indicators included in Table FMP-10:
12 indicators to be assessed up to this stage of plan development (Proposed LTMD)
4 indicators to be assessed prior to the submission of the Draft FMP
10 indicators to be assessed in the future after plan implementation as appropriate
All indicators are quantitatively measured

Of the 26 plan indicators:

7 indicators ACHIEVE or are moving towards the desirable level;
5 indicators do NOT ACHIEVE desirable or target levels;
14 indicators will be assessed in the FUTURE at draft plan or after plan implementation.

For the Forest Diversity – Natural Landscape Patterns targets, the forest management plan does not achieve the desirable levels and moves away from the target in all mature and old forest texture patterns and the majority of young texture patterns as well. The targets are unable to be met for several reasons; age class structures are biased to mature/old, clearcut harvesting levels are low and reserves restrict management in a large portion of the forest, meaning that the bias towards mature/old and deficit of young forest is a difficult trend to reverse.

For the Forest Diversity – Forest Structure and Composition Indicators, the forest management plan could not achieve the desirable levels for all Landscape Classes and Old Growth, while the Young Forest indicators could be met. In the case of Landscape Classes, all classes can be trended towards in the long term, but the Tolerant Hardwood and Intolerant Hardwood are not trended towards in the short or medium term. This trend is seen because stand conversions in shelterwood tend to be slow and the model requires more than 20 years for these conversions to count. Old Growth desirable levels are met during the planning horizon for most Plan Forest Units, but the desirable levels are often surpassed, which represents an unnaturally high level of

Old Growth and technically counts as not desirable. The exception to this is the MXCCC PlanFU, which trends towards the desirable level in all terms, but fails to meet its desirable level even in the long term. Young forest desirable levels are achieved in the short, medium and long term. Finally, the White/Red Pine indicator begins the plan above the 1995 threshold and remains above throughout the horizon, while the total area trends towards the target in the long term, but has slight movement away in the short and medium term.

For the Forest Diversity and Provision of Forest Cover objective indicators, the forest management plan achieves some desirable levels and not others. The critical thermal cover indicators for the Effingham Deer Yard are met, whereas the Canonto Deer Yard are not and are trending slowly away from the target. The Cashel Moose Emphasis Area has the desired amounts of Mature Conifer and will continue to do so, but will have a surplus of Hardwood/Mixedwood and deficit of Browse/Young Forest. The plan trends away from Young Forest and towards the target for Hardwood/Mixedwood.

In Silviculture objectives, the target to maintain Oak growing stock above plan start levels is achieved in all terms.

The Socio-Economic Targets for Harvest volumes by species groups and by product were achieved for all periods within the modeling horizon with the exception of Poplar and White Birch, which are unable to meet long term goals. These species groups decline significantly on the landscape because of the low utilization of clearcut silviculture and the associated low recruitment levels of this species as a result. The target to reduce variation in available harvest area (AHA) by forest unit was also not achieved, as there is more variation between some terms than were targeted (50% increase and/or decrease vs a target of 25%). Only the Selection (HDsel, CEsel, HEsel) and PWus forest units are able to remain within 25% of the previous terms AHA over the entire planning horizon. The variations in AHA is required as the model must address age class distributions imbalance and long-term habitat targets via stand conversion in the early terms of the plan and reducing harvesting over time to maintain old growth features. The middle terms have significant drops in AHA as a result before recovering in the long term.

5.2   Preliminary Spatial Assessment

A number of preliminary spatial assessments were conducted to analyze achievement of management objectives that are influenced by the location of planned harvest areas. Documentation of these spatial analyses will be included in FMP Supplementary Documentation 6 Analysis Package. Brief summaries for each analysis follow.

Harvest Areas- Harvest areas were selected to create economically viable stands throughout the management unit. Fragmentation of stands is minimized as much as possible and other considerations were weighed, such as access. The forest was categorized into two Strategic Management Zones (SMZ), which are used to track the distribution of several key indicators in a spatial context. The Madawaska Highlands have been identified as a specific SMZ and represents an area of the Management Unit with unique landscape objectives and land use criteria that will have implications on modelling parameters in the LTMD. The second SMZ encompasses the remainder of the Management Unit. The allocations are distributed between the Madawaska Highlands and the rest of the management unit based on the amounts of available forest within each area. Roughly 1/3 of available landbase is in the Highlands, thus the LTMD places 1/3 of the harvest allocations there. This pattern has been modelled out for the

next 4 terms (i.e. 40 years), where roughly 1/3 of the allocations will continue to occur within the Highlands, balancing the harvest allocations between the Strategic Management Zones (SMZ)s. The projected distribution of harvest map is available in Section 5.1 of the Analysis Package.

Landscape Pattern –

Other Spatial objectives and indicators affected by the location of preferred harvest areas are:
- Texture of the Mature and Old Forest
- Young Forest Patch Size Distribution
- Moose Emphasis Area General Habitat
- Deer yard Critical Thermal Cover

The PT relied on MNRF Ontario's Landscape Tool (OLT) projections of the simulated natural forest condition when determining appropriate desirable levels for landscape pattern indicators. The spatial distribution of landscape pattern was measured in OLT for Plan End 2031 with preferred harvest allocations simulated to be depleted.

The OLT projects that the forest will have higher concentration of mature and old forest than the simulated ranges of natural variations from the Landscape Guide. Mature and Old Forest is overrepresented at plan start and the relatively low levels of clearcut harvesting make it difficult to change this pattern.

The Young Forest Patch Size Distribution is projected to shift towards a greater representation of medium young forest patches (101-250 ha) but a reduction in the representation of larger patch sizes (>251 ha) as well as small patches (<100 ha). Landscape Guide direction is to increase the representation of medium and large patch sizes and reduce the representation of small patches. Large and medium harvesting blocks are difficult to create in the fragmented landscape as large patches of clearcut forest units of this size are rare on the landscape.

One Moose Enhancement Area (MEA) has been delineated on the Mazinaw-Lanark Forest. MEAs are landscapes where the management of forest cover for the benefit of moose populations is prioritized. Generally, the Cashel MEA is showing movement towards the ideal composition of the 2 key indicators; Mature Conifer and Hardwood/Mixedwood however Browse is trending downward over time in comparison to the simulated range of variation, as clearcut patches are not being created.

There are three Deer Emphasis Areas (DEA) on the Mazinaw-Lanark Forest. DEAs are landscapes where the management of forest cover for the benefit of deer populations is prioritized. The Effingham and Canonto Deer Emphasis Areas (DEA) will be assessed in the FMP as these two areas contain enough managed Crown Land to significantly impact outcomes. The Effingham DEA Critical Thermal Cover (CTC) level begins above the target level and ends above the target level. The Canonto DEA CTC begins below the target level and moves slightly away from the target by plan end. Operational planning prescriptions will be applied to mitigate this trend. The Dalhousie was not assessed as it is only comprised of 6% Crown land, however allocations within the area will be subject to operational deer habitat planning.

5.3   Social and Economic Assessment

A qualitative social and economic assessment was undertaken for the proposed LTMD; a quantitative assessment using the SEIM model will be done later and included with the Draft FMP (only if applicable). This assessment outlines the expected social and economic impacts associated with the current direction.

The proposed management strategy endorsed by the planning team, projected a decrease in available wood supply of the primary species groups currently utilized by industry. This evaluation compared the volume availability for the new FMP and the current FMP. The annual harvest volume approved in the current FMP was 184,315 m^3 (Table FMP-9) and the projected annual available harvest volume in the new FMP is 173,468 m^3. The projected 5% decrease in volume could potentially have negative direct and indirect socio-economic benefits to the Province of Ontario. Decreased harvest volumes generally result in lower industry output, person years of employment and gross domestic product.

Based on the Socio-Economic Description and the Socio-Economic Assessment associated with the proposed management strategy, there are 25 communities that have greater than 1% of their labour force within the forestry industry or rely on income from wood fibre from the Mazinaw Lanark Forest. There are also six First Nation communities within or adjacent to the Mazinaw Lanark Forest who will be affected by forest management activities in the area, including Pikwakanagan (Golden Lake 39), which has >1% of its labour force in forestry, for example. The total planned harvest volume has decreased from 184,314 m^3 (current FMP) to 174,461 m^3 (new FMP), with an overall decrease of 5%. Based on complete utilization of the planned sustainable harvest area, the 2021 projects a total annual silvicultural cost of $841,497.01. Comparatively, the 2011 plan had $857,694 total expenditures planned, a reduction of 2%. The current FMP projected unit costs for the various silvicultural treatments that comprise the total silviculture expenditures are forecasted to change minimally during the new FMP.

5.4   Risk Assessment

The planning team has identified several factors that have the potential to impact the achievement of specific objectives, and thus could impact the future forest condition and desired benefits of the forest. The impacts may affect environmental, social, and economic values, alone or in combination.

The uncertain market conditions for wood is the most significant risk to the plan. Utilization within the current FMP, and preceding plans, has been lower than planned. This was an issue highlighted in the 2016 Independent Forest Audit. This is especially relevant for low demand species groups and their associated forest types. Since planned outcomes are based on a predetermined amount of harvesting activity there are risks associated with low utilization. However, scoping investigations for the new FMP demonstrated that historic levels of utilization (based on the utilization from annual reports) trend towards the targets for many of the objectives set in table FMP-10. Further investigations with utilization fixed to 50% of planned harvest area was also explored to provide additional insight. The investigations confirmed that the objectives that are at greatest risk in a low utilization environment are industrial volume targets. From a forest diversity perspective, the Intolerant Hardwood landscape class, represented mostly by poplar and white birch stands, are also projected to decline in a low utilization environment.

Additionally, the age class imbalance of the forest increases with low utilization, creating a decline in young forest area (specifically those relating to clearcut conditions) and an associated increase in mature and old forest.

Recent experience has shown that regulatory changes can have a profound impact on the implementation of FMPs and thus form a potential risk to objective achievement. In particular, changes to policy requirements, such as species at risk implementation, may result in lower harvest levels within planned operational areas or remove them from harvesting entirely. The regulations and provincial policy that governs species at risk are dynamic and may further reduce the flexibility needed to accommodate other operational constraints such as access or silvicultural timing, creating de-facto reductions in harvesting area unintentionally. A large portion of area is currently bypassed in order to meet the requirements of these regulation and an increase in regulatory complexity could make this bypassed area increase, further limiting the ability to manage the forest and compounding the lack of disturbance occurring on the forest.

Invasive species are a significant risk to the plan as well. Current threats, such as Beech Bark Disease, are accounted for in the LTMD with input received from local practitioners and scientific literature. For probable future threats (Hemlock Wooly Adelgid, Oak Wilt, etc.), the timing, duration and intensity of these threats is difficult to account for in a long-term deterministic model, as the science and practitioner experience is still developing. However, the adaptive management approach within FMPs, which are re-written every 10 years, allows for emerging invasive species to be addressed as new information becomes available. Additionally, increasing forest diversity increases the resilience of the forest by reducing the over representation (and thus vulnerability) of particular forest types, such as Tolerant Hardwood.

As was noted in the 2016 IFA, climate change also poses a potential threat to the health and condition of the forest by creating favorable conditions for some species while creating unfavorable conditions for others. Since the timing and magnitude of these shifts are uncertain, it is impossible to model for a particular scenario. As such, increasing forest resilience by creating diversity in forest composition, genetics and structure is the most effective approach to reducing risk. Again, the adaptive management approach within FMPs, which are re-written every 10 years, allows for emerging science to be incorporated. Operationally, weather pattern changes also can affect access by reducing the length of time that frozen ground is available, increasing the length of spring break up and flooding, as well as increasing fire risks in the summer months. A climate change objective was thus created in the new FMP, where the assisted migration of suitable genetic sources for planting stock will be explored. This kind of objective will help provide the localized knowledge needed to address climate change and its impact on the forest.

Ownership changes influence the amount of landbase available in the LTMD and thus pose a risk if significant changes occur. Changes in the tenure of planned allocations during plan implementation normally result in the approved harvest area being removed from harvest. The known tenure changes to Unopened Municipal Road Allowances and other land claims have been accounted for in the LTMD model. Additionally, the large proportion of area reserved from harvesting in MLF creates scenarios where positive management intervention cannot outpace negative changes happening in reserves. As ownership changes generally increase the amount of reserved forest, they posing a risk by taking a larger proportion of Crown land outside of management.

Access limitations can pose risks to accessing the allocations outlined in the LTMD. Due to the large amount of private land and the fragmented nature of the available crown land, reliance on

private land access creates uncertainty for many harvest allocations. In the event that planned access to approved harvest blocks is not available, then primary, branch or operational road planning may require a plan amendment and/or an Annual Work Schedule revision. In the event that economically feasible access is unavailable, the harvest block area may be dropped entirely or replaced with contingency area.

5.5   Conclusion on the Sustainability of the FMP

Overall, based on the quantitative and qualitative objectives (Table FMP-10) that can be assessed during preparation of the LTMD, there has been achievement in meeting or exceeding the desirable levels and associated targets for most indicators (forest condition, and goods and services).

The majority of the Management Objectives that are measured at the LTMD stage are achieved or trend towards achievement at a reasonable pace. While certain objectives cannot be met in the short term, these are typically limitations brought by the overabundance of mature/old age classes, the amount of time required for the results of ongoing shelterwood silviculture to be realized for some landscape class targets, the amount of area held in reserve (and therefore unavailable for management) and the forest composition imbalances in the forest. These factors all contribute to the reality that some targets simply cannot be reasonably achieved in the short term, while other cannot be achieved at all in the status-quo of low disturbance rates. A focus on the long-term achievement of goals is the most consistent and realistic means of working towards a natural landscape, with an emphasis of mimicking natural disturbances and the associated stand conversion when reasonable.

The spatial assessment shows that the spatial distribution of harvest is balanced across the SMZs for at least 4 terms (i.e. 40 years), meaning that wood supply will be relatively consistent geographically. Additionally, the Cashel MEA has positive trends towards 2 out of 3 of its targets and desirable levels, with the young forest/browse target trending away. The Effingham DEA Critical Thermal Cover (CTC) level begins above the target level and ends above the target level. The Canonto DEA CTC begins below the target level and moves slightly away from the target by plan end. Operational planning prescriptions will be applied to mitigate this trend.

The overall wood volume has reduced since 2011, however the planned volumes are still above the Industrial Wood Requirements and the utilization rate of the current plan. While utilization is highlighted as a risk in IFA recommendations and annual reports, the scoping analysis and supplemental risk assessment models demonstrate that more than half of the plan objectives can still be met in low utilization scenarios. The new FMP has updated utilization targets set at >75% of the planned forest unit harvest area.

Many of the risks to the LTMD are outside of the ability of the model to predict or represent. Climate change, invasive species, changes to land tenure and regulatory changes are all important to identify and consider, but cannot yet be meaningfully represented in the model nor controlled by the SFL. The approach to managing these risks is to increase the resilience of the forest through continued progress towards a diverse, natural forest condition.

Overall, the assessment of objective achievement, the spatial assessment, the social and economic assessment and the risks described above, have all demonstrated that the proposed

LTMD has regard for environmental, social, and economic values. As a result, it can be concluded that this proposed LTMD provides for the sustainability of Ontario's Crown forest.

6.0 PRIMARY ROAD CORRIDORS

The harvest areas for the next 20-years require minimal construction of primary access roads.

The following existing roads are planned for upgrade to primary during 2021-2041:

1. Dickey Lake Primary Road
2. Reddys Creek Primary Road
3. Dobbie Lake Primary Road

The locations of primary road corridors, and alternative road corridors, are portrayed on the summary map (Appendix C). Primary road planning, including the consideration and environmental analysis of a reasonable range of alternate practical one-kilometre wide corridors, is documented in the Primary Road Planning Supplementary Documentation prepared for this stage of plan development.