Nipissing Forest
Independent Forest Audit
2011 – 2016

Arbex Forest Resource Consultants Ltd.

November, 2016

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1.0. Executive Summary

This report presents the findings of an Independent Forest Audit (IFA) of the Nipissing Forest (NF) conducted by Arbex Forest Resource Consultants Ltd. The audit scope includes the last three years' implementation (April 1 2011-March 31 2014), of the Phase I 2009 - 2019 FMP and two years' implementation (April 1 2014 – March 31 2016) of the Phase II 2009 - 2019 FMP. The development and planning process for the Phase II FMP is also included in the audit scope. Procedures and criteria for the IFA are specified in the 2016 Independent Forest Audit Process and Protocol (IFAPP). Forest Management Plans (FMP) were reviewed in relation to relevant provincial legislation, policy guidelines and Forest Management Planning Manual (FMPM) requirements. Audit field site examinations were completed by helicopter and truck in August 2016.

The Nipissing Forest (NF) is managed by Nipissing Forest Resource Management Inc. (NFRM) under Sustainable Forest License (SFL) # 545053. The Ministry of Natural Resources and Forestry (MNRF) North Bay District is responsible for the administration of the management unit. There is one Local Citizens Committee (LCC) associated with the NF (Nipissing Forest Local Citizens Committee).

The downturn in the forest sector economy negatively impacted the delivery of forest management on the NF. Harvest levels over the audit term achieved approximately 35% of the planned Phase I available harvest area forecast due to poor markets, the poor quality of the hardwood resource, mill downtime, and low demand for some species.

The previous audit recommended that the SFL licence be extended and made 14 recommendations to improve forest management. This audit found that the issues identified in the previous audit had, in most instances, been effectively addressed.

Forest management was planned and implemented in accordance with the Crown Forest Sustainability Act (CFSA) and the FMP targets are consistent with the achievement of plan objectives and forest sustainability. The LCC was well managed, and provided significant benefits to the forest management process.

An effective silviculture program was delivered during the audit term. The management of white pine forest units is challenged by initial stand conditions, competitive sites, past harvest practices and economic factors. The intensive silviculture regime necessary to rehabilitate these stands to a pine free-to-grow (FTG) condition typically requires significant expenditures and the diligent monitoring of treatments. The forest manager must also be knowledgeable of the autecology of pine and its principle competitor species. We found auditee staff to be competent and professional. It is our assessment that the management challenges associated with the harvest and renewal of pine were being met during the audit term.

Initially we were concerned with the reported low levels of silvicultural success for the white pine uniform shelterwood (PWUS) and white pine seed tree (PWST) forest units. We concluded that the implementation of the aggressive tending program and effective monitoring of treated areas in this audit term in combination with initial harvest prescriptions that are better tailored to existing stand conditions will result in higher levels of silvicultural success.

We provide six recommendations to address identified shortcomings in the delivery of the forest management program. We require NFRM meet its contractual obligations with respect to the survey and renewal of X, Y and Z category lands and continue to investigate with the MNRF the reasons for the consistent variation between FTG survey results and FTG audit results. A joint recommendation is also provided to ensure that reporting deadlines for Annual Report review comments and re-submissions are met.

We provide recommendations to the MNRF Crown Forests and Lands Policy Branch to remove the wood supply commitment to Precut Hardwood Inc. and Columbia Forest Products from Appendix E of the SFL (as these companies are no longer operating) and to ensure that Forest Resource Inventory (FRI) information is better synchronized with the forest management planning process.

We recognize NFRM's participation in the development and use of hand held technologies as a tool to assist in the delivery of its monitoring and compliance programs as a Best Management Practice.

The audit team concluded that the management of the Nipissing Forest was generally in compliance with the legislation, regulations and policies that were in effect during the term covered by the audit. We further conclude that forest sustainability as assessed through the 2016 Independent Forest Audit Process and Protocol is being achieved. The audit team recommends the Minister extend the term of the Sustainable Forest Licence # 545053 for a further five years.

2.0. Table of Recommendations

TABLE 1. RECOMMENDATIONS

Conclusion:
The audit team concludes that management of the Nipissing Forest was generally in compliance with the legislation, regulations and policies that were in effect during the term covered by the audit, and the Forest was managed in compliance with the terms and conditions of the Sustainable Forest Licence held by Nipissing Forest Resource Management Inc. Forest sustainability is being achieved, as assessed through the Independent Forest Audit Process and Protocol. The audit team recommends the Minister extend the term of the Sustainable Forest Licence # 545053 for a further five years.

Recommendations Directed to NFRM.
Recommendation #5: NFRM must meet its contractual obligations with respect to the survey and renewal of X, Y and Z category lands.
Recommendations directed jointly to NFRM and the MNRF District Office
Recommendation # 3: To provide a reliable assessment of the free-to-grow condition, the District MNRF and NFRM must jointly implement a sampling procedure and protocol for FTG surveys and Core Task 1 SEM monitoring that resolves data discrepancies and variability. **Recommendation # 4:** The MNRF District and NFRM must ensure that Annual Reports meet FMPM submission deadlines.
Recommendations Directed to Crown Forests and Lands Policy Branch
Recommendation # 1: The MNRF Science and Information Branch must ensure the timely delivery of FRI products and the implementation of appropriate quality control protocols in order to facilitate the incorporation of the most current and accurate forest resource information in forest management plans. **Recommendation # 2:** Corporate MNRF should amend the FMPM Forestry Aggregate Pit closure and rehabilitation requirements to better reflect the operational and access requirements associated with forest management realities in the Great Lakes St. Lawrence Forest Region. **Recommendation # 6:** Corporate MNRF should remove the wood supply commitments to Precut Hardwood Inc. and Columbia Forest Products from Appendix E of the SFL.
Best Management Practice
Best Management Practice: We recognize NFRM's participation in the development of and use of hand held technologies as a tool to assist in the delivery of its monitoring and compliance programs as a Best Management Practice.

2.0. Introduction

This report presents the findings of an Independent Forest Audit (IFA) of the Nipissing Forest (NF or the Forest) conducted by Arbex Forest Resource Consultants Ltd. for the period of April 1, 2011 to March 31, 2016. The NF is managed by NFRM under the authority of Sustainable Forest Licence (SFL) # 545053. NFRM has five shareholders (Tembec, GP North Woods LP, Goulard Lumber, R. Fryer Forest Products Ltd and Hec Clouthier & Sons). The Ministry of Natural Resources and Forestry (MNRF) North Bay District is responsible for the administration of the management unit.

Forest Stewardship Council (FSC) and Sustainable Forestry Initiative (SFI) certifications were maintained/obtained by NFRM during the audit period.

3.0. Audit Process

The Crown Forest Sustainability Act (CFSA) requires that all Sustainable Forest Licences (SFLs) and Crown Management Units (CMUs) be audited every five to seven years by an independent auditor. Arbex Forest Resource Consultants Ltd. undertook the IFA utilizing a four-person team. Profiles of the audit team members, their qualifications and responsibilities are provided in Appendix 6.

The audit reviews the applicable Forest Management Plans (FMP) in relation to relevant provincial legislation, policy guidelines and the Forest Management Planning Manual (FMPM) and its regulated manuals. The audit reviews whether actual results in the field are comparable with planned results and determines if the results were accurately reported. The results of each audit procedure are not reported on separately but collectively provide the basis for reporting the outcome of the audit. Recommendations within the report "*set out a high level directional approach to address a finding of non-conformance*"[1]. In some instances, the audit team may develop recommendations to address situations where "*a critical lack of effectiveness in forest management activities is perceived even though no non-conformance with the law or policy has been observe*d"[2]. A "*Best Practice*" is reported when the audit team finds the forest manager has implemented a highly effective and novel approach to forest management or when established forest management practices achieve remarkable success. A further discussion of the audit process is provided in Appendix 4.

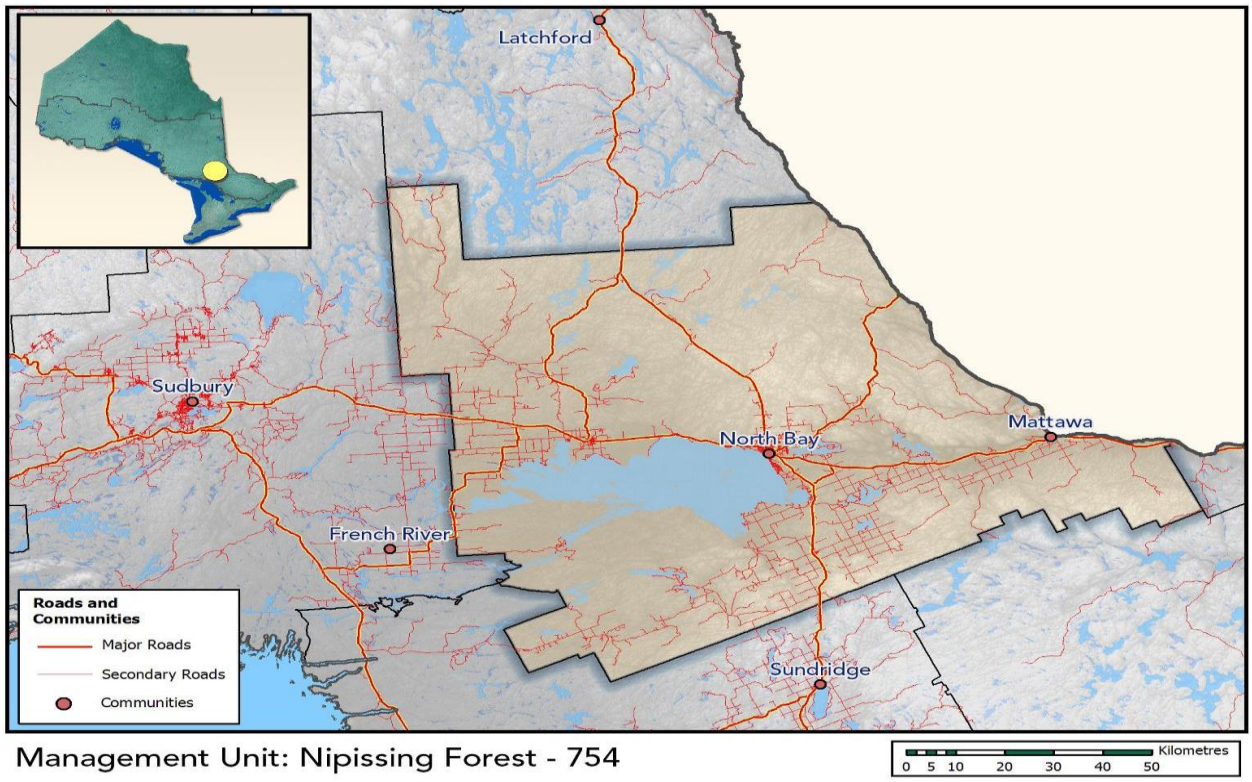
The procedures and criteria for the delivery of the IFA are specified in the 2016 Independent Forest Audit Process and Protocol (IFAPP). The audit scope includes the last three years' implementation (April 1 2011-March 31 2014), of the Phase I 2009 - 2019 FMP and two years' implementation (April 1 2014 – March 31 2016) of the Phase

[1] 2016 Independent Forest Audit Process and Protocol.
[2] Ibid

II 2009 - 2019 FMP. The development and planning process for the Phase II FMP is also included in the audit scope.

3.2. Management Unit Description

The Forest is centered on the City of North Bay. Other communities within the NF include Sturgeon Falls, Mattawa, Trout Creek, Callander, and Powassan (Map 1).



MAP 1. LOCATION OF THE NIPISSING FOREST

There are five First Nations with identified traditional uses on the NF. Two First Nation Reserves, Dokis and Nipissing are situated in the western and central parts of the Forest respectively. Two other aboriginal communities, the Mattawa/North Bay Algonquins and the Antoine First Nation, are situated in the Mattawa area, but do not have any reserve lands. The Temagami First Nation is located north of the Forest, but uses parts of the Forest for traditional uses.

The NF can be best described as a mosaic of relatively small stands with a varied interspersion of forest types and ages. The Crown land area is 843,546 hectares (ha) of which 764,582 ha is classified as managed Crown Land (Table 2). Managed Crown productive forest land occupies 552,298 ha (Table 2). Patent land comprises 23% of the land base. The area of land occupied by provincial forest types is shown in Figure 1. As the NF is situated within the Great Lakes St. Lawrence Forest Region, tolerant hardwoods are the dominant forest cover type occupying approximately 31% of the land

base. Other forest cover types include mixedwood, mixed conifer upland and white birch which occupy 14%, 13% and 11% of the land base respectively.

There are sixteen Species at Risk (SAR) associated with the NF including the spotted turtle (endangered) and threatened species such as the Least bittern, Peregrine falcon, Blandings turtle, Eastern hognose snake and Eastern massasauga rattlesnake (threatened).

TABLE 2. AREA SUMMARY OF MANAGED CROWN LAND BY LAND TYPE

Managed Crown Land Type	Area (Ha)
Water	134,339
Other Land (Grass & Meadow, Unclassified Land)	6,771
Subtotal Non-Forested Land	141,110
Non-Productive Forest Land[3]	
Non-Productive Forest	71,174
Protection Forest[4]	4,286
Production Forest[5]	
Forest Stands	500,703
Recent Disturbance	21,552
Below Regeneration Standards[6] (Older Low Stocked Stands/Recent Not Yet FTG)	25,757
Subtotal Production Forest	548,012
Subtotal Forested Land	623,472
Total Crown Managed Land	764,582

Source: Table 1 2009 FMP

[3] Non-Productive Forest is land within a forested area which is currently incapable of commercial timber production owing to its very low productivity or competing vegetation cover.
[4] Protection forest land is land on which forest management activities cannot normally be practiced without incurring deleterious environmental effects because of obvious physical limitations such as steep slopes and shallow soils over bedrock.
[5] Production forest is land at various stages of growth, with no obvious physical limitations on the ability to practice forest management.
[6] Lands Below Regeneration Standards are lands comprised of older stocked stands, areas of natural disturbance and depleted areas that have not yet met the free-to-grow standard for height and/or stocking.

The age class area distribution of forest units is shown in Figure 2. An age class area imbalance occurs with the majority of forested land being concentrated in the 81-100 and 101-120 year age classes (~46%). Over time, this age class area imbalance will have implications for the provision of a balanced wood supply (harvest level declines are projected in successive management terms) and for the supply of habitat for some wildlife species.

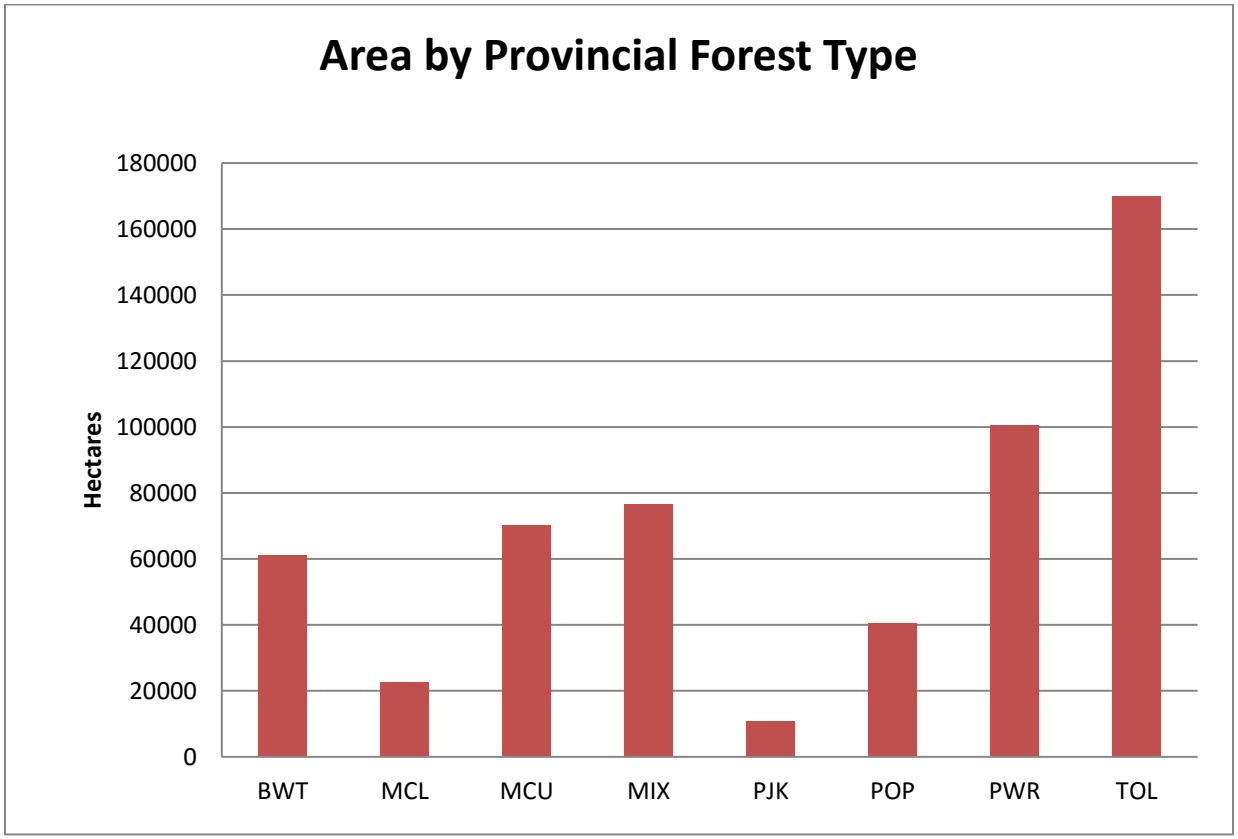


FIGURE 1. AREA OF MANAGED CROWN PRODUCTION FOREST BY PROVINCIAL FOREST TYPE
Source: FMP-2, 2009 FMP[7]

[7] Provincial Forest Types are as follows: BWT=White Birch/Tolerant MCL=Mixed Conifer Lowland, MIX=Mixedwoods, MCU=Mixed Conifer Upland, PJK=Jack Pine, POP=Poplar, PWR=White and Red Pine and TOL=Tolerant Hardwoods.

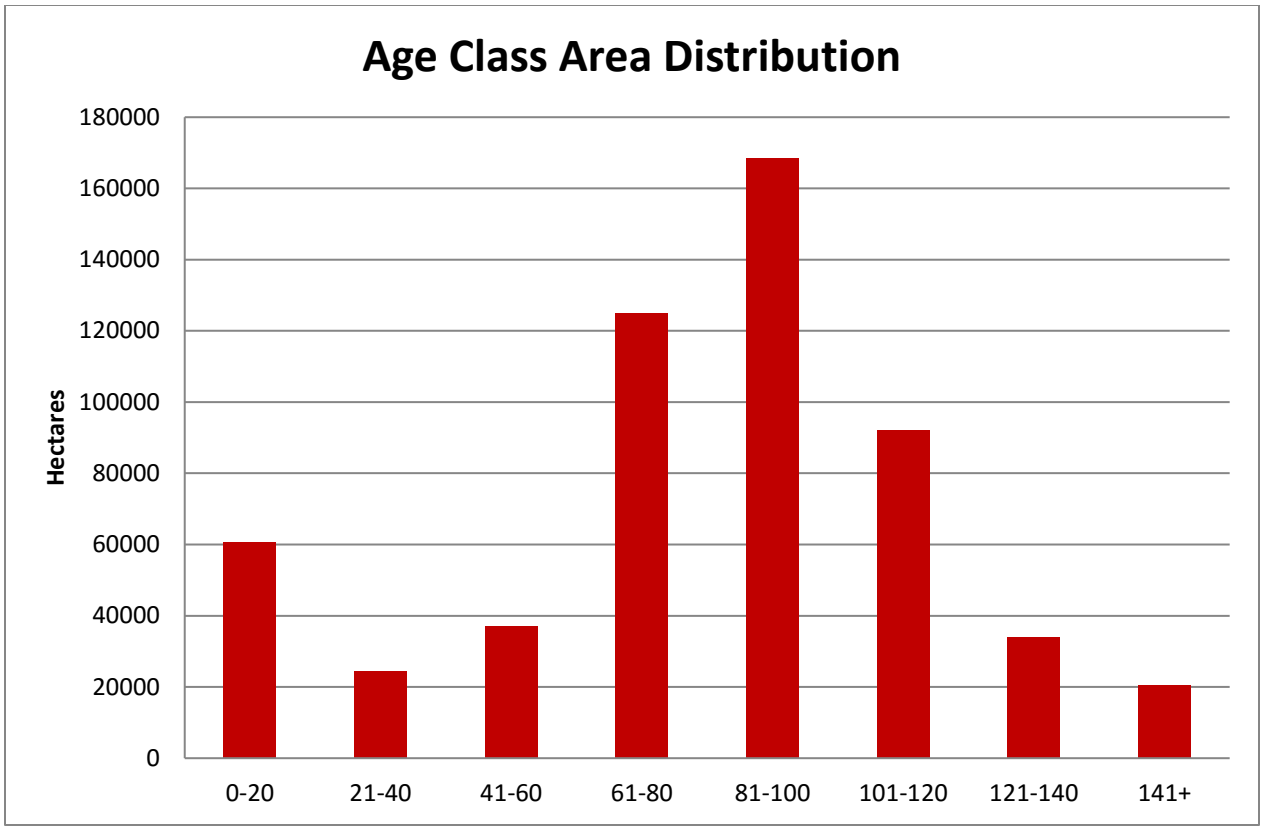


FIGURE 2. AGE CLASS AREA DISTRIBUTION (CROWN MANAGED LAND)

3.3. Current Issues

Our document review and discussions with NFRM and MNRF staff identified the following issues;

Historic Low Harvest: Poor market conditions have resulted in the underachievement of FMP harvest and related silviculture targets for approximately the past 15 years (See Section 4.4).

Differences between MNRF and SFL Data in Regeneration Assessments: There are consistent differences between MNRF Silvicultural Effectiveness Monitoring (SEM) results and SFL results for FTG designations and regeneration assessments. Surveys completed during the audit term indicate a low rate of silviculture success (See Section 4.6).

MNRF Staffing Levels: The MNRF transformation process has resulted in some SEM Core Tasks not being completed during all years of the audit term (See Section 4.6).

Survey of Class X,Y and Z Lands: There are approximately 867 ha of class X and Y lands requiring survey (Recommendation # 5, Appendix 1).

3.4. Summary of Consultation and Input to the Audit

Details on the public consultation process for this audit are provided in Appendix 4. Comments and opinions on the forest management activities of NFRM and the MNRF were solicited from the public, Aboriginal communities and Métis organizations, tourism operators and other stakeholders using a combination of a direct mail out[8] , a posting of a notice advising of the audit in the North Bay Nugget, and telephone contacts.

NFRM and MNRF (District and Regional) staff participated in the field audit and/or were interviewed by the audit team. Members of the LCC also participated in the field audit and/or were interviewed.

4.0. Audit Findings

4.1. Commitment

The IFAPP requires both the SFL holder and MNRF to have policy statements and display operational performance that demonstrates the organizations' commitment to sustainable forest management. NFRM maintained third party FSC certification during the audit term and obtained SFI certification in 2014. The certification status of the Forest during the audit term meet IFAPP commitment principal requirements. MNRF policy and mission statements were available on the MNRF website. All interviewed MNRF staff were aware of MNRF direction, sustainable forestry commitments and Codes of Practice. Our assessment is that MNRF met the requirements of the IFAPP commitment principal.

4.2. Public Consultation and Aboriginal Involvement

FMPM public consultation requirements for the development of the Phase II FMP, the Annual Work Schedules (AWSs), and Plan Amendments for the audit period were met. We note that Phase II FMP Information Centres had limited attendance and very few public comments on the FMP were received. The comments were appropriately documented and tracked.

Our record review indicated that stakeholders were made aware of the planning process and that opportunities were provided for input and engagement in the forest management planning process.

Issue Resolution and Individual Environmental Assessment

During Phase II planning, opportunities for person(s) to make a request for an Individual Environmental Assessment (IEA) for specific proposed forest management activities were clearly identified. There was one request for issue resolution which was resolved

[8] A random sample of 100 individuals and organizations listed in the 2008 FMP mailing list received a letter and questionnaire requesting input to the audit process.

at the Regional Director level. FMPM requirements for issue resolution were met.

Local Citizens Advisory Committee

The Nipissing Forest Local Citizens Advisory committee (NFLCC) is a standing committee with members appointed by the MNRF District Manager. Committee membership reflects the range of stakeholder interests on the Forest including Aboriginal representation. It is a large LCC with 14 regular members plus alternates to represent the resource interest when the regular member is absent.

Participation by LCC members was excellent and a sample of minutes confirm that there was always a quorum at meetings. As required by the FMPM the LCC Terms of Reference (TORs) were updated for FMP development.

The Committee was actively involved in the implementation of the Phase I and II FMPs (i.e. review of Annual Work Schedules, Annual Reports, etc.) and the planning of the Phase II FMP (representation on the Planning Team). Minutes of committee meetings show a further active involvement in other resource management areas (e.g. fisheries, wildlife management).

Interviews indicated that Committee members were very satisfied with the efforts by the MNRF and NFRM to respond to questions, provide information and solicit their input on the management of the forest. The NFLCC Committee Activity Report in the Phase II FMP Supplementary Documentation (8.9.16, 6.0) provides a discussion of the FMP and the general statement that:

"The LCC is in general agreement with the FMP as the best effort with the tools available. The Planning Team has considered many forest values and interests, some of which are diametrically opposed, and the FMP provides a reasonable balance of responses to those values and interests[9]*."*

Interviewed Committee members felt that their involvement provided benefit to the forest management program and MNRF and NFRM staff concurred. Our assessment is that this is a very effective LCC that enjoys an excellent working relationship with the MNRF and NFRM.

Aboriginal Involvement in Forest Management Planning

For the Phase II planning process the MNRF provided notification to the five First Nations involved in Phase I (Antoine Algonquin's, Dokis, Mattawa North Bay Algonquin's, Nipissing and Temagami) and included notification to Matachewan FN,

[9] The LCC statement consists of a paragraph that provides a discussion of the FMP and the Committees rationale for its support of the plan. For this report we have utilized the first paragraph that summarizes the LCC's position.

Timiskaming FN, Wolf Lake FN, and the Temiskaming Métis Council. The additional FNs and Métis Council choose not to participate on the planning team.

However, the five FNs that were involved in Phase 1 planning also participated in Phase II. Three of the communities appointed representatives to the Planning Team (PT) and all five communities signed and agreed to the Terms of Reference (TOR). There is a long standing Aboriginal Working Group (AWG) in the District that provides a strategic discussion forum and another avenue for Aboriginal input into the planning process. We note that aboriginal planning team members were also members of the AWG. Meetings of the AWG worked in sync with the FMP Planning Team to ensure there was an ongoing exchange of information/views on the developing planning process.

MNRF met all FMPM requirements for Aboriginal involvement in the planning process (i.e. communities were informed and updated on the planning process and Aboriginal values maps were updated (based on available information). Those maps were appropriately utilized for the development of the management plan.

MNRF's Forest Environmental Assessment Approval (Declaration Order MNRF-71) requires MNRF District Managers to conduct and report on negotiations with Aboriginal peoples to identify and implement ways of achieving a more equitable participation in the benefits provided through forest management planning. Condition 56 District Reports (formerly Condition 34) were completed by the MNRF and met the required FMPM format and content requirements.

Our assessment is that all IFAPP requirements for Aboriginal participation in the forest management planning process were met.

4.3 Forest Management Planning (Phase II)

The TOR for the 2014 Phase II FMP was approved by the Regional Director and met all FMPM requirements. It included documentation of schedules, procedures and was updated with changes during the planning process. It identified PT membership including representation from the Local Citizen's Committee and First Nations. Plan advisors included people with the necessary skills and experience. A Steering Committee was appointed as required by the FMPM.

For the development of a Phase II FMP, the 2009 FMPM requires that the Year 3 Annual Report (AR 2012-2013) include an analysis of the validity of basing Phase II planning on the Phase I FMP long term management direction (LTMD). The validity of the LTMD must be endorsed by the Regional Director (RD). The LTMD was endorsed by the RD as "*substantially valid*". To facilitate the planning for operations for Phase II appropriate *"minor*" adjustments to the level of renewal, tending and protection activities were required[10]. There was also a requirement to alter some of the locations identified as preferred Phase II harvest areas in the Phase I FMP and to update strategic road planning.

The PT appropriately reviewed the Phase I FMP background information and confirmed its use for the preparation of the Phase II plan. Appropriate modifications to operational prescriptions for Areas of Concern (AOC) were made to ensure consistency with the *Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales* (Stand and Site Guide). The planning team with input from the LCC appropriately developed AOC prescriptions using direction from the Crown Land Use Policy Atlas (CLUPA), approved implementation manuals, field knowledge, consultation with First Nations, resource tourism operators and the public.

In response to a recommendation in the 2011 IFA that the planning team review FMP objectives to ensure that they are measurable, feasible and within the scope of the CFSA[11] the planning team conducted a review of the 2009 FMP objectives during the development of the Phase II plan and determined that no changes were required. FMP management objectives will be revisited for the preparation of the 2019 FMP.

The 2009 FMP (Phase I and Phase II) was developed utilizing a 1989 Forest Resource Inventory (FRI). The vintage of the inventory and issues with its accuracy resulted in challenges and issues for strategic and operational planning. Issues with the inventory have been partially offset through the utilization of 2008-2009 digital photography. We note that a new enhanced forest resource inventory (eFRI) was delivered in 2016[12]. We were informed that issues related to the accuracy of stand descriptors (e.g. species compositions, age and volume estimates) still exist. Because of the late delivery there is limited time for the preparation and verification of a planning composite inventory for the development of the next FMP. NFRM has implemented numerous initiatives to validate the eFRI attributes and to begin the development of the planning composite inventory. Initial results of this work indicate that the depletion information provided by NFRM was used inconsistently for the development of the eFRI. This circumstance

[10] The following statements were made in the report; 1) The LTMD for the 2009 Plan should be adjusted to account for permanent mill closures as well as the introduction of new wood supply offers put forth by the MNR. 2) LTMD for the 2009 Plan should be adjusted to allow harvest areas to respond to current and anticipated market conditions, forest inventory inaccuracies and silvicultural timing considerations and 3) LTMD for the 2009 FMP should be adjusted slightly in its silviculture program in terms of altering the level and the way site preparation and tending are applied to certain site conditions.
[11] Recommendation # 3, 2011 IFA.
[12] The original delivery date for the eFRI was 2014.

resulted in significant discrepancies in the inventory that require correction (Recommendation # 1, Appendix 1).

Operational planning for Phase II harvest areas appropriately considered the most current values information, relevant guidelines (i.e. *Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales*), the requirements of the Natural Disturbance Pattern Emulation Guideline (NDPEG) and public input. The planned and preferred harvest areas identified in the Phase I plan required some changes to respond to market conditions, inaccuracies in the forest resource inventory (FRI), NDPEG requirements and silvicultural timing considerations. Overall the Phase I LTMD Available Harvest Area (AHA) was not exceeded for any forest unit. We found the rationale for the projected AHA, and the selection process for the allocation of harvest blocks was well documented in the Phase II FMP. There were no planned salvage harvest areas in the Phase II FMP. We note that the level of age class substitutions was reduced in the Phase II FMP[13].

The Silviculture Ground Rules (SGRs) in the Phase I FMP were updated and revised, resulting in nine new SGRs to provide more operational flexibility for harvests in some forest units.

Some contingency wood allocations (1,525 ha) in the Phase II FMP were relocated as there was overlap with the settlement area proposed in an Algonquin Land Claim (ALC). Two areas from Phase I may also be impacted by the land claim. The ALC settlement is currently structured to permit planned forest operations to continue within these areas with enhanced consultation. However, NFRM elected to re-allocate the affected contingency areas to lands outside of the proposed settlement area since future forest management activities in these areas would not be eligible for Renewal Trust funding due to the status of the areas as private land.

Species at Risk (SAR) listed under the Endangered Species Act were appropriately considered in the Phase II planning. Habitat descriptions, the application of guidelines and operational prescriptions were provided in the text and supplementary documentation. It is noteworthy, that the planning team assigned a special task team to review the Phase I moose habitat strategies and update the Phase II plan as required The AWSs contained the required directions with supporting AOCs.

[13] Age class substitutions in the harvest schedule continue to exist for all forest units due to the long history of logging on the unit prevailing forest conditions (mosaic of small stands of various ages and species compositions).

All requirements for the protection of resource based tourism values were addressed. Sixteen Resource Stewardship Agreements (RSAs) were re-signed during the audit term. No complaints from tourism operators were received during the audit period.

The Phase II FMP was approved on time for implementation on April 1, 2014.

The content of Annual Work Schedules (AWSs) conformed to FMPM requirements and the forest management activities were consistent with those outlined in the relevant plans.

FMP amendments and revisions were appropriate and well documented.

4.4. Plan Assessment and Implementation

Three silvicultural systems are utilized for harvest and renewal; selection, shelterwood and clear cutting. The shelterwood system is used for both tolerant hardwood and white pine stands and the selection system is utilized in hardwood stands when tree quality permits. Our field assessments confirmed that Silvicultural Ground Rules[14] (SGRs), Silvicultural Treatment Packages[15] (STPs) and Forest Operations Prescriptions (FOPs) were appropriate for the forest cover types and site conditions on the NF.

The management of white pine forest units is challenged by initial stand conditions[16], competitive sites, past harvest practices and economic factors. Many white pine stands are in a degraded condition due to the improper application of the shelterwood harvest system 10-20 years ago and other historic harvest practices. The low initial stocking to suitable pine seed trees presents challenges for the application of the shelterwood harvest system and the subsequent renewal of the site to pine. These stands are now characterized as having few merchantable mature pine trees, high levels of hardwood in the mid-canopy (i.e. red maple, poplar, birch, balsam fir) and little or no pine regeneration. We visited several sites where it was necessary to change the marking prescription from a uniform shelterwood cut to a seed tree cut due to low stocking levels of merchantable pine. The more open canopy in legacy pine harvest areas has stimulated the establishment of competitor species (principally red maple) and multiple tending interventions and infill planting are typically required to achieve the pine stocking standard. The intensive silviculture regime necessary to rehabilitate these stands to a pine free-to-grow (FTG) condition typically requires significant expenditures

[14] Silvicultural Ground Rules specify the silvicultural systems and types of harvest, renewal and tending treatments that are available to manage forest cover and the type of forest that is expected to develop over time.
[15] A Silvicultural Treatment Package is the path of silvicultural treatments from the current forest condition to the future forest condition. STPs include the silvicultural system, harvest and logging method(s), renewal treatments, tending treatments and regeneration standards.
[16] Low initial stocking to pine which poses limitations with respect to the number of seed trees which can economically be retained within cutovers.

and the diligent monitoring of treatments. We note that NFRM successfully applied to the Forestry Futures Trust for funding to support its efforts in white pine restoration.

The prescribing of appropriate silvicultural treatments to maintain pine forest units requires the forest manager to be knowledgeable of the autecology of pine and its principle competitor species and to exercise considerable professional judgement when planning and implementing stand treatments through to the final removal cuts under the shelterwood harvest system. We were initially concerned with the reported low levels of silvicultural success for the PWUS and PWST forest units. Our review of the FTG/SEM data and interviews indicates that past cutting practices coupled with the lack of past tending were significant contributing factors for the failure of harvested areas to achieve the projected forest unit. (Section 4.6). We concluded that the implementation of the aggressive tending program (aerial and ground chemical tending) augmented by manual tending (as required)) and effective monitoring of treated areas in this audit term in combination with initial harvest prescriptions that are better tailored to existing stand conditions will result in higher levels of silvicultural success.

Harvest

NFRM is organized as a Cooperative Sustainable Forest Licensee with five shareholders and ten independent operators. Each operator is assigned a proportion of the available harvest area equivalent to their owned share-proportion of NFRM.
The downturn in the forest sector economy negatively affected the achievement of plan harvest targets (35% of the planned area forecast was harvested) (Table 3).

This underachievement in harvest area largely reflects poor market conditions for a variety of species and wood products and associated mill curtailments and closures. The inability to achieve planned harvest targets had implications with respect to the achievement of other planned silvicultural activities which follow harvesting, and will, (should the trend continue), affect the achievement of objectives related to habitat supply, forest age class distributions and future wood supply.

During the audit term the harvest focused mainly on the PWST, PJ, and MW forest units. The average annual harvest for the PWST and PJ forest units in the audit period are currently above the planned AHA (113% and 117% respectively). Actual volumes realized for the PWST and PJ forest units are below planned levels, likely reflecting factors such as initial stand conditions at harvest, and inaccuracies in the forest resource inventory related to species composition and volumes. We were informed by both NFRM and MNRF staff that that the overharvest in pine forest units was a function of inaccuracies in the planning inventory (where PWST forest units were delineated as PWUS forest units) and that it was expected that the new forest inventory with its better-defined forest units would likely remedy the problem. Utilization of the AHA is market driven and harvests above planned levels for individual forest units may occur periodically during the plan term. The objective at the end of the plan term is not to exceed the AHA for any forest unit with harvest areas being reported on annually and monitored through the submission of Annual Reports.

TABLE 3. PLANNED VS. ACTUAL HARVEST AREA BY FOREST UNIT[17] (2011-2014)

Forest Unit	Total Planned Phase I Harvest (ha)	Actual Harvest (Ha)	Planned Vs Actual %
BW	836	253	30
BY	197	38	19
HDSEL	1,844	124	7
HDUS	1,452	851	59
HE	260		0
LWMX	183		0
MCL	143		0
MW	747	706	94
PJ	81	95	117
PJSB	232	55	24
PO	424	216	51
PR	96	64	67
PWST	372	419	113
PWUS	1,240	264	21
SF	994	124	12
Total	**9,103**	**3,209**	**35**

Clearcut harvests were most frequently implemented, achieving approximately 66% of the planned target (8,052 ha). Shelterwood harvests were implemented on 3,628 ha (40% of the FMP planned area). Selection harvests only achieved 7% of planned target. Many of the stands scheduled for single tree selection cuts were switched to shelterwood harvest due to poor tree quality, low stocking levels and insufficient acceptable growing stock. These stand conditions are largely a reflection of the location of the forest in the northern range of tolerant hardwood species[18] coupled with historic harvest practices where marking and careful logging guidelines were not implemented.

Table 4 presents a summary of the planned vs. actual volume utilization between 2011 and 2014.

[17] Forest Units are as follows: BW= White Birch, BY= Yellow, HDSEL=Tolerant Hardwood Selection, HDUS=Hardwood Uniform Shelterwood, HE=Hemlock, LWMX=Lowland mixedwood, MCL= Mixed Conifer Lowland, MW=Mixedwood, Pj= Jack Pine PJSB= Jack pine/black spruce, PO=Poplar, PR= Red pine, PRWST = White/Red Pine Seed tree PWUS = White Pine Shelterwood, SF=Spruce/Fir

[18] There is a legacy of designating stands for selection management (in the mid-to late 1990s) as a future stand-level objective even though the quality, structure and site conditions were often not present to support the application of selection cuts.

TABLE 4. ANNUALIZED PLANNED VS. ACTUAL VOLUME UTILIZATION (M^3) 2011-2014

Species group	Planned m^3	Actual m^3	% of planned
Cedar	3,717	299	8
Hemlock & Larch	13,311	388	3
Spruce-Pine-Fir	174,124	89,995	52
White & Red Pine	145,264	63,512	44
Sub-total conifer	336,417	154,154	46
Maple	77,655	67,319	87
Poplar	145,000	38,345	26
upland/Lowland hardwood	91,592	13,800	15
white Birch	93,352	29,516	32
Sub-total Hardwood	407,599	148,980	37
mixed biofibre		5,684	
Total	744,016	308,818	42

Conifer utilization achieved 46% of the planned volume (154,154 m^3) while hardwood utilization achieved 37% of the planned volume forecast (148,980 m^3).

Harvest operations are guided by tree marking prescriptions, and implemented by contracted "*certified tree markers*". Our site inspections indicated that marking operations in hardwoods (even and uneven age management systems) was effective in securing hardwood renewal and improving overall stand quality. On the inspected sites, stand basal area targets were met, wildlife trees were appropriately retained, and the overall quality/condition of the residual stand was improved.

Shelterwood marking in white pine forest unit stands focused on the controlled removal of the overstory and/or mid-story to improve light availability to promote the regeneration of pine. As indicated previously, prevailing site and stand conditions offer significant challenges to the successful implementation of the white pine shelterwood and seed tree harvest systems[19]. We visited several cut blocks where pine renewal was variable

[19] The incomplete application of shelterwood harvest systems 15-20 years ago has resulted in an abundance of degraded white pine stands with low densities of white pine. Surveys indicate that approximately 37% of stands that received a regeneration cut 12-20 years ago have low overstory

due to competition in the mid and understory and low initial densities of mature pine arising from past harvests. The improper application of past shelterwood cuts has posed limitations with respect to the number of seed trees which can economically be retained within cutovers and the ability to control competition in the understory by overstory shading. A lack of past vegetation management has also contributed to low levels of natural ingress by pine. We note that NFRM has submitted applications to the Forestry Futures Trust Committee to facilitate silviculture work within these degraded stands and we encourage the company to continue to seek similar support in the future.

Pre-commercial thinning operations were conducted on 541 ha. Marking and harvest operations in red pine plantations achieved the desired stand densities. Harvest and thinning operations in red pine plantations situated in the northern portion (particularly the northwest) of the unit are currently not economically viable due to factors such as piece size, location of markets etc. We were informed by NFRM staff that approximately 4,000 ha of pine plantations are potentially eligible for thinning operations in the next FMP. Without thinning interventions site productivity, will not be maximized and potential future economic opportunities will be lost. NFRM staff are aware of the requirement to thin the plantations and we encourage them to explore options (i.e. applications to the Forestry Futures Trust) to enable pre-commercial and commercial thinning operations in red pine plantations during the next FMP term.

Our site inspections indicated that audit term harvest operations were properly implemented despite the challenges of low densities of merchantable pine in many harvest blocks. Operator care to minimize site damage and damage to residual stems was evident. This finding is confirmed by the relatively low number of compliance issues associated with harvesting during the audit term. All inspected sites were approved for operations in the Annual Work Schedules (AWS) and harvest prescriptions were implemented in accordance with the SGRs and required guidelines (i.e. Natural Disturbance Pattern Emulation Guideline (NDPEG)).

All inspected harvest blocks were approved for operations in the AWSs. Harvest prescriptions were implemented in accordance with the SGRs, and individual FOPs were prepared and appropriately implemented for each harvest block. There was little evidence of site or environmental damage. AOC prescriptions were properly implemented. Harvest block configurations were designed to meet landscape level objectives and NDPEG requirements were met (to the extent possible given existing forest structure).

Slash Management

Several strategies were utilized to manage slash during the audit term including piling, chipping and the re-distribution slash in the harvest blocks. Efforts to grind piles for bio-

stocking, high levels of competition in the mid-canopy and a well-developed understory dominated by undesired species (e.g. red maple). There is typically little merchantable volume of pine in the overstory or mid canopy requiring that these stands be harvested as clear cuts with seed trees.

fuel recovery were undertaken on a limited basis due to the sporadic market for bio-energy.

NFRM implements its pile burning program based on accumulated piles to control program costs. Piles were burned in 2011 and 2013. The next burn program is scheduled for the fall/winter of 2016. Although we did not observe issues related to the size and depth of chipper debris during our site inspections, we were informed by MNRF of concerns with respect to the loss of productive forest land associated with chipping operations. We were also informed that the NFRM had recently implemented measures (site preparing and planting) to address this issue.

It is our assessment that an effective slash management program was being implemented.

Area of Concern Management

AOC prescriptions were appropriate for the protection and/or maintenance of the identified values and were implemented in accordance with the FMPs and the AWSs. Our review of FOIP records indicated few compliance issues associated with AOCs during the audit term.

Renewal, Tending and Protection

Renewal

The 2009 FMP forecast an annualized area of 7,187 ha of natural regeneration and 2,357 ha of artificial renewal. FMP renewal targets were not achieved due to the low level of harvest. However, the annualized area treated for renewal closely approximates the area harvested (3,154[20] ha harvested vs.3,309 ha renewed) over the audit term (Table 5). All renewal treatments observed in the field were consistent with the FMP SGRs.

[20] Based on 4 years of data.

TABLE 5. ANNUALIZED AREA (HA) OF PLANNED VS. ACTUAL RENEWAL TREATMENTS 2011-2016[21].

Treatments	Planned Ha	Actual Ha	Planned Vs Actual %
Natural Renewal			
Clearcut Silvicultural System (even-aged)	3,032	1,727	57
Shelterwood Silvicultural System (even-aged)	2,278	907	40
Selection Silvicultural System (uneven-age)	1,877	124	7
Artificial Renewal			
Plant	2,270	452	20
Seed	87	99	114
Total Renewal	**9,544**	**3,309**	**35**

***Shelterwood and selection regeneration areas for 2015 are pending SAP imagery processing.

FMP targets for artificial renewal (e.g. planting and seeding) were underachieved with 452 ha treated by planting and 99 ha treated by seeding.

Natural renewal was utilized more frequently than artificial regeneration (annualized – 2,758 ha vs. 652 ha) as natural renewal is typically scheduled for stands managed by the shelterwood (40%), clearcut (66%) and selection (7%) harvest systems. To promote natural seeding success NFRM staff made efforts to synchronize the timing of harvest operations to coincide with good seed years. Areas managed for hardwoods under the even-age and uneven-age harvest systems were typically well stocked to desired species.

Our site inspections also indicated that audit term even-age management strategies in pine forest units were resulting in sufficient levels of natural ingress. Areas of in-fill planting and artificial renewal sites typically exhibited good spacing and stocking to crop tree species.

Our assessment is that an effective renewal program was implemented.

Tending

Multiple tending treatments are typically required to reduce hardwood competition within pine forest units managed under the uniform shelterwood or seed tree harvest systems[22] due to past cutting practices and the lack of vegetation management in harvested stands. In response to the observed shortfalls in silviculture success and some instances of crop tree damage by herbicides, NFRM appropriately implemented an

[21] Shelterwood and selection regeneration areas for 2015 are pending Supplementary Aerial Photography (SAP) processing.
[22] Two to three chemical tending treatments are often required in white pine stands depleted with a regeneration harvest under the uniform shelterwood system.

aggressive chemical tending program utilizing either a single herbicide or a combination of herbicides for species specific competition control (e.g. red maple) and/or to minimize the adverse effects of the spray program on desired crop species (e.g. red pine, white pine) and non-target species (i.e. red oak)[23]. The company also implemented measures to improve the efficacy of its herbicide program including the re-calibration of spray equipment, refining the "hardening off" periods for white pine, adopting "low drift" technology and using trichlopyr on sites with heavy red maple competition.

Chemical tending operations (ground air blast spray and aerial) were conducted on 8,330 ha achieving 96% of the Phase I FMP target (Table 6). Aerial herbicide tending treatments were tailored to existing stand conditions and appropriately considered factors such as the height of residual trees, desired crop trees (white and red pine, white spruce, red oak, yellow birch and black cherry), the canopy position of competitor species (i.e. mid-canopy/understory, ground), competitor and non-target species present, level of site competition etc. It is our assessment that an effective chemical tending program was implemented during the audit term.

TABLE 6. ANNUALIZED AREA (HA) OF PLANNED VS. ACTUAL TENDING TREATMENTS 2011-2016.

Treatments	Planned Ha	Actual Ha	Planned Vs Actual %
Tending			
Cleaning (Aerial Herbicide, Ground Herbicide, Manual Tending Spacing, Pre-commercial thinning, Improvement Cutting)	1,737	1,666	96
Clearcut and Shelterwood Silvicultural Systems	393	271	69
Selection Silvicultural System	939	101	11
Tending Total	**3,068**	**2,038**	**66**

Manual tending treatments are typically targeted to reduce balsam fir competition within pine forest units. Two treatments are typically implemented to reduce balsam fir competition. The first is a pass with brush saws followed by a second pass with chainsaws to remove mid-story competition by larger trees. Our inspection of manual tending sites indicated that an effective competition control program was implemented.

During the site inspections, we visited several red pine plantations where pre-commercial and commercial thinning had been undertaken to control stand density. These treatments were appropriately implemented with no visible damage to residual trees and the prescribed stand density targets were achieved.

[23] A herbicide mix of triclopyr and glyphosate is typically applied when red oak is present.

NFRM staff also implemented an effective monitoring program to assess the efficacy of competition control measures and to schedule future competition assessments and tending treatments (Section 4.6).

We concluded that an effective tending program, consistent with the FMP SGRs was being implemented.

Site Preparation (SIP)

FMP targets for mechanical and chemical site preparation were not achieved (23% of the Phase I forecast area) principally due to the reduced harvest level (Table 7). Mechanical SIP treatments included the use of spiked anchor chains, blades, patch scarifiers and root rakes. The inspected areas treated by mechanical site preparation exhibited good mineral soil exposure. There was no evidence of environmental or site damage. We note that NFRM regularly monitors seed crops in hardwood and conifer shelterwood seeding cuts to ensure site preparation treatments can be implemented at the optimum time.

TABLE 7. ANNUALIZED AREA (HA) OF PLANNED VS. ACTUAL SITE PREPARATION TREATMENTS 2011-2016.

Treatments	Planned Ha	Actual Ha	Planned Vs Actual %
Site Preparation (SIP)			
Mechanical SIP	1,330	207	16
Chemical SIP	1,242	365	29
Slash Pile Burning	0	10	
SIP Total	**2,572**	**582**	**23**

Typically, sites receive two site preparation treatments prior to planting; a mechanical treatment followed by chemical site preparation the same year or a year later. This treatment regime offers early proactive vegetation control. During the audit term, there was a shift to utilize chemical site preparation more frequently to control initial species competition. Three hundred and ninety-six hectares were treated by a chemical site preparation treatment[24].

Chemical site preparations consisted of aerial spray treatments (to control advance hardwood growth) or ground treatments by a skidder mounted air blast sprayer to control herbaceous competition. In some circumstances the prescribed site preparation treatment consisted of a combination of mechanical, aerial chemical and ground chemical treatments. Our field audit indicated that the treatment was effective as a

[24] Skidder-mounted air blast sprayer (FORZA herbicide)

vegetation control measure and as a treatment to prepare sites for planting or natural seeding.

The use of prescribed burning is an effective silviculture technique for the renewal of pine and we note that NFRM is scheduled to conduct a prescribed burn on an experimental basis in 2017. We encourage NFRM to continue to investigate the use of prescribed burning as a site preparation tool where site and stand conditions are conducive to the application of the technique.

Protection

No areas were identified in the Phase II plan for insect pest management and no pest management activities occurred during the audit term.

Access Planning and Management

Forest access planning for the Phase II FMP met FMPM requirements. During the audit term 5.1 kilometres (kms) of primary and 15.4 kms of branch roads were constructed and approximately 2,097 kms of road maintenance work were completed. Sixty-one water crossings were constructed. Our sampling of the invoices submitted to the Forest Roads and Maintenance Agreement (FRMA) indicated that they were complete and accurate.

Water crossings were inspected by helicopter and during our on-the-ground site visits. Most inspected water crossings were well-constructed, although we did encounter a few culverts which were perched[25] due to their installation on bedrock. This was not a widespread occurrence so a recommendation is not provided.

No instances of environmental damage or public safety concerns related to access or water crossing installations were observed. Our review of FOIP records confirmed this finding.

Our sampling of forestry aggregate pits and FOIP records indicated that there were no significant non-compliances related to pit operations.

However, several issues related to the management and operation of aggregate pits were identified over the course of the field audit. We observed an on-going discussion between NFRM and MNRF as to "*what constitutes a Forestry Aggregate Pit (FAP)*" with respect to "grubbing"[26] operations and the use of roadside burrow pits. Typically, the grubbing of material "*within the roadbed*" is not deemed to constitute a FAP. In instances where grubbing occurs "*outside of the roadbed*" and the excavated material is placed in/on the roadbed the excavation site is considered a FAP. Other factors considered when designating an excavation site as a pit are the extent of the grubbing

[25] A perched culvert is one with an outlet elevated above the downstream water surface.
[26] Grubbing involves removing roadside material for minor maintenance such as filling holes, smoothing the road surface, improving sight lines, etc. The resulting holes/disturbed areas are often referred to as "burrow pits

activity and volume of material excavated. Our understanding, is that the current direction provided in the Forest Compliance Inspector training and certification examination is that road side grubbing can constitute a FAP. Company staff believe this direction can be too far reaching. Should this direction be rigorously applied it could potentially result in an unmanageable number of FAPs and significant additional work load. We encourage the parties to continue a dialogue to find a pragmatic solution to this issue.

Another issue linked to pit management and operations relates to on-going access requirements for areas managed under the selection and shelterwood harvest systems. These silviculture systems require multiple stand entries over a progressive number of cutting cycles (rotation). Under the current provincial standard operators are required to close and rehabilitate FAPs after 10 years of operation. Pit management guidelines are not in sync with the extended access requirements for stands managed with successive cuts common to the Great Lakes St. Lawrence Forest. We were informed by NFRM staff that in some instances they would be closing and rehabilitating pits only to likely reopen them when access was required for the next cut in the harvest cycle. We observed numerous pits that had been closed and properly sloped but final rehabilitation work had not been completed due to the likelihood that aggregate would be required to facilitate a future harvest. One solution to the issue could involve the re-classification of the pit as a Category 9 pit[27]. However, the small size and large number of FAPs, as well as the increased guidelines, rules and bureaucracy associated with Category 9 pits makes that option somewhat impractical. Another solution could involve opening new FAP in the immediate proximity of the closed pit. However, there are rehabilitation and new pit establishment costs, as well as the increased footprint of FAPs across the Forest associated with that solution.

The government moved to establish FAPs (2006) in response to the Recommendations of the Minister's Council on Forest Sector Competitiveness (MCFSC) (Aggregates Task Group) to streamline the process of building and maintaining forest access roads. An implicit recognition of the extended access requirements associated with the cutting cycles in hardwood and pine management is required if the standard for the management of aggregate pits is to meet the intent of the MCFSC initiative. We concluded that some modification to pit closure requirements would support government efforts to streamline regulations, respond proactively to forest industry economic issues and provide a practical solution to the problem. We provide a recommendation (Recommendation # 2, Appendix 1).

Renewal Support

Renewal support includes the activities necessary to support the forecast types and levels of renewal and tending operations. Renewal support activities over the audit term were sufficient to meet projected renewal program requirements.

[27] Category 9 pits can remain open for periods of longer than 10 years.

Audit term renewal support included; cone collection, seed tree inventory and site improvement work (road brushing) at the Mattawan Seed Orchard and work to mitigate white pine weevil and blister rust at a white pine progeny test area in Gurd Township.

4.5. System Support

NFRM met IFAPP Human Resources principle criterion through its SFI and FSC certifications. Both the MNRF and the SFL holder implemented effective training programs during the audit term. We found auditee staff (NFRM and MNRF District) to be competent and professional.

It is noteworthy that during the audit term NFRM employed two full time silviculture foresters. This staffing compliment is atypical for small scale SFLs in Ontario. We believe the forest management program benefited from having two professionals engaged in silviculture management and is an appropriate response to the complexities and challenges associated with the NF.

Document and Record Quality Control

Forest management records are maintained at the NFRM office in Callandar and in the North Bay District Office (MNRF). The SFL holder and the MNRF District Office have effective systems for record and document management and both organizations made effective use of Geographic Information Systems (GIS) technology (in-house and contracted) to support their forest management program. We note the forest certification certificates held by NFRM also include a requirement for the maintenance of a quality document and record control system.

NFRM made effective use of computer technology for the delivery of its forest management program. The company in collaboration with other area SFLs has funded and participated in the development of a number of “applications” tailored for use on iPads and other computing equipment to assist field staff in the delivery of their monitoring functions (i.e. compliance inspections, water crossing inventories, regeneration assessments) and forest management responsibilities (e.g. SHMON is a Shelterwood Monitoring Application which assists with the reporting and scheduling of silviculture treatments and shelterwood cuts in stands managed under the shelterwood system). We consider the adoption and use of hand held technology by NFRM as a Best Management Practice (Best Management Practice # 1, Appendix 1).

4.6. Monitoring

SFL and District Compliance Planning and Associated Monitoring

District Compliance Planning and Monitoring

MNRF Districts are responsible for the preparation of an Annual Compliance Operations Plan (ACOP). The North Bay District produced ACOPs for each year of the audit term.

The ACOP listed compliance priorities based on the AWS, assigned targets and identified responsible staff. We note that the District held regular internal compliance strategy sessions and there was evidence of on-going communication/meetings with NFRM staff and specific operators.

Based on the ARs, MNRF completed approximately 21% of the compliance inspections during the audit term (127 of 601 inspections). Our assessment is that this was an appropriate percentage of inspections based on the harvesting activity and past compliance history.
Our assessment is that the MNRF implemented an effective compliance program.

SFL Compliance Planning and Monitoring

NFRM completed compliance plans as required by the guidelines and the plans met content and format requirements. We reviewed compliance plans in the AWS's and the format and content met FMPM requirements. From the AR's, NFRM completed 474 inspections over the audit term.

MNRF and NFRM inspections (601) yielded an in-compliance rate of approximately 98%. There were 13 not-in-compliance reports. There was no discernable trend in the non-compliances and all the issues were appropriately addressed. We reviewed 25 randomly selected FOIPs from this audit period (both MNRF and NFRM) and submission timelines were generally met.

We concluded that the compliance record is the result of experienced staff, ongoing and issue specific training, and regular communications between the parties. Potential compliance issues were often identified early and avoided or resolved in the field. Our assessment is that NFRM produced appropriate compliance plans and delivered an effective compliance program.

Monitoring of Silvicultural Activities

In response to a recommendation in the 2011 IFA, NFRM expanded its monitoring program. Monitoring activities included; plantation survival assessments, regeneration assessments, competition assessments and Free-to-Grow (FTG) surveys. Table 8 presents the monitoring functions by regeneration type adopted during the audit term.

We found that NFRM has placed an emphasis on understanding both renewal needs and responses to silvicultural interventions on harvested areas through regular monitoring and has developed monitoring protocols (i.e. Forest Renewal Monitoring Protocol (2009-2019 FMP)) to measure the effectiveness of its harvest practices and silviculture treatments.

TABLE 8. MONITORING FUNCTIONS BY REGENERATION TYPE.

Regeneration Type	Measurement Type	Timing of Monitoring
Planting	Planting Quality	At time of tree plant.
	Temporary Sample Plots	1,2, & 5 years after planting.
	Post Tending Surveys	Season after herbicide use.
	FTG	5 to 12 years after planting.
Natural Regeneration in Shelterwood Cuts	PW/BY Shelterwood Progress	5 to 7 years after Regeneration Cut.
	Post Tending Surveys	Season after herbicide use.
	PW Shelterwood Status	8-12 years after the Regeneration Cut.
	FTG	After Shelterwood Final Removal Cut.

The tracking of silviculture work is facilitated by a geographic information system (GIS) and the use of "applications" on hand held and other computing devices (Best Practice # 1, Appendix 1). For example, the Company utilizes an in-house program (SHMON) for strategic planning, and the scheduling and reporting of harvest, thinning (pre-commercial and commercial operations) and tending treatments. Data tracked includes past stand treatments, stocking levels of desired species, a schedule for planned silviculture interventions and monitoring, information on site competition intensity, past operations etc.

NFRM has established a network of temporary sample plots (TSP) to track the survival of planted nursery stock and assess site competition levels. Data collected has provided for the evaluation of planting stock quality, the presence of blister rust, natural ingress, vegetative competition, browse damage and the effectiveness of renewal and tending treatments. One hundred and seventy-seven plots were established between 2008 and 2014 and 92% of the plots have received four measurements.

We concluded that NFRM had developed and implemented an effective silviculture assessment program.

Free to Grow Survey

Free to Grow (FTG) surveys were completed on 9,759 ha during the audit term. Surveys were completed using SOI-STARS and Calibrated Ground Ocular Measure.

NFRM reports that all surveyed areas have regenerated to tree species that are currently marketable.

We are concerned with the significant and consistent variation between FTG surveys and FTG audit results and discuss this issue further in the paragraphs below (See Silviculture Success and Silviculture Effectiveness Monitoring).

Silviculture Success

Regeneration is considered a *"silviculture success*" when all the standards contained in the SGR applied to that stand have been met and the projected forest unit is achieved. A *"regeneration success*" occurs when the regeneration meets all the standards of an SGR but the stand has regenerated to a forest unit other than the projected unit.

Table 9 indicates a very low silviculture success rate of 30%. Overall 83 % of the area assessed, was successfully regenerated. The area classified as "*not successfully regenerated*" had yet to achieve the minimum height and stocking requirement or require additional tending. Renewal to other forest units can frequently result in acceptable future forest conditions. For example, despite the low level of silvicultural success reported, the relative proportion of cover types has been relatively stable over several management terms. It is also noteworthy that in its planning process NFRM utilized a modeling strategy where silvicultural treatment packages (STPs) reflect the target forest unit and a suite of related forest units which could potentially develop from the application of a specific STP (i.e. 100% silviculture success is not assumed). This approach to modelling appropriately reflects the reality that a percentage of the area treated will not regenerate to the projected forest unit.

As previously indicated, we were initially concerned with the reported low levels of silvicultural success reported for the PWUS and PWST forest units. Our review of the FTG/SEM data and interviews indicated that past cutting practices coupled with a lack of tending in previous management terms were significant contributing factors for the failure of harvested areas to achieve the projected forest unit. (Section 4.6). We concluded that the implementation of the aggressive tending program (aerial and ground chemical tending augmented by manual tending as required) and effective monitoring of treated areas during this audit term in combination with initial harvest prescriptions that are better tailored to existing stand conditions will result in higher levels of silvicultural success.

TABLE 9. SILVICULTURE AND REGENERATION SUCCESS BY FOREST UNIT (2011-2015)

Forest Unit	Total Area Assessed (Ha)	Area Regenerated to the Projected Forest Unit (Ha)	Area Regenerated to Another Forest Unit (Ha)	Area Regenerated (Ha)	Not Successfully Regenerated (Ha)	% Area Silviculture Success
BW	2,466	631	1,425	2,057	409	26
HDUS	1,186	517	387	904	282	44
LWMX	13	13	0	13	0	100
MCL	94	25	69	94	0	27
MW	2,206	404	1,338	1,742	464	18
PJ	340	72	261	333	7	21
PJSB	445	190	241	431	14	43
PO	849	423	298	720	129	50
PR	37	34	0	34	3	92
PWST	898	167	592	759	139	19
PWUS	714	300	285	585	129	42
SF	511	156	312	468	44	31
Total:	**9,759**	**2,932**	**5,207**	**8,139**	**1,620**	**30**

Source: NFRM

Silvicultural Effectiveness Monitoring

Silviculture effectiveness monitoring (SEM), as described in the Silviculture Effectiveness Monitoring Manual for Ontario (MNR 2001), directs the MNRF to assess the SFL holder's renewal efforts and the effectiveness of approved Silvicultural Ground Rules (SGRs) implemented on the management unit. Silvicultural assessments are conducted on areas depleted through harvest and salvage activities, to determine if the regeneration standards of the prescribed SGRs have been met. Knowledge of the effectiveness of forest operations prescriptions in achieving the desired forest unit must be understood to facilitate reporting on forest sustainability and to provide reliable information for forest management planning (e.g. development of SGRs, SFMM inputs). As identified in the FMPM and the Forest Information Manual (FIM) the SFL holder is required to provide information on the outcomes of its silviculture program to the MNRF. MNRF is required to substantiate the reported results and evaluate the effectiveness of the silviculture program.

MNRF implemented Silviculture Effectiveness Monitoring (SEM) during all years of the audit term. Not all required Core Tasks were completed due to staff layoffs during the period of "*transformation*" at the MNRF. Monitoring activities included audits of FTG surveys, 5-year re-assessments of polygons declared FTG, assessments of tree planting operations, regeneration assessments, tree marking audits, slash pile burning, and assessments of forest management prescriptions with the focus of the monitoring during all years being an audit of SFL FTG surveys. Other SEM included field assessments of the effectiveness of tending and site preparation treatments

It is our assessment that the MNRF SEM reports were well-written and provided a thorough analysis/assessment of field observations. However, we are concerned with the significant and consistent variation between FTG survey and FTG audit results. The reports indicate that "*MNR and NFRM need to investigate the reasons for these differences and determine how to reduce these*". The reports also reference the fact that "*The MNR audits of stands declared FTG has consistently shown significant differences between the survey and the audit*." (2013 SEM Report). The 2015 SEM report also concluded that "*The stand conditions assessed during the (SEM) audit show differences between the audit and the FTG results. These findings are of no consequence because there is no procedure or requirement to address the differences*".

We are concerned that, due to the different sampling intensities and methodologies adopted by the auditees to determine the free-to-grow condition, that the SEM program as implemented is not meeting its intent as a monitoring program. The SEM manual states that "*foresters from industry and the MNRF should examine whether certain treatments are meeting expectations and if they are not they should investigate why the treatments were not successful and make appropriate modifications in the future*."

Given the wide range of variation and discrepancies between survey and audit results it is challenging for forest practitioners to assess and evaluate the effectiveness of the SGRs and STPs. The previous audit included a recommendation that the MNRF share and discuss SEM findings with NFRM annually.[28] The Action Plan Status Report indicates that meetings and information sharing between the organizations occurred but the root issues associated with the data discrepancies have not been resolved. We provide a recommendation to address the issue (Recommendation # 3, Appendix 1). As required, MNRF and NFRM are encouraged to also discuss the effectiveness of the SGRs and STPs in achieving FMP forest renewal standards when surveys and audit work indicate that the projected forest unit has not been achieved.

<u>Exceptions Monitoring</u>

Exceptions monitoring is carried out to determine the effectiveness of prescriptions included in forest management plans that are "*not recommended*" in the MNRF forest

[28] Recommendation # 12 (2011 IFA): Ontario Ministry of Natural Resources North Bay District shall share the silviculture effectiveness monitoring audit reports it produces annually with NFRM and discuss report findings with the Company.

management guides. The Phase II FMP identifies two exceptions to the Silviculture Guides that require monitoring[29]:

1. Full tree skidding of soft-limbed trees in the PWUS and HE forest unit stands that are deemed to be in the Seeding Cut stage of management.

2. Implementation of the Clearcut Silviculture System in the HDUS forest unit using a strip cut harvest method.

No exceptions monitoring was required during the audit term.

Forest Renewal Trust Specified Procedures Report

In addition to our randomly selected field sites we also inspected 10% of the area invoiced in the "*Forest Renewal Trust Specified Procedures Report* (SPR) to verify conformity between invoiced and actual activities. No non-conformities were found.

Access Monitoring

NFRM monitors roads and water crossings through the course of normal operations. Roads monitoring is largely confined to areas of active operations.

Monitoring of water crossings is supported through the implementation of a 3-year formal inspection schedule, a water crossings inventory and the use of a hand-held computer application where compliance information, work requirements, schedules and monitoring reports are readily accessible to NFRM field staff and compliance inspectors.

Annual Reports

ARs were available for each year in the audit scope except for the 2015-2016 AR, which is not required until November 15, 2016. NFRM did provide the auditor with the "*Additional Requirements for the Year Seven Management Unit Annual Report*" section of the 2015-2016 Year 7 AR to assist with the analysis of trends for the IFA.

Initial reporting schedules for the submission of ARs were generally met,[30] however, deadlines for review comments and AR re-submission of the documents were not adhered to (Recommendation # 4, Appendix 1).

As required, the reports were presented to the LCC.

4.7. Achievement of Management Objectives & Sustainability

The 2009 FMP identified 42 objectives for managing the NF. Objectives are monitored annually and reported on in the year 3, 7 and 10 Annual Reports. The lower than expected level of harvest has resulted in the underachievement of FMP

[29] The requirement to monitor full tree skidding in the LWMX, HDUS and BY forest units stands that are deemed to be in final removal stage no longer applies.
[30] The 2013-2014 AR was submitted in December 2014.

targets/objectives related to forest development and condition and those related economic benefits derived from forest management activities. Appendix 2 provides more details on our assessment of plan objective achievement.

The IFAPP requires that an updated Year Seven AR using Section 4.0 of the 2009 FMPM be prepared. The Report Author identified the following trends:

- Actual harvest and volume utilization have not achieved planned levels during any management period. This trend principally reflects the downturn in the forest sector economy.
- Harvest areas have been satisfactorily regenerated.
- Levels of silviculture are lower than planned, due to the reduced level of harvest.
- Silviculture success is variable.
- Renewal trends are inherently linked to harvest and as such, are lower than planned. The lower level of harvest has resulted in less area being available for treatment and reduced funding in the Renewal Trust.
- The application of the single tree selection harvest system has declined as fewer stands have the quality or stocking to facilitate that type of silviculture treatment. The low quality of stands can be attributed to historic cutting practices and the location of the Forest at the northern range of tolerant hardwood species.
- The reduced level of harvest is resulting in a lower proportion of early-successional forest and a higher proportion of late succession forest than planned.

The Report Author concluded that the NF is progressing well towards the forest management plan objectives (although the lower than planned level of harvest has impacted objectives related to forest development and condition) and that forest sustainability was not at risk. We concur with this assessment.

In our assessment of forest sustainability, we examined factors such as the achievement of plan objectives, progress towards the desired future forest condition, the level of benefits derived from the implementation of the Phase I and II FMPs, our field observations and other audit evidence. We concluded that the achievement of long-term sustainability as assessed by the IFAPP is not at risk. This conclusion is premised on the following findings:

- Forest management was planned and implemented in accordance with the Crown Forest Sustainability Act (CFSA) and FMP targets are consistent with the achievement of plan objectives and forest sustainability.
- NFRM maintained/obtained FSC and SFI certifications during the audit term.

- The area renewed approximates the area harvested.
- The area of productive forest land has remained stable for several management terms.
- Forest operations were largely compliant.
- White pine restoration work has been initiated through Forestry Futures Trust Committee to increase the value and productivity of white pine forest units.
- We did not observe any instances of environmental damage or wasteful practices.
- AOC prescriptions were appropriately implemented to protect/maintain identified values.
- Silvicultural Ground Rules (SGRs), Silvicultural Treatment Packages (STPs) and Forest Operations Prescriptions (FOPs) were appropriate for the forest cover types and site conditions.
- An effective field silviculture program was delivered. The implementation of an aggressive tending program, effective monitoring of treated areas, and harvest prescriptions that are better tailored to existing stand conditions will result in higher levels of silvicultural success in future management terms.
- The contractual obligations of the SFL holder were met, and appropriate actions had been implemented to address the recommendations of the previous IFA.
- The low silviculture success rate reported in this audit period is largely a product of past management practices and those practices have improved and evolved considerably during this audit term. Better tending results were observed during our site inspections. We concluded that in future the silviculture success rate can reasonably be expected to improve.

4.8. Contractual Obligations

We concluded that NFRM was substantially in compliance with the terms and conditions of its SFL (Appendix 3).

The IFAPP requires auditors to assess the effectiveness of the actions developed to address the recommendations of the previous audit. The previous IFA resulted in 14 recommendations (10 to the SFL/MNRF District and 4 to the corporate MNRF). We concluded that the North Bay MNRF and NFRM had appropriately addressed the 2010

IFA recommendations. Both the required Action Plan and Action Plan Status Report were submitted on time.

The NF has a unique forest resource licence structure that permits an overlapping licence agreement on an overlapping licence. Currently there are seven overlapping/overlapping licencees operating on the unit. This structure was established to facilitate the harvest of wood that otherwise may not be harvested and/or to provide economic opportunities for small scale operators. The overlapping/overlapping licencee is required to pay management fees (based on a rate per m^3), Crown Dues, Forestry Futures Renewal Trust fees and area charges to the Crown for timber harvested by it on its licence area. In interviews, we heard concerns that the traditional licencees were utilizing the overlapping/overlapping licence structure to devolve themselves of their management obligations while still maintaining the security of their licence. Additional concerns were that overlapping/overlapping licencees may not have experience operating on Crown land or may not have a long-term commitment to the Forest. Our interviews revealed that there is some confusion amongst auditee staff and LCC members with respect to the conditions of the overlapping/overlapping licence. The licence documents clearly articulate these conditions and we encourage senior staff at MNRF and NFRM to review the licence documents with their staff and the LCC.

The minimum balance was not maintained for the first three years of the audit period. Reasons cited included; a delay in a decision by the Canada Revenue Agency with respect to whether the Ontario Government was exempt from the Harmonized Sales Tax (HST)[31] and the reduction in harvest resulted in unanticipated funding shortages.

The SFL term expires in 2021 but we are concerned that the SFL has not been extended since 2006[32]. We note that previous two IFA's made recommendations to extend the licence for a further five years. We were informed that the MNRF has a backlog of licences for renewal consideration and is working to resolve this situation. There is also a requirement to amend the SFL to remove the wood supply commitment to PreCut Hardwood Inc. and Columbia Forest Products as these companies were not operating or ceased operations during the audit term (Recommendation # 6, Appendix 1).

The obligation to survey and renew class X, Y and Z lands[33] was transferred to the SFL holder in 1996. While a considerable amount of work has been undertaken to determine the regeneration status of these areas, approximately 867 ha of class X and Y lands still requires survey. We provide a recommendation to address this concern (Recommendation # 5, Appendix 1). The requirement to address the status of Z

[31] During this delay, contractors were paid the harmonized sales tax (HST) on services and the provincial government did not reimburse money paid as HST to the Renewal Trust Fund.
[32] Personal correspondence with staff in MNRF Licencing Section.
[33] X lands are areas harvested on or after April 1, 1995. Y lands are areas harvested prior to April 1, 1995 and treated by artificial regeneration techniques. Z lands are areas harvested prior to April 1, 1995 and scheduled for natural renewal

category lands has been addressed through the photo interpretation in the new eFRI. The results of this work indicate that 3,349 ha remains classified as not-sufficiently regenerated.

4.9. Conclusions and Licence Extension Recommendation

Our assessment is that an effective forest management program is being implemented and the NF is being managed in compliance with the terms and conditions of the SFL.

The audit team concluded that forest sustainability as assessed through the 2016 Independent Forest Audit Process and Protocol is being achieved. The audit team recommends the Minister extend the term of the Sustainable Forest Licence # 542053 for a further five years.

Appendix 1

Recommendations

Independent Forest Audit – Record of Findings

Recommendation # 1

Principle: 3. Forest Management Planning

Criterion: 3.3.2. Forest Resource Inventory

Procedures: 1. Assess whether the FRI has been updated, reviewed and approved to accurately describe the current forest cover that will be used in the development of the FMP.

Background Information and Summary of Evidence

The 2009 FMP (Phase I and Phase II) was developed utilizing a 1989 Forest Resource Inventory (FRI). The vintage of the inventory and issues with its accuracy resulted in challenges and issues for strategic and operational planning. Issues with the inventory were partially offset through the utilization of 2008-2009 digital photography.

A new enhanced forest resource inventory (eFRI) was scheduled for delivery in 2014 but was received in 2016. We were informed that issues related to the accuracy of stand descriptors (e.g. species compositions, age and volume estimates) exist as depletion information provided by NFRM was used inconsistently in the production of the eFRI (i.e. development stage and forest unit descriptions). This circumstance resulted in significant discrepancies in the inventory that require correction. To address this issue, NFRM implemented several initiatives to validate the eFRI attributes and to begin the development of the planning composite inventory.

Discussion:

The timely delivery of FRI products is out of synchrony with the forest management planning cycle. This circumstance is not unique to the Nipissing Forest. Because of the late delivery of the inventory there is limited time for the preparation and verification of a planning composite inventory for the development of the next FMP.

Up-to-date and accurate forest inventory information is critical for reliable inputs and informed decision-making in the forest management planning process.

Recommendation # 1:

The MNRF Science and Information Branch must ensure the timely delivery of FRI products and the implementation of appropriate quality control protocols to facilitate the incorporation of the most current and accurate forest resource information in forest management plans.

Independent Forest Audit – Record of Findings
Recommendation # 2

Principle: 3 Forest Management Planning

Criterion: 3.9.7 Road Planning

Procedure(s): 1. Assess the effectiveness of roads planning including whether: operational standards for the extraction of aggregate resources for Forestry Aggregate Pits, aggregate extraction areas and appropriate conditions on operations for Forestry Aggregate Pits are documented in the Phase II planned operations

Background Information and Summary of Evidence:

Appendix VII of the FMP requires that by the end of the 10-year period starting from the commencement of the FAP that rehabilitation of the site must be completed. FAP management guidelines, while responsive to operations in the Boreal Forest, are not in sync with the extended access requirements for stands managed with successive cuts common to the Great Lakes St. Lawrence Forest Region.
An recognition of the extended access requirements associated with the cutting cycles in hardwood and pine silviculture is required if the management of aggregate pits is to meet the intent of the Minister's Council on Forest Sector Competitiveness (MCFSC) initiative.

Discussion:

During the field audit NFRM staff indicated that in some instances they would be closing and rehabilitating a pit only to likely reopen it when access was required for the next cut in the harvest cycle. One solution to the issue could involve re-classifying the FAP as a Category 9 pit[34]. However, the small size and large number of FAPs as well as the increased guidelines, rules and bureaucracy associated with Category 9 pits makes that option somewhat impractical.

Another solution could involve opening new FAPs in the immediate proximity of closed pits. However, there are rehabilitation and new pit establishment costs, as well as the increased footprint of FAPs across the Forest associated with that solution.

[34] Category 9 pits can remain open for periods of longer than 10 years.

The Forestry Aggregate Pit designation was initially in response to the Minister's Council on Forest Sector Competitiveness (Aggregates Task Group) recommendations to streamline and minimize costs for the forest sector**.** **S**ome modification to pit closure requirements would support government efforts to streamline regulations, respond proactively to forest industry economic issues and provide a practical solution to a common problem.

Conclusion:

An implicit recognition of the extended access requirements associated with the cutting cycles in the Great Lakes St. Lawrence Forest Region is required if the standard for the management of aggregate pits is to meet the intent of the MCFSC initiative. We concluded that opportunities to modify pit closure requirements during FMP development are warranted.

Recommendation # 2:

Corporate MNRF should amend the FMPM Forestry Aggregate Pit closure and rehabilitation requirements to better reflect the operational and access requirements associated with forest management realities in the Great Lakes St. Lawrence Forest Region.

Independent Forest Audit – Record of Finding

Recommendation # 3

Principle: 6 Monitoring

Criterion: 6.3. Silvicultural Standards Assessment Program

Procedure(s): Review and assess, including in the field achievement and reporting of the silvicultural standards for the specific SFL/management unit.

Background Information and Summary of Evidence:

MNRF implemented a Silviculture Effectiveness Monitoring (SEM) during all years of the audit term. It is our assessment that the MNRF SEM reports produced were well-written and provided a thorough analysis/assessment of field observations.

However, the reports indicated that there was significant and consistent variation between FTG survey (SFL holder) and FTG audit (MNRF) results. The reports indicate that "*MNR and NFRM need to investigate the reasons for these differences and determine how to reduce these*". The reports also reference the fact that "*The MNR audits of stands declared FTG has consistently shown significant differences between the survey and the audit*." (2013 SEM Report). The 2015 SEM report (with respect to Core Task 1 (audit of FTG surveys), also concluded that "*The stand conditions assessed during the (SEM) audit show differences between the audit and the FTG results. These findings are of no consequence because there is no procedure or requirement to address the differences*".

Discussion:

We are concerned that the data variations and discrepancies between the parties persisted throughout the audit period given the intent of the SEM program is to facilitate reporting on forest sustainability and to provide reliable information for forest management planning. The SEM manual states that "*foresters from industry and the MNRF should examine whether certain treatments are meeting expectations and if they are not they should investigate why the treatments were not successful and make appropriate modifications in the future*."

The previous audit included a recommendation that the MNRF share and discuss SEM findings with MNRF annually. The Action Plan Status Report indicates that meetings and information sharing between the organizations occurred. Due to differences in data collection processes and systems significant discrepancies in results persist.

Conclusion:

It is our opinion that the SEM program implemented by the District is not fully functional as a monitoring program. The utility of the program's audit function is undermined by the inherent variability in the data generated when different processes and systems are used utilized.

Recommendation # 3:

To provide a reliable assessment of the free-to-grow condition, the District MNRF and NFRM must jointly implement a sampling procedure and protocol for FTG surveys and Core Task 1 SEM monitoring that resolves data discrepancies and variability.

Independent Forest Audit – Record of Findings
Recommendation # 4

Principle: 6. Monitoring

Criterion: 6.5 Annual Reports

Procedure(s): 6.5.1. Determine if Annual Reports have been prepared in accordance with the applicable FMPM including associated deadlines.

Background Information and Summary of Evidence:

Annual Reports are to be submitted to the MNRF in accordance with the requirements of the FMPM and the Forest Information Manual (FIM). The AR is to be prepared and submitted by November 15. MNRF staff review the report for accuracy and completeness and are to provide the results of this review to the report author within 30 days of the receipt of the AR. Comments provided by the MNRF are to be addressed and if required a revised AR is to be submitted by February 15.
The submission review and re-submission timelines for the audit term ARs are as follows:

Year	Initial Submission Date	Date of Receipt of Comments	AR Resubmission Date	Date of Final Approval
2011-2012	15/11/2012	15/12/2012	29/03/2013	05/04/2013
2012-2013	15/11/2013	29/01/2014	13/06/2014	28/10/2014
2013-2014	12/12/2014	30/01/2015	10/04/2015	27/05/2015
2014-2015	16/11/2015	16/12/2015	08/02/2016	06/06/2016

Discussion:

There was slippage by both the MNRF and NFRM in meeting FMPM schedules for the review comments and the re-submission of the Annual Reports.

Recommendation # 4:

The MNRF District and NFRM must ensure that Annual Reports meet FMPM submission deadlines.

Independent Forest Audit – Record of Finding Recommendation # 5
Principle: 8 Contractual Obligations **Criterion:** 8.1.14. Silvicultural Standards Assessment Program **Procedure(s):** SFLs include requirements related to Class X,Y,Z lands. The company is required to assess and report on in accordance with FOSM, FIM and the FMPM, the achievement of regeneration efforts to ensure obligations and standards are met.
Background Information and Summary of Evidence: The obligation to survey and renew class X, Y and Z lands was transferred to the NFRM in 1996. While a considerable amount of work has been undertaken to determine the regeneration status of these areas, an area of approximately 867 ha of class X and Y lands still requires survey. The requirement to address the survey Z category lands was addressed through the photo interpretation in the new eFRI. The results of this work indicate that 3,349 ha remains classified as not-sufficiently regenerated.
Conclusion: NFRM must meet its obligation to survey and renew class X, Y and Z lands which were transferred to the NFRM in 1996.
Recommendation # 5: NFRM must meet its contractual obligations with respect to the survey and renewal of X, Y and Z category lands.

Independent Forest Audit – Record of Finding Recommendation # 6
Principle: 8. Contractual Obligations **Criterion:** 8.1.2. Wood Supply Commitments, MOAs, sharing arrangements, special conditions **Procedure(s):** 1. Determine whether wood supply commitments and any special conditions have been complied with, including completing any required MOAs or sharing arrangements.
Background Information and Summary of Evidence: The current SFL licence requires that NFRM make available volumes of wood fibre to Precut Hardwood Inc. (Supply Agreement # 536245, May 2006) and Columbia Forest Products.
Conclusion: The wood supply commitments to Precut Hardwood Inc. and Columbia Forest Products should be removed from Appendix E of the SFL.
Recommendation # 5: Corporate MNRF should remove the wood supply commitments to Precut Hardwood Inc. and Columbia Forest Products from Appendix E of the SFL.

Independent Forest Audit – Record of Finding Best Management Practice # 1
Principle: 5: System Support **Criterion**: 5.2 Document and Record Quality Control The organization's information management system must include processes for identification, preparation, distribution, collection and maintenance of forest management documents and records.
Background Information and Summary of Evidence NFRM made effective use of computer technology for the delivery of its forest management program. The company in collaboration with other area SFLs has funded and participated the development of a number "applications" tailored for use on iPads and other computing equipment to assist field staff in the day-to-day delivery their day-to-day monitoring functions (i.e. compliance inspections, water crossing inventories, regeneration assessments etc.) and forest management responsibilities (e.g. SHMON is a Shelterwood Monitoring Application which assists with the reporting and scheduling of silviculture treatments and shelterwood cuts in stands managed under the shelterwood system).
Discussion: NFRM has embraced new technologies for the delivery of its forest management obligations. The development and use of "applications" for the delivery of forest management compliance and monitoring functions is an effective and efficient use of technology.
Best Management Practice: We recognize NFRM's participation in the development of and use of hand held technologies as a tool to assist in the delivery of its monitoring and compliance programs as a Best Practice.

Appendix 2

Achievement of Management Objectives

2009 FMP OBJECTIVES	ASSESSMENT OF OBJECTIVE ACHIEVEMENT	AUDITOR COMMENTS
Objective 1 Move toward a distribution of disturbances that more closely resembles the expected natural disturbance template.	MET	Targets were met during FMP planning but the lower than planned harvest levels have affected the achievement of this objective. All but two of the disturbance class targets were met when compared to the natural disturbance template. Planned clearcuts over the remaining plan term (if implemented) will achieve the 90/10 standard (ratio of smaller cuts to larger clearcuts) outlined in NDPEG.
Objective 2 *Increase the frequency of old growth area occurring in larger patch sizes.*	MET	SFMM indicates that this FMP target will be achieved. Additionally, the reduced level of harvest being achieved will result in more mature forest succeeding to overmature (old growth) should that trend continue.
Objective 3 *With consideration given to the current landscape, ensure that an even distribution across the forest of old growth stands, and old aged stands is allowed to occur*	MET	The target was achieved in SFMM scoping runs. Additionally, with less harvesting being achieved more areas of mature forest will succeed to overmature (old growth) should that trend continue.
Objective 4 Maintain the area of forest cover types that would occur naturally on the Nipissing Forest, similar to the expected natural landscape dynamics, with consideration of the pre-settlement forest condition.	MET	The area occupied by the forest cover types of the NF has remained relatively stable over the past three management terms.
Objective 5 Provide Red and White Pine forest area not less	MET	The plan start level for the area occupied by PR, PWUS and PWST forest units was

than 1995 levels, consistent with the Conservation Strategy for Old Growth Red and White Pine Forests Ecosystems in Ontario, 1996.		79,671 ha. At plan end in 2019, the area occupied by red and white pine forest units is expected to increase to 111,449 ha.
Objective 6 Restore to the PWUS or PR forest unit, a proportion of all harvested area in the white pine seed tree, mixedwood and offsite poplar and white birch forest units.	NOT MET	The proportion of area treated by intensive treatments is below planned due to the lower levels of harvest achievement during the audit term. The 2009 FMP did dramatically increase the proportional area restored when compared to other plans. Additional area is planned and expected to increase the percentages by 2019.
Objective 7 Move towards a more natural age class distribution for each forest unit over the entire forest in mature and old-aged condition, similar to that of a natural forest dynamic.	MET	All forest unit targets for mature forest were met for all terms.
Objective 8 Maintain or increase the mid-tolerant hardwood component in stands with suitable conditions.	MET	Post harvest surveys are indicating that residual stands contain higher proportions of red oak and yellow birch.
Objective 9 For the mixed conifer lowland forest unit (MCL), ensure that the proportion of spruce and cedar remain relatively similar for the forest unit as a whole.	MET	No harvesting has occurred in the MCL forest unit to date in the 2009 FMP term. The eFRI is indicating a slightly higher percentage of spruce and lower percentage of cedar than the previous FRI. In the absence of harvest any changes in the composition will be the result of natural processes.
Objective 10. Protect and maintain genetic diversity of tree	UNCERTAIN	The target for the achievement of this objective is 2019, and it will be reassessed

species, including species at the northern end of the range on the Nipissing Forest (i.e. black cherry, red oak, beech, white ash, burr oak, elm, silver maple, red spruce, green ash, basswood and natural red pine stands).		at that time in the Year 10 AR. At that time the assessment will include updated FTG data. Since 2006, 100 ha have been planted to red spruce (approximately 100,000 seedlings). Seed collection and planting of red spruce is expected to continue during Phase II operations. The new eFRI shows that the target is met for all species except black cherry and silver maple.
Objective 11 To achieve wildlife habitat levels similar to the natural condition for forest dependent provincially and locally featured species on the Nipissing Forest.	MET	All provincially featured wildlife species targets were met for all terms in the planning horizon.
Objective 12 To provide early successional forest over 100-year term.	MET	Early successional forests are created when harvest disturbances occur. Although the level of harvest is below planned early successional forest cover is being created.
Objective 13 To achieve wildlife habitat levels similar to the natural condition for forest dependent wildlife species at risk with known to occurrence on the Nipissing Forest.	MET	All species at risk habitat targets were met for all terms over the planning horizon. No losses in habitat associated with SAR species has occurred.
Objective 14 Create and maintain a landscape that ensures the long term sustainability of preferred red-shouldered hawk habitat on the Nipissing Forest as modeled in Ontario Wildlife	MET	The desired habitat target (36,928 ha) was achieved in SFMM. Forest operations implemented to date are conducive to the maintenance of red-shouldered hawk habitat on the Forest (i.e. maintenance of hardwood forest cover types, riparian habitats and mature/overmature age classes).

Habitat Assessment Model (OWHAM).		
Objective 15 Create and maintain the white-tailed deer critical thermal cover condition in the Loring Deer Yard core area to ensure the long term sustainability of this condition on the Nipissing Forest.	MET	This objective is to be assessed at the end of the plan term, but preliminary investigations reveal positive movement to achieve this objective. The Loring Deer Yard has been actively managed over two management plan terms and AOC prescriptions are implemented to protect cover.
Objective 16 Create and maintain suitable white-tailed deer summer habitat on the landscape to ensure the long term sustainability of this condition on the Nipissing Forest.	MET	Based on planned disturbances the objective will be achieved. The underutilization of the clearcut harvest system may impact the achievement of this objective on Crown land.
Objective 17 Create and maintain a landscape that ensures the long term sustainability of pileated woodpecker feeding, nesting and roosting habitat on the Nipissing Forest as modeled in OWHAM.	MET	Planning targets were achieved in SFMM. The lower than planned harvest levels are resulting in more mature forest that will succeed into an overmature condition which will benefit species dependent on older forest conditions for habitat.
Objective 18 Create and maintain a landscape that ensures the long term sustainability of suitable moose summer and winter habitat on the Nipissing Forest as projected in OWHAM.	MET	OWHAM indicates that creation of suitable habitat is occurring and a 4.4% increase in overall carrying capacity for moose on the Forest. The underutilization of the clearcut harvest system may result in less summer forage (early successional) habitat availability should trends continue.
Objective 19 Maintain the health of the forest under changing climate conditions.	MET	The achievement of this objective is related to tree improvement, preventing the spread of forest pests, and salvage and treatment of damaged areas. Tree improvement work occurred at the tree improvement/progeny test area in Gurd Township and no

		movement of infected wood has occurred. Stand rehabilitation projects funded through the FFT were implemented during the audit term.
Objective 20 Measure carbon emissions changes in the forest influenced by harvest operations.	MET	Computer modeling indicates that the objective is achieved (Carbon Budget Measurement – OFRI FORCARB-ON Analysis).
Objective 21 Protect critical sites for any wildlife species including vulnerable, threatened, endangered or species of special consideration known to occur on the Nipissing Forest.	MET	Critical sites for wildlife are protected through the AOC process. There were no non-compliances related to the protection of critical sites for any wildlife species.
Objective 22 Increase the amount of early successional shoreline forest habitat.	MET	11 blocks were treated in accordance with the direction in the Stand and Site Guide to increase the area of shoreline early successional habitat.
Objective 23 Evaluate changes to the road density indicator in the short term, in order to set realistic targets in future objective setting. Encourage the maintenance or decrease of present road density in remote EMA's through the development of road use strategies. Medium term (20 year) objective is to maintain the present road density on the forest, subject to further assessment.	MET	The medium term objective is to maintain the present road density on the forest. Road development and deactivation is on track to meet the objective. Primary and secondary road density remains the same as it was at plan start. Road density with remote access EMAs has declined slightly.

Objective 24 Conduct intensive forest management activities on the Nipissing Forest, to support timber quality and mill demand.	MET	Thirty-one percent of the area managed by the clearcut harvest system (10,717 ha between 2009 and 2014) was managed intensively. This level of achievement is above the planned target.
Objective 25 Ensure silvicultural activities create the desired future forest condition or successful regeneration in the areas harvested on the Nipissing Forest.	BEING MET	Progress is being made to increase the level of silviculture success. Reported levels are currently below planned levels. Silviculture assessments reflect stand treatments that were implemented 12-20 years ago when there was incomplete application of the shelterwood harvest system and a lack of vegetation management. This audit concluded that progress is being made through the application of effective silviculture, the use of improved site preparation, more effective vegetation management, improved planting practices and an effective monitoring program. These practices will result in higher levels of silviculture success in the future.
Objective 26 Ensure land use direction is being followed in enhanced management areas as well as adjacent to parks and conservation areas.	MET	No instances of non-compliances were recorded with respect to ensuring the land use direction is being followed.
Objective 27 Respect the presence of resource-based tourism as well as other commercial businesses on the Nipissing Forest.	MET	Values associated with resource-based tourism and other commercial businesses were maintained or preserved through the implementation of RSAs (16 were re-signed during the audit term) and AOC prescriptions. There was a trespass into a cold water fisheries AOC that was properly addressed.
Objective 28 Provide a sustainable, continuous and predictable wood supply from the	MET	Although, harvest levels over the audit term achieved approximately 35% of the planned Phase I AHA, the wood supply was met for operating facilities.

Forest that will meet, as closely as possible and for as long as possible, the current recognized industrial demand of the Forest.		
Objective 29 Protect cultural heritage values within the Nipissing Forest.	MET	Cultural heritage sites were identified during the planning process and delineated on values maps. AOC prescriptions are prepared on an as required basis to protect values. There were no FOIP non-compliances for damage associated with cultural heritage values during the audit term.
Objective 30 Minimize the potential impact of forest operations on recreation areas that are identified on the values map.	MET	Recreation values and areas are being appropriately protected through RSAs and AOC prescriptions.
Objective 31 Protect water quality of known sources of drinking water.	MET	Known sources of drinking water were protected through the AOC process. No non-compliances were reported related to the protection of drinking water sources.
Objective 32 Minimize the amount of productive forest land negatively impacted, causing site damage and loss of forest productivity.	MET	An effective slash and logging debris management program was implemented during the audit term. The program was effective in minimizing the area of productive land lost to debris and slash. We did not observe any instances of site damage during the field audit.
Objective 33 Protect water quality and fish habitat within watercourses and water bodies affected by forest management.	MET	Water quality and fish habitat was appropriately protected through the effective implementation of AOC prescriptions.

Objective 34 Maintain the area of Managed Crown Productive Forest available for timber production at the highest possible level and minimizing conversion of Crown forest area to non-forest land.	MET	An effective slash and logging debris program was implemented. The FMP target for this objective was for less than 1% of the managed forest Crown land base to be lost to non-forest area. Estimated losses to new roads and landings is 0.2 % of the land base.
Objective 35 First Nations and Aboriginal Communities are involved in forest management both during the development of the forest management plan and also with the implementation of the plan.	MET	Three FN communities appointed representatives to the Planning Team and all five communities with an interest in the NF signed the TORs. An Aboriginal working group provides a strategic discussion forum and another avenue for FN input into the planning process. All FMPM Aboriginal notification requirements were met. NFRM also participated in the Algonquin Land Claims process consultations.
Objective 36 First Nations and Aboriginal Communities will benefit economically through partnerships, employment opportunities and new business relationships.	MET	NFRM has agreements with 4 FNs centred around the continuous protection of Native Values, open communication, harvesting and potential contracting opportunities (silviculture contracts), forest management planning and training etc.
Objective 37 First Nations and Aboriginal Communities will continue to benefit from forest management through educational and social opportunities.	MET	NFRM meets on a regular basis with FN communities with an interest in the NF.
Objective 38 To facilitate opportunities for the harvesting of non-timber forest products on the Nipissing Forest	MET	Training and information is provided to NFRNI staff and contractors on the identification and protection of non-timber forest products commonly harvested locally on the Forest.

Objective 39 To reduce and eventually eliminate the use of herbicides used in forest management on the Nipissing Forest.	NOT MET	The competitive nature of sites on the NF requires the diligent use of herbicides to successfully renew white pine. Herbicide treatment techniques were refined to improve treatment efficacy through the recalibration of spray equipment, refining "hardening off" periods for white pine, and the adoption of "low drift" technology in the spray program.
Objective 40 To encourage support of the Local Citizens Committee in the development of the FMP for the Nipissing Forest	MET	The LCC was actively engaged in the development of the management plan. The LCC self-evaluation questionnaire indicated a very high level of satisfaction with the planning process and its participation.
Objective 41 Maintain and increase the level of compliance on the forest.	MET	An overall high level of compliance (98%) was achieved over the audit term. While there were several non-compliances for harvest infractions (e.g. regeneration damage) these were minor in nature and corrective action and enhanced operator training was initiated.
Objective 42 Volume of fuelwood made more readily available to the general public.	MET	Fuelwood was made available to the public (4,332 m^3).

Appendix 3

Compliance with Contractual Obligations

SFL Obligation	Comment
Payment of Forestry Futures and Ontario Crown Charges.	FRLs are in arrears as follows: Forestry Futures- $ 31,298.82 Crown Dues - $ 49,669.04 A repayment schedule has been negotiated with the MNRF so a recommendation is not provided.
Wood supply commitments, MOAs, sharing arrangements, special conditions.	The current licence document provides wood supply commitments to the following companies: 1. GP North Wood's LP's (Supply Agreement # 536260) 2. Columbia Forest Products 3. Tembec Industries 4. Precut Hardwood Inc. OFRLs are provided to the following Operators: • Emile Janveaux Forest Products Ltd. • Behnke Farms Inc. • Frerot Forestier • B. Quenneville • Lucien Groulx & Son Planing and Saw Mill Ltd. • Scott Douglas Gray • Dokis Bay Indian Corporation First Nation • Nbisiing Forestry Inc. • Madadjiwan Economic Development Corporation • Antoine Algonquin Community Services Corporation Precut Hardwood Inc. and Columbia Forest Products ceased operations during the audit term. We provide a recommendation to amend Appendix E

	of the SFL (Recommendation # 6, Appendix 1).
Preparation of FMP, AWS and reports; abiding by the FMP, and all other requirements of the FMPM and CFSA.	Reports were prepared and FMPM production and reporting schedules were met.
Conduct inventories, surveys, tests and studies; provision and collection of information in accordance with FIM.	Inventories and surveys were completed as required. FIM requirements were met.
Wasteful practices not to be committed.	There was one wasteful practice reported in FOIP where corrective action and training were implemented. We did not observe any wasteful practices during the audit.
Natural disturbance and salvage SFL conditions must be followed.	No salvage harvest operations were implemented during the audit term.
Protection of the licence area from pest damage, participation in pest control programs.	There were no pest control operations during the audit term. Monitoring of spruce budworm populations is ongoing.
Withdrawals from licence area.	There were no withdrawals from the licence during the audit term. The SFL voluntarily shifted contingency plan allocations away from a potential land claim settlement area (Algonquin of Pikwakanagan).
Audit Action Plan and Action Plan Status Report.	The Action Plan and the Action Plan Status Report were submitted in accordance to the IFAPP schedule.
Payment of forest renewal charges to Forest Renewal Trust (FRT).	The FRL's owed $ 64,793.59 which is under a payment schedule to MNRF.
Forest Renewal Trust eligible silviculture work.	Audit site inspections determined that work was completed and appropriately invoiced in the Specified Procedures Report.

Forest Renewal Trust forest renewal charge analysis.	Forest Renewal Trust renewal charge analysis was completed on an annual basis.
Forest Renewal Trust account minimum balance.	The required minimum balance is $ 1,440,100. The minimum balance was only maintained for the last two years of the audit term. Rationale for the shortfall in the minimum balance is provided in Section 4.8.
Silviculture standards and assessment program.	An effective silviculture assessment program was implemented. Monitoring work was supported through the establishment of temporary sample plots and use “applications” such as REAP (Regeneration Assessment Program) and SHMON (Shelterwood Monitoring Program).
Aboriginal opportunities.	Economic opportunities (harvest allocations, manual tending) were provided with all four of the FN’s associated with the Forest
Preparation of compliance plan	All required compliance plans were prepared.
Internal compliance prevention/education program.	An excellent compliance prevention/education program is in place. Training and education programs were available.
Maintenance of records, including maps, of the amount of Eligible Silviculture Work implemented and the cost.	Annual records were maintained for all silviculture work.
The Company shall meet the silvicultural standards on all class X and Y lands.	A requirement exists to complete the survey of X and Y category lands. We provide a recommendation (Recommendation # 5, Appendix 1).
The Company shall assess and report on the achievement of its regeneration efforts.	Documentation of Company regeneration is provided in Annual Reports.
The Company shall carry out tending treatments on Class Z lands as required by the Minister	The requirement to address the survey Z category lands was addressed through the photo interpretation in the new eFRI. The results of this work indicate that 3,349 ha remains classified as not-sufficiently

	regenerated (Recommendation # 5, Appendix 1).
Compliance inspections and reporting; compliance with compliance plan.	Inspections and reporting were completed as planned. Identified compliance priorities were adhered to.
SFL forestry operations on mining claims	Mining companies were notified in the AWS as to the location of annual operations.
SFL Extension Recommendation	The SFL has not been extended since 2006. We note that previous two IFA's made a recommendation that the licence be extended for a further five years but the formal extension of the SFL has not occurred. We were informed that the MNRF has a backlog of licences for renewal consideration and is working to resolve the situation. Based on the findings of this audit, in accordance with the IFAPP we concluded that the SFL should be extended for a further five years.

Appendix 4

Audit Process

This IFA consisted of the following elements:

Audit Plan: An audit plan describing the schedule of audit activities, audit team members, audit participants and the auditing methods was prepared and submitted to the NFRM MNRF North Bay District, Northeastern Regional MNRF Office, Forestry Futures Trust Committee and the LCC Chair on May 6, 2016.

Public Notices: Public participation in the audit was solicited through the placement of a public notice in the North Bay Nugget (August 2, 2016) and a random mailing to 100 individuals/organizations listed in the 2010FMP mailing list. All Aboriginal communities with an interest in the Forest were contacted by mail to participate and/or express their views. Community leaders received several follow-up telephone calls and/or e-mails.

All LCC members received letters and follow-up telephone calls with an invitation to participate in the audit process.

Field Site Selection: Field sample sites were selected randomly by the Lead Auditor in May 2016. Sites were selected in accordance with the guidance provided in the IFAPP (e.g. operating year, contractor, geography, forest management activity, species treated or renewed, and access) using GIS shapefiles provided by NFRM. The sample site selections were finalized with NFRM and MNRF District Staff at the Pre-Audit Meeting (June 27, 2016).

Site Audit: The audit team spent 5 days on the NF in August 2016 conducting the field audit, document and record reviews and interviews. The field audit was designed to achieve a minimum 10% of the forest management activities (including road construction and maintenance) that occurred during the audit term (see the IFA Field Sampling Intensity on the NF below).

Not every hectare of the area sampled is surveyed, as this is not feasible. Individual sites are initially selected to represent a primary activity (e.g. harvesting, site preparation) but all associated activities that occurred on the site are assessed and reported in the sample table.

The audit team also inspected the application of Areas of Concern prescriptions, aggregate pit management and rehabilitation and water crossing installations. Areas listed in the "*Road Construction and Maintenance Agreement*" were visited to ensure conformity between invoiced and actual activities.

The field inspection included site-specific (intensive) and landscape-scale (extensive helicopter) examinations.

Report: This report provides a description of the audit process and a discussion of audit findings and conclusions. Recommendations are directed at deficiencies in forest management and associated processes that require a corrective action.

Procedures Audited by Risk Category

Principle	Low Risk			Medium Risk			High Risk	Comments
	Applicable (#)	Selected (#)	% Audited	Applicable (#)	Selected (#)	% Audited	Audited (#) (100% Audited)	
1. Commitment	0	0	0	0	0	0	0	The certification status of the Forest met IFAPP criterion for Principle 1.
2. Public Consultation and Aboriginal Involvement	0	0	0	6	6	100	2	All procedures were audited.
3. Forest Management Planning	7	5	71	12	11	92	41	The following procedures were not audited; 3.2.1., 3.2.2. & 3.6.2.
4. Plan Assessment & Implementation	1	1	100	1	1	100	10	All procedures were audited.
5. System Support	0	0	0	0	0	0	0	The certification status of the Forest met IFAPP criterion for Principle 5.
6. Monitoring	0	0	0	7	7	100	11	All procedures were audited.
7. Achievement of Management Objectives and Forest Sustainability	0	0	0	2	2	100	15	All procedures were audited.
8. Contractual Obligations	0	0	0	2	2	100	5	All procedures were audited.
Totals	8	6	85	30	29	97	84	

IFA Field Sampling Intensity on the Nipissing Forest[35]

Activity	Total Area (Ha) / Number	Planned Sample Area (Ha)	Actual Area (Ha) Sampled[36]	Number of Sites Visited***	Percent Sampled
Harvest (all types)	12,841	1,284	2,099	29	16
Natural Renewal	10,040	1,004	1,341	33	13
Chemical SIP	1,824	182	729	15	40
Mechanical SIP	1037	103	748	16	72
Manual Tending	541	54	346	3	64
Chemical Tending	7,788	778	1,671	25	18
FTG	9,759	975	1,141	19	12
Pre-Commercial Thinning	567	56	168	5	30
Water Crossings (# of Crossings)	104	10		10	10
Forest Resource Aggregate Pits (Opened # of Pits)	73	20		17	23

*** Multiple treatments were observed on individual sites and are included in the sampling intensity

Summary of Consultation and Input to the Audit

Public Stakeholders

Public participation in the audit was solicited through the placement of a public notice in the North Bay Nugget (August 2, 2016). This notice directed interested individuals to contact the audit firm with comments or complete a survey questionnaire on forest management during the audit term on the Arbex website.

One hundred individuals/organizations in the 2010 FMP mailing list received a letter and the survey questionnaire. One response was received. The respondent expressed a dissatisfaction with how logging practices impacted recreational use of the Forest and in

[35] During the field audit we observed numerous areas where AOCs had been implemented in either linear buffer strips or in association with an identified value. We cannot provide an accurate estimate of the sample intensity given the linear nature of many of the buffers. All AOCs associated with sample sites were observed. These included riparian reserves and nest buffers.

[36] Not every hectare of the area sampled is surveyed, as this is not feasible. Individual sites are initially selected to represent a primary activity (e.g. harvesting, site preparation); all associated activities that occurred on the site were assessed allowing the audit team to augment the planned sampling intensity.

general with the MNRF. The respondent did indicate that he was very satisfied with the efforts by NFRM staff to address his concerns.

MNRF

MNRF District staff and Regional staff who attended the field audit and/or had responsibilities on the NF were interviewed. General comments expressed by staff to the auditors were:

- Concern about the licencing structure for overlapping/overlapping licencees has created additional work (tracking, collection of fees, etc.).
- A perception that the main overlapping licencees were using the overlapping/overlapping licence structure to avoid their licence responsibilities and associated accountability.
- Concern that the overlapping/overlapping licencees and the SFL holder were extending the definition of roadside “grubbing” beyond normally accepted practices.
- Concern that overlapping/overlapping licencee contractors with past records of poor performance are being issued licences.

NFRM

NFRM staff were interviewed and/or attended the field audit. General comments made to the audit team included;

- Concern with the economic viability of selection and shelterwood systems on some portions of the Forest.
- Concern that opportunities to management red pine plantations would be lost due to lack of markets for pine harvested in the northern portion of the Forest.
- An overall concern that there may not be an appropriate/realistic balance of the costs and benefits associated with the forest industry and the tourist industry vis a vis harvesting restrictions (e.g. access, timing, etc.).

LCC Members

Individual members of LCC received a letter inviting their participation in the audit. Interviews were conducted with 6 members and 3 members attended the field audit. The LCC respondents provided the following general comments:

- Excellent relations with the SFL and MNRF.
- A perception that the contribution of the LCC is well received and their efforts worthwhile.
- A concern that vegetation competition threatens pine regeneration.

First Nations and Métis Organizations

All Aboriginal communities with an identified interest in the Forest were contacted by mail, telephone and/or email and asked to express their views on forest management during the audit term.

- The Aboriginal Working Group has been an effective means of providing input to forest management and other natural resource issues.
- Some confusion with respect to the various auditing processes (i.e. certification audits vs. Independent Forest Audits)
- Good working relationship with both NFRM and MNRF.

Overlapping Forest Resource Licencees (OFRLs)

One OFRL contacted the audit firm to express an interest in participating in an interview and the field audit. At the time of the audit, the OFRL declined to participate in the audit process.

Appendix 5

List of Acronyms Used

AHA	Available Harvest Area
AOC	Area of Concern
AR	Annual Report
AWG	Aboriginal Working Group
AWS	Annual Work Schedule
B&S	Barren and Scattered
B.Sc.F.	Bachelor of Science in Forestry
CFSA	Crown Forest Sustainability Act
eFRI	Enhanced Forest Resource Inventory
EMS	Environmental Management System
FAP	Forestry Aggregate Pit
FIM	Forest Information Manual
FMP	Forest Management Plan
FMPM	Forest Management Planning Manual
FN	First Nation
FOIP	Forest Operation Inspection Program
FOP	Forest Operations Prescription
FRI	Forest Resource Inventory
FRT	Forest Renewal Trust
FSC	Forest Stewardship Council
FTG	Free-to-Grow
Ha	Hectares
HST	Harmonized Sales Tax
IEA	Individual Environmental Assessment
IFA	Independent Forest Audit

IFAPP	Independent Forest Audit Process and Protocol
KMS	Kilometers
LCC	Local Citizens Committee
LTMD	Long Term Management Direction
m^3	Cubic Metres
MCFSC	Minister's Council on Forest Sector Competitiveness
MNRF	Ministry of Natural Resources and Forestry
NDPEG	Natural Disturbance Pattern Emulation Guideline
NF	Nipissing Forest
NFRM	Nipissing Forest Resource Management Inc.
NRS	Not Satisfactorily Regenerated
OFRL	Overlapping Forest Resource Licence
OWHAM	Ontario Wildlife Habitat Assessment Model
PT	Planning Team
RD	Regional Director
R.P.F.	Registered Professional Forester
RSA	Resource Stewardship Agreements
SAP	Supplemental Aerial Photography
SAR	Species at Risk
SEM	Silvicultural Effectiveness Monitoring
SFI	Sustainable Forestry Initiative
SFL	Sustainable Forest Licence
SFMM	Strategic Forest Management Model
SGR	Silvicultural Ground Rule
SIP	Site Preparation
SPH	Stems Per Hectare

SPR	Specified Procedures Report
STP	Silvicultural Treatment Package
TSP	Temporary Sample Plot
VS	Versus

Appendix 6

Audit Team Members and Qualifications

Name	Role	Responsibilities	Credentials
Mr. Bruce Byford R.P.F. President Arbex Forest Resource Consultants Ltd.	Lead Auditor Forest Management & Silviculture Auditor	Audit Management & coordination Liaison with MNRF Review documentation related to forest management planning and review and inspect silviculture practices Determination of the sustainability component.	B.Sc.F. ISO 14001 Lead Auditor Training. FSC Assessor Training. 35 years of consulting experience in Ontario in forest management planning, operations and resource inventory. Previous work on 31 IFA audits with lead auditor responsibility on all IFAs. 27 FSC certification assessments with lead audit responsibilities on 7.
Mr. Al Stewart Arbex Senior Associate	First Nations & LCC Participation in Forest Management Process Auditor Forest Compliance	Review & inspect AOC documentation & practices. Review of operational compliance. First Nations consultation.	B.Sc. (Agr) ISO 14001 Lead Auditor Training. FSC assessor training. 44 years of experience in natural resource management planning, field operations, policy development, auditing and working with First Nation communities. Previous work experience on 31 IFA audits.
Mr. David Watton Arbex Senior Associate	Forest Management Planning & Public Participation Auditor	Review documentation and practices related to forest management planning & public participation. Determination of the sustainability component.	B.Sc., M.Sc. (Zoology) ISO 14001 Lead Auditor Training. 44 years of experience in natural resource management planning, land use planning, field operations, and policy development. Previous work experience on 30 IFA audits.

Mr. Trevor Isherwood R.P.F. Arbex Senior Associate	Silvicultural, Forest Management and Contractual Compliance Auditor	Review and inspect silvicultural practices and related documentation. Review and inspect documents related to contractual compliance.	B.Sc.F. Former General Manager of an SFL. 44 years of experience in forest management and operations. Previous work experience on 27 IFA audits.