Black Spruce Forest
Independent Forest Audit
2011 – 2017

Arbex Forest Resource Consultants Ltd.

November, 2017

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1.0 Executive Summary

This report presents the findings of an Independent Forest Audit (IFA) of the Black Spruce Forest (BSF) conducted by Arbex Forest Resource Consultants Ltd. The audit utilized a risk-based approach based on the 2017 Independent Forest Audit Process and Protocol (IFAPP). The audit scope is six years which included the implementation of the Phase 1 FMP (2011-2016), the development of the 2016 Phase II FMP and the implementation of that plan until March 31, 2017.

Procedures and criteria for the IFA are specified in the 2017 IFAPP. The audit field site investigations were completed by helicopter and truck in October 2017.

The Black Spruce Forest (BSF) is managed by Resolute FP Canada Inc. (Resolute) under Sustainable Forest License (SFL) # 542526. The BSF is situated primarily within the Ministry of Natural Resources and Forestry (MNRF) Thunder Bay District with small portions situated in the Nipigon and Dryden Districts. The Thunder Bay District has lead administrative management responsibilities. The forest is certified as sustainably managed by the Forest Stewardship Council (FSC) and the Sustainable Forestry Initiative (SFI).

It is our assessment that Resolute delivered a quality forest management program over the audit term. The forest management planning process and the implementation of the FMPs met all legal and regulatory requirements. An effective silviculture program was delivered, where the area renewed exceeded the area harvested, and substantial progress towards caribou habitat objectives was achieved. An excellent compliance record was achieved with a 99% in-compliance rate reported.

MNRF met its administrative and forest management obligations.

The audit team did identify some shortcomings with respect to the retention of residual wildlife trees within some harvest areas (Finding # 1) and the efficacy of aerial chemical tending operations (Finding # 2). FMP operational standards for aggregate pits were also not consistently met (Finding # 3). We concluded that these localized issues did not pose a significant risk to long term forest sustainability.

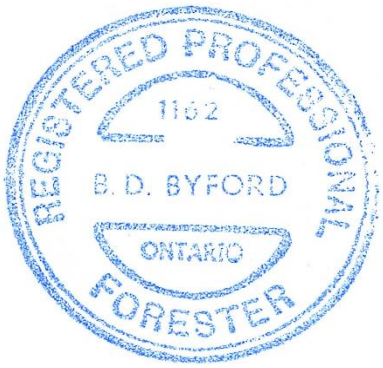
We also found that contrary to provisions in the Crown Forest Sustainability Act and IFAPP direction that SFL # 542526 has not been extended beyond 2023 (Finding # 4).

The audit team concludes that 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. Resolute FP is managing the Black Spruce Forest in compliance with the terms and conditions of its sustainable forest licence and forest sustainability as assessed through the 2017 Independent Forest Audit Process and Protocol is being achieved.

The audit team recommends the Minister extend the term of the Sustainable Forest licence # 542526 for a further five years.

Bruce Byford

Bruce Byford R.P.F.
Lead Auditor



2.0 Table of Findings

Table 1 Findings

Concluding Statement on Licence Extension:
The audit team concludes that 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. Resolute FP is managing the Black Spruce Forest in compliance with the terms and conditions of its sustainable forest licence and forest sustainability as assessed through the 2017 Independent Forest Audit Process and Protocol is being achieved. The audit team recommends the Minister extend the term of the Sustainable Forest Licence # 542526 for a further five years.
Findings
Finding # 1: FMP standards for residual tree retention were not consistently met. **Finding # 2:** The efficacy of the herbicide tending program was uneven. **Finding # 3:** FMP operational standards for forestry aggregate pits were not consistently met. **Finding # 4:** The term of Sustainable Forest Licence # 542526 has not been extended.

3.0 Introduction

This report presents the findings of an Independent Forest Audit (IFA) of the Black Spruce Forest (BSF or the Forest) conducted by Arbex Forest Resource Consultants Ltd. for the period of April 1, 2011 to March 31, 2017. The audit utilized a risk-based approach based on the 2017 Independent Forest Audit Process and Protocol (IFAPP). The audit scope is six years. It includes the implementation of the Phase 1 FMP (2011-2016), the development of the 2016 Phase II FMP and the implementation of that plan until March 31, 2017.

The Black Spruce Forest (BSF) is managed by Resolute FP Canada Inc. (Resolute) under Sustainable Forest License (SFL) # 542526. It is situated primarily within the Ministry of Natural Resources and Forestry (MNRF) Thunder Bay District with small portions situated in the Nipigon and Dryden Districts. The Thunder Bay District has lead administrative responsibilities for the unit.

The Forest is certified by the Forest Stewardship Council (FSC) and the Sustainable Forest Initiative (SFI).

3.1 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. The Independent Forest Audit Process and Protocol (IFAPP) provides guidance in meeting the requirements of Ontario Regulation 160/04 made under the CFSA and further required in the Conditions of MNR's Class Environmental Assessment Approval for Forest Management on Crown Lands in Ontario (MNR-75). The scope of the audit is determined by the MNRF in specifying mandatory audit criteria (Appendix A of the IFAPP). The audit scope is finalized by the auditors in conducting a management unit risk assessment by identifying optional audit criteria from Appendix A to be included in the audit. The final audit scope is accepted by the Forestry Futures Trust Committee (FFTC) with any subsequent changes to the audit scope requiring agreement between the FFTC, MNRF and the Lead Auditor.

The procedures and criteria for the delivery of the IFA are specified in the 2017 IFAPP. The audit generally assesses licence holder and MNRF compliance with the Forest Management Planning Manual (FMPM) and the CFSA in conducting forest management planning, operations, monitoring and reporting activities. The audit also assesses the effectiveness of forest management activities in meeting the objectives set out in the Forest Management Plan (FMP). The audit further 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. The audit provides the opportunity to improve Crown forest management in Ontario through adaptive management. Findings of *"non-conformance*" are reported. 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.

Arbex Forest Resource Consultants Ltd. conducted the IFA in October 2017, utilizing a four-person team. Profiles of the audit team members, their qualifications and responsibilities are provided in Appendix 6. Details on the audit processes implemented are provided in Appendix 4.

3.2 Management Unit Description

The BSF is an amalgamation of the former Black Sturgeon Forest Management Unit (FMU), the Spruce River FMU and the Kiashke Crown Management Unit. The Forest is located within the Ministry of Natural Resources and Forestry (MNRF) Northwest Region primarily in the Thunder Bay administrative district. Figure 1 shows the geographic location of the Forest.

The north and northeastern portion of the Forest lies within the caribou continuous and discontinuous distributions, as per Ontario's Caribou Conservation Plan (CCP). Areas within caribou distributions are managed under a Dynamic Caribou Habitat Schedule (DCHS) with the objective of maintaining a continuous supply of suitable year-round habitat distributed both geographically and temporally across the landscape.

The Forest is typical of the Boreal Forest Region. The dominant tree species are black spruce, jack pine, trembling aspen and white birch. There is a relatively high proportion of mixedwood stands present in the eastern, southern and central portions of the Forest. The northern and far western portions of forest are dominated by boreal conifer species and are slightly less diverse in terms of species composition.

Large wildfires and a history of harvesting have impacted the age class area structure resulting in a significant area in the 1-20-year class and a gap in 41-60-year age class. This age class area imbalance has negative implications for the provision of a balanced wood supply and the habitat for some species.

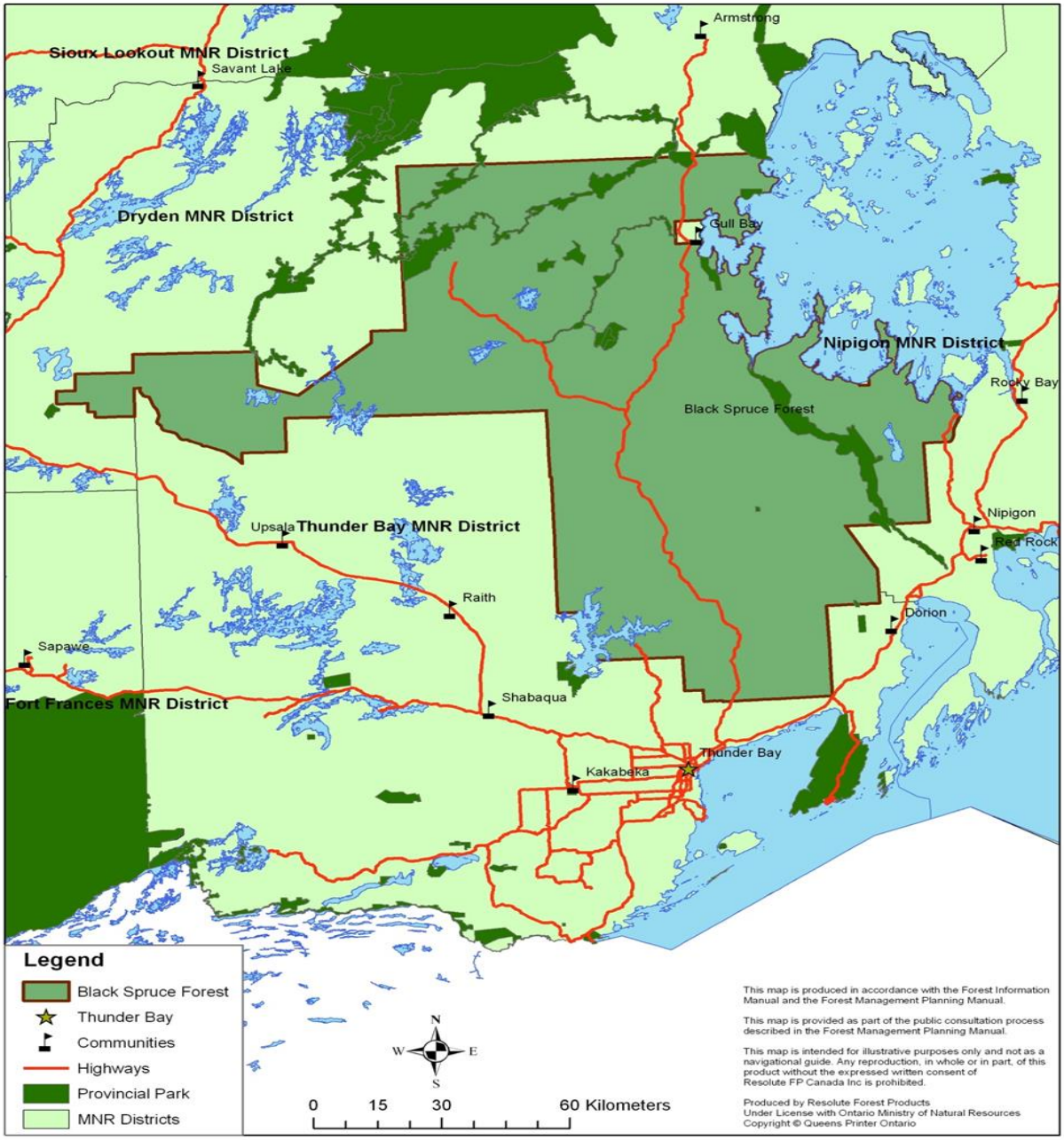


Figure 1 Location of the Black Spruce Forest

One Local Citizens Committee (LCC) is associated with the Forest (Black Spruce Forest Local Citizens Committee).

There are five Indigenous communities within or immediately adjacent to the BSF; Biinjitiwaabik Zagging Anishinaabek, Fort William First Nation (FN), Kiashke Zaaging Anishinaabek (Gull Bay FN), Lac des Milles Lacs FN and the Red Rock Indian Band.

There are several Species at Risk (SAR) identified in the FMPs including the bald eagle, American white pelican, golden eagle, whip-poor-will and the woodland caribou. As indicated, the Phase II FMP addresses the requirements of the CCP on a portion of the Forest.

The BSF encompasses a total Crown managed land area of 1,200,086 hectares with 1,010,765 ha classified as production forest (Table 2).

Table 2 Area of Crown Managed Land by Land Type (Ha)

Managed Crown Land Type	Area (Ha)
Non-Forested	98,530
Non-Productive Forest	77,354
Protection Forest[1]	13,436
Production Forest[2]	
Forest Stands	877,736
Recent Disturbance	55,447
Below Regeneration Standards[3]	77,582
Total Production Forest	1,010,765
Total Forested:	1,101,556
Total Crown Managed:	1,200,086

Source: Table 1 2011 FMP

4.0 Audit Findings

4.1 Commitment

The Commitment Principle is deemed to be met since the Forest is certified under the Forest Stewardship Council (FSC) and Sustainable Forestry Initiative (SFI) certification standards.

[1] 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.
[2] Production forest is land at various stages of growth, with no obvious physical limitations on the ability to practice forest management.
[3] Below Regeneration Standards refers to the area where regeneration treatments have been applied but the new forest stands have yet to meet free-to-grow standards

4.2 Public Consultation and Aboriginal Involvement

Aboriginal Involvement in Forest Management Planning

The development of the 2016 Phase II FMP met all FMPM requirements with respect to the participation of Indigenous peoples in the forest management planning process. The 2012 IFA included a recommendation (Recommendation # 2) that required the MNRF and Resolute to increase contacts with the involved Indigenous communities. We found that both organizations expended considerable effort to increase contacts and met the intent and direction of the recommendation.

Our review of Term and Condition 34 and 56 reports found that the MNRF met its reporting obligations.

Local Citizens Advisory Committee

There is one Local Citizens Committee (LCC) associated with the Forest (Black Spruce Forest Local Citizens Committee). This is a standing committee with members appointed by the MNRF District Manager. The membership represents a broad range of community interests and included Indigenous representation. Audit interviews with members indicated there is a good relationship with both the MNRF and Resolute. Meeting minutes indicate that the Committee is involved in a range of natural resource management issues (i.e. fisheries planning) in addition to its forest management responsibilities and functions. The Terms of Reference for the LCC was updated and the meeting minutes indicate that there was always a quorum. We concluded that the LCC is functions very well and that it fully meets the requirements and intent of the Forest Management Planning Manual (FMPM).

4.3 Forest Management Planning

We found the planning for the 2011 Phase II FMP met FMPM requirements. 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 LTMD was endorsed as being valid for Phase II planning.

Phase I FMP background information was reviewed and confirmed for use in the production 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 Silviculture Ground Rules (SGRs) in the Phase II FMP were updated and revised as required to provide more operational flexibility.

Operational planning for Phase II harvest areas appropriately considered the most current values information, relevant guidelines (e.g. Ontario's Woodland Caribou

Conservation Plan (CCP), *Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales*) and public input.

The Woodland Caribou is listed as a threatened species under the Endangered Species Act (ESA) (2007), and is managed under the Forest Management Guidelines for the Conservation of Woodland Caribou: A Landscape Approach (MNR 1999), as well as the Ontario's Woodland Caribou Conservation Plan (CCP).

Strategic and operational planning for the 2011-2021 FMP followed the FMP direction. Protection of caribou habitat was principally through harvest scheduling which identifies areas that can be harvested and areas that will be deferred for caribou habitat over the long-term. Harvest areas are organized into large contiguous blocks in order to achieve an effective habitat configuration. Forest renewal practices are implemented that perpetuate dominant conifer composition and decrease hardwood composition. Caribou protection is also provided through road decommissioning strategies, the provision of linkages to habitat concentrations and the protection of key calving lakes through Area of Concern (AOC) prescriptions.

Outside of the caribou zones a primary consideration during development of the Phase I FMP was moose habitat management. The selection of harvest areas appropriately considered the supply of browse, summer and late winter habitat, and the creation of edge and residual patches within large cutovers. This approach was refined and updated in the production of Phase II of the 2011 FMP.

There was considerable discussion among members of the Phase II planning team about the management of hardwoods as it affected moose and caribou habitat objectives. It is our assessment that the planning team did a good job discussing these issues and translating them into reasonable strategies for habitat management.

Species at Risk (SAR) were protected under FMP AOC prescriptions. A precautionary zone protection is applied when new SAR species are observed, or when new AOC prescriptions are being developed in consultation with the MNRF.

We note that there was a strong commitment to the protection of resource based tourism values in the 2011 Phase I and Phase II FMP and operations. There were no new area of concern (AOC) prescriptions arising from the Resource Stewardship Agreements (RSA) process during the development of the Phase II plan.

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

Thirty-five FMP amendments (34 administrative, 1 minor) and related revisions were approved during the audit period. Most were approved within four weeks or less from the time of submission; longer approvals were associated with more complex issues or were resubmissions. All amendments were consistent with FMP objectives, and were documented.

4.4 Plan Assessment and Implementation

The full implementation of the FMPs was negatively impacted by the economic downturn in Ontario's forestry sector. Lower than planned harvest levels resulted in the underachievement of planned targets for post-harvest silvicultural treatments.

Harvest

Audit term harvest levels were below planned (~ 40%) due principally to the economic downturn in the forestry sector.

All harvest operations utilized the clearcut silvicultural system and block harvest method. Conifer utilization levels exceeded hardwood utilization levels. Table 3 presents the actual vs. planned harvest area by forest unit for the first five years of the audit term[4]. Table 4 presents a summary of the actual vs. planned volume utilization between 2012 and 2016. During the audit term harvesting effort was concentrated on completing harvest blocks from previous plan terms by processing the remaining merchantable hardwood and slash for biofibre production.

The area harvested in the caribou continuous zone was 11,711 ha, representing 51% of the total harvest across the forest with 73% within the 2011 first five-year term. The harvest of conifer and mixed conifer FUs accounted for 8,571 ha or 73% of the cut within the caribou continuous zone, reflecting the general composition of the forest. The caribou "A blocks" are scheduled for completion by 2021. Harvest activity within these blocks totaled 5,213 ha or 23% of the total harvest. No harvesting took place in the caribou discontinuous zone. It is notable that, as an audit firm we have audited several management units within the caribou range and this Forest has made the most progress towards achieving the target dates for the completion caribou "A blocks".

Harvest area within the non-caribou distribution zone was 11,465 ha (49% of the overall harvest area). The harvest within this zone was concentrated principally within hardwood and mixedwood forest units (6,943 ha). Five options were developed in the FMP to address hardwood in mixed conifer and conifer dominated stands in areas outside of the continuous and discontinuous caribou zones. These strategies were to be implemented in instances where markets for hardwood did not exist. Strategies included the avoidance of hardwood concentrations, the option to retain a higher density of hardwood wildlife trees, the option to implement multi-pass harvests, defer blocks or extract only conifer. Recommendation # 13 in the previous BSF IFA recommended that Resolute minimize the use of two-pass harvests and adopt an avoidance strategy wherever practical. Resolute requested approval to apply mixedwood management strategies on 21 harvest blocks, but the strategy was only implemented on four blocks.[5] An issue with the utilization of white birch (particularly in the northern portion of the Forest) persists due to lack of markets but is expected to improve with the expansion of biofuel and hardwood markets.

[4] Data is not available for 2017.
[5] All species were harvested in the other 17 blocks.

The inability to market birch/other hardwoods has resulted in some blocks remaining open in the compliance system for extended periods of time. This issue was compounded by contactor bankruptcy and poor spring weather which delayed hauling. We do not issue a finding, as the Resolute is tracking the issue and intends to clean up the blocks by the end of the plan term.

Salvage harvest operations were undertaken on 19 ha to recover timber damaged by small wildfires and blowdown. SFL conditions for salvage operations were met.

Our site inspections found that, on balance, harvest operations were properly implemented with the exception that residual tree requirements as outlined in the Conditions on Regular Operations (CROs) for average stem diameters and species composition were not consistently met (Finding # 1).

All inspected harvest blocks were approved for operations in the AWSs. There was little evidence of site damage arising from harvest operations. AOC prescriptions in or adjacent to harvest blocks were properly implemented.

Slash Management

Resolute implements a debris management protocol as part of its Environmental Management System (EMS) to reduce roadside debris accumulation. We found that an effective slash management program (piling, spreading, grinding and burning) had been implemented due in part to the proximity of the Resolute wood pellet plant and cogeneration facility in Thunder Bay. Debris piling also took place as part of a Forestry Futures program in 2015 to reclaim productive land loss due to the insolvency of an Overlapping Licensee (OL).

Table 3 Actual vs. Planned Harvest Area by Forest Unit (2011-2016)

Forest Unit[6]	Planned 5 Year Harvest Term 1 (Ha)	Actual 5 Year Harvest Term 1 (Ha)	Actual vs Planned % 5 years
BF1	679	193	28
BW1	3,710	616	17
MC1	3,748	2,351	63
MC2	7,415	3,338	45
MH1	22,827	7,965	35
OC1	66	42	63
PJ1	2,232	1,801	81
PO1	3,649	1,512	41
SPL	7,474	2,128	28
SPU	5,512	3,231	59
Total	**57,310**	**23.167**	**40**

[6] Forest Units are as follows: BF1=Balsam fir dominated, BW1=White Birch Dominated, MC1=Mixed Conifer minimal hardwood, MC2= Mixed conifer with significant hardwood, MH1= Mixed hardwood, OC1=Cedar or Larch dominated, OH1=Other Hardwood, PJ1= Jack Pine, PO1=Poplar dominated, PR1=Red Pine Pw1=White Pine, SPL= Spruce Lowland, SPU=Spruce Upland

Table 4 Actual vs. Planned Volume (000's m^3) (2011-2016)

Species group	Planned Volume (000 m^3)	Actual Volume (000 m^3)	% of Planned
Conifer (all)	3,130,935	2,258,810	72
Bw	710,410	40,156	6
Po	1,487,760	628,180	42
Other Hardwood Biofuel	656,220	359,795	55
Total	5,985,325	3,286,941	56

Area of Concern Management

Our sampling of FMP AOC prescriptions confirmed that they were in accordance with MNRF guidelines, and that they were appropriate for the protection and/or maintenance of the identified values. Our field site investigations confirmed that the prescriptions were properly implemented.

Renewal, Tending and Protection

Site Preparation (SIP)

During the audit term, SIP treatments achieved 55% of the planned FMP targets due to the lower than planned harvest level and the adoption of alternative prescriptions such as direct planting (Table 5). Mechanical site preparation treatments comprised 92% of the SIP treatments implemented. However, the actual area treated with mechanical site preparation was lower than planned (54%) due to site conditions being suitable for planting without the need for site preparation. The inspected areas exhibited good mineral soil exposure and there was no evidence of site damage arising from the operations.

Chemical site preparation treatments were not planned during the first five-year FMP term but were conducted on 569 ha to control competing vegetation prior to renewal treatments. The treatment appeared to be effective in achieving early competition control on the inspected sites.

Table 5 Area (Ha) of Actual vs. Planned Site Preparation (2011-2016)

Site Preparation Treatments	Planned Ha	Actual Ha	Actual vs Planned %
Mechanical SIP	16,759	9,029	54
Chemical SIP	0	569	
Prescribed Burn	1,269	258	20
SIP Total	18,028	9,856	55

Renewal

The 2011 Phase I FMP forecast an area of 34,010 ha of natural regeneration and 20,990 ha of artificial renewal (Table 6). FMP renewal targets were not achieved due to the lower than planned harvest. However, the area renewed exceeded the area harvested[7]. Regeneration assessments indicate a high level of regeneration (100%) but the silviculture success is low (37%) (See Section 4.6).

All renewal treatments observed in the field were consistent with the SGRs. In the caribou continuous zone 10,146 ha were renewed (natural and artificial renewal) while 15,855 ha were renewed in the non-caribou zone. Approximately 55% of the harvest area was renewed by natural treatments. Natural regeneration in the caribou continuous zone is typically prescribed for the renewal of hardwood dominated forest, lowland black spruce and other lowland conifers. Our site inspections of harvest blocks managed for natural renewal found the blocks were typically well-stocked to the desired species.

Artificial renewal treatments were less frequently adopted during the audit term reflecting the suitability of sites for natural renewal. Artificial renewal focused on conifer dominated and mixed conifer forest units within the DCHS.

Although well below the plan forecast level (50%), tree planting was the most frequently adopted artificial renewal technique, reflecting the higher proportion harvest of upland conifer sites which are more conducive to planting operations. Our site inspections found planted areas to be well stocked with both planted trees and natural ingress.

The area treated by seeding achieved 86% of the planned forecast area. The area treated by seeding is roughly four times greater in the continuous caribou zone than the non-continuous caribou zone. This is indicative of the effort to maintain and enhance conifer stands within the continuous caribou distribution zone. Our site inspections found these treatments were effective with all sites exhibiting high stocking levels to desired conifer species.

[7] 23,167 ha were harvested, and 26,089 ha were renewed at the end of year 5 of the 2011 planning term.

Table 6 Area (Ha) of Actual vs. Planned Renewal Treatments (2011-2016)

Renewal Treatments	Planned Ha	Actual Ha	Actual vs Planned %
Natural Renewal	34,010	14,345	42
Artificial Renewal - Plant	17,255	8,545	50
Artificial Renewal - Seed	3,735	3,200	86
Total Renewal	55,000	26,090	47

We concluded that the field application of silviculture is achieving high levels of regeneration success while maintaining conifer and reducing hardwood levels on the forest and that an excellent renewal program was implemented during the audit term.

Tending

Aerial herbicide tending treatments were implemented on 11,919 ha (Table 7). Tending treatments were focused on pure conifer forest units principally within areas in the dynamic caribou habitat schedule.

The assessment of the effectiveness of the spray program was complicated by the fact that leaf drop was occurring at the time of the field audit. In areas that could be assessed, our site investigations found that the efficacy of the spray was uneven (Finding # 2). Resolute staff attributed the variable effectiveness of the aerial spray to a number of factors (e.g. droplet size, weather) and indicated that areas with poor competition control would be re-treated as required.

Table 7 Area (Ha) of Actual vs. Planned Tending Treatments (2011-2016)

Tending Treatments	Planned Ha	Actual Ha	Actual vs Planned %
Aerial Herbicide Tending	13,644	11,919	87
Pre-Commercial Thinning	500	0	0
Total Tending	14,144	11,919	84

No thinning or manual spacing work occurred during the audit term due to a lack of sites suitable for treatment.

Protection

No protection programs other than monitoring functions were implemented during the audit term.

Access Planning and Management

Access planning was in accordance with the requirements of the FMPM. During the audit term 43 kilometers (kms) of primary road and 283 kms of branch roads were constructed. In order to reduce operational road construction on the forest, some blocks are accessed with skid trails to move wood to existing roads for processing.

Decommissioning of roads and landings is a requirement of the current FMP to reduce the loss of productive land, improve woodland caribou habitat and prevent public access into protected areas. Decommissioning activities included signage, water crossing removals, berm construction, and placement of slash and/or scarification of the road surface. In general, the decommissioning efforts were successful in preventing vehicle traffic.

Fifty-six water crossings were constructed, and 39 crossings were replaced. Our field inspections found that, on balance, culvert installations were well-constructed. We did encounter some localized issues with respect to culvert installations situated in areas where the bedrock was at or near the surface. Typically, at these sites, less than ten percent of the pipe diameter was below the natural stream bed. Given the watercourse characteristics (i.e. ground water seeps) at these locations, the audit team concluded that the installation would not have an adverse effect on fishery values or fish movement.

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.

During the field audit, we visited eleven aggregate pits. FMP operational standards for forestry aggregate pits were not consistently met (Finding # 3).

Renewal Support

Resolute is a member of the Superior Woods Tree Improvement Association. Cones were collected during all years of the audit term. Tree improvement work also took place within several tree orchards. Renewal support activities were sufficient to meet the projected renewal program requirements.

4.5 System Support

Resolute FP met 2017 IFAPP Human Resources Principle criterion through its SFI and FSC certifications.

4.6 Monitoring

Both MNRF and Resolute are effectively tracking and monitoring forest management activities on the BSF. Resolute prepared a compliance plan in accordance with the Guidelines for Industry Compliance Planning. The annual inspection targets were appropriate for the extent of harvesting and other forest management activities.

Based on the data in the ARs 409 Forest Operations Inspection Program (FOIPs) inspections were completed with only four non-compliances reported, which resulted in an impressive 99 percent in-compliance rate.

MNRF staff completed 20% of the reported inspections. MNRF compliance planning was completed on an annual basis and included targets and identified individuals responsible for completing the work. The format and content of the plans met compliance guidelines.

The previous IFA provided two recommendations (Recommendations # 14 and # 15) related to meeting submission timing deadlines and ensuring that the FOIP reports contained the required information. Our review of a sample of FOIPs[8] indicated that the recommendations had been addressed.

Recommendation # 9 of the previous IFA identified a requirement that harvest operators follow the requirements of the Stand and Site Guide regarding residual wildlife tree retention. In response to that recommendation (starting in 2013 -14) the compliance section in the ARs was to include mandatory text reporting specifically on wildlife leave trees. Our site inspections and compliance inspection documentation indicated that residual tree requirements outlined in the Conditions on Regular Operations (CROs) with respect to average stem diameters and species composition were not consistently met on all harvest areas during the audit term (Finding # 1).

<u>Monitoring of Silvicultural Activities</u>

Silviculture assessments and other monitoring functions were in accordance with the direction in the FMP. Monitoring activities completed by the MNRF and Resolute included; plantation survival assessments, regeneration and post-tending assessments and Free-to-Grow (FTG) surveys. We concluded that an effective monitoring program was implemented.

[8] 15 Industry and 10 MNRF.

Free to Grow Survey (FTG)

During the audit term, FTG surveys took place on 21,015 ha (2011-2014). Although FTG surveys have not been undertaken since 2014 a backlog in area requiring survey did not accumulate as SGRs were revised to extend the timing of surveys from 7-10 years after renewal to an average 10-15 years after renewal. Eighty-three percent of the surveyed area was declared FTG (17,686 ha). Our field sampling (visual assessments) of FTG survey blocks generally substantiated the stand descriptions and forest unit designations reported.

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.

A high level of regeneration success (83%) was achieved but the silviculture success was low (37%) (Table 8). 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. In many instances, the percent species composition of the stand at the time of FTG assessment (typically 7-15 years after renewal) will not be same at stand maturity (since shorter lived and less shade tolerant hardwoods will be replaced by shade tolerant conifers as the stand ages). Restrictive definitions of forest units[9] and/or a lack of historic records related to past SGRs (or management prescriptions) also complicate the determination of silviculture success. We understand that a Provincial Silvicultural Program Initiative Committee is currently reviewing the Silviculture Effectiveness Monitoring (SEM) program so a finding related to silviculture success is not provided.

Silvicultural Effectiveness Monitoring

MNRF implemented Silviculture Effectiveness Monitoring (SEM) during all years of the audit term. District SEM results were reported in a format which effectively describes the Core Task results, sampling procedures, summarizes the findings and identifies trends, rationalizes the findings and prescribes areas for further investigation. We concluded that MNRF delivered an effective program.

[9] Typically, 10% percent species composition.

Table 8 Silviculture and Regeneration Success by Forest Unit (2011-2016).

Forest Unit	Total Area Assessed (Ha)	Area Regenerated to the Projected Forest Unit (Ha)	Area Regenerated to Another Forest Unit (Ha)	Area Regenerated (Ha)	Area Not Successfully Regenerated (Ha)	% Area Silviculture Success
BF1	28	20	8	28	0	71
BW1	958	327	529	856	102	34
MC1	2,707	777	1,547	2,323	383	29
MC2	4,435	1,544	2,436	3,980	455	35
MH1	4,621	2,186	1,768	3,954	667	47
OC1	1	0	1	1	0	0
PJ1	1,884	777	1,013	1,790	94	41
PO1	1,403	618	517	1,136	267	44
SPL	617	101	129	229	388	16
SPU	4,661	1,606	1,781	3,630	1,274	34
PW1	0	0	0	0	0	0
Total:	21,314	7,955	9,729	17,685	3,630	37

Exceptions Monitoring

Exceptions monitoring is carried out to determine the effectiveness of prescriptions included in forest management plans that are "*not recommended*" in the MNRF forest management guides. Monitoring was undertaken to assess the impacts of full tree logging on shallow soil sites (Ecosites 11 and 12) in accordance with the "Full Tree Harvesting of Ecosites 11 and 12 in Northwestern Ontario: Monitoring Procedures and Best Management Practices" protocol. Conditions on Regular Operations (CROs)[10] were implemented to mitigate the effects of harvesting (e.g. minimize ground disturbance and avoid nutrient loss) on these sites.

Forest Renewal Trust Specified Procedures Report

We inspected 11% 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

[10] FMP Section 4.2.2.2.

Roads and water crossings are monitored through the Forest Operations Inspection Program. There were no non- compliances reported in the system. Resolute conducts an annual inspection program, as part of its Environmental Management System (EMS). An inspection is completed for all water-crossing installations, repairs and removals occurring on the SFL.

All roads with harvesting operations received active road maintenance and all other road networks were monitored on a rotation basis. Both the MNRF and Resolute conduct additional inspections as part of their respective compliance planning targets. Informal checks of roads and water crossings are conducted on an ongoing basis as part of the field program.

We concluded that an effective access monitoring program was implemented.

Annual Reports

ARs were available for each year in the audit scope except for the 2016-2017 AR, which is not required until November 15, 2017. Schedules for the submission and review of the ARs were met. The content of the reports met FMPM requirements with the exception noted in Section 4.6 related to reporting on residual wildlife trees. As required, the ARs were presented to the LCC.

4.7 Achievement of Management Objectives & Sustainability

FMP objectives are monitored annually and formally reported on in the year 3, 7 and 10 Annual Reports. The lower than forecast level of harvest negatively affected the achievement of FMP objectives related to forest cover, forest diversity and those related to the economic benefits derived from forest management. Appendix 2 provides more details on our assessment of plan objective achievement.

We identified the following trends in the Trends Analysis Report as significant:

- Planned harvest levels (area and volume) have not been achieved resulting in plan targets for silviculture activities linked with the harvest to be underachieved.
- In spite of the lower than planned harvest levels the focus of harvest operations within the caribou management zones shows progress towards caribou plan objective achievement.
- Conifer utilization was significantly higher than hardwood utilization.
- The area renewed exceeded the area harvested.
- The field application of silviculture is achieving high levels of regeneration success while maintaining conifer and reducing hardwood levels on the forest.
- FTG data demonstrates consistency between the modeled successional pathways and actual field results.

The Report Author concludes that forest sustainability is not at risk from the implementation of forest management activities and that planning objectives are meeting or are within an acceptable tolerance of desired levels in order to maintain progress towards sustainability.

The audit team concurs with that assessment. In our assessment of forest sustainability, we examined factors such as the achievement of plan objectives, progress towards the desired future forest condition, and the level of benefits derived from the implementation of the forest management plan. Our field site visits, document and record reviews and interviews also informed our sustainability conclusion. We concluded that the achievement of long term forest sustainability as assessed by the IFAPP is not at risk. Our conclusion was premised on the following:

- 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.

- Our site inspections and document reviews indicated that an effective silviculture program was implemented.

- Despite the lower than planned harvest, FMP objectives and targets are being achieved or progress is being made towards their achievement. There was significant progress towards achieving FMP target dates for the completion caribou A blocks.

- The area renewed exceeds the area harvested and a high level of regeneration success has been achieved. Within the caribou zones, conifer forest units are being maintained and hardwood levels have been reduced.

- We did not observe any instances of environmental damage associated with forestry operations and our site inspections confirmed that AOC prescriptions were appropriately implemented.

- FOIP results indicate a high in-compliance rate was achieved for forest management activities (99%).

- Silvicultural Ground Rules (SGRs), Silvicultural Treatment Packages (STPs) and Forest Operations Prescriptions (FOPs) were appropriate for the forest cover types and site conditions.

4.8 Contractual Obligations

We concluded that Resolute was substantially in compliance with the terms and conditions of its licence agreement (See Appendix 3).

The IFAPP requires auditors to assess the effectiveness of the actions developed to address the recommendations of the previous audit. The recommendations had been appropriately addressed, with the exception that an issue with residual wildlife tree retention persisted on some harvest blocks (Finding # 1).

We note also that the term of Sustainable Forest Licence # 542526 has not been extended, even though previous IFAs have recommended the extension (Finding # 4).

4.9 Conclusions and Licence Extension Recommendation

It is our assessment that Resolute delivered a quality forest management program over the audit term and we found the forest to be well managed. The forest management planning process and the implementation of the FMPs met all legal requirements and regulatory requirements. An effective silviculture program was delivered, where the area renewed exceeded the area harvested, and substantial progress towards caribou habitat objectives was achieved. A good compliance record was also achieved with a 99% in-compliance rate.

MNRF met its administrative and forest management obligations.

The audit team did identify some shortcomings with respect to the field implementation of Conditions on Operations related to the retention of residual wildlife trees within some harvest areas (Finding # 1) and the efficacy of aerial chemical tending operations (Finding # 2). We concluded that these issues did not pose a significant risk to long term forest sustainability due to their localized occurrence. FMP operational standards for aggregate pits were also not consistently met (Finding # 3).

We noted that contrary to provisions in the Crown Forest Sustainability Act related to the extension of the SFL licence extension in accordance with the IFAPP direction that SFL # 542526 has not been extended beyond 2023 (Finding # 4).

The audit team concludes that 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. Resolute FP is managing the Black Spruce Forest in compliance with the terms and conditions of its sustainable forest licence and forest sustainability as assessed through the 2017 Independent Forest Audit Process and Protocol is being achieved. The audit team recommends the Minister extend the term of the Sustainable Forest Licence # 542526 for a further five years.

Appendix 1

Findings

Independent Forest Audit – Record of Finding

Finding # 1

Principle: 4 Harvest

Criterion: 4.3. Harvest

Procedure(s): 4.5.1. Review and assess in the field the implementation of approved harvesting operations. Include the following:

- Residual stand structure required in the FMP including individual residual tree retention and downed woody material

Background Information and Summary of Evidence:

The Phase II FMP provides direction with respect to residual stand structure and requirements for residual trees retained under the clearcut silvicultural system. Conditions on Regular Operations (CRO 11) requires, for any given 20 ha area within a harvest block, or for the entire block when the block is less than 20 ha, that:

- An average of 25 stems/ha be retained.
- An average of 10 or more large diameter stems (> 25 cm) or stubs be retained.
- In the caribou zone, stubbing of merchantable white birch > 3m in height from the ground will be encouraged in order to minimize birch seeding. The stubbed tops will be left in the cutover in order to provide downed woody material.

To assist with the achievement of biodiversity objectives CRO 4 requires that:

- Harvested residual forest will normally have a species composition, average stem diameter, and average stem quality similar to that found in the stand before harvest.

FOIP inspection reports indicate that the requirements were not consistently met within all harvest blocks. Our field observations confirmed these findings.

Discussion:

During our site inspections we encountered four sites where residual tree requirements for average stem diameters and species composition were not met. In addition to tour field observations, MNRF staff commented on the issue and provided supporting compliance inspection documents which noted the need for improvement with respect to wildlife tree retention. Although not a widespread problem, or a threat to long term forest sustainability, we provide a finding as the issue of residual tree retention was raised in the previous audit.

Finding # 1:

FMP standards for residual tree retention were not consistently met.

Independent Forest Audit – Record of Finding Finding # 2
Principle: 4 Plan Assessment and Implementation **Criterion:** 4.5. Renewal, Tending and Protection **Procedure(s):** 4.5.1. Review and assess in the field the implementation of approved tending and protection operations and determine if actual operations were appropriate for actual site conditions encountered.
Background Information and Summary of Evidence: Effective tending treatments are typically required to promote the establishment and growth of desired crop tree species. Tending treatments were implemented on 11,919 ha. Our assessment of the effectiveness of the chemical spray program was complicated by the fact that leaf drop was occurring at the time of the field audit. In areas that could be assessed our site investigations found that the efficacy of the spray program was uneven with some treated areas exhibiting good competition control, while in other areas, the herbicide application was less effective (~30% of sampled sites). This observation was confirmed in interviews with company staff. The variable effectiveness of the spray program was attributed to a number of factors (e.g. droplet size, weather).
Discussion: In the absence of an effective tending program investments in conifer renewal can be lost. Ineffective competition control over extended periods will have negative implications for the full achievement of objectives dependent on the renewal and maintenance of conifer-dominated cover types. Resolute is aware of the issues associated with its herbicide tending program and plans to re-treat sites on an as required basis.
Finding # 2: The efficacy of the herbicide tending program was uneven.

Independent Forest Audit – Record of Finding
Finding # 3

Principle: 4. Plan Assessment and Implementation

Criterion: 4.7 Access

Procedures:

Review and assess in the field the implementation of approved access activities. Include the following:

- select a representative sample of each type of access activity (road construction, various types of water crossings - winter, culverts, bridges, road maintenance, decommissioning, and reclamation) from primary, secondary/branch and tertiary/operational roads constructed during the five-year period of the audit; include category 14/forestry aggregate pits for new roads and existing roads

Background Information and Summary of Evidence

Appendix VII of the FMPM (2009) details the operational standards that apply for the extraction of aggregate resources for Forestry Aggregate Pits. Included in the standards are requirements that:

- no undercutting of the working face is permitted and; the working face must be sloped at the angle of repose,
- all trees within 5 metres of the excavation face must be removed,
- when the pit is inactive, all pit faces must be sloped at the angle of repose.

The FMPM further states that final pit rehabilitation must include:

- sloping of all pit faces to a minimum of 3:1 (horizontal : vertical);
- re-spreading of any topsoil or overburden that was stripped from the site;
- mitigation measures, to the satisfaction of MNR, to prevent erosion.

The FMP outlines the direction for the management of aggregate pits on the Forest.

Discussion:
Site investigations revealed that operational standards for forestry aggregate pits were not consistently met (~ 45%). Issues observed at non-conforming pits were steeper slopes, the undercutting of the working face and trees within 5 metres of the excavation face.

Finding # 3:

FMP operational standards for forestry aggregate pits were not consistently met.

Independent Forest Audit – Record of Finding

Finding # 4

Principle: 8 Contractual Obligations

Criterion: 8.1.21 SFL or Agreement extension recommendation

Procedure(s):

- Based on consideration of audit results for the preceding criteria in 8.1 related to the SFL or Agreement make a concluding statement and recommendation on the extension of an individual SFL or the Agreement in accordance with the IFAPP direction for such a recommendation (Appendix D).

Background Information and Summary of Evidence:

The Black Spruce Forest is the amalgamation the former Spruce River FMU (Sustainable Forest Licence # 542526), the Kiashke Crown Management Unit and most of the former Black Sturgeon FMU (SFL # 542500).

The land base was amalgamated for the start-up of the 2011 FMP. The SFL was issued in December, 2012 to reflect the amalgamation of the Forests.

The previous (2011) Independent Forest Audits of the Spruce River Forest and the Black Sturgeon Forest recommended that the "*new Sustainable Forest Licence being developed for the Black Spruce Forest be issued …..with a full term of twenty years*."

Instead of the issuance of a new SFL, the existing Spruce River Forest SFL was amended to include the area encompassed by the new Black Spruce Forest. Specifically, Section 2.3 of the SFL states "*The term of this licence commences on the 1st day of April 2003 and expires on the 31st day of March 2023, but may be extended in accordance with section 26(4) of the Crown Forest Sustainability Act (CFSA)*".

The 2006 IFA recommended an extension of the Spruce River SFL # 542526.

Discussion:

It is understood that the IFA recommendation on licence extension is only a component of the Minister's consideration for the extension of an SFL. The current licence expires in 2023, indicating that an extension has not taken place since 2003. Provisions for SFL extensions are provided in Crown Forest Sustainability Act.

Subsection 26 (1) of the CFSA provides that:

"*The Minister may, with the approval of the Lieutenant Governor in Council, grant a renewable licence to harvest forest resources in a management unit that requires the licensee to carry out renewal and maintenance activities for the benefit and on behalf of the Crown necessary to provide for the sustainability of the Crown forest in the area covered by the licence."*

Subsection 26 (3) and (4) of the CFSA provide that:

(3) "*Subject to subsection (3.1), during the term of the licence, the Minister shall conduct a review every five years to ensure that the licensee has complied with the terms and conditions of the licence*." And (4) "*If a review conducted under subsection (3) or (3.1) satisfies the Minister that the licensee has complied with the terms and conditions of a licence, the Minister shall, with the approval of the Lieutenant Governor in Council, extend the term of the licence for five years*."

Finding # 4:

The term of Sustainable Forest Licence # 542526 has not been extended.

Appendix 2

Management Objectives Table

2011 FMP OBJECTIVES	ASSESSMENT OF OBJECTIVE ACHIEVEMENT (MET, PARTIALLY MET, NOT MET, UNCERTAIN)	AUDITOR COMMENTS
Note: Forest Diversity objectives, as created and tested in the production of the 2011 FMP are by their design, long term. For most of the diversity objectives and their indicators (i.e. Objectives 1, 2.1 and 3.1) inadequate time has elapsed since approval of the 2011 FMP for the effects of limited natural disturbance and limited harvesting to have a measurable impact on forest diversity. The 2017 Trends Report noted that a detailed evaluation of the achievement of these objectives as well as Objectives 6.1,6.2, and 6.6 will follow the completion of the proposed Long Term Management Direction and the completion of Phase 1 operational planning for the 2021 term (Year 10). Notwithstanding the short time that has elapsed since approval of the 2011 FMP we do comment (below) on some of the forest diversity objectives where it is reasonable to do so based on 2011 FMP planning and implementation.		
Objective 1: To create a range of forest disturbances that emulates the frequency distribution of a natural landscape pattern. Indicator: Percent frequency distribution of forest disturbances by size class.	**MET**	In 2011 FMP planning, targets and desirable levels were projected to be achieved. Public concerns over large disturbances in some areas (i.e. tourism operators, cottagers) will make it difficult to move towards the template in all sizes immediately.
Objective 2.1: To create a forest age class structure, composition and abundance that represents a natural landscape. Indicator 2.1: Productive area (ha) by forest type and age class grouping. Indicator 2.2: Productive area (ha) by landscape class Indicator 2.3: Old Growth - Productive area (ha) of old growth forest by forest. Indicator 2.4: Old Growth - Productive area (ha) of habitat for wildlife species that prefer	**MET**	2.1, 2.2, 2.3, and 2.4: The 2011 FMP planning analysis projected that most targets and desirable levels would be met. 2.5. The target and desirable level were not projected to be achievable given current levels of PR1 and PW1 old growth but were projected to be met in the future. 2.6, 2.7: Objectives for black ash trees and red and white pine forest unit levels were met. The Trends report notes that "*The strategy to maintain areas of "old growth" (red and white pine) and rare forest types (black ash) has been met due to the lack of harvesting in these*

old growth. Indicator 2.5: Old Growth - Productive area of red pine and white pine forests. Indicator 2.6: Rare (infrequently occurring) tree species - black ash. Indicator 2.7: Rare (infrequently occurring) tree species - red pine and white pine.		*forest units*."
Objective 3.1: To maintain or increase the habitat area for forest dependent provincially and locally featured species. Indicator 3.1: Caribou Habitat - Area (ha) of winter-used, winter-preferred and refuge habitat within the caribou zone (continuous zone only). Indicator 3.2: Marten Core Habitat - Area (ha) of suitable habitat in core areas. Indicator 3.3: Wildlife Habitat - Area (ha) of aspatial habitat for forest-dependent provincially and locally featured species. Indicator 3.4: Habitat (ha) for Forest Dependent Species at Risk (SAR), which includes woodland caribou, lake sturgeon, bald eagle, American white pelican, peregrine falcon, etc.	**MET**	All targets for caribou habitat, marten core areas and for featured species were projected to be met.
Objective 4.1 a): To minimize increases in road density in the caribou zone (<u>continuous zone</u>) due to forest management activities. Indicator 4.1a): Road	**NOT MET**	Road density at the start of the 2011 FMP was 0.0038 kms/ha. The Year 3 AR indicates a road density of 0.0041 kms/ha (19% increase from plan start). While the target is not currently being met, the Trends Report projects that

Densities - Kilometres of drivable primary, branch and operational roads per hectare of Crown forest for public use.		progress towards the achievement of this objective will be made as harvest and renewal operations are completed and harvest blocks are closed.
Objective 4.1 b: To reduce road densities in the caribou zone (<u>discontinuous zone</u>) due to forest management activities. Indicator 4.1b): Road Densities - Kilometres of drivable primary, branch and operational roads per hectare of Crown forest for public use.	**NOT MET**	The road density was calculated to be 0.0057 kms/ha at the start of the plan. The Year 3 AR indicates that the road density has not changed since no roads were constructed or decommissioned in the zone during the audit term.
Objective 4.2: To maintain road access for recreational opportunities in the area outside the caribou zones (continuous and discontinuous zone). Indicator 4.2: Roads Densities - Kilometres of drivable primary, branch and operational roads per hectare of Crown Forest for public use.	**MET**	There has been an 8% increase in road density (increase from 0.0071 km/ha to 0.0061kms/ha) over the plan term.
Objective 5.1: To ensure harvested areas are successfully regenerated and free- growing in a timely manner. Indicator 5.1: Percent of harvested forest area assessed as free-growing. Indicator 5.2: Percent of harvested forest area assessed as successfully regenerated to projected forest unit (silviculture. success) or to another forest unit (regen. success). Indicator 5.3 a): Conifer dominated forest units (SPU, SPL, PJ1, MC1) in the caribou	**MET**	During the audit term, FTG surveys took place on 21,015 ha (2011-2014). Eighty-three percent of the surveyed area was declared FTG (17,686 ha). Our field sampling (visual assessments) of FTG survey blocks generally substantiated the reported stand descriptions and forest unit designations. Regeneration success is high, but silviculture success is low. The assessment of silviculture success is a complex undertaking and we note that a Provincial Silvicultural Program Initiative Committee is currently reviewing the SEM program. We concluded that an effective renewal

zone (continuous only). Indicator 5.3 b): Conifer dominated forest units (SPU, SPL, PJ1, MC1) in the caribou zone (discontinuous only). Indicator 5.4 a): Percent change in conifer species composition in the caribou zone (continuous only). Indicator 5.4 b): Percent change in conifer species composition in the caribou zone (discontinuous only).		program was implemented. The area renewed exceeds the area harvested and within the caribou zones, conifer forest units are being maintained and hardwood levels have been reduced.
Objective 6.1: To provide a continuous supply of available harvest area (ha/year) by forest unit. Indicator 6.1: Long and Short Term Harvest Area - Projected available harvest area (ha/year) by forest unit.	**MET**	Desirable levels & targets were projected to be achieved.
Objective 6.2: To provide a continuous supply of available harvest volume (m3/year) for the major species groups. Indicator 6.2: Long and Short Term Harvest Volume - Projected available harvest volume (m^3/year) by species group.	**MET**	Desirable levels & targets were projected to be achieved.
Objective 6.3: To increase the ratio of actual area and actual volume harvested in comparison to the planned forecast harvest allocations in the FMP. Indicator 6.3: Ratio of actual harvest area to planned	**NOT MET**	Harvest levels averaged 40% of annualized planned harvest area at the end of Year 5. The Trends Report Author indicated that the transition from bridged harvest areas to the current FMP harvest allocations would result in an increase in the harvest area. This would result in the

harvest area by forest unit = (Actual Area/Planned Area). Indicator 6.4: Ratio of actual harvest volume to planned harvest volume by species group.		objective being achieved by the end of the ten-year planning term.
Objective 6.5: To ensure maximum utilization from harvested timber. Indicator 6.5: Wood Utilization by Mill - Percent of forecast harvest volume utilized, by mill.	**NOT MET**	The three-year average annualized harvest volume total was 56% of planned. Increased hardwood utilization through market expansion and biofibre production may improve progress on this objective by the end of the plan term.
Objective 6.6: To maintain the managed Crown forest available for timber production. Indicator 6.6: Managed Crown forest available for timber production (ha).	**MET**	The total area managed for timber production has remained stable.
Objective 7.1: To ensure that forest operations maintain compliance with prescriptions for the protection of natural resource features, land uses or values dependent on forest cover. Indicator 7.1: Compliance - with prescriptions for the protection of natural resource features, land uses or values dependent on forest cover (% of inspections in compliance).	**PARTIALLY MET**	There were no non-compliances reported in the FOIPs. Our field audit found that FMP standards for wildlife tree retention were not consistently met.
Objective 7.2: To ensure that forest operations maintain compliance with prescriptions for the protection of resource-based tourism values. Indicator 7.2: Compliance -	**MET**	There was only one non-compliance related to AOC prescriptions for the protection of resource-based tourism values during the audit term (2014).

with prescriptions for the protection of resource-based tourism values (% of inspections in compliance).		
Objective 7.3: To ensure that forest operations maintain compliance with management practices that prevent, minimize or mitigate site damage. Indicator 7.3: Compliance - with management practices that prevent, minimize or mitigate site damage (% of inspections in compliance.	**MET**	There were no reported instances of site damage arising from forest operations.
Objective 7.4: To ensure that forest operations maintain compliance with prescriptions for the protection of water quality and fish habitat. Indicator 7.4: Compliance - with prescriptions developed for the protection of water quality and fish habitat (% of inspections in compliance).	**MET**	There were no reported instances of environmental damage to water or fishery resources from forest operations.
Objective 7.5: To minimize non-compliance in forest operations. Indicator 7.5: Non-compliance - In forest operations inspections (% of inspections in non-compliance).	**MET**	An in-compliance rate of 99% was achieved.
Objective 8.1: To provide opportunities for Aboriginal communities to be involved in plan development through Aboriginal consultation, planning team participation and incorporation of Aboriginal values. Indicator 8.1: Initial contact	**MET**	MNRF contacted all Aboriginal communities six months prior to the commencement of the public consultation for the 2011 – 2021 FMP. A position was available on the FMP planning team for a representative from each Aboriginal community and almost all communities had representation on Phase 1 and 2 planning teams.

with Aboriginal communities. Indicator 8.2: Opportunities for representation on planning team. Indicator 8.3: Opportunities to produce or comment on Aboriginal Background Information Report and the Report on the Protection of Identified Aboriginal Values.		Draft Aboriginal Background Information Reports and Protection of Identified Aboriginal Values were received by MNR staff and considered in the development of the 2011-2021 FMP.
Objective 9.1: Local citizens committee's self-evaluation of its effectiveness in plan development. Indicator 9.1: Local citizens committee's self-evaluation of its effectiveness in plan development.	**MET**	The LCC score on their self-evaluation surveys was 77%, exceeding the target score of 75%. This indicates satisfaction with the planning process and the LCC involvement in the planning process.

Appendix 3

Compliance with Contractual Obligations

Licence Condition	Licence Holder Performance
Payment of Forestry Futures and Ontario Crown charges.	Outstanding Charges as of March 31st, 2017 were: Forest Futures – $441.20 Crown Dues - $385.59 These charges reflect the timing of stumpage invoice submissions.
Wood supply commitments, MOAs, sharing arrangements, special conditions.	The following wood supply commitments are in effect: 1. Annual supply of 4,000 m^3 of white birch to the 366956 Ontario Limited sawmill. 2. Annual supply of 33,000 m^3 of white birch the Precision Wood Design Inc. sawmill. MOA's related to the wood supply agreements are in place and signed.
Preparation of FMP, AWS and reports; abiding by the FMP, and all other requirements of the FMPM and CFSA..	All required forest management documents (AWS, ARs and FMPs) met the requirements of the FMPM, FIM and CFSA.
Conduct inventories, surveys, tests and studies; provision and collection of information in accordance with FIM.	Inventories, silvicultural assessments and other information required (i.e. values information) for the development of the Phase I and II FMPs were completed as required in conformance with the FIM.
Wasteful practices not to be committed.	No wasteful practices were reported during the audit term
Natural disturbance and salvage SFL conditions must be followed.	Salvage operations were conducted on 19 ha during the audit term. Conditions for salvage were followed.
Protection of the licence area from pest damage, participation in pest control programs.	No pest management activities or programs were implemented during the audit term.
Withdrawals from licence area.	There were no withdrawals from the license area during the audit term.
Audit Action Plan and Action Plan Status Report.	An Action Plan and the Action Plan Status Report were prepared and submitted in accordance with the IFAPP schedule.
Payment of forest renewal charges to Forest Renewal Trust (FRT).	Renewal Charges were fully paid to the Forest Renewal Trust.
Forest Renewal Trust eligible silviculture work.	There were no non-conformities between the Specified Procedures Report and activities

Licence Condition	Licence Holder Performance
	observed in the field.
Forest Renewal Trust forest renewal charge analysis.	A renewal charge analysis was completed and approved annually.
Forest Renewal Trust account minimum balance.	The Minimum balance of $5,160,500 was maintained in the Silviculture Trust Account during each year of the audit term.
Silviculture standards and assessment program.	A silviculture standards and assessment program was implemented. Field assessments included FTG surveys, competition assessments, and the assessment of the effectiveness of silviculture operations (i.e. site preparation). .
Aboriginal opportunities.	Indigenous people are represented in woodlands operations working independently or for numerous contractors. Both the MNRF and Resolute have made numerous attempts/offers to employ/engage indigenous communities with good success.
Preparation of compliance plan.	Resolute prepared a compliance plan which met the requirements of the Compliance Handbook.
Internal compliance prevention/education program.	Resolute has an effective compliance program which is supported by its internal EMS. The Company maintains a comprehensive training matrix which documents the level and currency of training of all forest workers.
Compliance inspections and reporting; compliance with compliance plan.	The number of compliance inspections was appropriate for the level of activity on the Forest. A high in-compliance rate of 99% was achieved during the audit term. FOIP submissions were generally within the required timelines and directions in the compliance plan were generally followed. FMP standards for gravel pits were not consistently met (Finding # 3). CROs for the retention of wildlife trees were not consistently met (Finding # 1).
SFL forestry operations on mining claims.	There were no disputes with respect to mining claims.
SFL Extension Recommendation.	We provide a recommendation that the SFL

Licence Condition	Licence Holder Performance
	be extended for a further five years. A finding that the SFL has not been extended over its term is provided (Finding # 4).

Appendix 4

Audit Process

Appendix 4
Audit Process

The 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 Resolute, MNRF Thunder Bay District, Northwestern Region MNRF Office, Forestry Futures Trust Committee and the LCC Chair on August 29, 2017.

Public Notices: Public participation in the audit was solicited through the placement of a public notice in the Thunder Bay Source (October 12, 2017) and a random mailing to 100 individuals/organizations listed on the FMP mailing list. All Indigenous and Métis communities with an interest in the Forest were contacted by mail to participate and/or express their views. Indigenous 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. Harvest contractors were invited by letter to participate in the field audit or provide comments to the audit firm.

Field Site Selection: Field sample sites were selected randomly by the Lead Auditor in August 2017. 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 the Resolute. The sample site selections were reviewed by Resolute, MNRF District Staff and two members of the audit team during a conference call and a GoToMeeting session on September 29, 2017.

Site Audit: The audit team spent 5 days on the BSF in October 2017 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 BSF 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. A sample of the areas invoiced in the "*Forest Renewal Trust Specified Procedures Report"* (SPR) was also inspected to verify conformity between invoiced and actual activities. The field inspection included site-specific (intensive) and landscape-scale (extensive helicopter) examinations. The Closing Meeting was held on October 20, 2017.

A member of the Red Sky Métis Community participated for one day of the field audit.

Report: This report provides a description of the audit process and a discussion of audit findings and conclusions.

Procedures Audited by Risk Category

Principle	Optional – Applicable (#)	Optional – Selected (#)	Optional - % Audited	Mandatory Audited (#) (100% Audited)	Comments
1. Commitment	N/A	N/A	N/A	N/A	The FSC and SFI certification met IFAPP Principle 1 criterion.
2. Public Consultation and Aboriginal Involvement	5	0	0	3	
3. Forest Management Planning	45	13	29	38	
4. Plan Assessment & Implementation	3	0	0	9	
5. System Support	N/A	N/A	N/A	N/A	The FSC and SFI certification met IFAPP Principle 5 criterion
6. Monitoring	12	8	67	6	
7. Achievement of Management Objectives and Forest Sustainability	0	0	0	15	
8. Contractual Obligations	7	7	100	25	

IFA Field Sampling Intensity on the Black Spruce Forest

Activity	Total Area (Ha) / Number	Planned Sample Area (Ha)	Actual Area (Ha) Sampled	Number of Sites Visited	Percent Sampled
Harvest	25,316	2,531	3,797	20	15
Plant	10,060	1,006	1,181	43	10
Seeding	3,191	319	373	11	12
Natural Renewal	17,180	1,718	1,813	43	11
Site Preparation	10,816	1,141	1,141	18	11
Tending	14,033	1,671	1,671	16	12
FTG	17,910	1,800	1,830	25	10
Water Crossings (# of Crossings)	124	17	17	17	14
Aggregate Pits (# of Pits)	100	11	11	11	11
SPA Activities	6,897	700	760	8	11

Source: RW Forestry Shapefiles

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 Thunder Bay Source (October 12, 2017). The 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. No responses from the general public were received.

One hundred individuals/organizations on the FMP mailing list received a letter and the survey questionnaire. One response was received.

An additional sample of stakeholders was contacted directly by telephone. Comments were received from resource-based tourism operators and anglers and hunters. Nearly all respondents indicated that they had been made aware of FMP processes and opportunities to engage in the planning process were provided. Some specific concerns/comments expressed to the audit team included:

- A concern with respect to AOCs around bush cabins.
- Concern with the amount of slash on the Forest.
- General support for access controls (including pulling culverts and bridges to protect values).

- Concern that large continuous harvest blocks increase harvest pressure on moose by providing too much hunter access.
- Concern with the use of herbicides and its indirect impact on moose (browse availability) and direct impact on wildlife and fisheries populations.
- Good communication with Resolute staff with respect to the timing and location of road building.
- Disagreement on the necessity of moving bear baits to 200m from roads--- support for changing the setbacks to 30m or 50m.
- Concern that declining number of moose tags would negatively impact tourism businesses.
- A strong preference for winter vs. summer forest operations (summer operations conflict with angling and hunting activities and results in increased access).
- Concern that mining exploration was resulting in detrimental access to hunting and fishing.
- Concern that caribou were being managed to the detriment of moose.
- A concern that there was insufficient notice of spray operations.

MNRF

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

- Concern with respect to the inability to market white birch.
- Concern that Conditions on Regular Operations for wildlife tree retention were not being consistently met.
- Concern with the inability to fully utilize the hardwood resource and its implications for caribou management.
- Concern with the density and quality of branch roads.
- A concern that caribou were being managed to the detriment of moose.

Resolute FP

Resolute staff were interviewed and participated the field audit. General comments made to the audit team included:

- A concern with the lack of markets for hardwoods (particularly white birch).
- A concern with the spotty efficacy of aerial tending treatments.

LCC Members

Individual members of LCC received a letter inviting their participation in the audit and several LCC members were interviewed. General comments to the audit team included:

- They were pleased with the relationship with Resolute and MNRF.
- A concern with the age of LLC members and a need to recruit younger members.
- A preference for the management of moose over caribou.
- Concern with the size of clearcuts.
- General disagreement with the decommissioning of some roads for caribou management.

First Nations

All Indigenous 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 and/or participate in the field audit. A member of the Red Sky Métis Community participated in the field audit. Comments expressed to the audit team included:

- Opposition to the use of herbicides on the Forest.
- A perception that clear cuts were too large.
- A desire to see more benefits accruing to Indigenous communities from forest management.
- A perception that past audits had not adequately addressed their concerns.

Harvest Contractors

Contractors operating on the unit were sent a letter inviting their participation in the audit and inviting comment on forest management activities of the MNRF and Resolute during the audit term. No responses were received.

Appendix 5

List of Acronyms Used

List of Acronyms Used

AHA	Available Harvest Area
AOC	Area of Concern
AR	Annual Report
AWS	Annual Work Schedule
B.Sc.F.	Bachelor of Science in Forestry
BSF	Black Spruce Forest
CCP	Caribou Conservation Plan
CFSA	Crown Forest Sustainability Act
CRO	Condition on Regular Operations
DCHS	Dynamic Caribou Habitat Schedule
EMS	Environmental Management System
FFTC	Forestry Futures Trust Committee
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
FU	Forest Unit
Ha	Hectares
IFA	Independent Forest Audit

IFAPP	Independent Forest Audit Process and Protocol
KM	Kilometer
LCC	Local Citizens Committee
LTMD	Long Term Management Direction
m^3	Cubic Metres
MNRF	Ministry of Natural Resources and Forestry
R.P.F.	Registered Professional Forester
RSA	Resource Stewardship Agreement
SAR	Species at Risk
SEM	Silvicultural Effectiveness Monitoring
SFI	Sustainable Forestry Initiative
SFL	Sustainable Forestry Licence
SGR	Silvicultural Ground Rule
SIP	Site Preparation
SPR	Specified Procedures Report
STP	Silvicultural Treatment Package
VS	Versus

Appendix 6

Audit Team Members and Qualifications

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. 38 years of consulting experience in Ontario in forest management planning, operations and resource inventory. Previous work on 37 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. 47 years of experience in natural resource management planning, field operations, policy development, auditing and working with First Nation communities. Previous work experience on 37 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. 47 years of experience in natural resource management planning, land use planning, field operations, and policy development. Previous work experience on 36 IFA audits.

Mr. Trevor Isherwood R.P.F. Arbex Senior Associate	Silviculture, Forest Operations 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 BSFL. 47 years of experience in forest management and operations. Previous work experience on 34 IFA audits.