ALGOMA FOREST
Regeneration Status Check on XYZ Lands (IFA Recommendation #29)

Special project on the Algoma Forest. Note that all the harvest and initial regeneration treatments date to when these forests were Crown management units (CMUs), just prior to the sustainable forest licences being signed for Algoma and (at the time) Wawa Forests in 1998. Once the sustainable forest licence was signed, Clergue Forest Management Inc. (CFMI) assumed some responsibility for stand regeneration and maintenance.

Note that for all blocks, the data was collected using SO-iSTARS program. Stands that showed less than 40% stocking in the enhanced forest resource inventory (eFRI) were excluded from the selection to sample; the Ministry of Natural Resources and Forestry (MNRF) does not accept these stands as free to grow. The blocks were evaluated compared using the standards at the time they were harvested in the respective Crown management units. The stands surveyed were in three different Crown management units and different plan terms; Wawa Crown Management Unit(CMU), Algoma Crown Management Unit and Goulais-Batchewana Crown Management Unit. At that time as Crown Units, the MNR was carrying out the silvicultural decisions and initial treatments.

Over time the Goulais-Batchewana CMU, Ranger Lake CMU and Sault Ste. Marie CMU were merged into one management unit, the Algoma Forest CMU which extended north as far as Montreal River. The Wawa Crown Management Unit became a sustainable forest licence held by Clergue FMI in 1998 and was amalgamated with the old Algoma Forest to make one SFL (present day Algoma Forest) in time for the 2005-2025 forest management plan implementation.

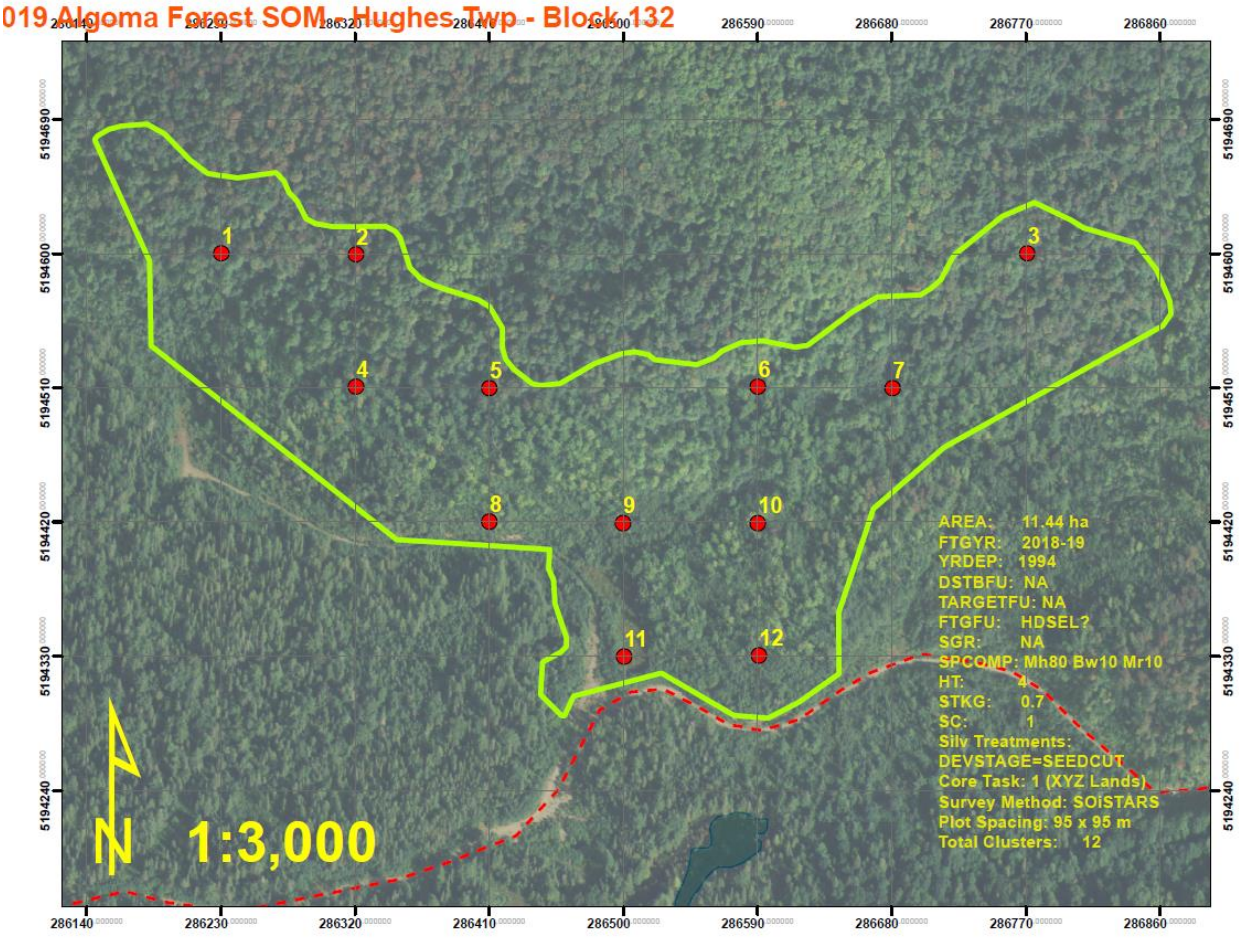
RESULTS BY BLOCK

Assessed in 2020

Block No. ID **FID132, Algoma XYZ**		Hughes Township. Off Campus Creek Road (new road name – Old Goulais River Road)	
Depletion Year 1994	SGR Code HDSEL ?	Target Intensity Not Stated	SFL FU Not assigned
SFL Species Composition – FRI Composition)		Mh8 Bw1 Mr1	
MNRF Species Composition – Overstory Composition		Mh69 Po08 SW06 BY06	
SFL Understory Composition (eFRI)		Mh8 Bw1 Bf1	
MNRF Regeneration Layer Composition		Mh51 Po21 Bw07 Mr07 Bf07	
MNRF FU		Regen success as HDUS	
Survey method:		SO-iSTARS	

SGR used for analysis, Goulais-Batchewana 1990-2010 Crown Timber Management Plan Silvicultural Ground Rules:
For Tolerant Hardwood (TH)– stocking standards minimum 40% to proposed species Mh, By, Or; greater than 30% to acceptable species Bf, Pw, Sw, Ab, Aw, Ce, He. No treatment.

*800 stems per hectare as an inventory update survey (from SO-iSTARS manual v. 7.4 April 2018)



The stand's regeneration is a success as HDUS forest unit but does not meet the threshold of 800 stems per hectare that should be used for inventory update. The site occupancy (net) is 757 stems per ha. The author believes that the stand has self-thinned to the point that the number of stems per ha is lower than the regeneration standards. It is felt that the stand is being assessed later than was intended, which is the reason it appears as a 'fail' according to stems per hectare. The standard of 800 stems per ha is intended for SO-iSTARS inventory update assessment between 12 and 20 years after harvest, whereas this stand is 26 years post-harvest.

The author's opinion is that the stand is not a failure and that the inventory results for the main species (hard maple) is close to that found by MNRF's SO-iSTARS ground survey.

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Block No. ID **FID 195, Algoma XYZ**		Curtis Township; adjacent to Ranger Lake Road	
Depletion Year No depletion year	SGR Code BF1 or 2 (Goulais Batch 1990 SGRs)	Target Intensity Not Stated appears to be Extensive	SFL FU SF1
SFL Species Composition (Overstory FRI Composition)		BF4 Sw2 Po1 Pw1 Mr1 Bw1	
MNRF Species Composition – Overstory Composition		Bf40 Sw18 Pw18 Mr14 Bw07	
MNRF Regeneration Layer Composition		Bw49 Bf22 Mr22 Po08	
MNRF FU		Bw1 (regeneration)	
Survey method:		SO-iSTARS	

Regeneration Site occupancy 81%

Regeneration Standards used: Goulais Batchewana Crown Management Unit 1990-2010 Timber Management Plan Silvicultural Ground Rules for Balsam Fir. Spruces and poplar were added as acceptable species. The ground rule specified no treatment applied.

Balsam Fir Regen standards Bf 50%; Sb + Sw + Po = 50%;

Site occupancy for All 50%. There were no stems per hectare standard in the SGR.

*800 stems per hectare as an inventory update survey (from SO-iSTARS Manual v. 7.4 April 2018)

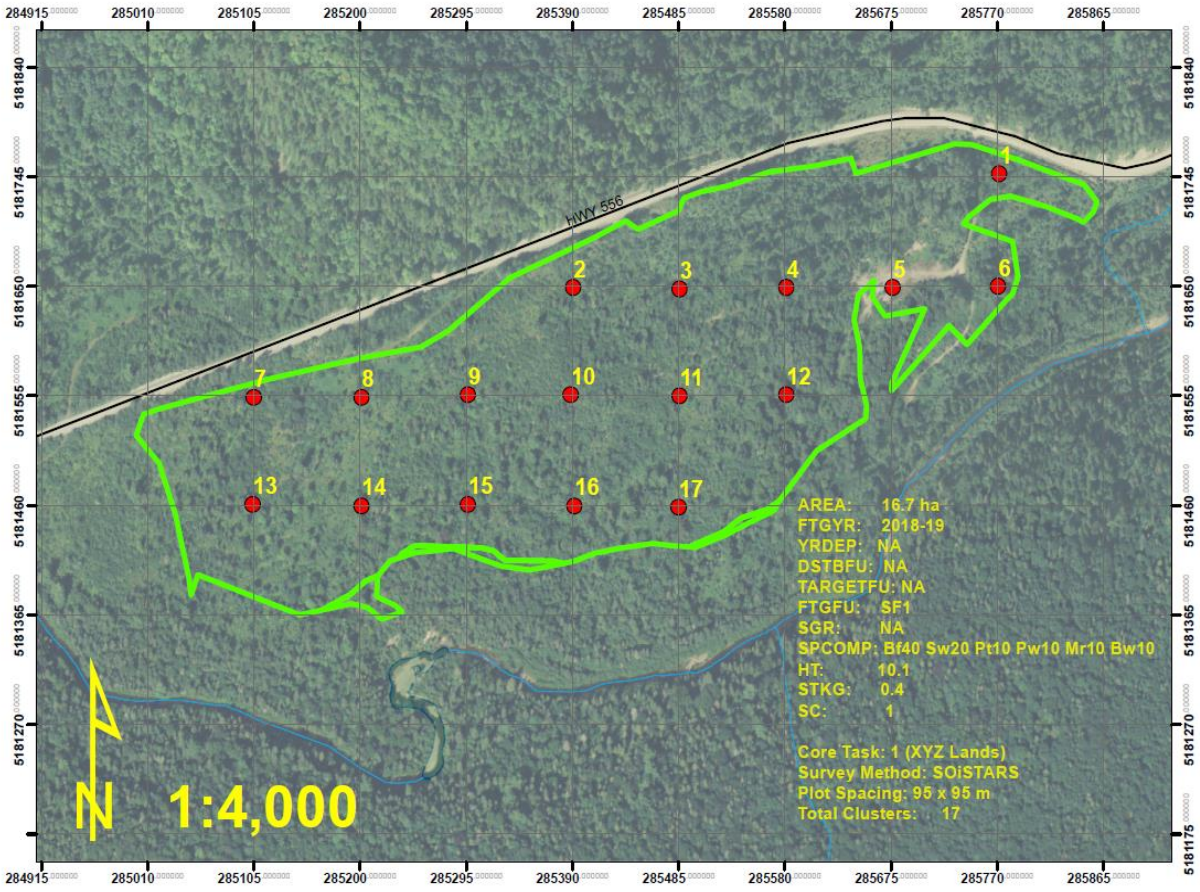
The overstory composition results from MNRF's prism sweeps is very close to the FRI composition.

The SO-iSTARS audit result shows as Fail for the regeneration layer to Spruce-Fir, calculating the regeneration forest unit as BW1 with net FTG site occupancy at 722 stems per hectare for all species. The stand failed to meet the regeneration standard of 50% balsam fir site occupancy, and the threshold of 800 stems per hectare. The stand may have been a partial cut for conifer which is the reason there was no depletion year in the FRI but rather a year of origin. At some point during the stand's history some supplemental planting of white spruce and white pine took place in portions of the stand.

It is felt that the stand is being assessed later than was intended, which is the reason it appears as a 'fail' according to stems per hectare. The standard of 800 stems per ha is intended for SO-iSTARS inventory update assessment between 12 and 20 years after harvest, whereas this stand is an unknown number of years post-harvest, appearing to be more than 20 years.

The author's opinion is that the stand is not a regeneration failure and that the inventory results for the main species of balsam fir and most of the composition is close to that found by MNRF's SO-iSTARS ground survey.

2019 Algoma Forest SOM - Block FID 195 - Ranger Lake Road



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Block No. ID **OBJ ID Block FID 135, Old Goulais River Road**		Hughes Township; Off Old Goulais River Road	
Depletion Year Not specified – 1956 YOrg	SGR Code 'S' for Spruce	Target Intensity Not assigned, appears to be CLAAG	SFL FU SbLo
SFL Species Composition – FRI Composition)		Sb100	
MNRF Species Composition – Overstory Composition		Bf38 Sb23 La23 Pw10 Bw05	
SFL Understory Composition (eFRI)		Sb100	
MNRF Regeneration Layer Composition		Bf30 La28 Sb21 Bw09 Mr07	
MNRF FU – (regeneration)		MxC – Mixed conifer	
Survey method:		SO-iSTARS	

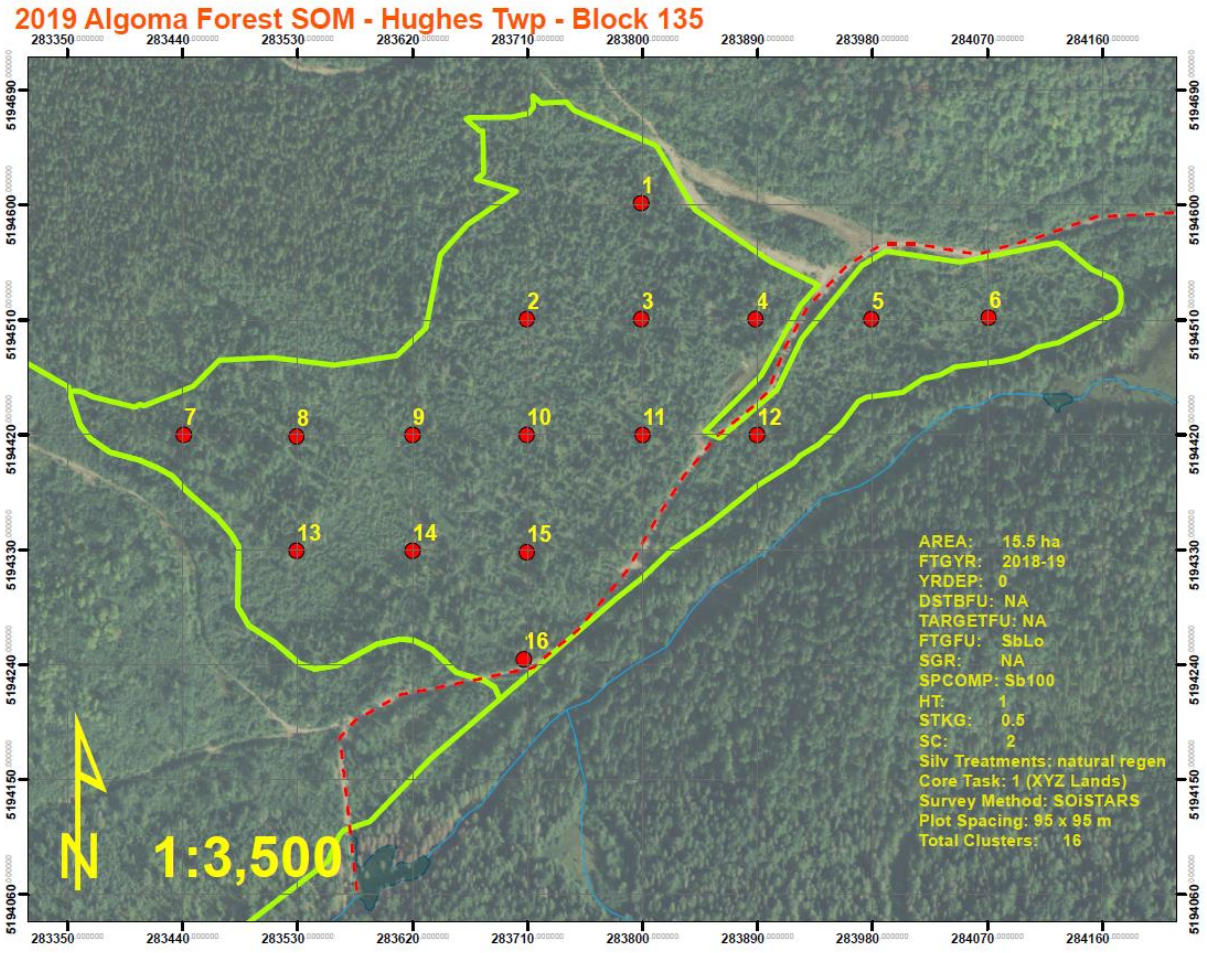
Silvicultural Ground Rules for Normal Operations from April 1 1995 to March 31 2000, Algoma Crown Management Unit for Spruce**.** There are no standards dating to the time the year of origin.

Standards: Sb>40% occupancy; Pw+Pj+Sw+Bf > 30%.

Site occupancy for All 50%. There were no stems per hectare standard in the SGR.

*800 stems per hectare as an inventory update survey (from SO-iSTARS Manual v. 7.4 April 2018)

Site occupancy 96%



Note that the overstory result is quite different from the FRI results in this stand, showing predominantly balsam fir (38%) over black spruce (23%) followed by 23% larch, 10% white pine and 5%white birch. This stand appears to have been prescribed as CLAAG (Careful Logging around Advanced Growth) and left untreated for natural regeneration.

The audit result shows as Fail for the regeneration layer to Black spruce lowland, calculating the regeneration forest unit as mixed conifer (MxC) with net FTG site occupancy at 761 stems per hectare for all species. The stand failed to meet the regeneration standard of 40% black spruce site occupancy, and the threshold of 800 stems per hectare. However, the stand was likely cut approximately 1994 or ’95, whereas the 800 stem threshold is intended for between 12 and 20 years post harvest. It is felt that the stand is being assessed later than was intended, which is the reason it appears as a ‘fail’ according to stems per hectare. There are a number of clumps of mature larch within the stand. The stand may have been a partial cut for desirable conifer (spruce) which is reason there was no depletion year in the FRI but rather a year of origin.

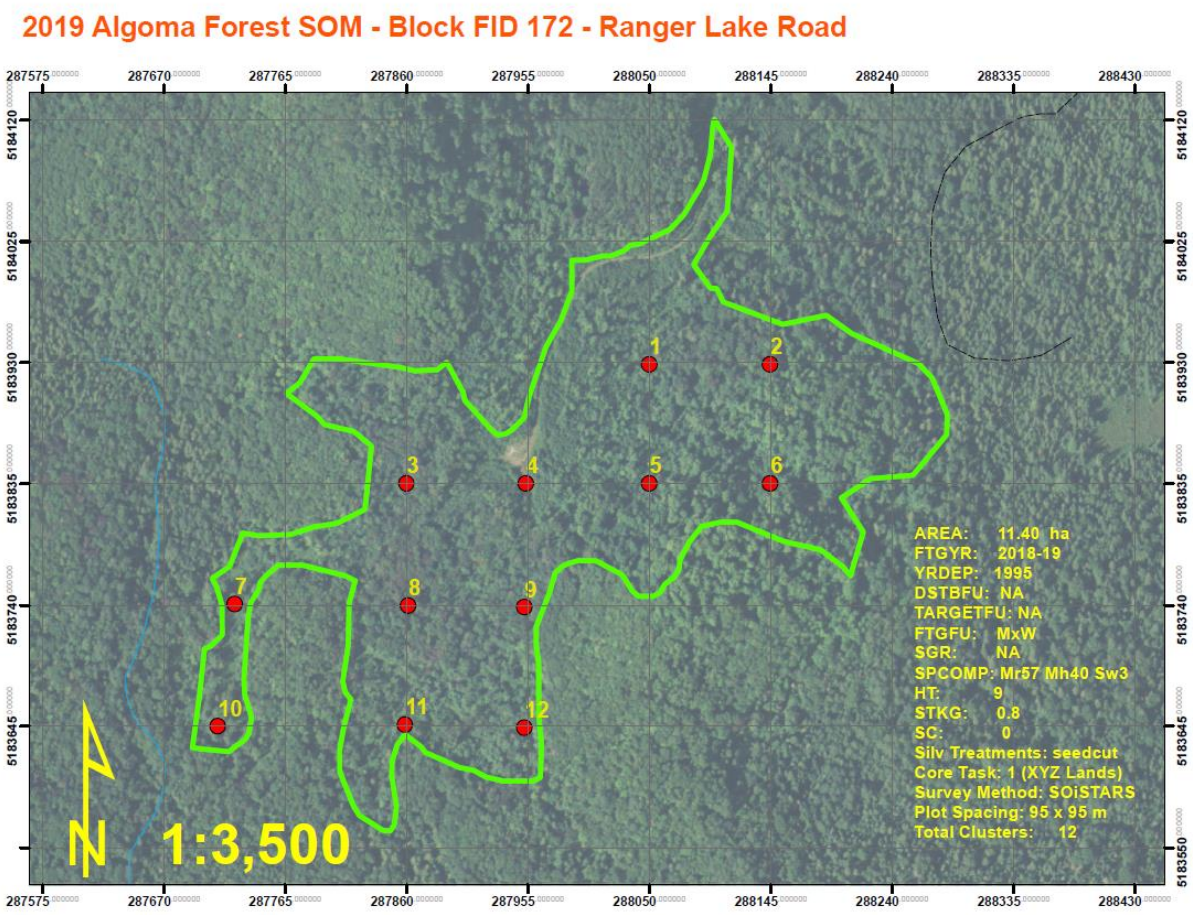
The author finds this stand to be a regeneration success as mixed conifer, with the overstory as mixed conifer as well. However, the overstory composition is quite different than the pure black spruce that the FRI indicates.]

Block ID **FID 172**	Location:	Near to Ranger Lake Road Curtis Township	
Depletion Year	SGR Code	Target Intensity	SFL FU
1995	Not assigned	None assigned	MxW
SFL Species Composition (eFRI typing)		Mr57 Mh40 Sw03	
MNRF Overstory Species Composition		Mh58 Mr08 Bw08 Bf08 Sw08 By08	
MNRF Regeneration Species Composition		Mh43 By17 Bw13 Bf10 Po08 Mr 08	
MNRF FU (regeneration)		HDUS	
Survey method:		SO-iSTARS	

Silvicultural Ground Rules for Normal Operations from April 1 1995 to March 31 2000, Algoma Crown Management Unit for TH1 (Tolerant hardwood – Selection).

Set as Target species Mh + Or + By >40% occupancy;

Acceptable species Pw + Sw + Bf + Ce + He + Ab + Aw >30% occupancy; no stems per hectare standard. No treatment and/or supplemental planting of SW or Pw. An 800 stems per hectare site occupancy standard for inventory updates from SO-iSTARS was used.



(Block 172) 98% site occupancy; 782 FTG stems per hectare

Discussion: The overstory of this stand is composed of mostly maple however the ground survey indicates that it is 58% hard maple and only 8% red maple, in contrast to the FRI results which show red maple to be dominant. There also is a good scattering of yellow birch which is represented more in the regeneration layer (17%) than in the overstory (8%).

The SO-iSTARS analysis result appears that the stand has failed, due to not meeting the 800 stems per hectare threshold. However in the author's opinion this stand is a silvicultural success due to meeting the target species parameters, and waive the stems per hectare. The stand, at 25 years, is several years older than the upper end age range that this assessment is expected to be carried out (20 years). The stand has probably self-thinned to below the standard of 800 stems per hectare. Note that the regeneration is 782 stems per hectare, with 98% site occupancy.

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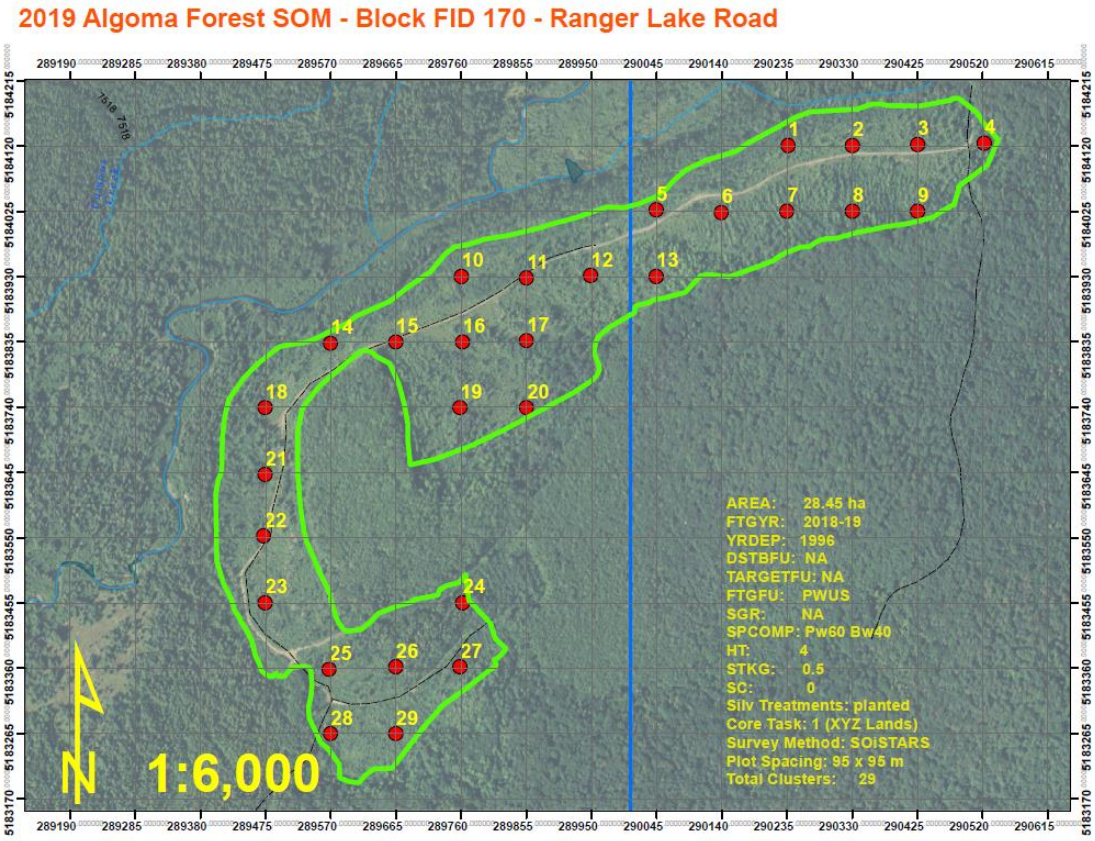
Assessed in 2019

Block No. **FID 170 – Pw US**	Location	Off Garden Lake Road Curtis Township; planted Pw and Sw 1997	
Depletion Year	SGR Code	Target Intensity	SFL FU
1996	PW2 – Clearcut	Not stated	PW US
SFL Species Composition (eFRI)		Pw60 Bw40	
MNRF Species Composition – Overstory		Sw36 Pw21 Bf15 Po13 Mh11	
MNRF Regeneration Species Composition		Po21 Mh20 Bw19 Sw13 Bf09 Pw07	
MNRF FU		Closest is MX1 (1995 SGRs), similar to MXW	
Survey method:		SO-iSTARS	

Regeneration standards for PW2 from Algoma Crown Management Unit, 1995-2000 FMP:
For PW US – Clearcut: min 30% Target species Pw, Pr, Sw.
Sb, Ce, Mh and By as acceptable species. Harvest method seed trees with options of leaving untreated for natural regeneration and/or plant Pw or Sw, and/or mechanical and chemical site prep and plant Pw and Sw.



Discussion:

Block FID 170 was clearcut in 1996. Other data about the previous stand type is not available. No seed trees were apparent. The stand was treated with artificial regeneration by planting white pine in the fringe north of the central road and in the southern tip and planting of white

spruce in the eastern part south of the road (clusters 6-17). No tending (release) appears to have taken place.

The stand was assessed for its success compared to the eFRI typing as PWUS. The MNRF's net summary field survey results show considerably less white pine than the 60% that the eFRI interpretation indicates (MNRF - white pine, 6.9% FTG). White pine was present in many portions of the stand, but white pine weevil and white pine blister rust have taken a toll on the trees in damage and mortality. In a number of plots the pine were simply overtopped by hardwoods due to these pests. White spruce fared somewhat better making up about 20% of the canopy but many others were overtopped. The stand make up was dominated by hardwoods; poplar 21%, hard maple 20% and white birch 19%. The sugar maple and birch were healthy and will likely dominate the rolling stony site on the south portion, and the poplar on the northern portion.

Note that the data is collected using SO-iSTARS however the block is being evaluated compared using the standards for PW2 forest unit at the time it was regenerated, which is this case is the 1995-2000 Algoma Forest Timber Management Plan. At the time of harvest, the MNR was carrying out the silvicultural decisions and treatments. The standards are in percentage stocking only, with no stems per hectare targets. The net site occupancy is 96%, with 698 stems per hectare free to grow, all species. According to SO-iSTARS, the block is a regeneration success as an 'MX1' in the 1995 ground rules, similar to a current plan's hardwood mixedwood, tolerant hardwood and intolerant hardwood mixed.

The white pine would likely have fared better with blister rust if it had been planted on the upper slope (southern side of road) rather than on the lower slope, where more cool air pools and it is closer to a stream (higher humidity). Tending treatment would have been beneficial in the stand particularly for white spruce, but white pine would have been more subject to weevil in higher light conditions.

Current silviculture practices on the Algoma Forest for regenerating white pine are by Uniform Shelterwood system. This system does take into account the above risk factors by planting white pine on low risk sites for blister rust and managing overstory light levels to provide optimum growing conditions and to lower the risk of white pine weevil attack.

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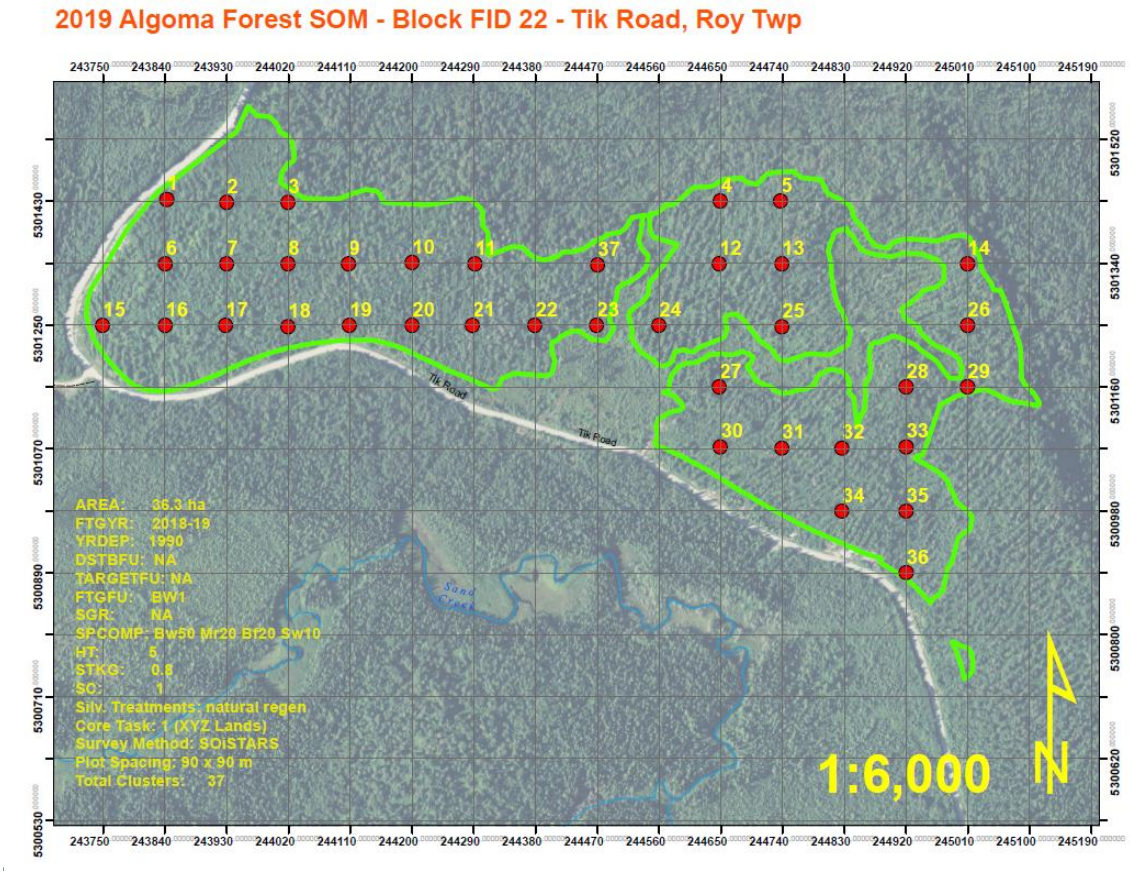
Block No. **FID 22**	Location:	OBM Tik Road, Wawa District Roy Township	
Depletion Year	SGR Code	Target Intensity	SFL FU
1990	Bwhrd.001.BWsft (2000 FMP)	(Spot Planting white spruce)	BW1
SFL Species Composition (from eFRI)		Bw50 Mr20 Bf20 Sw10	
MNRF Overstory		No overstory	
MNRF Regeneration Species Composition		Bw59 Bf17 Mr09 Mh06	
MNRF FU		BWsft(in 2000 Wawa FMP), similar to BW1 in current plan	
Survey method:		SO-iSTARS	

FTG Standards for BWsft were Wawa Management Unit (2000–2020 FMP, closest standard)
Bw target species; Acceptable species Po, Bf, Sb, Sw, Ce, Pw, Mh, By, Ab
Minimum 600 s/ha Bw; and minimum 400 s/ha of acceptable species (Well-spaced free growing standard) for a total minimum of 1000 stems per ha



Comments:
Block FID 22 was harvested by clearcut in 1990. No additional information is available about the previous stand. White spruce was planted on at least part of the site.

The stand was assessed for its success compared to the eFRI typing as BW1. Note that the data is collected using SO-iSTARS however the block is being evaluated compared using the standards for BW1 forest unit at the time it was regenerated, which is this case is the 2000-2020 Wawa Forest Management Plan (the closest SGR that could be found). It was unknown until the ground survey that spruce had been planted. The MNRF's results indicate the stand Is well occupied with white birch at 59% of the species composition, with an average height of 7.6 m. The rest of the stand composition is balsam fir, red maple and sugar maple at 17%, 9% and 6% respectively. There were 399 stems per hectare of white spruce present in the stand, but only makes up 1.8% of the stand composition due to being outcompeted by hardwoods. The net site occupancy for all free to grow species is 90% and the net site occupancy is 694 stems per ha all species. MNRF's result agrees with the eFRI determination as BW1.

The SO-iSTARS program indicates the stand is a regeneration success rather than a silvicultural success. This appears to be the result of the stand not meeting the 600 stems per ha threshold for white birch (370 s/ha white birch). However, the stand is 29 years post-harvest. In our opinion this shortfall in number of stems is due to self-thinning mortality because of how much later this assessment is than what would normally be timed for FTG assessment. Our opinion is that the stand is successful as birch however the planted white spruce indicates a different species mixture was likely intended.

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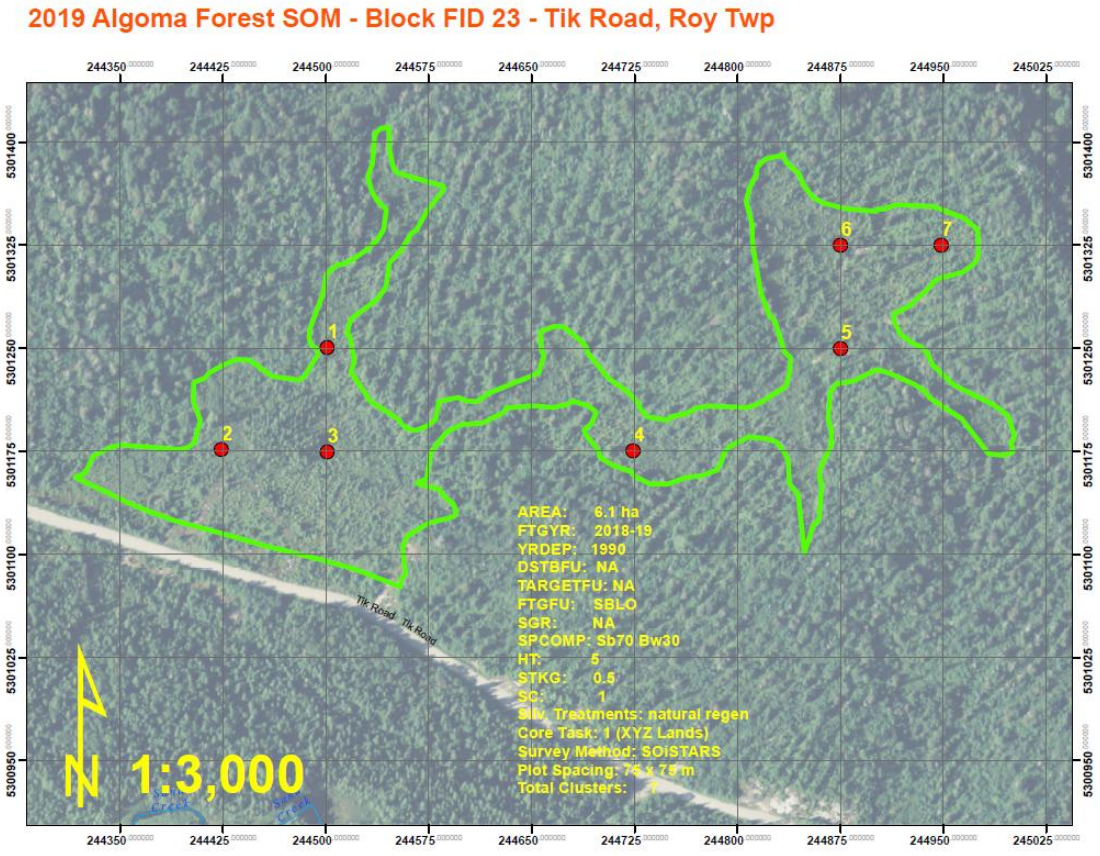
Block No **FID 23**	Location:	OBM Tik Road, Wawa District Roy Township	
Depletion Year	SGR Code	Target Intensity	SFL FU
1990	SPlo.001.SPLo (2000 FMP)	Extensive (natural)	SbLo
SFL Species Composition (from eFRI)		Sb70 Bw30	
MNRF Overstory Composition		No overstory	
MNRF Regeneration Species Composition		Sb38 Bf28 La26	
MNRF FU		SPhrd (2000 Wawa FMP), similar to current MxC	
Survey method:		SO-iSTARS	

Updated

FTG Standards for SPLo were Wawa Management Unit (2000–2020 FMP, closest regeneration standard that could be found)
Sb Target species; Acceptable species Sw, Bw, La, Ce.
Minimum 450 stems per hectares Sb; minimum 450 stems per ha acceptable species



Comments

The stand was conventionally clearcut in 1990. The site was more lowland than upland, but with shallow organic soils.

The stand was assessed compared to the eFRI typing as spruce lowland (SpLo). The net site occupancy was 93%, with 926 stems per ha free to grow (all species) and average heights between 5.9 and 6.8 meters. Black spruce was the dominant regeneration species at 38%, followed by balsam fir 28% and larch 26% respectively. However, the average height of larch was taller than the black spruce. When compiled again with a site occupancy standard of 800 stems per ha, the result was still a fail.

According to the SO-iSTARS stems per hectare the stand fails to meet the FTG stand however as with stand FID 22, in our opinion this shortfall in number of stems is due to self-thinning mortality because of how much later this assessment is than what would normally be considered for FTG assessment. The stand does type out as mixed conifer rather than black spruce lowland. The stand is considered to be a regeneration success but as a conifer mixedwood. Enough black spruce is present on the site to meet the standard (752 stems per hectare net site occupancy) but is overtopped by enough balsam fir and larch to push the stand into conifer mixedwood forest unit.

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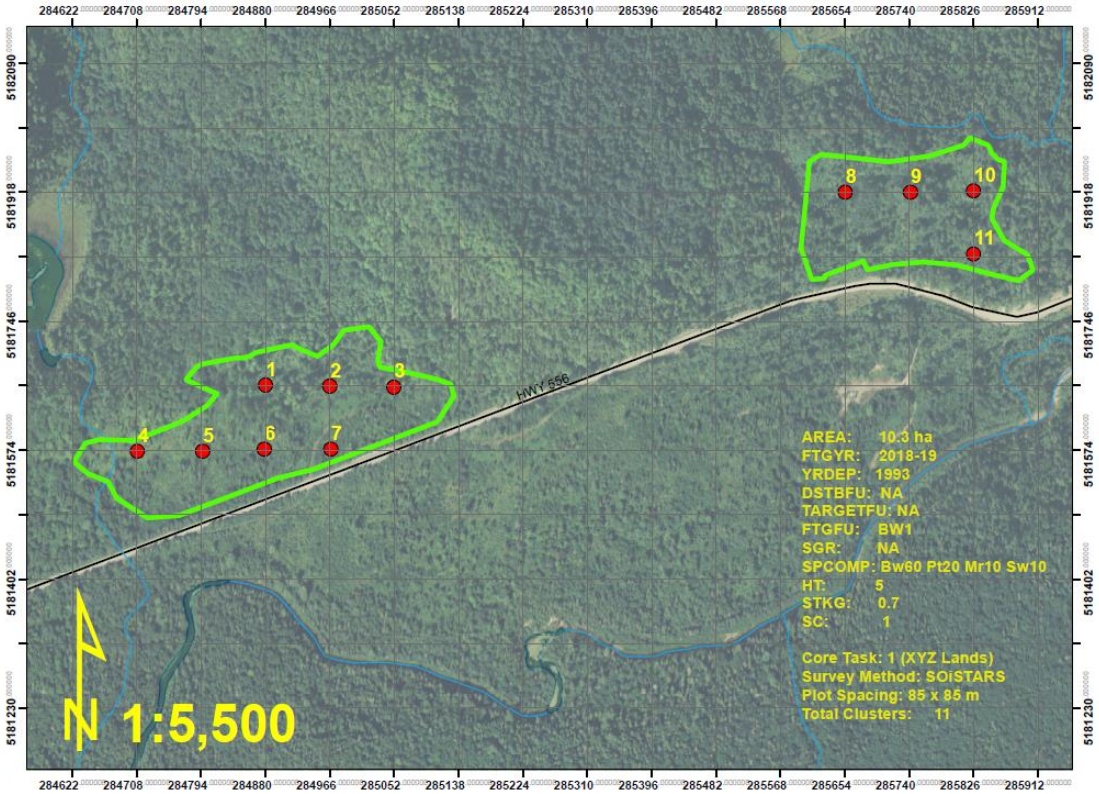
Block ID **FID 193**	Location:	Adjacent to Ranger Lake Road Curtis Township	
Depletion Year	SGR Code	Target Intensity	SFL FU
1993	BW1 (1990 SGR)	(Extensive) with some planting	BW1 (2010 SGR)
SFL Species Composition (eFRI typing)		Bw60 Pt20 Mr10 Sw10	
MNRF Overstory Species Composition		Mh23 Bf23 Sw15 Pw15 Po15 Mr08	
MNRF Regeneration Species Composition		Po31 Bw 23 Pw16 Bf 11 Mh 08 Sw 08	
MNRF FU		No match to any SGR in the 1990 SGRs; similar to MXW in current ground rules	
Survey method:		SO-iSTARS	

Regeneration Standard for BW1 which site was prepared and planted from the Goulais-Batchewana Crown Management Unit 1990 TMP:
40% minimum site occupancy to proposed species (but species not listed); used Pw and Sw as proposed species because they were planted; minimum 50% site occupancy to Acceptable species but again the acceptable species is not specified in plan. Input Pj, Sb, Bf, Mh, Mr, By, Bw as species that seemed logical to include as acceptable.*

** 'proposed species ' was the terminology in the Goulais-Batchewana 1990 SGR for Target species*

2019 Algoma Forest SOM - Block FID 193 - Ranger Lake Road



Comments:

This 10.3 ha stand was harvested by clearcut. No data is available about the previous stand.

While doing the field assessment some planted white spruce and white pine trees were noted, which prompted a change to a ground rule for a BW stand which had been planted (stand conversion). The dominant regeneration species by occupancy is poplar (31%) followed by white birch, white pine, hard maple and white spruce. The net site occupancy is 90%, with 733 free to grow stems per hectare of all species, with 224 stems per hectare of poplar and 166 of white birch. There are significantly more stems of white pine and white spruce present in the stand than are free to grow (166 and 205 stems per hectare respectively), but these were largely outcompeted by hardwoods or seriously damaged by either white pine blister rust or weevil.

The stand is not a match with any stocking standard objective in the Goulais-Batchewana Crown Management Unit (1990-2010), which was the current forest management plan at the time of harvest. There is no broad 'mixedwood' forest unit in the 1990 ground rules; not all forest units were defined. The stand would have to reach 40% minimum stocking of a proposed (i.e. target) species to fit into a ground rule in the SGRs of the day.

In the author's opinion the stand is a regeneration success as an intolerant hardwood mixedwood (MXW). The stand is 26 years since harvest. The stand does not reach the free to grow stems per hectare threshold, even when set at 800 per hectare (inventory update level). The lower number of stems is likely due to self-thinning that has taken place in the stand.

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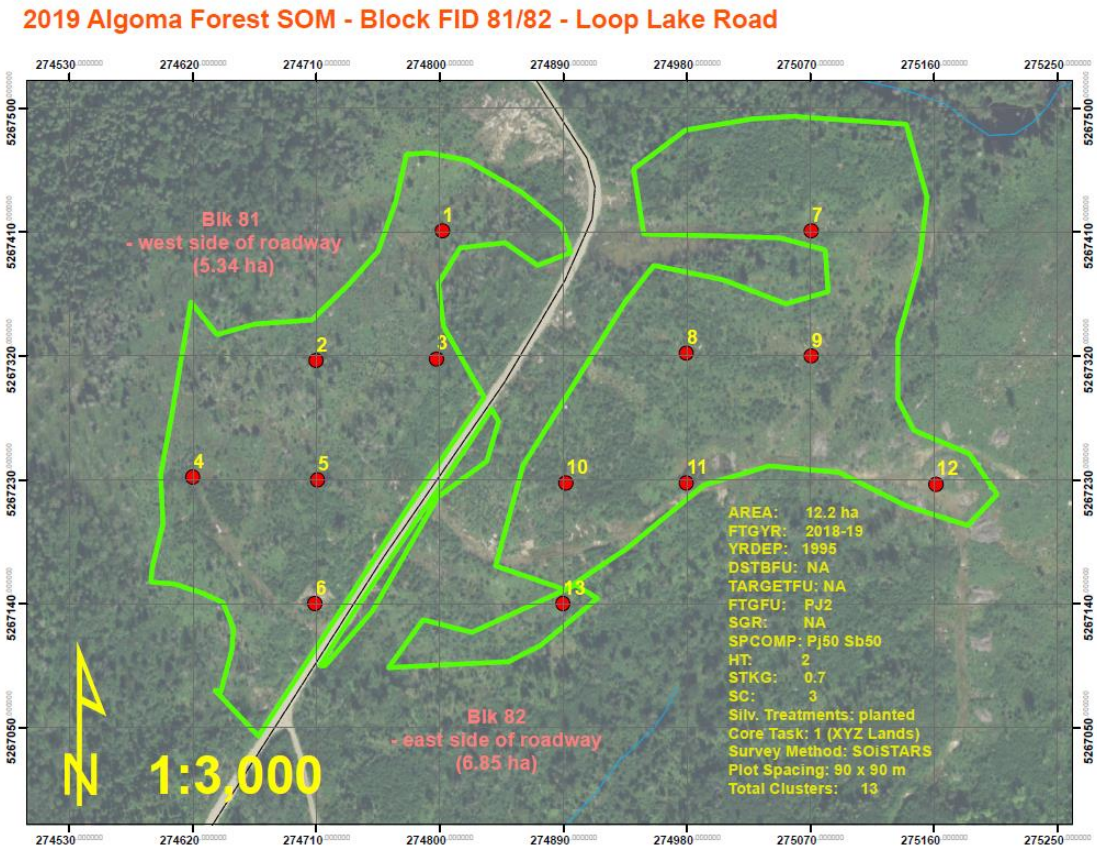
Block No **FID 81-82**	Location:	Loop Lake Road, Wawa District Emiry Township	
Depletion Year	SGR Code	Target Intensity	SFL FU
1995	Pjhrd.109.PJhrd (2000 FMP)	Not stated	PJ2 (2010 FMP)
SFL Species Composition (from eFRI)		PJ50 SB50	
MNRF Overstory Species Composition		No overstory	
MNRF Regeneration Species Composition		PJ50 BW17 SB16 MR11	
MNRF FU		PJhrd (in 2000 FMP SGRs), similar to a PJ2 in current SGRs	
Survey method:		SO-iSTARS	

Regen standards for PJhrd from Wawa Management Unit SGRs 2000-2020
Primary species PJ, SB; Acceptable species SW, BF, CE, PO, BW, MH, AB. Minimum number Well-spaced free growing trees per ha: 450 s/ha of primary species plus 450 s/ha total acceptable species. * 'Primary' – term for target species*



Comments:

These stands were harvested in 1995 by clearcut method. The stands were replanted with jack pine and black spruce. Two small stands, 81 and 82, were similar enough in composition to combine them for assessment.

The MNRF field survey indicates a slightly lower amount of jack pine (43%) than the eFRI interpretation and included some hardwoods. (PJ component was bumped up to 50% to make the composition total 100%). The composition included 17% white birch, and 11% hard maple. The amount of black spruce was lower than in the eFRI as well, at 16%. MNRF's survey result proposes PJ2 as the forest unit. There are some barren gaps in the stands populated with red raspberry or bracken fern but for the most part the site occupancy is good (net site occupancy 86%, 777 stems per ha, all species combined).

Again, SO-iSTARS indicates the stand is a failure due to the lack of free to grow stems per hectare, because it is lower than the threshold of 450 s/ha of Sb and PJ (actual 361 s/ha jack pine and black spruce combined). Of spruce and jack pine, 478 stems per hectare are present, but not enough are free to grow. By the stands current age of 23 or 24 years, some self-thinning has occurred, which naturally reduced the number of stems below the threshold due to their age as the remaining trees grow larger.

The stand is still considered a regeneration success as jack pine 2 at minimum.

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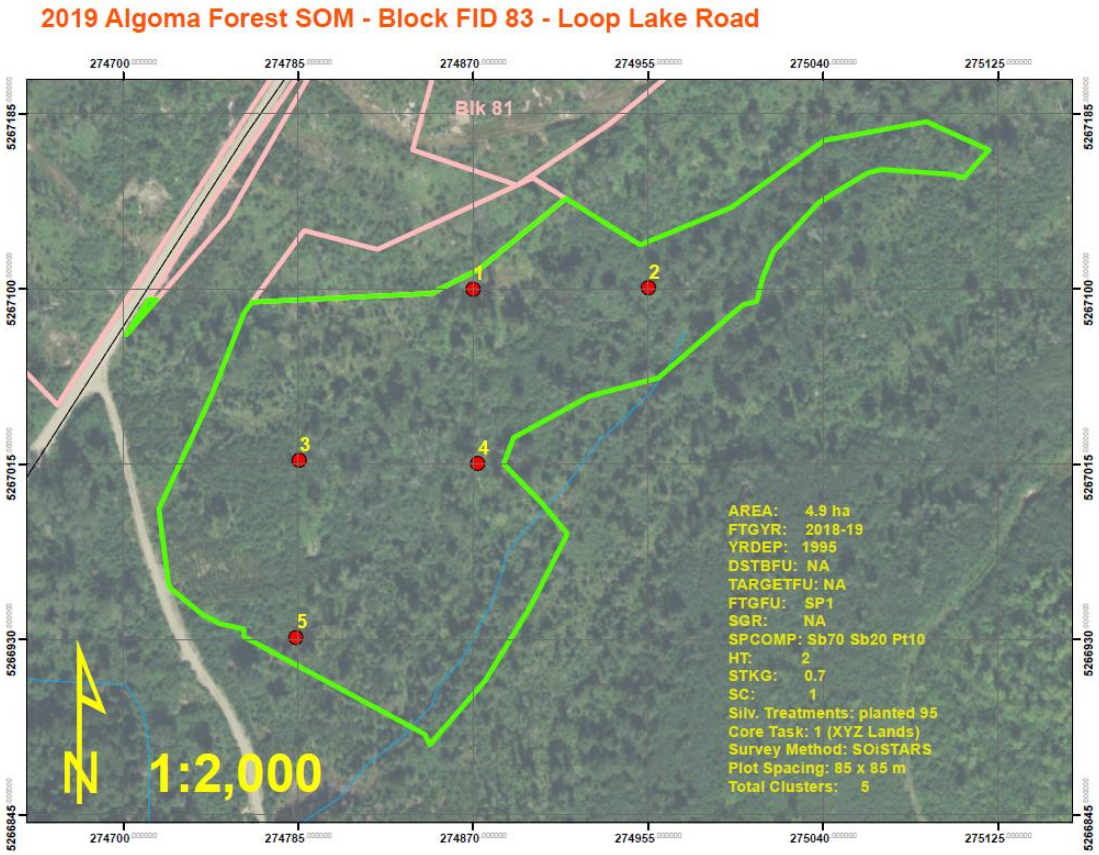
Block No **FID 83**	Location:	Loop Lake Road, Wawa District Emiry Township	
Depletion Year	SGR Code	Target Intensity	SFL FU
1995	SPhrd.071.SPhrd (2000 FMP)	Not stated	SP1 (2010 FMP)
SFL Species Composition (from eFRI)		SB70 PJ20 Po10	
MNRF Overstory Species Composition		No overstory	
MNRF Regeneration Species Composition		PJ59 BW17 PO17	
MNRF FU		PJhrd (in 2000 FMP SGRs), similar to PJ1	
Survey method:		SO-iSTARS	

Regen standards for SPhrd from Wawa Management Unit SGRs 2000-2020
Primary species SB; Acceptable species SW, BF, PJ, CE, PO, BW, LA. Minimum stems per ha: minimum of 450 s/ha SB plus 450 s/ha acceptable well-spaced and free growing.



Comments:
Stand FID 83 was harvested as a conventional clearcut in 1995. Black spruce and jack pine were planted through most of the block.

Contrary to the eFRI interpretation, MNRF's survey results indicate more jack pine (59%) than any other species in the stand. The other species consisted of white birch (17%), and poplar (17%). Free to grow black spruce was a minor component (3.3%). Spruce was present in 11% of clusters but was overtopped by one of the other species above.

The net site occupancy is 83% for all Free to grow species combined, and 696 free to grow stems per hectare. There were a few plots with no regeneration however in most cases this was because the plot was occupied by a mature tree ('Treed').

SO-iSTARS did not determine whether the stand was regeneration or silvicultural success due to the small stand size (4.9 ha). Statistics are not calculated for stands less than 8 ha. Although the stand does not meet the stems per hectare threshold, the shortfall is again thought to be the result of self-thinning of the stand over 24 years. The stand is felt to be a regeneration success but as jack pine (PJhrd, similar to current FMP's PJ1 forest unit) rather than SP1.

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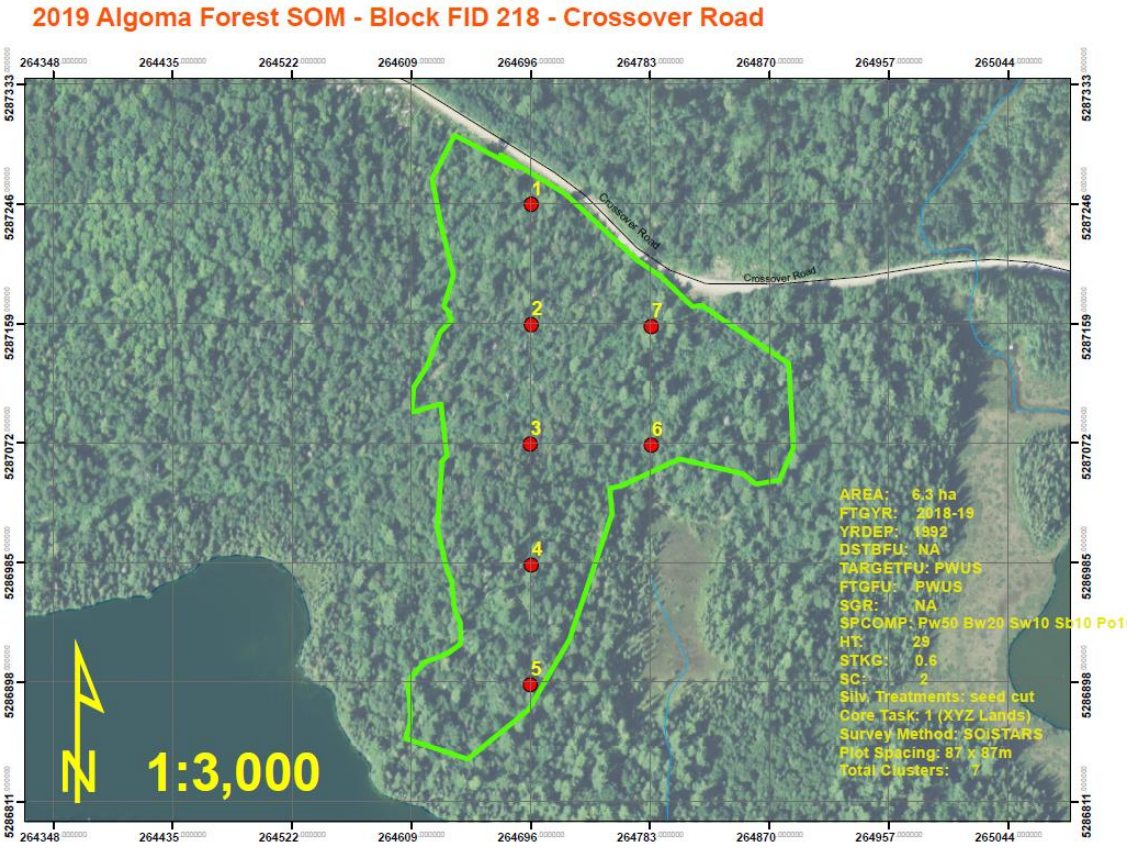
Block No **FID 218**	Location:	Crossover Road, Wawa District Waswa Township	
Depletion Year	SGR Code	Target Intensity	SFL FU
1992	PWrus.300.PWrus (2000 FMP)	Not stated	PWUS (2010 FMP)
SFL Species Composition (from eFRI)		PW5 Bw2 Sw1 Sb1 Po1	
MNRF Overstory Composition		Bf5 Bw2 Pw2 Po1	
SFL Understory Species Composition (from eFRI)		BW80 BF10 SB10	
MNRF Species Composition (regen)		BW38 PO32 BF20 MR06	
MNRF FU		BWhrd (from 2000 Wawa FMP), similar to current BW1	
Survey method:		SO-iSTARS	

Regen standards for PWrUS from Wawa Management Unit SGRs 2000-2020:
Primary spp Pw, Pr; acceptable species Sw, Sb, Ce, Po, Mh. Minimum stems per ha, 500 s/ha PW+PR plus 500 s/ha all acceptable species well-spaced and free to grow



Comments:
This stand was harvested in 1992 leaving white pine seed trees and had no signs of artificial regeneration.

MNRF's cluster surveys showed predominantly intolerant hardwood regeneration; 38% white birch, 32% poplar, followed by balsam fir 20% and red maple 6%. The site was a largely rugged bedrock knob type with mature balsam fir, large white pine and some cedar residual from prior to the harvest. The prism sweeps also indicate that the composition is quite different from the eFRI, showing dominated by balsam fir, not white pine. The net free to grow site occupancy was 99%, with 787 free to grow stems per hectare, all species. The stand was not above the well-spaced stems per hectare threshold for success, which again is attributed to self-thinning and the age of the stand (27 years). The stand is considered to be a regeneration success as BWhrd, which is similar to a white birch 1 in the current FMP, but with quite different overstory composition than the eFRI.

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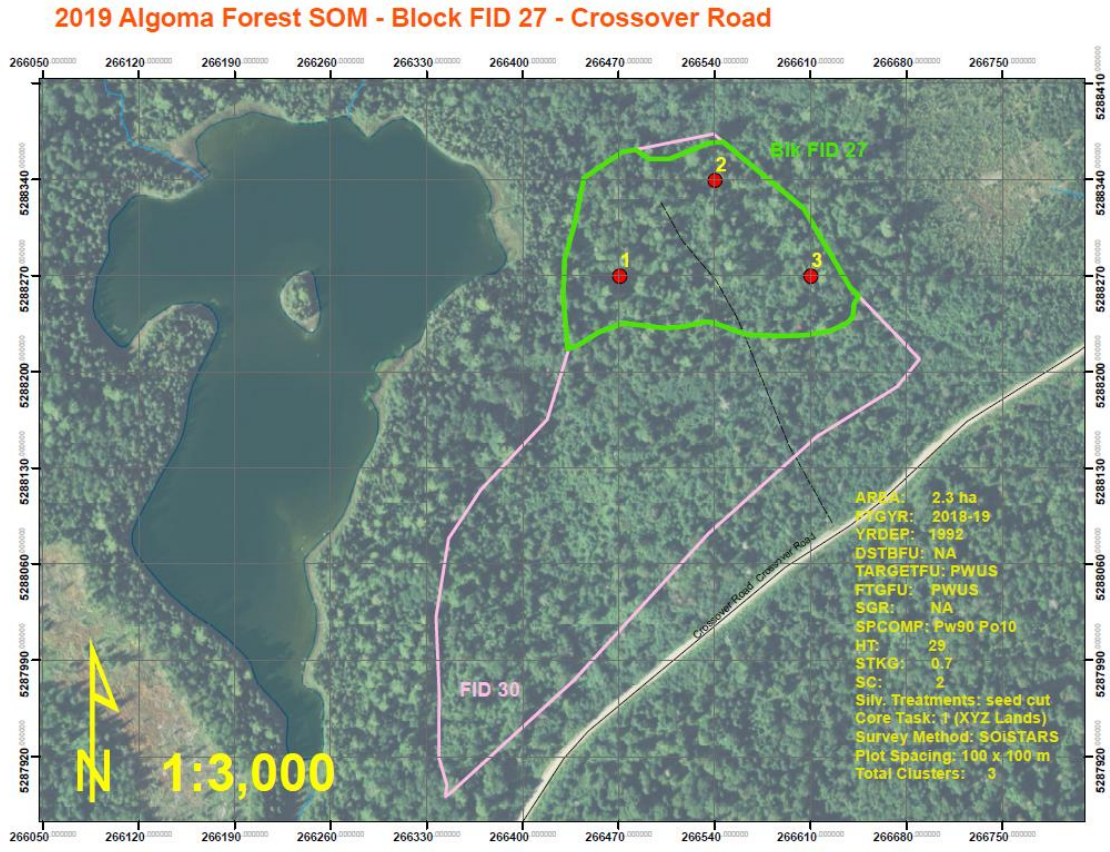
Block No **FID 27**	Location:	Crossover Road, Wawa District Waswa Township	
Depletion Year	SGR Code	Target Intensity	SFL FU
1992	PWrus.300.PWrus (2000 FMP)	Not stated	PWUS (2010 FMP)
SFL Species Composition (from eFRI)		Pw90 Po10	
SFL Understory Species Composition (from eFRI)		Bw40 BF30 SW10 BY10 Cw10	
MNRF Overstory Species Composition		Sw64 Bw18 Pw09 Bf09	
MNRF Understory Species Composition		BW62 BF23 SW15	
MNRF FU		BWsft (from 2000 Wawa FMP), similar to current BW1	
Survey method:		SO-iSTARS	

Regen standards for PWrus from Wawa Management Unit SGRs 2000-2020:
Primary spp Pw, Pr; acceptable species Sw, Sb, Ce, Po, Mh. Minimum stems per ha, 500 s/ha PW+PR plus 500 s/ha all acceptable species well-spaced and free to grow



Comments:
This small stand was harvested in 1992 as well. There was no sign of artificial regeneration but there were white spruce and white pine seed trees remaining on the site.

The MNRF's field assessment of the regeneration indicates the stand is 62% white birch, 23% balsam fir and 15% white spruce. The net site occupancy was low at 69%, a number of barren plots with shrub cover (pincherry, beaked hazel) and many bare of regeneration but occupied by mature trees. The net free to grow site occupancy is 659 stems per ha. The midstory light interference is high in two thirds of the stand. The overstory is dominated by white spruce (64%), contrary to the eFRI.

This stand appears to be a regeneration failure due to the areas occupied by brush. The stand is still treed with mature trees but there is a lack of regeneration. The understory stand types as BWsft in the 2000 FMP ground rules, similar to a white birch 1 in the current plan.

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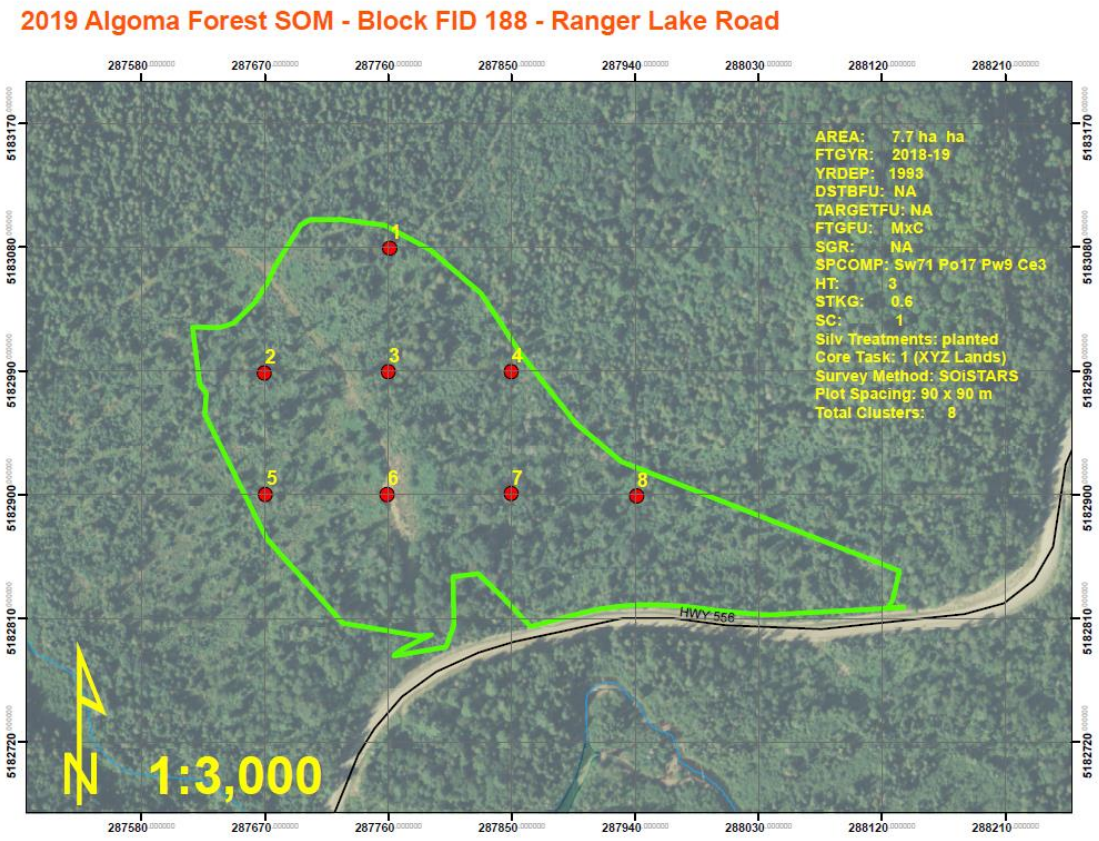
White pine on Block FID 218 still showing tree marking 27 years after the operation.

Block No **FID 188**	Location:	Ranger Lake Road, Curtis Township	
Depletion Year	SGR Code	Target Intensity	SFL FU
1993	BF SC2 spot planted to Sw and Pw (1990 SGR)	Not stated	MxC – 2010 FMP
SFL Species Composition (from eFRI)		SW71 PO17 PW09 CE03	
MNRF Overstory Species Composition		No overstory	
MNRF Understory Species Composition		Sw29 Bw25 Bf20 Pw12 Mr11	
MNRF FU		Not matching any FU in 1990 SGR; closest resembles conifer mixedwood in current FMP	
Survey method:		SO-iSTARS	

SGR used for analysis, from Goulais-Batchewana 1990 Crown Timber Management Plan:
BF site class 2, proposed forest unit spruce. Chemical and or mechanically site prepped and planted with spruce. Minimum 40% to proposed species; species not named but author included Sw, Pw and Sb as proposed species; minimum to acceptable species 50%; species not specified in SGR but included Pj, Sb, Bf, Mh, Mr, By, Bw, which seem logical to use.



Comments:
This stand was harvested in 1993. The original stand type is not recorded.

While doing the assessment some planted white spruce and white pine trees were noted, which prompted a change in the regeneration standards to a ground rule for a balsam fir working group stand which had been planted. The dominant species is white spruce at 29%, followed by white birch (25%), balsam fir (20%) white pine (12%) and red maple at 11%. The net free to grow site occupancy is 92% all species, with 1018 FTG stems per hectare. The white pine, living and dead, showed signs of white pine blister rust and some had also been attacked by white pine weevil.

The stand does not meet any stocking standard objective in the Goulais-Batchewana Crown Management Unit (1990-2010 Plan), which was the current forest management plan at the time of harvest. The stand would have had to reach a minimum of 40% stocking of a desired species to fit into a ground rule of the day. There are no broad ‘mixedwood’ forest units in the 1990 ground rules. The stand is not a match to any of the current ground rules but is closest to a mixed conifer Basic to or Extensive treatment. The author agrees with the FRI that this stand is a regeneration success as a conifer mixedwood.

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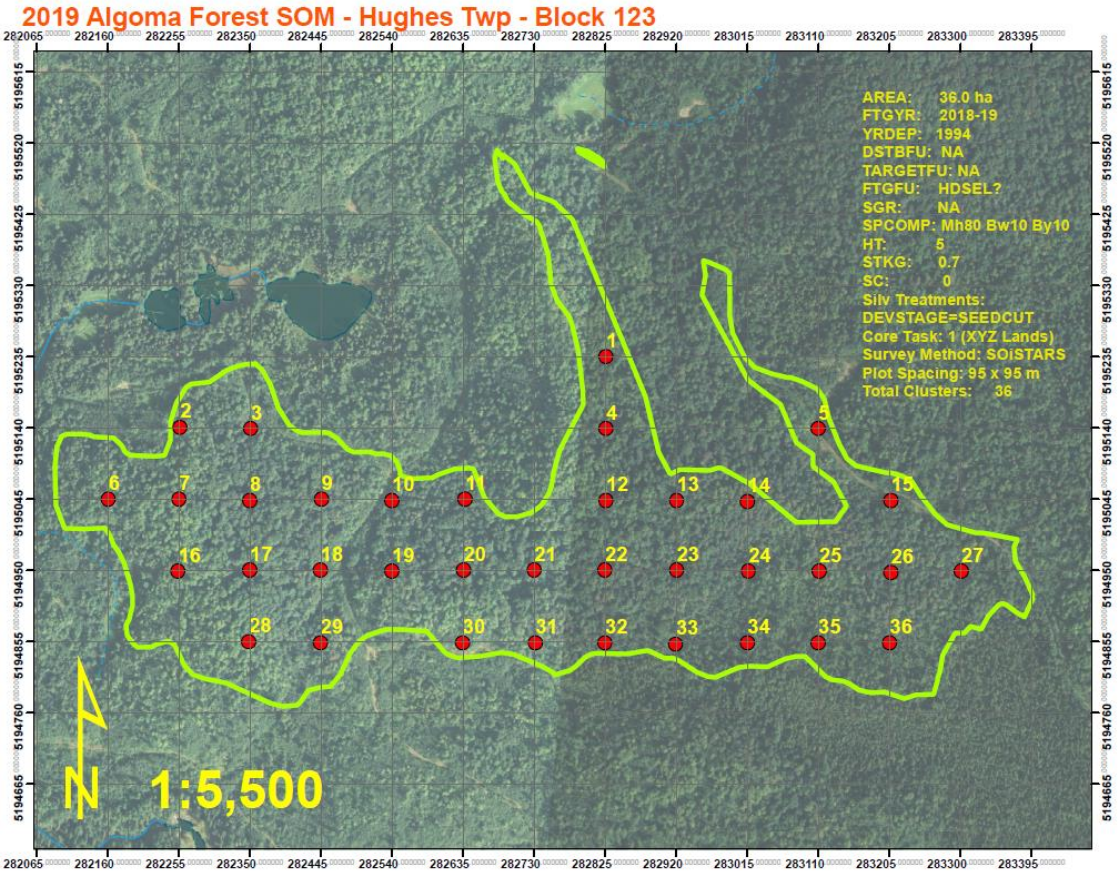
Block No **FID 123**	Location:	Off East Goulais River Road, Hughes Township	
Depletion Year	SGR Code	Target Intensity	SFL FU
1994	TH Uniform Shelterwood	Not stated	HDUS2
SFL Species Composition (from eFRI)		Mh80 Bw10 By10	
SFL Regeneration Composition (eFRI)		Mh80 Cw10 Bw10	
MNRF Species Overstory Composition		Mh68 BF08 Sw05 BW05	
MNRF Species Composition (understory)		Mh56 By10 Bf 09 Bw07 Po06	
MNRF FU		Tolerant Hardwood Uniform Shelterwood (1990 SGR)	
Survey method:		SO-iSTARS	

SGR used for analysis, Goulais-Batchewana 1990 Crown Timber Management Plan:
For Tolerant Hardwood (TH)– stocking standards minimum 40% to proposed species Mh, By, Or; greater than 30% to acceptable species Bf, Pw, Sw, Ab, Aw, Ce, He. No treatment.



Comments:
Block FID 123 appears to have been selectively cut in 1994, prior to implementation of tree marking. The forest unit is not known from the data but from the stand composition was tolerant

hardwood species with scattered white spruce, cedar and larch. The stand regenerated naturally following harvest aside from some white pine and spruce planted to reclaim one of the side roads.

According to MNRF's prism sweeps, the overstory composition is Mh68 BF08 BW 05 SW05, showing a little less hard maple and white birch and no yellow birch compared to the FRI typing. The quality of the overstory was felt to be good (average 88% AGS) however the surveyors were not qualified tree markers.

The free to grow net site occupancy is 55% sugar maple, combined with 10% yellow birch, 9% balsam fir, 7% white birch and 6% poplar regeneration. The site occupancy was 98%, with 906 free to grow stems per hectare of all species. There were pockets of large cedar in the few areas, and patches of ironwood on a ridgetop (clusters 12 and 13). The regenerating stand was healthy with little sign of disease other than a few target cankers.

The block is felt to be a regeneration success as tolerant hardwood harvested using the standard of the day (pre-tree marking). There are no stems per hectare standards in the 1990 ground rules for tolerant hardwood, only a percent to proposed species, with no species specified. The stand appears healthy. Some of the residual trees may be suitable for harvesting but the regeneration is still rather small (25 years old).

Tolerant Hardwood stand showing relative size of residual maple and maple regeneration stems (2019). This photo is from Block FID 172, one of the stands harvested in 1995, prior to the implementation of tree marking. Resource Technician Hailey Esdon in photo.

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Summary

In our comparison of the eFRI results, hardwood forest units were mostly confirmed to be the same or similar hardwood forest units, both in overstory and understory. The proportions of species sometimes varied, or in one case hard maple rather than red maple was dominant. These differences are likely normal, since the FRI is strategic rather than stand-level accurate. Some favourable signs were seen in some stands such as yellow birch regeneration that did not appear in the FRI.

The MNRF's SO-iSTARS ground surveys did not agree with the results for the conifer stands in all but one case (jack pine plantation). The black spruce lowland stands showed to be mixed conifer forest units with significant amounts of balsam fir and larch - nearly 30% of each – even though the eFRI indicated they were close to 100% black spruce. This difference from the eFRI is very concerning. These spruce lowlands had been treated as either CLAAG or left for natural regeneration. It is fortunate that this practice is not a common treatment anymore on Algoma Forest sites. Several additional spruce stands in Way-White Township were planned to be surveyed but were too difficult to access from the ground.

The surveyed stands that are white pine forest unit according to the eFRI appear significantly different upon SO-iSTARS ground survey. These stands were found to be 40 to 60% white spruce in the overstory and more commonly mixedwoods in the understory. The 2 (small) white pine stands in Waswa Twp in Wawa District were left for natural regeneration which was unsuccessful. The regeneration tended toward white birch and balsam fir in both stands.

White pine and white spruce were planted in several stands which MNRF's assessment determined to be regeneration successes as hardwoods or mixedwoods. These conifers would have benefited from release spray, either aerial or airblast treatment. During the 1990s there was some more emphasis in MNR Crown Unit budgets on planting new sites than on keeping the stands tended. Whatever the case the white pine suffered from blister rust partially due to being subject to so much competition, and white spruce was largely outcompeted but often remains in the understory today. Many of the sites in the Algoma Forest are high risk for white pine blister rust (an invasive species) so suitable low-risk site selection is crucial for white pine regeneration.

All but one stand surveyed was felt to be regeneration successes but not silvicultural successes, even though SO-iSTARS indicated that most of them were failures. The author consulted with Wayne Smith (co-creator of SO-iSTARS program) and we agree that most of the blocks appear to fail due to the age of the stands at the time of assessment. The standards used from the silvicultural ground rules were intended to evaluate results at a much younger age. No age was stated in the ground rules, but today most are surveyed between 5 to 15 years since establishment. The SO-iSTARS inventory update site occupancy standard of 800 stems per ha is intended to be used in surveys between 12-20 years in clearcuts and after the final removal cut in shelterwoods in the stable small polewood stage. These XYZ stands assessed were 24 years or older since harvest, and in our opinion the stands have self-thinned to a point to be lower density than the standards entered. It is apparent that stands needs to be assessed in a timelier way otherwise the standards are no longer relevant.

Information Exchange Meetings

Summarize any discussions or outcomes from the Information Exchange Meeting between MNRF and the Forest Manager if this took place.

Conclusions

To be compiled following discussions with industry representatives.

Residual maple and regeneration, Block FID 123, September 2019