ENDANGERED OLD-GROWTH FORESTS IN TEMAGAMI, ONTARIO: LOCATION, AMOUNT AND PROTECTION

Preliminary Results Bulletin #3, **September 21, 2018**

P. A. QUINBY AND M. HENRY

Ancient Forest Exploration & Research (AFER), Powassan, Ontario P0H 1Z0
contact: Peter Quinby, info@ancientforest.org; www.ancientforest.org

God's Lake Old-Growth Pine Conservation Reserve

At *AFER* we:

- treat old-growth forests as "non-renewable resources", which is not consistent with the practice of mining them or logging them;
- we consider biodiversity conservation needs at local, provincial, federal and international scales;
- we support the Government of Canada's official commitment to increase protected areas in Canada to 17% of the land base (Government of Canada 2018); and
- we support the New York Declaration on Forests to ban logging of natural forests by 2030 (Climate Focus 2015).

OBJECTIVES

It is now generally accepted that old-growth forests in Ontario, south of the Boreal Forest region, are rare ecosystems at minimum. More likely, they are endangered, as has been documented for North America's old-growth red and eastern white pine forests (Quinby 1993, EAB 1994). The effective stewardship of old-growth forests depends on an understanding of the composition and amount of what remains, where it is located, and how much is protected. Data obtained from First Resource Management Group (2018) were used to estimate the amount and types of old-growth forest located in the Temagami Management Unit (TMU; Figure 1, map of Temagami old growth) and how much of that old-growth forest is protected. The size of the crown productive forest in the TMU is 342,000 ha.

FINDINGS

1. There are 24 forest harvesting working groups (silviculture terminology) in the TMU (Table 1) and 10 forest types (Table 2) that are based on a simple composition classification of the working groups. Forest type descriptions and code definitions are provided in Appendices 1 and 2.

2. In total, old-growth forest makes up 25.6% of the TMU (Table 1), which is much less than what Wirth et al. (2009; pgs. 24-27) report for pre-settlement forests: up to 80% old-growth coverage for deciduous forests and up to 50% old-growth coverage for coniferous forests. To increase the old-growth (pre-settlement) component to 40% of the TMU, which is a reasonable estimate based on the literature and the federal commitment to increase nature protection to 17% of the land base, an additional 46,000 ha of old-growth forest would need to be protected.

3. None of the old-growth working groups occupy more than 4.3% of the TMU and 14 of them occupy less than 1% of the TMU (Table 1). Two old-growth forest working groups have been eliminated from the Temagami landscape (yellow birch, hardwood selection-north) and four (red pine, hardwood shelterwood, white pine-red oak, red oak) occupy less than 200 ha.

4. There are ten old-growth forest types that make up a total of 25.6% of the forested area in the TMU (Table 2). The three most abundant old-growth forest types are black spruce and other conifers (8.5%), white pine (6.4%) and mixedwood (5.7%). The other seven old-growth forest types each make up less than 1.9% of all old growth. There are only 712 ha of old-growth tolerant and other hardwoods (0.3%) and 199 ha of old-growth red pine forest (0.1%).

5. A total of 38.8% of the old-growth forests in the TMU are protected and at least one third of the area occupied by six of these types is protected (Table 2). Very little of the following old-growth forest types is protected: white cedar (270 ha, 7.3%), poplar (73 ha, 6.7%) and tolerant and other hardwoods (16 ha, 2.2%). None of the 199 ha of old-growth red pine forest is protected.

6. Due to the large fires that occurred in Temagami during the summer of 2018, the values presented in this report are likely inaccurate in a few cases. However, quantification of the loss of old-growth forest due to fire can only be determined accurately from remote sensing analyses, which to our knowledge have not yet been completed.

Figure 1. Location and Type of Old-Growth Forest in Temagami, Ontario in 2018 (from: FRMG 2018)
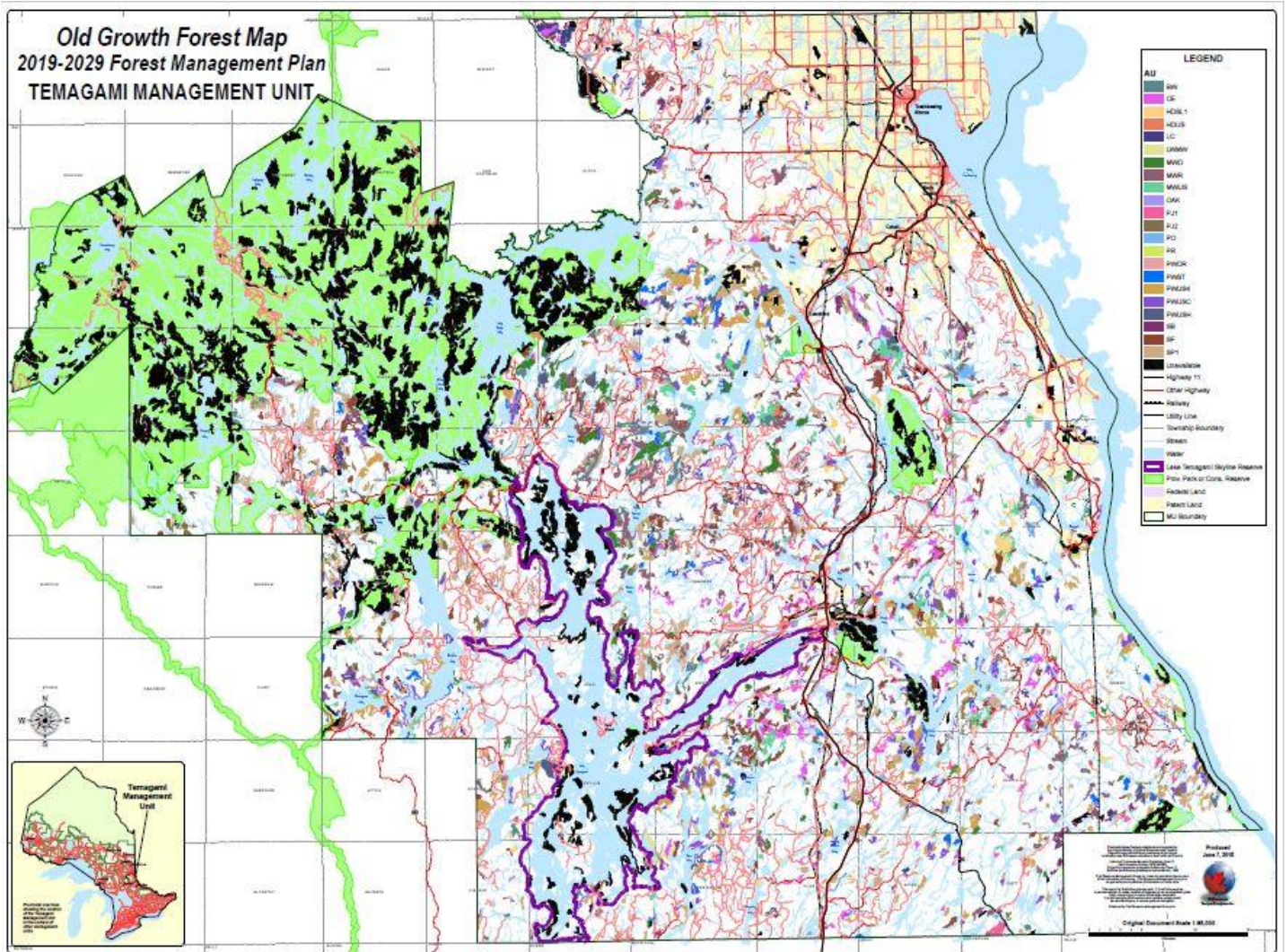
Table 1. Forest Working Groups, Old-Growth Area and Protection in Temagami, Ontario (2018)

Old-Growth Forest Working Groups	Area in TMU		Area Protected	
	Ha	%	Ha	%
Black Spruce	14,797	4.3	8,520	57.6
Spruce-Fir	11,047	3.2	3,230	29.2
White Pine Cut Shelterwood	9,734	2.8	3,729	38.3
Mixedwood Rich	9,003	2.6	2,871	31.9
White Pine-Conifer Shelterwood	7,236	2.1	3,135	43.3
Mixedwood Dry	5,524	1.6	2,346	42.5
Mixedwood Shelterwood	4,067	1.2	1,033	25.4
Jack Pine-Conifer	4,022	1.2	1,922	47.8
White Cedar	3,706	1.1	270	7.3
Black Spruce	3,285	1.0	2,203	67.1
White Pine-Seedtree	2,978	0.9	844	28.3
White Birch	2,664	0.8	889	33.4
Lowland Conifer	2,645	0.8	968	36.6
Jack Pine-Pure	2,065	0.6	1,362	66.0
White Pine-Hardwood Shelterwood	1,965	0.6	517	26.3
Poplar	1,089	0.3	73	6.7
Lowland Mixedwood	858	0.3	91	10.6
Hardwood Selection-South	622	0.2	16	2.6
Red Pine	199	0.1	0	0.0
Hardwood Shelterwood	76	0.0	0	0.0
White Pine-Red Oak	25	0.0	0	0.0
Red Oak	14	0.0	0	0.0
Yellow Birch	0	0.0	0	0.0
Hardwood Selection-North	0	0.0	0	0.0
Total	**87,621**	**25.6**	**34,019**	**38.8**

Table 2. Area and Protection of Old-Growth Forest Types in Temagami, Ontario in 2018

Old-Growth Forest Types (including working group codes)	Area in TMU		Area Protected	
	Ha	%	Ha	%
Black Spruce & other Conifers (SB, SF, SP1)	29,129	8.5	13,953	47.9
White Pine (PWUS4, PWUSC, PWUSH, PWOR, PWST)	21,938	6.4	8,225	37.5
Mixedwood (LWMW, MWD, MWR, MWUS)	19,452	5.7	6,341	32.6
Jack Pine (PJ1, PJ2)	6,087	1.8	3,284	54.0
White Cedar (CE)	3,706	1.1	270	7.3
White Birch (BW)	2,664	0.8	889	33.4
Lowland Conifer (LC)	2,645	0.8	968	36.6
Poplar (PO)	1,089	0.3	73	6.7
Tolerant and Other Hardwoods (HDSL1, HDSL2, HDUS, OAK, BY)	712	0.2	16	2.2
Red Pine (PR)	199	0.1	0	0.0
ALL OLD-GROWTH FOREST TYPES	87,621	25.6	34,019	38.8

REFERENCES

Climate Focus. 2015. ***Progress on the New York Declaration on Forests – An Assessment Framework and Initial Report: Technical Annexes. Goal 1: At least halve the rate of loss of natural forests globally by 2020 and strive to end natural forest loss by 2030.*** Prepared by Climate Focus, in collaboration with Environmental Defense Fund, Forest Trends, Global Alliance for Clean Cookstoves, Global Canopy Program and The Sustainability Consortium. (www.forestdeclaration.org)

Environmental Assessment Board (EAB). 1994. ***Reasons for Decision and Decision: Class Environmental Assessment by the Ministry of Natural Resources for Timber Management***. Ontario Environmental Assessment Board, EA-87-02, 2300 Younge Street, Toronto, Ontario.

First Resource Management Group (FRMG). 2018. ***Temagami Management Unit Analysis Package Version 27 – April 5 2018***. Draft Analysis Package, Supplementary Document 3, Temagami Management Unit, 2019-2029 Forest Management Plan. First Resource Management Group, New Liskeard, Ontario.

Government of Canada. 2018. ***Canada Biodiversity Targets 2020***. From: http://publications.gc.ca/collections/collection_2016/ eccc/CW66-524-2016-eng.pdf. (accessed May 9, 2018)

Quinby, P. A. 1993. Old-growth eastern white pine forest: An endangered ecosystem. ***Forest Landscape Baselines*** No. 2, Ancient Forest Exploration & Research, Powassan, Ontario. (http://www.ancientforest.org/wp-content/uploads/2015/02/flb2.pdf)

Wirth, C., G. Gleixner and M. Heimann (eds.). 2009. ***Old-Growth Forests: Function, Fate and Value***. Springer-Verlag, Berlin, Germany.

APPENDICES

Appendix 1. Forest Type Definitions (from: FRMG 2018)

Forest Type	Code	Description	Detailed Composition with SQL Model Manipulation (see APP. 2 for definitions)
Black Spruce	SB	Forest area with a high proportion of black spruce	((Sb >= 80) AND ((Mh+Aw+Be+Iw+Qr+Ow+Yb+Pr)=0) AND ((Pw+Pj)<=10))
Hardwood Selection-North	HDSL1	Forest area dominated by hard maple	(((Mh+Aw+Be+Ew+Iw+Qr+Ow+Yb+He)>=50)AND((Pb+Pt+Pl+Bw+Bf)<=30) AND (Sc 18 <= 2))
Hardwood Selection-South	HDSL2	Forest area dominated by maples and mid-tolerant hardwoods; more commonly found in southern portions of the GLSL region	(((Aw+Qr+Ow)>=30) OR ((Be+Qr+Ow)>=30) OR (Be>=20))
Hardwood Shelterwood	HDUS	Forest area dominated by hard maple	((Mh+Aw+Be+Ew+Iw+Qr+Ow+Yb+He)>=50)
Jack Pine- Conifer	PJ2	Forest area with a high proportion of jack pine and other conifers managed under the clearcut sylvicultural system	((((Pj+Sb+Pr)>=70) OR ((Pj>=50)AND((Pj+Sb+Bf+Sw+He+Pw+Pr+Cw+La)>=70)AND((Bf+Sw+He+Pw+Cw+La)<=20))) AND (Pj>=Sb))
Jack Pine-Pure	PJ1	Forest area with a high proportion of jack pine	((Pj>=70)

Lowland Conifer	LC	Forest area with a dominating mixture of black spruce, cedar and larch	(((Sb+Cw+La)>=80) AND ((Mh+Aw+Be+Iw+Qr+Ow+Yb+Pr)=0) AND ((Pw+Pj)<=10))
Lowland Mixedwood	LWMW	Forest area dominated by lowland hardwoods such as black ash, red maple and yellow birch, along with various other hardwoods such as white birch and elm	(((Cw+Ab+La+Sb)>=30) AND ((Ab>=20)OR((Ab+Mr+Yb)>=30)))
Mixedwood Dry	MWD	Forest area comprised of a mixture of tree species that do well on drier, well drained shallow soils such as poplar, birch and red maple	((Pj+Pw+Pr>=20))
Mixedwood Rich	MWR	Forest area comprised of a mixture of tree species that do well on moist, rich soils	All remaining polytype FOR
Mixedwood Shelterwood	MWUS	Forest area comprised of a mixture of tree species that are shade and wind tolerant, and capable of regenerating under a partial canopy	(((Sw+Pw+Pr+Cw+Mh+Yb+Aw+Qr+Ow+Iw+Be+He)*STKG) >= 30)
Poplar	PO	Forest area dominated by poplar, and associated with other hardwoods	(((Pb+Pt+Pl)>=50) AND 25 ((Mh+Ab+Aw+Be+Ew+Iw+Qr+Ow+Pb+Pt+Pl+Bw+Yb+Mr)>=70))
Red Oak	OAK	Forest area dominated by red oak	((Qr>=(Mh+Be)) AND (Qr>=30) AND ((Qr+Mh+Aw+Ab+Be+Yb+Pw+Pr+Sw+He)>=40))
Red Pine	PR	Forest stands with significant natural and artificially regenerated components of red pine that are primarily intended to be managed under the shelterwood or clearcut silvicultural system	((Pr>=70) AND (Pw<30))
Spruce-Fir	SF	Forest area with a dominating mixture of conifer	((Sb+Sw+Bf+Cw+La+Pw+Pj+Pr+He)>=70)
Upland Spruce	SP1	Forest area with a dominating mixture of conifers, leaning towards a heavier concentration of black spruce, jack pine and red pine	(((Sb+Sw+Bf+Cw+La+Pw+Pj+Pr+He)>=70) AND (((Bf+Cw+Pw+La+Sw+He)<=20) OR (Pj>=30)))
White Birch	BW	Forest area dominated by white birch, high levels of poplar and lesser amounts of other hardwoods	(((Pb+Pt+Pl+Bw)>=50) AND ((Ab+Aw+Be+Ew+Iw+Qr+Ow+Pb+Pt+Pl+Bw+Yb+Mh+Mr)>=70))
White Cedar	CE	Forest area with a high proportion of cedar	((Cw >= 40) AND (Cw >= (Sb+La+Bf)) AND ((Ab+Aw+Be+Ew+Iw+Qr+Ow+Pb+Pt+Pl+Bw+Yb+Mh+Mr)<30))
White Pine Cut Shelterwood	PWUS4	Forest stands with significant natural and artificially regenerated components of white and red pine that are primarily intended to be managed under the shelterwood system	(((Pw+Pr)>=50) AND (Pw>Pr) AND (((Pw+Pr)*STKG) >=30) AND ((Qr+Ow)<20))

White Pine-Conifer Shelterwood	PWUSC	Forest stands with significant natural and artificially regenerated components of white and red pine, as well as other types of shade tolerant and mid tolerant conifers, which is primarily intended to be managed under the shelterwood system	$((((Pw+Pr)>=30)AND(((Pw+Pr)*STKG) >=30))$ OR $((Pw>=He)AND(Pw>=Sw)AND(Pw>Cw)AND(Pw>=(Qr+Ow))AND((Pw+Pr)>=30)AND(((Pw+Pr+Sw+He+Qr+Ow+Pj+Cw)*STKG) >=30)AND(AllCon >= 80)))$
White Pine-Hardwood Shelterwood	PWUSH	Forest stands with sufficient levels of natural and artificially regenerated components of white and red pine, as well as a blend of hardwoods and tolerant conifers, which is primarily intended to be managed under the shelterwood system	$(((Pw >=Pr)AND ((Pw+Pr)>=30)AND(((Pw+Pr)*STKG) >=30))$ OR $((Pw>=Pr)AND(Pw>=He)AND(Pw>=Sw)AND(Pw>Cw)AND(Pw>=Qr)AND((Pw+Pr) >=30)AND(((Pw+Pr+Sw+He+Qr+Pj+Cw)*STKG) >=30)AND(AllCon < 80)))$
White Pine-Red Oak	PWOR	Forest stands with significant natural and artificially regenerated components of white and red pine, as well as red oak, which is primarily intended to be managed under the shelterwood system	$(((Pw+Pr+Qr+Ow)>=50)$ AND $(Pw>=(Qr+Ow))$ AND $(((Pw+Pr+Qr+Ow)*STKG) >=30)$ AND $((Qr+Ow)>=20))$
White Pine-Seedtree	PWST	Forest stands with low abundance of white and red pine. The seed tree system by itself is not conducive to natural regeneration of white and red pine	$(((Pw+Pr)>=30)$ AND $((Pw+Pr)>=He)$ AND $((Pw+Pr)>=Sw)$ AND 28 $((Pw+Pr)>=Sb)$ AND $((Pw+Pr)>=Cw)$ AND $((Pw+Pr)>=Qr))$
Yellow Birch	BY	Forest area dominated by yellow birch	$(Yb>=40)$

Appendix 2. FRI Species Code Definitions (from: https://dr6j45jk9xcmk.cloudfront.net/documents/2837/fim-tech-spec-forest-resources-inventory.pdf); * not found in this document

FRI Species Codes	Species Name	
	Common	**Scientific**
Aw	white ash	Fraxinus Americana
Be	American beech	Fagus grandifolia
Bf	balsam fir	Abies balsamea
Bw	white birch (or paper birch)	Betula papyrifera
By	yellow birch	Betula allegheniensis
Cw	northern white cedar	Thuja occidentalis
Ew	white elm (or American elm)	Ulmus americana
He	eastern hemlock	Tsuga Canadensis
Iw	ironwood (or eastern hop-hornbeam)	Ostrya virginiana
La	eastern larch (or tamarack or American larch)	Larix laricina
Mh	hard maple (or sugar maple)	Acer saccharum
Mr	red maple (or soft maple)	Acer rubrum
Ow	white oak	Quercus alba
Pb	balsam poplar	Populus balsamifera
Pj	jack pine	Pinus banksiana
Pl	large-toothed aspen	Populus grandidentata
Pr	red pine	Pinus resinosa
Pt	trembling aspen	Populus tremuloides
Pw	eastern white pine	Pinus strobus
Qr	red oak*	Quercus rubra
Sb	black spruce	Picea mariana
Sw	white spruce	Picea glauca
Yb	yellow birch*	Betula allegheniensis