

**CHARACTERISTICS OF ANCIENT FOREST LANDSCAPES  
LARGER THAN 20,000 HECTARES IN THE  
LAKE TEMAGAMI SITE REGION OF ONTARIO**

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### **Introduction**

Both the governments of Canada and Ontario have committed to establishing a network of reserves to represent the common and unique features of Ontario's natural heritage, which includes the Lake Temagami Site Region (LTSR). Currently, only about six percent of the land base in the LTSR has been set aside in protected areas. To meet the minimum of 12 percent protection as stated in the Canadian Wilderness Charter (Hummel 1989), as much as 300,000 additional hectares of protected area may be required to adequately represent the natural heritage of the LTSR's five million hectares. The objective of this project was to identify the ancient (unlogged and roadless) forest landscapes in the LTSR as a first step towards meeting this additional need for natural heritage protection. By identifying the largest natural areas that remain in the region, this work provides significant information for protected areas planning and outdoor recreation development.

Ancient forest landscapes (AFLs) are the most natural portions of our forested areas. They are the combination of terrestrial and aquatic ecosystems that have developed together and interact within a region. In addition to forests, they include the lakes, streams, wetlands, and non-forested terrestrial ecosystems that make up the entire landscape. Their common characteristic is their natural integrity. Because of natural barriers, ruggedness of the terrain, management choices, or mere fluke, they have not been altered by logging, mining, or hydroelectric development, and their original species composition and ecosystem processes are maintained throughout the mosaic of forests and other habitats.

### **Methods**

Ancient forest landscapes in the LTSR were identified by determining the extent of logged-over areas, roads, railway lines, mining, and hydro-electric development (see Table 1 for AFL characteristics). The extent of these human activities was determined by (1) examining records available at government offices, (2) inter-viewing knowledgeable experts, and (3) using a variety of thematic maps that are available for purchase. The minimum landscape area identified for an AFL was 20,000 hectares, with the narrowest connections between any two portions of an AFL no less than 500 metres wide. The decision to choose 20,000 hectares as the minimum size criterion was largely a pragmatic one. Although much larger areas have been suggested as the minimum required to be self-regulating - in some cases as much as 500,000 hectares (Hackman 1989).

Forest cover in each AFL was characterized using the Forest Resource Inventory (FRI) maps available in September 1993. Ten percent of the FRI stands within each landscape were sampled to estimate the relative abundance of each tree species in each AFL. The number and area of stands with more than 30 percent red and white pine greater than 50 years of age were estimated using the GIS based Ranking System for Pine (GRASP) program (Baldwin et al. 1994).

Geologists with the Ontario Ministry of Northern Development and Mines provided information on active and closed mines, and on the mining potential within each AFL. The number of identified potential mineral deposits is indicated in Table 1. Protected areas in the LTSR were included if they had legal protected status, were greater than 250 hectares, and had a significant component of natural ecosystem protection (e.g. recreational parks that do not provide biodiversity protection were not included).

Ontario Ministry of Natural Resources staff in the LTSR provided qualitative information on historical logging based on unique sources of information or personal knowledge of the areas. This was particularly valuable for those districts which did not have complete logging records prior to the 1970's. Most districts also provided anecdotal information on logging prior to the late 1950's. This information did not provide exact locations of cutting and consequently was not used as a criterion for excluding areas from any of the AFLs. However, areas that had likely been logged in the past were indicated on the AFL maps.

**Table 1. Characteristics of large ancient forest landscapes in the Lake Temagami Site Region** (Bw - white birch; Sb - black spruce; Po - poplar; Mh - sugar maple; Pj - jack pine; Sw - white spruce; B - balsam fir; C.R. - conservation reserve; W.P. - waterway park; R.P. - recreation park; Wl.P. - wilderness park; R. - river; C. - creek; L. - lake; 4E-1 - Michipicoten Site District; 4E-3 - Mississagi Site District; 4E-4 - Temagami Site District)

AFL	AREA (HA)	COMMON TREE SPECIES	STANDS WITH 30% PW/PR	MINERAL OCCURRENCE	PROTECTED AREAS NAME/SIZE (HA)/% OF AFL
1	18,800	Bw, Sb, Po	0.3	none	none
2	53,000	Bw, Sb, Mh	0.1	none	Tikamaganda C.R./ 3,000/ 5.7
3	39,200	Bw, Po, Sb	0.2	none	none
4	20,100	Po, Sb, Pj	0	yes (10)	none
5	161,400	Pj, Bw, Sw	4.9	none	Mississagi River W.P./ minor
6	63,000	Pj, Po, Bw	0.1	none	Mississagi River W.P./ minor
7	43,200	Pj, Sb, Bw	0.3	none	Bark Lake C.R./ 8,000/ 18.5
8	43,600	Sb, Bw, Po	0.4	yes (19)	none
9	38,500	Sb, Bw, Pj	0	yes (3)	Mississagi River W.P./ minor
10	50,000	Sb, Po, Bw	0	yes (1)	Biscotasi Lake R.P./ 1,238/ 2.5
11	25,000	Pj, Po, Bw	0	none	none
12	55,800	Pj, Bw, Sb	0	yes (1)	none
13	21,000	Sb, Bw, Po	0	none	none
14	27,600	Pj, Bw, Sb	0	yes (3)	none
15	23,200	Pj, Bw, Sb	0	yes (10)	none
16	77,700	Bw, Sb, Po	0.1	yes (1)	none
17	22,900	Bw, Pj, Sb	0.8	yes (3)	none
18	30,900	Pj, Bw, Po	0.1	yes (5)	none
19	21,800	Pj, Bw, Po	0	yes (8)	none
20	31,600	Bw, Po, Pj	0	yes (5)	none
21	33,700	Sb, B, Pj	0.1	yes (5)	Lady Evelyn-Smoothwater Wl.P./ minor
22	72,700	Bw, Sb, B	0.3	yes (7)	Lady Evelyn-Smoothwater Wl.P & Solace River W.P. & Sturgeon Riv. W.P./40%
23	69,700	Sb, Bw, B	0	yes (3)	Lady Evelyn-Smoothwater Wl.P & Obabika River W.P./ 50%

The recent fire history of each AFL was determined using records available from the Canadian Forest Service in Sault Ste. Marie showing the fire occurrences greater than 200 hectares between 1920 and 1995 in the LTSR. Because our estimates of area burned in each AFL are based on "known" fires and many small fires go undetected, they are likely underestimates. Large rivers and lakes that have their headwaters within an AFL were listed.

The extent to which each AFL can contribute to natural heritage protection in the LTSR was based on

analysis of the spatial coincidence of AFLs with soil landscapes shown on the *Gap Analysis of Present Landform Status in Ontario Map* (WWFC 1995). From this map it was possible to estimate the amount of area within each AFL covered by (1) moderately represented soil landscapes, (2) partially represented soil landscapes and (3) unrepresented soil landscapes (WWFC 1994) (Table 2).

## Results

The 23 large AFLs in the LTSR combine for a total of 1,044,400 hectares - approximately one-fifth of the total LTSR area. The most common tree species in the AFLs include white birch, black spruce, poplar, jack pine, white spruce, balsam fir and sugar maple. Only one AFL had more than one percent of its stands composed of at least 30% white and red pine (#5). Significant mineral occurrences are located within 15 of the 23 AFLs, ranging from one to 19 occurrences per AFL. Only eight

**Table 1. Con't.**

AFL	HISTORICAL LOGGING	FIRE YEAR	% BURNED	SIGNIFICANT HEADWATERS	SITE DISTRICT(S)
1	yes	1955	6-10	none	4E-1, 4E-3
2	yes	1934,34,48,55	1-5,1-5,11-15,<1	Indian R., Tikamaganda L., Tikamaganda R.,Eleven Mile R., Wildcherry C.	4.00E-03
3	none	1948	6-10	Cow R., Nushatogani R., West Aubinadong R., Aubinadong R.	4.00E-03
4	none	none		Kinogama R.	4.00E-03
5	likely	1922,39,39,47,48	<1,<1,1-5,<1,51-55	Spanish R., North Abinette R., West Abinette R., Mississagi R., Embarass R.	4.00E-03
6	none	1948,55,55	71-75,11-15,1-5	Kindiogami R., Little Kindiogami R.	4.00E-03
7	none	1923, 55,55,88, 88	<1,1-5,1-5,1-5,1-5	Sables R., Wakonassin R.	4.00E-03
8	none	1948,55	6-10,1-5	Rush L.	4.00E-03
9	likely	none		Spanish R.	4.00E-03
10	yes	none		Dead R., Biscotasi L, Tassie C., East Spanish R.,	4.00E-03
11	likely	1922,47	1-5,1-5	Spanish R.	4.00E-03
12	likely	1957	<1	Mozhabong L, Wakonassin R., Sinaminda L., Pogamasing L., Mogo R.	4.00E-03
13	likely	1921,41	6-10,11-15	Tatachikapika L., Tatachikapika R., Katodawa C.,	4.00E-03
14	yes	1935,41	6-10,51-55	Minisinakwa R.	4E-3, 4E-4
15	likely	1936,41,51	6-10,96-100,6-10	West Shining Tree C., Mattagami R.	4E-3, 4E-4
16	yes	1923,32,34,47,51	1-5,1-5,1-5,1-5,1-5	East Sand R., Donnegana L., Vondet C., Muldrew C., Wanapitei R., Scotia L.	4.00E-03
17	yes	1921,41	1-5, 61-66	Barnet L., Welcome L., Wanapitei R.	4.00E-04
18	likely	1923,34,41	1-5,1-5,41-45	Burwash L., Vermillion R., Parkin C.	4.00E-04
19	none	none		Sandcherry C., Venetian R., Nelson R., Wingekeisinaw R.	4.00E-04
20	none	1921,21,41	1-5,1-5,76-80	none	4.00E-04
21	none	1936,44	11-15,26-30	Sturgeon R., Montreal R.	4.00E-04
22	none	1988	<1	Lady Evelyn R., Florence L., Yorston R., Sturgeon R.	4.00E-04
23	none	1941,47,92	1-5,1-5,1-5	Montreal R., Lady Evelyn R., Lady Evelyn L., Anima-Nipissing L.	4.00E-04

**Table 2. Potential contribution of large ancient forest landscapes towards protecting moderately protected to unprotected soil landscapes in the Lake Temagami Site Region (areas in hectares)**

AFL	TOTAL AREA	AREA OF MODERATELY REPRESENTED SOIL LANDSCAPE	AREA OF PARTIALLY REPRESENTED SOIL LANDSCAPE	AREA OF UNREPRESENTED SOIL LANDSCAPE
1	18,800	9,400	9,400	
2	53,000	53,000		
3	39,200		39,200	
4	20,100	18,090	2,010	
5	161,400		145,260	16,140
6	63,000		63,000	
7	43,200		43,200	
8	43,600		39,240	4,360
9	38,500		38,500	
10	50,000		50,000	
11	25,000		25,000	
12	55,800		55,800	
13	21,000	7,350	13,650	
14	27,600	2,760	2,760	22,080
15	23,200	6,960	13,920	2,320
16	77,700		77,700	
17	22,900	21,755		1,145
18	30,900	23,175	7,725	
19	21,800		21,800	
20	31,600	30,020	1,580	
21	33,700	28,645		5,055
22	72,700	47,255	25,445	
23	69,700	62,730	6,970	
<b>ALL</b>	<b>1,044,400</b>	<b>311,140</b>	<b>682,160</b>	<b>51,100</b>

protected areas share some portion of their area with the 23 AFLs - between seven and eight percent of the total AFL area is protected. No single AFL is completely protected. Ten of the AFLs have no known historical logging (approximately 42%). At least 50 fires greater than 200 hectares distributed within 19 AFLs have burned between 1921 and 1992. A total of 47 large rivers and creeks have their headwaters located in 20 AFLs and 15 large lakes have their headwaters located within 10 AFLs. Most AFLs are located in the Mississagi and Temagami Site Districts. Only one AFL is located within the Michipicoten Site District. No AFLs were located within the Bachewana or New Liskeard Site Districts. The AFLs may provide up to 51,000 hectares towards protection of unrepresented soil landscapes in the LTSR, and many more towards protection of partially and moderately represented soil landscapes.

## References

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