Forest History Society of Ontario

Forestory

Volume 3, Issue 1, Spring 2012

NEWSLETTER

Contents

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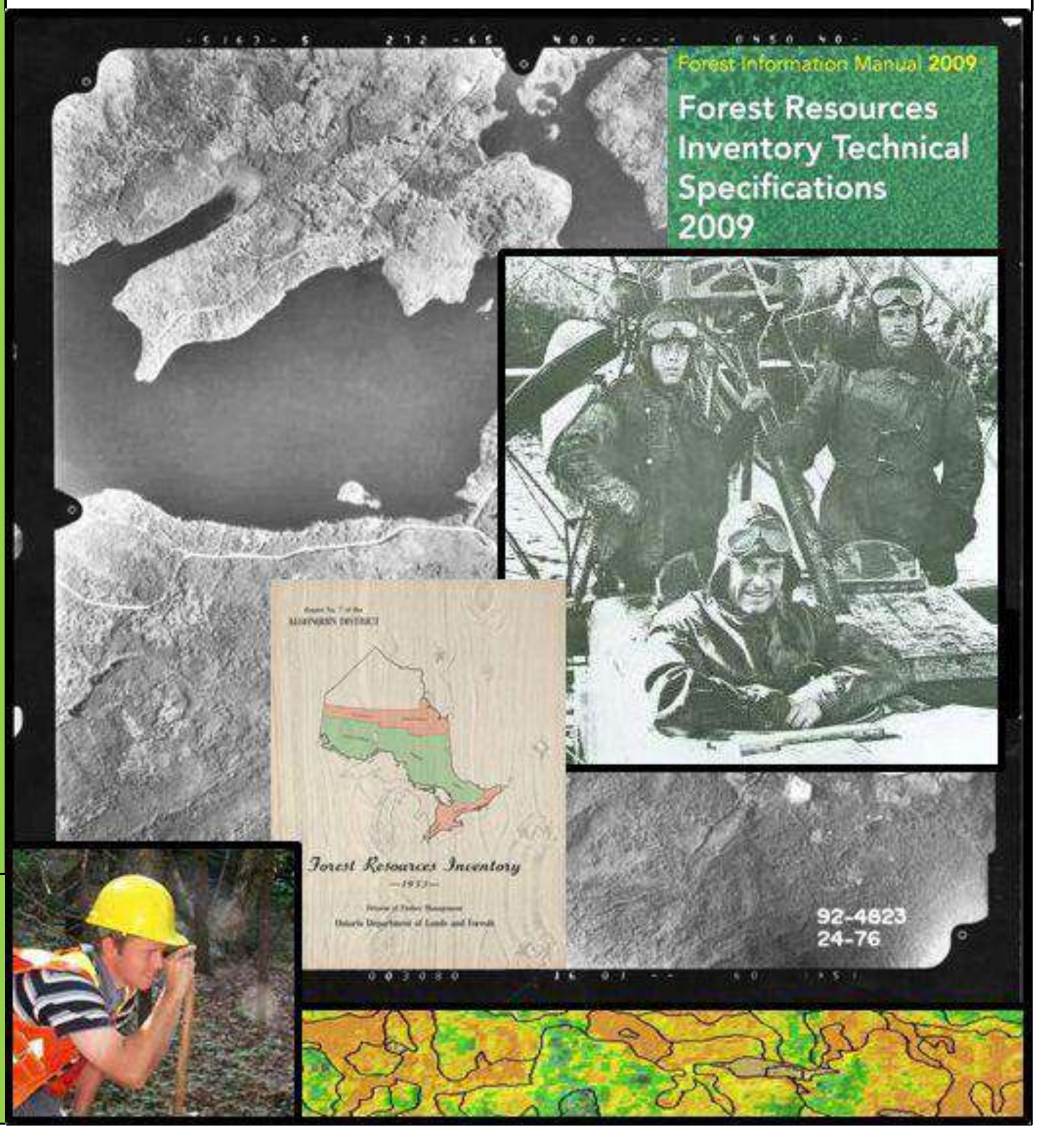
If you have articles, photographs or images, interesting facts, web links, personal reflections or events that would be suitable for this newsletter, please contact the editor.

Forest Inventory / 1



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Request for Content

Do you have an interesting story to tell about some aspect of forest history in Ontario? Or are you prepared to write an article for the newsletter on some aspect of forest history? Do you know of interesting photographs, documents, web sites or other items that would be suitable for inclusion in the newsletter? If so, please contact the editor to discuss the possibility of publishing your information in the newsletter.

Please provide your comments to the editor on items or themes you would like to see in the newsletter.

President's Message

The third Annual Meeting of the Society, held on 9 February, 2012, was most successful with 25 persons present. In 2011 we had a total of 92 members and hopefully look forward to a significant increase this year. Our financial status was helped in 2011 by a grant of $10,000 from the Canadian Forest Service; similar grants were made to each of the four provincial forest history groups (British Columbia, Alberta, Québec and ourselves).

The main items of business at the annual meeting were amendments to the By-Laws proposed by Mike Rosen. The first was the change of title from "President" to "Chair". The rationale was that the position of President in most organizations is an operating one reporting to a Chair and Board of Directors. The second was the change of term of office for Directors from annually to a three-year period with the intent to introduce staggered terms to provide for both renewal and continuity. The meeting concluded with an excellent, illustrated presentation by one of our members, Monte Hummel, President Emeritus of the World Wildlife Fund of Canada on "The History of YOUR Forest".

Last summer, members may recall that the Society worked with and supported the Port Rowan and South Walsingham Heritage Association in establishing the Edmund J. Zavitz Forest at St. Williams and providing a memorial to him. In addition we took part in the rededication of the memorial to Dr. James Herbert White at Turkey Point Provincial Park. Dr. White was the first forester to graduate in 1909 from the newly founded (1907) Faculty of Forestry at the University of Toronto.

The history of the describing and measuring Ontario's forests is colourful and intriguing and during the past winter the Society has worked with the Canadian Heritage Bushplane Centre in Sault Ste. Marie to develop a display of this history. One of our members in the Sault, Rich Greenwood, was primarily involved in the development of the display and I thank him on the Society's behalf. The display was opened on 18 April in conjunction with the annual general meeting of the Ontario Professional Foresters Association, at which I was invited to speak on the "Evolution of Forest Management in Ontario". In Ontario, bushplanes have played an important role in forest inventory and protection and the Society looks forward to continuing our relationship with the Canadian Bushplane Heritage Centre. The display will be at the Centre into the summer and I would urge any members who anticipate being in Sault Ste. Marie to visit it if possible.

On 11th May the Simcoe County Forest will be celebrating its 90th anniversary at the Simcoe County Museum and I will be bringing greetings from our Society on that occasion.

I wish all members an enjoyable summer and trust you may experience some interesting aspect of Ontario's forest history during this year.

Ken Armson R.P.F.

Editor's Message

Another issue that I have thoroughly enjoyed putting together for a number of reasons: One is the great people I meet over email who write the articles for the newsletter; people who dedicate their precious time and effort to provide us with wonderful material. Thanks to all the authors for your excellent work. I would also like to thank Murray Radford, Coordinator, Forest Resources Inventory Program of the Ontario Ministry of Natural Resources, for supporting our themed newsletter. Murray not only provided staff time to write articles, he gave me great leads on whom to contact for other articles. We have had such great response to this theme that we are going to extend it to the next issue. The second reason relates to my undergraduate days in forestry at the University of Toronto when I was so envious of my student colleagues who landed jobs doing forest inventory field work for the summer. Not only was the work lucrative financially, those lucky enough to snag one of these jobs always had great tales to tell when they returned to school in September. The one I remember best is the crew that was left stranded in the bush after their designated plane pick up was late because the red pin indicating their location fell off the map! I was not eligible for field inventory jobs because I was female! Thank heavens times have changed is all I can say to that.

On a more serious note, this issue underscores the vital importance of forest inventory data in understanding and managing our forest resources. From the time of European settlement to now, this information has been a core building block for the settlement and expansion of Ontario. From an initial industrial use, this information is now vital in the broader approach to State of the Forests Reporting and biodiversity reporting and management. The Forest Resources Inventory has also relied on and driven technological advances. Ontario was and is a world leader in the use of technology to gather and analyze forest resources data. There is lots of history left to explore on this topic.

This issue also reinforces for me the great interest in local forest history that is out there. Books can tell us a lot but personal knowledge of local history adds a special flavour to the larger view. Local archives and museums are another source of information. I urge all members to engage their community archives and museums to tell them about us and to tell us about them.

Personal accounts of events also provide a different angle to view forest history. Everyone has a story to tell – make sure you sharpen your pencils and write that story for our newsletter. If you would like to relate the story to me and have me write it, just let me know.

Finally, it was with sadness that I learned that Jim Cayford had passed on. Jim was a classmate and good friend of my husband Dave when they were in forestry school at the University of New Brunswick. I have heard many a story over the years involving "Cayford" as my husband called him.

Have a great summer and we will see you in the fall!

Sherry Hambly M.Sc.F.

Pre-Industrial Forest Cover of Northeastern Ontario

By Fred Pinto

Introduction

Knowledge of the pre-industrial forest condition is an important component of Forest Management Plans in Ontario as this information helps to develop forest biodiversity objectives. There are several methods such as use of pollen records in sediments or written descriptions that can be used to describe the historic distribution, composition and abundance of tree species. One method that has been used extensively is the data recorded by the first land surveys in N. America. Changes in forest cover over the past 50 to 150 years can be determined by comparing the historic land survey information to current Forest Resources Inventory (FRI) data. The analysis of these data sets can provide insight into determining factors (logging, climate, etc.) that resulted in observed changes and the insights this information provides to possible future changes. Forest reconstruction has never been attempted over such a large area (***Figure 1***); analysis and validation of the land survey method will help to realise the use of this uncommonly complete historic data in Ontario. The main objective of my study is to illustrate changes in forest composition and to speculate as to the dominant factors and their implications in controlling vegetation change.

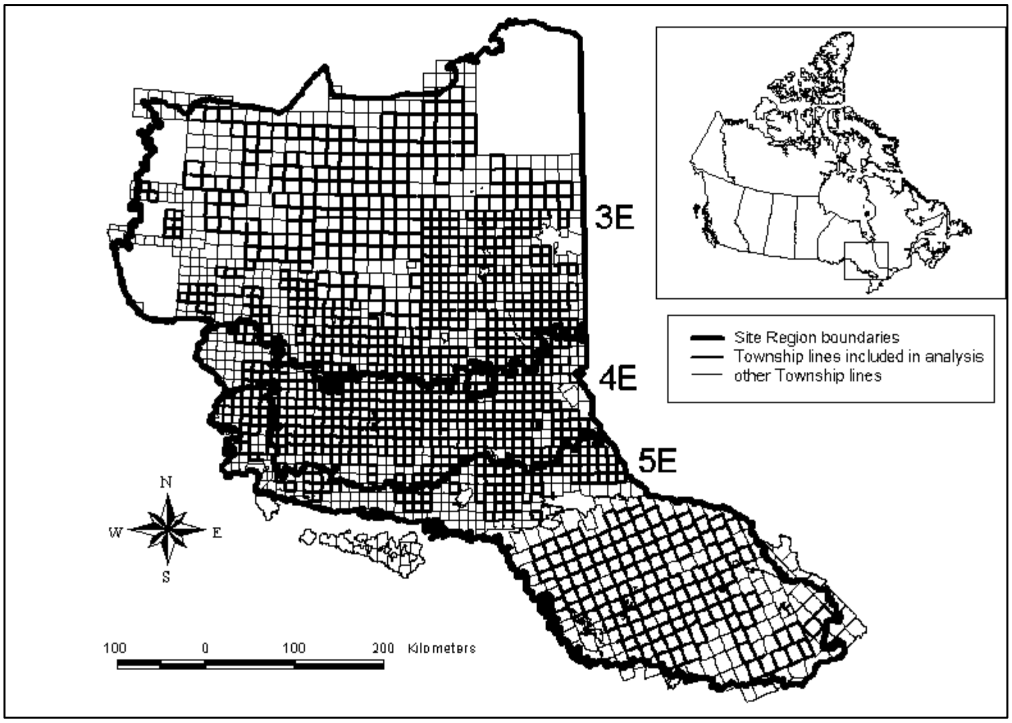


Figure 1. Outline of the township boundaries in the study area. Site Regions described by Rowe (1977) in central and northeastern Ontario, Canada, are outlined by a heavy dark line.

Methods

The pre-industrial forest composition was reconstructed from Ontario Crown Land Survey Notes (OLS) dating from 1856 to 1958 in central and northeastern Ontario (***Fig. 1***). The survey notes contain a detailed description of vegetation cover along the boundaries of each township including the name of the township, the location and extent of the stand along the township boundaries, and a list of tree taxa present within the stand. Stands were delineated by changes in taxa composition or changes in the order in which taxa were listed. Before any analysis could be undertaken I had to translate the tree species names in the OLS to the current tree species names. For example, black birch was re-named yellow birch, banksian or pitch pine was classed as jack pine, Norway or Yellow pine was re-classed as Red Pine (for a complete list see Pinto et al. 2008).

The survey notes explain only the forest composition along township boundaries and do not describe the entire forest cover as the air-photo based FRI do. To account for this difference and perhaps validate the land survey method, the FRI was transcribed into township boundaries and compared to the entire cover to determine the accuracy of boundary descriptions in re-creating the entire forest. In the analysis of tree functional categories, dominant species were grouped into hardwoods and conifers and their percent cover of the forests calculated. The mid-tolerant and tolerant hardwoods could not be distinguished from intolerant hardwoods since birch species were not always distinguished in all land surveys. An attempt was made using binary logistic regression models to determine the tree species when only the genus was recorded by some land surveyors (see Pinto et al 2008 for details).

Results and Discussion

Samples of the results from the 24 different forests in NE Ontario will be sued to illustrate the major findings in tree species changes observed between the historic OLS survey and the current FRI. The analysis revealed that sampling along the township boundary described the composition for common tree species such as spruces, pines, poplar and maple. Tree species composition changes were classed as undetermined when the township boundary description was insufficient in describing the composition of the whole forest. For example, the composition of eastern cedar and soft maple described along each township boundary differed at the 99% confidence level from the composition of these two species within each township in the Algoma – Wawa Forest.

Some major trends are visible in the comparisons (the example shown in ***Table 1*** is from the Minden Bancroft Forest), namely an increase in hardwoods (birch, poplar and maple) and decreases in softwood conifer species, especially red and white pine, jack pine and spruce

Table 1. Comparison of percent composition of first tree taxa (based on percent of township boundary line occupied by the first tree taxa) listed in the Ontario land survey notes and current FRI for the Minden Bancroft Forest.

Species/Species Group	OLS (1837 – 1895)	FRI (2005)	p-value
Black ash	0.75	1.12	
All Ash spp.	0.92	1.12	0.658*
Basswood	0.08	0.07	0.686*
Beech	6.50	0.60	0.000*
Balsam Fir	2.09	5.20	0.000*
White Birch	0.11	5.18	
Yellow Birch	n.p.	0.48	
All Birch spp.	4.12	5.66	0.177*
Eastern Cedar	9.36	5.29	0.000*
Eastern Hemlock	14.10	3.99	0.000*
Tamarack†	2.38	0.22	0.000*
Hard Maple	n.p.	42.33	
Soft Maple	0.03	4.62	
All Maple spp.	16.01	46.95	0.000*
Red Oak†	n.p.	4.36	0.000*
Jack pine†	0.02	<0.01	0.655*
Poplar	1.66	18.37	0.000*
Red Pine	3.02	1.68	
White Pine	2.12	4.58	
All Pine spp.	21.99	6.26	0.000*
Black Spruce	n.p.	0.74	
White Spruce	n.p.		
All Spruce spp.	2.03	1.81	0.933*

* Wilcoxon test on related proportions; † was not able to state with certainty that the changes found along township boundaries for these species reflect changes to the whole forest area; n.a. not applicable; n.p. not present.

These changes are further illustrated using tree functional categories (the example for Figure 2 is from the Algonquin Park Forest) which also show a decrease in conifers and an increase in tolerant and mid-tolerant hardwoods in all forest management units in the study area. Similar results have been found in other studies (Pinto et al., 2008, Jackson et al. 2000). The Algonquin Park and French Severn Forest were different from other forests studied in that evidence of logging was present when the OLS was conducted. In forests where the evidence of logging was low or not evident intolerant hardwoods show a major increase in their abundance.

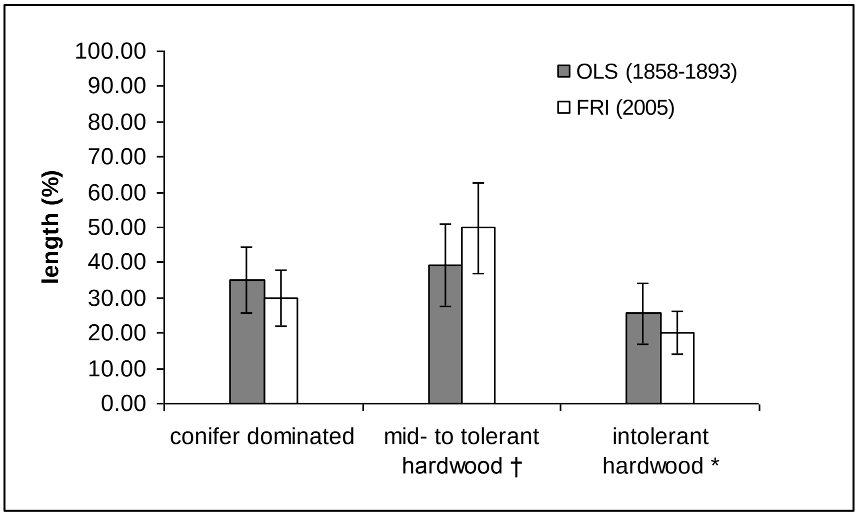
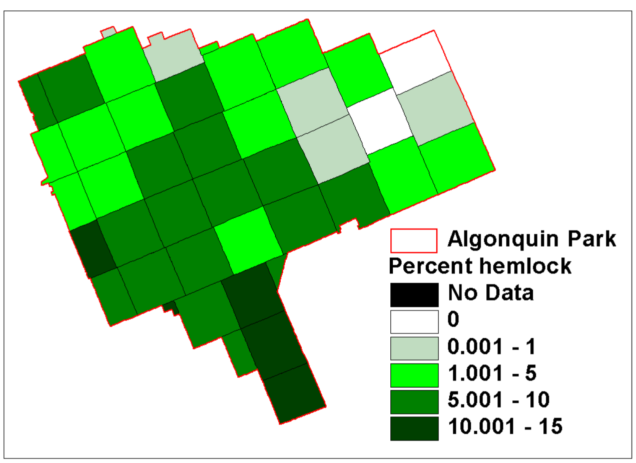


Figure 2. Tree functional categories based on dominant species for the Algonquin Park Forest.* Wilcoxon test on related proportions; † paired t-test with arcsine square root transformation. P-values are 0.140, 0.000 and 0.005, respectively.

It is speculated that changes seen appear to be caused primarily due to fire control and logging operations that removed conifers and selected hardwoods. In the past logging slash left behind and low controls on forest operations, railways and settlers often caused subsequent fires that destroyed potential regeneration, further damaged or killed seed producing trees. Regeneration and tending efforts in the early years of logging in Ontario were extremely small. This enabled trees capable of vegetative reproduction such as poplar and species capable of producing large amounts of wind dispersed seed such as white birch and poplar to become more abundant. These results match the conclusions of similar studies in the United States (Cwynar (1977), Radeloff et al. (1999)). Tree species changes observed are also believed to be due to the introduction of exotic insects (e.g. European larch sawfly) and disease (e.g., white pine blister rust).

The locations of uncommon tree species documented during the OLS were mapped and provided to forest managers (Figure 3, example from Algonquin Park Forest). This information could be used to help in restoring these tree species



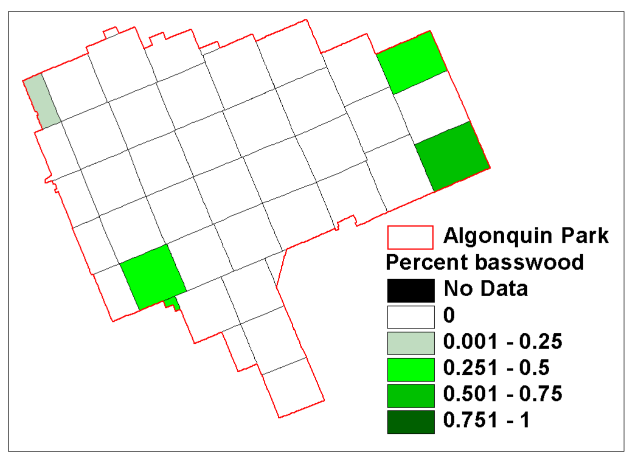


Figure 3. Location of total basswood, hemlock, in the OLS data. Data represents the length of the township boundary occupied by each species as a percentage of the total length of the boundary, assuming equal abundance.

Changes to species composition are also described graphically to help illustrate the changes observed. Figure 4 shows the change in the abundance and distribution of red and white pine across the study area.

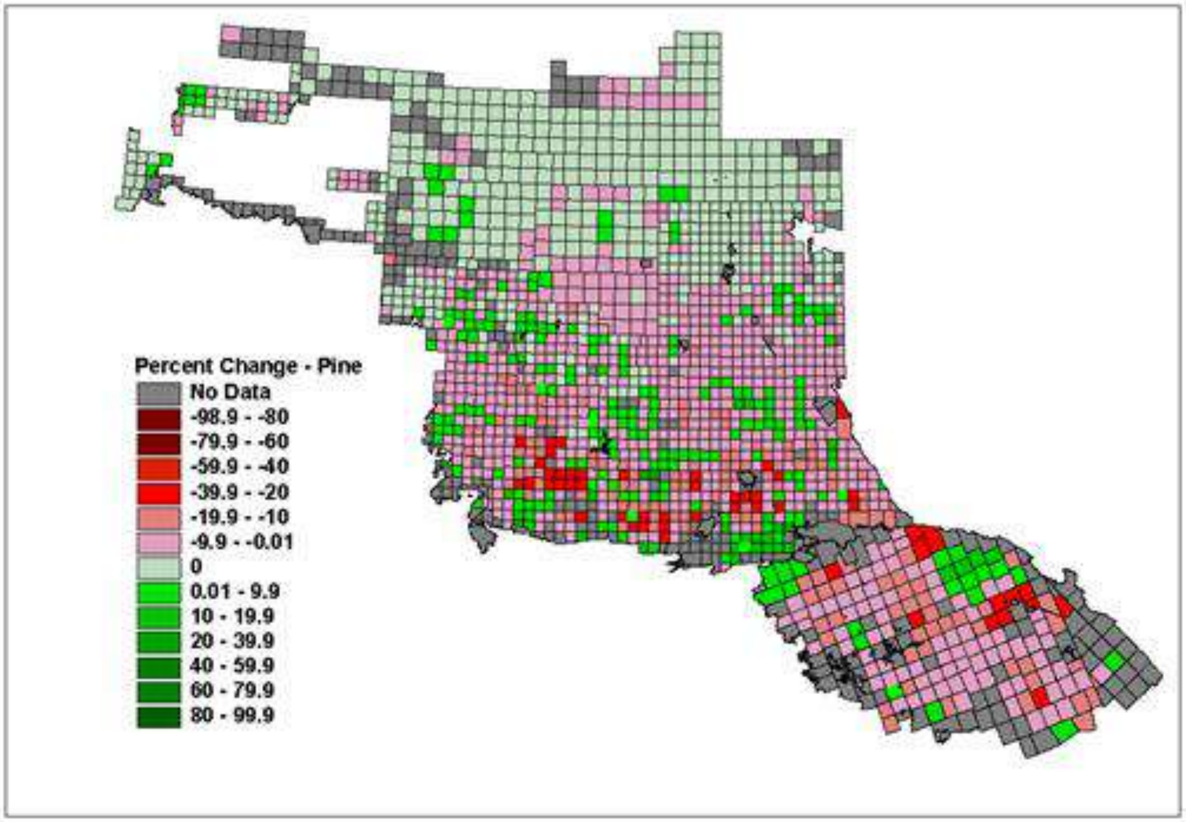


Figure 4. Change in the abundance of red and white pine in the study area between the time of the OLS and the current FRI.

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A History of Forest Resources Inventory in Ontario

By Geordie Robere-McGugan RPF

The history of Forest Resources Inventory (FRI) in Ontario has developed in parallel with forest management and management planning for the province. As the province and the country were being discovered and settled, little consideration was given to any sort of land management or land stewardship. The primary objective was to develop this new land and harvest its resource wealth. It was during the 1800s that most of southern Ontario was surveyed and made ready for development. Settlers who were primarily English, Irish, and Scots from the United Kingdom cleared lands, primarily for agriculture. The only method of gathering any sort of information about the quality of the land for agriculture was to develop associations relating individual tree species or tree species associations with soil type and soil moisture regime. At this time, the only method to obtain this type of information was from information gathered by the surveyors as they ran the concession and lot lines and were recording the main tree species encountered. This collected survey data provided the prospective settler with broad scale cursory level information about the potential productivity of the land for farming and the level of effort required for land clearing.

At this stage of development, the forest in the territories of Ontario was thought to be inexhaustible. Forestry in Ontario, as in every other forested country of the world, began with a century of crude exploitation dominated by policies of immediate gain and short-term expediency (Sylva: Forest Resources Inventory). The concept of a legislative and regulatory framework for forest management was not developed other than the regulation imposed by the Royal Navy. That regulation ensured the harvesting of oak and pine timber were to be reserved for the Royal Navy, and only contractors holding licences from the Navy could harvest timber on public lands (Forest Resources Inventory, Kemptville District, 1957). At this stage, general notes from surveyors provided a satisfactory level of detail of inventory information. However, by 1826 the regulation for reserving oak and pine for the Royal Navy was altered so that anyone could harvest timber on unallocated lands. Associated with the change in the regulation was the requirement of a stumpage fee to be made to the Crown for all volume harvested. These licenses or grants allowed the cutting of all tree species, but the high quality required in the marketplace meant much of the timber volume was never utilized due to the limited size of the market and the transportation logistics of moving hardwoods at the time. These transportation issues resulted in the produced lumber, specifically the hardwoods, being used only in local markets and this resulted in a high risk for wildfire and, combined with land clearing and poor cutting practices, these wildfires were relatively common. Again, the concept of forest inventory was not developed as much of the timber volume present was not utilized. There was no infrastructure to effectively move the cut timber other than using the river systems. Additionally, hardwoods such as maple, beech, birch, and poplar were difficult to move by river systems and there was limited infrastructure to move these hardwoods to other markets. In 1892, granted licenses separated the white and red pine from other conifer species and the less desirable species were the responsibility of the Crown to dispose of. Even at this time there was a concern of the utilization of all tree species and not wasting wood volume by leaving it to contribute to the forest fire fuel load. The development of the regulations associated with timber harvesting indicates that there were starting to be issues with access to quality timber, safety from wildfire, and potential shortages of easily accessible timber volume. Any inventory information collected at this time would be based on ground surveys alone

In the late 19th and early 20th century, Ontario continued with settlement of the province, saw the opening of the west with the development of the Canadian Pacific Railway (CPR) and the birth of the pulp and paper industry. Each of these developments saw the settlement pressure in southern and eastern Ontario change. With the expansion of the west, the CPR created a transportation corridor for both freight and population, connecting the transportation routes on the Great Lakes and the northern interior of the province. The Forest Resources of Ontario, 1930, indicates that a 'general exploratory survey was conducted in 1900 under the supervision of the Department of Crown Lands'. The purpose of this survey was to assess the lands north of the CPR for their suitability for agriculture, settlement, timber resources, and mining potential. This survey must have been completed by ground crews using water as the access for this area in combination with the CPR.

Shortly after World War 1, a survey by the Forestry Branch in Ontario marked the first planned reconnaissance for the whole province. This survey was a partnership between the Ontario Forestry Branch, The Woods and Forest Branch, private industry, and the Dominion Topographical Surveys Branch. The first survey was conducted by ground parties and captured general forest type and age classes but they were limited by existing access. The earliest ground surveys conducted under this sampling plan were located south of the French and Mattawa Rivers and were bound by the roads, trails, and canoe routes of the area.

The development of this planned survey coincided with a regulation that the province had to provide an inventory for lands included in a pulpwood volume application submitted by industry. The huge demand for immediate information to support these applications and the large area these applications represented required a method to map forest type and age class distribution in relation to standing amounts of merchantable timber at a pace much faster than could be provided by a standard ground survey of the time. This demand for information marks the beginning of a Forest Resources Inventory process that shaped modern forest inventory methods. With technological advances of the aircraft during World War I, the concept of aerial sketching of the application areas was introduced. The procedure could quickly assess the application area for merchantable timber volume and could efficiently plan the ground sampling surveys to support the aerial sketching. With aerial maps, ground crews could target important forest types and minimize their time spent in recent burns, muskeg, and other non-productive cover types. The figure below illustrates the typical condition for aerial sketching.

"The front or observer's cockpit, in the hull of the HS2L, was so constructed that the occupant was exposed from the chest up. A sidcotte suit, helmet, goggles and gauntlets were standard equipment. In this exposure and altitude, it was cold at any time. In the early spring and fall flights, it was very penetrating, similar to a stepmother's breath. Working continuously in bare hands was at times unpleasant." (H.H. Parsons – Aerial Timber Sketching Memoirs, 1922-1976).


Typical aerial inventory crew, circa 1922. Photo courtesy of Ontario

The 1920s survey confirmed the vast forests of Ontario required a combination of aerial mapping refined by field visits. The aerial sketching was used to provide efficiencies for the ground survey procedure. The ground survey was integral to accurately assess the conditions described from the air and affirmed that the inventory procedure of the forest, as vast as found in Ontario, was going to require a combination of aerial mapping refined by field visits. By 1926, the first aerial photographs were captured for mapping and inventory. Over the next 20 years the techniques of the newly termed 'Aerial Photographic Method' were perfected and ready to be fully implemented at the end of World War II.

The 'Aerial Photographic Method' included six steps and these are listed as follows:

1. capture of aerial photography
2. preparation of planimetric base maps
3. forest typing on the photographs
4. field checking of forest type maps and collection of volume and growth data by field crews
5. preparation of final forest type maps
6. compilation of quantities of timber and final reports

By 1946 camera, film, and aircraft technologies had advanced significantly and had been widely used for reconnaissance during the Second World War. The development and testing of film types to maximize the ability to interpret forest conditions was conducted during this first cycle of aerial photographs after the war. Film technology advanced from orthochromatic, to panchromatic, to infra-red panchromatic film with a blue lens filter. There was also recognition between the differing needs of the photogrammetrist and those of the forester. There was also the recognition of the skill level required to interpret forest conditions and an understanding of the limitations of the accuracy of assessing certain attributes in stands.

FRI Staff of the Ontario Department of Lands and Forests reviewing aerial photographs. Photo courtesy of the Ontario Ministry of Natural Resources.

The manual *Photographic Interpretation of Tree Species in Ontario* produced by Victor Zsilinszky, originally in 1963, reaffirmed the skill requirements of the photo interpreter. He made the following statement in the introduction of the second edition of the manual *'…the amount and reliability of the information extracted depends on the training and aptitude of the interpreter and his ability to recognize, under the stereoscope, objects with which his is familiar on the ground. In order to interpret forest data successfully, the interpreter requires a forestry background, field experience in the area to be interpreted, and good stereoscopic perception. Forest interpretation involves the appraisal of both quantitative data, such as tree heights that can be measured, and qualitative data, such as the identification of tree species, which is subjective.'* Nearly 50 years later these same assessments of the inventory programs and required skill levels of the people involved are still being made in relation to the assigning of both the subjective and quantitative forest attributes. In the early 1960s, the first edition of the manual produced by Zsilinszky received so much interest that a second edition was required within two years of the first printing. Ontario was known world-wide for its expertise in this area.

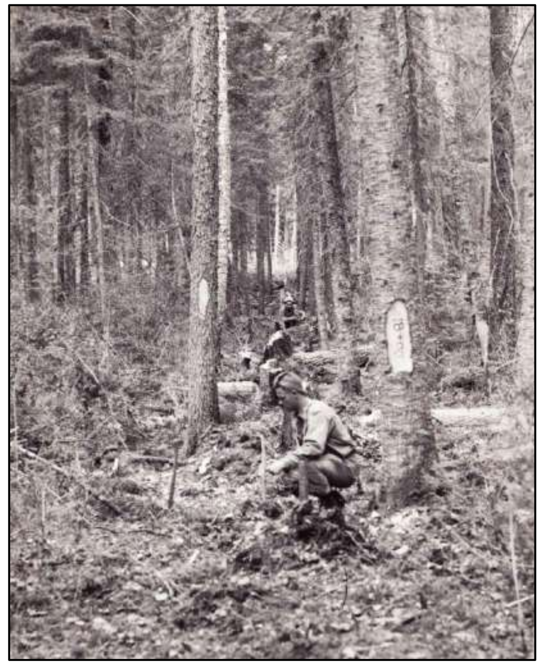
During the post-World War II economic boom there seemed to be a real sense of developing a land ethic and moral obligation to do the "right thing" with respect to managing natural resources. There was the recognition that forestry could no longer just be only exploitation. There was growing awareness that effective management of the forest on a sustained yield basis and forest inventory would be key to developing a new forest management process. In 1958, in the document titled 'Point-Sampling, Wedge Prisms and Their Application in Forest Inventories' direct reference is made to the same issues faced today in the creation of inventory information. 'Forest inventory and operational cruising are items that require the expenditure of money with no direct monetary return. Their value lies in the fact that they form the basis for other operations from which financial return is obtained …… essential that the cost of cruising bears a realistic relationship to the value of the timber involved. At the same time, however, the results which may lead to considerable expenditures must be dependable.'

Conducting a prism count. Photo courtesy of Photo courtesy of the Ontario Ministry of Natural Resources.

Assessing soil type. Photo courtesy of the Ontario Ministry of Natural Resources.

From the Forest Inventory Procedure for Ontario, 1978, the introduction identifies a challenge with the forest inventory that is still present for each iteration of the inventory procedure and ties directly to the insights from 1958. This challenge is 'Since the forest area of Ontario is vast and the volume and value per hectare relatively low, it is essential that the inventory be provided at a low per hectare cost. This requires the widest possible use of aerial photographs, a simplified method of field sampling and rapid and accurate methods of compilation.' This realization of the balance of cost of acquiring inventory information to the relative value of the timber volume on the land base continues to be a balance with each planned inventory.

The FRI Procedure manual from 1978 has two important concepts that continue to play an important role in today's FRI development. 'FRI can only provide an approximation of existing conditions at any given time. It is subject to errors in the measurement of trees and stands, to a sampling error because of the small proportion of the forest actually sampled, and finally to an imperfect correlation between the items measured (e.g., diameter, height) and the answers desired (e.g., volume, growth). There are obvious changes in the methods of creating the new enhanced FRI as compared to previous versions.


Early years survey work crew. Photo courtesy of the Ontario Ministry of Natural Resources.

The largest change has been the introduction of computer technology in all stages of inventory production. Technology has created the transition from film based cameras to digital cameras and this has facilitated the capture of the new imagery being used in the current eFRI. Geographic Information Systems (GIS) have integrated the imagery and planimetric data, made it widely available, relatively easy to edit and update, and integrate into all levels of forest management planning. Technologies have also been integral to the reduction of the cycle time of producing the eFRI. Previous aerial photography schedules were a minimum of ten years in length to capture the photos and did not include the time required to complete the remaining tasks for the inventory. Additionally, technology has increased the accuracy and efficiency of the field program. Aerial sketching assisted the ground crews of the 1920s era from sampling areas of little economic value; technology has assisted in the correct placement of the field calibration plots used in the FRI. Data collected and the collection procedures from the field calibration plots have been integrated into other business sectors of the Ministry of Natural Resources to create better efficiencies for the collected data.

In 1987, the Rosehart report was generated as a reflection of the public's growing concern with the state of management of Ontario's forests. Identified in this report is the concern that the user's needs and expectations have outpaced the progress of the FRI and the FRI development. This report made 19 recommendations for the FRI program to ease the public's concern regarding forest management. Many of these recommendations pertain to the proper financing of the program, incorporation of new technology, decreased turnaround times for the inventory, and making the program interesting enough for young people into the labour market. These recommendations that were brought forward are still applicable to the program and many of these recommendations have been addressed, but with the speed of the technological advances in both computing and remote sensing technologies this is always a moving objective that a large institution has to chase.

With the increased technology and the wider distribution of the data the complexity of demands required from the FRI has increased. The initial collection of the FRI was to provide some level of data for both the Crown and the Licensees of the time. This was an era where there was no information about the forest at all, so even a broad level inventory provided a significant amount of information for anyone operating on the landscape. In today's economic condition, the FRI is transitioning from a strategic level to user's demanding tactical level data to operate efficiently in the global market where labour and delivered wood cost is of paramount importance. With the demands for tactical data, advances are being made to minimize errors in measurement at both the interpretation and field sampling stages. A quicker inventory cycle can be achieved with digital imagery and using computer technologies to automate the description of the forest trees and stands but the FRI will always wrestle with the principle of the 'forest area of Ontario is vast and the volume and value per hectare relatively low.' This requires the widest possible use of remote sensing technologies, efficient field sampling, and accurate and concise compilation. The 2009 revised forest inventory procedures directive reflects this change.

The goal of the FRI has been to 'provide both general statistical data and detailed information on each individual stand' (Forest Inventory Procedure for Ontario, 1978). With the current eFRI there is a strong desire to gather more detailed information for tactical level planning for many uses and users over and above the forest industry including land use planning, conservation planning, forest operations, resource extraction activities, hydro-electric development. The ability to gather tactical level data has always been available but has been limited recently due to the cost associated with field data collection on our large license areas and the relatively low value of each cubic metre of wood volume. With the image and mapping technologies that are currently available some of this tactical information can be derived at the management unit level and provincial level; however, all of these processes require extensive field data collection. The opportunities to gather tactical level data within the FRI under Ontario's current economic reality requires the co-operation between all sectors interested in the forest resources of the province. In the past, the Forest Industry has been expected to provide the FRI; but the FRI is no longer just a data source to prepare Forest Management Plans and harvest areas but rather a critical data source for a variety of program interests. The FRI has traditionally always evolved to support expanded data requirements and the evolution will continue. This evolution will require the enhanced cooperation and combined effort among all resource industries and stakeholders to clearly identify their needs for data, data collection, and cost to produce the future FRI dataset.

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Land – The Foundation

By Peter Uhlig

The early part of the 20th century saw many portions of Ontario's forests significantly depleted. Close to 200 years of widespread and unregulated harvest, burning for potash and charcoal, combined with clearing of the remaining and often unsuitable land for agriculture by waves of immigrants left vast tracts of Ontario damaged and degraded.

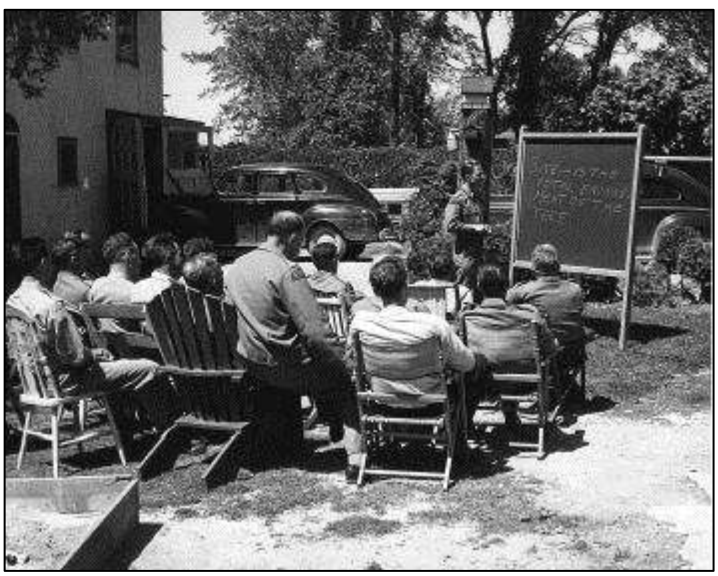
Pioneering and the heady days of initial exploration and economic expansion during the 1800s and early 1900's ran full on into the reality of a depleted resource and the reduced potential of a damaged productive land-base.

The environmental and economic crises of the Great Depression focused further attention on the declining land resource at the highest political levels and resulted in the formation dedicated government resource agencies, resource oriented schools, formal land management legislation guiding planning and practice, land reclamation programs and research facilities.

"A nation that destroys its soils destroys itself. Forests are the lungs of our land, purifying the air and giving fresh strength to our people." F.D. Roosevelt

From this same crucible emerged the early principles of forest and land conservation and accelerated the evolution of the North American profession of forestry. A conservation ethic espousing restoration, wise management and more sustainable and integrated approaches emerged simultaneously from numerous authors such as Zavitz, Leopold, Simonson and Lowdermilk.

"We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect." A. Leopold



Building the foundation – soil and ecosystem training for professional foresters and technicians in southern Ontario during the 1950s – a legacy that continues to today. Photo courtesy of the Ontario Ministry of Natural Resources.

Knowledge of the Land, its capabilities, potentials and limitations, is the foundation for long term sustainability. The impact of early Canadian and Ontario leaders such as Zavitz, Larose and Cousens has already been dealt with in earlier issues of this newsletter. Growing out of that legacy, and within the institutions they helped to create, work was undertaken to systematically study, characterize, inventory and evaluate the land resource and then apply that knowledge formally through forest management planning and practice.

Early thought and practice related to land description was based primarily in the agronomic philosophy, with concepts of husbandry, soil and crop production, crop planning and rotation as their focus. The relatively long traditions of agriculture, soil survey and forest management began to merge into a more holistic and ecological approach that sought to employ the methods and practices best suited to the potentials of the land.

"If the soil is destroyed, then our liberty of action and choice are gone ..." - W.C. Lowdermilk, 1953.

Of particular note here in Ontario is the emergence post-war of concerted studies in forest resources inventory and productivity. While formal soil surveys began earlier in the century work accelerated and expanded in the 1930s.

Combined with the availability of improved war-time technologies of aerial photo-interpretation and mapping released for civilian use it became feasible to consider the assessment of the vast geography and resources of Ontario. Concurrently there was a maturation of soil classification and survey methods, landform and ecological knowledge which was brought to bear in the assessment of Ontario's lands.

A leading figure in this evolution was G. Angus Hills who began his career with government in 1934 as a soil surveyor. Firsthand experience on the contrasting lands of southern and northern Ontario ignited a strong curiosity to investigate the reasons for the differences and a life-long personal commitment to improve strategic decision making based on sound ecological information. A pioneer in Ontario's soil survey program he pursued graduate studies and made a dramatic shift in 1944 to the Ontario Department of Lands and Forest so as to be better positioned to influence positive change.

His work continued to have a soil focus. However, his consistent message was one of an integrated environmental approach making use of climate, vegetation, landform and soils information as a framework for evaluation and planning. In 1949 he participated as a special advisor to the Select Committee on Conservation in Northern Ontario demonstrating the need to change the province's settlement and land practice policies. Studies like the Glackmeyer Land-Use Report (1960) proved effective in presenting the case for environmental assessment to guide sustainable development. Throughout the 50's and 60's Hills' studies, writings and personal influence began to be recognized. Numerous articles published by Hills during this period and on into the 1970's clearly articulated his vision for a holistic basis for resource evaluation and planning based not only on soils but also on regional climate, topography, landform and biota.

Angus Hills takes sighting of bedrock slope during soil survey field work. Photo courtesy of the Ontario Ministry of Natural Resources.

His appreciation for integration across spatial scales was profound and led him to produce Ontario's first comprehensive ecoregionalization known as the site regions and districts of Ontario. This framework has recently been revised and still serves as strategic tool guiding resource management and protection. Hills was among the very first ecologists to elaborate a full landscape classification typology from ecoregions down through landscape and land type units for regional and sub-regional planning; continuing to site units representing the finest scaled components of individual plant communities and soil types for use in detailed assessments of community ecology, resource productivity and as guidance for inventory.

Concurrent work by colleague Walter Plonski, who was examining forest productivity trends as measured by site index and volume, together with work by Morawski on forest mortality was integrated with photo-interpretation to provide Ontario's first comprehensive Forest Resources Inventory and forest management planning information framework (see article elsewhere in this issue for the history of Ontario's Forest Resources Inventory).

In1961 Hills published his pivotal report entitled "The Ecological Basis for Land use Planning" which summarized classification approaches, a hierarchical classification typology from regions to sites, principles for field assessment and inventory plus many principles to guide evaluation and sound decision making. This seminal work emerged just prior to the initiation of the Canada Land Inventory and Ontario Land Inventory programs and was enormously influential. As a result of this work, Hills and Ontario took a leadership role in the development of classification and evaluation concepts and field methods applied nationally. Although the program concluded in the late 1970's, many of the products, particularly the base land maps, are still of value today due to the excellent conceptual basis and strong technical skills of those who delivered the program.

Across Canada numerous contemporaries built upon Hills' work and are echoed in the work of Rowe (nationally); Loucks in New Brunswick and Nova Scotia; Damman in Labrador and Newfoundland, Jurdant in Quebec; Krajina and Klinka in B.C., and many others.

Beginning in the late 1970s Ontario saw a rapid development of regionally focused ecosystem classifications, beginning in the Claybelt portions of northeastern Ontario and progressing across northwestern, northcentral and central Ontario. Due to very high need for sound ecological information to help guide forest management practices, wetland and wildlife habitat interpretations, and protect important systems like old growth, work expanded rapidly beyond the original domain of forests and also began to examine wetlands. The work of Jeglum in the mid-70's followed by the Canadian Wetland Classification, wetland ecosystem classification work by Harris and colleagues continues to this day. It is this work which resulted in the realization of many of the critical site–level tools envisioned but not completed by Hills during his lifetime.

The ecosystem classification products were greeted with enthusiasm and were widely applied. However, individual classifications were different enough in their structure that further work was identified to unify the regional classifications into a consistent provincial framework. This effort has resulted in the evolution of the current objectives of the provincial Ecological Land Classification (ELC) program and will result in a consistent as well as ecologically and geographically comprehensive classification addressing all ecosystems on the entire land base of Ontario.

Classification is only one tool and serves to identify the range of site conditions and controlling factors. It provides a typology addressing the question of – what is out there. Classification serves as the legend for inventory and through inventory and provides essential information on where specific conditions exist, their abundance and pattern on the landscape. It is this direct and explicit connection of ecosystem classification products to various methods of inventory that have been an important focus for some time.

Angus Hills and field survey crew pause during work in Northwestern Ontario. Photo courtesy of the Ontario Ministry of Natural Resources.

Coinciding with the emergence of geographical information system technology considerable interest emerged during the late 1970's and '80's in the area of specialized component soil surveys. Several regionally focused programs provided excellent work done in broad area soil surveys for portions of the province poorly addressed by traditional agricultural surveys. The Forest Land Productivity Surveys and Prime Land Inventory programs were explicitly linked to forest growth and yield assessments in order to provide land stratification for managing investment based on the enduring attributes of soils.

The most modern effort is now combining the ecosystem classification approach directly with digital imagery and new interpretation techniques to provide a fully integrated enhanced forest resources inventory. The new inventory presents traditional forest attributes together with ecosystem class and soil parameters the integrated inventory is poised to provide a powerful comprehensive tool to provide the foundation for ecological planning in the province.

Despite great progress and improved knowledge it is still apparent that resources are under threat, driven by growing population and demand, short-term economic gain and with rampant and consumptive exploitation of the world's agricultural and forest lands globally.

Drawing on the rich legacy of ecosystem classification and inventory in the province we have the tools to promote the ethical and sustainable use of all our lands now and into the future.

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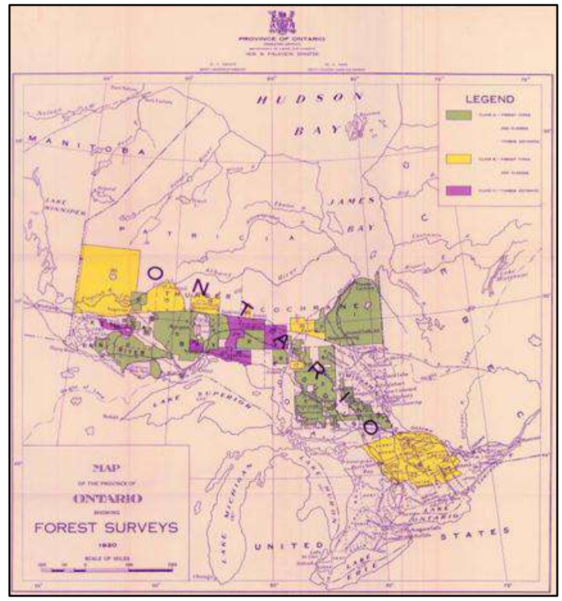
Reporting on the Forest

By Larry Watkins

The Forest Resources Inventory (FRI) has been summarized, analyzed and reported on for nearly 100 years. Starting in 1919, the Ontario Forestry Branch began inventorying portions of the province. By 1930, over 18 million hectares had been surveyed, with an additional 3 million hectares completed by pulp and paper companies.

In those days, the Forests Resources of Ontario (FRO) summaries were generally text based descriptions discussing forest conditions, fire and insect history as well as the physical features of each forest region. There were eight forest regions at the time, an early form of an ecological land classification. Total area was reported (in acres), including agricultural area and forest area.



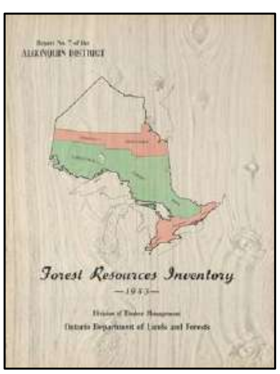
Map showing state of forest inventories circa 1930. Photo courtesy of the Ontario Ministry of Natural Resources.

Forest resources summaries before the 1950's were very product-centric. Each region had estimates of spruce, fir and jack pine in cords, as well as maple, yellow birch, white and red pine in board feet. Forests were grouped into age classes – mature, second growth, young, recently burned and barren or muskeg. Non-commercial products such as poplar were often ignored in stand descriptions unless they made up a significant portion of the stand.

In 1946, the Ontario Department of Lands and Forests began surveying more extensively. R.M. Dixon began enhancing forest inventories through increased operational cruising and better inventory technology. The high-tech wedge prism and stick relascope (a stick with a peep-hole attached to a metal pole) are described in Dixon's point sampling manual. The foreword of his manual reads:

"Forest inventory and operational cruising are items that require the expenditure of money with no direct monetary return. Their value lies in the fact that they form the basis of other operations from which a financial return is obtained.

During the past few years an inventory method producing accurate results in a shorter time at a lower cost has gained wide acceptance across Europe, the U.S. and Australia."



Algonquin District forest resources inventory report. Photo courtesy of the Ontario Ministry of Natural Resources.

After six years of intensive inventory work and compilation, Dixon began to publish the Forest Resources Inventory report series by district. With the classic wood-grained cover, the series was produced between 1953 and 1957. An aerial photo of a districts' most significant forest industry town in each district was included, as well as photos of inventory work, the local people, forests and harvesting operations. Some of the photo captions are entertaining.

Each of the province's 22 districts had an individual report. The reports have survey highlights, area summaries by ownership, age classes and forest types, as well as volume and growth tables. A report based on the far north was also created, with the forest lands labelled "potentially exploitable".

The cover type summary for the Geraldton District is shown at right. Cover type in the FRO series was broken down into coniferous, hardwood and mixedwood forest cover types and three age class groupings or seral stages. The hardwood and softwood cover types contain 75% of the appropriate species, leaving the remainder as mixedwood.

Table showing classification of productive forest lands into cover types.

Cover type and age class	Crown land		Patented land		Total	
	acres	*per cent*	*acres*	*per cent*	*acres*	*per cent*
Coniferous type:						
Mature	2,289,595	36	121	17	2,289,716	36
Immature	738,862	12	38	5	738,900	12
Young-growth	537,223	9	96	14	537,319	9
TOTAL	3,565,680	57	255	36	3,565,935	57
Hardwood type:						
Mature	121,794	2	....	....	121,794	2
Immature	112,387	2	2	....	112,389	2
Young growth	45,536	1	....	....	45,536	1
TOTAL	279,717	5	2	....	279,719	5
Mixedwood type:						
Mature	1,139,619	18	68	10	1,139,687	18
Immature	567,238	9	73	10	567,311	9
Young growth	185,205	3	299	42	185,504	3
TOTAL	1,892,062	30	440	62	1,892,502	30
Reproducing forest	524,147	8	16	2	524,163	8
TOTAL PRODUCTIVE FOREST	6,261,606	100	713	100	6,262,319	100

A quick comparison to the Crown forests that make up Geraldton District in 1953 show that the current forest cover classes match very closely.

Cover types, Geraldton District Crown forests.

Cover Type	FRO 1953	FRO 2011
Coniferous	57%	59%
Hardwood	5%	9%
Mixedwood	30%	24%
Reproducing	8%	8%

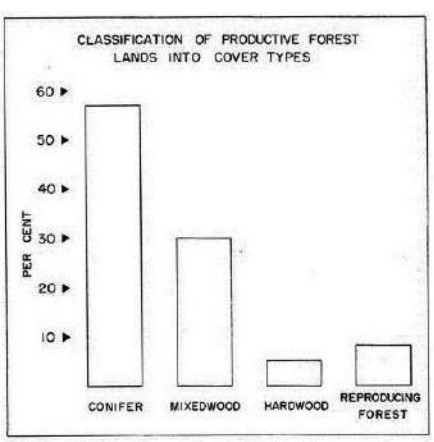
However, I'm sure that the five minutes it took to compile these statistics on my GIS system in 2012 must have taken weeks or months of ledger work in 1953. As well, the reader needs to remember that inventory methodologies were certainly different in the 1950's.

The 6.3 million acres in this forest translates to 2.5 million hectares, and are made up of the eastern portions of the Lake Nipigon and Ogoki Forests, and the bulk of the Kenogami, Big Pic, Pic River and Black River Forests.

At the bottom of table 3, the "reproducing forest" illustrates that classifying non-free-to-grow stands was an issue even in the 1950's.

"Reproducing forests include all areas of young growth which have not attained a sufficiently stable or complete composition to be classified into types."

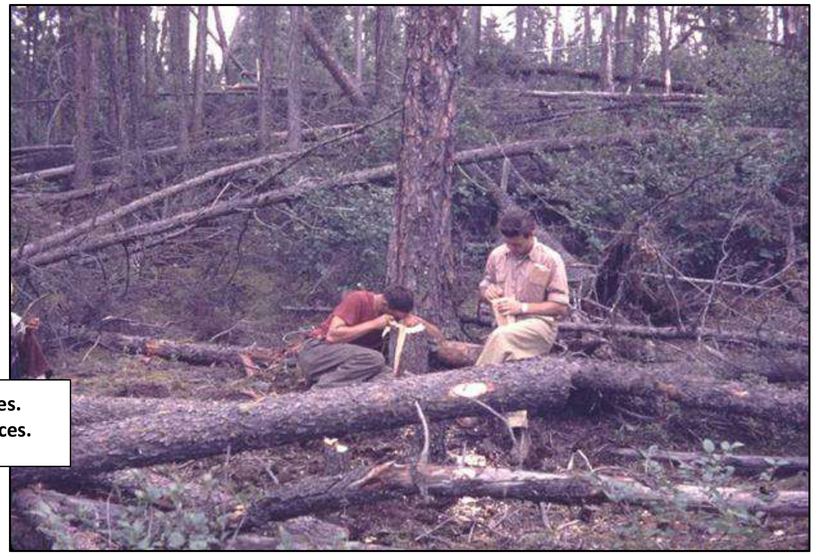
Volumes were calculated in a similar methodology to today, and were reported on in cubic foot volumes by dbh (diameter breast height) classes. The only additional feature of the early FRO reports were a summary of allowable cut, including methodology and cull factors used in the calculations. The formula was a simple calculation: 5/8ths volume over rotation age of the forest.



The allowable cut for the Geraldton District translates to 4.6 million cubic metres annually, higher than what is currently allocated, roughly 3.1 million cubic metres annually.

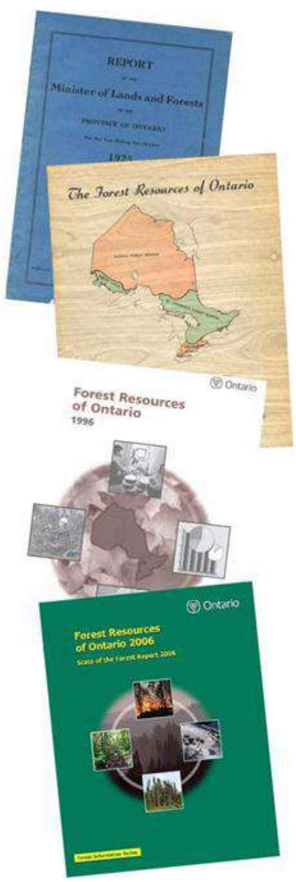
It would be 25 years before allowable cuts were calculated on the mainframe in Queen's Park; 30 years before personal computers were crunching the allowable cut, and 45 years before the strategic forest management model was introduced to generate an optimized harvest level.

At the same time Dixon was compiling the FRO series, Walter Plonski began his growth and yield research across north-eastern Ontario. In 1956 he published the first edition of his normal yield tables. The introduction of the normalized pure species yield curves allowed foresters to further refine volume calculations and allowable cut levels. These tables were refined and republished several times over the next 25 years.



Field crew collecting data for Plonski's normal yield tables.
Photo courtesy of the Ontario Ministry of Natural Resources.

In 1963 a provincial summary of the 1950's publications was also generated, with more maps, tables and graphs detailing non-forest land classes as well as enhanced forest area and volume summaries. This was the most comprehensive FRO to date.

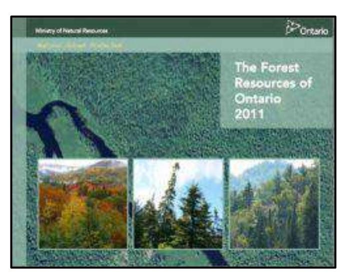


From 1963 through to 1986, the FRO series was not published in favour of the Ontario Ministry of Natural Resources (OMNR)Annual Statistics Report series. A land area and primary growing stock volume table were all that were reported on under the Timber Sales Branch portion of the reports, along with allowable harvest levels and forest management activities. This series was discontinued in 1988, and evolved into the Provincial Annual Report on Forest Management in 1996. Detailed inventory summaries were generated internally as part of the Timber Production Policy work that focused on wood supply and calculating allowable harvest levels.

In 1986, The Forest Resources Group undertook the task of generating an FRO. Since this was before the Forest Environmental Assessment, the report focussed on inventoried area rather than the managed Crown forest. Inventories collected from the mid-1970s by the OMNR, as well as company inventories were compiled on a mainframe in Toronto. Summaries of area and growing stock were published at a provincial level as well as the eight administrative regions at the time.

Rather than cover type, forest classes were aggregated into working groups, or dominant stand tree species. Working group had been used in aggregating stands for some time as it made relating Plonski's volume work easier. Working group summaries continue to be published in the FRO series as a historical link back to previous versions of the report, even though new ways of classifying stands have been introduced.

In 1996, 10 years after the most recent FRO, I began to compile inventories for the Forest Resources Assessment Project. Since we had taken the time to summarize very similar forest information, we decided to publish FRO 1996. The 1996 Assessment Policy recommended that it be produced every five years from that point onward. So in 2001, 2006 and just posted for 2011, I have written and published the series. Each new report contains more information, more detail and more maps than the previous one. I have tailored the report to answer the many questions about the forest that come across my desk on a daily basis. The 2011 version is available online at:



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Forest Inventory Past and Present

By Laura Pickering and John Pineau

Since 1908, the Canadian Institute of Forestry/Institut forestier (CIF/IFC) du Canada has played an important role in advancing sound forest science, and has also worked to help forest professionals and practitioners have access to the best and most up-to-date information. As a result, the CIF/IFC has a distinct interest and some pride in how far forest inventory science has come, and where it is heading now and into the future. Much to the delight of members of the Institute, the Forest History Society of Ontario unveiled an excellent forest inventory display at the Bush Plan Museum in Sault Ste. Marie, during the recent Ontario Professional Foresters Association conference. Hopefully this display will draw attention to the crucial importance of forest and natural resources inventory as it relates to the sustainable management of Canadian forests.

With an evolving and progressive definition of what actually is involved in sustainable forest management over many decades, there has been an ever increasing need for accurate and cost-effective spatially referenced forest data and information – whether paper or mylar maps, or eventually digital and contained in geographic information systems. Taking inventory of our forests serves many purposes at both operational and strategic levels. First and foremost it allows forest practitioners to know what tree species are growing in a certain area, and the distribution of those species throughout many stands. Inventory contains any variety of attribute data relating to the trees specifically, as well as to characteristics of the forest ecosystem itself. All of this data can then be used in timber supply analysis and to populate models, including for wildlife habitat supply, that are integral to the development of forest management plans, maintaining biodiversity, road layout and plans for silvicultural regeneration activities.

Technologies have advanced in the past 20 years, and forest practitioners are working hard to keep up. LiDAR and high resolution multispectral digital imagery are remote sensing technologies that we are now using to create enhanced forest inventories of areas in order to ensure the best management possible. LiDAR stands for Light Detection and Ranging and is described as being able to measure the distance to, or other properties of an intended target by illuminating the target with light – i.e. using pulses from a laser. Airborne LiDAR systems can be used to study canopy heights, biomass measurement and leaf area indices. However until recently, LiDAR has been underutilized in Canadian forestry, even though it is being used extensively in other parts of the world.

There is a regular complaint in Canadian jurisdictions with respect to the lack of quality of existing forest inventory and the need to enhance the attributes that we derive and interpret, generally from remotely sensed images. To effectively and sustainably manage forest ecosystems and all their values, we must have a good handle on what is out there. For any company to make intelligent business decisions, up to date, accurate inventory is also essential. Remote sensing technology, including high-resolution digital imagery, LiDAR, as well as associated interpretation software, combined with valid field verification techniques can now very positively contribute to the production of enhanced forest inventory and higly accurate digital elevation models, arguably in a cost-effective manner. This is actually happening and is already operational in a growing number of jurisdictions, but it is not as common as it should be at an operational level.

In the not too recent past, remote sensing technology made big promises but failed to deliver until improvements in sensor technologies, including inertial navigation, GPS, spatially accurate digital multispectral imagery and spatially accurate LiDAR were realized. The technology components have matured and are also finally delivering at much more reasonable prices. However, we have become risk averse, given past promise and lack of delivery, so now many individuals responsible for inventory in government and industry are hesitant to take a chance... But the time has never been better to take the risks and begin to reap the benefits of what new or improved technology, new science, and dedicated and innovative professional and technical people can actually deliver.

As we move into a future that will no doubt continue to bedazzle us with ever-changing and more powerful technology and innovation, it is important to remember that this change is a largely a good thing, and it can be used very positively. The display at the Bush Plane Museum is a wonderful visual history that demonstrates just how far forest inventory has come; and LiDAR and high resolution digital imagery, with its endless possibilities, represents a future where the sky is limit!

LIDAR - Enhancing Forest Resources Inventory

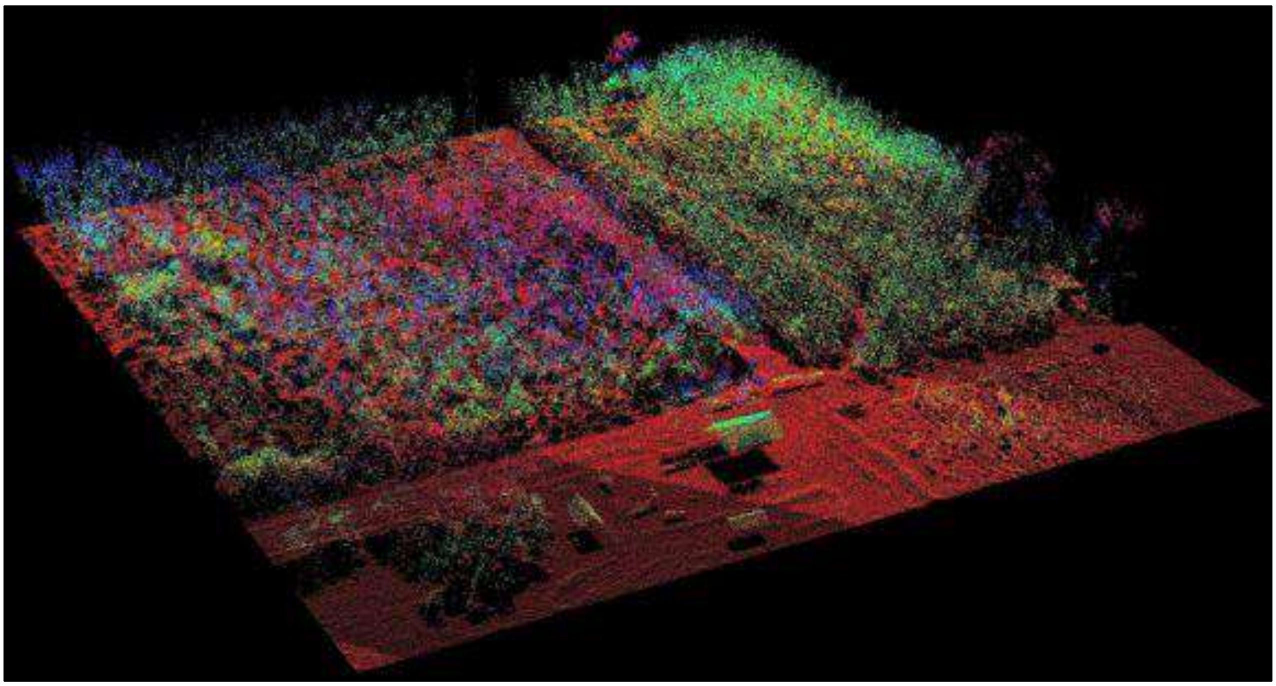
Kevin Lim PhD

Introduction

The purpose of this article is to provide a general overview of how LiDAR remote sensing is being used to enhance the information content of traditional forest resources inventories. While LiDAR sensors can be mounted on a vehicle (i.e., mobile LiDAR), such as a truck, or a tripod (i.e., terrestrial LiDAR), the focus here will be on LiDAR remote sensing from fixed wing aircraft (i.e., airborne LiDAR).

What is LiDAR?

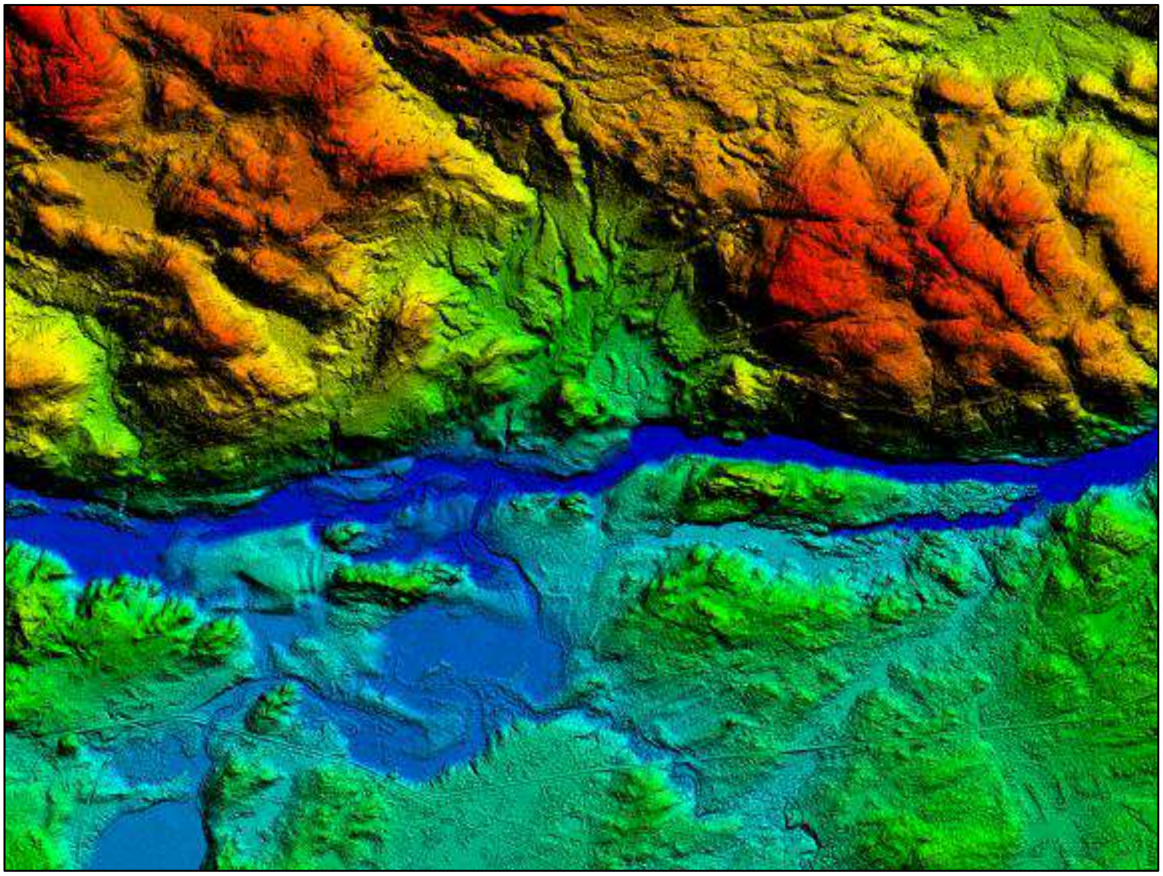
LiDAR is an acronym for light detection and ranging and is a remote sensing technology that is capable of collecting very accurate measurements of the earth's terrain and features found on it. The output from LiDAR remote sensing is a three-dimensional (3-D) point cloud, which is comprised of millions of individual x-y-z points. The vertical accuracy of each point measurement can be as good as 15 cm with horizontal accuracies well within half a meter. An example of a point cloud is depicted below. Of note is that despite the presence of forest canopy, LiDAR is still capable of collecting measurements of the underlying terrain (brown points) unlike other remote sensing technologies.



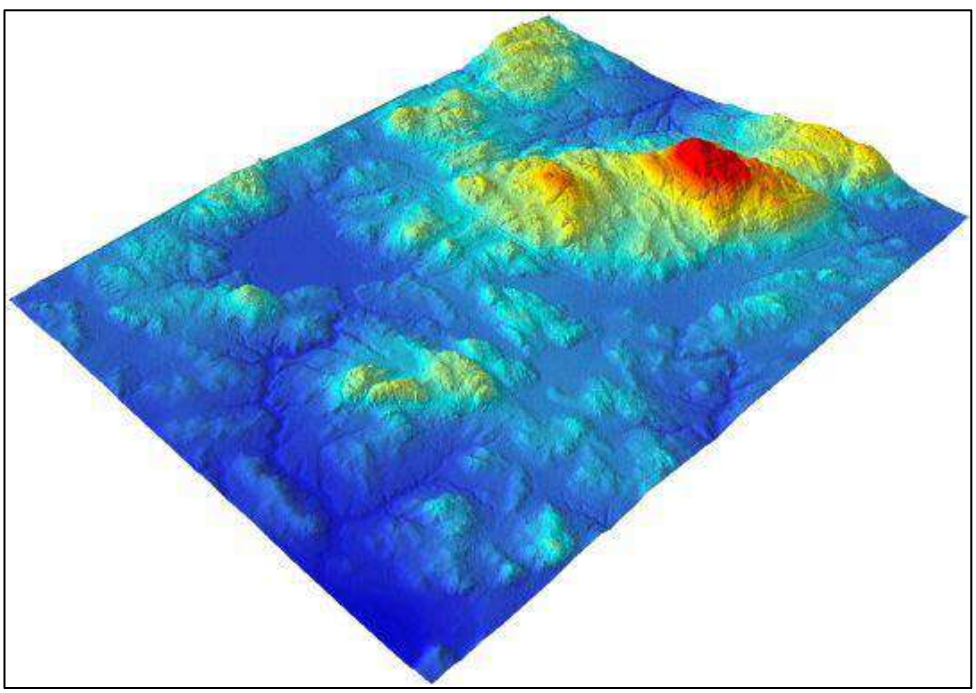
Common LiDAR Products

Before discussing how LiDAR can be used to enhance forest resources inventories, it is important to note that there are several very useful information products that can be easily derived from the point cloud. The first is what is called a digital elevation model or DEM. A DEM is a surface model of the ground or terrain. It is derived from the LiDAR point cloud by using only those points that have been classified as the ground—when a customer receives a point cloud as a deliverable, the points are often classified into ground and non-ground classes.

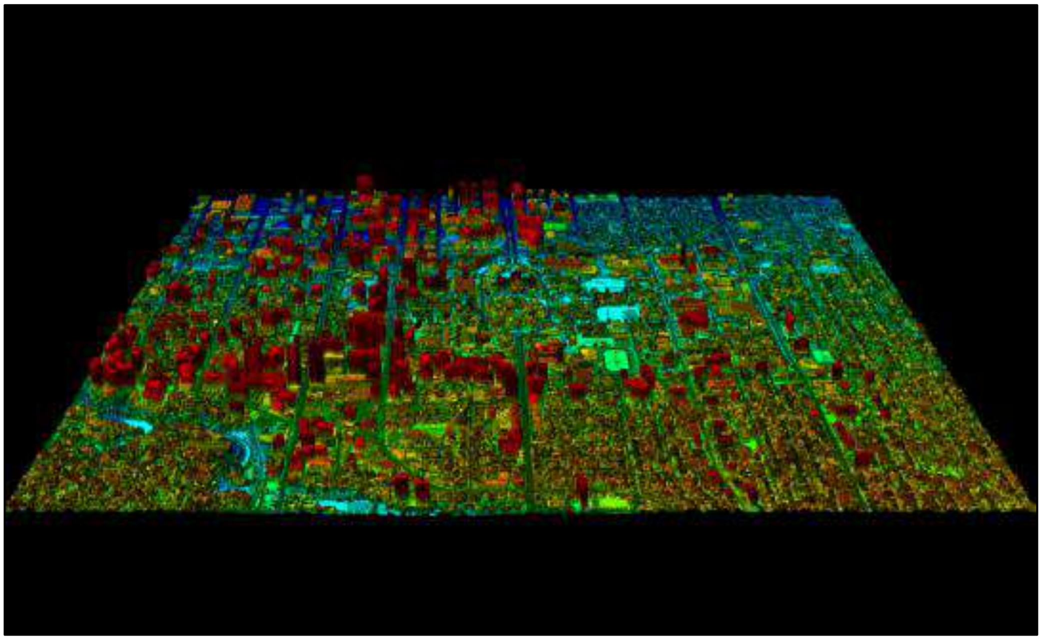
The figure below illustrates a 2 m DEM of the Samuel de Champlain Provincial Park area. A DEM is comprised of many pixels and the 2 m descriptor simply indicates that each pixel represents a 2 x 2 m area. These types of high resolution DEMs are very useful to foresters as they can be used to optimize forest road planning and engineering. Furthermore, computer algorithms can be applied to the DEM to predict hydrological features, such as potential unmapped streams, thereby allowing foresters to plan appropriately and efficiently for water crossings during road planning and remain compliant with provincial regulations.



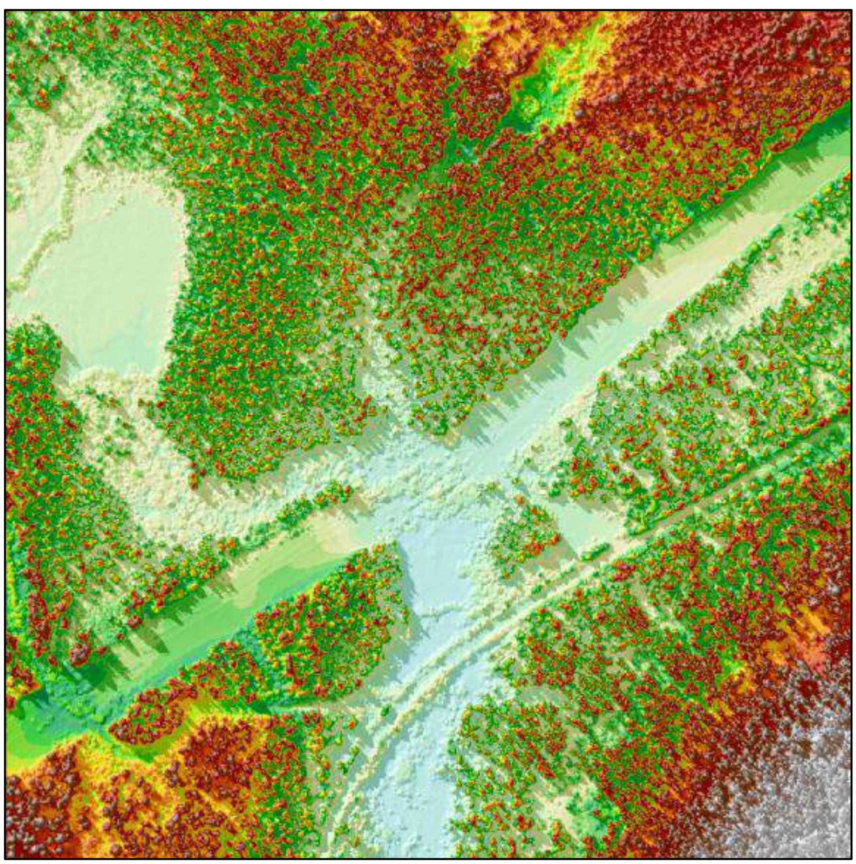
Because LiDAR remote sensing collects three-dimensional information, the DEM can also be visualized in 3-D space as shown below. The ability to visualize in 3-D space and “fly” through the land base is incredibly powerful.



Another common product derived from the point cloud is a digital surface model or DSM. A DSM is similar to a DEM, but represents the above ground features (e.g., trees and buildings), in addition to the ground terrain. An example is shown below.



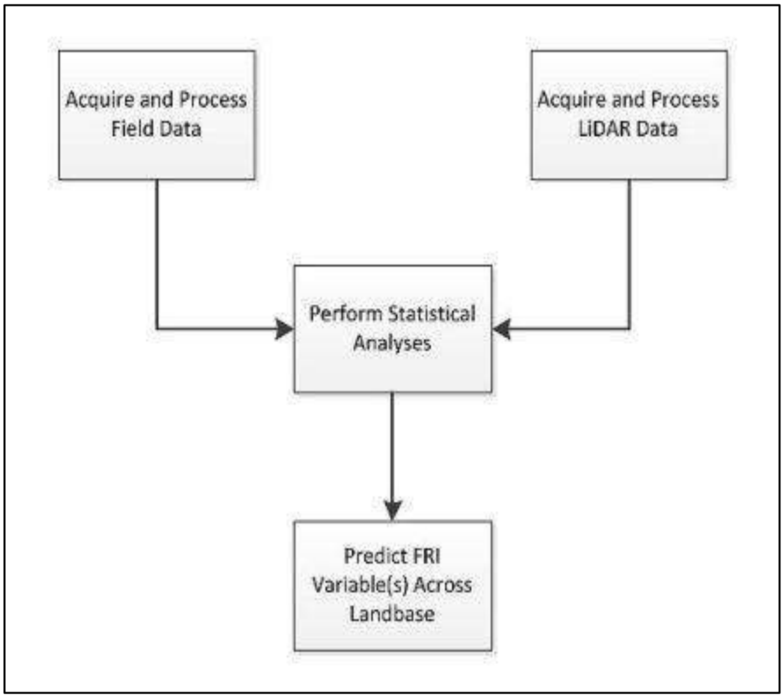
Lastly, by subtracting the DEM from the DSM, a Canopy Height Model (CHM) is obtained. A CHM is a very powerful information product for foresters as it accurately and consistently describes forest canopy height across forested land bases. A 1 m CHM, meaning that for each 1 x 1 m pixel, there is an associated forest canopy height value, is shown below.



DEMs, DSMs, and CHMs are common information products that can be easily derived from LiDAR remotely sensed data using geographic information system (GIS) software, but there is much more that can be derived from the point cloud.

Enhancing Forest Inventories

LiDAR can also be used to enhance forest resources inventories by providing spatially explicit predictions of forest resources inventory variables, such as gross merchantable volume and aboveground biomass. Whereas a university course could be taught on how this is accomplished, the flowchart below provides a high level summary.

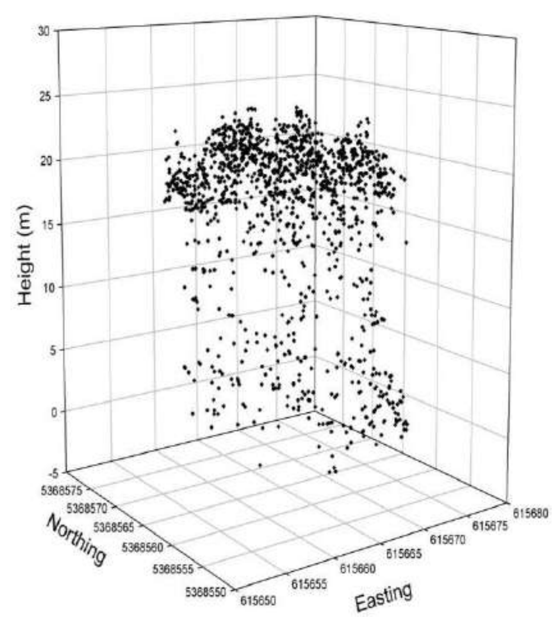


Field data from geo-referenced (e.g., by GPS) permanent and temporary sample plots (PSPs and TSPs) are required and cannot be avoided. Whereas accurately positioning plots using GPS under forest canopies have been problematic in the past, recent advances with GPS technology have largely resolved past challenges. Plot summaries of the forest inventory variables of interest need to be tallied up. Variables that have been considered to date include:

- Top Height
- Average Height
- Density
- Quadratic Mean Diameter
- Basal Area (BA)
- Gross Total Volume
- Gross Merchantable Volume (GMV)
- Total Aboveground Biomass
- GMV, BA, and Density by Size Class

By no means is this an exhaustive list and the potential exists to model other forest inventory variables.

For the LiDAR data, subsets of the point cloud corresponding to the points that intersect the field plots are extracted, and predictors are derived from the LiDAR point cloud for each plot. The figure to the right depicts the point cloud for an arbitrary plot.

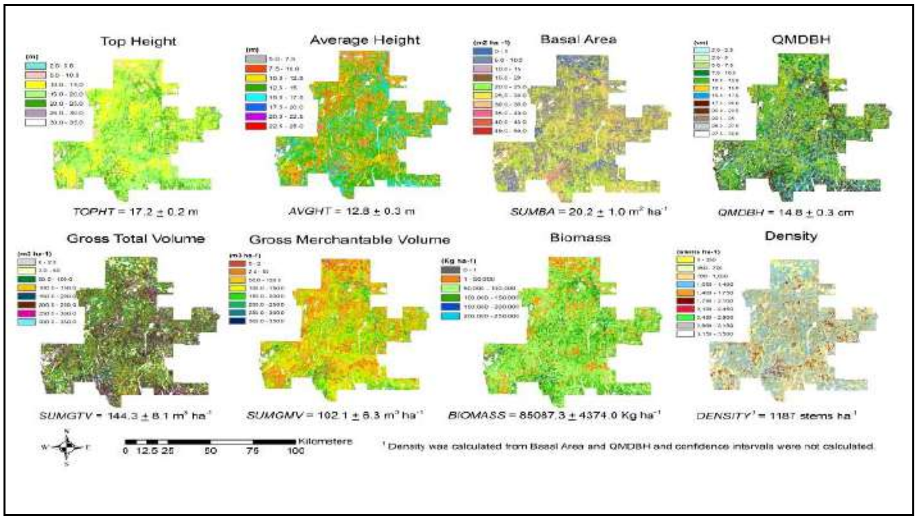


From the points that intersect each field plot, various LiDAR predictors are extracted. The following is a list of common LiDAR predictors:

- Mean Canopy Height
- Maximum Canopy Height
- Standard Deviation of Canopy Height
- Percentiles (e.g., median) of Canopy Height
- Canopy Density Metrics

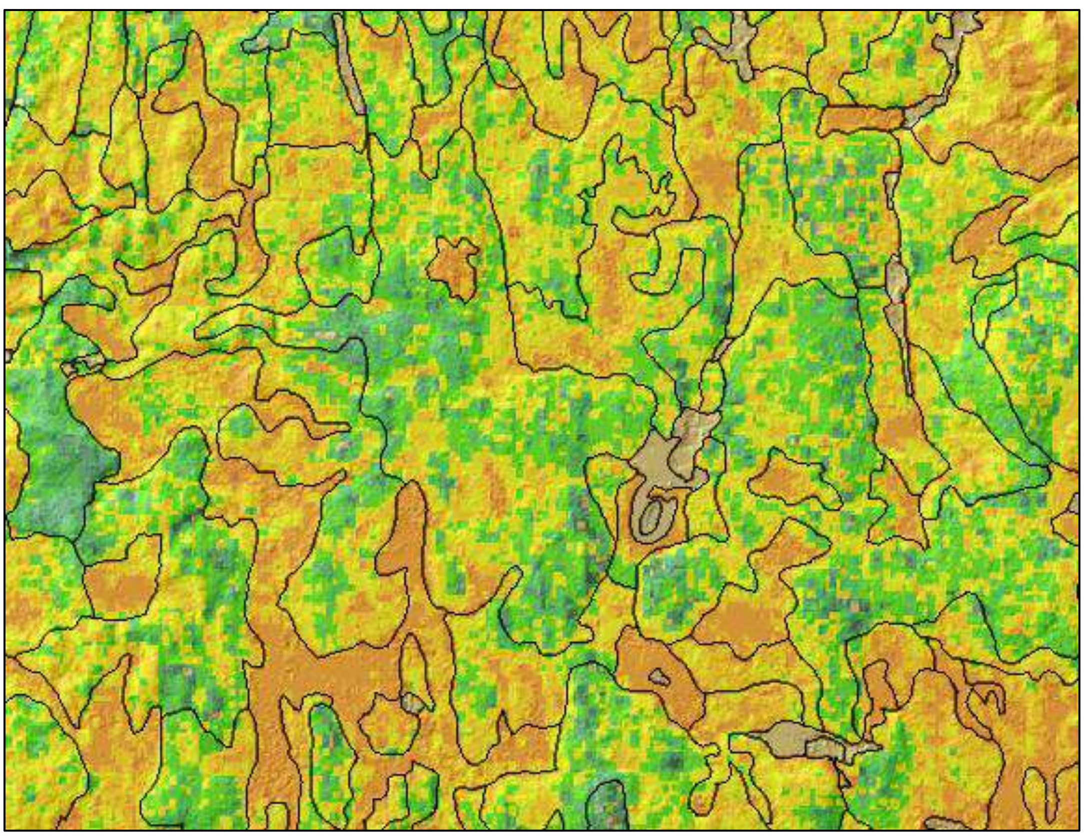
Once the plot summaries are available and the LiDAR predictors have been extracted, statistical analyses are performed to develop predictive models for each forest inventory variable considered. With these predictive models (i.e., regression equations) in hand, spatially explicit predictions across the entire forested land base can be made.

As an example, spatially explicit predictions for eight forest inventory variables for the Romeo Malette forest in Northern Ontario is shown below. Each 20 x 20 m pixel is comprised of individual predictions of the forest inventory variables considered.



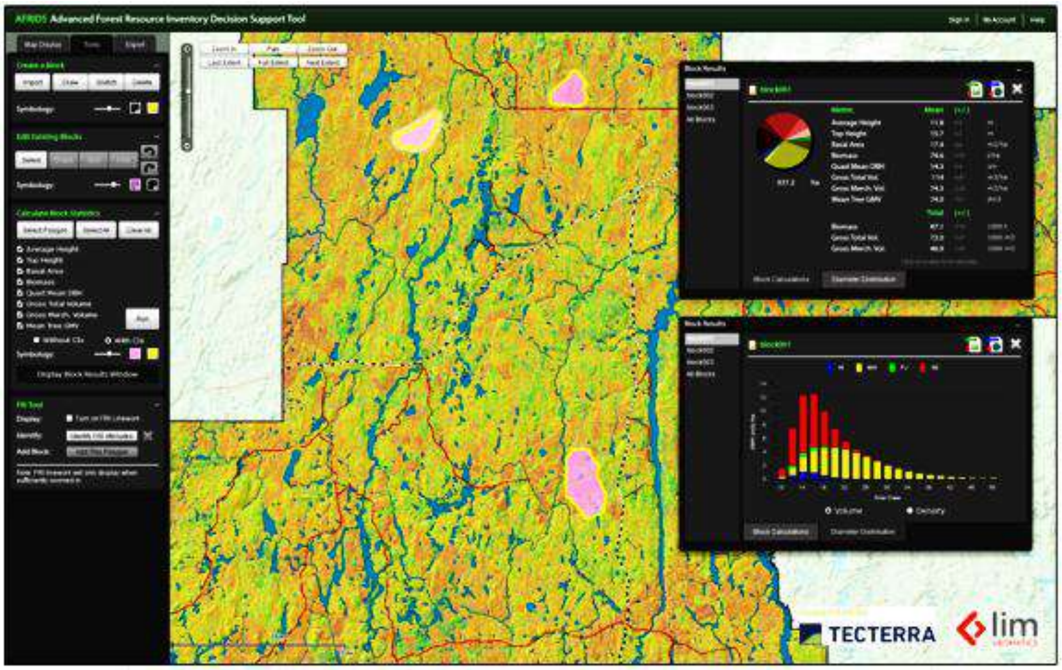
Source: Woods, M., Pitt, D., Penner, M., Lim, K., Nesbitt, D., Etheridge, D., and Treitz, P. 2011. Operational implementation of a LiDAR inventory in Boreal Ontario. The Forestry Chronicle 87(4): 512-528.

These spatially explicit predictions of forest inventory variables derived from LiDAR can now be used to enhance traditional forest inventories by providing additional information about delineated stands. The figure below displays the Ontario Forest Resources Inventory (FRI) with spatially explicit predictions of GMV in the background. We can now not only quantify the variability of forest inventory variables within stands, but also obtain more accurate predictions of mean values for the FRI polygons.



The obvious question that arises is how accurate are these predictions that are made by LiDAR. The answer is very good. Volumes predicted by LiDAR for the Romeo Malette Forest have been shown to be within 4% of actual scaled volumes for harvest blocks that have been clearcut.

Decision Support Tools
Recognizing that foresters need tools to allow them to work with the information products and ultimately support decision making, decision support tools can be developed. The example below highlights the Advanced Forest Resources Inventory Decision Support (AFRIDS) tool. The AFRIDS tool has several capabilities, but most notably allows foresters to import pre-defined stands and harvest blocks, or ones draw on-the-fly, and calculate mean predictions bounded by confidence limits. Another key capability is recovering GMV, basal area, or density by size class. With these types of tools in hand, foresters become better equipped to make informed business decisions.



Concluding Remarks
Airborne LiDAR remote sensing is a mature and proven technology rather than an emerging one. In fact, Optech, a world leader in LiDAR sensor manufacturing, is headquartered in the Toronto area. When it comes to remote sensing tree and canopy height using LiDAR, it has been demonstrated and proven time and time again that LiDAR is the definitive technology for this application. Recent advances with recovering DSMs from digital imagery and using DEMs obtained by LiDAR to produce CHMs is promising, and is an active area of research.

When it comes to costs, the common perception amongst foresters is that LiDAR is expensive. This is true only under situations where project areas are very small (e.g., 1,000 ha). When the project area starts approaching 1 million ha, it is not uncommon to negotiate pricing at the 50 cents/ha level; however, the final pricing will ultimately depend on the project requirements and deliverables expected. Readers interested in LiDAR technology are encouraged to research and ask the right set of questions to guarantee a successful project. Furthermore, parties interested in acquiring LiDAR data should explore forming consortia and pooling areas of interest together to leverage economies of scale. When the cost to acquire and process LiDAR data is weighed against the cost savings realized in forest planning by having LiDAR data, an overall net benefit is often seen.

LiDAR remote sensing should be viewed as a complementary technology to those that are currently in use to support the production of forest resources inventories, instead of a replacement. Digital imagery is still required for species identification as LiDAR falls short with this use case. The reality is that the next generation of forest resources inventory protocols will likely be based on not just one remote sensing technology, but multiple ones.

Lastly, the question is not whether or not LiDAR technology will be adopted by the forest industry and government to enhance existing forest inventories. Nor is it about when this will occur. Several implementation projects have already been successfully completed, with many other ones underway across the country. As we look forward, more success stories will continue to emerge, making it a very exciting time for not only LiDAR remote sensing technology, but others remote sensing technologies as well.

History in the Making? *LiDAR based Enhanced Forest Inventory*

By Steve D'eon

I was rummaging through some old inventory maps in the office and came across a local forest inventory map dated 1920. The bottom corner stated the map was compiled from field surveys conducted on horseback between 1917 and 1920. The map depicted trails, water bodies, non-forested land, and forest stands. Nearby was a more recent 1941 forest cover map with almost the same stand data we see today on FRI maps: cover type, age, density, volume. The thought dawned that, despite our advanced production, display, and analysis, we still provide foresters with the same basic information to plan forest management as almost 100 years ago.

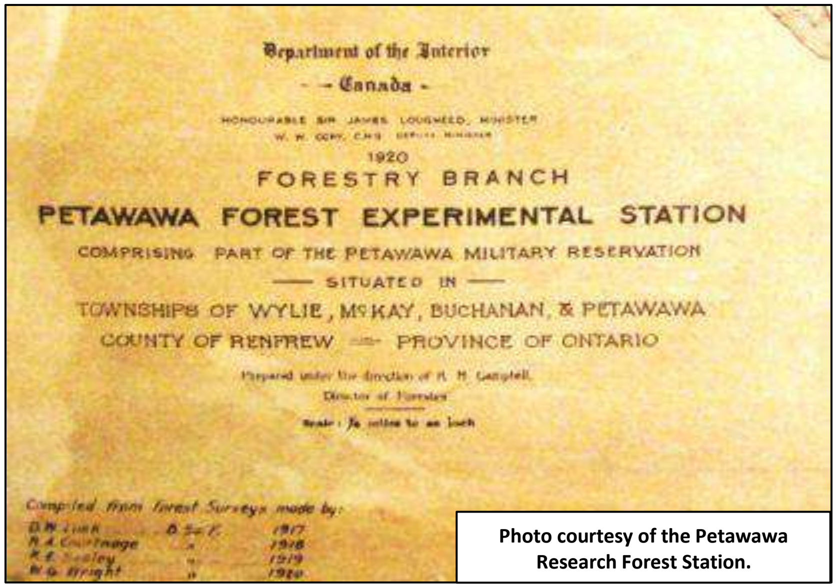


Photo courtesy of the Petawawa Research Forest Station.

That is until now.

A new LiDAR based Enhanced Forest Inventory is emerging that provides a whole lot more information to make management decisions than the stand data of the past. Instead of our eyes as scanners and horses as our transport we now can use lasers mounted on aircraft to 100% enumerate a million hectare management unit. Powered by several hundred horsepower engines, aircraft mounted LiDAR sends ultra-rapid pulses of light that reflect off the ground, the canopy, and all plant parts in between. Computers compile this precise data into 3D versions of the forest profile at a sub-meter scale. Systematically placed ground plots statistically correlate the remote sensed images into accurate estimates of volume, basal area, height, diameter, and piece size. Linking to imagery provides tree species. The data is accumulated for the entire management unit and output for every 20 m by 20 m parcel.

Piece size is an interesting output for use in management decisions. Piece size is quite often one of the driving economic factors that makes harvesting cost effective or not and what type of machine performs closest to its optimal efficiency in a block. Placing a machine designed for 30 cm wood in a block with mostly 20 cm wood can greatly increase costs. The reverse is also true where a machine designed for smaller wood works through a block of larger wood. Previously strategic and planning forest inventories did not provide this metric and foresters would ground cruise blocks to see if the wood matched their plans. Now the flick of a switch and the distribution of piece size within the block is displayed with error estimates. Boots and feet stay dry.

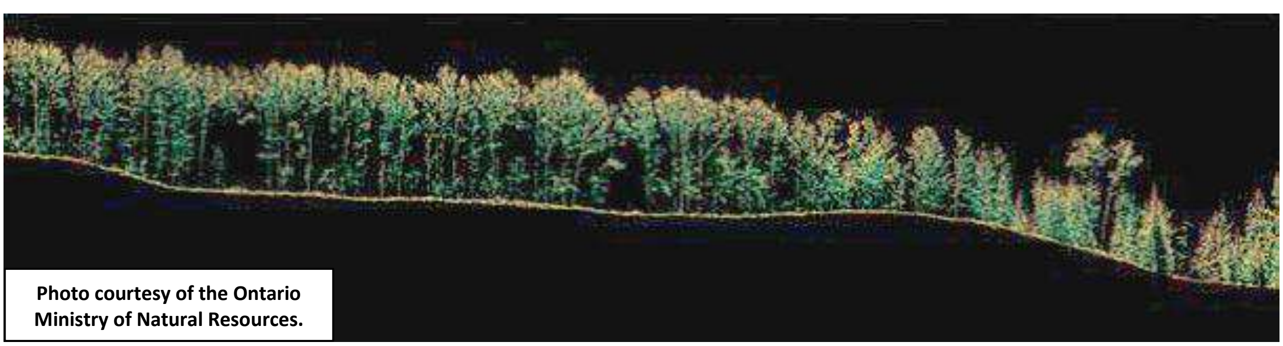


Photo courtesy of the Ontario Ministry of Natural Resources.

LiDAR also provides a wonderfully accurate terrain map. Environmental values that were never considered before like ephemeral streams and ponds are teased from the accuracy of the data and can be worked into plans to enhance protection during operations. Road locations, wet areas, and other problematic features can be worked into plans right from the beginning. One company has found the savings in road construction easily offsets the cost of acquiring the LiDAR data. In the good old days this information did not appear until the block had been walked or plans were well underway. Costly and time consuming plan amendments would have to be filed to adjust for the situation that existed on the forest floor that was not captured in the forest inventory.

As the wood accumulates to be trucked to a mill, directing wood based upon the expected piece size in a block sends the right wood to the right mill for efficient processing. With better information about the logs coming to the mill optimizers can be set for efficient sawing and conversion. Decisions about future equipment purchases can be made with confidence the wood basket will provide material suitably matched to the choices made. All along the value chain, industry reduces costs and can capture added value from the harvest. Planning all this in advance of machines heading to the bush places today's operations forester in good with his banker bosses.

We can also look inside the stem to see what type of wood fibre is growing and how to best plan for the processing in pulp and paper mills. Correlating trees crowns with measured internal fibre characteristics allows the LiDAR based Enhanced Forest Inventory to output maps of fibre characteristics such as wood density. Mill planners can then plan and harvest specific wood density mixes that produce the product quality their customers' desire. Again, achieving this at the planning stage without a lot of boots ground truthing each stand reduces mistakes and generates efficient operations that cut to the bottom line of the company balance sheet.

The system is not without challenges. Airborne LiDAR is an added cost to the inventory process. LiDAR acquisition for small blocks is prohibitively expensive but bidding out large areas can put the cost at a competitive $0.50/ha or less. The system requires some intensive computer crunching to create the data layers but once created they can be included in most company's GIS product line and planning software.

Numerous organizations have been instrumental in developing and implementing LiDAR based Enhanced Forest Inventory. The Federal government and several provinces have provided resources and expertise. At four flagship sites across Canada industry partners and consultants have joined academia in solving the challenges to bring this technology to a forester's desktop.

Many times in the past the old-timer has said to the newbie 'What have you got there son?' What we have is a new way of planning forest management and operations by providing a forest inventory on the forester's desk that gives him/her the information to make better business decisions. Times are tough, they always were. Foresters have always cautiously adopted new technologies that make a better job of the work they do. Is this history in the making? Time will tell.

Changing Demands for Forest Information

By Jeffery P. Dech PhD

The first attempts to formally describe forested lands in Ontario can be traced back to the Ontario Crown Land Survey (OLS), which consisted of township surveys where the majority of data were collected along boundary lines. The primary goal was to define lots and concessions so that land could be privatized; however, these surveys also described the composition and extent of dominant forest types (Pinto et al. 2008). These survey notes provide a valuable record of conditions at a time (1854-1931) that precedes the widespread effects of settlement and management on the forest, and have been used as the basis for tracking changes in forest cover and composition over time (Jackson et al. 2000, Leadbitter et al. 2002; Pinto et al. 2008). These initial attempts to describe the forest landscape under the OLS were satisfactory for distributing or selling land for settlement, but much less detailed than current forest inventories. Over the last 160 years, the information we require to effectively understand and manage our forest lands has evolved substantially in response to the changing demands of society at large.

The modern incarnation of Ontario's Forest Resources Inventory (FRI) was initiated in 1946 to satisfy a demand for extensive information about timber resources to support harvest and mill development, and was therefore designed to provide critical data about species composition, age, size and stocking in individual forest stands (OMNR 2012). This information could then be used to calculate wood supply at the forest level (Clarke 1953). The inventory was produced from interpretation of aerial photography calibrated with field data and delivered as a map product, from which management plans could be made (Clarke 1953). However, no attempt was made to quantify the accuracy of these interpretations.

There have been different inventories produced by various companies and agencies over time as responsibility for the FRI has shifted between industry and government. However, at its core, the inventory has been produced in a fairly consistent manner in terms of methodological approach and delivered information for approximately 60 years. In 2005, the OMNR announced plans to redesign the FRI in order to meet a growing list of demands placed on it by an increasingly diverse group of users. How did demands placed on the FRI change so significantly as to require an overhaul of the system? The answer to this question is rooted in changes that occurred in the way that we view and manage forests as a public resource.

To begin, the modern forest management planning process and business planning in an extremely competitive global economy require an inventory that is accurate and data rich. A series of reports in the 1980s (e.g., Baskerville 1986; Rosehart et al. 1987) indicated that although the FRI provided satisfactory estimates of wood supply at the forest level, the accuracy of stand level information was inconsistent. As demands for spatially explicit data increased in recent time, it became apparent that the FRI (at least in some cases) was unable to meet the need for accuracy placed on it, in its traditional mode of production (Thompson et al. 2007; Pinto et al. 2007). As companies looked for efficiencies in harvests that depend on reliable information to plan operations in specific forest stands, greater spatial and temporal resolution in the FRI was required. The advent of regulatory mechanisms such as forest management planning and forest certification systems (e.g., Forest Stewardship Council) have also increased the demands placed on inventories as the backbone of these processes and their goals of sustainable forest management.

Understanding how forests change over time also requires a strong inventory system. The models used to predict growth and yield of forest stands in Ontario depend on reliable inventory data of known accuracy as the starting point for simulating forest production over time. Thus, the critical importance of FRI data in all aspects of forest management has produced an overall demand for increased accuracy and resolution. This strong demand has led to a move from a 20 to a 10 year cycle of inventory production, and to the definition of ecologically-based polygons as forest stands in the new FRI (OMNR 2009). An increased acquisition of calibration data and the addition of a validation report are also planned components to modernize the FRI to meet the needs of users with respect to spatial and temporal accuracy (OMNR 2009). These demands have evolved in lock-step with technological capacity, as remote sensing data (e.g., digital orthoimagery), data management systems (e.g., GIS) and computing resources (increased speed and storage capacity) provide the opportunity to work with datasets that would have been prohibitively large and difficult to process in the past.

The concepts of ecosystem-based forest management and a multi-value view of the forest landscape have created a demand for more diverse information from the FRI. Because of the extensive coverage of the FRI (it is anticipated to reach 555,000 km^2 in the next inventory cycle) and its' standard data collection and reporting methods, the maps and stand-level information are an important source of data that could be used to characterize other forest values such as biodiversity (Loo 1993), wildlife habitat (Maxie et al. 2010) and forest carbon stocks (Ter-Mikaelian et al. 2011), to name a few. In fact, there is an estimated market of $100 Billion represented by the new bioeconomy; however, adapting traditional inventory approaches to include bioproducts information remains a significant challenge for development of these resources (Wetzel et al. 2006). The move to ecologically-based polygons will go some way to provide a common link between diverse users of the FRI, as one can talk about timber, bioproducts, biodiversity and wildlife habitat in the common language of ecosite (Pokharel and Dech 2011). Furthermore, there is potential to use the ecosite fabric as a basis to model and predict some of the attributes not directly reported in the inventory, such as understorey species distributions. There is no doubt that the technological advances in the production and management of FRI data have unlocked a significant opportunity to better understand the forest landscapes of the province.

An interesting question to consider is what will the forest resources inventory of the future look like in Ontario? In the last decade, significant progress has been made in research projects aimed at developing enhanced forest resources inventories (eFRIs). These projects have demonstrated the potential of Light Detection and Ranging (LiDAR) based inventories (Woods et al. 2011; Treitz et al. 2012) to provide extremely-accurate spatial inventory data, and indicated that the power of individual tree classification (ITC), which would provide data on every visible crown on the landscape, is close to being unlocked (Gougeon and Leckie 2006). These two advances will further satisfy our demands for spatially accurate information, which are likely to continue to evolve in lock-step with the opportunities technology affords to us. Beyond that, what other directions might the FRI take? Perhaps something as transformative as FRI 2.0, where some new dimension is added that changes the whole function. Tropical biologist Dan Janzen has envisioned a unique future in which all forest resources are carefully quantified and valued as part of a "Forest Green Pages" (Janzen 1999). In Janzen's hypothetical Green Pages, a web-based catalogue of ecological goods and services can be perused by any user, and products from such green pages (ranging from medicinal plant biomass to the services of biological control insects) can be located and ordered from a co-operative unit that involves all stake-holders on the land, and works towards a common goal of ecological and economic sustainability.

What stands in the way of this vision is the demand for extensive data, which we have demonstrated a strong capacity to generate as needed since 1854, and a system for valuing natural wealth (or ecosystem good and services), which is a problem we must make progress on in the immediate future. Such progress can be made, as exemplified in Costa Rica, where environmental services contracts place real dollar values on ecological processes such as carbon fixation, water filtration and biological pest control (Janzen 1999). No doubt a shift in thinking of this magnitude would require substantial research, pilot studies and perhaps overcoming many obstacles, both economic and ecological.

Nevertheless, this future seems plausible and very interesting. Consider an inventory system that one could use not only for timber management, bioproducts development, or even as the basis of a carbon-trading system, but an inventory that would also include places to harvest wild mushrooms or assist in planning of the location of a blueberry crop adjacent to populations of pollinating insects. The history of the FRI in Ontario indicates that it continues to evolve in response to the needs and demands of the public, and technological advances are beginning to keep pace with ideas about how information can be used. The situation for Forest Resources Inventories is reaching a cusp, over which the demand may change from requiring more data to produce a better inventory to requiring more ideas to better use the data we have.

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Observations on a Plantation – *The Anders Plantation in the Black Spruce Forest*

By Mac Squires RPF

Introduction

Canada's boreal forest is seen by some as possibly the slowest growing commercial forest on earth. That may be so but like most generalities it doesn't always hold up to close scrutiny. Here is the tale of one forest stand of the archetypical boreal forest tree, black spruce (*Picea mariana*), and a stand that, in the predictions of some informed foresters, had little chance of success.

On April 1, 1980, a precedent setting Forest Management Agreement (FMA) was signed between Abitibi-Price Inc. (API) and the Ontario Government. The company agreed to assume responsibility for forest management planning and renewal of depleted stands in exchange for a 20 year legal guarantee of a sustained wood supply based on its efforts and the capability of the resources to supply. An additional FMA, the Spruce River Forest (SRF) north of Thunder Bay and now a part of the Black Spruce Forest Sustainable Forest Licence (SFL), was negotiated and subsequently signed by API in December, 1981, retroactive to April 1, 1981. A deal breaker condition of FMAs was that the company would guarantee satisfactory regeneration of all backlog unregenerated areas of the FMA. These areas were designated in the forest resources inventory (FRI) as not sufficiently restocked (NSR). Our stand occurs on what was then NSR.

Background

During the mid-1970s Ontarians were increasingly critical of their government's forest management performance and heavy mortality in plantations and were justifiably skeptical of the industry's intent and competence to do better. API foresters understood that skepticism and believed that cost control had to initially take a back seat until we could achieve quality results from our efforts. We and company management believed that we would have a very narrow time window in which to convince government and an untrusting public that we could and would effectively maintain forest yield and manage the forest in their interest.

API had already selected the paper pot container system (PCS) in 1975 to grow its planting stock for its 200,000 hectare private land (freehold) northwest of Thunder Bay. The selection of the PCS was based largely on its relative ease of handling, ability to retain moisture and withstand repeated handling and, most importantly to API at the time, its high post-planting survival rates and initial growth performance of planted seedlings. In choosing the system the company had relied heavily on the experience of J.D. Irving Limited in New Brunswick where, with the guidance of Professor Ken Armson of the University of Toronto, it witnessed areas of vigorously growing black spruce trees that had been first grown and planted in the PCS. At signing of the FMA s some API foresters had already been successfully using the PCS for five years on the company's freehold lands at Thunder Bay. The high survival rate of PCS-grown seedlings was counted on as the key that would help gain public credibility.

After joining Duncan Naysmith and Frank Robinson midway through as the junior member of the API team that negotiated the first FMA I was attached to the Lakehead Woodlands Division as Divisional Forester in 1980 responsible for the forest management of the division's timber licenses and its freehold property. That year we began negotiating an FMA for our main timber licence. Upon signing our SRF FMA I was charged by our Vice President of Woodlands, W.J. (Bill) Johnston, "…to make it work". Our corporate chief forester, Duncan Naysmith, said, "If an FMA can be made to work at the Lakehead then an FMA can be made to work anywhere". At that time I didn't know if I was being challenged or set up as a scapegoat.

API had already assembled a dedicated team of foresters and technicians who knew what they had to do and approached their jobs with determination and commitment to success. They and I had an unspoken collective belief that management would give us approximately three year's grace to become relatively successful and then they would begin demanding efficiency and cost control. We were right, and as time passed I became positively impressed that, along with cost control, management continued to emphasize quality control. I well remember spending one uncomfortable day in 1982 with Bill Johnston, and the Woodland's Ontario/Manitoba General Manager, Bill Pauli. They had heard that we were "throwing away" seedlings that the public had paid for. I was instructed to take them to the bush and show them what we were doing. They easily understood that, yes, we should only plant healthy seedlings, but what of the cull piles? They viewed some and systematically queried the reason for culling individual seedlings. They accepted my explanations, but demanded that I get the legitimate cull piles cleaned up and remove any eyesores that might encourage public distrust. They then systematically examined planted trees asking me why individuals might survive or die. They stated that they didn't want to see any more of those with poor survival chances in our plantations. I was told, "We will be back and we want anything that is wrong righted". They were and it was.

Senior executives continued to be interested in what we were doing and I had the pleasure of guiding several to view our work through the years as seedlings grew and the results became more visible. I learned from working for those managers under the rules of an FMA that accountability for success or failure clears the mind, stimulates action, boosts moral, and builds self respect and pride of accomplishment.

Growth performance of our plantations was acceptable from the beginning. Well planted and balanced PCS seedlings added significantly to their height during the same season planted. We strictly adhered to our own seedling standards at the greenhouses and in the field. We had our bad experiences, but by keeping on top of things we discovered our mistakes before they became disasters, and through working with all of our partners, improvements were made. Generally only acceptable seedlings tended to arrive in the bush and be planted. Meanwhile the PCS, by virtue of its moisture holding capacity, helped seedlings in the early years of our freehold program and the first couple of years of the FMA through what, relative to later practices, was rough handling, crude storage and sometimes inadequate watering in the field prior to being planted.

The proof that the PCS was a successful container system is visible on approximately 100 square kilometers of forest north of Thunder Bay. I have chosen one particular stand primarily because of its accessibility; it is one of the oldest on the FMA (there are others that are one year older but less accessible), one of the most studied by me and it was featured in the industry's case before the Ontario Class Environmental Assessment of Timber Management.

Getting Started
Here begins the story of a black-spruce stand that I call the Ander's Plantation.

As we approached signing of the FMA we were already preparing to tackle what we saw as a formidable task, that of returning large areas of NSR to the production land base of the FRI. Our early emphasis on NSR was in the southeastern leg of the FMA known as the Wolf River Watershed where we believed the soils were some of the most fertile on the FMA and the land was the nearest we had to our mills. The soil was described as medium to shallow silty loam to sandy loam. We decided to begin south of Anders Lake on an area bounded by 48° 55' 17" and 48°55'07"N Lat. and 88°52'07" and 88°51'45"W Long. The 88 hectare area bordering the north east bank of the Wolf River had been harvested by Buchanan Forest Products in 1974-75. The harvest had left variable numbers of immature white spruce (*Picea glauca*) and jack pine (*Pinus banksiana*) trees and mature balsam fir (*Abies balsamea*), trembling aspen (*Populus tremuloides*) and white birch (*Betula papyrifera*) per hectare. The ground was now primarily covered by a dense stand of trembling aspen saplings with scattered clumps of mature white birch and some patches of alders (*Alnus spp.)* and willows (*Salix spp*.). (The details contained in this paragraph and the following treatment descriptions are based on the silviculture project files retained by API and now in safe keeping with Resolute Forest Products).

Site Preparation
The Ministry of Natural Resources (MNR) district forester insisted that all pine and spruce remaining after the harvest be left for insurance as possible seed trees should later efforts fail, but we did not intend to fail. In early July, 1982, the area was sprayed with 2,4-D which was then the only effective herbicide legally available. This was intended to kill the brush and make it brittle for crushing.

We had been using a Marden Chopper, a tandem pair of two hollow drums with approximately 15 cm deep blades radiating all around them. The total unit weighed 30 tons when the drums where full of sand. It was hauled by a D-8 tractor to crush the brush and logging slash on similar vegetation and soils on the freehold. From August to October of 1982 the chopper was effectively used to create a virtual farmer's field of the former near jungle appearance NSR but leaving approximately 10-12 near-mature white spruce and jack pine per hectare. Most of the mature balsam fir, birch and aspen, except for those contained in two large islands in the middle of the plantation reserved under instructions from the MNR, were effectively crushed and driven into the soil.

The chopping was followed in September through October by patch scarifying with a Bracke Patch Scarifier. This machine towed behind a wheeled skidder created regular scalps of sod that were spaced approximately two metres apart in rows also two metres apart. This was designed to prepare spaced planting locations to assist in organizing next year's planting crew. By this time, based on our freehold experience and ongoing research by the Ontario Forestry Research Institute and The Canadian Forestry Service, we were convinced that the best location for the planted seedlings was near the edge of the upturned sod.

Was all this expensive site preparation over kill? You bet, but this was good forest soil and nobody had yet demonstrated to us that black spruce could be consistently and successfully regenerated on these highly competitive sites using standard methods. We weren't taking chances and preferred to learn from our successes and if from mistakes they should be those of others. Despite our confidence and determination to get it right it didn't take long to see a dense field of bluejoint grass (*Calamagrostis canadensis*) developing on nearly 100% of the site-prepared ground. We had dealt with dense grass on the freehold before and had not yet learned how it could be successfully managed. We entered the fall of 1982 with developing doubts.

The Planting Stock

In late March, 1982, at Hill's Greenhouses Ltd., in Murillo, west of Thunder Bay, some 16,000 trays of size 408 Paperpots were filled with growing medium and seeded with black spruce from open-stock seed collected on then seed zone 25 and supplied by the MNR. Trays of filled paperpots were started in the heated greenhouses in early April and the seedlings were grown through the summer for a total of sixteen weeks at which time they had reached demand height specifications. They should have been moved outdoors daily in early August to shade areas where naturally decreasing daylight period would initiate bud set, hardening off, and resulting top and root hardiness.

Nursery stock that was planted in the Anders Plantation as it was in the fall of 1982. Photo courtesy of Mac Squires.

Through a series of miscommunications some of the crop was erroneously retained in the greenhouse and continued to grow for an additional two weeks during which they reached specified stem caliper but, at 20 cm and more, exceeded our height specifications by several centimetres. They were whips (stories around the crop developed into an urban legend that API demanded tall whippy planting stock). They were, however, blessed with a good root plug (some judged "root bound", the subject of what, in my opinion, is another urban legend for black spruce). They over-wintered well in the shade areas and come spring we decided to take a chance based on the healthy root plugs, reasonable caliper of the stems and moisture holding capacity of the paperpot. We decided to direct the stock to our subject area and other similar areas across the FMA. We had hope, based on past field observations, that the tall stock would gain caliper before height growth. If that happened with this stock it may not get crushed by the grass and weight of snow.

Planting the Seedlings

In early May, 1983, the seedlings were delivered in paperpot trays to the planting site where they were stored in the open air and watered as needed until the planters placed them in their planting bags. The 8-person planting crews consisted of members of our logging force who would otherwise have been laid off until bush roads firmed up and highway load restrictions were lifted. The planting tool used was the Potti Putki, which was designed to plant paperpot seedlings. It was essentially a hollow tube with an opening beak that was controlled by a spring-loaded foot pedal and a hand trigger. Starting May 16 the planters were given a one week training period on planting technique and each were daily graded on quality and coached until quality met our high standards. Anyone who couldn't meet standard (almost all did except for productivity targets) was assigned other duties such as transportation and watering.

Waiting and Seeing

The planted seedlings weren't buried. The grass actually supported them during the summer as they gained caliper. They were so sturdy come fall that we had 98% survival and in 1984 they gained a small amount of additional height and caliper. During 1985 Roundup (glyphosate) was approved for forest-vegetation control and we applied it at 3.5 litres per hectare to control the grass, raspberry and some areas of aspen. It was applied starting August 1, a bit too early in the season before the seedlings had sufficiently hardened off, and some seedling damage occurred. Many were set back for a whole year; however, they recovered the following year and never looked back. No additional treatments were applied or deemed necessary. The reserved white spruce and jack pine semi-mature trees did seed some locations, particularly the extraction road edges, but throughout the stand there is, by my ocular estimate, a combined presence of up to 5% white spruce and jack pine. There are also variable concentrations of trembling aspen in long narrow strips left through variation in the Roundup coverage.

The Plantation Today

In the fall of 2011 I placed a one-hundredth-hectare plot in a mixedwood portion of the stand. A dominant black spruce that measured 13 metres tall was 14 cm diameter breast height (dbh) and 10 cm in diameter at 7 metres high. There are 1,900 black spruce per hectare 12 cm and over in diameter with the largest at 17 cm. There are an additional 700 smaller spruce that are suppressed and I expect will soon drop out. There are 1,500 trembling aspen per hectare with two hundred exceeding 12 centimetres diameter at breast height. I suspect they arose as seedlings post plant and probably post Roundup application. It appears to me that only a small number will find a place in the mature canopy. Total merchantable volume of black spruce is 118 cubic metres per hectare (volume was determined using Lakehead University School of Forestry Adaptation from Honer's Standard Volume Tables 1967 by Joanne Kavanagh). Coincidentally that is the average softwood volume harvested from mature stands on the Spruce River Forest at three times the age of this stand (from company records prior to 1997).

A pure black spruce section of the Anders Plantarion In 2010. Photo courtesy of Mac Squires.

When API began strategizing leading up to our FMAs the target stand volume per unit of area that we used for black spruce plantations was approximately 150 cubic metres per hectare at 45 years old. There is ample reason to believe that this plantation will exceed that target. If the current mean annual increment of four cubic metres per hectare is maintained there should be 183 cubic metres per hectare, but MAI should be increasing at current age so volume will probably exceed 200 cubic metres per hectare. I have no data to show if this plot is representative of the total plantation. However, I have walked extensively through it and am confident that over 75% of the ground is fully stocked to black spruce, and 2007 aerial imagery as per Google Earth shows roughly 20% poplar canopy and 80% fully stocked softwood. Assuming the pure softwood canopy areas are at least equal to my plot (I believe, based on my observations, that they are higher volume) and that there is no softwood under the hardwood canopy, I believe average volume at age 45 will exceed 150 cubic metres per hectare on the 88 hectares. My examination of Google Earth imagery and my years of walking through many other PCS black spruce plantations, although planted after much less intense site preparation, lead me to believe that this stand is representative of a large portion of such stands.

Helpful foresters outside API warned us that we could anticipate large scale disaster in plantations of PCS seedlings. Some saw pot binding causing poor growth, others saw unbalanced root systems causing tree toppling, and still others saw increasing root rot. I have seen small numbers of all of these in the plantations but none of them have to date caused enough tree losses to severely depress stand yield. Most that I have seen upon examination can't be blamed on the PCS but usually on poor choice of plant location and too shallow planting. The real problems with the PCS were mainly those faced in the green houses and almost all of the most serious problems related to inability to dry the containers on schedule to entice timely root growth and root plug formation. Ironically the grower's disadvantage proved to be the planter's advantage. Poor root plugs were reason to refuse receipt of a shipment but a wet plug meant the seedling could withstand severe drought in the field and was more forgiving of poor planting practices.

A pure black spruce portion of the Anders Plantarion as seen from one of the reserved white spruce, July, 2010. Photo courtesy of Mac Squires.

There is still potential for massive loss from wet snow, ice, or strong wind storms. I am convinced, however, if that occurs that close examination will show that the trees were not predisposed any more than those planted in other types of container systems, as bare root seedlings or even natural regeneration. I have seen all of the forecast problems in subsequently planted styroblock system (SBS) seedlings and as with the PCS when roots are examined poor planting rather than the container appears more likely to have been the real problem. During the past two years I have walked through areas of 30-year old naturally seeded jack pine and observed numerous patches of recent snow-load damage whereas I have seen only scattered individual tree losses in PCS black spruce plantations. The PCS has to date justified the confidence that API placed in it in 1975. After 1987 we moved quickly into the by then proven SBS and never looked back. The PCS had served its purpose but by that time several new systems were better. Our greenhouse techniques continued to improve after the initial help of Dr. John Scarrett of the CFS and later of Dr. Steve Colombo of OFRI, whom their employers made freely available to work with our growers, primarily Hill's Greenhouses Ltd., to test better container systems, develop growing regimes, hardening-off techniques, and cold storage regimes. Today the new company, Resolute Forest Products, the new name of Abitibi-Bowater Inc. that emerged from receivership and manages the former SRF, continues to use that technology with the addition of genetically improved black spruce seed. I expect the large areas of black spruce plantations around Thunder Bay to begin peaking in mean annual increment as early as 2027. I believe that when industry begins harvesting the first FMA black spruce plantations they will be harvesting the highest volume per hectare yet experienced in black spruce stands in the northwest and that as they harvest later plantations it will get even better. I also believe that the time is here to begin commercial thinning trials in the oldest plantations. At the outset API strategized commercial thinning at age 35 to enhance sawlog production. Trials well in advance will be necessary to test stand stability. If PCS black spruce plantations trees can remain standing after commercial thinning they will have truly proven their critics wrong.

Anders Plantation, July, 2010, looking north along the main extraction road. Photo courtesry of Mac Squires.

I am grateful to Resolute Forest Products for permitting access to the relevant silviculture records and to the following for providing relevant information and reviewing drafts of this article: Brian Cavanagh who supervised the site preparation and is currently with Resolute Forest Products, Herman Vanduyn, former owner of Hills Greenhouses Limited and his son Kevin the current owner and Peter Nicholas the General Logging Superintendent of API at Thunder Bay at the time and currently a private-land manager and business consultant. I take full responsibility for the opinions expressed and for the accuracy of the final document.

In Search of Answers on the Agawa

And Using Historical Forestry Databases to Find Them

By Jeff McColl

To understand how and why I ended up doing some pretty intense research on the Agawa River, using the Historical Forestry Database maintained by the Sault Ste. Marie Public Library, you have to know a little bit about what attracted me to the area in the first place.

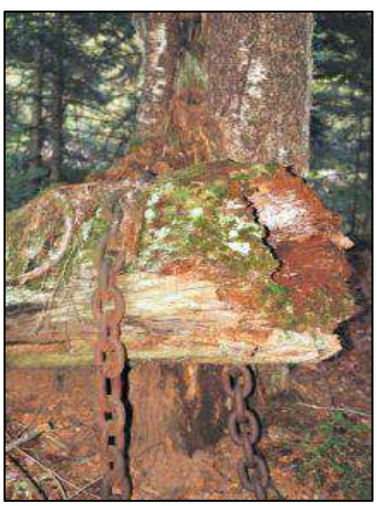
In 1976 while traveling across Canada with my father to go to a National Canoe and Kayak Championship in Alberta, we stopped on the Highway #17 bridge where it crosses the Agawa River. My father, like many other veterans, did not speak much of his experiences in WWII (Mid Upper Gunner Lancaster Bomber). I was riding shotgun on this part of the trip when he turned to me and said that he worked up here after the war as a Telegraph operator on the Algoma Central Railway (ACR) and he would like to go back and paddle in the area. Sadly he never did, but the seed was planted in me to venture into the area.

My first trip was in 1985, and trying to find information on the river was challenging to say the least, as maps were not very informative about details of the river. We knew there had been logging in the area and that the Group of Seven had painted there, but this was more of a personal search of the area where my Dad had wanted to go back to, and where he learned paddling and bush skills from a First Nations member.

What started as a plan for one or two river trips soon became an annual pilgrimage, each time finding something else to return and search for, and as the internet provided the ability to research more, the more there was to try and find.

Up until this past fall I was unaware of the vast information available on the Historical Forestry Database, so on my trips, little was known and I just wandered around following the hidden steps of those who worked and traveled here before. So I will share with you what I found and then explain what got me to dig much deeper into the history of the area.

On our first trip in 1985, we came across this old wood stove where the Little Agawa River enters the main Agawa. We guessed that loggers must have used the site for a base camp on the drives or as the loggers made their way upstream. I did not get a good picture of it then since it was in the pre-digital age and the conditions at the time where not favorable for slides. But a few years later conditions where great!



I was aware of the old logging dam, Dam Site 6, on the Agawa which is approximately 1km above Agawa Falls, but the only thing left of that site are the chains and some parts of the old boom that have become part of the shore line.

When you run the first part of the rapid from the old dam site down there is only one way to go, and no doubt that is where they cleaned a channel for the logs to go through and when the water is up a bit it is a lot of fun.

Also at this dam site there is an interesting land feature that looks like an upside down ice cream cone or as we call it, the “Agawa Pyramid” which is a poke at late night radio programs and the mysteries/legends that surround the different pyramids around the world. This hill is visible from the ACR tracks but one does not realize how steep it is until you hike up to the top, but it does offer great views of the valley.

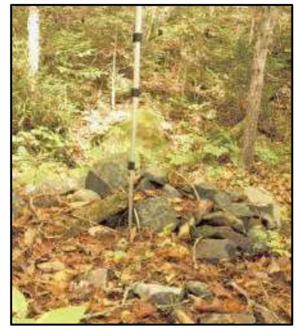
On the way down I came across an old trail cut into the side of the hill, and the way it arced down and around the hill you could easily picture in your mind the team of horses pulling the logs down towards the river. When you are alone with the forest around you, and sounds of the river reaching up from the valley floor it is easy to visualize the images of the horse teams performing their duties.

Still it wasn't enough to get me searching for more information on the logging history, but going for my first winter camping trip up there last year started to pique my interest even more. Living in a Baker style tent with a wood stove in temperatures for most of the week that were minus 30 to 40 Celsius with approximately a metre of snow on the ground gave me a new found respect for a job that I already knew was very tough.

I also found out why much of the cutting was done in the winter. With snow shoes on it was much easier to move through the bush. This is a shot of my son P.J., taken in January, 2011, at minus 30 degrees Celsius with more than a metre of snow in the bush.

But no matter the season the Canyon is a spectacular setting and when the weather conditions are just right you see what they faced in trying to access the resources of the area.

What led me to use the Historical Forestry Database records was what I found on my trip last September. The many small streams that enter the canyon give a photographer numerous locations for spectacular shots, if the light conditions are favorable. I have stopped at this one stream numerous times because of the series waterfalls as it drops into the Canyon. The undergrowth coverage is different from year to year, and depending on whether there has been a heavy frost what you see or don't see can be very different, so this pile of rocks caught my eye this year.



There was no doubt in my mind that this is most likely a logger's cairn. This neatly placed pile of rocks was totally out of place for the rest of the terrain. The shape is elliptical and the length is that of an average size person. (My camera unipod is appoximately 5 feet long) There is also a rotten piece of wood at the one end that could have once been a marker. It is far enough away from the river that high water would not affect the site. It is also the location of a very technical rapid with a good vertical drop into large boulders with some very tricky currents. When your canoe is loaded with gear this rapid can even be a challenge for someone like me with over 40 years of white water experience. I can't imagine what it must have been like driving logs through it.

I have paddled many rivers in Ontario that have the "Graveyard" moniker as a monument to unnamed loggers who have died while doing their job. I thought it would be more appropriate to name the rapid after this logger, not only as way to honour him and his profession but as a way for the general public to relate easier to the history of logging in Ontario and the dangers loggers faced. With the site being in a Provincial Park it makes it that much more appropriate.

My research online was not producing satisfactory results but my search led me to the Ontario Forest Historical Society and they pointed me in the direction of the Sault Ste. Marie Public Library and their extensive online historical forestry records. At this time I still have not been successful and this research thing is new to me and would appreciate any help in this endeavor.

My use of the historical records did not stop there. Around the same time Sue and Jim Waddington, who have a hobby of finding Group of Seven painting locations, contacted me. They have been very successful in finding locations that were painted in Killarney and Algonquin Provincial Parks. They had a number of paintings and wondered if I could identify the locations. What was beautiful then is still beautiful now. The number of locations where I had unknowingly stood and taken pictures at the same places the group painted many of their paintings was truly amazing. J.E.H. MacDonald's painting titled "Agawa River, Algoma", can be viewed at the McMichael Gallery's online gallery: http://www.mcmichael-artdb.com/ . Click on "Group of Seven and Contemporaries" and cycle through to the 60th photo.

With all the images painted by the Group of Seven in the canyon one would think there would be one of Agawa falls. But there isn't. There are painting sites both upstream and downstream from the falls. Checking the Historical Forestry

Database records it was easy to find that the falls is clearly marked and the portages and trails are also on the maps that where available at the time. One would think that maps from that era would be lacking in details but the opposite is the true. Most of the maps that I found are incredibly detailed and accurate so the Group of 7 had to know about the falls. What I did find is one sketch by the Group titled "Agawa Falls" but this sketch does not have a lot of clear detail to guarantee a clean match. There are some questions raised by this drawing, it can't be reproduced because copyright but I can give you a link.

Link: http://www.artfinder.com/work/falls-agawa-river-lawren-stewart-harris/ .

I had always thought that the "quarried" (blasted) look of the bottom of the falls was from freeze thaw cycles breaking up the rock. There are certain similarities between the sketch and present day falls, the logs in the pool at the bottom of the falls would have been 16' long and using them as a scale in the drawing would make for a fair comparison of the height of the present day falls (75'; 25m).

There also seem to be some similarities to the sides of the falls and the background above the falls. This may be reaching a bit, but the rock areas at the top middle of the falls have some of the same characteristics of that of the rock in the sketch. So was the bottom of the falls blasted to make for easier passage of the log drives? That is another mystery that I could use some help with. I was able to find records of blasting and river work upstream of the Railway trestle at Mile 112 of the ACR and all the way up to the upper Agawa and Spruce Creeks, but none of the area around the falls.

As for where the blasted rock went, there used to be much more debris rock at the bottom of the pool when I first started to run the river, but several high floods have cleaned it out in recent years. I would think we would have to find a person experienced with blasting to be able to identify the signs.

I will continue to dig to try and find and answer to both these riddles. As for the importance of the Historic Forestry Database Records being relevant for use? When I ran the Agawa River the first time in 1985 getting good information on what one would find was next to impossible and the park information on the lower half of the river is pretty much the same as it was then. Had I access to the information contained in these files it would have helped a great deal in trip preparation.

Paddle sport has changed a great deal in the last couple of years with a variety of different boats that are designed for the rough waters and conditions one finds in the creeks and rivers of Northern Ontario. These watersheds are mostly unknown to the "creeking" community, the high quality of the information and maps that can be found in these historical records will entice more paddlers to go up and explore the areas.

Information gathered by the loggers of yesterday will be of great value to these paddlers, and it would be a great tribute to them to remember the work they did.

All photos by the author and used with permission.

Six Moments in the History of an Urban Forest

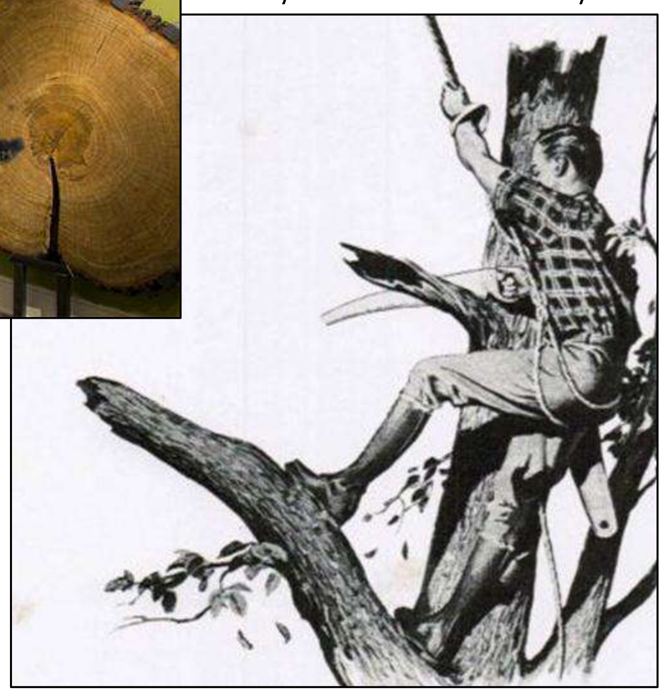
By Joanna Dean PhD

Urban foresters tell us that the life span of the average urban tree is 32 years; inner city trees can be expected to live only seven years. The past offers some clues to explain the short and difficult lives of street trees. For the past ten years, I have been digging in archives, scrutinizing photographs and talking to retired arborists in order to understand the fraught relationship between one city, Ottawa, and its trees.

This research is now on display at the Bytown Museum in Ottawa in the form an exhibit co-curated with doctoral candidate Will Knight: Six Moments in the History of an Urban Forest. Although reference is made to the undeniable beauty and benefits of urban trees, our emphasis is on trees as active agents, and on the moments of conflict that shed light on their contested place in the modern city.

The exhibit opens with the massive section of a bur oak tree. The environmental history of the city can be read in the tree's rings. Its lineage is ancient: the tree sprouted in one of the groves of oaks along the Ottawa River first observed by Samuel de Champlain in the early 1600s.

The exhibit then moves through six transformative moments in the history of Ottawa's trees. The first, "Planting," explores the enthusiasm for tree planting in the late nineteenth century when hundreds of large forest trees were planted along city streets to provide shade and beauty. "Controlling" explores the moment when these closely planted trees came up against the infrastructure of the expanding city. In the 1920s, as growing trees buckled sidewalks and tangled with utility wires, the Ottawa Horticultural Society lobbied the city for professional tree trimming. Thousands of trees were trimmed and removed in the ensuing decades; the American elm was described as a particular nuisance.



Arborist, from *Davey Guide to Tree Beauty and Tree Care*, 1956.

The third moment follows a new wave of tree planting enthusiasm in the postwar suburbs, and maps the shifts in canopy cover in the Alta Vista suburbs with geospatial analysis of aerial photographs. Canopy cover rebounded in the decades following construction, but the high number of ash trees makes this forest vulnerable to the emerald ash borer in the coming years. The next moment examines the misguided attempt to turn Ottawa pink for 1967, the centennial year, when thousands of ornamental crab apples were planted in gardens and along parkways by the City of Ottawa and the National Capital Commission.

The fifth moment considers the arborists who were on the front line between the city and its trees. Technology that was developed during the Second World War -- lightweight chain saws, bucket trucks and cranes -- eased the task of removing thousands of trees in the wake of Dutch elm disease in the 1970s. Arboricultural tools donated by Gardiner Tree Trimming and Removal are on display, interpreted with the assistance of Bill Gardiner.

The final moment returns to the massive section on display at the opening of the exhibit. The bur oak co-existed for many years with the city. Aerial photographs show it growing into a magnificent tree as the city's roads spread out towards it, and in the 1940s a house was built in its shade. In 2011, however, a developer purchased the property, and applied to the city for a tree cutting permit in order to build high density infill housing. He was successful, despite vigils and appeals from the neighbourhood, and the tree was cut down in May of 2011.

The exhibit offers no simple answer to the problem of the seven year tree. The visitor is left to draw their own conclusions from the six moments: a pessimist might read each moment for its losses, but an optimist will read each for the lesson learned.

The exhibit has a postscript: the story of Ottawa's famous wooded promenade, *Lovers Walk*, refused to fit into the six moments and fills the adjacent room. The ruins of the walk can be seen wending their way through the wooded slopes of Parliament Hill above the Bytown Museum. The exhibit asks why this iconic walk was closed down in the late 1930s. It offers two answers. One is that the slopes of Parliament Hill were unstable. Reforestation efforts in the 1930s failed, and when landslides took out sections of the walk, repairs were deemed too expensive. But a second answer emerged from the archival records: it appears that by the 1930s *Lovers Walk* had become known for casual sexual liaisons. Policing the walk proved difficult, and it was easier to simply close it down. Like many urban woodlands, the slopes behind Parliament Hill offered dangers as well as beauty.

My own research on urban forest history continues, and I would be interested in talking to anyone with memories of urban forests of the past, particularly retired arborists. Please contact Joanna Dean, at Carleton University, for further information: joanna_dean@carleton.ca

We would like to thank the Network in Canadian History and Environment (NiCHE), a Jack Kimmell grant from the Canadian Tree Fund, and Carleton University for financial support, and Grant Vogl and the rest of the staff at Bytown Museum for their assistance.

The exhibit is open at the Bytown Museum until September 31, 2012. A number of events is planned, including a tour of the exhibit with arborist Bill Gardiner.

Guest Curator's Talk
Carleton University PhD candidate and Guest Co-Curator of Six Moments in the History of an Urban Forest, Will Knight will give a talk in the exhibition.
Sunday, July 8, 2 pm - Free admission to the talk.

Arborist Tour
Join Arborist Bill Gardiner and Guest Curator Joanna Dean, Professor of History at Carleton University for a tour through Six Moments in the History of an Urban Forest.
Sunday, August 26, 2012, 2 pm - Free admission to the tour.

Ottawa's Urban Forest, a Panel Discussion
A panel discussion examining the history and themes from our special exhibition, Six Moments in the History of an Urban Forest.
Thursday, September 20, 7 pm - Free admission.

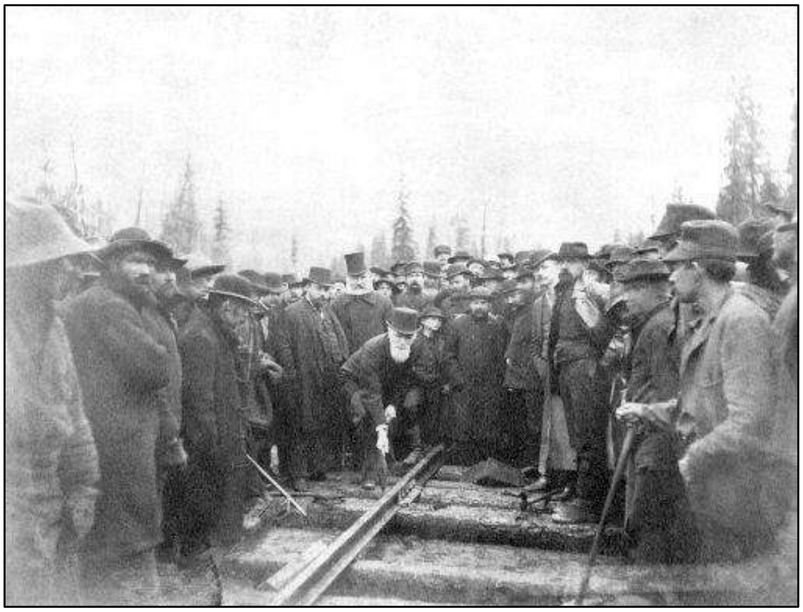
Building the CPR

Recounting the Wildfire-Related Fatalities Experienced During the Surveying of the Canadian Pacific Railway In 1871

By Martin E. Alexander PhD RPF

"And many are the dead men too silent to be real" is the closing line to Gordon Lightfoot's 1967 epic song "Canadian Railroad Trilogy" describing the building of the Canadian Pacific Railway (CPR). It's well known that many lost their lives during the construction of the CPR (Berton 1970, 1971; Lavallée 1974).

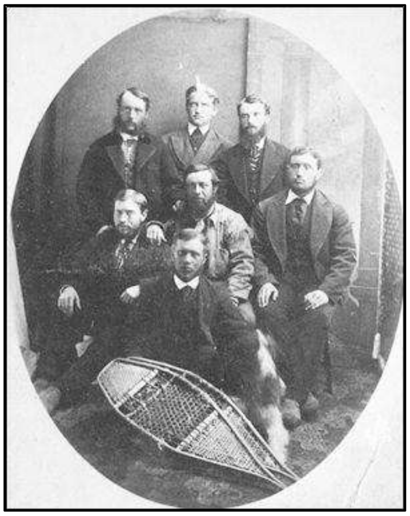
Surveying the route for the CPR was also recognized as hazardous work, regardless of the season. In the summer months, it's been said that surveyors were attacked by wild animals (e.g., bears) and died in forest fires or drowned (Canadian Pacific Railway 2006).



Donald Alexander Smith driving the last spike of the Canadian Pacific Railway (CPR), Craigellachie, British Columbia, 7 November 1885. The Engineer-in-Chief for CPR, Sir Sandford Fleming, is situated directly behind Smith. Hundreds died of illness and accidents during the surveying and building of the CPR. Photographer: Alexander Ross.

I doubt that Lightfoot would have been thinking of the men that perished as a result of being overrun by forest fires while engaged in surveying the route for the CPR back in the 1870s. Nevertheless, the sentiment could easily have been extended to them as well.

Pierre Berton (1970: 153), in the first of his two seminal books on the early history of the CPR, mentions that in the first year of exploratory survey in 1871 along the north shore of Lake Superior that "seven members of a survey party were lost near Jackfish River as the result of a forest fire". He based this statement on Rowan's (1872: 63) report, the incident having taken place east of Nipigon in early August of that year relating to a wildfire that had been burning for some time in the vicinity of the survey party's camp. It was later reported that the wildfire had started from a neglected cooking fire (Roland 1887).



An unidentified group of Canadian Pacific Railway survey engineers, 1872.
From http://en.wikipedia.org/wiki/Canadian_Pacific_Survey

According to Rowan (1872), the group of seven men had been engaged in transporting supplies from one cache or depot on the lake shore to another while the main party proceeded with the exploratory survey work further inland. Following a lack of contact after several days, a search party was sent out to try to locate them as there was "fears for their safety, as the whole party had on several occasions, very narrow escapes from fires" (Rowan 1872). The search party found only one body, this within the burned area. As Rowan (1872) notes, "He was lying on his face with his shirt, which he had taken off, between it and the ground, placed in that position to exclude the smoke from his lungs; he was not burned, but evidently died of suffocation caused by the smoke." No trace was found of the others, although "In a swamp nearby were found six holes which had been excavated by the others, in order that by getting into them they might escape the fire, but the smoke becoming too dense had driven them away and no further trace of them could be found" (Rowan 1872).

Having worked along the north shore of Lake Superior during the late 1970s and early 1980s, I can fully appreciate the difficulty these men faced in light of trying to evade the fire, given the dense forest vegetation and arduous terrain.

According to Bell (1889) similar tragedies happened to other CPR survey parties, although no details are readily available. In any case, the above incident is a reminder, as Barrows (1974) points out, of the need for "maintaining full respect for the power of fire and the effects of this power on both wildland environments and the people who live and work in these environments" (Alexander 2010; Alexander and Buxton-Carr 2011). To this list we should also add recreationists and tourists (Alexander et al. 2012).

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Albert Pack, North Shore Lumberman

By John Haegeman

Fletcher, Gilchrist, Pack and Woods were all famous Alpena, Michigan, lumbermen. Both Gilchrist and Pack were mayors of the city with Pack serving from 1872-73 and 1887-88. Albert Pack logged Michigan's Upper Peninsula as well as the north shore of Lake Huron.

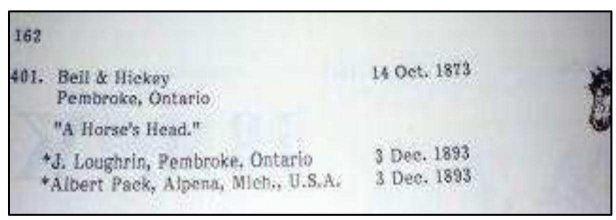
Albert Pack was born in Madison County, New York, on Nov. 10, 1842, but most of his life was spent in Michigan and this is where he was living when he died suddenly at age 57. As a young man he went into the lumbering business. He started by getting out logs, going into the woods in person, overseeing operations and taking part in the actual work. He was handy in all aspects of logging whether it was log running or breaking log jams. In 1880, he was an operator of importance and he formed a partnership with George N. Fletcher of Detroit. The firm was named "Fletcher Pack and Company". The firm was long known as one of the largest in the state and owned large tracts of pine lands, mills, tugs and all the equipment to run a large lumber concern. The firm was always successful and Mr. Pack made a great fortune in the lumber business.

During his long residence in Alpena, Mr. Pack was involved in many of the town's enterprises. He was always a large employer of labour and was successful in all engagements with his employees, which made him very popular. He was bright and congenial and had a great faculty for making friends and holding them. Although he made Detroit his home, his interests were in Alpena and in his large timber holdings in Canada.

Pack stamp hammer from Ministic Creek near Espanola. Photo courtesy of John Haegemen.

It was at Camp 7 across the Ministic creek that I saw my first Pack stamping hammer in July of 1980. It was a beautiful horse head shaped hammer with the number five inside. There was only one problem. We had no idea that Mr. Pack logged anywhere near here, so maybe the hammer was not his. The break came 20 years later when a paper trail going back to the Lake Huron North Shore Timber Auction of 1872 showed that indeed Mr. Pack did own the timber limits to berths #100,101,105,106 and 135. These later became the townships of Hyman, Totten, Porter, Vernon and Shedden. In the 1872 auction, John Shedden of Toronto bought these berths but he must have died shortly thereafter because they were disposed of by his estate. As of Jan.1, 1890, these berths remained in the hands of Mr. Pack.

The horsehead hammer was first registered to Bell and Hickey of Pembroke, Ontario, as registration #401 on Oct. 14, 1873. Mr. Pack took over the mark on Dec. 3, 1893. Albert Pack registered another mark "Pack " as #845 on Jan. 12, 1894. This mark I have never seen. Camp #14 which I have written up under Graves and Bigwood was also an Albert Pack camp.



162

401. Bell & Hickey — 14 Oct. 1873
Pembroke, Ontario
"A Horse's Head."
*J. Loughrin, Pembroke, Ontario — 3 Dec. 1893
*Albert Pack, Alpena, Mich., U.S.A. — 3 Dec. 1893

Part of the registration letter for the Pack horse head timber stamp. Photo courtesy of John Haegemen.

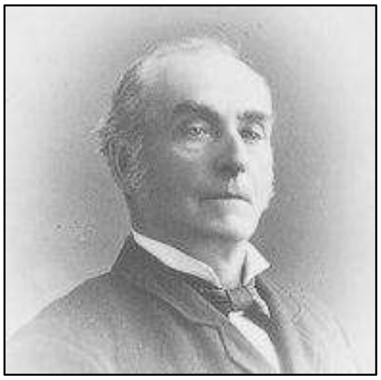
Footnote (From page 3 of the May 23, 1894, edition of the "Alpena Argus" newspaper as provided by the Alpena public library): "One of the worst storms on Lake Huron hit the tug ***John Owen*** near Middle Island with a raft of 4,000,000 feet of logs belonging to Albert Pack of Alpena. The tug was unable to hold the raft against the gale and high seas, so the logs went ashore north of the island. It was the first raft of the season from Canada to this city and also the first time any disaster has happened in towing the Canadian logs to Alpena. Last year (1893) 30 million feet of logs were towed to this city from Georgian Bay without a lost log or a raft washed ashore."

Special thanks to the George N. Fletcher Public Library in Alpena for their valuable assistance in providing information for my research on George Pack.

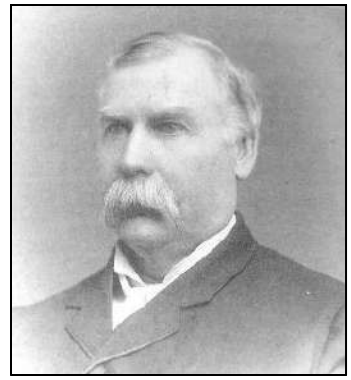
Origin of the Rivers and Streams Act, 1884

By Michael J. Umpherson HBScF

Many Ontario foresters will recall a lecture series during their university years entitled "Forest History and Legislation" (or Policy) that provided the historical background leading to today's provincial forest legislation. Undoubtedly, one of those lectures described the "Rivers and Streams Act" of 1884 and the national implications that it had - and has - to this day.

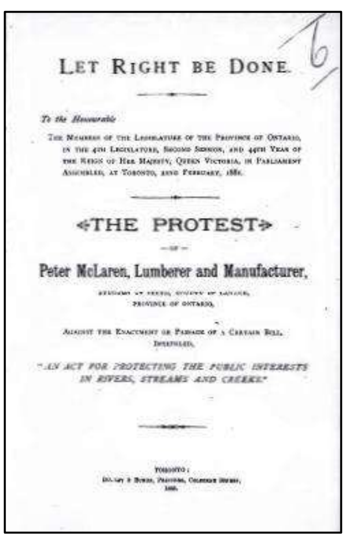


Boyd A. C. Caldwell. Photo courtesy of the Rev. John Fowler, Perth, ON (Great Grandson).



Senator Peter McLaren.

The Rivers and Streams Act resulted from a multi-year feud between two Ottawa Valley lumber barons from Lanark County: Boyd Caldwell and Peter McLaren. The dispute was over who controlled the water rights/slides/dams on the Mississippi River to move sawlogs to their respective sawmills at Carleton Place. McLaren, having made the improvements on the river, decided to stop Caldwell from floating his logs downstream through his slides and dams as he considered those portions of the river "private property". Caldwell took the other stance and regarded the Mississippi as a navigable, "public" right of way. On April 5, 1880, Caldwell wrote to McLaren asking for rates to float his timber through his improvements and offering to pay a "fair and reasonable price". McLaren's reply exactly one week later rebuked Caldwell and reminded him of not paying for the privilege of taking his logs through his improvements in the summer of 1878[1]. Thus, the battle began and would continue for another four years bouncing back and forth between Queen's Park in Toronto and Parliament Hill in Ottawa. Caldwells were strong supporters of Sir Oliver Mowat's provincial Liberal government and McLaren was an advocate of Prime Minister Sir John A. MacDonald's federal Conservative government.



LET RIGHT BE DONE.

To the Honourable

The Members of the Legislature of the Province of Ontario, in the 4th Legislature, Second Session, and 44th Year of the Reign of Her Majesty, Queen Victoria, in Parliament Assembled, at Toronto, [illegible] February, [illegible].

THE PROTEST

— of —

Peter McLaren, Lumberer and Manufacturer,

[illegible]
Province of Ontario,

Against the Enactment or Passage of a Certain Bill, Intituled,

"An Act for Protecting the Public Interests in Rivers, Streams and Creeks."

Toronto:
[illegible]

The controversy also filtered down into the local communities in Lanark County, and many fights erupted between McLaren's and Caldwell's shantymen. At a dance one Saturday night in McDonald's Corners frequented by "Caldwell men", one of McLaren's loggers asked his foreman if he could attend as he wished to court a certain girl who would be there. The Shanty Foreman at first refused but then his pride took over after much needling by his employees and he let his men go. His departing comments to his men were: "McLaren's men are afraid of nothing that walks, dances or fights on the Highland Line" (the road to the dance hall). "Put a bundle of axe handles in the sleigh and go".[2] Whether a battle royal broke out that night is not known. What is known is the fact that Caldwell's men slipped past McLaren's guards at the High Falls dam and cut the boom to let their logs go through. One local story has it that at the pre-mentioned dance, Caldwell's men bought the drinks for McLaren's gang in hopes of settling the feud. When the rival gang was well under the influence, Caldwell's lads slipped out the back door, down the road to the High Falls at Dalhousie Lake and then cut the boom to let their logs through.

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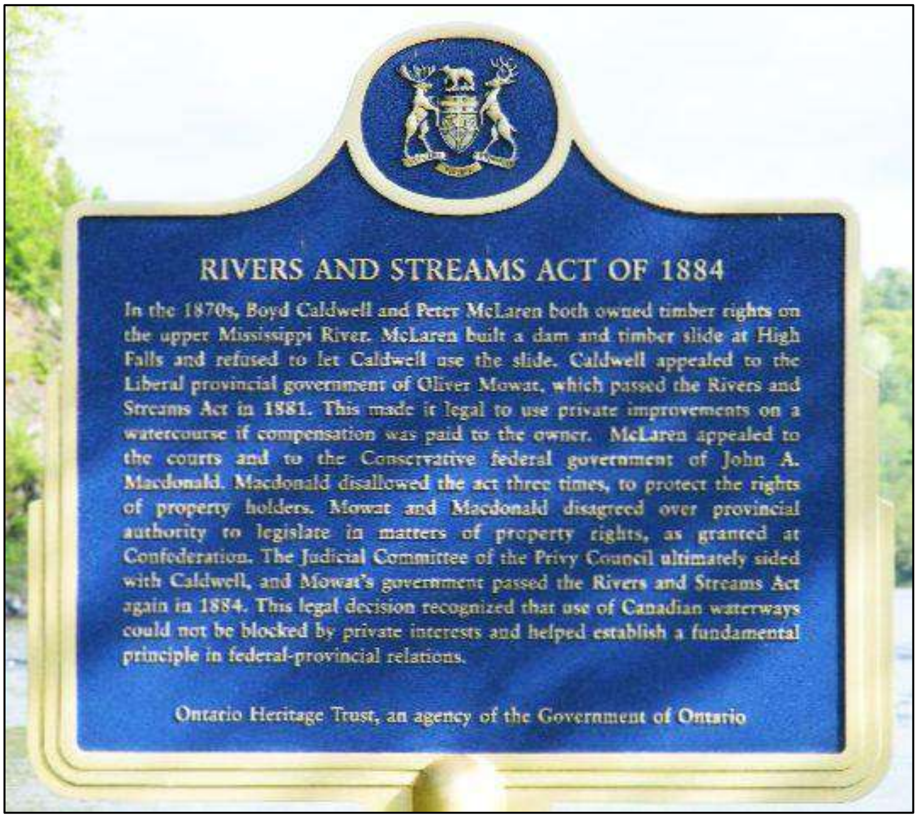
[1] Both letters recorded in "Official debates of the House of Commons of the Dominion of Canada: fourth session, fourth Parliament ... comprising the period from the ninth day of February to the seventeenth day of May, 1882, page 901".

[2] The Perth Courier, Mar. 23, 1988. The Legacy of Lanark County's Lumber Industry. Part 3.

The fiasco ended in 1884 with a decision by the Judicial Committee of the Privy Council in Britain to uphold the Provincial legislation and therefore set the standard for today's public use of navigable waters in Ontario and Canada. It also reinforced the fact that the federal government could not override legislation that fell clearly under provincial jurisdiction. At the end of the day, Boyd Caldwell was the victor. Boyd A. C. Caldwell passed away in 1888. Peter McLaren became a Senator in Ottawa in 1890 and passed away in 1919. Legend has it that they later became good friends.



On August 20, 2009, the Ontario Heritage Trust unveiled a plaque recognizing the 125th anniversary of the Rivers and Streams Act of 1884. The plaque is located at Centennial beach on the westerly shore of Dalhousie Lake in the Municipality of Lanark Highlands. It is near the entrance of the Mississippi River into Dalhousie Lake where Peter McLaren had his log slide at the High Falls. Direct descendants of the Caldwell and McLaren families were in attendance that day. A notable event in Ontario forest history.

Links

News Release Commemorating the 125th Anniversary of the Enactment of the Rivers and Streams Act
http://www.heritagetrust.on.ca/News-and-Events/2009/Aug/Provincial-plaque-commemorates-Rivers-and-Streams.aspx

Rivers and Streams Act of 1884 Historical Plaque
http://www.ontarioplaques.com/Plaques_JKL/Plaque_Lanark31.html

Copy of the Protest by Peter McLaren
http://archive.org/details/cihm_09454

David Dunlap Observatory Greenspace

By John Bacher PhD

The future of the 76 ha of predominately forested green space in the City of Richmond Hill that served as the University of Toronto's David Dunlap Observatory (DDO) from 1935 to 2007 will be decided in an Ontario Municipal Board Hearing that is scheduled to begin on August 7, 2012. Here the Richmond Hill Field Naturalists will attempt to secure the protection of all the green space on the site. The controversy illustrates the challenges to maintaining forested green space within our urban environments, as well as the processes that are available to make decisions on the fate of these kinds of lands.

Aerial view from the south of the David Dunlap Observatory grounds. From Google Maps, May, 2012, used under Google Information Usage Policy.

The intense public debates and exchange of testimony between experts at a hearing of the Ontario Conservation Review Board (CRB) in 2009 has given a great deal of historical understanding to the origin and development of these lands. The site is predominately forest and abandoned farmland, (farming stopped in the 1980s but tree growth was arrested because of weed cutting undertaken by the University of Toronto) but also contains a number of buildings of varying community and historical significance.

There is a small southern parcel known as the "panhandle" purchased for the University of Toronto by the Observatory's founder, the astronomer Clarence Chant. He inspired mining magnate David Dunlap by a compelling speech on a comet in 1921, which had been recently visible in Canada. The panhandle lands were leased in 1975 for a period of 40 years to Richmond Hill by the University for the purpose of the Elvis Stojko Arena and a passive park.

David Dunlap Observatory. Photo courtesy of Mary Lou Bacher.

Historically significant DDO structures are confined to the original property granted to the University of Toronto by Jessie Dunlap. She made the gift to carry to carry out the wishes of her suddenly deceased husband, for whom the observatory was named. The site was chosen by Chant partially because of its high knoll when he viewed topographical maps of farming areas outside Toronto. When Chant took Jessie Dunlap to see the site for the first time she said, "this is the place" and purchased the property. She then granted the site to the University of Toronto for "The David Dunlap Observatory" and a surrounding "David Dunlap Park."

The oldest historical building on the observatory grounds is the 1864 home of Alexander Marsh, known as Elms Lea, which served as Chant's residence. Of greatest significance is the 74 inch reflector telescope that opened in 1935, which at one time was the second largest in the world. It also has two sitting telescopes that a part of the main telescope with an option for a third to be used. There is also an impressive Beaux Arts administration building, the roof of which supports three smaller domes used for additional telescopes. The last of these was added to the central dome in 1965. There is a "shack" and associated antenna for a pioneering radio telescope that opened in 1956. Another historic structure is a pump house that provided water to the observatory before the extension of municipal services.

David Dunlap Observatory grounds around the time of the original development. Note the lack of forest cover.

From 1802 to the property's purchase by Jessie Dunlap it was continually under the ownership of the Marsh family. The ornamental trees to shelter the Elms Lea homestead were maintained under Chant's guidance as part of his never fully realized vision to create an arboretum to compliment the observatory. These features include a vestigial orchard, a mature spruce screen, a line of maple and a row of hickories along a farm lane to Yonge Street.

Although Chant carefully incorporated the farmstead trees on the site into his ambitious plans for an arboretum to compliment the observatory, the legacy of the Marsh farm was starkly typical of the barren nature of rural land in the Don watershed near its source with the Oak Ridges Moraine. Jessie Dunlap wished to change this situation. She was a supporter of the reforestation of the Don watershed. Her York Mills estate, Don-Alda Farm, was the start-off point for expeditions of the Don River's champion Charles Sauriol. Around the telescopes were planted ceremonially oaks by Sir William Mulock, the founder of the conservationist Men of the Trees.

As part of the plans to have a David Dunlap Park, the Department of Lands and Forests public nurseries, then under the supervision of the Chief of the Reforestation Branch, Edmund Zavitz, provided 8,100 mostly coniferous seedlings planted in the observatory site in 1939. These seedlings were intended to be later transplanted to compliment the ambitious reforestation project involved in the planned Arboretum.

Chant's reforestation plan never transpired during his lifetime since the outbreak of the Second World War delayed the Arboretum project. The trees were left to "naturally evolve", since they had become "too large to be transported."

According to the 2009 CRB decision, the nursery forest may have been encouraged to protect the observatory's operations from traffic on Bayview Avenue. The CRB however, found this possibility insufficiently documented for it to find the site to be of heritage significance. During these hearings none of the parties were aware of the gift of the trees to the University from the Ontario government's nurseries. This was only established through a copy of a letter discovered in the James Herbert White Papers, from the University, thanking Zavitz.

Although the young Bayview plantation was a small start it was, the 1950 Don Watershed Plan noted, the most successful reforestation effort of the Don watershed achieved by that time. The slow pace of reforestation in the Don watershed exemplified the inadequacies of the growth of public forests on the predominately agricultural landscape of Southern Ontario before the passage of the 1946 Conservation Authorities Act.

In 1950 the only other Don reforestation successes were a five acre North York Waterworks Plant Forest at Oriole and the "very few" trees that survived around the Richmond Hill water tower. Deforestation was so severe that the only hunting opportunities in the watershed were found to be the European hare, whose survival was doubtful. The study deplored the lack of recreational facilities in the watershed and documented how existing sites were being degraded as informal garbage dumps. One of the few bright spots for public recreation in the Don watershed was the DDO, which the report noted, "receives about 4,000 visitors a year."

During the CRB hearings one of the key witnesses for a heritage designation that would protect the entire site from development was University Toronto Astronomy Professor David Bolton. He used the large 74 inch telescope to confirm the existence of black holes in 1971 while a DDO postdoctoral fellow. The black hole he discovered was Cygnus X-1, which lies in center of the Milky Way galaxy.

Bolton told the CRB that the site at its peak attracted 30,000 visitors annually. He found they were attracted by both the grounds and the telescopes. He described recreational uses as quite varied including dog walking and cross country skiing. At the time of Bolton's discovery of black holes the telescopic facilities at the DDO had already begun to suffer from light pollution from the growth of greater Toronto around Richmond Hill. In 1971 because of this problem the University of Toronto built the University of Toronto Southern Observatory in Las Campanas Chile. It was here that the university's astronomer Ian Shelton discovered Supernova 1987 A. In 1995 Bolton lead the way to stop further degradation of the David Dunlap Observatory telescopes from light pollution. He persuaded the Richmond Hill Council pass a by-law against light pollution which he drafted. The by-law restricts lighting times, limits brightness, installs shielding on street lights and mandates the use of pink lights which emit a less harsh pinkish colour.

Following the passage of the light control by-law the University of Toronto leased the "panhandle" land to Richmond Hill for an arena and parking lot. Although Chant's ambitious plans for these lands as an impressive entrance to the Observatory were not realized, the positive relationship with Richmond Hill the lease negotiations generated helped secure Canada's first light pollution by-law.

Although there were concerns for the future to the telescopes on the property, a Metrus subsidiary, Corsica Development, signed a lease with the Royal Astronomical Society of Canada in 2009. The lease allows the society to operate the telescopes and provide public outreach and education programs at the observatory. Public astronomy events have been held, most notably during the Perseid meteor shower. The observatory has been used as film shoot for the Science Fiction television series Warehouse 13.

With the Royal Astronomical Society lease secured, heritage debates over the future of the observatory lands have increasingly revolved around the future of the green space. The use of a forest planted by the University of Toronto, Faulty of Forestry, from 1958 to 1960 was one of the critical reasons for the Conservation Review Board recommending to Richmond Hill that 70 per cent of the site be protected from development by a heritage designation. This indicated to the Richmond Hill Council that a far larger area could be protected by a heritage designation than had been recommended by its heritage expert, Andre Scheinman. His initial report sought protection for only 45 per cent of the site.

An example of the state of the forest plantations today. Photo courtesy of Mary Lou Bacher.

The purely advisory CRB could only deal with landscape heritage issues related to the operation of the observatory while the OMB hearing planned to begin on August 7th will result in a binding decision. The Richmond Hill Field Naturalists will bring issues related to the protection of the natural environment including increasing forest cover in the Don watershed, the protection of a wetland, York Region’s goal of 30 per cent forest cover and the use of the forested area by a variety of wildlife species. These species include a herd of 20 deer, coyotes, pine siskins which benefit from the predominately coniferous reforestation, and the barred owl.

An area of the David Dunlap forest that appears to be most carefully managed is a tract identified as the University of Toronto Faculty of Forestry "experimental" plantings. The CRB came to the conclusion that although the plantings were part of an experiment it was impossible to find any "documented importance to the research findings." Since “little is known about these plantings and no specific research findings could be found by the parties” the Board decided to theorize “that different species were planted, using different practices” but were “intended to remain in their current location, rather than be transplanted” like the 1938 nursery.

View looking east, on April 26, 1938, planting of the 4 "Mulock Oaks". As numbered: 1 - Astronomer Clarence Augustus Chant; 2 - Caretaker Tom McKenzie; 3 - Sir William Muclock; 4 - Donalda Dunlap, age 4, granddaughter of Jessie Dunlap; 5 - David Moffat Dunlap (Donalda’s Father).

The CRB appreciated the “impact that the curved entrance road, bordered by mature trees has on visitors”. It found that “the careful planting of these trees along a line that perfectly aligns with the north-south axial line so important and carefully contemplated in the DDO precinct area.” As a result the CRB saw “the adherence to this axial line as a very important connection to the observatory, and the fundamental trait that truly raises the significance of these plantings. “Given the topography of the knoll and how the DDO precinct is carefully framed by strategic plantings”, the CRB found “these research tree plantings that follow an axial planting line to also be a boundary of an important viewscape from the main DDO precinct.” On this basis it recommended that the “two clusters of research tree plantings...be protected.”

Following the CRB report in November 2009 a bulldozer and backhoe removed 100 trees as part of what was termed an archeological assessment study. According to Richmond Hill planner Martin Volhard the study required test pitting, turning the soil between the trees rather than cutting them down. After the trees were uprooted they were stacked in a pile south of the Elms Lea farmhouse. The trees were removed without making an application for a permit required under the Richmond Hill Tree-By law. This protects trees with a trunk diameter of at least more than 20 centimetres at breast height. Some 17 trees were found to have been protected under this by-law. In April 2010 in response to a guilty plea, Corsica was required to pay a fine of $14,880 and to replant 100 trees. It was also required to pay Richmond Hill $30,000 for a three year reforestation plan, minus interest accumulated and funds used to plant dead or dying trees within the plan. In the following June 100 trees were planted by Corsica to meet the court order.

The Toronto Region Conservation Authority (TRCA) added the site to its list of strategic land acquisitions in 2009 but ultimately considered the property too expensive to buy. (It is reported that Metrus bought the property for $70 million). The TRCA has worked closely with the Municipality of Richmond Hill on the negotiated agreement and will not be pursuing acquisition of these lands if the agreement stands after the upcoming OMB hearing.

The on-going battles over the ecologically restored forest of the DDO lands point to the enormous challenges in maintaining, let alone increasing from 21 to 30 per cent, as recommended by the Environmental Commissioner of Ontario in his 2010 annual report, the forest cover of Southern Ontario. Similar battles around the province lack instruments as strong as both York Region's and Richmond Hill's tree by-laws and effective local environmental groups.

In its forest controversies Richmond Hill has benefited from ties to its conservationist past. The first place where I spoke about the life of Edmund Zavitz, whose public nurseries provided many of the trees planted on the DDO lands and who fashioned legislation for tree by-laws and conservation authorities, was in Richmond Hill. The Richmond Hill Presbyterian Church where I spoke was just a few blocks away from the Richmond Hill Baptist Church, the parish of Reverend Milton Johnson who delivered the funeral eulogy to Edmund Zavitz.

Town of Richmond Hill Update on the David Dunlap Observatory Lands: May 11, 2012 (from its website – see below)

OMB Hearing Set for August 7, 2012

The mediated settlement between five parties for the David Dunlap Observatory (DDO) lands was formally presented at the May 7, 2012 Ontario Municipal Board (OMB) pre-hearing meeting. At the pre-hearing, the Richmond Hill Naturalists stated their objection to the settlement and an OMB hearing has been scheduled to begin August 7 to deal with their issues.

The mediated settlement represents the formal position of five of the parties, officially replacing the original development proposal submitted by Corsica Development Inc. The Town fully supports the mediated settlement as it proposes to save approximately 40 hectares (99 acres) from development and have this natural area dedicated to the Richmond Hill community as public space. The settlement was a result of many months of mediation facilitated by the OMB between Corsica Development Inc., the DDO Defenders, the Town of Richmond Hill, the Region of York, and the Toronto and Region Conservation Authority (TRCA). The Richmond Hill Naturalists are the only party objecting to the settlement and will now have their issues addressed at an OMB hearing scheduled to begin August 7, 2012.

List of Materials Consulted for the Preparation of this Article

Conservation Review Board Report – Dunlap Decision
http://www.crb.gov.on.ca/stellent/idcplg/webdav/Contribution%20Folders/crb/content/Hearing%20Report%202007-12-DDobservatory.pdf

Town of Richmond Hill – Dunlap Observatory
http://www.richmondhill.ca/subpage.asp?pageid=david_dunlap_observatory

Toronto Region Conservation Authority
http://trca.on.ca/dotAsset/134760.pdf

Metrus Inc. – Observatory Hill
http://www.observatoryhill.ca/index.php

Richmond Hill Naturalists – Save David Dunlap Observatory
http://www.rhnaturalists.ca/save-the-observatory/

People

James Cayford

By Lorne F. Riley and Jack H. Smyth

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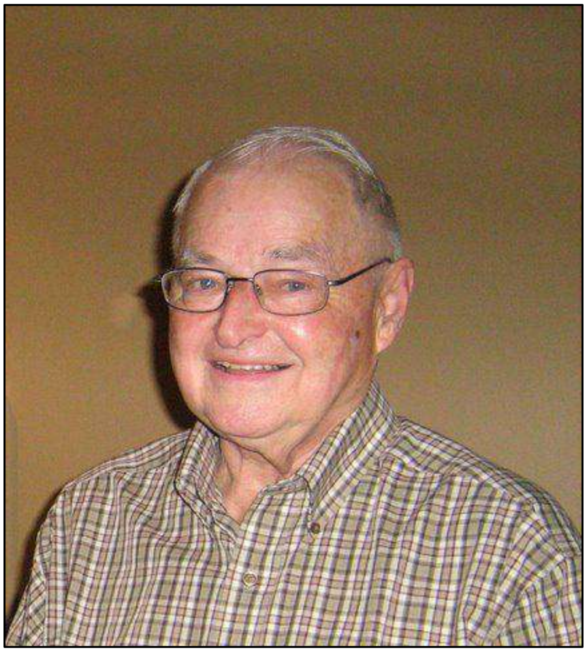


James "Jim" Cayford.

Canada's forestry community lost one it's most dedicated and stalwart members on November 17, 2011 with the passing of James (Jim) Harry Cayford. Jim had not been ill but was felled suddenly while attending a community concert on the University of Guelph campus near his home at Village by the Arboretum in Guelph, Ontario.

Born in Montreal in 1929, Jim attended the University of New Brunswick, receiving his B.Sc.F. in 1952, and then received his M.F. from Yale in 1956. His first job was with the Industrial Forest Service in Prince George, B.C. followed by a short stint with the Manitoba Forest Service. In 1954, he began a 35-year career with the federal government's Canadian Forestry Service (CFS), serving 12 years in Manitoba until he was appointed in 1965 as Assistant Program Co-ordinator, Silviculture at departmental headquarters in Ottawa. After holding several senior line and staff positions in Ottawa, Jim was named Director General of the Great Lakes Forest Research Centre in Sault Ste. Marie, Ontario in the fall of 1974. As Director-General, he was responsible for the Ontario region forest research program as well as for the implementation of many of the federal government's new direct delivery programs to the forest sector. Desiring to be the complete professional, Jim immediately studied to be, and became, a Registered Professional Forester of the Ontario Professional Foresters Association, the licensing body for professional forestry practice in the province. During his time in the Sault, Jim was co-chair of the Canada-Ontario Joint Forest Research Committee, a multi-lateral federal-provincial group that lead the planning and development of forest research in the province. He was Chairman of the Canada-USSR Working Group on Forestry, a bi-lateral international group that worked to foster cooperation in forestry matters between the two countries. He contributed to the programs of two World Forestry Congresses and was head of the Canadian delegation at the Eighth World Forestry Congress (1978) in Indonesia.

Jim retired from Canadian federal service in 1987 and left Sault Ste. Marie for Ottawa. There he accepted a 3-year appointment as Executive Director of the Canadian Institute of Forestry (CIF) where he put in many hours to revitalize that organization after a number of troubled years. He worked thereafter for some 15 years as a forestry consultant on a part-time basis and held contracts with a variety of organizations including the Canadian International Development Agency (CIDA), for whom he monitored programs in ten southern African countries, and the Canadian Forestry Accreditation Board (CFAB) in the 1990s, for which he was Executive Director.

Jim devoted much volunteer time to a range of organizations serving, among others, as a member of the Board of the Eastern Ontario Model Forest (EOMF) as well as Chair of that organization's Forest Science Committee. He made further contribution to the CIF as, successively, Vice-President, President (1985) and Past-President and, later, as Editor of The Forestry Chronicle. He was an active member and officer of both the Canadian Forestry Association and the Ontario Forestry Association. Not content with his contributions to forestry, he served in public life as a member of the Sault

Ste. Marie Economic Advisory Board and of the city's Manpower Assessment and Planning Committee. After moving to Guelph, he became a member of the Wellington County Stewardship Council.

Jim's enthusiasm for international travel and his numerous trips abroad are legendary and he shared this enthusiasm with his wife, Burla. It was when he became active in the International Union of Forest Research Organizations (IUFRO) in the early 1970s as Deputy Project Leader of Project Group P2.02 Production of High-yielding Trees, that his drive to see the world blossomed. Their travel opportunities were much enhanced when, in 1981, Jim was appointed to the IUFRO Executive Board. During this time, the Board met on a regular basis in many locations around the world. Although much of Jim's travel was for business and professional reasons, the Cayfords weren't to be deterred after retirement and made many subsequent trips as, simply, tourists. Jim's global travels took him to almost 100 countries over the course of better than 35 years.

Some of Jim's greatest career achievements occurred in the international sphere. As a member of the IUFRO Executive Board, he took a leadership role not only speaking for Canada but also adopting a global perspective striving to strengthen forestry research in the broader international community. From 1991 to 1995 he served as IUFRO Vice-President, Administration. His tenure on the Board came to an end with his retirement from the Canadian Forest Service but not his involvement with the organization. His advice was sought regularly thereafter. When IUFRO saw a need to reorganize, Jim was called upon to undertake the task. His review was thorough and his recommendations were implemented much as he had prepared them.

Over his career, Jim received a number of prestigious awards including the Queen Elizabeth II Golden Jubilee Medal, the CIF International Forestry Achievement Award, the Eastern Ontario Model Forest's Ross Silversides Forestry Award and the American Forestry Association's Bernhard Eduard Fernow Award. Other recognitions of Jim's service included being named a Fellow of the Institute (CIF) and an Honorary Member of IUFRO, designations in recognition of particularly important and outstanding services to the respective organizations. In a special recognition, the Eastern Ontario Model Forest will establish an ongoing award in Jim's name, a tribute to the incredible career of one of Canada's premier forestry professionals of the past half century.

Jim is survived by Burla, his wife of 57 years, daughters Carol and Diane, son Alan, six grandchildren and two great-grandchildren. His presence and contributions will be sorely missed.

The Archives Corner

Historical Forestry Database, Sault Ste Marie Public Library
By Kevin Meraglia

When one thinks of Industry in Sault Ste. Marie, the steel Industry is usually the first thing that comes to mind. But another industry has also played a major role in "The Sault's" history – the forest industry. St. Mary's Paper Limited, formerly Abitibi Power and Paper Company, was one of Sault Ste. Marie's first industries and the first Northern Ontario paper company to start managing their forest resources to maintain sustainability. Over the past 100 years St. Mary's Paper has saved their 'wood management' files. The Historical Forestry Database project was initiated in 2002 under the Sault Ste. Marie Public Library Archives first Archive Technician and database creator Linda Burtch in order to save and archive these files.

The Historical Forestry Database project was a multi-partner effort to preserve one of Sault Ste. Marie's oldest collections of historical papers. The plan was to make this invaluable collection available online with the assistance of the Sault Ste. Marie Public Library, Canadian Council of Archives, St. Mary's Paper, Sault College, Canada Foundation for Innovation, Ontario Innovation Trust, Upper Lakes Environmental Research Network, Ministry of Natural Resources, Human Resources Development Canada and Natural Resources Canada Canadian Forest Service. All these organizations helped to create the Provincial Archive Award-Winning Historical Forestry Database.

The Historical Forestry Database is an online interactive database allowing users to search an extensive collection, which includes thousands of maps and aerial photographs along with thousands of other documents. The collection details seasonal and regulatory management of the company, their bush camps, forestry information, as well as the implementation and effects of government legislation and the Second World War P.O.W records for this area.
Any individual can access the database through the Sault Ste. Marie Public Library website http://forestry.ssmpl.ca/; from here users can search Keyword, Title, District, Township, Watershed and Year. Once a record is selected by clicking on the blue hyperlink the record information is provided as well as a scanned copy of the document.

This information is valuable to researchers who need access to documents immediately and to the archives since it reduces the amount the documents are handled. Though most of the documents are in digital form the original documents can be viewed by researchers upon request. It must be noted that some of the documents are not available in digital form due to their poor condition or are part of oversized ledgers. Researchers can still access the material by submitting an archival retrieval form to the Sault Ste. Marie Public Library at 50 East Street; retrieval of archival documents usually takes 24 hours. Once retrieved individuals can view the documents and copies can be made if needed.

With the sale of St. Mary's Paper the Sault Ste. Marie Public Library is working with St. Mary's Paper to obtain historical documents to further increase our collection and preserve the history of such an valuable and integral part of our local history. Researchers can contribute archival documents to the Sault Ste. Marie Public Library whether it is forestry history or other aspects of local history by bringing the documents to the Main Library on East Street and signing a donation form. For further information on the database you can contact the Archive Technician, Kevin Meraglia, at (705) 759-5447 or by email at archives.library@cityssm.on.ca.

Personal Recollections

Bob Dixon: A Vignette of a Provincial Visionary with Gin in Guyana

By John Cary RPF

Bob adored a good Gin and Tonic, but I digress too soon.

I first ran into Bob in the mid-70s on one of my first visits to Queen's Park as a freshly anointed Unit Forester from Dryden. In the northwest, we were very interested in the provincial Forest Production Policy announced a few years earlier and specifically what role the Management Units around Dryden were to play. We were trying to write simple 30 page Forest Management Plans for the local Crown Unit and the Dryden Paper Company Unit. What yields were we expected to aim for and by what year?

In talking to him, this very green Unit Forester soon absorbed the wisdom of Bob's long term vision as the Policy was tied to government money for forest management and inventory on Crown land to achieve certain levels of long-term production of wood products from the forest. His leadership had the success it deserved, as in 1968, for the first time, the Cabinet supported a provincial vision and objective for forest management. I was quite awestruck and from then became more interested in provincial policy and legislation than in local silviculture, but I didn't tell my bosses. Bob and I met again a few times and he told me stories about his overseas work and I told him of our interest in that possibility.

Lo and behold, in mid-1977 I got a call from him asking if I was interested in being seconded to CIDA for a two year project in Guyana. My wife and I left Canada and arrived in Georgetown in August 1998. I was a co-operant in a CIDA $8 million inventory and forest management project.

By year-end and post Jim Jones, Bob arrived sweating profusely. As he cooled off at the Pegasus Hotel, he ordered his first G and T and a relaxed grin surfaced. Luckily, the hotel had a generator so the very erratic electricity did not make a difference to his acclimatization. Bob bought some loose-fitting brightly coloured Guyanese shirt-jackets and soon looked the part.

The next day he met with the Canadian High Commissioner and the Team with more gin and beer served afterwards. Over the next week he met with the Guyana Forestry Commission and all the major saw millers. His skill at diplomacy and the way he asked for more progress was wonderful. On his next visit in 1979 we went into the bush where there was gin, but no cooled air. Bob talked to all of the on-the- ground managers and quickly understood what progress had been made. We had him to dinner more than once and we talked about what was really going on!

Early in 1980, Bob was back and one of my reports on the sawmill situation was ready for his review. He read it and said parts were undiplomatic and strident, so he had me do some editing. He was right of course and subsequently it was presented to the Conservator of Forests who welcomed it.

Bob's aplomb coupled with his quick mind and ability to grasp the essence of a situation was simply amazing. Ontario's contribution to this project was key to making it work. Bob always understood that you must work within local limitations. During his leadership of forest management in Ontario, he used that understanding and gained success by diplomacy, practicality and sheer persistence. We all owe him.

Book Review

"Dictators Like Trees": Reviewing *Song of the Forest*

By Mike Commito

Stephen Brain, Song of the Forest: Russian Forestry and Stalinist Environmentalism, 1905-1953 (Pittsburgh: University of Pittsburgh Press, 2011)

When one thinks of Stalinist Russia, usually terror and the infamous Gulag prison camp system are the first thoughts that come to mind. For most it would be unfathomable to believe that in the mind of despot Josef Stalin there was any consideration for environmentalism and forestry. But in his book, *Song of the Forest: Russian Forestry and Stalinist Environmentalism, 1905-1953,* historian Stephen Brain tells us that "dictators like trees."

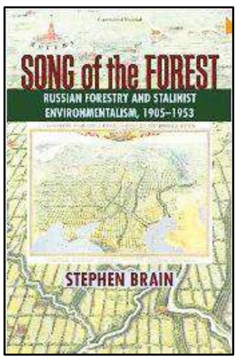


Photo from Amazon.com.

For Stalin in particular, the longstanding literature argues that his regime was implacably hostile to environmental initiatives. However, Brain finds new evidence that Stalin adamantly believed that Russia needed to be reforested to ensure its survival. In the early part of the twentieth century Soviet Russia went through three wars and a revolution but by the 1940s it still "went about protecting from exploitation more forested land than any other country in history."

The book contains six chapters, which chart the development of early Russian forestry practices to the emergence of Stalin's brand of environmentalism. With the outbreak of the Russian Revolution in 1917 and subsequent Civil War, Russian forestry practices were thrown into disarray. The turmoil continued into the late 1920s when the Soviet Union established an aggressive campaign of industrialization that plunged Russia's forests into further chaos. However, this reckless exploitation was eventually checked, as Stalin firmly believed that "deforestation represented serious environmental dangers to the state's larger project of modernization." Consequently, considerable effort was taken to bring in new protective measures. Even during the Second World War when victory was far from secure, the Soviet Union reversed temporary wartime legislation that allowed unsustainable logging. Moreover, during Stalin's reign, a forest preserve the size of France was established and grew to the size of Mexico despite vigorous opposition.

One of Stalin's most ambitious projects was the Great Plan for the Transformation of Nature, which was the world's "first explicit attempt to reverse human-induced climate change." The Plan called for creating nearly six million hectares of new forest in southern Russia in order to cool and moisten the climate. The initiative was based on the belief that "landscapes without forests are fundamentally unstable and that the integration of forests into landscape is a prerequisite for successful economic modernization."

There are times when the book can be dense but one must see the forest for the trees. It is a worthwhile read and even those unfamiliar with Russian/Soviet history should have little difficulty wading through the details. Many of Stalin's policies were environmentally sound and even paralleled existing efforts in Canada and the United States. However, the reality was that the Soviet Union's environmental policies were not implemented to promote forest health or relaxation but for the more sinister motive of increasing state power. Consequently, I was left with the curious thought that Stalinist Russia may have treated its trees better than its people.

Stephen Brain did his PhD at the University of California-Berkley. He currently teaches Soviet/Russian History and Environmental History at Mississippi State University.

“Renewing Nature’s Wealth”

(Lambert, Richard S. and Paul Pross. Toronto: The Ontario Department of Lands and Forests. 1967). The book cover describes this book as “the exciting story of Ontario’s natural resources, and John Robarts, in his Foreword to the book as ‘much more than a history of one of the Departments of the Government of the Province of Ontario: it is a vital component of the history of Ontario’, reaching back nearly 200 years to the days of the first surveyor General of Upper Canada in 1794. The book describes the impact made by a civilized people upon the primitive forest that originally covered the land, and the development of its natural resources under public administration from an early state of confusion and waste down to the modern era of conservation and scientific management.” We will provide a précis of one chapter of this book in each future edition of the newsletter.

Part II: Consolidation and Conservation, 1842-1900 - Chapter 5 (The Land Surveyor and His Work): This chapter describes the role of the land surveyor in land settlement and resource exploration. Land surveyors played a vital role in the progress of development as land had to be surveyed before it could be made available for use. There are two main periods of land surveys: the first occurred between 1763 and 1890 when the southern part of Ontario was surveyed into township lots and concessions; from 1890 on the focus was on northern Ontario. Surveyors were required to do more than just measure the land. They were expected “to assess its potential value, in terms of soil, terrain, timber, waterpower, minerals and wild life, for the purpose of facilitating the building of roads and railways, and locating mines, as well as encouraging farming.” Until the advent of the use of aerial photography in 1920, land surveyors provided the data required to create maps and establish boundaries.

The work was physically hard and the equipment primitive by today’s standards, which led to many errors in the surveys and many resurveys. Many of the early errors were due to the lack of qualifications of the surveyors and absence of government oversight of projects. It wasn’t until 1849 that legislation was passed establishing qualifications for the profession. By 1860 the profession was fully organized on a self-governing basis, through the Association of Provincial Land Surveyors (incorporated in 1866).

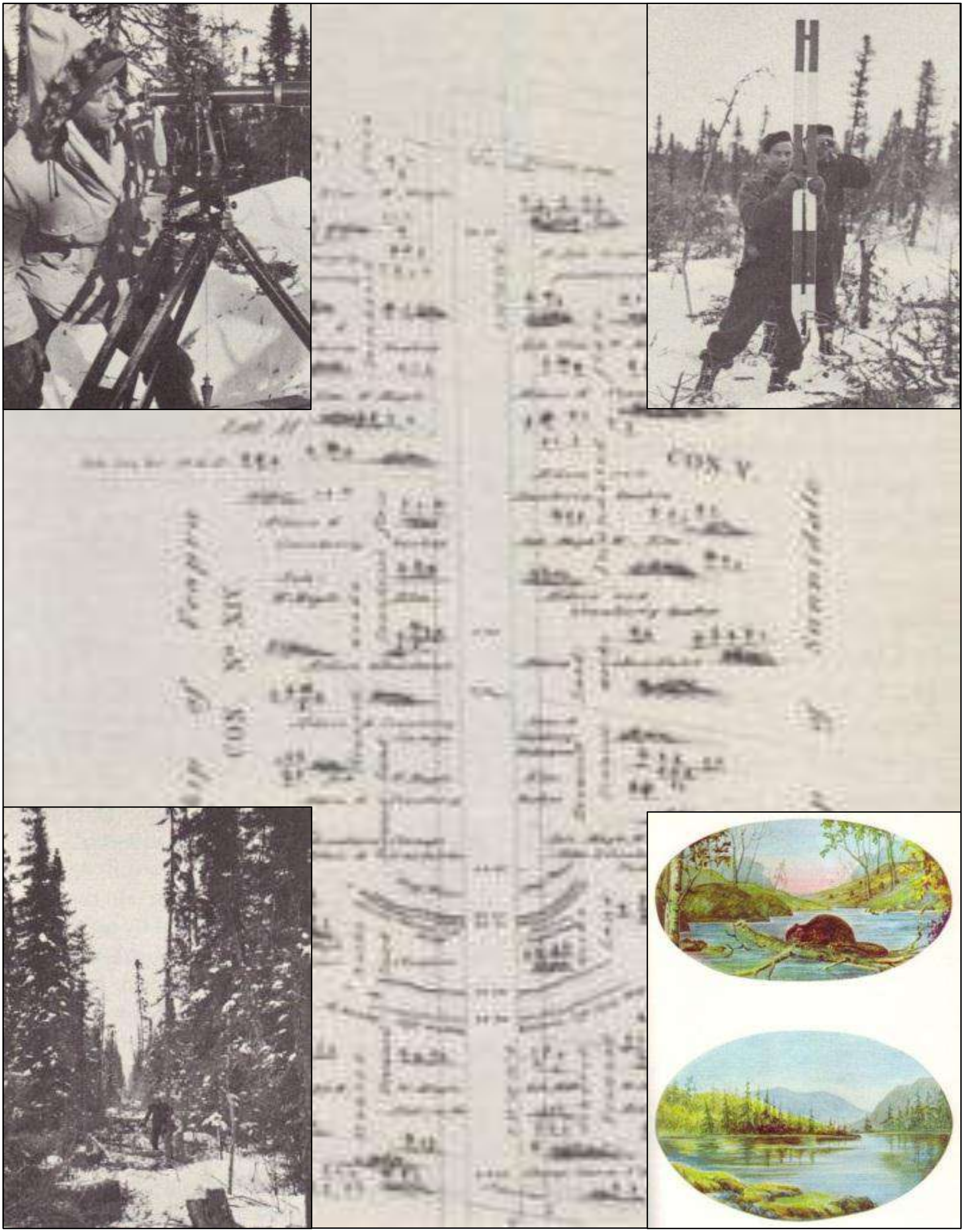
Provisions of survey parties are described in detail and it is noted that “pickles” were not an allowed food item! Surveys were conducted in both summer and winter. Isolation was a common theme as these parties were in remote situations without communication with the settled world. If someone died, they were buried on site and it was noted in the field book. The surveyor had to keep meticulous field notes, which were turned over to the government with an attestation to their accuracy at the end of each project. (These field books are now housed at the government building in Peterborough).

The original equipment consisted of a compass and a Gunter’s chain. Eventually, the theodolite and steel chain replaced these early instruments. Since 1900, mechanization and technology have played an increasing role in land surveys.

This chapter ends by describing a few of the more strenuous projects including the survey for Algonquin Park, the project for the exploration of northern Ontario, the survey for the boundary between Ontario and Manitoba and the survey for the boundary between the districts of Thunder Bay and Cochrane.

The survey data collected yesterday is still in great demand today and it continues to be referenced regularly in land disposition.

Editor’s Note - The photos below are from this chapter in the book.



Events and News

Forest History Society of Ontario Annual General Meeting – 2012

The annual general meeting of the Forest History Society of Ontario was held at the Nottawasaga Inn on Thursday afternoon, 9 February, 2012, at the Nottawasaga Inn, Alliston. The meeting was well attended with 25 members present. Business arising included the following:

- Bylaws updated
- Acknowledgement of and thanks for financial grant of $10,000 to the Society from Natural Resources Canada
- Acknowledgement of society's role in supporting Port Rowan Historical Society
- Ontario Historical Society is looking for articles on forest history for its publication
- The society's application for charitable status was rejected by Canada Revenue Agency; the Ontario Historical Society will support a future application
- The society helped secure transfer of Ontario Lumber Manufacturing Association archives to Archives Ontario
- Update on NICHE project to document forest related holdings across Canada
- Description of joint display between the society and the Canadian Bushplane Heritage Centre in Sault Ste Marie on forest resources inventory
- The society is moving to an online payment system for membership application and renewal
- The Guest Speaker was Monte Hummel, President Emeritus, World Wildlife Fund Canada. He spoke eloquently on the history of his forest near Kingston, Ontario.

FHSO Web Membership Renewal

New memberships and membership renewals for the Forest History Society of Ontario are now available via the internet. Visit this link to the FHSO home page –

http://www.ontarioforesthistory.ca/

to obtain or renew your membership by clicking on the 

button.

Or click on this link –

http://www.ontarioforesthistory.ca/index.php/membership – to go directly to the membership page.

"Ontario's Forest Sector Champion" Award

Ken Armson, Chair of the Forest History Society of Ontario, received the "Ontario Forest Sector Champion" award from the Ontario Forest Industries Association at their annual general meeting in Toronto on February 29, 2012. Ken was honored for his contribution to forestry over the years and his recent efforts in having the association's past historical records acquired by Archives Ontario.

Rebirth of a Forest – Goderich, Ontario
By John Hazlitt

In August of 2011 a force 3 tornado developed over Lake Huron, near Goderich (where I live), and came ashore to create massive destruction on a very narrow path through the central core of the Town of Goderich and on east, destroying all in its very narrow path. One of the areas of mass destruction was at the north side of the Goderich Maitland Cemetery that abuts the Maitland River, where the force completely flattened some 10 ha of second growth forest made up of many different species (this area was just north of, and adjacent to, the active part of the cemetery). The local parks superintendent, Martin Quinn, was put in charge of the cleanup, and a logging company was paid to remove the damaged trees to leave the site to regrow (REBIRTH). I was requested by the Parks Superintendent to visit the site in mid-March when the work was underway. The company used two skidders, both cable and grapple, along with a locally owned wood grinder to "do the Job".

Before and after photos of the destruction of the tornado. Photos courtesy of Martin Quinn.

Site preparation. Photo courtesy of the Hazlitt collection.

I decided that while some considered this an area of destruction I looked at it as a wonderful opportunity to record the actual rebirth of a forest. I believe that nowhere in the Province of Ontario has this opportunity ever existed, as with most blow down areas the trees and the stumps and the overburden are removed and then the soil is leveled and made into a seed bed and trees (seedlings) are planted in rows etc. In this case (the Maitland Cemetery Woodlot) only the stems have been removed, with the limbs and small wood put through a grinder. The bigger stems (logs) were piled and now are being sorted to merchantable timber (very little), firewood, with the soft wood sent to the grinder for landscape mulch. The stumps and other remains are being left as is as.

Dedication of the Home Hardware Grove – the Watson Family is to the left; Mike Rosen of Tree Canada is directly to the right of the sign. Photo courtesy of Ed Borczon.

I am recording the REBIRTH and I visit the site every 2-3 days to take pictures of the rebirth. I have certain sites that are marked and I take the picture of growth from the same place along with many other indications of rebirth.

Home Hardware of St. Jacobs, along with the local store, Watsons of Goderich and Gorrie, are providing some $8,000.00 for trees to be planted on a part of the site. This area is now designated was planted this spring, with some 80 trees, a few of which are 10 cm and bigger in diameter, with most being 2 -3 m whips. Tree Canada was also instrumental in supporting this project.

Rebirth of a maple tree. Photo courtesy of the Hazlitt collection.

The grand opening for this event was May 19, 2012. For this event, I and one of the parks employees made some benches from blow down eastern white cedar and also from hard maple. The name of the site is to be the “Home Hardware Grove”. The Canada Trust Bank has also picked up the opportunity to participate in the REBIRTH and will be doing a similar planting this fall.

CTV London has also visited the site and done a piece on it. I will continue to record the rebirth for some time.

Canadian Forest History Preservation Project Update
By David Brownstein PhD

The Canadian Forest History Preservation Project is a collaborative effort among the (US) Forest History Society, the Canadian Forest Service, and NiCHE (the Network in Canadian History and Environment), that helps match repositories and collection donors. The project includes a survey and assessment of Canadian archival repositories, and their ability and willingness to preserve collections of forest history. The survey has so far been completed for British Columbia, Alberta, and Ontario; Quebec is being surveyed at present, with remaining provinces/territories yet to come.

For more information, please view our project brochure and forward it to anyone who might know of a collection in need of archival protection.

English version:
http://www.foresthistory.org/research/Canadian_archives_brochure.pdf

French version:
http://www.foresthistory.org/Research/Canadian_archives_Fr.pdf

We have yet to shepherd any Ontario records into archives. Please help us change this!

The Project has facilitated the donation of two British Columbia forest inventory maps, owned previously by Don McLaurin of Whistler, to the Chilliwack Museum and Archives. The unique forest inventory maps, created in 1941 by H.M. Pogue or the British Columbia (BC) Department of Lands and Forests, were quite detailed for their time, and were created using some of the first aerial photos acquired by the BC Forest Service. John Hammons assisted in the donation and he writes of the project: "We have really come to appreciate how little has been done to preserve historical materials such as old forest cover maps. And once they are lost, they are lost for good. What a good initiative!"

Simcoe County Forest - Celebrating 90 Years of Forestry Excellence
Simcoe County News Release of May 11, 2012

Ninety years ago this month, the legacy of the Simcoe County Forests took root with the planting of a single tree on the Hendrie Tract in Anten Mills.

Now more than 20 million trees strong and spanning more than 31,000 acres, the County Forests are a shining example of good forest management, political commitment, and foresight. But it wasn't always this way.

On Friday May 11, foresters, former staff, landowners, and history buffs, from across the province gathered to celebrate the County Forests 90th anniversary at the Simcoe County Museum. Amidst the celebration, those in attendance were also reminded of just how far the County Forests have come because of their hard work, dedication, and sound leadership.

"In the late 1800s, the landscape throughout Simcoe County had dried up so much in some locations because of the lack of tree cover that the productivity of the soil had decreased. There were literally top soils blowing away, roads being plowed because of blowing sands, and streams drying up," Graeme Davis, Forester with the County of Simcoe, recounted.

What are now healthy forests, providing homes to wildlife, wood for the forest industry, and plenty of recreation, were once barren wastelands.

Original settlers and farming groups began expressing concerns about the serious impact the lack of tree cover was having on the environment and agricultural use in the area. There were several efforts being made at the provincial and municipal level to figure out how to regain tree cover in the landscape in the early 1900s, but it wasn't until 1922 when the province introduced the Agreement Forest Program that reforestation gathered momentum.

With the Agreement Forest Program in place, local governments would purchase lands and turn them over to the Ontario Department of Lands and Forests, now the Ministry of Natural Resources (MNR), for protection and forestry development.

"Simcoe County was really first off the mark with this provincial program," Davis said. "There were other municipalities that took advantage of the program, but none as early and as vigorously as Simcoe County did."

In the 1920s, 30s, and 40s, the County peaked at around a million trees a year being planted in the County Forests through the Agreement.

Doug Drysdale, whose family owns the Drysdale Tree Farm in Innisfil, began his 33-year forestry career in 1957 with the Department of Lands and Forests, and speaks fondly of the Agreement and Simcoe County's involvement.

"The Agreement Forest Program was a terrific program. Simcoe County was, and is, the very best of the best. It has one of the largest acreages, but it also has some of the best growing sites for trees as well," Drysdale said. "(Simcoe County) are the best managed forest areas, not just in Ontario and Canada, but possibly the world."

Drysdale, who attended the 90th anniversary celebrations, said he has a great sense of pride knowing he played a part in building the legacy of the County Forests.

The Agreement Forest Program continued until 1996 when the MNR turned full management responsibilities of the County Forests over to the County of Simcoe. Since that time, the average revenue generated from the County Forests has been $1-million a year under the sound management of Simcoe County forestry staff.

"Not a lot of people understand that through tree cutting and good management you create more growth and more value," Davis said. "It's all done with a lot of long-term planning, good inventory, and history, so we know how much the forest grows so we don't over harvest."

Looking to the future of the Simcoe County Forests, Davis is focused on growing the County Forests and moving forward in the context of the 20-year Simcoe County Forests Management Plan approved in 2011.

"There is a real sense of responsibility to keep alive the legacy of those who came before you. The focus has always been, and will always be, to leave things better than you found it," Davis said. "It's been tremendous for me to be part of the County Forests' continued expansion. County Council is supportive of continuing to grow the resource, which is really significant, so that is what we'll do."

"County Council is incredibly proud of the Simcoe County Forests, the largest and one of the most productive municipally-owned forests in Ontario," said Warden Cal Patterson. "We look forward to the continued growth and good management of the forests for generations to come."

-30-

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graeme.davis@simcoe.ca

Jennifer Burden,
Communications Co-ordinator
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History of Forest Resources Inventory in Ontario

Joint Display between the Canadian Bushplane Heritage Centre and the Forest History Society of Ontario

A new display, "**Seeing the Forest through the Trees**", opened at the Canadian Bushplane Heritage Centre in Sault Ste Marie during the week of **April 16, 2012.** The display chronicles the history of describing and inventorying Ontario's forests from the late 1700's to the present. Exhibits illustrate, with writings, maps and equipment, how the materials and procedures used to obtain information about Ontario's forests have changed over more than a century. It is a part of a major exhibit planned by the Centre on forest ecology education. Airplanes have played an important since the early 1920s part in gathering information on Ontario's forests. The display will be open through the summer.

Thanks to Rich Greenwood, FHSO member, and Ontario Ministry of Natural Resources Staff for their contribution to organizing the forest history side of the display.

Photos of the exhibit courtesy of Todd Fleet, Canadian Bushplane Heritage Centre.

United Nations Forest Heroes Award (From ForestTalk.com, December 22, 2011)

Photo obtained from the International Year of Forests web site.

Fred Pinto, Research Forester with the Ontario Ministry of Natural Resources in North Bay, was shortlisted for the *United Nations International Year of Forests – Forest Heroes Award*, one of only three individuals being considered for the prestigious North American category. The winner of the award was announced in January, 2012. While Fred was not the recipient of the award, he deserves recognition for the reasons he was considered. More information at International Year of the Forests web site: http://www.un.org/en/events/iyof2011/forests-for-people/awards-and-contests/forest-heroes-programme-and-award/ .

Fred is a former President of the Canadian Institute of Forestry, and is serving on its Board of Directors. He is the current Chair of the Board of Trustees of Forests without Borders. For the full story on Fred's achievements, click on this link to ForestTalk.com: http://foresttalk.com/index.php/2011/12/22/fred-pinto-northern-ontario-forester-shortlisted-for-united-nations-forest-hero-award/ .

Perth County Historical Foundation Arboretum

By Reg White

The Perth County Historical Foundation has as its principal asset the ownership of the historic Fryfogel Tavern/Inn at Shakespeare, Ontario, just six or seven miles east of Stratford. The tavern sits on a five acre property that, prior to the 1950s, was entirely given over to farming. Most obvious natural growth was apparently lost. Since 1964 the property has been allowed to return to somewhat of a natural state with intervention of man in the form of planting an abundance of black walnuts plus other plant material.

Two years ago the writer rejoined the foundation and suggested to the board that we create an arboretum on the five acres of indigenous trees but including shrubs and plants of southwestern Ontario.

We are in our second year! Now we are trying to acquire an additional five acres directly behind our own property.

The writer has done some preliminary research about the original forest cover but more needs to be done.

Our environmental objective is to return the site to its original forest cover as much as possible. Anyone who might have information to contribute to this project should contact the Foundation.

World Forest History – A New Book Series

The Australia and New Zealand Environmental History Network has initiated a series of volumes in forest history, intended (so far as feasible) to encompass the globe. Recognizing the importance of the Canadian story in forest history (and of forests to the history of Canada) the series editors have invited Dr. Graeme Wynn and Dr. David Brownstein to serve as co-editors for the Canadian part of this series. More information on this project is available at the link below:

http://environmentalhistory-au-nz.org/2010/05/new-book-series/ .

Upcoming Meetings and Conferences

- **Heritage Tree Workshop, June 8/9, 2012, Ottawa**

  http://www.oufc.org/2012/04/25/ottawa-heritage-tree-workshop/

- **Canadian Urban Forest Conference, October 2/4, 2012, London**

  http://www.oufc.org/conferences-seminars-2012/

- **Society for Ecological Restoration, Ontario Chapter, AGM, , October 20/21, St Williams Nursery and Ecology Centre**

  http://serontario.org/pdfs/2012SEROAGM1.pdf

About the Authors

David Brownstein PhD: Project Coordinator, Canadian Forest History Preservation Project, Vancouver, BC.

Fred Pinto RPF: Forest researcher with the Southern Science and Information Section, Ontario Ministry of Natural Resources, North Bay, ON, who has spent his career involved in research on central Ontario ecosystems and species.

Geordie Robere-McGugan RPF: Inventory Development Specialist, Forest Resources Inventory Section, Ontario Ministry of Natural Resources, Sault Ste Marie, ON, who has also worked for forest industry.

Jack Smyth: Retired Forest Economist, Natural Resources Canada, Ottawa, ON.

Jeff McColl: Jeff McColl is a Canada Post employee, avid photographer and life time paddler, representing Canada at international competitions for 10 years.

Jeffery P. Dech PhD: Assistant Professor and Forest Bioproducts Research Chair, Nippising University, North Bay, ON, with a research focus on various aspects of forest ecology and modeling, including the enhancement of Forest Resources Inventories.

Joanna Dean PhD: Associate Professor, Department of History, Carleton University, Ottawa, ON, is involved in studying street trees and just co-created an exhibition on the history of urban trees in Ottawa, ON.

John Bacher PhD: Historian and environmentalist from St. Catharines, Ontario, is the author of "Two Billion Trees and Counting: The Legacy of Edmund Zavitz", published this year by Dundurn Press.

John Cary RPF: Forestry consultant, who previously worked for the Ontario Ministry of Natural Resources, now active across Ontario and in Trees Ontario.

John Haegeman: Woodworker and avid collector of local logging history in and around the Espanola area.

John Pineau: Executive Director, Canadian Institute of Forestry, Mattawa, ON. John was involved in Ontario's forest resources inventory program for several years.

Kevin Lim PhD: President of Lim Geomatics, Ottawa, ON, consults world wide on geomatics projects and has experience working with the Ontario forest resources inventory program.

Kevin Meraglia: Archivist, Historical Forestry Database, Sault Ste Marie Public Library, Sault Ste Marie, ON.

Larry Watkins: Forest Analyst, Forest Evaluation and Standards Section, Ontario Ministry of Natural Resources, Sault Ste Marie, ON, has been involved in producing "Forest Resources of Ontario" reports for a quarter of a century.

Laura Pickering: Forest Historian, Canadian Institute of Forestry, Mattawa, ON.

Lorne Riley: Retired Forest Researcher, Natural Resources Canada, Ottawa, ON.

Mac Squires RPF: Retired Forest Manager and Boreal Forest Artist, Thunder Bay, ON, who now spends his time wandering the forest that he loves, appreciating its beauty and checking on the development of the stands that are his forest management legacy.

Martin E. Alexander PhD: Adjunct Professor of Wildland Fire Science and Management, Department of Renewable Resources and Alberta School of Forest Science and Management, University of Alberta, Edmonton, AB. He retired from the Canadian Forest Service in late 2010 following nearly 35 years in fire research.

Michael J. Umpherson HBScF: Forester and President of M.J. Umpherson Lumber Co. Ltd., a family sawmill/lumber business, Lanark, ON, that has its origins back to 1853 when his great great grandfather built a water powered sawmill on the Little Clyde River in Dalhousie Township.

Mike Commito: PhD student in Environmental History at McMaster University.

Steve D'Eon, PhD: Specialist, Knowledge Transfer, Canadian Wood Fibre Centre, Sault Ste Marie, ON.

Peter Uhlig: Forest Ecologist, Forest Resources Inventory Section, Ontario Ministry of Natural Resources, Sault Ste Marie, ON, has extensive involvement in the provincial ecosystem classification program.

Reg White: Member, Board of Directors, Perth County Historical Foundation.

Next Newsletter

We received so much great material on forest resources inventory for this newsletter that we are going to carry the series forward to the fall, 2012, issue. We are looking for personal recollections of folks who spent time cruising. And, we are always looking for other articles as well, so keep them coming. We are especially interested in establishing a link with local archives and museums that have forest related history material. Please make sure you check out your local institutions and let me know what you find. I will contact the organization to see if we can do an article on it. – Editor.

Sylva Recap

The Ontario Department of Lands and Forests published for many years a journal called “Sylva”. The purpose of this journal was to highlight changes in policy, individuals and the comings and goings of staff. This journal contains nuggets of forest history that will be selected for each edition of the newsletter. In the second issue of Sylva two Rangers were highlighted. We reprint one of those articles here.

The Timber Cruiser (Sylva Vol. 8(4) (1952):23-24)

By G.F. Coyne

Each summer, the Department of Lands and Forests hires a group of young men to undertake the job of cruising timber for the purpose of making an inventory of the Province's resources. These men, in groups of six, usually spend three months in the most remote parts of the Province, where their main contact with the outside world is through the pilot of a Lands and Forests aircraft. Canoes are their main means of travel, and the rivers and lakes are their highways.

These young men have pushed the bushes aside and peered into more lakes and streams than practically any other single group of people in the world. These are the men who know our Province intimately, not from a geography book, or from a travel folder, but from very personal contact with it.

They are the fellows who, in canoes, follow those wiggly blue lines on a map or cross them on trees, which they fell on the banks to make a foot bridge. A line or a small irregularly shaped spot of blue on a map means something personal to a cruiser. The stream or lake may have no name on it, but to him it will always be the place where he saw moose, or where that big pike ate the little duck.

There is something about cruising that gets into a fellow's blood, and by that I don't mean the stingers of hundreds of thousands of mosquitoes and black flies. There is always the feeling of exploration in cruising. Every bend in the river holds anew surprise. In spite of the fact that every mile is entirely different from the one preceding it, the thrill of rounding a bend for the first time never wanes.

There is a "silence" in the land that a cruiser can hear. He knows the loon's lonesome cry, the slap of a beaver's tail, the rustle of leaves, the roar of a falls, or the lapping of waves on a shore. These things are sound, not noise, and rather than spoiling the silence, they add nostalgia and "flavour" to it.

Timber cruising is something you either like or you don't. Some people acquire a taste for it, some never do, but if a fellow wants to get to know himself, if he wants to see country no one has seen before, if he wants fishing that surpasses all dreams, and canoeing and roughing it in the bush for a summer, I'd suggest that he try timber cruising. After a winter in the office, a fellow forgets there ever were flies, or portages, or heat and rain, and somehow, all he can remember is the beauty, the sport, the quiet and excitement that a year in the bush brings.

Editor's Note: The photos included with this article accompanied the original article.

Forest History Society of Ontario

Membership Form

Thank You For Your Support!

The mission of the Society is:

"To further the knowledge, understanding and preservation of Ontario's forest history" and accomplish this with the following objectives:

1. To preserve forest and forest conservation history;
2. To encourage and further the development and recognition of forest history;
3. To support research and studies of forest history;
4. To support the archival preservation of records and materials relating to forest history, and
5. To promote the better understanding of forest history through public education.

The Society has two ongoing projects, both available on our website:

www.ontarioforesthistory.ca

The first is a catalogue of publications dealing with all aspects of Ontario's forest history where members can submit contributions.

The second is in its initial stages of identifying and listing collections and materials relating to Ontario's forest history. The Society works with established archives such as the Archives of Ontario and several university archives in facilitating the preservation of significant collections.

The Society publishes a newsletter available to its members, the Forestory, twice a year – Spring and Fall - containing informative articles on forest history In Ontario.

(The FHSO has a privacy policy. Your information will not be shared or sold.)

You can initiate or renew your membership online by clicking on the link below:
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