Forest History Ontario

Forestory

Volume 17, Issue 1, Spring, 2026

Contents

Simcoe County Forest History Tour, Fire Science, White Pine Management and Much More

Prescribed Burn, Tosorontio Tract, Simcoe County, 2019.

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Chair's Message

By: Jim Farrell

The calendar tells us that March 20 was the first day of spring. However, many of us across Ontario just don't buy it, particularly our more northern colleagues who have seen record snowfalls. By many accounts though, the maple syrup season in southern and eastern Ontario has been a good one and syrup now cheaper than gasoline, presenting a bio-fuel opportunity!

I am delighted to congratulate and thank our Editor, Caroline, on producing another excellent issue of *Forestory*, Spring 2026, managing to fit this in while producing hundreds of litres of high-quality maple syrup. Shortly after my last *Forestory* message, Terry Schwan, R.P.F. (Ret.) and I attended the Canadian Institute of Forestry (CIF) Annual Meeting and Conference in Thunder Bay and showed off our new FHO pop-up banner and promoted our organization to anyone who came by. Member Jeff Mundy organized an excellent field trip that featured several historic forestry sites in the area.

As part of a national CIF webinar series on forest history, Board Member Mark Kuhlberg provided an intriguing sneak peak at his upcoming book on the history of Tembec by describing the 1972-73 tumultuous transition from International Paper and the birth of Tembec.

The Board continues its practice of holding meetings by Zoom every two months, recent agenda items included:

- an ambitious national historical database of all past and current sites of forest product mills across Canada led by CFS-Great Lakes Forestry Centre;
- celebration of Ontario Heritage Week in partnership with Ontario Wood;
- approved an FHO Investment Policy to ensure prudent and effective management of our funds;
- updated our Frank A. MacDougall Fund guidelines and procedures (more to follow on this); and,
- confirmed that our corporate partners, Ontario Forest Industries Association and Ontario Ministry of Natural Resources, have again contributed generously to FHO, for which we are very grateful.

In February 2026, we held our virtual annual meeting and recorded a record of over 40 participants. We welcomed a new Board Member, Ian McCormick of Thunder Bay, and confirmed that all Directors and Officers agreed to stay on for 2026. We were delighted to announce a very generous bequest (to FHO and to the FAMFund) from founding President

Ken Armson and hosted the first members Open Forum, moderated by John Pineau, to seek feedback and advice from members. We were very fortunate to host Martin Streit, a respected forester in eastern Ontario with over 40 years of experience, who provided an excellent presentation on the history of the Cornwall paper mill and associated forestry programs.

The OFIA annual conference is coming up in late April in Toronto and FHO will be represented by several Board Members, including myself. In June 2026 our annual Forest History Tour will be held in Simcoe County, generously hosted by the County of Simcoe who, in 2026, celebrates the 104th anniversary of their County Forests.

I would like to thank all the authors and contributors to the spring 2026 issue of *Forestory,* particularly our dedicated editor, Caroline Mach, R.P.F. As a volunteer organization we rely entirely on members to organize events, contribute articles and stories, and deliver activities and are very grateful for all their work and all members for their ongoing support. I again remind you that we have a very functional 'DONATE' button on our website Homepage and encourage you to give it a whirl and renew if your membership has lapsed. Stay strong, spring is in the air.

Facebook: http://www.facebook.com/forest.history.society.of.ontario

Editor's Message

Regular readers of this publication will no doubt notice that this issue looks somewhat different than past issues. This is a direct result of Microsoft's decision to discontinue Microsoft Publisher in October, 2026 and the fact that it seems impossible to find another free or reasonably priced program that would have the same features. (Anyone who has tried to use Microsoft Word to produce a publication such as this one will know that it is less than adequate.) This issue of *Forestory* was produced using Google Docs but there are some compatibility hurdles, hence the slightly different look. If anyone has any suggestions for software programs, please let me know at editor@fhso.ca.

Correction

In *Forestory* Volume 16, Issue 2 (Fall, 2025) there was an article about Homer Watson starting on page 32. Katie Pearson, from the Homer Watson House & Gallery, provided this clarification regarding the purchase of Cressman's Bush (page 34, paragraph 3): Homer Watson did not solely purchase the land known as Cressman's Bush but rather Watson and a group of concerned citizens formed "Waterloo County Grand River Park Limited" and purchased the land to preserve it as a forested park.

For further context, "In 1943, as the founding members of the organization began to pass away, the remaining shareholders proposed donating the land to the City. A liquidator was appointed, and the property was transferred to the City [of Kitchener] and renamed Homer Watson Memorial Park (Waterloo Historical Society 1944). The park includes 5.8 kilometres of hiking trails in a forest consisting of mostly maple and beech (Ontario Trails 2018)."

In that same paragraph, the property is incorrectly referred to as Creelman's Woods, rather than Cressman's.

Save the Date!
Forest History Tour
Simcoe County
June 12, 2026

The beginning of the Simcoe County Forest, May 8, 1922.

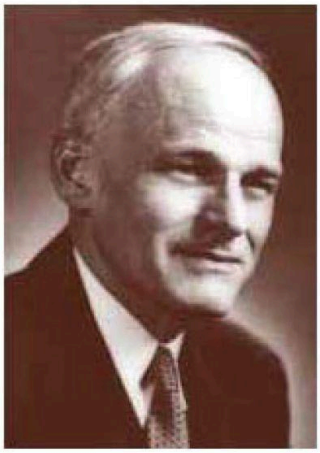
Simcoe County, like many parts of Ontario, has a history filled with both forest exploitation and forest renewal. We will visit some of the forests established in the early part of the 20th century and learn how they have evolved. We will view some of the lesser known plantings by Boy Scouts and community groups. The tour will pass by Camp Borden and learn how their forests have changed. We will stop by historic Fort Willow and the recently opened Huronia Outlook. As well, we will see some of the newer initiatives that the Simcoe County Foresters are involved in to keep their forests healthy and productive.

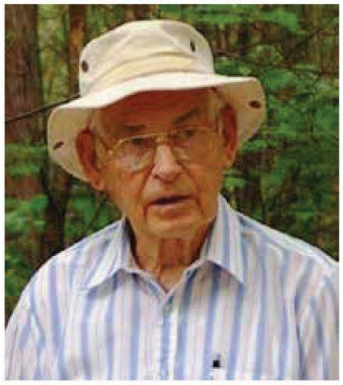
WRIGHT, BEALL, AND VAN WAGNER

PETAWAWA'S HISTORIC CONNECTIONS TO THE FOREST FIRE SCIENCE WE USE TODAY TO MANAGE WILDLAND FIRE AROUND THE WORLD

By Steve D'Eon, Renfrew County Chapter

It seems a bit odd to write about forest fire science when it is –20°C outside, but it was 100 years ago this upcoming summer that James (Jim) Wright started implementing his ideas relating today's weather and the previous days weather to the flammability of forest fuels and thus fire behaviour. Measure the weather – model the fuels – predict fire behaviour was his simple proposal that he set out in 1926 on the forest floor at Petawawa to investigate and, in an elbows-up moment, prove those wrong that said Canada could simply adopt the American system and why bother with a Canadian research program. Jim worked closely with his American counter parts at the time finding the American operational system undertook awkward direct measurement of fuel moisture by weighing sample sticks. Jim thought better results could be obtained by modeling fuel moisture and thus flammability by measuring four core weather variables we still use today: wind, humidity, temperature, and precipitation. Jim also introduced the concept of summarizing fire hazard into simple terms recognizable on forest fire hazard signs everywhere: low, moderate, high, and extreme fire hazard (Figure 1). Jim also realized flammability would vary by fuel type, so he made his system modular, an important decision allowing for the future deployment of the Canadian system.





James (Jim) Wright (above left), Herb Beall (above right), Charlie Van Wagner (right).

It was not until 1928 that the research program took off when Herb Beall joined Jim as a student conducting many tests across the Petawawa estate for the next few summers. Herb, originally a law student, spent the summers instrumenting the forest, gathering data, and lighting two-minute test fires (Figure 2). Beall provided an approximate definition of each flammability zone with 'extreme' described as *"Test fires are put out with the foot only with difficulty or other means are necessary to extinguish them."* Beall ceased to light two-minute test fires under extreme conditions in 1931 once the road crew had left for the season; perhaps because he did not have any help if he could not put a difficult test fire out with his foot 'or other means'.

Herb lived alone in a cabin at Racehorse Rapids with most of his visitors being log drivers on the adjacent Petawawa River. The accounting records for the summer indicate a high proportion of expenses for 'provisions' as Herb always kept a pot of coffee on the fire for the log drivers. Beall, ever the imaginative social engineer, ended his 1930 report with a request for a second person next season, one who could cook, justifying the request with a projected increase in scientific productivity. His request was turned down.

Wright once commented no one else had lit as many fires as he had (the two-minute test fire dataset eventually included over 20,000 fires by many researchers

Editor's Note: This article is reprinted with permission from *The Ontario Woodlander*—An Ontario Woodlot Association Quarterly. Issue 122, Spring 2026

Figure 1: *Forest fire hazard sign. Petawawa, 1932.*

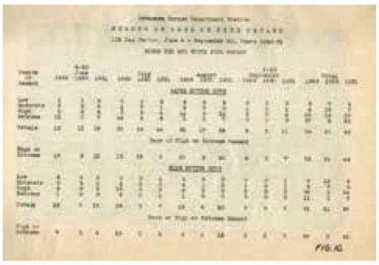


Figure 3: *Forest fire hazard for Petawawa 1929-1931.*

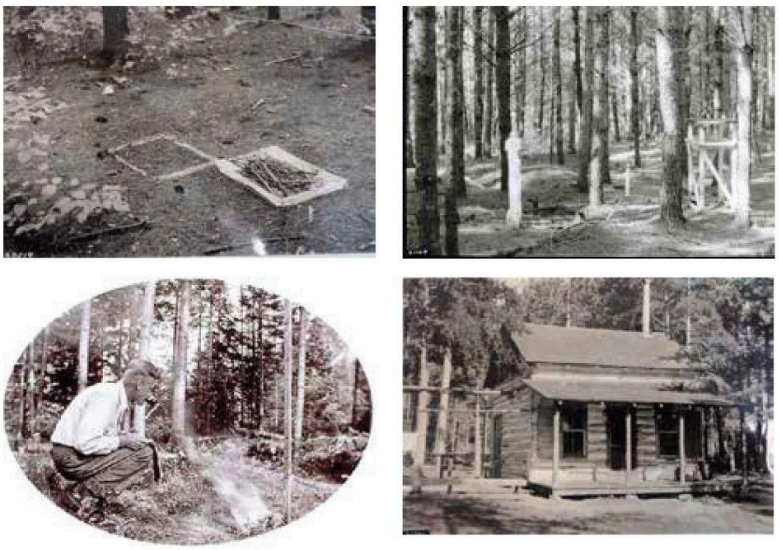


Figure 2: *Samples and instruments on the forest floor, Petawawa 1930 (upper left and right), two-minute test fire (lower left), Beall's cabin at Racehorse Rapids (lower right).*

at 11 sites). No wonder full approval for their work was a few years in the making as what manager today would authorize hundreds of 'test' fires, some at extreme conditions, to be put out only by stomping on the burning fuel? From this accumulation of data and experiments (Figure 3), Wright published his concepts in 1932 and the rest they say is history – a history that included the arrival of another researcher at Petawawa in 1960 – Charlie Van Wagner.

If Jim Wright is known as the father of forest fire science in Canada, then Charlie was the prodigal son who took things up a notch. Arriving at Petawawa as a student in 1960, Van Wagner embarked on a lengthy career that oversaw many of the advances in the Canadian forest fire system. His many publications span 60 years and touch on multiple aspects of forest fire research. His lead authorship of the 1987 technical report *Development and structure of the Canadian Forest Fire Weather Index System* is the most cited paper from Petawawa. All this was achieved in his second career, previously Charlie had been a chemist working for CIL paints before returning to school to study forestry.

In a 2018 interview Van Wagner stated he was simply lucky arriving at a time when researchers were allowed to work uninhibited by the many reorganizations research agencies struggle with. Van Wagner says the objective in fire science was always practical outputs which meant simple measurements, easy calculations, and ready interpretation into meaningful measures of the intensity and behaviour of the fire. At Petawawa he explored and investigated directions that seemingly would not provide fruit for the mission of the organization yet became essential parts of the research output that drove Canadian leadership in forest fire science.

Van Wagner, like Wright, was not one to allow the idea of deferring to the Americans to seep into the cost-cutter's mind. He attempted to intercept the concept before it could gain momentum by publishing *Comparison of American and Canadian Forest Fire Danger Rating Systems* in 1966. This report includes a theoretical comparison of the two systems using data from a fire at Petawawa under real fire conditions in Canada. In 1971 Van Wagner gave a talk in Florida titled *Two Solitudes in Forest Fire Research* reiterating the differences and necessity of the two approaches. Van Wagner said he minced his words in these publications and went gently on criticizing the American system that he did say had a lot of merits. But it was Van Wagner's opinion the Canadian system is superior because it has always combined laboratory data with empirical data from fires observed and measured in the field. Van Wagner said forests and weather interact in many ways that a purely theoretical approach cannot possibly provide the meaningful information fire fighters need. Over 400 experimental burns (with Petawawa hosting about 100 of these) along with data from wildland

fire observations continually improve the Canadian system which is used in whole or in part around the world.

Crown fires represent the extreme in forest fire behaviour and Canada has numerous fuel types that can burn in this manner. The May 7th, 1964, Gatwin Lake wildfire at Petawawa which Van Wagner studied represented the extreme of fire behaviour in mixed conifers and hardwoods (Figure 4). Under very hot, dry, and windy conditions a fire started, probably from a cigarette, on the east side of a large clearing, just inside a stand of 45-year-old jack pine. The hardwoods had not flushed yet, so the litter layer was extremely dry. The fire tower log shows the fire as being called in at 2:18 in the afternoon. Control crews arrived shortly after. The fire quickly spread and 30 minutes later jumped a 10-meter-wide road from which a backfire had been attempted but did not have enough time to preburn the fuels ahead of the advancing fire. The Fire Boss's description of the head fire is indicative of this fast-spreading fire, "the swoosh sent it over the road." The fire ran over two km past Gatwin Lake consuming 165 ha of jack pine, red pine, and mixed hardwoods and conifers before running out of fuel on the shores of Chalk Lake (now called Sturgeon Lake) where crews could get a handle on it. Rates of spread were estimated in excess of 80 feet per minute. Van Wagner's 1965 *Story of an intense crown fire at Petawawa* based on data from this fire offered that the paper would be of general interest because few accounts about crown fires had appeared in the literature. Hardly a titan in the literature, this paper is indicative of an opportunist researcher fully exploring the data available and getting to what it means and why it is important.

A suite of planned experimental fires provided better data on crown fires which are still part of the Canadian system to this day. An example of an experimental fire in plantation red pine is shown in Figure 5. Note the student at the rack whose job it was to record the time the

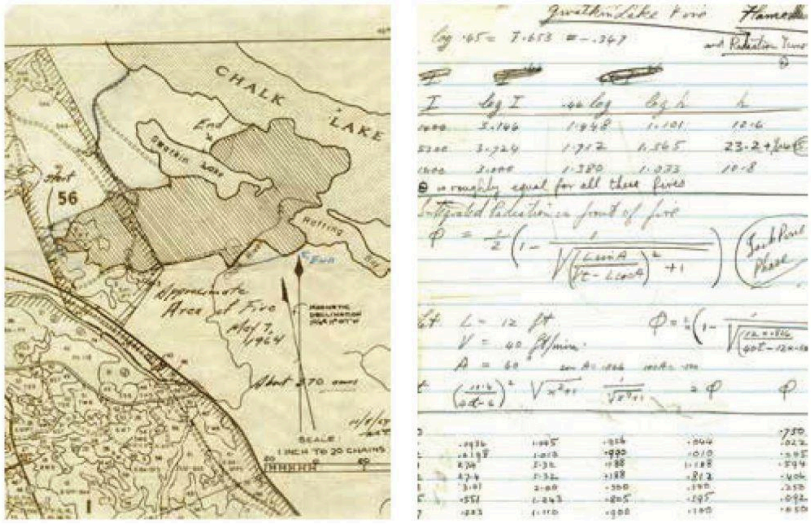


Figure 4: *Map of Gatwin Lake fire, Van Wagner's calculation of flame length.*

Figure 5: *Experimental burn in plantation red pine. Petawawa 1960's.*

weights dropped indicating the progress of the fire. The weights were attached to cord that burned in the fire releasing the weight as the fire progressed. Maybe they set their rack up a little too close to the fire.

Climate change was a topic Van Wagner warned about as early as 1987. In an April 1987 address at Lake Tahoe, Charlie postulated on climate change as a recipe for more severe fire weather and fire regimes:

> *As interest in this subject increases, one can expect more attempts to predict the nature of the forthcoming fire climate, and to plan some response. The outcome could range all the way from an increase in seasonal severity well within the present range* ***to a challenge so profound as to shake fire management to its foundation****.*

Charlie thought this conference was an eye opener for the fire communi-

ty about the potential impact climate change could have on fire regimes. Subsequent publications by numerous other researchers helped prepare the fire community for the climate change driven fire regimes that have now become obvious such as with the fire seasons of the 2020s.

Charlie once corrected me there were no "destructive" forest fires, only "stand replacing" fires. This ecological view of fire on the landscape led Van Wagner, along with Ian Methvan, to be invited to examine fire management in our National Parks publishing *Fire in the management of Canada's National Parks: Philosophy and Strategy* in 1980. Van Wagner stated Parks Canada's interest stemmed from his studies of fire at the landscape level and Methvan's work in prescribed fire. Van Wagner said their paper, "justified a new policy for reintroducing fire into parks that had long suffered from decades of fire exclusion", especially for the western parks which are "clothed in fire-dependent forests". Today Parks Canada is a leading agency in prescribed fire and includes credit and a link to Van Wagner and Methvan's paper on their website.

2025 was just recognized as the third warmest year on record. Forest fire is not an ecosystem-changing force that is going away and Petawawa played a critical role in quantifying and managing wildland fire. Van Wagner always said research was collaborative and this article does not do justice to the many researchers who worked together to build Canada's wildland fire systems, but for Charlie Petawawa was a special place:

> *Altogether, fire researchers at Petawawa produced about 200 papers from 1925 to 1995 covering every conceivable aspect of fire in the Canadian forest. No other centre of fire science come close to this record. Van Wagner, Jan. 2019.*

Charlie co-authored his last paper in 2021. He passed away at age 98 in July 2023 in Comox, B.C.

Both Jim Wright and Herb Beall have awards in fire research named after them. Herb Beall was awarded the Order of Canada (2000) for his work. Charlie Van Wagner's work was recognized with multiple prestigious awards including the Ember Award (2012).

The world thanks them for their efforts.

About the author: Steve D'Eon retired in 2022 from a 40-year career with the Canadian Forest Service, mostly at Petawawa. In his retirement Steve has returned to the Petawawa Research Forest to work part time as the site's archivist ensuring the 100+ year record of research is organized, preserved, and accessible. He can be reached at stevedeonforestry@gmail.com.

"The Canadian Forest Service Fire Danger Group, made up of researchers from across the country, has continued advancing the Canadian Forest Fire Danger Rating System, building on the research tradition established at the Petawawa Research Forest. A century after this pioneering work started, updated components of the internationally used Fire Weather Index System are now being implemented operationally. The new hourly system still draws on Charlie's foundational studies of fine fuels from the 1970s, while enhancements to the Fire Behaviour Prediction System incorporate test-fire data from Beall and Wright to better model ignition across diverse forest cover types."

The Basket Industry In Ontario

By: W.D. Mcilveen

Introduction

The need for a basket manufacturing industry in Ontario came about due to a long list of circumstances. Some containers, such as wooden boxes (i.e. butter boxes), were produced in the days before cardboard or plastic were available. In the circumstances of the time, Halton had been recently settled and the local farmers had found a good market for their wheat. The Crimean War produced a good demand for wheat to be exported through the harbour at Oakville which became very prosperous. The plank road to Oakville made it convenient to convey wheat from the Halton countryside to the harbour. But in 1856, the Crimean War ended and the plank road also closed down that same year. Railroads were introduced and that reduced the need for ships. This made for a bleak situation for area wheat farmers in Halton.

To compensate for these changes, one of the farmers, John Cross, whose farm was located in the vicinity of the current Oakville Go station, turned to producing fruit. His main crop was strawberries which had not been grown in the area before. Cross first had enough strawberries to ship to the St. Lawrence Market in Toronto in 1863. As there were no baskets to be had, he shipped the berries in pails within which the berries were wrapped in cabbage or rhubarb leaves. To be ready for the next crop, Cross designed and began to manufacture wooden veneer "strawberry" baskets.

Many other growers followed Cross's lead. By the mid-1870s, Oakville had become a great strawberry growing district and became known as the strawberry capital of the Canadas. Collectively, about 500,000 baskets of strawberries were being produced annually. Obviously, this would require suitable containers to deliver the fruit, mostly to Toronto, so there was a need for about 500,000 baskets each year.

The Oakville Basket Factories

Strawberry Pickers Oakville 1876 by Wm Cruikshank

Ad for Oakville Basket Co., 1895

Initial basket production was done in sheds on the Cross and John Alexander Chisholm farms. Later, production moved to a basket factory built on Trafalgar Road. John Chisholm also set up basket production in a shed at Division Street using a wood paring device developed by his son Charles. One report indicates that elm logs served as the raw lumber. The nature of the operations put them at risk of fire. The factories burned three times but were rebuilt on the Trafalgar Road sites.

A steam brewery was started in Oakville near the river at Trafalgar Road and Macdonald Street. It ceased operation in 1870 but four years later it became the new Chisholm basket factory. Hence that stretch of Trafalgar from south of Macdonald to 6th Line was often referred to as Basket Factory Hill.

In 1889, Pharis Doty & Son took over the Chisholm factory, then three years later founded the Oakville Basket Company. It was destroyed by fire in 1893. It was rebuilt but burned down again in 1920. It was again rebuilt south of the railway and remained in operation until 1984. That site until recently (2001) was marked by the flywheel which powered its operations. That artifact is now part of the Oakville Heritage Trails "Pioneer Industry" display which overlooks The Sixteen from its banks on the south side of Speers Road by the former Old Mill Road.

The Oakville Basket Co, 1895

Flywheel from Oakville Basket Co

The basket factory was an important business in town. In 1877, nearly three quarters of a million baskets were manufactured. There were piles of logs up and down Trafalgar. Complaints made to Town Council were dismissed on the grounds that if the log piles were necessary to an industry which afforded the town great benefits, the inconvenience they caused was incidental.

The factory used boiling water to loosen the bark on the logs before large sheets of veneer were peeled off like paper towels off a roll. Berry boxes were made of basswood as it didn't taint the fruit. Other baskets were made of any hardwood with a softwood bottom. Over the years, several employees fell to their deaths in the vat of boiling water. Power to run the factory was provided by a steam engine fueled by wood chips and bark.

The Glover Basket Factory

The next basket-making operation in Halton was founded in 1893 by W. T. Glover. Originally, it was known as the Burlington Box, Barrel and Basket Works. Glover was a successful fruit grower, but he recognized the need for a source of containers for national and international shipment of fruit grown in the Burlington area. He opened his first store in Freeman in 1893. His products were so in demand that in 1908 he incorporated and changed his business name to W.T. Glover Manufacturing Co. Ltd. The operation was later absorbed by Oakville Wood Specialties. The factory was located in Freeman near the train station at Brant Street and Plains Road. They used elm and basswood as raw materials. As these materials were highly flammable, the Glover factory burned down twice - in 1937 and again during the night of December 20, 1966, after which it was not rebuilt. The Glover factory employed workers seasonally and it was a place where immigrants from Europe after the Second World War could often find employment.

Glover Basket Factory, Burlington. 1901

Packing fruit at Freeman Railroad Station

Grimsby Basket Factories

Oakville and Burlington were definitely not the only locations that were growing fruit in Southern Ontario. The Niagara Peninsula was famous for growing peaches, grapes and other orchard fruit. They might have obtained some of their containers from the basket operations at Oakville and Burlington or the Niagara basket factories might have supplied some of the needs of the Halton farmers. For example, there were three local basket factories at Grimsby in 1912. While Grimsby is not part of Halton, a brief history of the basket-making industry there does shed some light on the nature of the industry in general. There are also some financial links between the Halton factories and the Grimsby factories.

Early Basket Factories

With the large quantity of local fruits being grown by farmers, the basket-making industry was very important to the farmers in Grimsby and other fruit producing communities in the area. Before 1912, there are records of three local basket factories, the first being Victor Carpenter's Basket Factory located on the east side of Main Street in the vicinity of 89 Main Street West. This factory may have been started by the Cross Family in 1879- 80. According to the minute books of the Grimsby Fire Department, the Carpenter Basket Factory was destroyed by fire on April 14, 1893. Mr. Carpenter was a local agent for the Thorold Basket Factory. After the Carpenter Basket Factory fire, John H. Grout built a basket factory behind the Grout Foundry at 3 Oak Street. Following the death of John Grout in 1901, Charles W. VanDuzer operated the factory until at least 1910. The factory then operated as the W. J. Dalton Basket Factory. On September 3, 1913, the Dalton Basket Factory was sold and reopened as the Consumers Box Company. It was destroyed by fire in June 1914. According to the *Grimsby Independent* of January 29, 1913, in addition to the Dalton Basket Factory,

there were two other basket factories, Merritt Bros. Basket Factory on Victoria Avenue and Hewson and Farrell's on Elm Street.

The Merritt Brothers Basket Factory

The Merritts of the Merritt Brothers Basket factory had originally operated a small basket factory on their farm in West Lincoln in 1909 using wood cut from their farm. The *Grimsby Independent* reported in January 1913 that the Merritt Brothers Factory was operating on Victoria Avenue in Grimsby. This original building was of wooden construction but this was destroyed by fire. By 1927 the factory was located at 18 Victoria Avenue in the concrete building built by Jack VanDyke for the Fruit and Vegetable Evaporator. The factory was operated by five of the eight Merritt brothers: Bert, James, John, Frank, and Norman. They supplied the local fruit industry with baskets and berry boxes as well as meat baskets.

In 1931, there was a fire, causing $100,000 damage and destroying the manufacturing section and the veneer storage. Firemen were able to keep the storage warehouse, which was full of baskets, from catching fire. The business expanded with year-round production of six-quart and eleven-quart baskets for pears and peaches as well as tomato hampers and meat baskets.

Once the baskets were manufactured, they were taken from the factory by horse and wagon or truck to destinations across the Niagara region. In 1944, the Merritt Brothers cut down more trees for the making of fruit and vegetable baskets than had ever been recorded in the province. The wood came from Algonquin Park and the total length of the boards cut was two million feet. Three-quarters of this wood was used for making baskets. The basket factories used their wood at a fast pace, needing several train carloads of wood per week. The majority of the wood used in the factory came from Katrine, Ontario. The family business was sold to Canadian Wood Products Limited in 1951. Canadian Wood Products continued to operate in this building until 1968 when the company dissolved. The building was purchased by Oakville Wood Specialties Limited and was used as a storage facility for their baskets. A fire on January 31, 1971 destroyed the old Merritt basket factory.

Beamsville Basket and Veneer Company

The Beamsville Basket operation was founded by Aquilla Reid and Samuel Piott in 1909 at Beamsville. They boiled logs to facilitate the peeling of wood strips that went into the making of baskets of all sizes. That operation lasted until 1981 when it too was consumed by fire.

Hewson and Farrell's Basket Factory

In 1913, Henry Farrell formed a partnership with Art Hewson and together they built their basket factory on Elm Street. By 1921, the partnership had dissolved and each partner opened his own factory. Henry Farrell named his H.H. Farrell and Sons and the other

factory was named A. Hewson and Son Basket Factory. After the partnership dissolved, Henry Farrell kept the original building on Elm Street. This building had a fire in 1933 which destroyed the entire inventory of baskets in the storage shed. H.H. Farrell & Sons became part of Canadian Wood Products. Despite the fact that the factory was equipped with an overhead sprinkler system, a fire at 3:00 a.m. on March 20, 1952 destroyed the buildings. Canadian Wood Products decided not to reopen the basket factory.

When Arthur Hewson left the partnership with Henry Farrell, he established A. Hewson & Son Basket Factory located at 80 Main Street West. Hewson was experienced in the basket manufacturing industry as prior to his partnership with Henry Farrell, he had been superintendent of the Consumers Box factory. On February 8, 1948 fire destroyed the A. Hewson & Son Basket Factory.

Basket factories were a risky business because they were so flammable. All of the basket factories in the area eventually closed because of fire damage. In January 1948, Canadian Wood Products Limited was established and from 1948 to 1951 the company acquired the remaining independent basket factories. Canadian Wood Products specialized in making fruit baskets, meat baskets, clothes hampers, bushels and picnic baskets. In 1968, Canadian Wood Products was purchased by Oakville Wood Products.

Carpenter Basket Factory, Grimsby, 1894

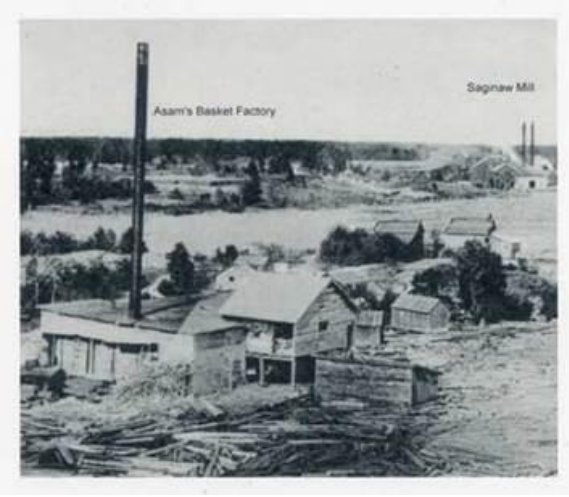
Grimsby Basket Factory product, 1922

Both images from the archives of the Grimsby Historical Society

Asam Basket Factory, Thessalon

One basket manufacturer was located in Northern Ontario and not in proximity to a fruit-growing area. That operation was the Asam Basket Factory located in Thessalon, Ontario. It operated from approximately 1920 to 1936. The dates suggest that the Great Depression likely had a role in the company's closure. The company started as the Gordon

Mill which was sold to Saginaw Salt and Lumber Company, and then operated as the Asam Basket Factory. The Asam mill used Yellow Birch to produce various baskets and crates.

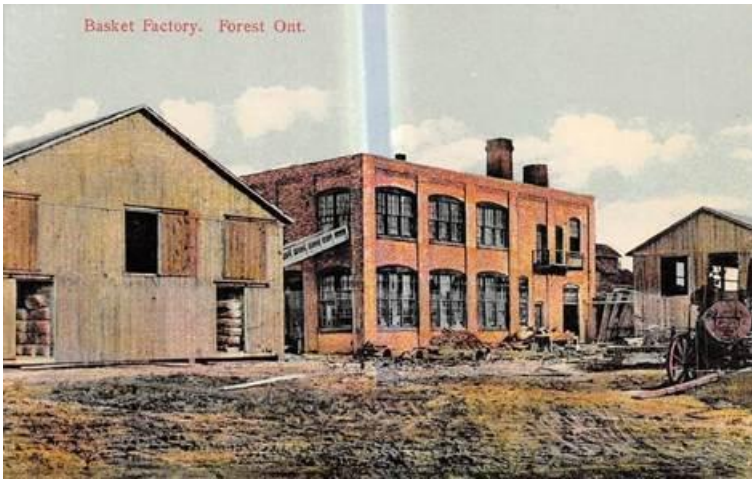


Asam Basket Factory, Thessalon

Asam Basket Factory, Thessalon 1930

Lambton Basket Factory

There was a basket factory located at Forest, Ontario. It is not clear whether that was formally named the Forest Basket Factory or the Lambton Basket Factory. It was established mainly to service the fruits (mainly apples) that were cultivated in that area. Peas, corn, and tomatoes are also grown in that area and those crops could possibly also have been served by baskets produced in the factory. It was reported that a worker there was able to produce 500 baskets per day. The start date could not be determined. Like so many others, the factory burned in 1934. A later photograph exists suggesting that the factory was rebuilt but how long it lasted is unknown. There is a report that a possible tornado touched down in the area on July 27, 1948. One casualty of that storm was the roof of a basket factory at Forest. It was blown off and severed five feeder power lines. There is no available information as to whether the factory resumed production after this damage.



Lambton County Basket Factory. Forest, Ontario

Summary

It is uncertain if there were additional basket-making operations in Ontario beyond those listed here. The summary presented in this article clearly shows that basket manufacturing is an industry with great risk of fire. Surely mere carelessness would not have resulted in all the fires. In any case, the product of the operations was needed and needed in large numbers to serve the agricultural industry in Ontario. In time, some of the wood veneer was replaced by cardboard. In more-recent times, the wooden baskets have been completely replaced by plastic containers.

THE LEGACY OF THUNDER BAY 46

By John Pineau, Near North Chapter

Almost half a century after the forest fire designated as Thunder Bay 46 occurred in northwestern Ontario, it still evokes thoughtful memories and perhaps some nostalgia for those who worked tirelessly to bring it under control and ultimately extinguish it during the summer of 1980. It was one of the most significant forest fires in our province's recent history, occurring during a severe wildfire season, and what was then a record-breaking forest fire year for most of west-central Canada.

Thunder Bay 46 at its height (left) and a newly burned area (right) on June 24th, 1980. Photo credit: Mac Squires.

Reports vary to some extent; however, it is believed that Thunder Bay 46 was human-caused (likely heavy equipment related) and burned approximately 313,200 acres (about 126,800 hectares) of Crown land forest. At the time it was Ontario's most aggressively attacked forest fire ever, with many hundreds of firefighters and support staff, and a huge array of equipment ranging from helicopters and planes to on-the-ground gear including trucks, boats, water pumps, and of course vast lengths of firehose.

Detected on June 16, 1980, Thunder Bay 46 took a month to bring 'under control' by Ministry of Natural Resources (MNR) fire crews, with the official date of containment being listed as July 17, 1980. Almost two months later, on September 7, 1980, the fire was finally declared as extinguished. Although damage to private property was minimal and no fatalities occurred amongst the public, sadly there were two fatalities amongst the firefighters when a helicopter crashed on what was dubbed 'Maggot Mountain' at the east end of the fire perimeter. The origin of the mountain's name was said to be the nickname of one of those fatalities, a popular young helicopter tech from a Geraldton-based crew.

The MNR had its hands full that year, as Thunder Bay 46 was part of a larger cluster of massive blazes in northwestern Ontario (including Red Lake 14), which forced widespread evacuations across the region, and caused the deployment of hundreds more firefighters, including many from abroad. There was actually a squadron of Polish water bombers that operated on Thunder Bay 46, from an airstrip and support facilities specially constructed inside the fire perimeter. Overall, the year 1980 was indeed a record-breaking fire year in Ontario to that time, characterized by extreme drought conditions.

Contributing to its memorable status, Thunder Bay 46 was also the focus of a Canadian Broadcasting Corporation (CBC) documentary hosted by Canadian folk music icon Sylvia Tyson, called Heartland. Now available only through a special request to CBC archives, the Heartland episode aired on television while the fire was still being fought. The video images and interviews provide a fascinating account of the people and equipment that comprise an effective response to controlling wildfire in Ontario's boreal forest.

A series of interviews conducted by Sylvia during daily fire suppression activities with fire bosses, unit crew members, and other engaged MNR staff including foresters and biologists, all stoic and looking somewhat weary, has the constant drone of helicopters and waterbombers in the background. Panoramic videos taken both on-the-ground and from the air show hotspots and smoke, and an immense mobilization of people and machines.

The video's late evening interviews are, however, more relaxed and casual, with the same cast of characters gathered around a very small campfire, sipping tea and coffee, and philosophizing about the lifestyle and culture that forest fire fighting fosters. The main sentiments shared were that while it is hard and isolating work, it pays well and there is nowhere to spend your money when you are out on a fire line... As a result, tuition can be readily paid in full after a fire-flap year like 1980.

A stark result of the Thunder Bay 46 fire and the forest resources it consumed meant that close to 30 years of annual allowable harvest was negated for woodlands operations and mills in the Thunder Bay region. The impact that followed was severe, with bush camp closures, employment issues, and the need to completely rework forest management plans. Other regions in northwestern Ontario wrestled with similar challenging outcomes related to the severity of the 1980 fire season.

For boreal forest ecosystems, however, Thunder Bay 46 was nothing new, and

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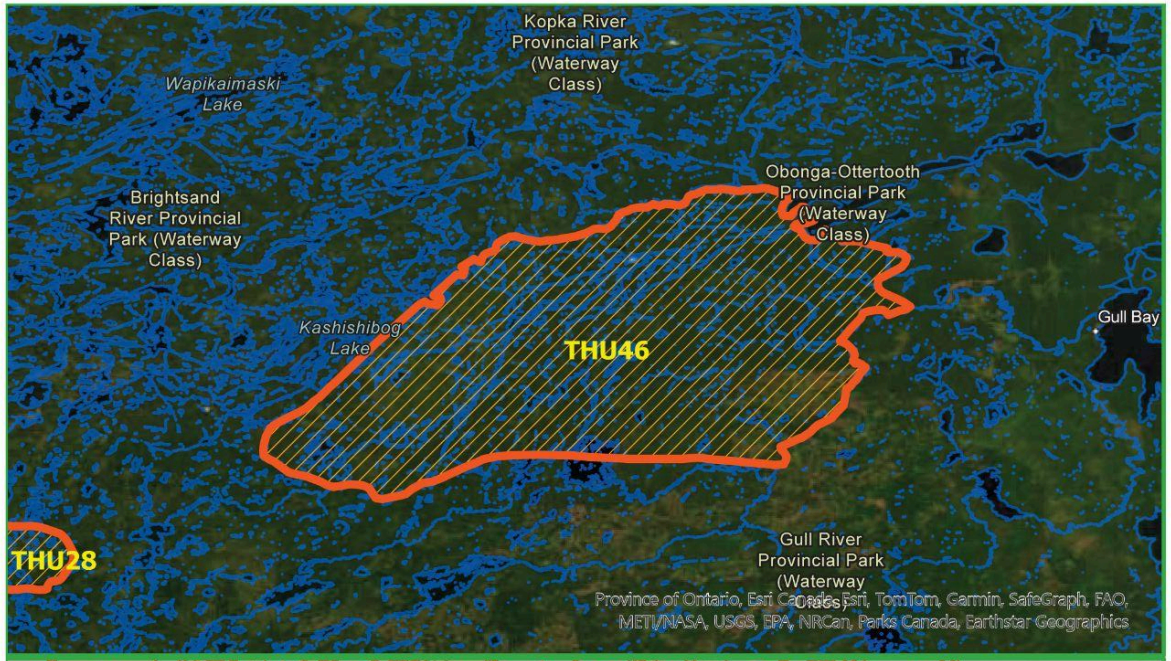
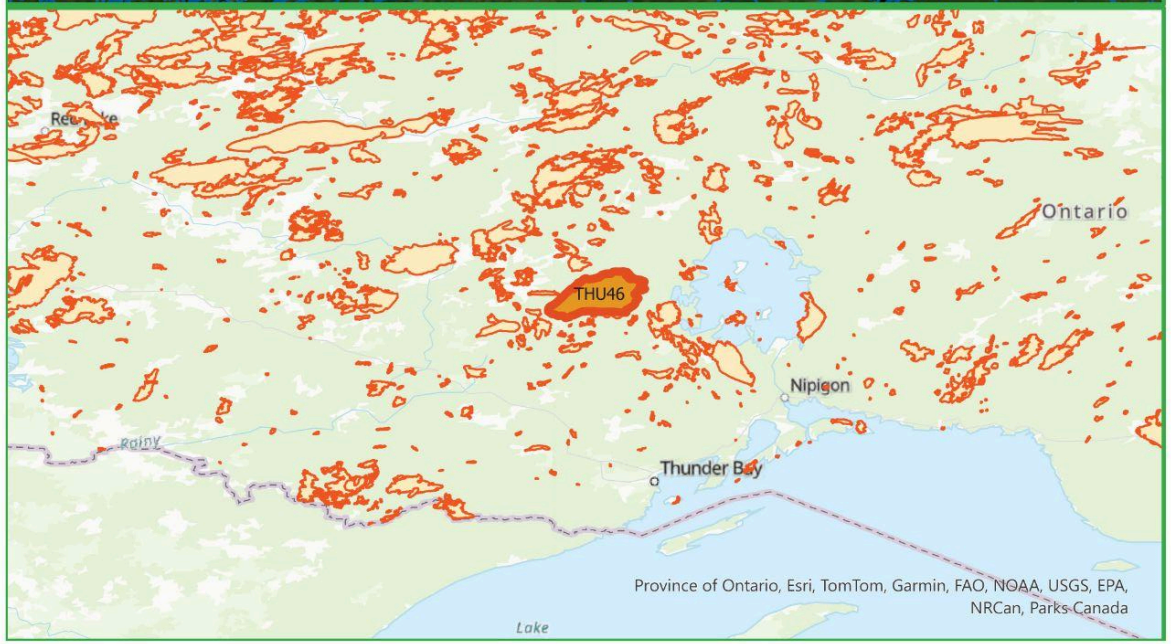




Thunder Bay 46 (1980)

Fire Extent Map (1:750,000)

Legend

- Thunder Bay 46 Extent
- Lakes and Rivers

0 10 20 40 Kilometers

Fire Area: 126,748 ha.

Maps and layout rendered in ArcGIS Pro 3.0.
Fire History Data obtained from the Ontario GeoHub.

John Pineau
February 1st, 2026

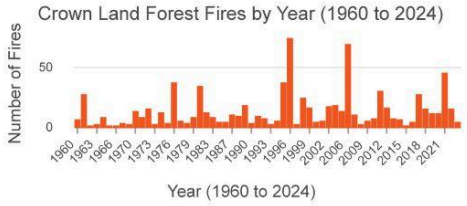
N

Regional Context (Location) Map (1:5,000,000)

Legend

- Thunder Bay 46 (1980)
- Forest Fires (1960 to 2024)

0 62.5 125 250 Kilometers



was not really unique or all that different. The boreal forest has evolved, as a result of fire and fire cycles that have gone on for millennia since the end of the last ice age around 10,000 years ago in our part of the world. Thankfully, the trees, plants, animals, soils, and water of the boreal are resilient after disturbances such as fire occur.

Most people often think of wildfires as devastating or destroying the forest. And clearly when they involve loss of life or property, they are tragic. But natural disturbances such as wildfire are also an opportunity for renewal. Many plants and animals rely on natural disturbances such as wildfires to create the early and mid-successional habitat conditions they require. Without natural disturbances, the forests of Ontario, both public and private, would actually have a much lower diversity of plants and animals.

While humans have certainly changed the boreal landscape in a number of ways, including through timber harvest, perhaps fire suppression has been our most significant intervention. Despite what it sometimes looks like or plays out in the media, we have been quite good at suppressing fire… even though fire is a normal and natural occurrence in the boreal. A general consensus is that fire suppression has resulted in an increased fuel load, which exacerbated by climate change, is causing larger, more intense fires. However, this is still speculative, as many factors influence the frequency and area of burns, and empirical evidence to date indicates no significant trend that total fire area burned annually is increasing in Ontario in recent decades. See Figure 1.

Today the forests within what was the fire extent of Thunder Bay 46 in 1980 have regenerated, both naturally and with considerable human intervention including tree planting and tending. Perhaps the legacy of Thunder Bay 46 is as simple as a reminder that fires are the boreal forest's past, present and future, and while it is important that we protect lives, property and timber resources, mother nature often has other ideas, and we very likely need to be more in tune with her… and for the musicians, with Sylvia Tyson.

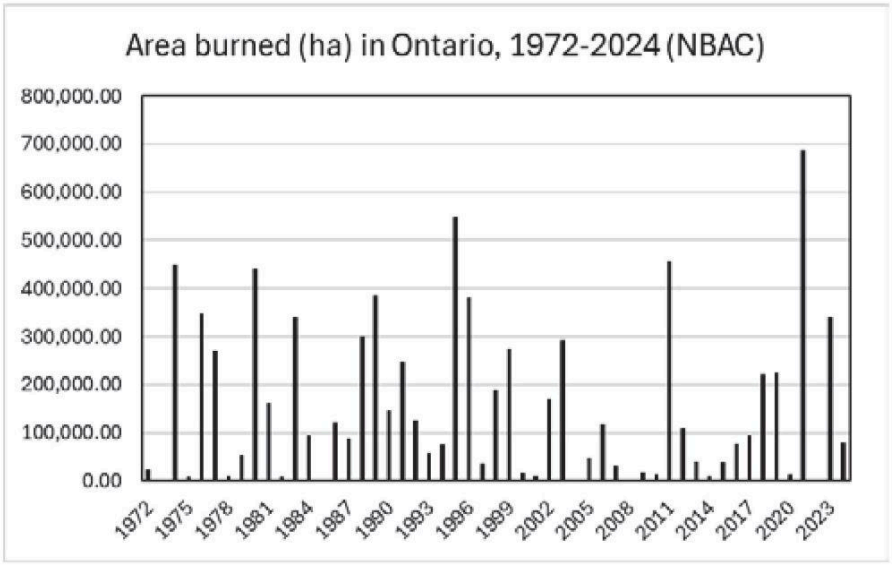
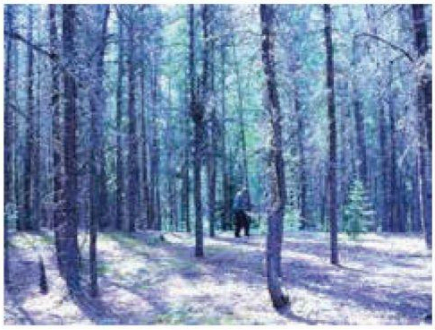


Figure 1: Area burned (ha) in Ontario, 1972-2024. Source: National Burned Area Composite Database. Canadian Forest Service: https://cwfis.cfs.nrcan.gc.ca/datamart/metadata/nbac

Syliva Tyson performing in 1980. Photo credit: Mike Barker.

Thank you to the following individuals for their assistance with this article: **Mac Squires, Jim Farrell, Fraser Dunn, Bob Elliott, and Mike Barker.**



Peter Nicholas in 2025 in stand that regenerated after Thunder Bay 46. Photo credit: Mac Squires.

Landsat Satellite Imagery of Thunder Bay 46 area from 1984 (top) and 2020 (bottom). Source: Google Earth Pro.

The Birth of Forest Conservation and the Canadian Renaissance 1878-1888

By: John Bacher

The two decades between 1878 and 1902 were a time of positive revolutionary change in attitudes towards forests in Canada. It was a significant part of a broader cultural shift which was termed by one of its architects, a Governor-General of Canada, John Campbell, the Marquess of Lorne, as the Canadian Renaissance. He served in this role from November 1878 to 1883. Lorne worked with intellects from both Euro-Canadian and Aboriginal cultures to reduce the vulgarity of Canadian culture.

Campbell's Renaissance was encouraged by what he called his "three children". These were the Royal Society of Canada, an association of intellectuals, the Royal Academy of Arts, and the National Gallery of Canada.

In giving birth to his three children, which was greatly assisted by his wife, Princess Louise, a daughter of Queen Victoria, and like her husband, an accomplished artist, the Governor-General challenged vulgar norms of Euro-Canadian culture. One aspect of this crudeness was a contempt for the heritage of Native peoples and the predominately forested ecosystems they strove to protect. [1]

Lorne worked with an impressive array of Canadian artists and thinkers in his shaping of the Canadian Renaissance. These included an anthropologist, Horatio Hale, a painter, Homer Watson, who benefited from Lorne's patronage, an art critic, Robert Baldwin Ross, the botanist John Macoun and the founder of Canada's network of Experimental Farms, William Saunders. Another key figure was the President of the Royal Academy, Lucius Richard O'Brien. He had been mentored by Paul Kane, who sought to emulate in his life's work the champion of Native American cultures, George Catlin. O'Brien was a key artist for the massive book project sponsored by Lorne, *Picturesque Canada*, whose introduction was written by the Principal of Queen's University, George Munro Grant. [2]

Saunders and Macoun were both founding members of the Royal Society of Canada, and in 1900 would help found the Canadian Forestry Association (CFA). Watson was a founding member of both the Royal Academy of Arts and the National Gallery of Canada. He was helped by the patronage of Lorne based on the recommendations of the then acclaimed British literary lion, Oscar Wilde. Wilde's tour of Canada focused on the promotion of the arts fit neatly into Lorne's vision. Wilde gave his address in Canada at Government House, the official residence of the Governor-General. [3]

Hale and Watson were frequent visitors to the cultured salons organized at the home of the Mohawk Confederacy Chief, George Johnson Chiefswood, by his wife, Emily. Johnson would communicate with Lorne in extensive correspondence and donations of trees for planting. Some of the trees, notably black walnuts, became part of a grove of Canadian trees at the Governor-General's estate around the castle of Inveraray in Scotland. [4]

Before the impact of the Canadian Renaissance forests were widely viewed in Euro-Canadian culture as impediments to agriculture, to be quickly cleared away. The prevailing view was vividly summarized by John Squair, a Professor of French at the University of Toronto and a historian. He was an uncle of one of the first Canadian foresters, Edmund Zavitz, who would bring back to ecological health landscapes that had been desertified through excessive deforestation.

Professor Squair lamented how in his youth in the days before the Canadian Renaissance, "a tree" was seen "as an enemy rather than a friend, something to be rooted up and burnt out." Deforestation became "an occasion for rejoicing and the passing around of the whiskey jug." Logging bees were riotous, sinister community rituals accompanied by widespread public drunkenness. [5]

Long before Lorne's arrival in 1878, Chief Johnson had been a towering figure in combating both the ecocidal and the genocidal impact of the whiskey trade. It was wiping out both Native communities and remnant forests in the heavily populated parts of southern Canada. Johnson's efforts curtailing this illicit trade from 1865 to 1878 resulted in three assassination attempts. This heroic effort caused him to be awarded a medal by Edward, Prince of Wales, the brother of Princess Louise. [6]

Chiefswood. Photo courtesy of Six Nations Tourism.

Johnson's determination, backed by the Haudenosaunee Confederacy Council, had made the Six Nations Reservation a forested oasis in a desolate barren landscape. By 1878 this situation caused a group of environmentally literate farmers to undertake a delegation from the Ontario Fruit Growers Association (OFGA) to his home, Chiefswood.

A longtime President of the OFGA, William Saunders, experienced how deforestation around his London, Ontario farm altered micro-climates, making it impossible for him to grow peaches. After viewing Johnson's "lovely native park", the delegates concluded that, "A great many households throughout the country would be much improved in appearance by the planting of walnut, butternut, or hickory trees, and beside the shade afforded, a rich profit could be made in a few years from the products therefrom."[7]

After the impact of the pilgrimage to Chiefswood, Chief Johnson became an active member of the OFGA and turned it into Canada's first effective environmental protection group. His efforts crescendoed at the OFGA's September 27, 1880 Annual General Meeting (AGM), held in London, Ontario. Here he detailed his close co-operation with Lorne, through a "long correspondence".[8]

After the AGM the association's President, Delos Beadle, further documented the decline of the black walnut. He found that even in his home community of the Niagara Region, which had been the valuable species' last Canadian stronghold, "all has been cut down." Hickories suffered a similar fate from the work of the ruthless "axe helve hunter." [9]

Johnson died on February 19, 1884, from the impact of injuries from assaults triggered by his forest conservation work. His death was used effectively by his friend, Horatio Hale, to build upon Lorne's appeal for Canada to move beyond the crude savagery of a settler-colonial society. Hale lamented on how the injuries "which enfeebled" Johnson's "stalwart frame" were "received in his endeavors to protect the morals and property of his people from the white outlaws and desperadoes who formerly frequented the Reserve." [10]

Hale found it "somewhat remarkable that an Iroquois chief, should in our peaceful time and among the quiet and law-respecting people of Canada die from the effect of wounds received from the enemies of the European race, as doubtless many of his ancestors had died in the fiercer days of old. But the conditions were strongly reversed. The conflict was still one of civilization with barbarism; but in this case Indian civilization stood at bay before White savagery, and conquered in the end at the expense of a noble life." [11]

Following Johnson's death the OFGA did take up Hale's challenge to combat the "barbarism" of the assault upon Canada's forests, which was unleashing desertification, forest fires and floods. One of its members, Robert W. Phipps, an apple grower from Grey County, persuaded the Ontario government to publish their members' pleas for forest protection in the Sessional Papers of the Ontario legislature.

Phipps' reports, eventually published through his role as a public servant Chief of Forestry, publicized the harmful impacts of what Hale called the "outlaws" and "desperadoes" who were inflicting such ruin on the landscape. One OFGA informant described how in Brant County, around the reserve that Johnson had defended at risk of his life, "with the regular

clearing of our forests, we have no more forests left to clear". There was now "but little pine and white oak, or any other timber for manufacturing". Massive flooding destroyed bridges in Brantford and springs, "once unfailing, have entirely disappeared." The very water supply had now become "uncertain". [12]

Phipps' OFGA assisted agitation finally bore fruit in 1893 with the creation of Algonquin Provincial Park. He served on the advisory committee that led to its establishment. He wrote then that, "It is time we understood that the cry to clear our forests; make the woodland into farms; has no application to the great stoney, granatic, pine-covered belt which hems our more fertile region." [13]

The creation of Algonquin Provincial Park as a forest reserve where agriculture would be excluded finally sealed the delusional notion of an ever expanding Canadian frontier, where forests would be burnt into farmland. The OFGA's efforts to spread the gospel of conservation extended beyond Ontario. One of its members, a fruit grower from Essex County, J. H. Morgan, was able to become a conservation advisor to Prime Minister John A. MacDonald, in a similar way that Phipps influenced his former law partner, James Whitney, the Premier of Ontario. His reports warning of the "wreckless and destructive waste of the great forests of Canada", were published by the Canadian parliament.[14]

Phipps' warnings were echoed by another prophet who benefited from Lorne's patronage, John Macoun. He helped secure the protection of the first wildlife sanctuary in North America, which eventually became the Long Lake National Wildlife Bird Sanctuary and Wildlife Refuge in Saskatchewan. He termed it the "Flower Garden of the North West", and played an important role in rescuing the site from being destroyed through a proposed route of the Canadian Pacific Railway. [15]

Although Morgan eventually had a falling out with MacDonald, his vision of protection through forest reserves and national parks of the Rocky Mountains was eventually implemented through the influence of the CFA on his eventual heir as a long time Prime Minister, Sir Wilfred Laurier. The CFA was led by many of the members of Lorne's founded societies, such as William Saunders and John Macoun. It would protect the Rocky Mountains' forests, aiding in the preservation of the remarkable landscape named after Lorne's wife, Lake Louise.

Lorne's Canadian Renaissance through royal patronage realized the visions of marginalized Canadian intellectuals who shared the Governor-General's loathing of "white savagery." Some of its long time reforms are expressed in the beauty of Canada's national capital Ottawa, whose later careful planning was a long response to Oscar Wilde's complaint of its domination by ugly, "saw dust and smoke." [16]

The reforms the Canadian Renaissance nurtured can also be seen in the health of the forests around Ottawa. During the time of Lorne's tenure as Governor-General, much of

the landscape near the city had become the desertified Bourget Desert. This was caused by the use of fire by farmers and railway corporations to clear land. Much of it is now the resurrected landscape known as the Larose Forest, one of the great achievements of the conservation advocacy begun by the OFGA during Lorne's creative Canadian Renaissance through its eventual bringing of professional forestry to Canada. [17]

Endnotes

1) P. B. Waite, "Campbell, John George Edward Henry Douglas Sutherland, Marquess of Lorne and 9th Duke of Argyle, 1998, " Dictionary of Canadian Biography", Vol. 14, University of Toronto Press and Universite Laval, Campbell was motivated to create the Royal Society in part because of the American Smithsonian museum's aggressive collection of Native artifacts on the Canadian prairies.

2) Dennis Reid, "O' Brien, Lucius Richard, "Dictionary of Canadian Biography", 1990, University of Toronto Press and Universite Laval, Vol. 14. Campbell, before his appointment as Governor-General, had worked on a major literary project celebrating the landscape of the United States, which gave him good training that was used effectively by him in shaping the Canadian Renaissance.

3) Kevin O' Brien, "Oscar Wilde in Canada: An Apostle For the Arts" (Toronto: Personal Library, 1982). passim. Wilde, in his attacks on the ugliness of areas of Canadian landscape dominated by Euro-Canadians, gave voice to the various artists and intellectuals he met. One such person became a life long friend, the Ottawa painter Francis Richards, whose painting of him inspired one of his most significant literary works, *The Portrait of Dorian Grey*.

O'Brien documents how Wilde spoke to, and was honoured by, the Haudenosaunee Confederacy, when the Mohawk Chief George Johnson was at his peak of influence there. He shows how the future great poet, his youngest daughter Pauline Johnson, was 23 when this took place. Wilde's influence was the likely reason for the still mysterious destruction of Pauline Johnson's personal papers by her younger sister Evelyn following her death in 1913. Wilde's notoriety exploded 13 years after his Canadian tour resulting in a two year imprisonment.

Wilde and Lorne together rescued Homer Watson from obscurity, to become the leading Canadian landscape painter for the next two decades. This allowed Watson to become an effective advocate for forest protection, notably through leading a fund raising campaign to create the park in Kitchener later named in his honor.

4) Annual Report of the Ontario Fruit Growers Association, 1880, Ontario Fruit Growers Association Papers, Brock University Archives; Robert M. Stamp, "Royal Rebels: Princess Louise and the Marquis of Lorne", (Toronto: Dundurn Press, 1988) passim.

5) John Squair, "History of Darlington and Clarke Townships", (Toronto: University of Toronto Press), 3-10. Another writer of the deadly combination of alcohol and logging was the author Susanna Moodie, whose husband, a Sheriff, was dangerously injured in a drunken logging bee while sober.

6) Pauline Johnson, "My Mother", Good Reads online.

7) Annual Report of the Ontario Fruit Growers Association, 1879, Annual Report of the Commissioner of Agriculture and Arts for the Province of Ontario, Toronto, Hunter Rose and Company by Order of the Legislative Assembly of Ontario, 1879, Appendix D, 305, 306.

8) Annual Report of the Ontario Fruit Growers Association, 1880, loc.cit.,

9) Minutes of the September 27, 1881, Meeting of the Ontario Fruit Growers of Ontario, Ontario Sessional Papers, 1882, No. 3.

10) Horatio Hale, "Chief George H. M. Johnson, Onwanonyshon, His Life and Work Among the Six Nations", Reprinted From the Magazine of American History for February, 1885, PDF, Brantford Public Library.

11) Ibid.,

12) Robert William Phipps, "Forestry Report, 1884" (Toronto: Legislative Assembly of Ontario, 1885), 2-26.

13) James Bradbam, "Forests forever: it shall remain: How Algonquin Park Came to Be", TV Ontario, May 26, 2023. The creation of Algonquin Park, largely through the pressure of OFGA members mobilized by Phipps, was one of the most impressive achievements of the Canadian Renaissance. One of the park's key supporters, Alexander Kirkwood, had previously been the leading skeptic of forest conservation in the Canadian public service, aggressively promoting agriculture on the Canadian Shield. Another vivid symbol of change is that the Premier who introduced the measure, Eric Hardy, had, 15 years earlier, been the leading critic in the provincial legislature of the conservation measures of George Johnson, which rescued the largest remaining tracts of Carolinian Forest on Native reservations. The bill to create Algonquin was approved without significant debate, except for calls for logging bans from a legislator from Kent County, a stronghold of the OFGA.

14) Wikipedia entry on John Macoun and Long Lake National Bird and Wildlife Refuge. On his Canadian tour in 1882, Oscar Wilde was able to meet with the Canadian Prime Minister, Sir John A. MacDonald. Wilde's habit of always decorating himself with sunflowers helped Macoun in his difficult task of persuading the Prime Minister to protect the "flower garden" of the Canadian prairies.

15) Ibid.

16) Randy Boswell, article, "River of Sawdust", Ottawa Citizen, August 27, 2016. In a speech Wilde denounced how the logging industry had despoiled Canada's capital as an "outrage".

In Ottawa Wilde said that, "No one has the right to pollute the air and water which are the common inheritance of all. We should have leave them to our children as we have received them."

Wilde's comments did spark a debate in the leading newspaper, the *Ottawa Citizen*, helping with efforts such as Saunders' circling the Experimental Farm he created in the city with a forested belt. This eventually became the core of a bigger effort by the Ottawa Improvement Commission, which was expanded later into the National Capital Commission.

17) Wikipedia entry on Larose Forest.

HISTORY OF WHITE PINE MANAGEMENT IN QUEBEC

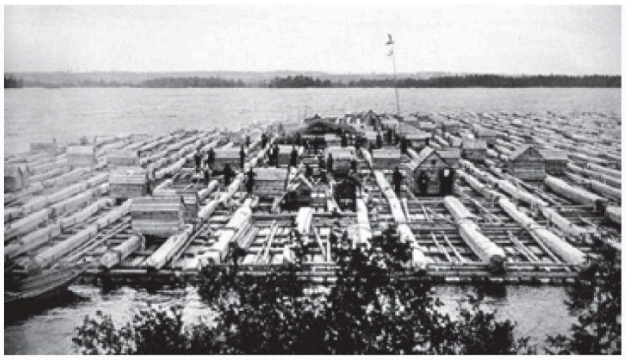
A STEP TOWARDS RESTORATION

By Michel Huot, Québec Ministry of Forests, Wildlife and Parks (retired), co-author of the first tome of Guide sylvicole du Québec

Majestic white pine were abundant at several locations in Quebec as shown in this picture of huge rafts of pine timber, in the 1800s.

A significant trade in squared timber used to supply ship-building in England gave rise to the forest industry as early as 1806, with the first log raft launched initially on the Ottawa River, then on the St. Lawrence River, as far as Sillery in Quebec City. The trees chosen to become masts had to be defect-free.

This era of the raftsmen also inspired artists such as Frances Anne Hopkins (1838–1919), whose watercolor can be admired below.



Northern raft on the Ottawa River in the 19th century. Photo credit: Paul Aird, University of Toronto. Courtesy of the Maison des Cageux.

DECLINE OF PINE FORESTS

The passage of numerous pine rafts near Bytown (later Ottawa) caused some concern in political circles throughout the 19th century, as there were fears of depletion of this resource. Others observed at the time that the natural regeneration of white pine was insufficient and that the stands often transformed into fir, paper birch, aspen, and other species. The majestic pine forests gradually disappeared almost everywhere, leaving only a few small fragments in remote locations. It was reported that in the Ottawa River watershed, only 4% of the pine forests remained. This would be somewhat the same situation in Minnesota, where it is estimated that only 2% remained in 1990 compared to 1837.

LACK OF REGENERATION

The difficulty of regeneration was observed, even in regions recognized as lumber-producing areas. One post-harvest and post-burn regeneration inventory showed a stocking value of less than 5%.

Was this purely a problem of a poor seed year? In general, the seeding density of white pine remained low, that is, less than 1,000 stems/ha in several inventories reported by Hosie.

The growth of this regeneration would be limited by numerous competing species, but it is prudent to maintain sufficient shade, as clearcutting situations are mostly cases of severe weevil damage. In Ontario. a thinning of ¾ to 1 times the crown width is currently recommended for the best results.

A study conducted in the Gatineau River Valley drew circumstantial information from land survey records to better understand the pre-industrial forest. We sought to measure the extent of the decline in white pine using forest inventory plots, their topographic position, and potential species composition. The results obtained provide a better understanding of the history of their reduction. The occurrence of white pine stands weakened, decreasing from 16.1% to 3.5% at the top of the slope, from 20.9% to 9.8% at mid-slope, and from 21.5% to 2% at the bottom of the slope. Overall, this type of stand decreased from 17.9% to 5.4%, a significant decline over a 140-year period.

Other data were examined, particularly those from forest inventories of the 1940s and 1950s with Gustave Piché (Lièvre Valley) and Ewan Caldwell (Coulonge River watershed). The percentages reported were very similar to those recorded elsewhere. Stands with white pine were still present on 18.4% of the area on Caldwell's side and on 21% on Piché's side; four areas with an abundance of white pine and red pine stands were identified. Data from the third decennial (10-year) inventory indicated that these areas are still visible. Another forest inventory, this one conducted in Algonquin Park in Ontario, showed that the harvested stands were dominated by balsam fir, meaning that white pine struggled to survive with less than 5 m^2/ha.

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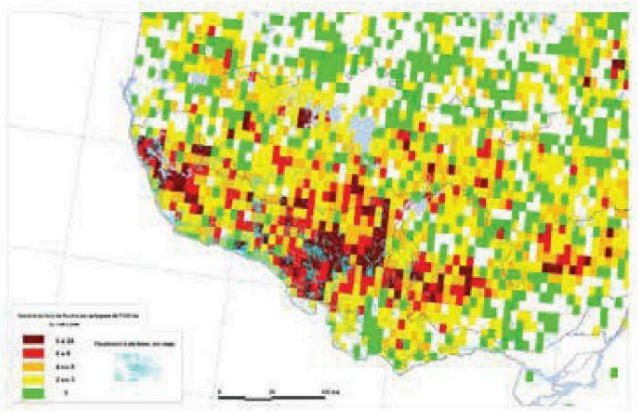
Wood raft on the St-Lawrence river, ca 1868. Illustration by Frances Anne Hopkins, from the Royal Ontario Museum (no. 962-37). Courtesy of Maison des Cageux.



Map showing fire risk based on the frequency of lightning fires in the period 1940-2008 and actual stands with some white pine.

KEY LINK WITH FIRE

Experts know that there can be a clear link between the presence of white pine and forest fires. The frequency of lightning fires during the period 1940–2008 is shown on the map below. It is important to remember that before 1940, the forest fire protection system was not very developed. For example, in the Lièvre River watershed, burned areas were significant, as reported by Gustave Piché, with 16 to 20% of the area burned. Today, there are practically no fires in this same area. In another location, near Lac Beauchêne, it was reported that 21% of the burned areas were 10-years-old or younger and concluded that the fire had been able to regenerate young pine stands over time.

The most beautiful pine forests are those where a low-intensity fire has burned through an unmanaged pine forest.

CHARACTERISTICS OF PINE FORESTS

Two stand conditions emerged from the ecological and dendrometric surveys conducted in Quebec, as shown in Table 1 below.

These observations indicate that white pine was found in transitional stands, which initially included birch, jack pine, or aspen. A gradual encroachment of the understory by balsam fir and red maple resulted in the pines being irrevocably replaced by short-lived species.

In the United States, almost identical results for white pine forests were reported in northern Minnesota... a density of 524 stems/ha, an average diameter of 28 cm, and a basal area of 32.3 m^2/ha. Higher values were obtained for the red pine stand, namely 46.9 m^2/ha, 33 cm diameter at breast height (DBH), and 610 stems/ha.

Other similarities were reported in Ontario. A basal area of 34.15 m^2/ha and a pine percentage of 61.5% are comparable. A pine-fir stand, which was essentially two stands in one, was also reported. The mature pine had a volume of 335 m^3/ha and the balsam fir, 48 m^3/ha, distributed over 207 and 1126 stems/ha, respectively. This pine-fir stand had a total volume of 388 m^3/ha. An inventory indicated there are approximately 75 pines/ha in coniferous stands over

Table 1: Stand Conditions Observed in Ecological and Dendrometric Surveys.

Stand Type	White pine stems/ha	Percent white pine	Basal area m^2/ha	Merchantable volume white pine m^3/ha	Percent white pine	Quadratic mean diameter (cm)	Average volume/stem (dm^3)
Red and white pine stand	522	64.4	32.4	273.8	90.5	29.4	707
Balsam fir-red maple or northern cedar stand and white pine	60	5.9	17.1	178.6	57.7	65.8	3165

120-years-old, which corresponds to the value of 60 stems/ha in Table 1. Under optimal conditions, white pine thrives up to 300 years of age, reaching impressive dimensions.

The pathologist Haddow revisited very old pine stands in Ontario and observed that rot and various types of decay were killing the last large pines, which were still present at 400 years of age.

This section shows that the fir stands are already at risk of losing their pine seed trees, as they are few in number and mature. Efforts should be made to prioritize these stands for pine production. Furthermore, the role that an epidemic of insects such as the spruce budworm (SBW) can play on the survival and growth of pines is poorly understood. Pine could be favored over fir, which have been killed or threatened by the budworm.

CURRENT STAND STRUCTURE

Near Waltham, in the Outaouais region, stem distribution according to DBH indicates an even distribution of white pine and significant understory encroachment by fir and red maple. This situation appears to be common and has been observed in the Aigle Forest. This means that balsam fir acts as a kind of fuel ladder, which can lead to very severe crown fires. It is recommended to remove and uproot these fir and red maple saplings to free the understory and allow for light scarification, for example, with a ski-mounted rake developed at Fort-Coulonge. This equipment allows to mimic the effect of fire. This fir regeneration is not desirable because fir stands on dry sites (fluvioglacial or outwash sand, for example) are highly vulnerable to spruce budworm. On this type of site, it is necessary to prioritize the production of white pine.

STEM DENSITY

The goal of characterizing pine stands is to learn how many stems are needed based on DBH and to understand the logic of full tree stocking. Data was collected for crown width in some regions of eastern Ontario. An equation establishes the link between crown width and DBH. Width can vary by 25% around the average, and this takes into account the variable stand density conditions in which a stem has developed. The equation is:

Crown width=0,15745 * DBH (cm) + 0,22629 with a R^2 of 0.98.

More recent density management models exist for white pine. But for the moment, it seems that with approximately 1500 white pines/ha, when the average DBH is 15 cm, recruitment is successful. At maturity, pine density is considered adequate when it reaches 300 stems with a DBH of 40 cm and only 50 stems with a DBH of 1 m.

PINE FOREST RESTORATION

White pine can produce large volumes and can therefore store a lot of carbon. More should be grown in the region. Here are some possible reintroduction opportunities for white pine. Mature or nearly mature aspen stands (i.e., 40 to 50 years old) were studied. These aspen stands have variable productivity, but some sites could allow for the reintroduction of white pine, for example stands with less than 15 m^2/ha, according to the data. Note that aspen stands with white pine and those with pine and red oak are not very productive for poplar but have high potential for pine. This situation is further confirmed by a set of independent inventory data reported that used a Site Quality Index (SQI). This data indicates that 28% of these plots are suitable for pine restoration with trees less than 15 m tall at 50 years old. The other more productive aspen stands should be kept as to produce aspen. Enrichment trials in young, degraded hardwood stands in Lanaudière have shown that the most significant problem is ensuring seedling dominance. They survive fairly well. The literature indicates that failures have occurred when the forest stand was too young. On the other hand, using an older stand facilitated the field work and yielded better results.

Large areas of balsam fir-yellow birch stands, and coniferous yellow birch stands have become early stages of succession dominated by light-demanding broadleaf trees. This significant transformation of southern balsam fir stands can be explained by the effect of moderate to severe disturbances, either from spruce budworm outbreaks and/or logging. According to a comparison of forest inventories reported, southern balsam fir stands are now found on only 26% of the area of their potential sites. There are therefore several aspen, white birch, and red maple stands that could be used for restoration, whenever they show low productivity.

The example of the current abundance zone of white pine, namely the maple-yellow birch forest of the west, is excellent, especially since the potential for white pine forestry is concentrated there. The following data comes from the guide to forest sites in ecological regions 3a and 3b. There are 120,000 ha of the RP1 series (typically red and white pine). There are also 75,800 ha of MJ0 and 161,100 ha of MJ1 (yellow birch-fir types), and these are potential sites that could support pine.

Collectively, we can set ourselves the objective of bringing as many hectares of these favorable sites back into priority pine production. We could, for example, start with 50-year-old intolerant hardwood stands on 10,000 ha of fluvioglacial sands, targeting the MJ1 series. In addition to the western sugar maple-yellow birch sub-domain, there are other areas further south with potential areas in dry sites. White pine restoration should be tested outside the Outaouais region.

However, further experiments with this shelterwood approach are needed, along with learning more about the facilitating role of an aging overstory under which light levels naturally increase. There is still an opportunity to enrich certain stands and properly manage the remaining fragments of RP1 series.

PERSPECTIVES

Given current knowledge of the public forest, the sugar maple sub-domains offer significant potential for shelterwood pine restoration, as the proportion of volume of white pine remains significant, representing over 15% of the gross merchantable volume of softwood species. The western maple-yellow birch sub-domain takes the lead, as the proportion of white pine has increased from 17.8% to 28.7% between the first and third 10-year forest inventories.

Finally, the potential annual cut of white and red pine was re-assessed in the Outaouais region. Region 07 (Outaouais) has experienced a 30% decrease in annual allowable cut since 2018, from 223,400 m^3/year in 2018–2023 to 154,900 m^3/year in 2023–2028. In the case of forest management unit 71, we observe an even more significant decrease of 71%, from 321,500 m^3/year in 1989 to 94,500 m^3/year in 2023–2028. This is enormous and, at the same time, quite perplexing. But how can we arrive at such declines?

According to a report on the evolution of the public forest for the western yellow birch-maple forest, the true spot of residual white pine, the gross merchantable volumes of white pine from the first decennial inventory to the third decennial inventory increased from 18,772,852 m^3 to 30,938,266 m^3. This represents a 65% increase for this bioclimatic sub-domain. Such an increase in volume, which should have been accompanied by increases in allowable cut, is instead accompanied by significant decreases. The allowable cut has become precarious, one must conclude. But without a doubt, the scarcity of young stands and post-harvest regeneration plays a role. Forests over 100-years-old continue to disappear, and white pines with a DBH of barely 40 cm are still being harvested. This persistent danger to both allowable cut and pine regeneration should convince us that we must take a further step towards restoration.

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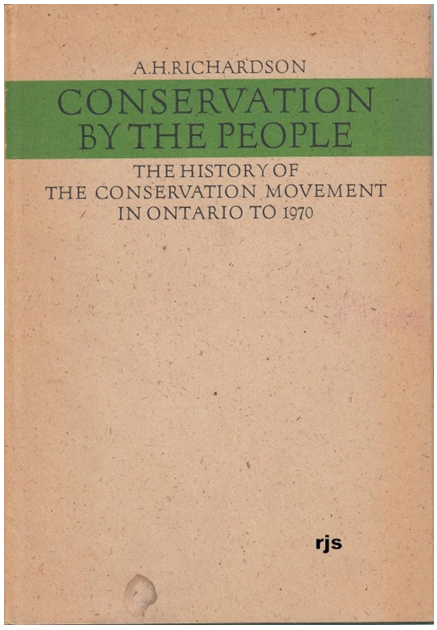
Website: www.shfq.ca

Example of a trembling aspen stand acting as a facilitating or nurse crop of white pine recruits. Photo credit: Michel Huot circa 1994.

White pine regeneration is possible. This picture shows seedlings of white pine and a recent stump. 'Les Palissades' nature trail in Charlevoix. Photo credit: Michel Huot circa 1976.



Conservation by the People
Arthur Herbert Richardson
University of Toronto Press
Toronto, 1974
Precis of Chapter 6: The Other Inhabitants
By: Sherry Hambly

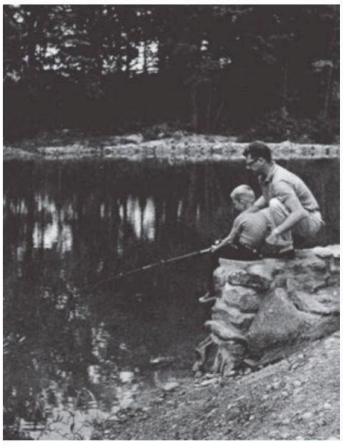
Ken Mayall joined the Conservation Branch in 1945 to direct the work of wildlife and recreation. He discussed how to proceed with Professor W.J.K. Harkness, who recommended that an inventory of all streams be undertaken to identify trout streams and to focus on these streams. He also recommended that the province use the inventory system developed by Professor F.P. Ide of the University of Toronto. The recommendation was adopted and his method was used for 25 years. It was not possible to classify all streams but each Authority produced a map showing which rivers or parts thereof that were suitable for fish. The pollution situation of rivers was also monitored but little action was taken on this front until the mid-fifties. Greater awareness of the state of water pollution led to the establishment of the Ontario Water Resources Commission headed by Dr. A.E. Berry, along with the enactment of a new provincial statute to address the gamut of water problems. In 1966 the Great Lakes Institute, led by Dr. George B. Langford, was created at the University of Toronto to investigate pollution and other matters related to lakes.

One task undertaken by each authority was the improvement of all streams in its watershed for fish life. Deflectors like these, often built with old barn beams and railway ties, create pockets of still water for trout. These examples were built on a tributary of the Saugeen.

Ontario was one of the first jurisdictions to use electric shock to conduct an accurate census of streams and stream fauna. Fish in the stream are stunned by the probes carried by the biologist in the middle; the stunned fish are netted, measured and sometimes tagged before being returned, unharmed, to the water. Note the long cord connecting the probes to the source of electricity.

Ontario embarked on stream improvement projects based on work undertaken by Michigan, which included using digger logs, deflectors and bank erosion devices, as well as fencing along streams. The work also incorporated a fish stunning implement to

The Owen Sound Mill Dam on the Pottawatomi River was restored in 1959 by the North Grey Conservation Authority; to the right of the dam can be seen the first fish ladder constructed in Ontario.



Several authorities have instituted junior anglers' days at which young fishermen, accompanied by fathers or teachers, try their luck unimpeded by adult competition. Some authorities have trout ponds exclusively reserved for junior anglers.

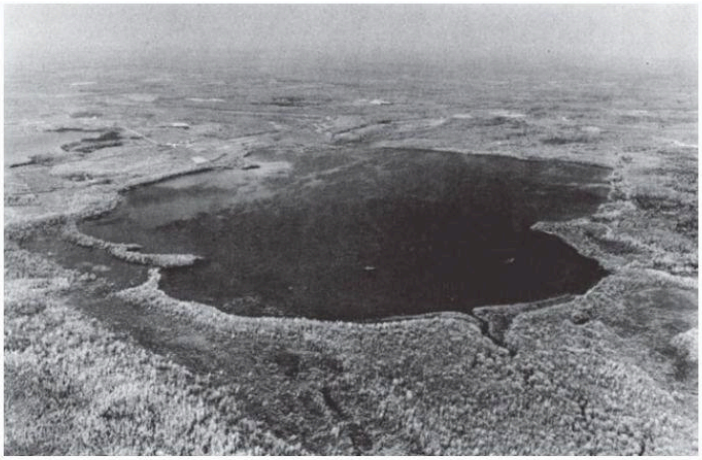
With the depletion of elm trees as a result of the Dutch elm disease infestation, nesting sites for wood ducks have also disappeared. Many authorities have been setting out artificial nesting boxes which approximate the hollow elms favoured by ducks.

allow fish numbers to be counted. Other approaches to stream improvements included competitions with prizes for the best projects. A number of projects competed across southern Ontario.

Murray Johnson was seconded from the Conservation Branch to the Metropolitan Toronto and Region Conservation Authority to implement wildlife improvement projects. His work included building a trout hatchery to stock streams and ponds, which was a big hit with the public. Other projects included fish ladders. New fish ladder designs were imported from Quebec with great success. Improvement work included the management of fishing in reservoirs and tailwaters below dams, which improved trout and pickerel populations in several areas. Emphasis was placed on trout fishing days in several Authorities to teach young people about conservation and the pleasures of angling.

Several large reservoirs were established at different Authorities to trap spring runoff to reduce flooding and increase summer water levels. These projects produced benefits of increased waterfowl populations. The knowledge that the giant race of Canada Geese preferred to nest in southern Ontario led to the release of these birds in conservation authority waters. Winter bird feeding programs for smaller birds and pheasants were introduced. Due to public interest, the Conservation Branch eventually published a bulletin entitled *Some Plants Suitable for Attracting Wildlife*.

It was recognized that the wood duck needed a special duck house to breed and live successfully and eventually a design was developed that suited the ducks but discouraged starlings and raccoons. In some reservoirs areas were designated to keep a shallow level of



Boat Lake, on the Bruce peninsula, and Isaac and Sky Lakes above it, had been drained almost dry by manufacturing firms seeking the marl on the lake bottom. Marl, a fine white powder, is used in the manufacture of cement. The lowering of the lake level destroyed acres of favourite nesting sites of waterfowl. When the Sauble Valley Conservation Authority dammed the Rankin River (right foreground) the water levels rose and the water fowl returned to the lakes.

water available for wildfowl habitat and to increase hunting opportunities. Very large scale improvements to marshes were conducted to attract nesting ducks. These improvements included clearing of woodlands close to water and replacing the areas with unmowed hay. Other projects included draining ponds and leaving them dry for a period to rejuvenate them.

Flora habitat for rare flowers was identified and protected in several Authorities. The Warsaw Caves were identified and bought to be included in authority lands. Dams, such as the one on the Rankin River that flows into the Sauble River, increased water levels, which improved boat access, waterfowl production, fishing and hunting. Halton Region imported a few buffalo, released pheasants and Chukar to stimulate interest in wildlife. Wildlife surveys were undertaken for birds and mammals, including bats. Nests of rare birds were identified.

Surveys were conducted to locate sources and amounts of pollution to alert the public to the issue and to arouse interest in pollution control. This work was done in collaboration with the Ontario Water Resources Commission.

Forest History Ontario

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The mission of FHO 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.

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