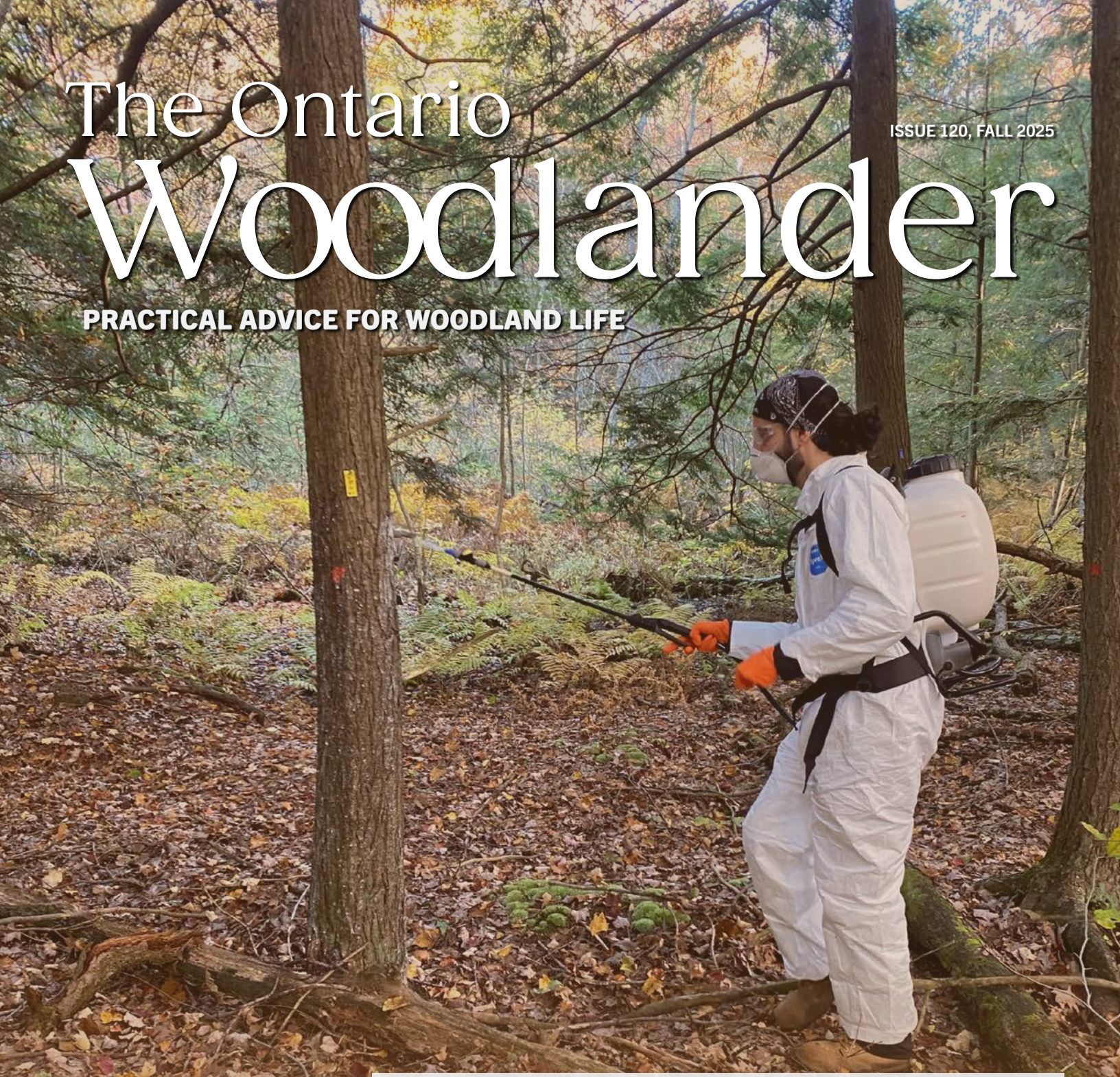
The Ontario Woodlander

ISSUE 120, FALL 2025

PRACTICAL ADVICE FOR WOODLAND LIFE



UNDERSTANDING SILVICULTURAL SYSTEMS

Single Tree Selection • Group Selection • Uniform Shelterwood • Irregular Shelterwood • Clearcut with Standards – A Primer • Emulating Natural Disturbances in Woodlot Management – the Path to END! • Diameter Limit Harvesting • Knowing When to Cut: Lessons from Haldimand County's Pyle Woodlot Harvest

ONTARIO WOODLOT ASSOCIATION
EST. 1992

STIHL DEALS

RECEIVE A

FREE WOOD-PRO™ KIT

WITH THE PURCHASE OF ANY ELIGIBLE STIHL GAS POWERED CHAINSAW. ①

Kit includes Woodsman® Carrying Case, Oilomatic® Chain and STIHL Hat.

NEW
MS 162
GAS CHAINSAW
30.1 CC • 9.9 LB ②

$269.99
MSRP with 16" bar

NEW
MS 172 C-E
GAS CHAINSAW
31.8 CC • 10.4 LB ②

$369.99
MSRP with 16" bar

NEW
MS 212
GAS CHAINSAW
38.6 CC • 10.8 LB ②

$449.99
MSRP with 16" bar

MS 250
GAS CHAINSAW
45.4 CC • 10.1 LB ②

$479.99
MSRP with 16" bar

MS 291
GAS CHAINSAW
55.5 CC • 12.3 LB ②

$699.99
MSRP with 16" bar

MS 391
GAS CHAINSAW
64.1 CC • 14.1 LB ②

$899.99
MSRP with 16" bar

Dealers may sell for less. Pricing on all products and accessories will remain in effect until November 21, 2025. Illustrations and descriptions are as accurate as known at the time of publication and are subject to change without notice. STIHL Limited is not responsible for a printing error, the local STIHL Dealer has the final authority to set product pricing. Pricing valid at participating dealers only while supplies last.

① Simply purchase any one of the following gas powered chainsaws between August 5, 2025 and November 21, 2025 and you will receive a STIHL Wood-Pro™ Kit - a $99.99 value! Hat may not be exactly as shown. Offer valid until November 21, 2025. Eligible Models up to 20" bar: MS 162, MS 172 C-E, MS 212, MS 250, MS 291, MS 391. While supplies last at participating dealers. ② Dry, without guide bar and chain.

STIHL

CONTENTS

INTRODUCTION

4

UNDERSTANDING SILVICULTURAL SYSTEMS

11

WOODLAND LIVING

35

WOODLAND SCIENCE & SKILL

43

WOODLAND BUSINESS

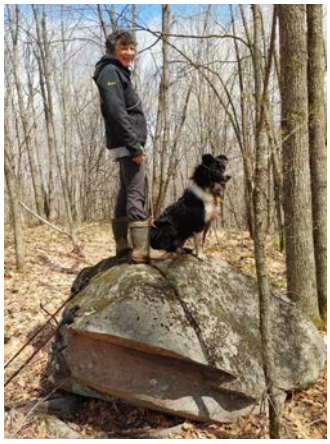
58

ISSN 2370-8638 (Print)
ISSN 2819-6066 (Online)

FRONT COVER PHOTO:
The OWA's Hemlock Woolly Adelgid Project involves pesticide inoculations on a selection of hemlock at Long Point Region Conservation Authority. The trees will be monitored over time to determine the effectiveness of the treatments. The OWA thanks the Invasive Species Centre and the Ontario Ministry of Natural Resources for funding this important project, and the staff at Trees Unlimited and Long Point Region Conservation Authority for their time and effort!

President's Message

Colleen Drew-Baehre,
Bancroft-Haliburton



OWA President Colleen Drew-Baehre with her energetic border collie, Joey.

With autumn well on its way, and beautiful colours to enjoy, it is with a sense of both great honour and some trepidation that I take on the role of President of the OWA. I am humbled and excited to be in this position with an organization that provides support to so many private woodlot stewards.

The OWA has experienced significant program growth, as well as a substantial increase in human resource capacity and annual budget. I also quickly came to realize that taking on the presidency is an opportunity that has exciting benefits, both personally (so many exciting new things to learn), and with respect to the potential to further advance the profile and recognition of our province's important private land forest sector.

Woodlots (privately owned forests) contribute significantly to maintaining Ontario's diverse ecosystems, biodiversity, wildlife habitat, clean air, and water, and in providing wood fibre for many products needed by our society. With 180,000 private landowners managing close to 5,000,000 hectares of forest, it is understandable why, collectively, we make a strong contribution to the province's greater forest sector.

Considering what to write in this message has forced me to think about why forested lands are so important to me. Certainly, as a child I had ample opportunity to spend hours of playtime in the woods. My father always enjoyed taking us for walks and teaching us to respect the land and water, and as an added bonus, made sure we knew our tree names too! My careers in both planning and teaching gave me so many opportunities to connect with the natural world. Working with and seeing through the eyes of students has further solidified my commitment to stewardship and sustainable management. Owning and spending time in a woodlot has made me aware of the incredible responsibility we each have, to manage these valuable places in a sustainable way, not only for our own benefit, but also for future generations.

Along the way on my career journey, I was lucky enough to be permitted to take the Ontario Tree Marking Course. It was an intense week, covering many topics such as tree identification, silviculture, harvesting methods, and tree defects and diseases. Ultimately of course, one learns how to decide which trees to remove. This may provide a desired monetary return, but should also improve the health of the forest, based on silvicultural methods appropriate for specific soil, landscape and moisture conditions. Maintaining biodiversity and a healthy functioning ecosystem with sustainable growing stock are the goals of tree marking.

This issue of The Ontario Woodlander is focused on silvicultural methods, including single tree and group selection, different types of shelterwood, and clear-cut options. The choice of which method to use with your woodlot will depend on many things, including the type of stand you have (for example upland tolerant hardwoods vs pine-oak), the landscape, soil type and moisture regime, the presence of invasive species, and ultimately what your goals are for your woodlot. Perhaps you wish to simply improve the overall health and biodiversity of your woodlot or maybe sell some merchantable timber. Maybe you want to make your woodlot a good habitat for certain species of birds, mammals, reptiles, and amphibians, or just increase your overall wildlife numbers. There are many ways to manage forested land. This issue will provide you with information to help you make good choices for stewarding your woodlot. As always, it is important to find well-qualified forest professionals to help you carry out your stewardship goals for your woodlot. These may include certified tree markers and registered professional foresters. Our OWA website is a good place to start looking for someone who can help you fine-tune your plans to build or maintain your healthy woodlot.

I hope that this fall you have lots of time to enjoy your woodlot, during what has to be one of the nicest times of the year (a bit cooler and NO BUGS), and consider, after reading this very informative issue of The Woodlander, what forest management type might best suit you and your woodlot.

SUMMING UP FIVE WONDERFUL YEARS

Executive Director's Note

John Pineau, Near North Chapter

There are three themes I will briefly touch upon in my final column as the OWA's Executive Director. The first will include my thoughts on what makes our association successful and effective, and the second will include some candid suggestions on what we need to do to both maintain and improve what we have grown and evolved to become. The third topic will be a more personal reflection of what made my time with the OWA pretty much the best job I have held in a 42-plus year career…

OWA'S SUCCESS AND EFFECTIVENESS

Hands-down the OWA has the best and most functional governance I have experienced, and that is saying something… I have spent a lot of time on both sides of the table in the not-for-profit sector. Our volunteer leaders stay strategic and are very supportive, including when tough decisions have to be made. Both the Executive Committee and the full Board of Directors know their roles well and are quintessentially dedicated and engaged volunteers, ensuring that what our members want and need are respected. There is an excellent balance of leadership and governance.

We have assembled a smart, talented, and hard-working staff team, all of whom are dedicated to the OWA and its mandate. Most of our chapters are active and engaged, and we have volunteers who give considerable time and energy toward events, committees, and for our various programs and projects. It is the old saying that… *many hands make for light work*. But it is also the natural state of cooperation and common purpose amongst this heterogeneous group that makes things work so well. That we actually reference and are guided by our strategic plan is rather unique…

WHAT WE NEED TO DO AND KEEP DOING

This is likely understood well already, but the OWA must continue to identify and pursue all funding opportunities that complement our mandate and allow us to build alliances and partnerships with all levels of government, industry, other not-for-profits, and academia.

Always within the context of our strategic plan, we must be evermore entrepreneurial and occupy the right niches that allow us to retail relevant products and services (existing and new) to private forest owners and managers, everywhere in Ontario. Diversification of revenue streams is paramount for our future. We cannot rest on our laurels at all, ever!

It is also time to get realistic and systematic about the membership fees we charge. Our dues are very low when compared to the value provided… and we have not had an increase since before my start (2020). The cumulative rate of inflation in Canada from 2020 to 2025 is estimated to be 18%. If periodically raising our dues to at least keep pace with inflation is unpalatable, then we will need to start trimming some of our core costs (i.e., *The Ontario Woodlander* could be published only twice instead of four times per year). I hope it does not come to this…

SOME PERSONAL REFLECTIONS

What made this work out so well for me personally is that during my tenure I was given thoughtful strategic direction, an abundance of support, and plenty of autonomy. I was allowed to run my own show, take risks, and occasionally make mistakes. I thrive in and truly enjoy this kind of work environment. Any form of micro-management is an anathema to me, and I was, of course, also able to provide our staff team with the same latitude to succeed and grow.

As a vocal supporter of life-long learning, the OWA gave me the opportunity to learn so much. It was absolutely impossible to be bored during my tenure. However, the opportunity to meet so many terrific people and make so many new friends has been the greatest blessing for me. OWA membership comprises 'salt of the earth' people… interesting, passionate, engaged, and dedicated to forest stewardship! My kind of people…

By the way, I am not completely retiring. I will still be working one day a week for the next few years, helping with *The Woodlander*, and a few other files as needed. I will continue to volunteer to help lead our Near North Chapter, and in launching our new Woodlot Wardens Program (stay tuned for more details). I also offer best wishes to Glen Prevost as he assumes the Executive Director position. I am confident that he will do an excellent job!

Finally, I extend my sincere thanks to the members, staff, volunteers, the Board, and the Executive Committee, and to all of our partners and supporters. It has indeed been five wonderful years, and I am grateful to have had the opportunity to serve our Association!

Stay well!

GET INVOLVED

Forest Certification

Carbon Offset Program

Private Land Forest Inventory

Educational Events

Forest Health Network

Silvicultural Restoration

Advocacy

Woodlot Buy & Sell

Woodland Store

Woodland Walk 'N' Talks

YOUR OWA AT WORK

IN SUPPORT OF ACTIVE FOREST MANAGEMENT

Communications Committee

Following is a short article written by OWA Executive Director John Pineau at the request of Bill Steer, Founder and General Manager of the Canadian Ecology Centre near Mattawa, Ontario. OWA staff often help out whenever called upon and in many different ways, without much publicity or fanfare. Although this short piece could also have easily been content for our regular Advocacy and Outreach column, it fits well under Your OWA at Work, as a demonstration of the many little things we collectively do day-to-day to promote good land stewardship and best forest management practices.

Natural disturbances, including events that are weather-related, as well as fire, insect infestations and disease, are a relatively normal and natural part of any forest ecosystem. The scientific evidence is clear that forests evolved over millennia within the context of this reality. However, the evidence is also compelling and increasingly corroborated by science that climate change is causing such events to occur more frequently and with greater intensity, and sometimes with devastating results… Such is the case with the recent storm that occurred on the first full day of summer in the Nipissing and Algonquin regions of Ontario, effectively flattening much of the forest of Samuel de Champlain Provincial Park (colloquially *Sammy d* to us local folk), and the Canadian Ecology Centre (CEC), near Mattawa. That there were no fatalities in the park's campgrounds resulting from this extreme weather event, is nothing short of a miracle.

While the impact on the aesthetics of the generally mature forest in the park is what immediately catches our attention, and causes much upset and sadness for so many, the impact on the forest ecosystem, its biodiversity, and its ability to provide habitat for the established species within, has also been sudden and profound, resulting in significant change and much more change to come. And again, while loss of tree cover is a relatively normal (and hopefully occasional) occurrence when forests are disturbed in such a way, it still does create a very new and different set of ecosystem parameters and processes, and the remaining forest as it is, will transition and undergo a series of quite natural successional changes over the years and decades ahead… Such are the vagaries of Mother Nature (who is unfortunately being pushed from behind by human-caused climate change).

Another consideration that is seldom discussed it seems, is the high potential for a resulting increase in the emission of carbon from the fallen, dying and eventually decaying trees. The very issue of climate change, that we know is causing more of these intense weather events to occur, can and will be further exacerbated by these very forests that are increasingly subjected to more frequent disturbances. It is important that we think (globally) and act (locally), not only within a regional mindset, but in this day and age when what happens anywhere on the planet can have potential impacts elsewhere.

The science is quite clear that best forest management practices that result in well managed forests are, over time, often better with respect to carbon sequestration than natural forests and can be a positive and mitigating factor in our fight against climate change. Well respected Canadian researchers who contributed to Al Gore's Nobel Prize winning efforts (An Inconvenient Truth), have clearly demonstrated this: https://bit.ly/45rbGT4.

We can and should give mother nature a helping hand with active management following such events, including and perhaps especially in a very public geography like Sammy d. We could just let nature take its course, but it would take a lot longer for the forest to regenerate and follow typical successional patterns; and in the meantime, a lot of carbon would be released to the atmosphere.

Active management including an immediate salvage harvest followed by the promotion of natural regeneration with supplementary tree planting, can help to mitigate that carbon release, and put wood fibre to use in any number of products needed by our society. The benefits of active forest management and using best practices based on science, are multiple including mitigating the release of carbon to the atmosphere; accelerating the regeneration of the forest so that it sequesters carbon more readily; more quickly enhancing ecosystem processes and biodiversity; and hastening improvement to the aesthetic appearance of the forest landscape.

There is also great potential for an educational and knowledge sharing focus by the CEC and the park's interpretive program, to demonstrate a science-based, rationale and effective approach to the impacts of climate change, through active forest management. It will help to instill hope for many… and that is very much needed now, and in the future.

These images were captured by the Sentinel-2 multispectral satellite, which revisits the same location on Earth every eight days. Sentinel-2 imagery is publicly available at a 10-metre resolution and is widely used to monitor global changes in vegetation, land cover, pollution, and natural disasters. The images of Samuel de Champlain Provincial Park shown here were taken one year apart, in July 2024 (top) and July 2025 (bottom).

For me personally, it is good to see that a pro-active forest management approach is being undertaken in the park, especially by engaging an organization like the Algonquin Forestry Authority, whose record of highly effective forest ecosystem management, stewardship, and sustainability in Algonquin Park (to the south of Sammy d) is exemplary!

John Pineau

Near North Chapter

Aerial view of a campground in Samuel de Champlain Provincial Park following the June 21st, 2025 extreme weather event. Photo credit: Northern Tornadoes Project (https://www.uwo.ca/ntp/index.html).

POP QUiz!

1 What is the single tree selection silviculture system intended to emulate?

2 What is the purpose of group selection and how does it work?

3 What is the definition of a clearcut?

ANSWERS:

1. *The single tree selection silvicultural system (STS) emulates single tree mortality caused by small scale natural disturbances such as wind, disease, lightning strikes, and natural stand thinning from competition.*

2. *Group selection emulates natural tree mortality caused by more serious storms. It favours the regeneration of mid-tolerant species such as red oak and intolerant species such as black cherry that require partial and full sunlight, respectively.*

3. *A clear-cut is defined as a harvest where all of the overstory is harvested in a short period and regenerated into a new stand of trees of the same age.*

ADVOCACY AND OUTREACH

***Editors' Note**: Leo Hall, a member in our Renfrew County Chapter, spearheaded writing a letter to the federal government earlier this year, garnering support, and signatures from key forest sector leaders in that region. The letter offers practical solutions relating to underutilized wood fibre and the production of bioheat.*

To the Attention of:
JOEL LIGHTBOUND
Federal Minister of Government Transformation, Public Services and Procurement Canada

We have seen a growing commitment from the federal government on behalf of Canadians to achieve decarbonization targets. A major opportunity will be the access for building heating systems to renewable energy sources. As participants in the eastern Ontario wood producing industry, we strongly support the government's commitment to sustainable clean energy from Biomass.

In recent years there have been significant declines in wood industry activity as regional pulp and paper mills such as those in Portage du Fort, Thurso, Trenton, and Cornwall have closed. These local closures alone have led to the loss of markets for over 3 million tonnes per year of pulp chips made from trees not suitable for sawlogs or better uses. With no markets, these trees cannot be cut economically, and harvest volumes have been reduced. Proper forest management cannot occur to remove these trees and make space for a stronger, healthier growing forest. We are left with a less productive Crown forest with less economic benefit to Canadians.

A simple and effective solution for this problem of unused fibre is wood-fueled district heating plants that will burn low quality biomass/wood fibre to provide heat within our local communities. Due to the interconnected nature of the forest products industry, the creation of a stable market for the lowest quality fibre will have a stimulative effect on the entire sector, helping the sawmill industry to grow, employ more people and produce more exports and tax revenue.

The initial Ottawa Energy Services Acquisition Program (ESAP) project, overseen by your department, will require about 100,000 tonnes/year. This amount of fibre is currently readily available locally to supply a district heating project in Ottawa. Having a stable and reliable outlet for wood chips would enable the forest industry to maintain our excellent forest management of Crown forests. This means better forest growth, higher quality log yields and a reduced risk of forest fires.

If a wood chip supply chain example were established for the ESAP project, it could serve as a catalyst for systems to serve the smaller communities on both sides of the Ottawa River. Prince Edward Island Energy Corporation was supported in the early 1980s by your department, and it now serves much of Charlottetown and the University of PEI with local energy generated by local wood residue products. Once the risk was gone and the system established, the private sector stepped in to take over and operate the system.

This vision has been widely established in other countries, particularly the Nordic nations. We believe that such opportunities are available across Canada and may be incorporated into many of the over 200 district heating systems at colleges, universities, DND establishments and government complexes across Canada.

We would welcome the opportunity for our industry to meet with you and your staff to explore how we might work together to decarbonize Canada while improving the economy.

Respectfully,

Leo Hall, Opeongo Forestry Service, Private Forest Owner

John Pineau, Ontario Woodlot Association

EASTERN ONTARIO SAWMILL OPERATORS:
Kris Heideman, Lavern Heideman & Sons Ltd.

Dan Bowes, Columbia Forest Products

Dana Shaw, Shaw Lumber

Malcolm Cockwell, Haliburton Forest and Wildlife Reserve Ltd.

Dean Felhaber, Ben Hokum & Son Ltd.

Grant Gulick, Gulick Forest Products

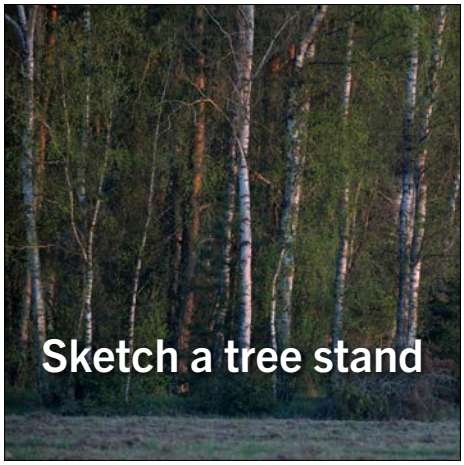
Dan Freymond, Freymond Lumber

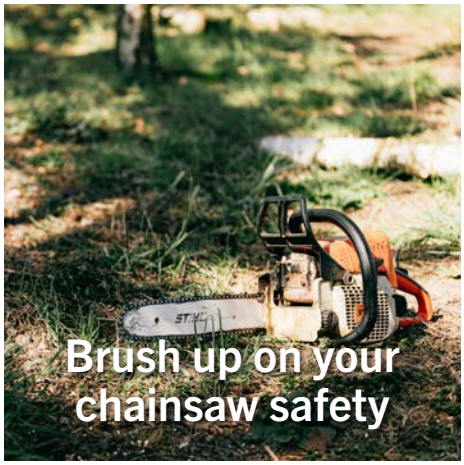
Jamie McRae, McRae Lumber Company

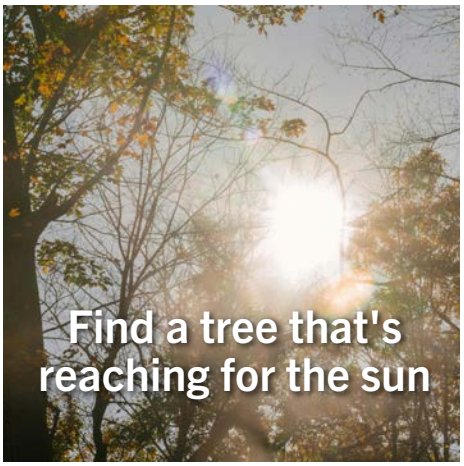
WOODLAND BINGO

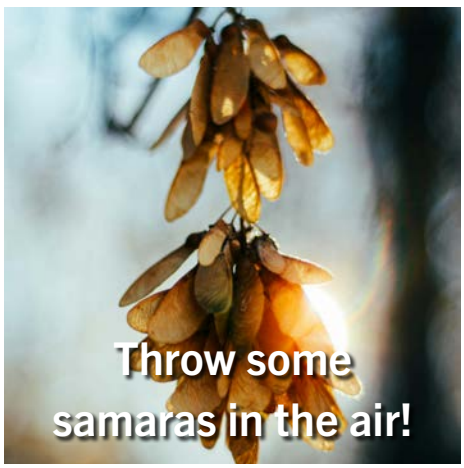
This fall's bingo card invites you to notice the small changes happening in your woodlot. From tossing samaras into the air to spotting fall fungi or brushing up on chainsaw safety, each activity offers a chance to connect with your forest and the season.

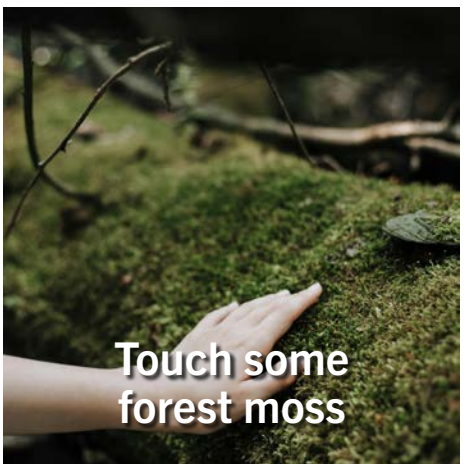
How many can you check off? Send your photos to info@ontariowoodlot.com. We'd love to see what's happening in your woods this fall.

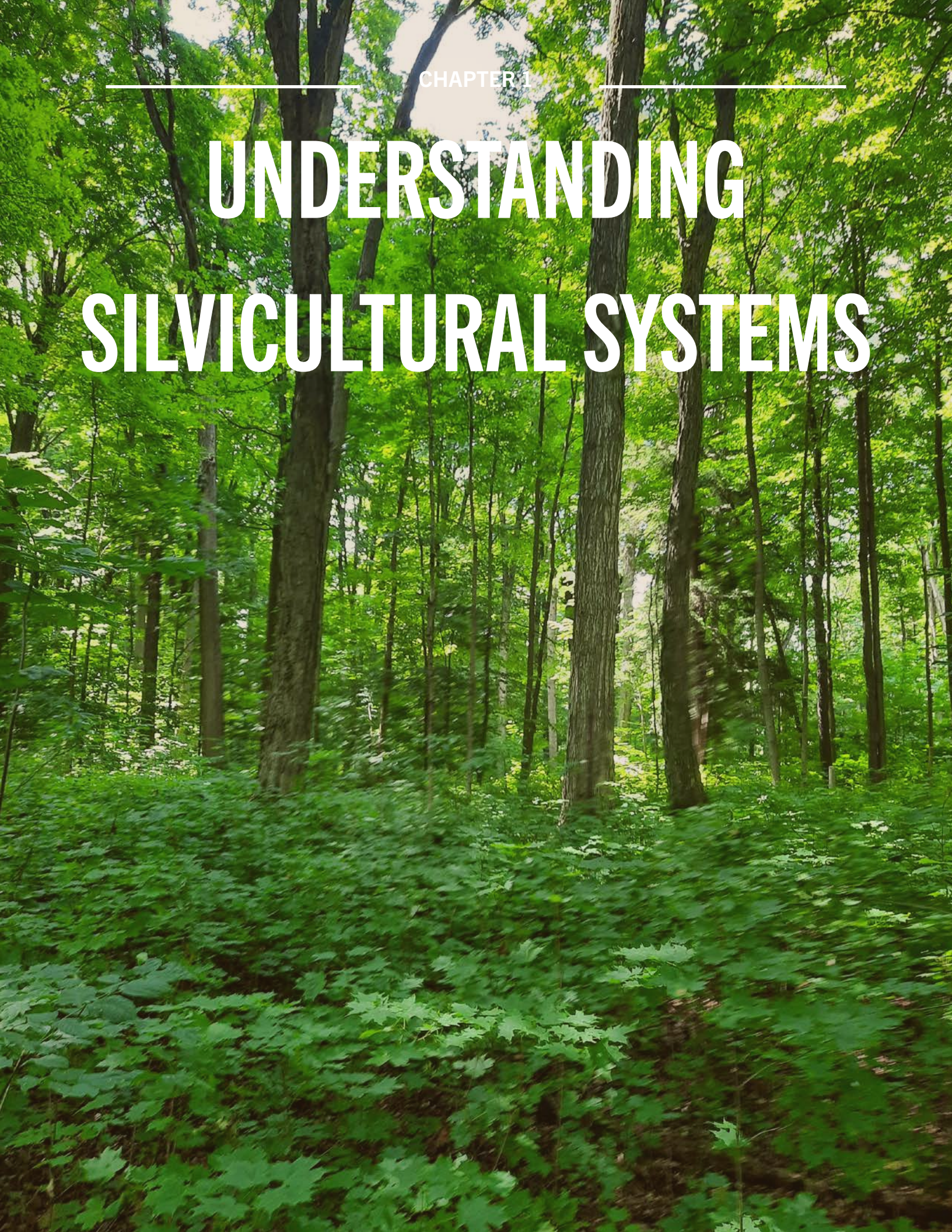












CHAPTER 1

UNDERSTANDING SILVICULTURAL SYSTEMS

UNDERSTANDING SILVICULTURAL SYSTEMS

Communications Committee

All of our *Woodlander* theme issues generate a certain measure of excitement and anticipation amongst the members of our Communications Committee, however this issue focusing on silviculture is particularly meaningful to us for a number of reasons. The articles herein will address an important topic for our members, clearly defining and articulating the often esoteric components involved in growing healthy trees and forests over time. Many questions will be answered, but many more will likely result for all who read this collection…

Silviculture is generally defined as: *The art and science of managing the establishment, growth, composition, health, productivity, and quality of forests to meet specific needs and objectives. This includes managing vegetation for a variety of purposes, including timber and biomass production, wildlife habitat and biodiversity, and recreational use. Silviculture is all about cultivating and tending forests in a way that aligns with desired outcomes*.

There are a multitude of complexities and nuances to the make-up of forest ecosystems, and the processes that are inherent to their health… and the corollary of this is that silvicultural science is almost equally complicated. Silvicultural systems including single tree selection, group selection, uniform shelterwood, irregular shelterwood and clear-cut with standards are applied based on well-researched and well-understood criteria. Our authors will collectively cover in detail, all of these systems, and then some… what they are… where, when and why they are chosen for use and then applied… and how they are supposed to work…

Successful regeneration in a red pine plantation.

There will also be some consideration given to closely related topics including the importance of tree marking, natural disturbance emulation, silvicultural intensity, and forest restoration within the context of these silvicultural systems. We will also look at the implications of 'bad' silviculture and the erroneous and misguided use of diameter-limit cutting.

A quote that is often used and is quite accurate for many of us who live and work within the world of forests and forestry: *Forestry is not rocket science… it is more complicated*. For those new to silviculture, please remember and repeat this quote, often. Because just when you think you understand things, it will often turn confusing and uncertain again. Forest professionals will often joke: *What do you get if you have six foresters in a room? Answer: 10 opinions…* The current silvicultural science is good but can always be improved. The art of silviculture is often quite subjective and there are indeed many opinions and interpretations.

Our hope is that this issue becomes possibly the handiest reference amongst your growing collection of issues of *The Ontario Woodlander*. For most of us, it may require multiple reads as well. For those who are even more voracious in their reading, here are links to two excellent documents that delve much deeper into the fascinating subject of silviculture and silvicultural systems.

Forest Management Guide to Silviculture in the Great Lakes-St. Lawrence and Boreal Forests of Ontario | ontario.ca

https://www.ontario.ca/page/tree-marking

SINGLE TREE SELECTION

By Elliott Groen, R.P.F. in training with scope, OWA Sustainable Forestry Coordinator, Kawartha Chapter

The single tree selection silvicultural system (STS) emulates single tree mortality caused by small scale natural disturbances such as wind, disease, lightning strikes and natural stand thinning from competition. At its simplest this involves cutting individual trees based on stand quality, structure, and stocking. This is carried-out periodically in cutting cycles ranging from 15-30 years and never removes more than one third of the stand. The goal is a multi-aged forest dominated by shade tolerant species; within this goal, specific objectives such as timber supply, wildlife habitat and old growth characteristics can be achieved.

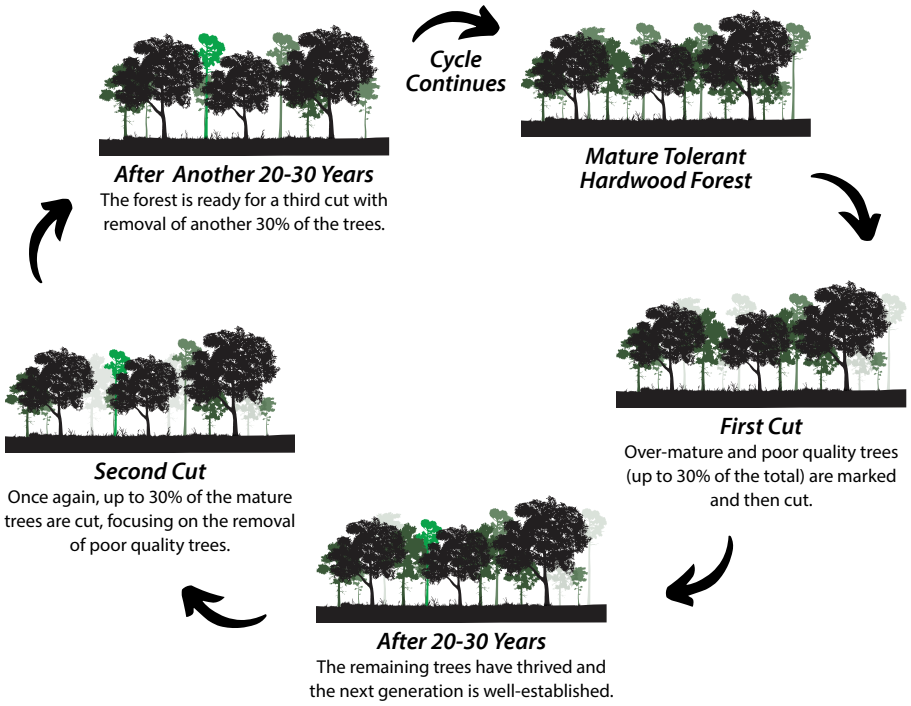


Diagram illustrating the stages of single tree selection.

WHERE CAN STS BE APPLIED?

STS is applied in forests dominated by shade tolerant trees including sugar maple, American beech, and eastern hemlock, species that can regenerate in the small canopy gaps created by the removal of individual trees. Stands must have appropriate stocking levels to support the regeneration of shade tolerant trees following the harvest. Stocking is commonly measured in basal area and expressed as m^2/hectare (ha). Basal area is the cross-sectional area occupied by the stems of trees measured at diameter at breast height (DBH) which is 1.3 meters above ground level. If you want to know the basal area in your woodlot, you can conduct a basal area prism sweep, refer to your MFTIP plan, contact a local forest service provider or wait for the soon to be released data from the OWA's Private Land Advanced Resource Inventory Program.

For STS in tolerant hardwoods (beech and maple) we normally need a minimum stocking of 25 m^2/ha and should leave a residual basal area no lower than 18 m^2/ha. These numbers will be slightly lower on marginal sites, especially towards the northern end of sugar maple's range. Conversely these numbers will be higher for stands dominated by eastern hemlock, because it has narrower crown structure and therefore can support higher stocking per hectare than tolerant hardwoods. If we go lower than this residual basal area, we are more likely to have shade intolerant species such as poplars and birch regenerate, which cannot be managed through STS; we may also have species such as raspberry and bindweed overwhelm young regenerating trees.

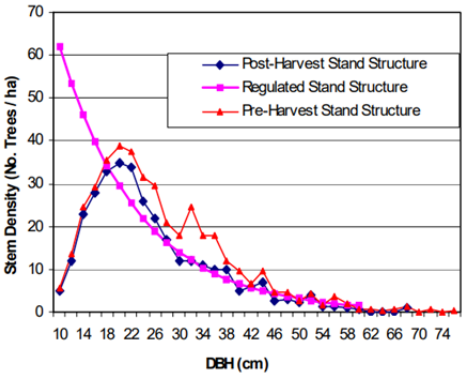
Besides stand stocking, the quality of the stand is important as well. Quality is commonly expressed in terms of acceptable and unacceptable growing stock (AGS and UGS). AGS generally refers to trees that are expected to maintain or improve their quality as a sawlog over the next ~20 years, while UGS trees are expected to decline in value in that same ~20 year period. These classifications are determined by the severity of defects present in the individual trees as noted in the Ontario Tree Marking Guide.

STS requires a minimum of 9 m^2/ha in AGS trees (quality). If a stand does not have this quality, it is unlikely that the residual trees will grow enough in size and sawlog quality to support another harvest in ~20 years. STS can still be applied, but aesthetic and wildlife habitat objectives will take priority over sawlog harvests. Depending on your objectives and forest conditions, it may be more suitable to harvest this stand through a shelterwood cut to release higher quality regeneration into the overstory layer, rather than slowing down their growth underneath poor quality overstory trees.

A sugar maple stand managed with the single tree selection silvicultural system.

GOALS OF STS

The main goal of STS is to develop a multi-aged forest. This means that trees of markedly different ages (at least 10-20 years apart) are intermingled within the forest. This is a common structure of late successional shade tolerant forests in the Carolinian and Great Lakes St. Lawrence Forest Regions. This structure often follows an inverse J curve with higher quantities of young small diameter stems (10-24 cm DBH) and fewer older large diameter stems.



Structure of a typical central Ontario tolerant hardwood stand before and after single tree selection harvest. Sourced from page 148 of the Ontario Tree Marking Guide. The pink regulated stand structure line is commonly referred to as the Inverse J Curve.

When it comes to structure (the diversity of size classes), a stand suitable for STS must have at least 7m^2/ha in stems larger than 24 cm DBH. If a stand does not have this, it is likely still young and even aged and requires more time to develop. Thinning around individual crop trees or personal harvest of firewood may be more appropriate in these conditions.

STS selection is not suitable for regenerating shade intolerant species (e.g., black cherry) or mid-tolerant species (yellow birch and oak species). Repeating STS over many cutting cycles is likely to favour maple, beech, and hemlock over these other species. This reduces overall forest diversity. It is good to consider implementing larger gaps through the group selection silvicultural system to maintain these species and recruit young stems within a stand. Oak and black cherry are important for nuts and fruits for wildlife. Additionally, their foliage provides shelter, nurseries, and food for insects. A good target for tolerant hardwoods is at least 10 mast producing trees per hectare, which depending on where you are located could also include basswood, ironwood, American beech, hickories, walnuts, chestnuts, and butternut.

The inverse J curve is a preferred structure because it ensures both even volume growth and a continuous recruitment of trees into the canopy. Even volume growth is achieved because trees of different size classes have the same diameter growth, but the bigger trees gain more volume as they are gaining that diameter on a larger circumference. Continuous recruitment of trees mimics typical natural mortality rates of around 1% a year. For most commercial operations, the different time scale (20% removal once every 20 years with a 25 m^2/ha harvested down to 20m^2/ha basal area scenario) equates to that 1% natural mortality every year for 20 years. If access is good and demand for wood products is low, STS could be

Single Tree selection with skid trails as seen from above.

applied on the more gradual time frame. This scenario can play-out on privately owned woodlots that are only being cut for their owner's fuelwood or as part of maintaining a sugar bush.

IMPLEMENTING STS

In larger and commercial harvests, STS is implemented through tree marking based on a prescription developed by a Registered Professional Forester (RPF) and executed by loggers. The tree marking will start by selecting UGS dying and diseased trees that do not have other desirable qualities such as quality cavities for wildlife habitat. Trees are then selected based on spacing, form and vigour to achieve the residual basal area target. Trees are also selected for removal from all ages. Smaller wood is often used for firewood or pulp, and larger high-quality wood is used for sawlogs and veneer. If large diameter wood does not have the potential to make a marketable product, then leaving it on the forest floor contributes to downed woody debris (DWD), one of the old growth characteristics found in shade tolerant forests. Other ways in which STS can promote old growth characteristics is by leaving higher residual basal area.

Loggers use skid trails which should be limited to less than 20% of the stand area. When operations are conducted in winter with snow cover damage to the understory vegetation is very low. While implementing STS careful logging can protect special features and where needed buffers are applied, for example around streams and woodland pools.

FINAL CONSIDERATIONS

This article has made little mention of regeneration. STS is much more likely to succeed in achieving its goals of a multi-aged forest when desirable regeneration is present in the understory in sufficient quantities. This is especially important if invasive species are nearby and could potentially invade a site with increased light availability and potential exposed soil from harvesting operations. There are many other considerations, and it is strongly recommended to keep learning, and to work with a Registered Professional Forester if considering a harvest.

STS is one example of how nuanced silviculture, the art and science of applied forestry can be... For me this reinforces the awe and joy I feel for exploring and learning from these beautiful spaces about the web of life. If you want to dive deeper into STS, I recommend a season two, episode three of the Silvicast Podcast: which can be found here: https://www.uwsp.edu/wfc/wisconsin-forestry-center/silvicast/season-2/the-green-wall/

GROUP SELECTION SILVICULTURAL SYSTEM

By John M. Quick, Near North Chapter

Single Tree Selection is quite familiar to most members. Its removal of single trees creates small canopy gaps that emulate natural tree mortality caused by wind, ice, and heavy wet snow storms. Those small gaps favour sugar maple regeneration in the resulting partial shade – a commercially valuable species very tolerant of shade. Single Tree Selection creates and maintains an uneven-aged forest, and its light basal area* reduction is a compromise between accelerated diameter growth following crown release, and increased sawlog quality due to sugar maple's self-pruning.

Group Selection's removal of several trees together creates larger (1.5X or 2X stand height in diameter) canopy gaps than the Single Tree Selection Silvicultural System, and they emulate natural tree mortality caused by more serious storms. They favour the regeneration of mid-tolerant species such as red oak, and intolerant species such as black cherry that require partial and full sunlight respectively. Similar to Single Tree Selection, Group Selection creates and maintains an uneven-aged forest, but diameter growth is accelerated at the expense of self-pruning due to so much full sunlight in those larger gaps. Heavy basal area reduction has to be compensated for in between those larger gaps.

This article is based on my 20 acre upland tolerant hardwood stand between Trout Creek and Commanda. A commercial thinning in August 2005 removed much Unacceptable Growing Stock (UGS) (firewood) and little Acceptable Growing Stock (AGS) (sawlogs). The timing intentionally maximized seedbed scarification and triggered an explosion of desirable black cherry regeneration. The current species mix (of stems 10 cm Diameter at Breast Height (DBH) and larger) is sugar maple 68%, beech 10%, balsam fir 8%, black cherry 8%, ironwood 3%, and yellow birch 1%. A non-commercial thinning for firewood began in January 2024 (when snow and tight bark protected my future crop trees).

A typical group opening in the canopy. Photo credit: Logan Steward.

I favour both red oak and black cherry species over sugar maple in the sections of my woodlot that are dry, rocky, shallow-soiled, and with surface bedrock. Sugar maples will still dominate in these sections (being very tolerant of shade), but the vast majority of them are UGS (and I am trying to grow sawlogs). Red oak seedlings were introduced in May 2024 after acorn planting in my Trout Creek nursery by Near North Chapter members in October 2022. Black cherry seedlings emerged naturally in 2006 and have been released from competition to achieve free-to-grow status and then pruned for veneer production.

Where soil depth allows me to grow AGS Sugar Maple sawlogs, I use Single Tree Selection governed by basal area. Where soil and moisture are limited, I use Group Selection with larger canopy gaps for red oak and black cherry.

** Basal area: A measurement of the density of a forest stand (i.e., how much space is occupied by tree stems within a given area). The cross-sectional areas of tree trunks at breast height (1.3 metres) above ground level is measured and calculated. In Canada, basal area is calculated in m^2 per hectare.*

Different stages of growth in John's woodlot... a young red oak and a mature black cherry. Photo credit: Logan Steward.

"THEY FAVOUR THE REGENERATION OF MID-TOLERANT SPECIES SUCH AS RED OAK, AND INTOLERANT SPECIES SUCH AS BLACK CHERRY THAT REQUIRE PARTIAL AND FULL SUNLIGHT RESPECTIVELY."

The author with black cherry polewood. Photo credit: Logan Steward.

Near North Chapter workshop at John's backyard nursery in October 2022.

UNIFORM SHELTERWOOD

By Margaret Scott, R.P.F., MFC, Westwind Forest Stewardship Inc., Near North Chapter

The most commonly used silviculture system in the French-Severn Forest is uniform shelterwood. This Crown land forest is found in the Parry Sound District of Ontario between Georgian Bay and Algonquin Park and is dominated by hardwood forest and pine stands. Not only does uniform shelterwood help to regenerate mid-tolerant hardwoods such as yellow birch or conifers like white pine, but it also helps to manage degraded hardwood stands that were not historically harvested in a sustainable manner.

Uniform shelterwood is a way of managing a forest that results in an even-aged stand where most trees are roughly the same age. This is achieved through a series of cuts of the overstory trees, usually two to four, that result in suitable levels of light for regeneration. The term uniform is used to imply that the harvest treatment is for the most part consistently applied across the stand.

Because these harvests gradually open up the canopy while still providing shade, uniform shelterwood is a very good system for managing mid-tolerant tree species. These are trees that can tolerate some shade but are not fully shade tolerant.

It can also be a good system for poor quality hardwood stands. These are stands where, due to past management practices, there is too much defect and/or disease for single tree selection to be sustainable. Uniform shelterwood can help to improve the quality of the stand more quickly.

There are three types of cuts in a uniform shelterwood system: the preparatory cut, the regeneration cut which is sometimes called the seeding cut, and the removal cut(s). Depending on the initial overstory stocking, there can be up to two removal cuts. Each has a specific purpose and requires a different approach in how trees are harvested.

The preparatory cut is intended, as the name implies, to prepare the stand for regeneration through a shelterwood approach. This harvest thins the trees so that smaller crowns have room to expand and produce more seed. The "prep cut", as it is often called, focuses on both spacing out residual trees so that there is plenty of room for the crown to expand and removing low-quality trees or undesirable species. Although this harvest can help set up the stand for success, it is very much an optional stage. This harvest is often skipped and the regeneration cut ends up being the first harvest in the cycle.

The regeneration harvest, also named appropriately, is intended to create ideal conditions for regeneration. This is accomplished by thinning the stand to create proper light conditions for establishing the next generation of trees. The "seed cut" or "seeding cut", as it can also be called, focuses on retaining good seed producing trees while providing the space and light for new seedlings to thrive. This harvest will also aim to remove trees with major defect or disease or undesirable seed-producing species. Once seedlings have established and have had some time to grow, it is time to start considering a removal cut.

The removal cut further removes the overstory trees to release the new trees below. As the new regeneration gets larger, it requires more light and space to thrive. Removing the overstory canopy can be carried-out in one or two cuts. If there are two cuts, the one done first is aptly named a first removal cut. The concluding harvest is called the "last cut" or final removal cut.

A first removal cut can be undertaken when the seedlings are a bit younger since there will still be some shade and protection provided after the harvest. The young regeneration is often one to three meters in height at this stage. These remaining overstory trees can help to moderate the temperature and moisture of the site.

The final removal cut on the other hand completely releases the understory trees which are now tall enough to survive without the overstory. The target for this stage is often for the understory regeneration to be at least six meters tall. Although the majority of trees are removed, it is important that some trees are left behind. This includes veteran trees which are healthy, long-lived species that have the potential to become supercanopy trees in the future. Supercanopy trees are large trees that extend beyond the main canopy of the stand.

Other important wildlife trees that are retained at all stages of a shelterwood system are: cavity trees – trees with at least one hole that can used be used by wildlife for nesting, eating, or protection; and mast trees – trees that produce edible fruits such as acorns or beechnuts.

The textbook example of a uniform shelterwood system is in an Eastern white pine dominated forest. In the French-Severn forest, preparatory cuts are almost never used, and instead white pine stands are cut in two or three cuts (a regeneration cut follow by one or two removal cuts).

At the regeneration cut, evenly spaced, dominant trees with fully developed

Uniform shelterwood sites.

Uniform shelterwood crown spacing.

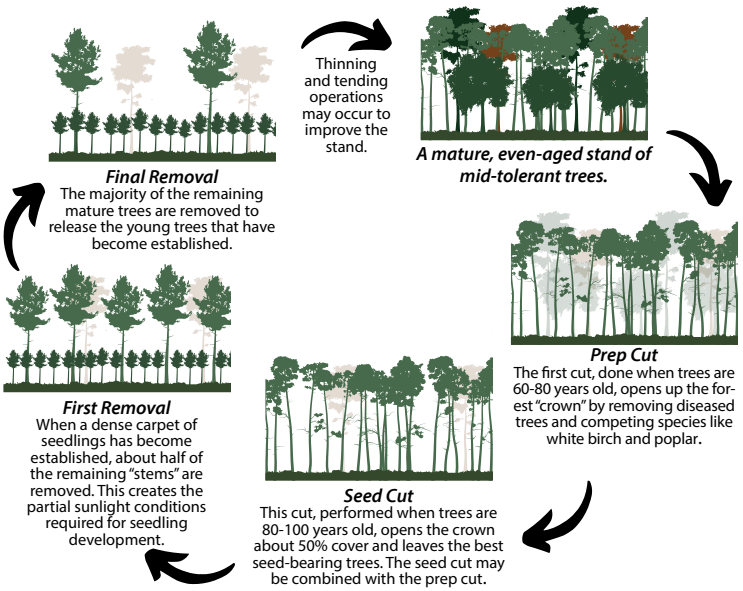


Diagram illustrating the stages of the uniform shelterwood silvicultural system.

crowns are retained. If there are going to be two removals cuts, more trees are retained at this stage to ensure there is sufficient volume for two more stand entries. This may translate to targeting about 50-60% canopy closure and retaining a basal area around 16-18m^2/ha. Setting the stand up for only one removal cut may mean a little less canopy closure of around 40-50% and retaining a basal area around 10-12m^2/ha.

It is particularly important with white pine to maintain this partial shade throughout the establishment of young seedlings as it reduces the negative impact of white pine weevil and white pine blister rust.

After the regeneration cut, stands are often planted to ensure that there is sufficient stocking of new trees. On rare occasions, there is abundant natural regeneration in the stand, and no planting is needed. Stands are often site prepared or tended to improve the growing conditions for the young trees.

The final removal cut usually retains about 2-4 m^2/ha of basal area including the veteran and wildlife trees highlighted earlier.

At this point, the new generation of white pine trees are ready to grow into the future forest before the process will begin again in 50-80 years. Although the people involved will most certainly be different, these white pine trees grown in a uniform shelterwood system may be harvested in a very similar way.

IRREGULAR SHELTERWOOD SYSTEMS IN SOUTHERN ONTARIO

By Peter A. Williams, R.P.F., Williams & Associates, Forestry Consulting Ltd., Waterloo-Wellington Chapter and Thomas McCay, Chief Forester, Haliburton Forest & Wild Life Reserve, Bancroft-Haliburton Chapter

Silviculture is the science of managing and regenerating forests using silvicultural systems to meet objectives including wood production, wildlife and habitat, recreation, income, carbon storage and other values. In Ontario, foresters and certified tree markers have mostly trained in the single-tree selection (STS), clearcut and shelterwood systems. Hybrid systems include group selection, expanding gap, and irregular shelterwood systems (ISS).

A forest stand is delineated by where conditions (i.e., species, ages, or site conditions) are mostly consistent. Stands can be over 50 or 100 acres in forested landscapes, while developed landscapes like southwestern Ontario may have three or four different smaller stands in a 10-acre woodlot. Stands of any size can be patchy and have "inclusions", where tree species or sizes vary in different parts of the stand, perhaps because of harvesting history. The ISS approach is useful in managing stands where the patches are not large or different enough to separate and manage as individual stands.

The Ontario Tree Marking Course was developed to train tree markers using the STS to manage deciduous forests and the uniform shelterwood system to regenerate white pine stands, in central Ontario. While the course was developed for Crown land, foresters and technicians in central and southern Ontario also take the training to become certified to mark on private, municipal, and other public lands.

However, the use of STS has many challenges. These can include a lack of desirable regeneration in general, and challenges maintaining the presence of intermediate-tolerant species like yellow birch, red oak, white pine, and black cherry. Achieving a strict diameter distribution target in STS can also include the premature harvesting of trees with future high-value potential. Many stands are even- or two-aged when first marked using STS, and the conversion of these stands to uneven-aged is slow and potentially challenging. Finally, especially in central Ontario, when planning a second STS harvest, many stands do not meet the minimum Acceptable Growing Stock (AGS) requirements for ongoing STS management.

The alternatives of uniform shelterwood, and group selection also have their challenges. One is stand conditions: mature and formerly managed stands usually have some multi-aged component that would be lost if a by-the-book uniform shelterwood approach was implemented. Another obstacle is aesthetics and competing land uses. Uniform final removal cuts over 1-2m high saplings are visually dramatic and almost impossible to walk through. Formal group selection does not have these challenges but requires a highly specific number and size of the group openings to create.

At a 2023 Canadian Institute of Forestry event in southwestern Ontario, none of the managers present had implemented either uniform shelterwood or group selection on private lands, outside of research programs. ISS presents an opportunity to use elements of these systems in a flexible and scalable manner.

The ISS and other hybrid silvicultural systems blend even- and uneven-aged management concepts to recognize or increase within-stand diversity, manage for species that require open conditions like oaks or yellow birch to regenerate, improve grade-value of timber, or provide a variety of habitats for wildlife. These hybrid systems include intermediate thinnings, group selection, group or expanding group shelterwood, and two-aged management. The ISS combines many aspects of the other systems in a single stand to meet particular objectives or address existing structures. Implementations of ISS labelled as extended and continuous cover are two approaches that are useful in southern and central Ontario.

ISSs have been used worldwide for many years in the rest of the world, and North America (e.g., Troup, 1928). Raymond et al (2009) reviewed irregular systems describing many applications, suggesting that the group of ISS approaches can be used to restore degraded forests and manage forests with irregular structure. In practice, many elements of ISS have been used here for many years to consider within-stand variability and in plantation management. Two broad variants of ISS that are currently being implemented in Ontario are described below.

The ISS extended system manages an even aged stand that uses regular thinnings, starting as young as economical, optimizing development of the older trees and developing a younger layer of regeneration over a number of thinnings. An excellent example of this is how most plantations are managed. At some point, the regeneration is released by a heavy harvest of the canopy trees. This differs from a standard Shelterwood approach which has two harvests, a regeneration cut to allow regeneration to develop and a release cut to harvest the overstory and

Photos taken side-by-side in the same forest stand showing irregular structure.

release the regeneration. In either case, some dominant trees from the canopy can be retained for structural diversity or wildlife habitat. Historically, foresters have used the ISS extended system, but included repeated thinnings into the shelterwood definition.

The definition of ISS from Raymond et al, 2009 establishes that the canopy is retained for >20% of the rotation length. This contrasts with the description of a shelterwood system in silvicultural guides got a period of 5-15% of the rotation length for the seedcut and release cut. for northern hardwoods. The original canopy may also be managed by thinning periodically, developing regeneration layer or layers over time. However, in either case, the system builds towards a final removal harvest and the release of a well-stocked sapling or polewood layer.

This system is well suited where, for whatever reason, the goal is the renewal of the stand, but horizontal and vertical variation of the mid-canopy is either desired, or already present. It is very well suited to two-aged or multi-aged stands with important components of immature AGS trees that should be managed or retained over time, but not enough immature AGS to recommend the use of STS or the thinning stage of a uniform shelterwood. This is a very common situation in stands formerly managed with STS in central Ontario.

The ISS Continuous Cover (CC) approach is used to manage or create patchy stands, where each "micro-stand" can be treated distinctly, depending on its structure and conditions. This approach may use the ISS Extended approach on each patch, maintaining a continuity of the patchiness where the patches move around over time as they grow older, or younger; as time and management progress over the years.

The CC approach can include thinnings in some patches and group selection in others, or perhaps unregulated group shelterwood, depending on the intensity of removals and the age class structure of the stand. However, the intention is that there is never a final removal treatment for the stand as a whole. The structure of the stand as a whole may show an uneven-aged structure because of the averaging of plot data from diverse even-aged patches.

The CC approach is best suited for good quality stands where there is abundant AGS and few regeneration impediments, to foster the development of high-quality mid-canopy trees and retain individual valuable trees for a long time to maximize tree value. But attempting to conform with strict density targets throughout the stand may compromise patch-by patch opportunities.

In this discussion of ISS, one can see that "irregular", "continuous" or "extended" are modifiers on the core concept of "shelterwood". Other shelterwood modifiers are typically so common that they do not appear in a silvicultural prescription. For example, "reserve", meaning the retention of canopy trees such as crop trees or wildlife trees into the new rotation, creating or maintaining a two-aged or multi-aged condition. These modifiers together establish a continuum of subtly different treatments from uniform shelterwood all the way through to single tree selection, and provide for flexibility to prescribe or describe within-stand opportunities and diversity.

What irregular approaches provide in flexibility, they give up in predictability. While two CC stands will share many features, they are likely to be more different from each other than two stands prescribed single tree selection, or two stands that have recently had a uniform shelterwood final removal cut.

In review, irregular variants of the shelterwood system are excellent methods to regenerate intermediate-tolerant species like yellow birch, black cherry, white pine, oaks, and hickories, which can be challenging to regenerate using STS, and without resort to the careful regulation of group selection, or the visual impact of uniform shelterwood. Irregular methods are also useful in regenerating and releasing young maple in patches, while tending immature maple, all within the same stand: a common condition in lower quality sites which are not suitable for single tree selection.

Publications with more information on ISS systems can be downloaded from the website forestar.ca, publications section.

LITERATURE CITED

Troup, Robert. 1928. Silvicultural Systems. Oxford: Clarendon Press. 212 p.

Raymond, Patricia; Bedard, Steve; Ray, Vincent; Larouche, Catherine Tremblay, Stephane. 2009. The Irregular Shelterwood System: Review, Classification, and Potential Application to Forests Affected by Partial Disturbances. Journal of Forestry. 107(8): 405-413.

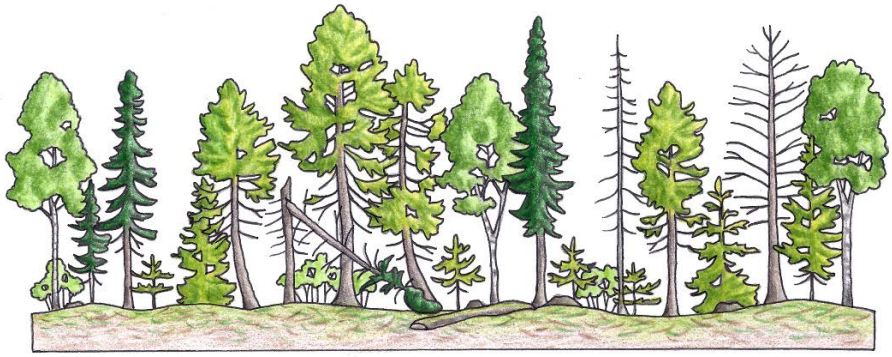


Figure 3e. An example of an irregular shelterwood harvest profile depicting 50 years after partial harvest (c)

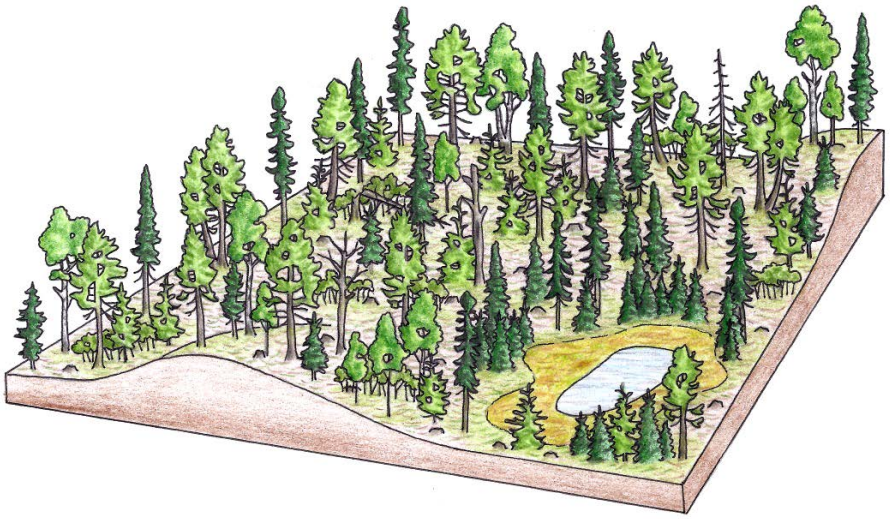


Figure 3f. An aerial view of an irregular shelterwood harvest in a cedar dominated stand 15 years after harvest (a)

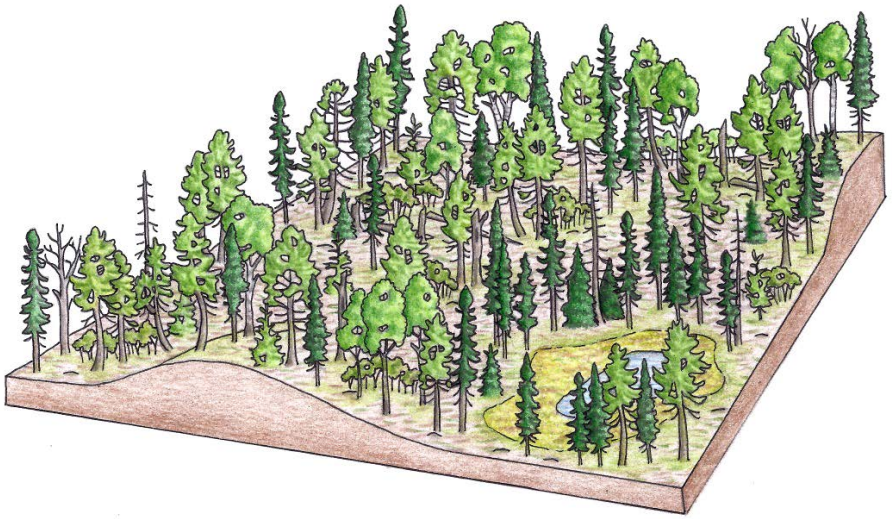


Figure 3f. An aerial view of an irregular shelterwood harvest in a cedar dominated stand 50 years after establishment resulting in a multi-aged stand (b)

The stages of irregular shelterwood from the Ministry of Natural Resources' Great Lakes St Lawrence Silvicultural Guide: https://www.ontario.ca/page/forest-management-guide-silviculture-great-lakes-st-lawrence-and-boreal-forests-ontario (Illustrations by Jodi Hall).

CLEAR-CUT WITH STANDARDS, A PRIMER

By Fred Pinto, R.P.F., Near North Chapter

Forestry in Ontario uses different harvest intensities along with follow-up treatments to regenerate the forest. These varying harvest intensities emulate the effects of different natural disturbances that plants and animals in our forests have adapted to over thousands of years. The harvest intensity ranges from gap-phase replacement, where single trees blow down, to large-scale openings that may result from intense natural disturbances. Clear-cutting with standards would be used to regenerate forests adapted to large-scale, intensive disturbances.

The term "clear-cut" has many connotations, mostly negative. It is often used to suggest forest destruction when it describes deliberate or unintentional land conversion from forest to other human uses that do not allow the forest to regenerate. This activity is frequently wrongly equated with forestry.

In the forestry literature, a clear-cut is defined as a harvest where most of the overstory is harvested in a short period and regenerated into a new stand of trees of the same age. In Ontario, some overstory trees are retained when clear cuts are used as a silvicultural system. I will explain why later.

The term "standard" is an old English forestry term for trees selected and retained to grow for a specific purpose. England wanted to build a powerful navy, so many trees in its forests and woodlands were chosen as standards and allowed to grow for a particular future use in building ships. Here is some trivia: Forests in England are wooded areas set aside by the Sovereign, whereas woodlands are areas of trees designated by others. Lord Nelson visited the Forest of Dean, where he selected standards used to construct his flagship, HMS Victory.

Other cultures around the world retain trees for specific human needs and ecological functions, yet this is rarely included or discussed in the West in forestry, ecology, or biology. The knowledge systems of other cultures, including those of Indigenous peoples in the Americas, can play a role in informing us about how we can lessen our impact on the environment.

Forest of Dean (Gloucestershire, England): Members of the Ontario Woodlot Association and Canadian Institute of Forestry visited the Forest of Dean in October 2024. There, some trees were carefully selected as standards and grown for the British navy in the past. These standards were used for specific parts of a ship. For example, Lord Nelson visited the Forest of Dean to select trees as standards used for key parts of his flagship, HMS Victory. Photo credit: Fred Pinto.

Cultures around the world manage their activities to achieve their objectives while reducing their impact on the environment. In this photo, the landowner in the state of Goa in southern India has retained forest structural diversity to maintain soil fertility, water quality, and pollination while obtaining food, medicine, and building materials from their forest garden. Photo credit: Fred Pinto.

In Ontario, we have opted to continue using the historic forestry terms, such as clearcuts and standards. I recall that when we worked on developing silvicultural guides for managing forestry activities on Crown lands, I advocated for the continued use of the historical forestry terms rather than creating new ones that might have greater public appeal. This decision was based on two reasons: firstly, these terms were employed in the Class Environmental Assessment for Timber Management on Crown Lands in Ontario hearings, and secondly, some people would argue that any new name was merely greenwashing.

Today, professional foresters in Ontario use their understanding of tree species' adaptations and effects of natural disturbances that create openings in the forests to develop harvest and regeneration prescriptions. Natural forest disturbances vary in both frequency and intensity. All forest disturbances, such as wildfires, wind, ice, floods, insects, and diseases, lead to three outcomes for the established trees: some trees are killed immediately, some are injured and die later, and some survive and continue to grow. When disturbances are particularly intense, the disturbance will lead to the death of most trees in the overstory. These concepts have been incorporated into professional forestry in Ontario, where the harvest intensity and frequency vary with the need to create microclimatic conditions for the establishment and the early growth of desired tree species.

Harvest intensity (or tree retention levels) varies from single-tree selection silvicultural systems, where individual trees are removed to create gaps for regeneration, to the removal of most of the overstory in clearcuts while retaining specific trees for ecological purposes, such as retaining veteran trees and trees for wildlife habitat. Accordingly, clearcuts with standards would typically only apply to stands abundant in tree species that are well-suited to establish and grow in open conditions, mixed with a few long-lived healthy trees. It would generally not be employed in stands well stocked with long-lived tree species.

For illustrative purposes, let us examine a simple example to understand how a clear-cut with standards prescription may function. If the pre-harvest stand evaluation shows that the area consists of poplars and white birch, both of which thrive in large openings, growing alongside some large white pine, red pine, and oaks likely to survive an intense disturbance, a clear-cut with standards may be implemented.

Note that the small number and scattered distribution of the standards are very unlikely to result in adequate white pine or oak regeneration. The forest opening will quickly become occupied by poplar suckers and white birch seedlings and sprouts as well as a variety of quick growing shrubs and herbs. The natural seed fall and survival of any seedlings germinating from the pines and oaks will be insufficient to

An aerial view of poplar, maple, and white pine standards. Photo credit: Fred Pinto.

Following harvest, the site will be occupied by plants such as poplar, hazel, and raspberries, which are adapted to establish and grow in large open areas. These fast-growing plants will prevent or kill smaller, slower-growing tree species from establishing and growing. The amount of seed fall from the retained trees is insufficient to re-establish the area with the pre-harvest abundance of these tree species. Additional treatments will be needed to reestablish these long-lived tree species to their pre-harvest abundance. Photo credit: Andree Morneault.

maintain their pre-harvest abundance. As oak and pines produce seed periodically, fast-growing tree and shrub species will likely occupy the area. In this case, follow-up treatments are very likely to be required, and the professional forester you employ can advise you on what needs to be done and when these activities should be done.

Another Ontario forestry term you may have heard of is "veteran trees". This term was introduced for silviculture in Ontario in 1996 to ensure that trees adapted to surviving natural disturbances could be retained after harvest. These large, healthy, long-lived, windfirm trees can also be considered standards. They are chosen and retained for long-term ecological purposes. These veteran trees are vital in providing wildlife habitat and restoring ecological functions, such as mycorrhizal connections that help plants absorb water and soil nutrients more effectively. Moreover, the veterans serve as insurance by preserving the natural genetic heritage of Ontario, ensuring that these trees' seed and pollen production continues into the future. The minimum number of veteran trees per hectare of ten was established as a guideline for retention following a review of the literature on tree mating adaptations and genetic health.

It is recommended that you employ a professional forester to develop a prescription to meet your woodlot objectives. The professional forester will evaluate the site, stand history, tree species, age or size, and distribution to help determine how these trees were established, what may happen under different silvicultural treatments, and which treatments are most likely to meet your objectives.

As a landowner, you will be more familiar with your property than anyone else. You should aim to identify individual trees that are exceptional seed or cone producers. Some trees consistently yield abundantly year after year. If possible, identify and retain these trees. They produce large quantities of seeds, and these seeds tend to be heavier, which are likely to have better germination rates. Observing wildlife use such as which trees are used by bats, birds and mammals for roosting, nesting, and feeding may also help you identify trees for retention.

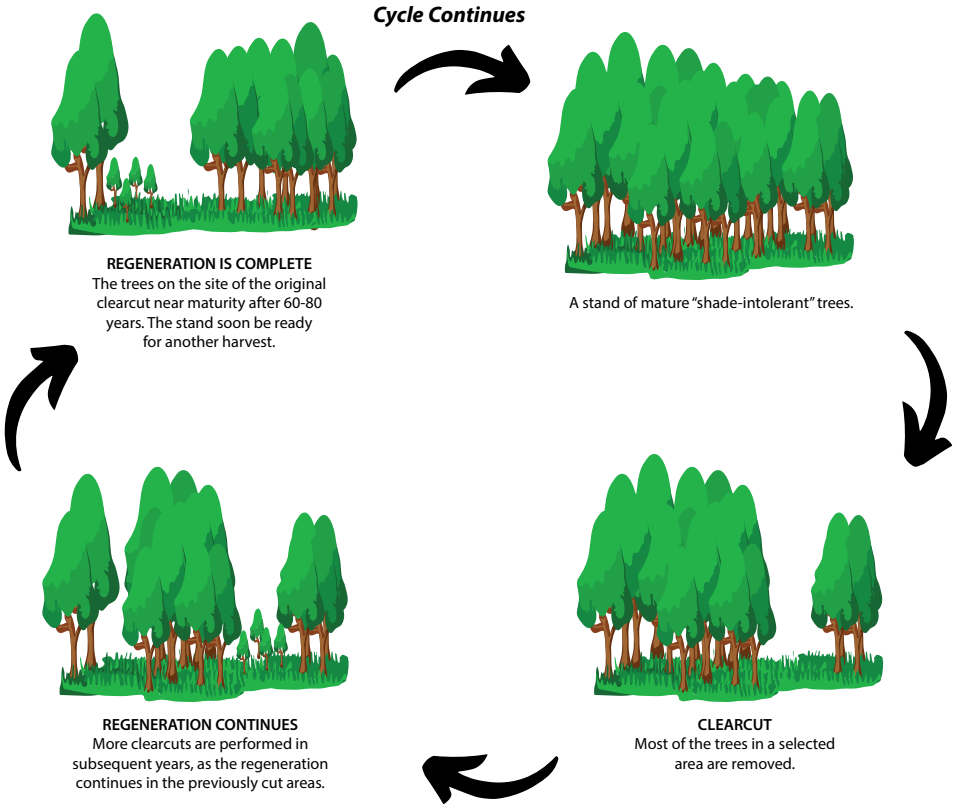


Diagram showing the general stages of the clearcut with standards silvicultural system.

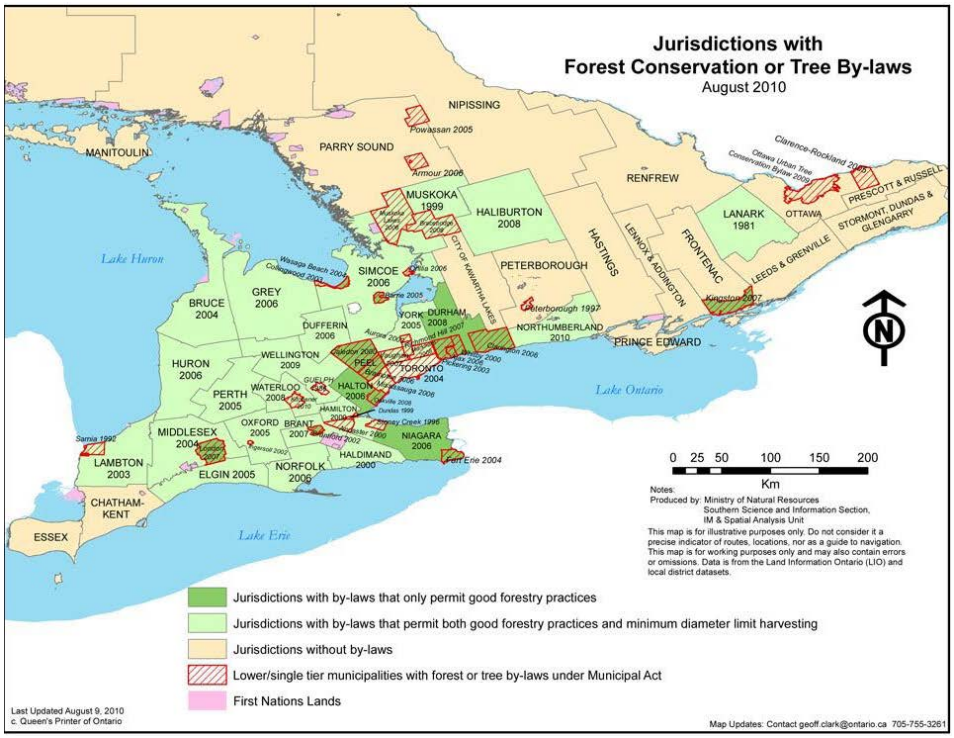
"THE TERM "CLEAR-CUT" HAS MANY CONNOTATIONS, MOSTLY NEGATIVE. IT IS OFTEN USED TO SUGGEST FOREST DESTRUCTION WHEN IT DESCRIBES DELIBERATE OR UNINTENTIONAL LAND CONVERSION FROM FOREST TO OTHER HUMAN USES THAT DO NOT ALLOW THE FOREST TO REGENERATE. THIS ACTIVITY IS FREQUENTLY WRONGLY EQUATED WITH FORESTRY."

DIAMETER-LIMIT HARVESTING

IT WAS NEVER REALLY OKAY

By Ken A. Elliott, R.P.F., Kawartha Chapter

The time has come for forest owners and practitioners to stop harvesting woodlots to diameter-limits. For a century and a half, some form of "high-grading" (the removal of the biggest and best trees or entire species) has continued to occur in Ontario's forests. Diameter-limit cutting (DLC) has been used as a simple way for anyone with a diameter tape to pick the largest trees to be harvested in a logging operation. It is based on its simplicity, not science, and is not recognized as an appropriate method of harvest in any silviculture guideline. Simply put, a minimum stump diameter is set, sometimes by species and any trees larger than that diameter are cut. Repeated DLCs progressively degrade woodlands and steadily reduce growth rates, while diminishing both species diversity and ecological integrity. Recovery often takes special inputs over many decades without any economic returns.



Map of jurisdictions with forest conservation bylaws as of 2010.

WHY DOES DIAMETER-LIMIT CUTTING EXIST?

"Go cut all the white pine bigger than 20 inches at the stump", was an extremely simple prescription used during the forest exploitation phase of the 1800s and early 1900s. In those days, almost all tree harvesting was a form of high-grading or DLC (sometimes referred to as "commercial harvests"). In southern Ontario, these abuses continued along with burning and grazing in the remnant forest patches that were becoming so scarce due to aggressive farm and town development. The barren state of these previously forested landscapes became a concern, with eroding soils, declining forest productivity, dried-up wells, and dwindling wildlife providing the real impetus for reforestation. In the 1920s Ontario's first Provincial Forester, Edmund Zavitz, worked closely with Premier E.C. Drury and others, to develop legislation establishing reforestation agreements with municipalities. Replanting efforts over the next three decades restored conifer plantations across Ontario's "blow sand" areas. Still, unregulated land clearing, high-grading, over-harvesting, and woodlot grazing continued. Eventually public concerns and the advice of provincial foresters led to regulating tree cutting on private land. In 1950 the provincial Trees Act allowed municipalities to enact Tree Cutting Bylaws on private land with approval from the Minister of Natural Resources. Unfortunately, to help in its enforcement, all the original bylaws used Diameter-limits (also known as Circumference-limits) to regulate cutting. The principle behind it was that if only the large trees were removed, the area could still be retained as a "woodland" (as opposed to grass or pavement). These same arguments are used today to justify the continued use of DLC.

Presently, legislation within the Ministry of Municipal Affairs & Housing enables any municipality to pass bylaws (and apply permits) regulating tree removal on private land. Today, 22 of 30 upper tier municipalities (or 73%) have tree bylaws (Yung, 2018) that regulate the harvesting of trees and/or the retention of forest cover in anticipation of urban development.

The negative aftermath of typical diameter limit cuts.

WHY IS DIAMETER-LIMIT CUTTING SO BAD?

DLC is not a recommended silvicultural treatment as it tends to remove those trees that are healthier, larger, and growing faster than what is left behind. Used repeatedly DLCs degrade genetics, forest health, species diversity, and the sustainability of the woodlot. Early in my career I heard a harsh analogy: "a DLC is like using the losers in a horse race as your breeding stock and sending the winners to the glue factory". Genetics are very important. An important consideration for all silviculture systems is where your seed and next generation is coming from. For example, the selection system favours the development of healthy, high-quality trees while removing diseased and low vigour trees. DLC is the reverse of this, where the poorest trees are left behind to reproduce. The shelterwood silvicultural system also carefully cultivates the best trees as the seed producers. These superior overstory trees are thinned to provide appropriate light and increased seed production. The end of rotation, "removal cut" under shelterwood may look like a DLC to some, as most of the largest trees are removed, but this is only after multiple treatments (thinning, planting, tending, etc.) and only when the new cohort is fully regenerated and "free to grow". Silviculture, practiced properly, using accepted methods with qualified professionals and trained tree markers, results in sustainably managed forests. DLC is not part of that culture.

ARE TREE BYLAWS WORKING?

Over the first 30 years of the Trees Act, it was the larger, more urbanized municipalities who passed bylaws. These bylaws met the initial goal of keeping woodlots on the land; however, they also legitimized the use of DLC as an acceptable forest harvesting method. Over-harvesting continued to be a problem, and beginning in the 1980s development pressures (primarily in the GTA) resulted in the loss of many woodlots - "Trees Act" bylaws were becoming difficult to enforce and outdated.

In the early 1990s, I was part of a group that included Mike Rosen, R.P.F. and other MNR and municipal experts. We worked with provincial lawyers on a template for municipalities wishing to pass bylaws or improve existing ones. With a focus on modernizing these regulations, we communicated with municipalities, and hosted bylaw officer training courses. A new idea, was to have bylaws that required landowners (and loggers) to follow a "good forestry practices" (GFP) approach when harvesting in woodlands. In this case, through a permitting process, the landowner needed to prove they were practicing "good forestry" before harvesting would be allowed. This would often include: Registered Professional Forester (R.P.F.) approved prescriptions, tree marking by qualified tree markers and restrictions on the timing of operations.

Over the past 35 years, new bylaws were passed (now under the Municipal Act), new bylaw officers (some R.P.F.s) were hired, a committee of provincial municipal tree conservation bylaw officers was created (meeting annually for past 25 years) and the overall need for and understanding of tree conservation bylaws improved within the community.

Unfortunately, the details are not so rosy. Fortuitously, a few municipalities have bylaws that are regulated entirely through GFP. Some still use DLC regulations and there are many municipalities that have no tree conservation bylaw at all. Most municipalities, however, allow a landowner to choose to harvest with

either a DLC or by following GFP. This has resulted in far too many DLCs. The root cause is that the two legal approaches have different up-front costs, and many landowners are unaware of how each affects the health, sustainability, and long-term economics of their woodlot. One approach, GFP, requires accepted sustainable forest management but has costs for planning, prescription writing, and tree marking, and the other, DLC, is an unsustainable administrative practice that degrades woodlands and only requires a diameter tape and no R.P.F.s or tree markers.

Our study of tree cutting permits in Huron and Perth Counties showed that landowners were choosing DLC over GFP. There were 1,108 tree cutting permits (with 7,714 ha of harvested area) issued between 1997 and 1999, only 8% of the woodlands were harvested using a recognized silvicultural system and the rest were DLCs or hybrids (Schwan and Elliott, 2010). One of the worst scenarios is where a woodlot managed long-term (25-30+ years) under the selection system is then cut to the diameter-limit by a new landowner. The beautiful large trees restored and grown through the selection system, vanish in one cut. Add to the mix, an unscrupulous logger, who underpays the landowner and also causes damage to the residuals, and the past 30 years of dedicated silviculture are lost, and recovery will take up to an additional 40 or 50 years. Adding GFP to the regulation system for tree conservation bylaws was a good first step and the benefits are clear, however allowing DLCs to legally persist is clearly at odds with this. In my opinion and that of all of my colleagues, the DLC option should be removed from current and future bylaws.

A well managed forest stand under the Single Tree Selection Silvicultural System.

THE END OF THE DIAMETER-LIMIT CUTTING ERA

The province mostly stopped using DLC on Crown lands in the 1970s. They are not found in the provincial silvicultural guidelines, other than to mention that they are a bad practice and should not be used. The provincial Managed Forest Tax Incentive Program (MFTIP) has an outright ban on the use of DLCs and high-grading. Landowners who use these approaches, may be removed from the program and be required to pay back the taxes that the program had saved them. All the existing forest certification schemes require that practices follow accepted standards and do not condone the use DLCs.

Good forestry practice and effective silviculture are grounded in emulating natural ecological processes. A farmer or maple syrup producer who knows their woodlot and understands basic forest ecology and genetics will strive to keep healthy mature seed trees, maintain biodiversity, create opportunities for regeneration, discourage invasive species, and maintain wildlife habitat while protecting wetlands and water features. Many of these folks and other woodlot owners seek further learning and join groups like the OWA while hiring R.P.F.s to help with management planning, prescription writing and operations. Unsustainable DLCs are no longer acceptable and their continued use in Ontario's woodlands disrespects the forests and the large number of neighbouring high calibre forest stewards that Ontario is so lucky to have. The time has come to finally leave diameter-limit cutting behind.

REFERENCES

Kenefic, L.S. and R.D. Nyland (editors). 2006. Proceedings of the conference on diameter-limit cutting in northeastern forests. USDA For. Serv., NE Res. Stat., Gen. Tech. Report NE-342, 57 pp.

Schwan T.D. and K.A. Elliott, 2010. Effects of diameter-limit by-laws on forestry practices, economics, and regional wood supply for private woodlands in southwestern Ontario. Forestry Chronicle, Vol. 86(5): 623-635.

Yung, Y.K., 2018. State of urban forest policy and by-laws across Ontario municipalities. Masters Thesis, Faculty of Forestry, University of Toronto, Ontario, Can. 45 pp.

EMULATING NATURAL DISTURBANCES IN WOODLOT MANAGEMENT

THE PATH TO END!

By Brian Naylor BScF, PhD and Kandyd Szuba, BScF, PhD, Near North Chapter[1]

WHY EMULATE NATURAL DISTURBANCES (END)?

Natural disturbance agents such as wildfire, wind, insects, and disease have shaped Ontario's Great Lakes-St. Lawrence (GLSL) forests since the glaciers receded more than 10,000 years ago. Wildlife have adapted to the habitat conditions created by these disturbances. Historically, each type of disturbance varied in frequency and intensity within different forest types. For example, fires ranged from light understory fires that killed few overstory trees, to intense crown fires that killed all, or almost all, overstory trees. Intense fires that killed enough overstory trees to initiate a new stand occurred roughly every 100 years in stands of intolerant hardwoods, every 200 years in pine and oak stands, and every 1,000 years or more in stands of tolerant hardwoods.

Fire suppression has greatly reduced the frequency of wildfires in the GLSL forest. Wind events, insects, and disease are still prevalent, although most of the effects are small scale involving individual trees or groups of trees.

In its simplest sense, END involves using forest management activities to emulate some of the ecologically important conditions created by natural disturbances. The term 'emulate' is used instead of 'duplicate' because management actions cannot reproduce exactly all the conditions created by natural disturbances, and some conditions are not economically feasible or socially acceptable to duplicate.

Historically, wildfires in the GLSL forest ranged from understory fires (bottom B) to intense crown fires (top T). Photo credits: USFWS, (B); Cameron Strandberg, CC-BY-SA-2.0 (T).

END is considered a "coarse filter" approach to management because it assumes that managed forests that look and function like natural forests will provide habitat for the majority of forest-dwelling plants and animals that are adapted to such conditions, thus helping to conserve biological diversity and maintain ecological processes. Using END as a goal can also help greatly to resolve differences of opinion about what direction forest management should take. For example, one stakeholder group (or family member) might want more young forest for moose, while another wants more old growth forest. Or, one person might want more habitat for deciduous-loving ruffed grouse, while another wants more habitat for conifer-loving songbirds such as the blue-headed vireo. Should the loudest voice win? How can

Rare severe wind events, such as this microburst in Samuel de Champlain Provincial Park in 2025, can blow down entire stands (or multiple stands) of trees. Photo: Kandyd Szuba.

Moose benefit from patches of young forest interspersed with patches of older forest. Photo credit: Kandyd Szuba.

Ruffed grouse prefer intolerant hardwood forest. Photo credit: Grayson Smith/USFWS.

The blue-headed vireo is a conifer-loving songbird. Photo credit: Mykola Swarnyk, CC BY-SA 3.0.

MNR's GLSL Landscape Guide describes the range of compositions that a natural landscape might assume in the 5E area depicted above.

conflicting desires like these be resolved fairly? How much of each forest type is enough? On Crown land, END helps provide the answer! A private woodlot owner has lots of personal latitude to make decisions about the direction their woodlot will take, and a landowner can get direction from END as well!

Ontario has been one of the leaders in developing the END concept and exploring ways to implement it. The desire for a more holistic approach to managing forests was first proposed in Ontario during the Class Environmental Assessment of Timber Management on Crown Lands in Ontario (the Timber EA 1988-1994). Discussions at the Timber EA inspired the Ontario Ministry of Natural Resources (MNR) to explore the concept of END in detail and to incorporate it into the Crown Forest Sustainability Act (CFSA; S.O. 1994; https://www.ontario.ca/laws). The CFSA refers to conserving biological diversity and ecosystem processes, and to emulating natural disturbances and landscape patterns, within the limits of silvicultural requirements.

The most complete instructions on how to implement END in the GLSL forest region can be found in Ontario's forest management guides:

a) Forest Management Guide for Great Lakes-St. Lawrence Landscapes https://www.ontario.ca/page/forest-management-great-lakes-and-st-lawrence-landscapes and

b) Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales https://www.ontario.ca/page/forest-management-conserving-biodiversity-stand-and-site-scales

In essence, these guides require a Crown land forest manager to think about forest stands as well as how the stands fit into the broader landscape. This means "thinking big" AND "thinking small". Where does a woodlot owner start?

THINKING BIG – THE LANDSCAPE

About 86% of the landscape in ecoregion 5E, the Georgian Bay ecoregion or southern shield, is forested and 11% is covered by water (https://www.ontario.ca/page/ecosystems-ontario-part-1-ecozones-and-ecoregions). To help forest managers understand what a "natural landscape" might look like in this enormous area, MNR's science team worked for years, using the best available, most up-to-date information on fire cycles, insect outbreaks, and major wind events in state-of-the-art simulation models that produced "simulated ranges of natural variation". More detail on the process and the outcomes can be found in the Landscape Guide. Table 1 summarizes what was concluded for the region as a whole.

To contribute to END at the landscape level, a private landowner could "think big" by creating young forest, transforming some of the intolerant hardwood and mixedwood into conifer, and by putting more emphasis on white pine and mixed pine forest, as described in Table 1.

Table 1 - "Thinking Big" - summary of key direction in the GLSL Landscape Guide.

- young forest (presapling and sapling age forest) needs to be increased,
- immature forest needs to be reduced,
- tolerant hardwood forest needs to be reduced,
- intolerant hardwood and mixedwood forest needs to be reduced somewhat,
- white pine and mixed pine forest needs to be increased greatly, and
- spruce-fir-cedar forest needs to be increased somewhat

Based on the simulation models and accompanying science packages, the Landscape Guide notes that there is variation within the GLSL forest region in what should be emphasized. For example, the Algoma Forest is directed to reduce spruce-fir-cedar, but the Sudbury Forest is directed to increase it. Thus, a private landowner might "think big

Google Earth image from the Parry Sound area showing a patch of riparian (shoreline) forest adjacent to water, and large patches of deciduous forest and white pine forest. All three add distinct habitat types to the landscape.

but not too big" by taking a closer look at the direction MNR proposed in the Landscape Guide for the Sustainable Forest License nearest them.

THINKING SMALL – THE WOODLOT

The focus of most landowners is on their own woodlot, and there is a lot one can do to emulate natural disturbances at this scale. For example, when a landowner applies good silvicultural practices as promoted by the Ontario Woodlot Association (see articles in this edition of the Woodlander), they are by default emulating the most common natural disturbances in our forests because the silvicultural systems were designed to exploit the adaptations trees evolved to respond to these disturbances (Table 2). While good silvicultural practices will produce stands with a mix of tree species and structures emulating natural processes, there are some key differences in structural features (Table 2). The most important of these from a habitat perspective is the lower number of declining, dead, and fallen trees in managed stands. Natural disturbance agents injure or damage trees, leading to decline and death. They also kill trees outright, or blow trees to the ground. Trees in each of these categories (declining, dead, and fallen) provide special habitat features that live, healthy trees do not (Table 3). Managed stands tend to have fewer declining, dead, and fallen trees because when we harvest trees to produce forest products, we remove them from the forest, but agents of natural disturbance leave them there.

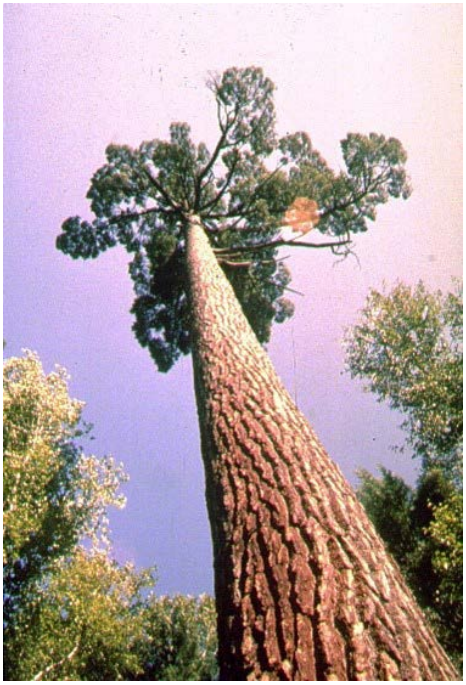
Thus, to better emulate natural disturbances, woodlot owners should retain some declining trees. Current tree marking rules suggest at least 10 declining trees with cavities/ha. Good choices for the retention of cavity trees (as well as supercanopy and veteran trees that are described below) are discussed in the Ontario Tree Marking Guide (https://www.ontario.ca/page/tree-marking). Retaining as many dead trees as safety and silvicultural objectives permit also produces a forest that better emulates stands created by natural disturbances. The declining trees and dead trees that are retained will eventually become fallen trees, which have great ecological value as well.

Other things a woodlot owner can do to better practice END include:

Selection system – Retain some trees past the economic rotation age to become large diameter "old growth" trees that stick up above the main canopy (supercanopy trees). These large trees provide special perch and nest sites and typically have deeply furrowed bark that is ideal foraging habitat for birds like the brown creeper. Current tree marking rules suggest at least 1 per 4 hectares.

Shelterwood system – Retain some healthy overstory trees (referred to as veterans) to grow and eventually become "old growth" trees in the regenerating stand. Veterans will ultimately become large declining trees, then large dead trees, and finally large fallen trees as the new stand develops. Current tree marking rules suggest retaining at least 10 veterans/ha in shelterwood removal cuts.

Clearcut system – As for shelterwood cuts, retain some healthy overstory trees (veterans) in all clearcuts (especially pines or oaks). In stands with scattered overstory pines that are managed using the seed tree clearcut method, current tree marking direction suggests retention of at least 10 veterans/ha.



Good silviculture that produces stands of healthy trees is a fundamental step in END. Retaining special structural features, such as this supercanopy tree that projects above the main canopy, better emulates stands created by natural disturbances. Photo: Brian Naylor/MNR.

CONCLUSION

The practice of END strives to conserve biological diversity and ecosystem functions by using silviculture to emulate ecologically important aspects of natural disturbances. If you are already practicing good silviculture, your woodlot is on the path to END! If you can also do something new in your woodlot by "thinking big" (Table 1) or "thinking small" (Table 3), you might be surprised at the wildlife that will appear to check your woodlot out!

Table 2. Silvicultural systems, the common natural disturbances they emulate, and some key similarities and differences between managed forests and those disturbed by natural events only.

Silvicultural system	Type of disturbance emulated	Key similarities and differences between managed and naturally disturbed forests
Selection in forest dominated by shade tolerant tree species such as sugar maple	Emulates small gaps caused by annual tree mortality associated with small wind events, insects, and disease. Group openings emulate larger gaps created by more severe wind events.	*What's similar?* Both produce an uneven-aged forest with a relatively continuous mature overstory dominated by shade tolerant tree species. Group openings provide suitable conditions for regeneration of mid-tolerant tree species. *What's different?* More declining, dead, and fallen trees in stands undergoing natural disturbances only. More large (including supercanopy) trees in stands undergoing natural disturbances only.
Shelterwood in forest dominated by trees that are mid-tolerant of shade, such as white pine	Emulates severe understory fires that occurred about every 200 years that removed the understory and killed some of the mature trees, leaving an open overstory.	*What's similar?* Both produce a relatively even-aged forest of mid-tolerant tree species developing under an open overstory of mature trees. *What's different?* There tend to be more declining, dead, and fallen trees in stands subject to severe understory fires. There tend to be fewer overstory trees in managed stands following the final removal cut.
Clearcut in forest dominated by shade intolerant tree species such as poplar	Emulates severe Crown fires that occurred about every 100 years and killed most of the overstory trees, providing sufficient light for the regeneration of shade intolerant tree species.	*What's similar?* Both produce a relatively even-aged forest of shade intolerant tree species. *What's different?* There are more dead and fallen trees (and sometimes more declining trees) in stands subject to severe crown fires. Depending on overstory composition and markets, there may be more small and fewer large diameter live overstory trees following a clearcut (fire typically kills most small diameter trees but leaves some large diameter trees, especially pines).

"TO CONTRIBUTE TO END AT THE LANDSCAPE LEVEL, A PRIVATE LANDOWNER COULD "THINK BIG" BY CREATING YOUNG FOREST, TRANSFORMING SOME OF THE INTOLERANT HARDWOOD AND MIXEDWOOD INTO CONIFER, AND BY PUTTING MORE EMPHASIS ON WHITE PINE AND MIXED PINE FOREST, AS DESCRIBED IN TABLE 1."

Table 3. The special habitat functions of declining, dead, and fallen trees (photos by Kandyd Szuba).

Type of structure	Special habitat features provided	Examples of wildlife that rely on these special habitat features
Declining trees (especially those with cavities or the potential to produce cavities) 	Roost, den, and nest sites in rotten or hollow trunks or in large dead limbs	• Pileated woodpeckers prefer to excavate nest holes in large, declining hardwood trees with extensive heart rot. Other wildlife will use old nest holes. • Declining trees with fairly small hollow chambers are used as den or nest sites by species that cannot excavate their own holes, such as saw-whet owls, wood ducks, and flying squirrels. • Large declining trees with hollow interiors provide roost sites for bats as well as chimney swifts. • Carpenter ants form colonies in rotten heartwood of declining trees which in turn attracts feeding by pileated woodpeckers.
Dead trees 	Perch sites on dead branches Feeding sites, roost sites, and nesting sites in rotting sapwood and heartwood Roost and nest sites under loose bark.	• Recently killed trees have moist sapwood for a few years after death attracting wood-boring insects such as the white-spotted sawyer. Sawyer larvae in turn attract feeding by black-backed woodpeckers. • Weak excavators such as chickadees and downy woodpeckers prefer dead trees over declining trees for nest excavation. • Dead trees may have large sheets of loose bark that provide roost sites for bats and nest sites for the brown creeper. • Large, sturdy dead trees like the one to the left can remain standing for decades, providing habitat for many species over the long term.
Fallen trees 	Display sites Feeding sites Resting sites Runways Cover Nest sites	• Relatively sound fallen trees like this one are used by ruffed grouse as drumming logs. • Black bears tear apart decayed fallen trees looking for invertebrate food. • Decayed fallen trees are used by blue-spotted, spotted, and red-backed salamanders as cover. They are also used by red-backed salamanders as sites for egg-laying. • Large fallen trees create air spaces under the snow ('subnivean space') which is used by species like the American marten as resting and hunting sites.

[1] The authors were both involved in the development and implementation of Ontario's current forest management guides that incorporate the concept of END.

ONTARIO
WOODLOT
ASSOCIATION

2025 MEMBERSHIP APPLICATION

OWA members are encouraged to invite friends, family, and neighbours to join our Association!

NOTE: THERE IS ALSO AN OPTION TO JOIN THE OWA ON-LINE AT: https://ontariowoodlot.com/join

Name: _____

Address: _____

City: _____ Province: _____ Postal Code: _____

Phone: _____ Mobile: _____

Email: _____ Chapter: _____

(Please see Chapter Map on page 3)

Annual Membership Fee: $50.00 + $6.50 (HST) TOTAL: $56.50

or

Annual Electronic (paperless) Membership Fee: $40 + $5.20 (HST) TOTAL: $45.20

Memberships extend from September 15th to September 14th of the following calendar year. Members joining mid-year will receive our latest issue of The Ontario Woodlander.

Please pay by including a cheque or by providing your credit card information:

Credit card type: ❑ Visa ❑ MasterCard Credit Card Number: _____

Name (as it appears on the Card): _____

Expiry Date: _____ (MM/YY) CVV Code (3-digit/back of card): _____

Mail completed application to:

Ontario Woodlot Association
10 Campus Dr., Unit 4
Kemptville, ON K0G 1J0

or

Scan and email to:
info@ontariowoodlot.com

CHAPTER 2

WOODLAND LIVING

Experience the varied and unique woodlands lifestyle through the fun and fascinating stories of your fellow Ontario Woodlanders

RESTORING A DEGRADED PLANTATION ONE STEP AT A TIME

By Elliott Groen, R.P.F. in training with scope, OWA Sustainable Forestry Coordinator, Kawartha Chapter

Realistically, plantations are 70 to 90-year restoration projects with the goal of returning native and diverse forest cover (cleared over the last century) back to our landscapes. This involves many steps and as you can imagine requires effort from many people over time. We engage in this work because of the values articulated so well in our strategic plan; we want our woodlots to be sustainable and productive, ecologically healthy and diverse, and spiritually and physically renewing. These values interconnect and are the reasons why we responded to members looking for help in restoring degraded plantations.

Last year we conceptualized our Private Land Silviculture and Restoration Program (PLSRP) as an evolution of the Community Forest Owners Cooperative pilot projects. The goal of PLSRP is to assist members with forests in need of some form of restoration investment and commitment. From a practical perspective, what this looks like for many plantations in the Kawarthas and several of our other chapters is that the value of the wood is not enough to attract a logger but needs to be thinned for forest health (prevent large scale blowdown and create canopy gaps for regeneration). Even if a timber sale is possible, it is often not enough to cover invasive species treatment to ensure a healthy and diverse regenerating tree layer and understory. As a provincial team we are working at getting this program funded on a larger scale, so that plantation and other degraded forests can be restored to provide us with societal benefits including carbon sequestration, water filtration, wildlife habitat, recreation opportunities and so much more. An initial success has been a grant through the Greenbelt Foundation funding a partnership with the Kawartha Land Trust to restore plantations on the Oak Ridges Moraine.

Before I dive in any further the specific restoration actions, I want to share a quote from the landowners whose plantation is featured in this article.

First of all, we would like to thank you all for the job done at our property in Bethany, Ontario. We were kept well informed and very happy from the beginning to the end. Our 100 acre farm has hayfields, cow pastures and approximately 1/3 forest and wetland. We are entering our senior years and have great joy watching and feeding a wide variety of birds and butterflies on our property. One of my passions is gardening and I am able to water and fertilize from the creek running through from a beautiful pond across the road. Turtles cross to lay eggs every year from that pond while the wetlands create an orchestra in the evening. We feel happy knowing that with your help this land will remain the same for at least our lifetime. Many thanks to you Elliott, your team, and your program for helping us to control noxious weeds, maintain and preserve habitat on our little piece of paradise and maintain our forest. We would be happy to recommend your service and refer you at any time. Thanks, from Aivars Koskins and Lori Campbell!

Aivars and Lori's plantation is 47 years old and at just over two acres is the smallest of the projects we have been working on through the Greenbelt Foundation grant.

Of course, it all started with an initial discussion followed by an inventory, contracts, prescription, and tree marking. Then in the winter of 2025 Woodleigh Farms conducted the thinning harvest, utilizing non-merchantable sawlogs for their compost production. The ice storm of March 2025 did not cause significant damage after the harvest, showing the value of tree marking. The thinning benefits the overall health of the forest by allowing the residual trees to maintain larger living crowns; the larger the crown the more resources the red pine and spruce can capture through photosynthesis, which helps with tree growth, longevity, pest, and wind resistance. It also opened canopy gaps particularly for the black cherry regeneration that was already present in small pockets where the 2022 derecho had blown over single and small groups of red pine stems. Black cherry is shade intolerant and while it can germinate and grow for three to five years in shady conditions, it will generally not grow into a canopy tree if it does not have access to light. Shade supressed black cherry starts growing sideways instead of up, and often gets black knot fungus which usually kills saplings after a few years.

In March before leaf out, cut stump treatment of buckthorn was conducted, which was the dominant understory vegetation in a ~1/3 acre patch closest to the farm fields. Buckthorn crowds out native vegetation and is an alternative host for fungi and aphids that respectively reduce yields in oats and soy. Buckthorn also does not provide nearly as much benefit to birds and pollinators as native understory shrubs such as elderberry and winterberry. By controlling buckthorn, we are not just restoring forests on a site level but also contributing to the health of the overall landscape with direct benefits to agriculture and biodiversity.

Unthinned spruce plantation.

Thinned red pine that made it through the 2025 ice storm with relatively little damage. This shows the value of tree marking in selecting the trees most likely to persist in the stand.

Dog strangling vine (DSV) a few weeks after herbicide treatment, preventing spread into an area with ostrich fern.

Enchanters nightshade (Circaea canadensis) thriving in the non-invaded parts of the plantation. By treating DSV and buckthorn, plants such as this will be able to spread further adding biodiversity.

Muscle Wood (Carpinus caroliniana) surviving this summer's drought after spring 2025 planting.

Degraded conditions in plantations are not just limited to overstory trees that are vulnerable to blowdown or invasive species. Most sites where plantations have been established are formerly farmland, and because of clearing and agricultural practices, they have a much-reduced repository of native forest species seed in the soil bank. Many plantations are also fragmented from other forests and do not have enough natural addition from wind, birds, squirrels, and other agents of seed dispersal to rapidly regenerate a native understory, especially when re-invasion of invasive species is a risk. Through the Greenbelt Foundation grant we were also able to plant 10 different species for a total 450 native trees and shrubs in this plantation to augment the natural regeneration and provide additional diversity.

Finally in the early summer just under an acre of dog strangling vine (DSV) was treated with herbicide. Even patches this size are hard to manage without spraying, and like buckthorn, DSV can outcompete native species including tree regeneration. It also impacts monarch butterfly populations by not allowing them to complete their life cycle, and on top of all that… it is no fun at all to walk through!

Thinning, invasives species control and supplemental planting will need to be followed up with monitoring and additional silvicultural actions as needed to ensure the restoration process is completed over the next several decades. This one site is meaningful and is also a drop in the bucket; from earlier work funded by the Ministry of Natural Resources' Biomass Program, we determined that in the Kawarthas alone there are around 1600 acres of plantations with similar degraded conditions. Let that not discourage us but rather inspire us to pick up where previous efforts have left off… and work to complete these long-term restoration projects.

MEMBER PROFILE

A LIFE IN THE WOODS

ELEANOR REED'S STORY OF FOREST STEWARDSHIP

By Melany Burant, OWA Outreach Coordinator, Kawartha Chapter, written in collaboration with Eleanor Reed, Kawartha Chapter

While some people stumble into forestry, Eleanor Reed grew up in it.

Some of Eleanor's earliest memories include climbing trees and hunting for frogs along the creek behind her home, or skiing and hiking the Bruce Trail near Burlington. She was thrilled to learn woodland skills such as animal tracking and wayfinding at day camps in local conservation areas. At age 17, she participated in the Junior Ranger Program at Kettle Lakes Provincial Park near Kirkland Lake, where she first learned about forestry and forged a deep connection with the woods.

After graduating from the University of Toronto in 1983 with a Bachelor of Science in Forestry, Eleanor became a Registered Professional Forester. She went on to spend many years working in remote northern communities across three provinces. Although the work was fulfilling, something was missing. Instead of moving from one forest to the next, she dreamed of finding a place to settle and witness the results of her efforts over time.

In 1995, that dream came true. Eleanor and her partner Paul found a home in The Land Between.[1] Together, with their children, they poured their hearts into the land and began their labour of love. Eleanor had reached a personal and professional milestone. It was a forest she could grow with, season by season and year by year.

Some of the first steps included becoming a Managed Forest Plan Approver and writing (but not approving) the Managed Forest Tax Incentive Program (MFTIP) plan for the property. She also became an Ontario Certified Tree Marker, took the Grower Pesticide Course to be able to purchase and apply pesticides on her own property, and became a Planting Delivery Agent with the 50 Million Tree Program (50MTP). Over the years, Eleanor has marked and sold trees on the property in four commercial sawlog and firewood harvests, one poplar harvest, and annual local firewood sales. The family planted over 15,000 trees by hand before any provincial subsidy was available, followed by another 10,000 through the 50MTP. She has maintained specific areas as "protection forest," such as the silver maple swamp surrounding vernal pools. An area of very old white pines and sugar maples is managed for "ancient forest" features, including snags, cavities, and species diversity. The family runs a small commercial maple syrup operation with all hands on deck. A small flock of sheep makes use of the limited arable land, and many kilometres of trails provide recreational opportunities and access for maintenance.

As time went on, the three children began to venture into the forest themselves—naming, mapping, and exploring. As they have grown, so have the projects. More recently, they have worked on recreating pioneer dry-stone walls, building cairns to mark trail intersections, and developing mountain bike trails full of challenges. They share Eleanor's interest in nature and species at risk, and are willing workers when time allows.

Eleanor's commitment to stewardship did not stop at home. She joined the Ontario Woodlot Association and became active in the Kawartha Chapter. As she put it, "I joined the Chapter and the Executive in order to share my passion for forests with like-minded folks. I have always felt that membership in the OWA was an extension of my professional responsibilities: to provide access to my knowledge and experience."

Although Eleanor is now retired, she remains deeply involved in sustainable forest management. She has been clearing trails after the ice storm and tackling invasive species on her property. She is also collaborating with the local Land Trust on species at risk projects throughout the property and working with the ALUS (Alternative Land Use Services) Program to protect grassland birds in their hay field. These ongoing efforts speak to the endless possibilities for stewardship when you pour your heart into the land. They show how one person's commitment can shape a landscape in lasting, deeply personal ways.

Over the years, Eleanor has gathered a lifetime of memories from her work in forest stewardship. Two stand out in particular: the day she was conducting a forest survey and feared being run over by two bull moose who thundered past, seemingly within arm's reach, and the day she planted her millionth tree through the 50MTP, with family and friends in attendance. You would think that Eleanor would put her feet up and just enjoy looking out her window at the forest that now surrounds her home. But like Glenda Jones (Woodlander, Spring 2025 issue), she still loads up the "baby" chainsaw and heads out, as there is more work to be done before the task is passed on to the next person.

It is a living reminder of what care, commitment, and decades of work can create.

[1]The Land Between is a unique bioregion in central Ontario, stretching from the Ottawa Valley to Georgian Bay. As the last intact wilderness in southern Ontario, it is a meeting place for northern and southern species, home to 59 Species at Risk, and rich in cultural and ecological diversity.

PROFESSOR EMERITUS PAUL LEET AIRD

Dr. Paul Leet Aird was a person of diverse interests and passions, and great intellectual curiosity and accomplishments, most of them focused on conserving nature, especially forests. He graduated from Macdonald College of McGill University with a B.Sc.Agr. in 1952 (Soil Conservation), from Cornell University with an M.S. in 1953 (Forest Soils, Conservation), and from Cornell University with a Ph.D. in 1957 (Forest Soils, Conservation, Biometrics). He was a forest research scientist in the Québec forest industry from 1952 to 1974 (Canadian International Paper Ltd. and the Pulp & Paper Research Institute of Canada). From 1974 to his 1996 retirement, he was Professor of Forest Conservation Policy at the University of Toronto's Faculty of Forestry. Paul was a Registered Professional Forester in both Ontario and Québec.

His continued involvement at U of T for several years after retirement as a Professor Emeritus included taking new forestry graduate students during orientation week on a "Walking Tour of the University of Toronto from a Forester's Perspective." Also, after retirement, he did freelance work as a Plan Approver under Ontario's Managed Forest Tax Incentive Program (MFTIP) helping private landowners manage their forests for conservation.

Paul became a well-recognized expert on the natural history and distribution of the Kirtland's Warbler, a bird species regulated as endangered in Ontario. He searched for suitable habitat (young jack pine stands) in the wilds of Ontario and Québec for the presence of the species for 40 years until 2016. His discovery of a singing male at CFB Petawawa, Ontario in the late 1970s led to the species being listed in Ontario as endangered. He served for many years on the Kirtland's Warbler Recovery Teams of both the American and Canadian governments.

A prolific writer on nature and conservation right through to 2021, Paul was the author of both scientific and popular papers, reports and commentaries on forestry and nature conservation issues. He authored the book *Loon Laughter: Ecological Fables and Nature Tales* in 1997 and the book *Butterfly Beautifly Beautiful: Nature Poems* in 2021, which collected his best poetry written over a 60-year period. Two of his poems became songs recorded by Canadian musical artists.

Paul loved to walk, hike, skate, ski, snowshoe, paddle a canoe and camp in Canada's wild places. Sharing these experiences with family, friends and students stimulated his writing of fables, stories, and poems. Paul left this Earth on February 18, 2024, at age 94, after a long illness. His soul is flying with the loons. Paul's daughter Lyn Aird Barsevskis is a member of our Huronia Chapter.

Adapted from: In Memoriam: Professor Emeritus Paul Leet Aird | Forestry

University of Toronto, John H. Daniels Faculty of Architecture, Landscape and Design

MEET THE ARTISAN

By John Pineau, Near North Chapter

TOM PARK, SOUTH WEST CHAPTER

Getting to know member families across the province has been a really nice perk the past five plus years. I had the honour of helping to present the Park family, specifically Bertha-Rose Park in our South West Chapter, with their Woodlot Management Award during an event in Alvinston in March 2023. Thinking this would make for an interesting Woodlander article, I followed up with a visit to see and interview Bertha-Rose and her son Tom during the summer of 2024, resulting in The Park Family Heritage Woodlot in our 117th issue. During this visit, I also found out that Tom is a rather unique fine woodworker, and I made a mental note that he had to be a future featured artisan.

Tom at work in his shop.

During his childhood, Tom Park's father, Marshall had a woodworking shop where he built items for use around the home and constructed wood projects such as cabinets, rocking horses, toy trucks and wood turnings on the lathe. He showed Tom how to use the equipment properly, including the table saw, jointer, drill press, bandsaw, and lathe. Tom naturally followed his lead and gradually upgraded the equipment and tools that his father had used over the years and incorporated newer machines into his own shop.

Tom also conducted a lot of research and read many articles to make sure he was acquiring high quality equipment and tools. Over time, he purchased a planer, and a larger jointer, table saw, bandsaw, drill press and lathe. Additional tools such as a miter saw, routers, spindle sander, drum sander, scroll saw, dust collector, hand planes, saws, carving tools, wood turning tools and inlaying tools were acquired. He also took a number of in-depth courses, at the Rosewood Studio in Almonte, Ontario, where specific instructors were available to teach detailed woodworking skills. As well, he took courses at the Mark Adams School of Woodworking in Indianapolis, Indiana, where they offered extensive woodworking learning opportunities.

"Woodworking is my main hobby," says Tom. "I tend to spend a good part of any given day in the shop. There are many tasks to be completed in preparation for the next project and time is required to learn and practice new skills. I am retired now, so I have more flexibility. If I have a goal in mind for a project, I can just focus my time and effort to get it completed."

Over the past 30 years Tom's products have included pie crust tea tables, lowboys with carved ball and claw feet, small tables, spice boxes, cabinets for tools and books, wood turnings and he is currently attempting wood veneering and marquetry projects. If he sees a project in a woodworking magazine, he generally follows the plan but does like to adapt the plan and make slight modifications. He particularly likes to make small boxes of different shapes and sizes, with fine detail, using a variety of woods for all the accents. "My goal is to use wood that has interesting grain patterns and colours and cut and fit it together with precision and be meticulous throughout the process."

Most of Tom's products end up as gifts, which he generously gives to friends and family. During the pandemic in 2020 and 2021 he made about 110 boxes in what he describes as mass production, although each box was unique and no two boxes were the same, utilizing different wood materials, inlays, hinges, and box sizes. Recently, Tom donated four of his wooden boxes to the OWA's silent auction at our conference in Kemptville in May. Their sale raised several hundred dollars.

Tom uses a lot of wood from the Park family woodlot including black cherry, maple, tulip, red oak, elm, beech, and white pine. In the 1990s, he hired an individual with a Wood-Mizer portable sawmill to cut a large supply of lumber which would be readily available for future projects. Tom also uses some exotic wood for his fine woodworking projects including African blackwood, ebony, pink ivory, padauk, bloodwood, cocobolo, pau amarello, purpleheart, and rosewood. He even uses small amounts of holly, which is a very white wood suitable for use in string inlay for table legs.

"I used to go to wood shows and could find just about any type of wood including exotics, but the number of wood shows have diminished in recent years," says Tom. "There are a few lumber dealers around where I can locate specific exotic rare woods that I use, along with figured woods of birdseye maple, curly maple, burl woods, and wood veneers."

Tom's now famous fairy houses were introduced in the article previously mentioned (Woodlander #117). Their origin involved relatives in Toronto who told a story of putting a small door in the hollow of a tree in their neighbourhood. Tom ran with this idea and would find trees in the family woodlot that had a hollow in the trunk, make a front panel to fit the opening, add windows and a door with tiny hinges. He would also put a floor inside the hollow of the tree, and design furniture including tables, chairs, beds, and benches. Small lights would be added, creating an elaborate and ornate fairy home. Bertha-Rose's great grandkids love the four fairy houses that are now part of the family woodlot. Although no one has ever seen the fairies, the children will find treats for them at the homes and will leave letters for the fairies in their mailbox.

"The younger kids in the family thought there were little people living there," says Tom. "It is now a wonderful family folklore that will undoubtedly be repeated with future generations."

Tom pays great attention to detail and strives for perfection in wood projects. Many people enjoy seeing a project through from start to finish, and doing it to the best of their ability, and learning along the way. Tom takes this approach to his woodworking, and the results are unique, functional, and quite aesthetically pleasing!

"Some of these fine woodworking skills have been lost," says Tom. "Being able to cut dovetails by hand, using hand planes and sharpening blades and chisels for a keen edge. Having good tools is really important. Superior quality hand tools make for a good result."

Thank you again Tom for your donation to our 2025 silent auction, and for sharing your unique and interesting approach to woodworking!

Two of Tom's intricately designed wood boxes.

Low Boy table with carved ball and claw feet.

Serpentine Table.

Woodturning bowls.

Spice box.

A fairy house somewhere in the Park Family Heritage Woodlot.

FEATURED RECIPE

By Melany Burant, OWA Outreach Coordinator, Kawartha Chapter

This yummy recipe comes from the 1974 edition of Tempting Treats from Ontario Maple Bushes, a vintage treasure trove of maple inspired recipes published by the Ontario Maple Syrup Producers' Association. It originally called for butternuts, which were easy to find at the time.

Things are different now. Butternut trees have become rare because of a fungal disease called butternut canker. These trees need protection. Nuts from healthy butternut trees should be left for groups like the Forest Gene Conservation Association, who rely on them for conservation efforts. Report any healthy trees you find, or leave the nuts for the squirrels, who still love them and are blissfully unaware just how rare they have become.

In this version, I have used walnuts because they are easier to find and work well in the recipe. If you can get your hands on heartnuts, they are a great option too. Their mild, buttery flavour makes them perfect for baking.

Whether you are making these for a gathering or just because you love maple, these biscuits are a sweet little nod to Ontario's maple traditions with an update that fits today's landscape.

MAPLE BUTTERNUT BISCUITS (WALNUT)

INGREDIENTS:	
2 cups	flour
4 tsp	baking powder
1 tsp	salt
2 tbsp	shortening (lard or vegetable)
¾ cup	milk

FILLING:	
1 cup	soft maple sugar
¼ cup	cream
½ cup	chopped butternuts (walnuts)

DIRECTIONS

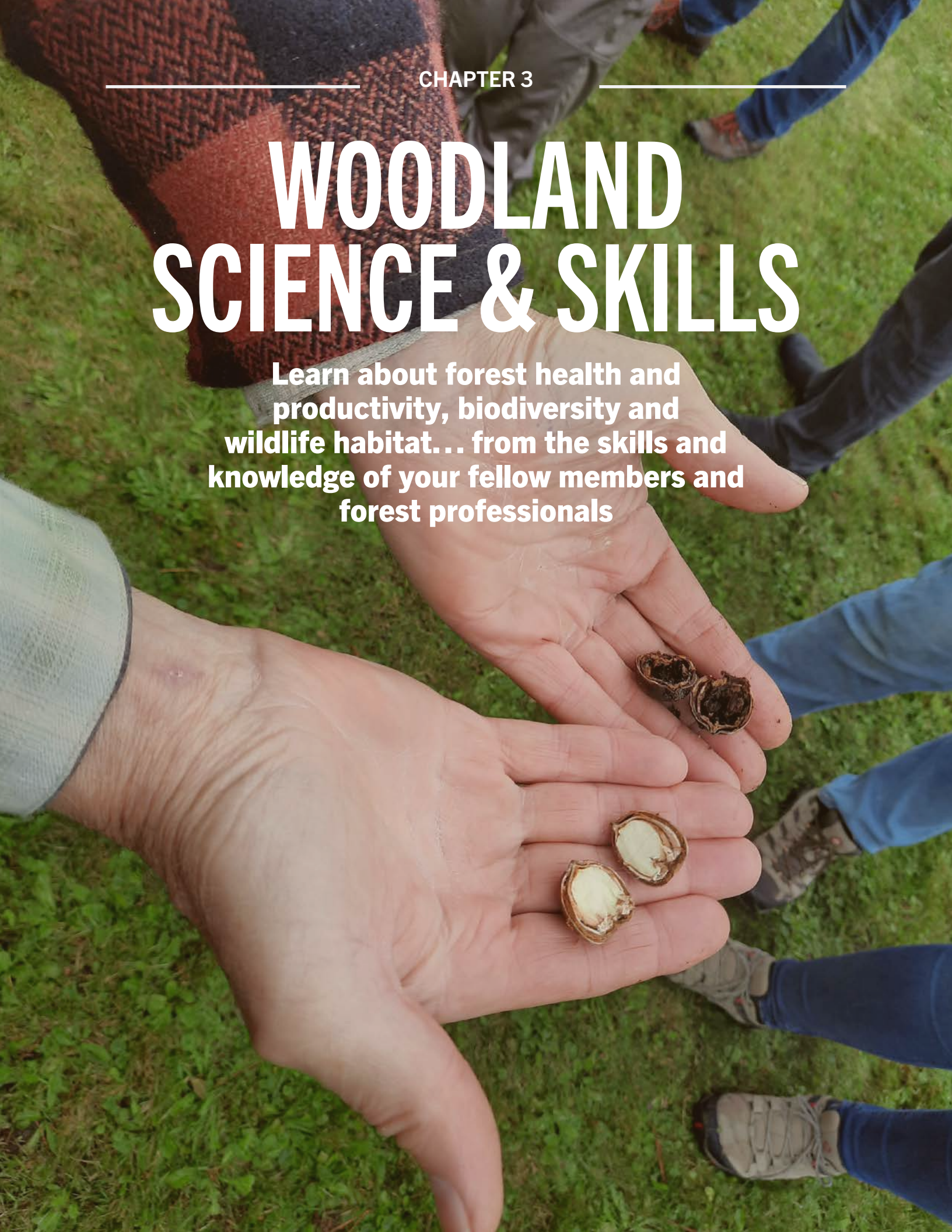
1. Sift together flour, baking powder, and salt.
2. Cut in shortening until mixture resembles coarse crumbs.
3. Add milk and stir to form a soft dough.
4. Turn onto floured board and roll to ½ inch thickness.
5. Combine filling ingredients and spread over dough.
6. Roll dough like a jelly roll and slice into rounds.
7. Place on greased cookie sheet and bake at 400°F for 20 minutes.
8. Makes 18 biscuits.

*SOFT MAPLE SUGAR

INGREDIENTS:
Maple syrup (any grade)

DIRECTIONS

1. Boil maple syrup to 240°F.
2. Remove from heat and stir constantly until thick and creamy. (Use a stand mixer to save time)
3. Pour into a buttered pan and let cool.
4. Store in an airtight container in a cool, dry place.



CHAPTER 3

WOODLAND SCIENCE & SKILLS

Learn about forest health and productivity, biodiversity and wildlife habitat… from the skills and knowledge of your fellow members and forest professionals

THE COMPARATIVE EFFECT OF WOOD BURNING ON CO_2

By Pieter Leenhouts, Lower Ottawa Valley Chapter

THE QUESTION

Having easy access to fuelwood, I am sure many woodlot owners like me, are familiar with heating with wood. I always did so, believing that wood burning was a comparatively natural and harmless practice. After all, did our human ancestors not cook and heat with wood ever since they first learned to start a fire? And forest fires have been around ever since trees existed. But yet when I discussed woodburning as a heating option, I was often challenged by folks saying that the effect of burning wood is no different on atmospheric carbon dioxide (CO_2) release, than burning petroleum, coal, or gas. At the same time, I have been told by others that burning wood is no different that letting a tree rot. The reasoning for that made sense, but the argument was too involved to simply accept without some probing, and this is what I discovered.

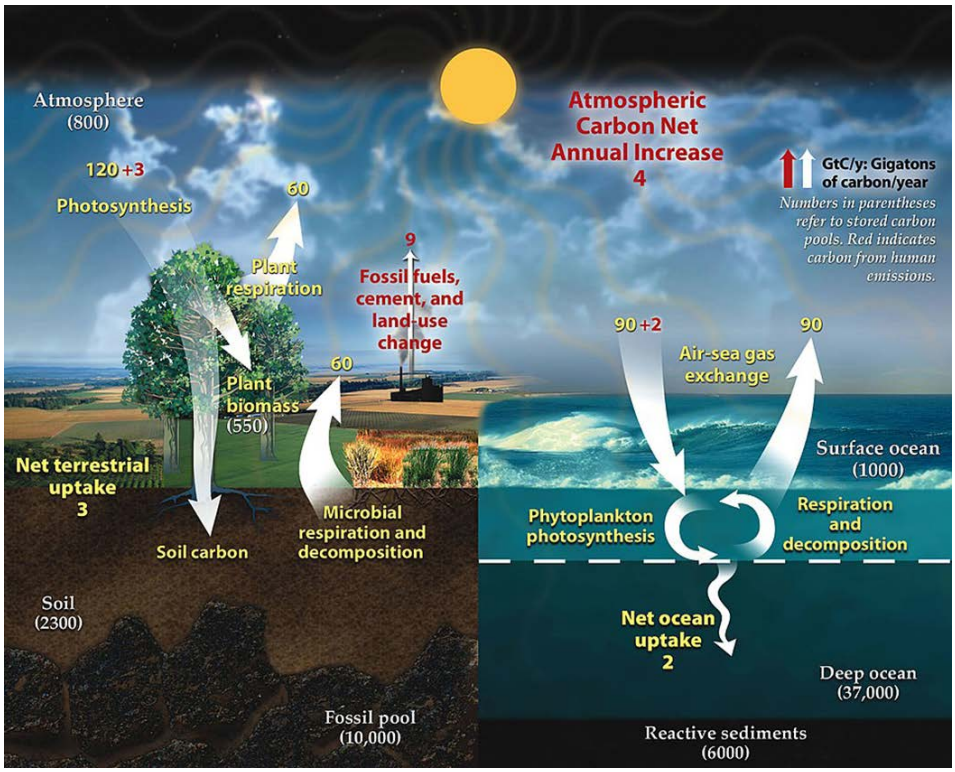


Figure 1: The Global carbon cycle, the numbers are in units of billions of tons per year. Credit: U.S. Department of Energy.

CARBON CYCLE

To understand the question, for starters it helps to visit the carbon cycle. While the role of trees is quite significant in the grand scheme of things, the carbon cycle of a tree is but a simpler part of a much more complex global carbon cycle as depicted in Figure 1, above.

The carbon cycle of a tree consists of two processes. The first is growth where plants absorb solar energy and CO_2 to build biomass. The second is decomposition of the biomass into its constituent elements that can occur through various chemical and biological pathways.

The most important part of the growth process is photosynthesis, Figure 2. It is without a doubt the miracle that is fundamental to all life on earth. The tree absorbs CO_2, water, and sunlight to produce sugar and oxygen. CO_2 as a gas is absorbed through leaves from the atmosphere, water plus nutrients through roots from the ground, and energy from sunlight by the chlorophyll in its leaves. This produces carbohydrates, proteins, and enzymes. From this, the tree produces solids like lignin and cellulose which are the carbon bonds in wood. Lignin reinforces cellulose by providing the structure for a tree and also enables the flow of sap. The nutrients like nitrogen, phosphorus and potassium are important too but amount to but a tiny fraction of the tree mass.

DECOMPOSITION

For the purpose of this article, decomposition will be defined as all processes that happen after the death of a tree, including combustion, consumption and decay or rot.

COMBUSTION OR FIRE

Combustion is a chemical reaction that involves the rapid oxidation of a fuelwood in the presence of oxygen, releasing energy in the form of heat and light. The process occurs in two phases. The ignited wood starts the phase of gasification, producing interim products namely volatile organic compounds (VOCs), suspended particulate matter, and char. The next phase, in the case of a clean burn, produces CO_2, water, a few carbon molecules, ash, plus a lot of heat. Ash is the inorganic mineral remnant and contains mostly calcium, potassium and then lesser amounts of phosphorus, magnesium, and other trace minerals, but no carbon.

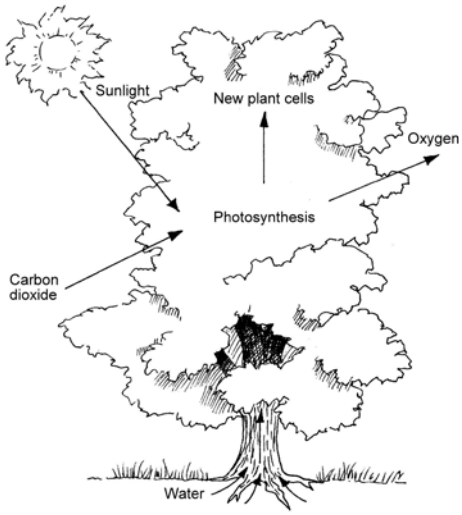


Figure 2: Source: Hilts, S, and P. Mitchell. The Woodlot Management Handbook. Toronto: Firefly Books, 1999. (Illustration by Anne-Ida Beck).

Figure 3: This rotting stump exhibits fungi fruiting bodies and is so riddled with insect galleries that the stump weighs less than half its original weight.

CONSUMPTION

Herbivores will consume and digest tree cellulose, mostly young bark, leaves, and twigs, and produce manure. Boring insects such as ants, beetles and wasps also feed on tree residue.

DECAY OR ROT

Rotting is where microorganisms break down the molecules in wood into less complex forms, see Figure 3. There commonly exists a symbiotic relationship between these microbes (particularly fungi) and insects. Fungi break down the wood fibres making them edible to insects.

Respiration by all these organisms releases CO_2 into the atmosphere plus heat. These processes assume aerobic respiration where there is free and ample access to oxygen.

ANAEROBIC DECAY

But in biology things are rarely clear-cut. Part of the decay process can also be anaerobic and produce humus containing organic carbon, and nutrients for the next generation of trees. This is important for building up the organic soil as well. Anaerobic decay occurs where there is restricted access to oxygen. One can easily envision this where the decomposing material is submerged in water or wet soil. Anaerobic decay happens where the temperature and chemical environment is amenable to only anaerobic microorganisms. This is the case for example were methane is produced. So, decay continues in one form or another. There is however an anaerobic state that is inhospitable to all bacteria, for example too acidic or too cold, and the decay is completely stalled. This would be typical in a peat bog which are normally acidic, and its contents are then preserved in perpetuity. Only when it is disturbed and exposed to oxygen will aerobic decay resume. A dramatic example of this is the Tollmund bog man, Figure 4. Found in a peat bog in Denmark, he was preserved there for some 2,400 years, and the details of skin and hair etc., were amazingly well preserved.

Figure 4: Tollund Bog Man. Photo credit: Nationalmuseet, CC-BY-SA-3.0.

One would speculate then that trees dying in wetlands like bogs etc., also have a much higher likelihood of being preserved for a very long term.

STOCK AND FLOW CARBON

For this discussion, a useful analogy is to classify carbon as either stock carbon or flow carbon. A classic example of stock and flow is a hydro dam. The water held in the dam reservoir is stock. The streams and rivers feeding the reservoir are flow, as well the release of water from the dam to the hydro generators is flow. Stock carbon is that carbon

that is stored or sequestered and not accessed. Flow carbon is that which is in circulation. If you look at Figure 1 above, you will see stock carbon nicely denoted by the numbers in white and in brackets underground or underwater. The arrows denote flow carbon. If there is a flow imbalance, then it affects the stock level. If there is more flow out than flow in then the stock decreases, and so on. Atmospheric carbon is also stock but stored as CO_2 gas. The Keeling Curve in Figure 5 is interesting as it shows the increasing concentration of CO_2 in the global atmosphere. It is not balanced. If it were balanced the curve would be level or flat. The saw-toothed waves denote annual variations.

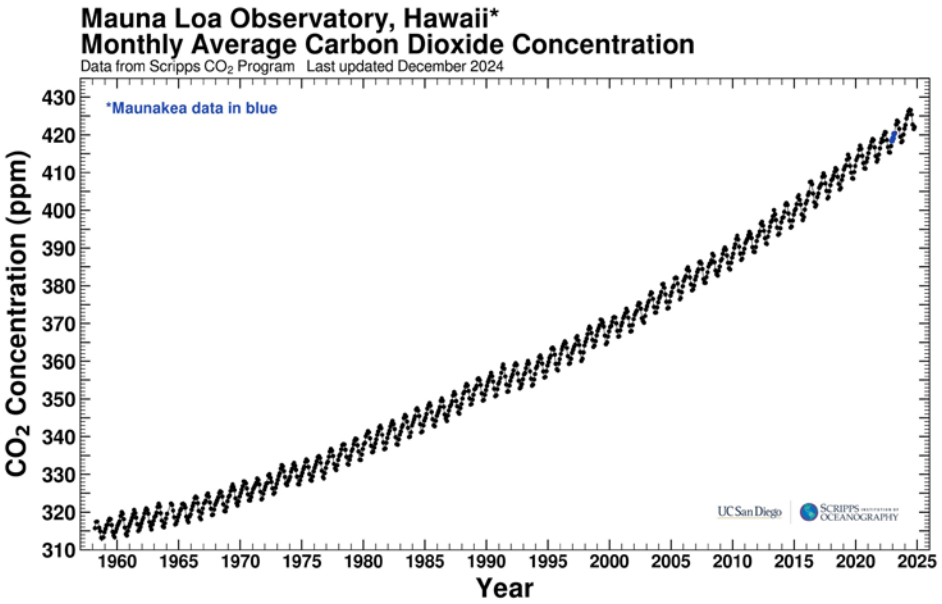


Figure 5: Source Scripps Institution of Oceanography at UC San Diego, CC-BY-4.0.

TIME SCALES

For this comparison, time scales play an important role. Obviously, fire or combustion is a very rapid process. Kindling can take minutes to burn. Large stumps can take hours and even days. But in the grand scheme of things, it is very rapid.

Growth of a tree used for firewood can take from 30 to 80 years. Decay can take months to decades.

Anaerobic decomposition of fossil fuels took hundreds of millions of years, starting at least as far back as the carboniferous period (354 to 290 million years ago), so for the case of this comparison, the time scale can be considered infinity. This anaerobic decomposition, likely was prompted by the extremely inhospitable conditions of the many extinction events during this period. Figure 6 shows the five big mass extinction events plus a dozen or more minor extinction events.

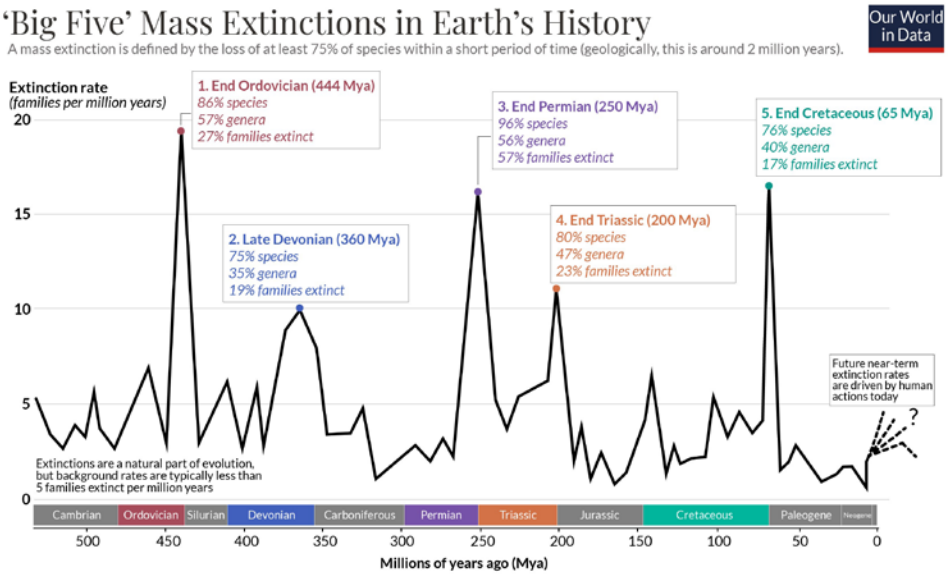


Figure 6: 500 million years of extinction events. Credit: Hannah Ritchie, CC-BY. Sources: Barnosky et al. (2011); Howard Hughes Medical Institute; McCallum (2015). Vertebrate biodiversity losses point to a sixth mass extinction. OurWorldinData.org - Research and data to make progress against the world's largest problems.

COMPARISONS

Let's first examine the case comparing burning wood and letting wood rot. The argument can be made that they are the same, with some improbable stipulations as follows. The baseline is a natural scenario where a tree grows and dies naturally, falls and rots on dry ground and away from wetlands, and without human intervention. The rot needs to be 100% aerobic. The wood rots completely without leaving any humus on the ground. There is no smoke - particulate matter, or unburned gas caused by incomplete combustion. The time scale in question must include the full lifecycle of the carbon atom from tree seed to the last decayed remnant, so a period that could last up to a century.

Unfortunately, as much as I love heating with wood, it is difficult to make the case that burning wood is ideally the same as letting wood rot. Even with the best of masonry heaters and highest efficiency stoves, there will be smoke, ash, char, and chimney creosote. Also, rot is rarely

100% aerobic and will almost always contribute some humus to ground, something that burning wood will not do. Ash does contain some nutrients and trace minerals, but its high alkalinity and lack of nitrogen makes it a poor substitute for humus.

Another point is that processing of firewood will consume energy in the form of labour and machinery. Powered machinery will consume additional fossil fuels.

The other case of comparing burning wood with burning fossil fuels, typically coal or gas, is very different. Burning fossil fuels invariably releases sequestered or stock carbon from the earth below to CO_2 in the atmosphere.

So, it becomes a question of proportions. Burning wood and rotting of wood both engage mainly flow carbon and relatively little stock carbon. Both consume CO_2 and release mostly CO_2 and thus could be claimed to be sustainable. But fire does eliminate any chance of the creation of humus from decay. So, in this assessment, the case can certainly be made that wood burning is much more comparable to letting a tree rot, than burning coal or gas.

HARDWOODS AND HARD LESSONS:

A LANDOWNER'S EXPERIENCE WITH TREE SHELTERS

By Thomas Haney, Provincial Chapter

For landowners seeking to restore resilient, biodiverse forests in Southern Ontario, few tasks are more frustrating—or more critical—than successfully establishing mast-producing deciduous species. Oak, hickory, walnut, and other native hardwoods provide enormous ecological value: they offer hard mast for wildlife, develop deep root systems that anchor soil, and possess traits like windfirmness and drought resistance that make them well-suited to a warming, increasingly erratic climate. And yet, these species remain underrepresented in many publicly supported tree-planting programs.

Why? Because they are slow to establish, often challenging to source, and vulnerable to deer browse. The standard workaround, planting tall stock (150+ cm), fails to protect seedlings fully and often underperforms for species with deep taproots that suffer from transplant shock. Enter the tree shelter…

Three-acre Carolinian assisted migration plot, planted in 2017/2018. Windbreak at upper left planted by TRCA in 2017. Species include pawpaw, Quercus *spp.,* Carya *spp., black gum, tulip tree, and redbud. Spring 2025.*

BACKGROUND

I began reforesting my family's 40-acre hobby farm in Caledon in 2007, naively planting 200 hardwoods without any protection whatsoever. High hopes quickly degenerated into high browsing rates, with nearly every single tree suffering rabbit or deer damage. As of 2025, the tallest surviving red oak from 2007's wholesale butchery measures 10 ft.

However, initial artificial regeneration efforts began in 1998, four years after the property was purchased, when the Toronto and Region Conservation Authority (TRCA) planted 4,400 trees, primarily white pine, white spruce, and European larch. As of 2025, over 16,000 trees have been planted on the property, including approximately 2,500 5-ft tree shelters. This year, the TRCA did infill plantings, adding about 500 shelters. Since it was purchased in 1994, the property has gone from 15% forest cover to 70% and features over 60 native tree species.

SITE

The property sits in Caledon at the northern edge of Ontario's Carolinian Forest, 35 km northwest of Toronto. As Cat Cybulski R.P.F. notes so eloquently in the 2023–2032 MFTIP she prepared for the site, "The property itself is a reflection of the mosaic around it, consisting of original hardwood forest, wetlands, conifer and mixed plantations both young and mature, and open field." The wetlands on the property are part of the Mount Wolfe Wetland Complex—a provincially significant wetland—and, accordingly, are enrolled in the Conservation Land Tax Incentive Program (CLTIP).

The soils are predominantly clay loam and vary from mesic in the bottomlands to xeric on the south-facing slopes, while the topography is gently rolling to flat near the riparian areas. As a result, there is significant variation in terms of moisture, which has affected the growth and vigour of plantings.

TREE SHELTERS 101

Tree shelters, not to be confused with tree guards, are plastic or cellulose tubes placed over seedlings and fixed to a stake to protect them from browse, reduce competition, and improve microclimate. A few of the best-known brands are Tubex, Tree Pro, and Plantra. They range in size (up to 6 ft) and are typically sold in bundles.

THE CASE FOR TREE SHELTERS

For high-value, small-scale plantings in areas prone to animal browse, tree shelters are invaluable. Tall stock is

often used in high-browse areas, but even this type of planting material is still susceptible to browsing. Furthermore, tall stock for species with deep taproots, such as hickory, oak, and walnut, requires extensive root pruning, which hampers survival, growth rates, and establishment.

The benefits of tree shelters are many: they provide physical protection and shield seedlings from mechanical damage; they create a greenhouse effect, which promotes faster and more vigorous growth; they are easier to spot in the field, which facilitates maintenance and monitoring and prevents accidental damage; and they are well suited to open field plantings because they prevent wind desiccation.

Tree shelters do have a few drawbacks, however. They are labour-intensive, require upfront costs, and require maintenance to keep them upright. Moreover, the lack of lateral branching makes the trees less wind firm, and animals and insects (ants especially) can create nests at the bottom. That said, in my experience, the pros far outweigh the cons.

A 3+0 shellbark hickory, planted in spring 2018, after seven growing seasons. Once established on favourable sites, this species grows quickly. November 2024.

A red oak from the 2007 planting. Year after year of deer browsing has stunted this tree entirely. Spring 2025.

150+ cm bitternut hickory from spring 2025 planting showing deer browse damage after one month. June 2025.

COST BREAKDOWN

Material	Sheltered Seedling	Tall stock (150+ cm)
Seedling	$4 (2+0, 3+0 for *Carya*)	$12
Stake (e.g., 3/4” PVC)	$4.50	–
Shelter (5-ft Tubex)	$5	–
Total (excl. labour)	$9.50	$12

Without factoring for labour, tree shelters, stakes, and seedlings are cheaper than tall stock. Some agencies, including conservation authorities, offer shelters, so do not forget to enquire!

SILVICULTURAL CONSIDERATIONS

The primary goals of my reforestation efforts have been (1) enhancing biodiversity by planting mast-producing species, (2) improving connectivity by linking the existing mature forest with the property’s riparian areas, and (3) focusing on climate resilience. The main driver underpinning this approach has been the relentless onslaught of invasive pests and diseases. Indeed, many of Ontario’s traditional mast species are under siege from diseases such as butternut canker, beech bark and beech leaf disease, and oak wilt; pests like spongy moth and hemlock woolly adelgid; and climate-related stressors.

Now that I have nearly run out of room to plant, the focus has shifted to forest management. Here are the main silvicultural objectives going forward in the Carolinian compartment:

- Retain trees with large, vigorous, and well-rounded crowns.
- Prioritize *Carya* spp. and manage oaks in a way that prevents root grafts.
- Continue infill planting of understory (e.g., *Amelanchier* spp.) to encourage vertical stratification.

Ultimately, the aim is to foster a structurally diverse, mast-producing forest that can support wildlife, resist disturbance, and continue to adapt over time.

"OAK, HICKORY, WALNUT, AND OTHER NATIVE HARDWOODS PROVIDE ENORMOUS ECOLOGICAL VALUE."

TIPS FOR SHELTERS

- Use PVC instead of wood stakes. For my initial plantings, I used 1" by 1" white oak stakes, double treated with latex stain. After a couple of years, however, many had rotted and needed to be replaced. The ideal solution, which I stumbled across on Reddit: ¾" Schedule 40 PVC. Just buy a 10-ft piece (about $9), cut it in half, and you have two stakes that will never rot. They can also be used for subsequent plantings.
- Prepare your site: Perennial weeds that make their way into the shelter are supercharged by the greenhouse effect and grow like, well, weeds. To avoid this issue, install the stakes either in the fall or later in the following spring before planting, once emergent weeds are receptive to herbicide. Then spot spray a broad-spectrum herbicide like glyphosate around the stake. Seedlings are also much easier to plant in prepared soil.
- Mulch your seedlings: Given that most landowners will use tree shelters for small-scale, high-value plantings, mulching with woodchips is an option. No need to go over the benefits of mulch.

Another option for those who prefer not to use herbicides: sheet mulch with landscape fabric. A cost-effective method is buying staples and landscape fabric from sites like Amazon and Vevor and creating your own mulch mats. For example, a 4 ft x 250 ft roll of weed barrier costs roughly $93 and yields fifty 4 ft x 5 ft squares. You will have to cut them by hand, but it is much cheaper than buying them individually. Keep them in place after planting and top with mulch for ultimate weed control and moisture retention.

CONCLUSION

After nearly two decades of reforesting our Caledon property, one lesson stands above the rest: successful establishment of mast-producing hardwoods requires more than good intentions. It requires strategy, persistence, and the right tools. Among those tools, tree shelters have proved to be the single most effective one I have adopted—especially for deep-rooted, slow-starting species like hickory and oak that are poorly suited to tall nursery stock and highly susceptible to browse.

More broadly, I believe mast species like *Carya* spp. will play an increasingly critical role in building climate-resilient, ecologically significant forests in Ontario. These trees are drought-tolerant, windfirm, and compensate for the decline of vulnerable species like beech and oak. As pests, pathogens, and extreme weather events continue to reshape our woodlands, we need to lean into species that can hold their ground—and feed the wildlife that depend on them.

Before and after. Left: Early stages of reforestation in 2013 with minimal canopy cover. Right: Same compartment in 2025, showing canopy closure and visible rows of white pine from 2007.

FOREST AND TREE HEALTH

READING THE SIGNS OF PROSPERITY, POTENTIAL, AND PERSISTENCE

By Jacob Wakelin, Forestry Technician, County of Renfrew, Renfrew County Chapter

There is no single definition of a good tree. A tree's value is determined by the services it provides or is perceived to provide. Think of the iconic depictions of eastern white pine in the works of the Algonquin School, the Group of Seven. Rarely did these artists choose the sprawling, towering, primeval giants as their subjects but rather, imperfect, stunted, and crooked individuals. A.J. Casson's 1957 work "The White Pine", for example, depicts a bent and wind-swept pine growing on a rocky outcrop. In portraying its bare and broken branches along with the green branches, the artist concedes that, while aesthetically pleasing, the tree is not a healthy and vigorous specimen that showcases the mighty and awe-inspiring potential of its kind. Nevertheless, many would argue this is a beautiful and valuable tree whose image contributes to an essential sense of identity and community through familiarity with the symbols of a shared landscape.

A.J. Casson, The White Pine, 1957.

For many, appreciating a tree is much less spiritual. Trees provide shade, habitat, food, and visual relief from relentlessly artificial urban landscapes. And for many woodlot owners, the value of the trees lies in the forest rather than the individuals themselves. But we can discuss tree quality in a more empirical way if we view it through the lens of forest health. Many think of forestry professionals as focused on tree qualities that support efficient use of fiber for forest products. Most forest managers, however, are as interested in tree health, forest health, and ecological integrity as they are about economically valuable trees. For the sake of communicating something of practical worth in this piece, I will provide the perspective of a tree marker and offer some thoughts that may help identify trees that are healthy, vigorous, and have the potential to persist for many years to come. After all, a healthy and diverse forest should provide a full suite of goods and services to any and all forest users.

Marking to improve forest health always starts with a prescription—a document prepared by a Registered Professional Forester who has assessed current forest conditions and provided guidance on marking that aligns with the direction of forest succession (i.e. the natural evolution of a forest type that sees age, structure, and species composition change over time). These professionals are your best resource for information about your forest. Although this article may provide some basic guidance in identifying healthy trees, there is no substitute for the insight and analysis of trained forestry professionals when it comes to forest management.

It can be useful to look at some of the broader characteristics of the forest as a starting point for determining tree health and potential. What species are growing? What is the soil like? And what is the history of the site? Not all trees grow equally well on different soil types, so it is important to know what species are suited to the site. Off-site species may be the result of previous management practices and are generally less vigorous and are at a competitive disadvantage to those naturally suited to the soil conditions. A sugar maple growing in coarse, dry, gravelly, soil may appear healthy at first glance, but if it is not getting the re-

Left: Suppressed eastern white pine, 19 cm DBH. Right: Vigorous young eastern white pine, 18 cm DBH.

sources it needs to grow at its potential, it may lack the energy reserves to combat pathogens and withstand environmental stressors such as drought. Knowledge of tree silvics and the conditions under which they thrive will help identify the kinds of trees that have the potential to be healthy and strong on a site. Digging in the forest can be an arduous task so look for upturned root masses that provide an opportunity to see what is below the surface. The online Soil Survey Complex, a detailed an interactive map of the province's soil conditions, is a great starting point.

Understanding that not all trees grow at the same rate is also important in determining the overall health and potential of a tree, particularly in young trees. The bark of two trees of the same species may appear so dissimilar as a result of differing rates of growth that it can lead to misidentification. Eastern white pine provides an excellent example of observable vigour characteristics. An "intermediate" species, white pine needs partial sunlight to thrive, and although it can survive under a closed canopy it will not respond well to finally being exposed to sunlight if it has spent too long under cover. Suppressed growth manifests itself most evidently in furrowed, thick, scaley bark even in apparently young (i.e. small diameter) trees. Although small, these trees are not young and may be the same age as much larger individuals in the immediate vicinity, having endured diminished access to resources and the correspondingly slow rate of growth. A young and vigorous white pine will exhibit smooth, tight bark almost all the way to the butt. If growth is exceptional, small cracks may be observed where the expansion of the bark is not able to keep pace with annual growth of the stem itself.

Acquaint yourself with the signs of rapid growth for the species of tree of interest to you; it is an accessible starting point for assessing health and potential and with time, it will improve your tree identification abilities as well. Species-specific Extension Notes published by the Ministry of Natural of Resources and Forestry (available in the OWA's online library) offer useful overviews of the character traits and life-cycles of common forest

Poplar with seam and hidden rot.

Large and healthy eastern white pine with a storm damaged branch.

trees, covering topics ranging from identification to common pests and diseases.

Tree and forest health depends to a great extent on the available resources and suitability to environmental conditions but can be heavily impacted by external and less predictable factors as well. Pests and pathogens can have a devastating effect on forested areas—the impacts of Dutch elm disease, the spongy moth, and the emerald ash borer are well known and easily observed. Identifying infected, declining, or diseased trees for removal is the job of the certified tree marker. But even without the practiced eye of an experienced marker some defects are easy to spot. Cracks, seams, and cavities (naturally occurring or those created by wildlife) usually mean rot. Visible or not, rot is almost certainly there as these wounds also create entry points for pathogens. Fungal fruiting bodies—the 'mushroom' growing out of the stem or the roots—are the visible signs of an infection that brings decay, decline, and the eventual death of the tree. If many individuals of the same species seem to be affected by a pathogen, perhaps that species is particularly vulnerable, which may affect its ability to thrive and persist in a given area. The Ontario Tree Marking Guide provides a brief but effective overview of common forest fungal pathogens and their identification. Bear in mind, however, that the visible portion of the fungal corpus may not be visible at all times of the year.

The changing climate is another major variable that will strongly affect the health of our forests in the medium and long term. Perhaps you have already noticed the effects of diminished rainfall, or the impact of more frequent damaging storms. As the changes unfold, forest owners and forest users will need to remain observant and note the ways in which trees are being affected. To put a positive spin on this change, think of it as an excuse to go into the forest and look at trees, good trees.

DOG-STRANGLING VINE AND ITS HISTORY

By Madhur Dahal, OWA Fleming College Cooperative Student, Kawartha Chapter

Dog-Strangling Vine (DSV) *(Cynanchum rossicum)* is a twining annual herb in the milkweed family. It was brought to Ontario from Ukraine more than one hundred years ago as an ornamental plant. Along with *C. nigrum* (black swallow-wort) and *C. vincetoxicum* (white swallow-wort), this is one of three alien species of swallow-wort that grow in the area.

DSV was first seen in Canada in 1885 in Victoria, BC, but did not establish there. In 1899, it was first seen in Ontario near Toronto Junction. The Ottawa Central Experimental Farm confirmed naturalization in 1931. This likely started as ornamental planting around 1905.

DSV is a noxious weed under Ontario's Weed Control Act due to its aggressive spread and environmental damage. It is now mostly found between London and Ottawa in southern Ontario and parts of the northeastern U.S.

HOW CAN YOU IDENTIFY IT?

DSV is part of the milkweed family and shares many of its physical characteristics. Its seed pods look a lot like milkweed but are more slender. The seeds are very similar, brown and oblong with tufts of white fluffy hair. Native milkweed grows from an erect stem however DSV grows as a vine commonly reaching lengths of 0.6 to 2 meters. In shady woods, it can grow up to six meters long. They coil around themselves or any nearby plants to keep them up. The vine that looks most similar to DSV in Ontario is Bittersweet (*Celastrus spp.*). The broad to narrow leaves are oppositely arranged, 7–12 cm long, have smooth sides, and pointy tips. The flower on the plant looks like five pointed stars and is about 5–7 mm across in the early summer.

WHY IS IT A CONCERN?

DSV has expanded almost three times from its Eurasian range in 100 years. Chemicals in its roots and fruits, like antofine, give it an advantage on this continent. This harms other plants growing nearby. Its leaves also release chemicals that harm other species when they break down. DSV gains an advantage over many native species by changing soil microbe and mycorrhizal fungi communities.

According to a New York study, DSV threatens 23 plants and six rare animal species. It also reduces the variety of insects, thereby also disrupting food webs for animals that eat insects. Monarch butterflies are especially affected. Females confuse DSV for milkweed (*Asclepias spp.*) and lay their eggs on its leaves. However, the leaves are poisonous to the milkweed larvae, so they are not able to feed and metamorphose into the next generation of butterflies. DSV becomes an ecological trap for monarchs and on top of that DSV will often replace milkweed plants in meadows and forest edges. The dense, matted growth of DSV makes it difficult for grassland birds to build nests, while also providing mice with warm shelter in winter. This shelter increases mouse survival but reduces the hunting success of raptors that rely on them for food.

DSV has a big effect on rare alvar ecosystems in the Great Lakes area by changing the groups of microbes in the soil that are needed for native plants to survive. DSV also impacts farming and gardening. Infestations have devastated New York orchards, Christmas tree plantations, and no-till corn and soybean fields. The vine blocks sunlight, water, and nutrients, and reduces plant rooting space. This can lead to land being abandoned because there are not enough effective ways to control it. Along with that, DSV is a home for insects and rust diseases that hurt pine trees.

HOW CAN IT BE CONTROLLED?

Early action is key. Once it goes to seed, DSV spreads fast. Most contractors and landowners aim to get control measures in place before the pods set—that is when the plant puts its energy into reproduction, and when control is most effective.

Mechanical and manual methods can be used for small infestations, but are often labour intensive. Hand-pulling or digging can eliminate DSV if the whole root system is removed from the soil. Mowing several times a year can prevent DSV from going to seed, mitigating the spread. Hand-pulling seedpods is another manual method for slowing down the spread. Finally tarping patches with heavy duty fabric can solarize the soil and 'cook' the DSV.

European moths, beetles, and flies have been tested as biological control agents. More research is needed but to date none of these have proven effective. Similarly there are signs of native insects feeding on DSV, but not to the point where it is affecting even individual plants enough to stop its spread. Some vegetation can compete with DSV usually by shading it out and/or producing its own allelopathic chemicals that hinder the growth of DSV. Black walnut and its production of juglone has been observed to inhibit DSV growth locally.

The most common way to deal with DSV infestation is herbicide. DSV patches are treated with selective or non-selective herbicides based on the other vegetation in the area. Herbicide is usually applied

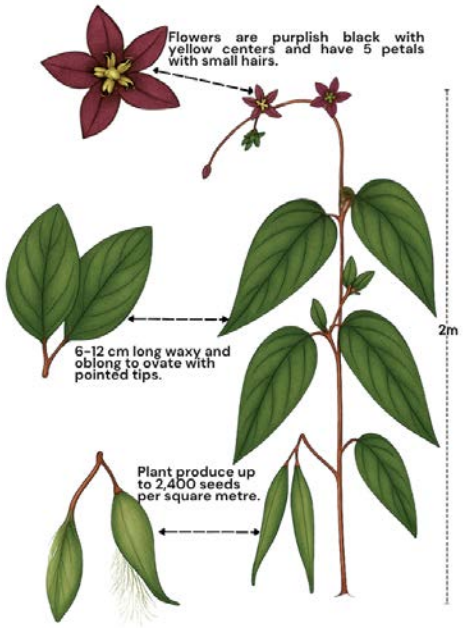


Illustration of DSV appearance.

through a foliar spray in early summer. Glyphosate (a non-selective herbicide) can be used later in the season and translocate down to the root systems. Areas often require multiple years of follow up.

CONCLUSION

DSV is a major threat to forests, meadows, alvars, and farms. Early detection and removal are key. Herbicide treatment is the best option for larger areas and allows natural regeneration or plantings to restore understory diversity. This can be laborious or expensive, but native plants, wildlife, and resilient ecosystems are worth it.

The Couchiching Conservancy and Nature Conservancy of Canada treated over 100 hectares of DSV-infested land in Carden Alvar, Ontario, offering hope. Multiple spot-spraying, manual removal, and close monitoring were used on dense monocultures over four hectares. Native grasses and wildflowers are returning as herbicide use drops each year. This project shows that with sustained effort and targeted treatment, large-scale restoration is possible.

For more information on DSV: Dog-strangling vine – Profile and Resources | Invasive Species Centre: https://www.invasivespeciescentre.ca/invasive-species/meet-the-species/invasive-plants/dog-strangling-vine/?gad_source=1&gad_campaignid=10379724192&gclid=Cj0KCQjwzOvEBhDVARIsADHfJJR-3rZPmp0XP4lpF3848ydjpGukQr9k9nhqZpt9e38dLAOI35y2HpfUaAgoIEALw_wcB

Editors' Note: The OWA acknowledges the significant contributions of the Canadian academic community to our knowledge of DSV and for references consulted in the preparation of this article.

A forested site dominated by DSV.

OWA QUINTE CHAPTER CHAINSAW SAFETY COURSE

By Mary Caldbick, Lower Ottawa Valley Chapter

On April 12 and 13, 2025, the Quinte Chapter of the Ontario Woodlot Association held a Certificate Chainsaw Safety and Operation Course. The course was hosted by Peter Kuitenbrouwer, writer, lecturer, Registered Professional Forester, and owner of a woodlot property in Madoc, Ontario. It was delivered by Marvin Kellar, a chainsaw expert who has worked in the forest industry for over 30 years and has done extensive safety training as an approved Ministry of Labour trainer. He currently works as an instructor at Loyalist College, and has been teaching the course there for over 20 years.

Marvin Kellar explaining chainsaw maintenance points to the group.

My journey to becoming one of the participants in the course began last summer when a tree at our family cottage in northern Ontario became hung up on a hydro line. After a HydroOne crew cut the tree down, all that remained was to saw it up along with other deadfall on the cottage woodlot, a task which would have the salutary effect of bulking up the cottage firewood pile.

The task of sawing up the felled tree, however, obviously required a functioning chainsaw and someone with knowledge to be able to safely use it. Fortunately, we did have a gas-powered chainsaw – an 80s era Pioneer purchased by my father that had fallen into disrepair through many years of neglect sitting in the tool shed at the cottage. As a first step in the wood cutting project, I took the chainsaw to a local small engine repair shop where the staff worked their magic and got it running like a charm[1].

Once that task was accomplished what remained was to learn how to use the saw safely and confidently. For that, my amazing partner Sara conducted research to determine where chainsaw courses might be available. She learned that there had been chainsaw safety courses offered in the past by the Ontario Woodlot Association and so we registered as members of the OWA to be able to receive notifications of upcoming courses. In March, we learned of the course offered by the Quinte Chapter and registered right away. Through the fantastic folks at the Quinte OWA Chapter, we were also set up with accommodations with Peter, who rents out his cabin in Madoc for short term stays. He was kind enough to offer Sara and me a place to stay for the weekend.

The next step was to acquire the proper protective equipment which included a helmet with visor and ear-muffs, protective chaps, steel-toed boots, and protective gloves. Also required for the course were proper files and fuel, oil, etc. for the chainsaws.

The course itself was amazing. It was advertised as being a two-day in class and outdoor practical course, appropriate for beginners and seasoned chainsaw operators and suitable for both men and women. It is safe to say though that Sara and I did not know quite what to expect in terms of the other participants. Would we be the only women taking the course? Would others be much more experienced in chainsaw use? As folks began arriving on the first day of the course, we were pleased to learn that the participants made up a diverse group, with both men and women of varying ages and degrees of experience using a chainsaw.

Instruction on day one was in class. Our course leader, Marvin Kellar, was fantastic. He was able to explain various

aspects of chainsaw maintenance and operation in a clear and engaging way. Using a model chainsaw, he explained basics of handling the chainsaw: how the brake works, how cutters and depth limiters on the chain work; when and how chainsaw kickback happens and what to do to avoid it. Marvin also explained proper cutting techniques, including types of notches used when felling trees, as well as how to cut trees lying on the ground. A key portion of the course was chainsaw maintenance, including selection of fuel and oil, filter maintenance, and how to file the chain to keep it in proper working order. He showed us some interesting videos including some demonstrating how not to cut trees. Hint: up on a ladder in your shorts trying to cut a heavy tree limb above your head is a no-go! Some takeaways were: never cut above your shoulders (anything that feels awkward or uncomfortable is a red flag) and always cut with a partner.

On Day Two of the course, it was time to put what we had learned into practice. We headed outside with our equipment and spent the morning learning to take apart and inspect the chainsaw, how to clean the bar and file the chain. Each participant took apart their chainsaw, inspected the chain and put it back together. We then fired up the saws to make sure they were all working smoothly. After lunch, we all headed out to Peter's pine woodlot, to work on felling trees. One by one, each participant took a turn at felling a tree under Marvin's supervision. We learned to properly clear the area around the tree and how to make a proper notch and then a back cut and finished with practice limbing the fallen tree. Marvin also demonstrated what to do with trees that get hung up, as well as situations requiring a metal wedge.

The final chapter to our journey came in June when Sara and I were back at the cottage. We were able to "buck up" the tree taken down last summer using the techniques and equipment we obtained through the course. We were pleased to be able to take apart and clean debris from the chainsaw and put it back together to continue using it. The old Pioneer worked like a charm, and our woodpile is bulked up for the season.

[1]*A special "shout out" to Alex at Danny Dear Service Centre in Ottawa, for getting the chainsaw back up and running smoothly.*

Course participants heading to Peter's pine forest to practice felling trees.

Course participant Kate McLaren felling a tree under Marvin's supervision.

The author, Mary Caldbick, in full gear with the Pioneer!

BIRDS CANADA FEATURED BIRD

CEDAR WAXWING

By Samreen Munim, Forest Birds at Risk Field Biologist, Birds Canada, Norfolk Chapter

CONSERVATION STATUS: Cedar Waxwing populations appear stable and have been increasing in some areas, possibly due to an increase in ornamental and invasive fruiting shrubs.

Cedar Waxwing. Photo credit: Jack Belleghem

IDENTIFICATION

Cedar Waxwings can be identified by their sleek crests, black eye masks, red tips on wings (absent on some), and yellow tips on tails. Cedar Waxwings differ from Bohemian Waxwings by a yellow belly, whitish undertail feathers, and brown-grey wings.

HABITAT

Cedar Waxwings breed in a variety of generally open habitats with trees and shrubs (e.g., open woodlands, old fields, urban parks, orchards, young pine plantations, and even up in the boreal forest). In winter, waxwings congregate in large flocks and travel widely in search of fruit.

DIET

Cedar Waxwings are one of the most fruit-reliant birds in North America. They especially like sugary fruits like cherries, hawthorn fruits, and crab-apples. In winter, they are often associated with cedars (hence the name!).

BREEDING BIOLOGY

They are one of the latest nesting species in North America, starting in early June, likely because of their reliance on berries. Nests are placed in the fork of a horizontal tree or shrub branch. Females do most of the construction, though males help collect material. Once the young have hatched, both parents feed the young, though male contributions drop after the first few days. The parents regurgitate food into the nestlings' mouths, unlike many other songbirds.

DID YOU KNOW:

When waxwings eat overripe berries, they can become intoxicated (and sometimes die) from the alcohol produced through fermentation.

The red tips on their wings are waxy secretions, and its function is still poorly understood.

Waxwings swallow fruit with the seeds which pass through undamaged. As a result, waxwings are likely important seed dispersers for several fruit-producing plants.

CHAPTER 4

WOODLAND BUSINESS

Understanding the many exciting opportunities of owning a woodland business and all that is available to help your goals and ambitions to be successful

SEEING A PLAN THROUGH TO FRUITION

By Andy Ross, Huron-Perth Chapter

I had a plan. Retire. Then plant the remaining 14.5 acres of cropland on my property in trees. I would spend my retirement tending my trees to give them the best start in life. I was preparing ahead. I saved up funds for the project. I did not have much budget information, but I guessed that about $1,000 per acre should get me some trees and a planting contractor. I also wanted some professional advice. This is where a site visit from the Maitland Valley Conservation Authority (MVCA) rearranged the schedule of my plan.

Geoff King (since retired from MVCA) liked my plan and informed me that my project should qualify for a rebate from the Huron Clean Water Project, (HCWP), and the 50 Million Trees program. If the planting was broken into three separate projects (three years), I could maximize the rebate. Besides, 14.5 acres was a lot to do in one year. If done right and done while the programs were still in effect, I might get all of my money back. Do I wait for retirement and risk having these grant programs being cancelled? …Nope. Retirement was planned for 2021, but I needed to start planting right away: fear-of-missing-out. My project was spread over 2017-2019 to maximize the grants. Sure enough, the province dropped the 50 Million Tree Program in 2018, but the federal government picked it up. That was good. And the Huron Clean Water Project (HCWP) carried on, and is still carrying on, with a maximum grant size of $5,000. In the end, my afforestation project cost me $0. I still had to put up the money (less the 50M trees input), but I received a rebate cheque after a satisfactory planting inspection each of the three years.

What to do with the money that I had saved up? My budget line said, "trees", not "cruise", so I looked for enhancements to improve the survival rate. I invested some of the money in a cover crop planted the fall before the trees went in; white clover. In particular, huia clover. Where it caught, it provided a thin but dense mat that smothered the weeds. Also, 1,800 tree tubes were purchased, along with the same number of wood stakes and mulch disks. The 4 ft high plastic tubes were intended to prevent deer munching. That worked, but they also acted as little greenhouses. Trees grown in the tubes reached much greater heights in the first two years than did the trees without tubes.

The HCWP rebate came with some conditions:

- Do not cut the trees for 15 years (does not apply to a new owner in the case of a sale)
- Must have a professional prepare a planting plan
- Must have a professional contractor plant the trees
- Subject to inspection after year 1 and year 5. Required survival rate: 60%. I achieved 90%
- Must ***attempt*** to reduce predation by insects, deer, mice.
- Cut weeds for the first 5 years.

These are easy conditions to meet. I wanted the advice of a professional anyway. My consultant and my contractor were the same: The Ausable-Bayfield Conservation Authority (ABCA). Although my property is in the Maitland watershed, ABCA contracts outside of their own area and are approved by the grant managers. When I met with Ian Jean of ABCA, his first question was, "What kind of forest do you want?" My dream was to have a hardwood forest from which someone, (not me), would harvest trees in about 80 years. Until that time, it would be a haven for wildlife and be an extension for our family's walking and ski trails. We already have 80 acres of mixed forest adjacent to this area. From previous woodlot tours with the Perth-Huron Woodlot Association, I already knew that the best strategy was to plant pine or spruce between each hardwood tree in order to suppress weeds and train the hardwoods to reach skyward instead of bushing out. Ian confirmed this strategy, but he also recommended planting every 4th row as all conifers. He explained that when the canopy closes over in about 20 years, the rows of conifers can be taken out to let more light in… Then there is also an access corridor for future maintenance or harvesting equipment. I had not thought of that. It sounded like a good plan, but I asked if we could make it every 5th row instead. "Sure. No problem."

The next question: "What kind of hardwoods do you want?" My answer was for the largest variety possible. My heart goes out to anyone who planted a grove of ash trees 25 years ago. So, ash and beech were out. The list was as long as the nurseries' menus each of the three years: sugar maple, red oak, white oak, bur oak, black walnut, black cherry, white birch, tamarack, sycamore, bitternut hickory, shagbark hickory, tulip. Huron County is at the northern edge of the Carolinian zone, but that zone is creeping north. Some of these Carolinians should do alright. Naturalized trees are also sprouting up; seeded from the perimeter forest and fence line. There are elm, apple, sweet cherry, and ash that were never on the planting list. The best black walnut tree is in a row that was only planted in white pine.

At the planning stage I was preparing for some push-back from some of the local farmers. The land has been fairly

Huron Clean Water Project sign on Andy's property.

productive. I was braced with arguments for when I had to break the news to my tenant farmer, Roger, "Trees are a crop too…."It can be restored to cropland 80 years from now." My prepared defence was totally unnecessary. Roger replied, "It's not a bad idea." It turns out, the small, irregular fields were annoying to work with the wider machinery. The yields would have been good except for the tax imposed by the deer, racoons and turkeys that came out of the adjacent forest. In fact, Roger offered to frost-seed the clover cover using a spreader mounted on his ATV. I miss the rental income, but it is worth it to witness the regeneration; the hundreds of species that have moved in to replace the monoculture of industrial food production. I am a fan of food. But there are other places for that. Perhaps it will be back here in 80 years when the soil has been recharged.

The grant money was an amazing incentive to start the plantation four years ahead of schedule. But the savings did not stop there. Once the plantation was complete, I decided to register the combined 95 acres of trees with the Managed Forest Tax Incentive Program, MFTIP. Back came Ian Jean from ABCA as my trusted consultant. We had an interview, and Ian did his traverses of the property. The cost of the report was $1,071. However, I had over 10 acres of wetland in my forest, so Ducks Unlimited sent me a cheque to rebate 40% of the cost of the MFTIP. I just had to sign a document saying that I would not develop my wetland for at least 10 years. Now the real cost of the MFTIP report was down to $643. My property taxes dropped by a little more than that, so the payback period was just under one year. The thing is, the MFTIP report is good for 10 years. Not counting interest and inflation, my return on investment is about 1,000 percent. And there is a bonus: the report. After spending a few minutes rolling around in the money that I had saved, I cracked open the report and actually read it. It was beautiful. Ian had carefully documented the family history on the property and laid out our short and long-term goals. He had provided recommendations and strategies for areas where thinning would be appropriate. He identified some invasives just starting to emerge that would need attention. He even suggested target areas for firewood harvests: a beech stand where disease was likely to kill trees faster than I could harvest them.

Without the incentives of the Huron Clean Water Project and the 50 Million Tree project I probably would have carried out my plan anyway. However, these programs accelerated the project by 4 or 5 years, and the success of the project was increased by the extra resources available and the professional advice and work provided. Check out what supports or incentives are available in your region. Your Conservation Authority staff may know of some opportunities, even if they do not hold the funds themselves.

Tree planting and the outcome...

A raptor perch.

Jasper enjoys a jaunt within the young growing forest.

The author Andy Ross checks out some oak in his woodlot.

KNOWING WHEN TO CUT

LESSONS FROM HALDIMAND COUNTY'S PYLE WOODLOT HARVEST

By Adam Chamberlin, R.P.F., Project Manager, Forestry, Haldimand County, Brant Chapter

One of the most important and challenging decisions associated with owning a woodlot is knowing when to harvest. Harvesting too early removes trees before they reach optimal size, resulting in lost income. Waiting too long to harvest can lead to declining tree health and increased risk of mortality from pests, disease, or wind damage in overmature stands. When timed correctly, a harvest conducted following Good Forestry Practices can unlock sustainable economic returns for woodlot owners while protecting long-term forest health. Harvests of the Pyle Woodlot demonstrate that by following five key steps: stand analysis, identifying basal area targets, tree marking, understanding timber markets, and post-harvest evaluation, woodlot owners can better determine the optimal timing for harvesting to maximize both economic returns and long-term forest health.

STAND ANALYSIS

A stand analysis is an inventory of the trees within a woodlot. It involves walking through a forest with tools to measure diameter, a prism lens to measure basal area, and a clipboard to record tree species, size, and health. Basal area measurements are collected to assess tree density and estimate the volume of wood growing in the forest.

Basal area is a measurement of the cross-section of a tree measured from the base of the tree at 1.37 metres (4.5 feet). Visualize a hectare of trees cut off at 1.37 m and then measuring the surface area of each tree where it was cut. Adding up the surface areas of all trees gives you the basal area of that hectare.

In 1999, the Haldimand and Area Woodlot Owners' Association (HAWOA) and forestry professionals conducted a stand analysis of the Pyle Woodlot. The analysis showed a pre-harvest basal area of 28 m^2/ha composed primarily of red oak, sugar maple, white ash, basswood and bitternut hickory.

IDENTIFY BASAL AREA TARGETS

Before harvesting, it is important to identify the basal area targets for the forest type. Basal area targets are recommended levels of tree density, directing tree growth toward management objectives such as sawlog production, old-growth characteristics, or wildlife habitat. Basal area targets help ensure trees are harvested when they are valuable sawlogs, while leaving the right density for vigorous regrowth and wildlife habitat. Harvesting based on these targets supports long-term, sustainable income rather than short-term gain followed by long recovery periods.

The Ministry of Natural Resources (MNR) Silvicultural Guides and forestry extension notes on the OWA website are excellent resources to identify basal area targets. The recommended basal area for the Pyle Woodlot for sawlog production is 20 m^2/ha across the following trunk diameter sizes.

- Polewood (10 - 24 cm): 4 m^2/ha
- Small Saw Logs (26 - 36 cm): 5 m^2/ha
- Medium Saw Logs (38 - 48 cm): 5 m^2/ha
- Large Saw Logs (50 - 60 cm): 4 m^2/ha
- Extra-large Saw Logs (60+ cm): 2 m^2/ha

Based on the species, age, composition, and location of the Pyle Woodlot, a tree marking prescription was developed to guide harvesting once the basal area reached 28 to 30 m^2/ha. The prescription recommended reducing the basal area to 17 m^2/ha.

TREE MARKING

Tree marking involves the careful selection of individual trees to be harvested, while leaving trees to grow for future harvests and to provide habitat. The MNR Certified Tree Marker Program and the Ontario Tree Marking Guide are great resources to learn how to identify and mark trees in your forest.

Trees to be harvested are identified as either Acceptable Growing Stock (AGS) or Unacceptable Growing Stock (UGS). AGS trees are healthy, well-formed, and have good potential to grow into valuable timber for the next harvest cycle. UGS trees are poor quality, diseased, or damaged and unlikely to survive until the next harvest cycle. When marking trees, it is beneficial to start by removing the UGS trees and retaining AGS trees in the forest. This will help ensure strong future growth, better wood value, a healthier forest and increase the value of future harvests.

It is important to identify and mark trees that provide important wildlife habitat for protection during harvest. Mast-producing species like oak and beech, cavity trees used by nesting birds and mammals, scattered conifers for winter cover, and trees with stick nests. Protecting these features during harvest helps maintain biodiversity.

TIMBER MARKETS

Before selling timber from your woodlot, it is important to understand what it is worth. Timber prices can vary depending on the species, quality, volume, and dis-

tance to the nearest mill. To get a sense of current rates, contact local mills, log buyers, or forestry consultants who are active in your region. Speaking with more than one buyer is recommended to ensure you receive fair value for your trees.

Call before you cut! Make sure to consult with your local forest conservation officer to see if a permit is required before starting to harvest.

During the 1999 harvest of the Pyle Woodlot, 154 trees were cut, which produced over 29,000 fbm (board feet) and 53 cords of firewood, which generated $17,500 in revenue.

EVALUATION

It is important to assess if the harvest met your woodlot management goals and that your forest is on track for healthy future growth. Regular post-harvest evaluation helps woodlot owners learn from each harvest and make improvements for future harvests. As you complete subsequent stand analyses, you can evaluate the productivity of your woodlot and develop a sustainable harvest rotation.

In 2023, Haldimand County updated the Pyle Woodlot stand analysis, which showed that the basal area had rebounded to 30 m^2/ha and was ready for a second harvest. The tree marking prescription recommended reducing the basal area again by a third to the optimal basal area of 20 m^2/ha.

During the 2024 harvest, 123 trees were cut, which produced over 56,900 fbm (board feet) and 89 cords of firewood, which generated $18,600 in revenue.

An evaluation of the 2024 harvest showed:

- Tree quality improved with fewer UGS trees and more high-value AGS trees to be harvested.
- The 2024 harvest produced 39,400 more board feet from fewer trees than the 1999 harvest.
- Lower market value in 2024 than in 1999, resulting in less revenue for the board feet harvested.
- The 2024 harvest averaged $151/tree compared to $114/tree in 1999.
- The 2024 harvest has encouraged Oak regeneration within the previously barren understory.

The 2024 harvest was well-timed from a silvicultural and forest health perspective, yielding high-quality trees and strong regeneration. However, due to lower market values for sawlogs, the financial return was less optimal than in 1999. The challenge for woodlot owners is striking a balance between ecological conditions and market timing to maximize both long-term forest health and economic return.

If the growth trends from 1999 to 2024 continue, the basal area should return to 30 m^2/ha in 2043. This means that a sustainable harvest rotation for the Pyle Woodlot is between 19 - 20 years. Every woodlot grows differently due to previous management practices, climate, species, moisture, and soils. A highly productive site may be able to be cut every 15 years, whereas a site with low productivity may only be able to be cut every 30 years.

CONCLUSION

Knowing when and how to harvest your woodlot is key to maintaining its long-term health and productivity. As demonstrated by the harvests of the Pyle Woodlot, starting with a stand analysis, setting appropriate basal area targets, marking trees carefully, understanding timber markets, and evaluating outcomes can help woodlot owners achieve both economic returns and maintain ecological integrity.

Every woodlot is unique, and applying these practices can vary depending on local conditions such as species, soil quality, and past management. If you are unsure how to apply this information to your woodlot, working with a forestry professional can help ensure it is managed sustainably.

Pyle Woodlot during harvest.

Pyle Woodlot log pile.

Pyle Woodlot post harvest.

Pyle Woodlot post harvest with oak regeneration.

NEW ZEALAND TO ONTARIO

A KIWI FORESTER'S CANADIAN CHAPTER

By Phoebe Milne, OWA Forester, Young Professional Foresters Exchange Program, Canadian Institute of Forestry (CIF)

I am back in New Zealand after nearly four months in Canada as part of the Young Professional Foresters Exchange Program. This program is an industry initiative designed to grow global connections, deepen professional knowledge and support the next generation of foresters across New Zealand (NZ), Australia, Canada, and the United Kingdom. It was an honour to be selected as a participant of the 2025 exchange cohort and spend three months working with the OWA from March to May.

Field day out at a GreenFirst harvest site.

Forestry has always been part of my life. I grew up in and around my parents' forestry nursery near Christchurch, NZ, and have spent considerable time travelling the South Island of New Zealand, visiting farms and forests, with my dad who is a Registered Forest Consultant. Choosing forestry as a career felt natural as I came to recognise its value as a primary industry and the diverse range of career pathways it offers those of us lucky enough to work with the woods. I graduated with a Bachelor of Forestry Science from the University of Canterbury in 2021. Now, I work for Matariki Forests helping to manage an estate of 120,000 hectares (ha) of *Pinus radiata* (radiata pine) forests across New Zealand. My current role as Forest Planner sees me focused on estate woodflow planning, valuation, and growth and yield predictions.

Forestry in New Zealand is distinctly split between native and plantation forests. Our native species are endemic, with forests dominated by beech species and *podocarps*, a genus of evergreen trees and shrubs. As is common across much of the world, human settlement in NZ has been coupled with significant deforestation and forest loss through burning. A lot of the remaining native forests are on public land and managed by the Department of Conservation for recreation, cultural, conservation, and biodiversity values. To preserve the remaining native forests, no harvesting occurs. Instead, our production forestry industry relies on exotic plantations, of which 90% are radiata pine.

Native to California, radiata pine is very productive across NZ and has subsequently been scaled for commercial use. It is versatile, used for a wide range of end uses including construction, appearance grade products, and engineered wood products. Today, NZ has 1.8 million hectares of plantation forests, mostly privately owned, managed on a 25-to-30-year clearfell rotation[1], with the majority of stands producing between 400 – 900 m^3/ha at harvest. Total annual harvest sits around 35 million m^3 and 60% of this is exported as logs, primarily to Asia.

My time with the OWA provided a fresh perspective on forestry, completely different to the plantations I am familiar with at home. The OWA has parallels to NZ's Farm Forestry Association as an organization which represents small growers and fosters connection through 'branch' (chapter) events, field days, and an annual conference. I was struck by how Ontario's private forestry is largely unregulated compared to its equivalent on Crown land, making the OWA's work, of championing sustainable forest management, all the more important. It was also inspiring to see how the OWA has scaled its operations in recent years to deliver projects that benefit not only its members, but the wider industry across southern and central Ontario.

My Canadian forestry experience was diverse and gave me a well-rounded

understanding of what drives forestry in Ontario. It spanned forestry across urban, private and Crown settings, from nursery to sawmill, and winter snowfall to spring flush. I attended industry conferences, worked across a range of forest types, and visited both small private woodlots managed for non-timber values as well as large commercial blocks. Throughout the trip I had the privilege of connecting with passionate and knowledgeable foresters and landowners. Everyone was welcoming and generously shared both their time and expertise. This shaped my Canadian experience, and I am very grateful to the OWA team and all the members who welcomed me so openly.

A typical New Zealand landscape comprising some recent cutover in the foreground, native bush through the middle with plantation pine, and pasture in the background.

Throughout my trip I experienced Ontario's forests from the Carolinian hardwoods in the south, through the transitional forests of the Great Lakes - St. Lawrence region, and up to the boreal forests in the north. Each came with its own surprises. Managing forests using single tree selection and shelterwood harvest systems is something I learned at university but had never seen in practice. It was great to live the process of getting out with a prism to measure basal area, tree marking for selection, and then harvesting to manage forest structure and enable regeneration of target species. True forestry, some would say!

Standing with a 30-year-old radiata pine in Hawke's Bay, New Zealand (diameter about 80 cm).

Learning about tree-marking with the MNR, standing beside a red oak marked to keep!

Moving north, I took the opportunity to visit GreenFirst Forest Products operations in Timmins towards the end of my placement. Many Canadian foresters had told me that northern forestry is more like New Zealand's. They were right, it was more familiar than single tree selection in hardwood stands. Still, my mind was blown seeing the expansive, flat forest areas and learning that rotations are >80 years, a good clearfell yield is 100m^3/ha and logs >40cm are too large to go through the sawmill!

It was also interesting to learn about the industry dynamics in the province, especially how the lack of a viable pulp market is limiting the industry. In New Zealand we are lucky to have strong export demand for much of our pulp grade product. However, four domestic pulp or paper mill closures in the past year illustrates the industry's challenges with rising energy costs, weak markets and expensive upgrade requirements. Domestic biomass opportunities are emerging, such as Fonterra (a large dairy company) trialing converting coal boilers to wood pellets. While such initiatives show promise for creating a new market for low-value forest products, they currently remain unscaled.

There were many highlights from the varied nature of my work program. A classically Canadian standout was maple syrup. During the sap season I visited sugar bushes of different scales, saw the importance of maple syrup as a non-timber forest product and came away with homemade maple syrup for

my pancakes! A couple of weeks were spent plotting in the Ottawa area as part of the data collection program for the OWA's inventory project. Through this I became well acquainted with a maple swamp, got my money's worth out of my rubber boots, and improved my North American species identification. I spent time with the City of Ottawa learning some of what goes into building and maintaining an urban forest, the importance of which feels much more developed in Canada than at home in NZ. I finished my placement on a high with the International Model Forest Network Global Forum (IMFN) and the OWA Conference and Woodlot Tour. A lot of time was spent building up to these events, working alongside the IMFN Secretariat and Global Landscapes Forum (GLF) to bring the weeklong event to life. It was a powerful reminder of the strength of global connections and testament to the rich history of the Eastern Ontario Model Forest.

Opportunities to compare and contrast forestry between Canada and NZ were not limited to scale, species, and structure. Reoccurring themes emerged, none more so than climate change, erosion control, and the impact of invasive species.

Canada's vast land borders present unique challenges for biosecurity, whereas NZ benefits from the natural barrier of the Pacific Ocean and Tasman Sea. However, even this can be overcome as evidenced by the fungal disease 'myrtle rust', which blew over from Australia in 2017 and impacts our native *Myrtaceae* species like pōhutukawa and rātā. New Zealand's heavy reliance on radiata pine means keeping its key pests and diseases out of the country is critical to maintaining a viable forestry industry.

It was particularly interesting to learn how pine plantations have been used for erosion control, and to facilitate conversion to mixed hardwood stands in Ontario. Both are relevant in NZ today. The use of pines to transition to native forest has become more popular with NZ's Emissions Trading Scheme incentivizing 'permanent forestry.' However, success of the practice is largely unproven at scale and will not occur without pest control, underplanting, and other management interventions.

In NZ, one of the most significant impacts of climate change is going to be an increased frequency of severe weather events. Recent events have highlighted the risk associated with managing forests on highly erodible soils and steep terrain, even when these forests were planted to mitigate the effects of erosion in the first place. In these cases, the rainfall intensity is often great enough that erosion occurs under forested areas. The resulting addition of woody debris to already significant sediment depositions has since sparked widespread public criticism of forestry.

Reflecting on my time in Ontario, the memorable experiences were not limited to forestry. The weather and wildlife provided stories for my return home. Seeing bears, moose and beavers ticked off my 'Canadiana' checklist, while waking up to spring snowfalls and the April ice-storm were extremes I am not used to. Weekends were spent exploring the province, from Niagara in the south, Tobermory in the west, up to North Bay and out east to Montreal and Quebec City. I was then lucky to cap my time off with a summer holiday on the west coast exploring the Rocky Mountains and Vancouver Island, which rounded out my time perfectly.

This exchange was an opportunity to refresh some broad forestry principles, expand my perspective and network, and to be reminded that, no matter where we are in the world, good forest management is rooted in the same core values.

A massive thank you to everyone who I met, worked with, stayed with, and shared stories with. I have returned home richer for the experience.

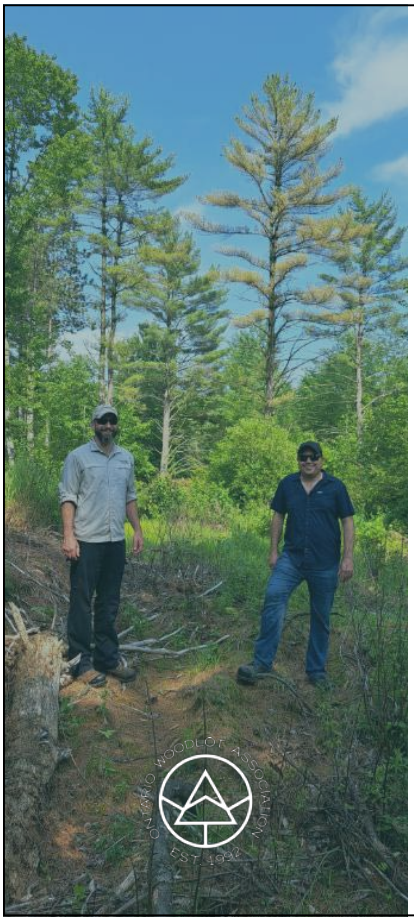
For more information about the CIF's Young Professional Foresters' Exchange Program: https://bit.ly/45FHswZ

Pohutukawa (known as New Zealand's Christmas tree) in flower in December. One of the species impacted by myrtle rust's arrival from Australia.

Mel and I at the registration desk on day one of the IMFN Global Forum.

An early morning at Moraine Lake – ticked that one off the bucket list!

[1] *A clearfell rotation refers to the cycle of growing a forest stand to maturity, harvesting the trees in a single operation, and then replanting to begin the next rotation.*



Telling the story of silviculture practices

Are you a great record keeper? Or was your woodlot planted under the Woodlands Improvement Act (WIA) or managed by the Ministry of Natural Resources?

If so, consider submitting these silviculture records to the **Silviculture History Library**.

Now in its final year, this project collects and digitizes historical records of silviculture on private lands. The OWA is working with stakeholders to **preserve this history** in a digital map layer as part of the Private Land Forest Inventory project.

We're especially seeking records from the WIA or other forest assistance programs showing treatments like **planting, site prep, or tending** from the past century.

All documents and personal information will remain **confidential**.

We are also seeking volunteers to **visit local archive offices**. No prior experience necessary.

To inquire or submit records, please reach out to Sionaid.eggett@ontariowoodlot.com.

DUFFERIN COUNTY FOREST AND CONSERVATION TOUR JUNE 13, 2025

By Jim Farrell, Lower Ottawa Valley Chapter (borrowing generously from Terry Schwan's tour guide)

It was a gorgeous spring day with enough sun to keep you comfortable and just enough breeze to keep the bugs at bay. The 6th Forest History Ontario tour attracted a record 40 attendees and made for a full bus of enthusiastic history buffs. It should be noted that apart from tour director Terry Schwan the only other tour member who has joined all six tours is dedicated history buff, Ken Reese. The group assembled at the Museum of Dufferin in Mulmur Township and generally followed a 1939 field day sponsored by the Counties of Grey and Dufferin with the goal of inspecting various forest plantings in the two Counties.

Participants gather for the Dufferin County Forest and Conservation Tour.

The FHO tour series, aptly named the *Rewards of Planting Trees* explores the natural and planted forests across southern Ontario with the goal of learning about their origins, history, current management regimes, and future plans.

By 1900 much of Dufferin County's forest was cleared for agriculture and with the loss of tree cover not only were winter jobs for farmers lost, but the light soils degraded making even farming very difficult. In the early 1900s land reclamation began and gradually more properties were returned to forest. In 1993 the County decided to commission a forest management plan for their forest holdings and a couple of years later recruited a full-time permanent County Forest Manager, Caroline Mach, the first in Ontario. Today, the Dufferin County Forest covers an area of just over 1,000 hectares.

The first stop was at the Main Tract for introductions and to view a Centennial Year (1967) planting. A young Greg Greer planted this now 53-year-old plantation when he just started out with the Department of Lands and Forests.

The second stop was at the Simmons Tract named after one of the recent owners, John F. Simmons, District Forester for the Lake Simcoe District. Simmons' colleague, forest researcher, Andrew Leslie established a very species-diverse collection of forest parcels in the area and tested a number of fir species as Christmas tree options. A most interesting feature is the very healthy specimens of white fir (*Abies concolor*), a tree which is native to the western US but also widely planted in Canada.

The next stop was the Randwick Tract, which was almost entirely red pine plantations, but a recent addition was a small planting of butternut whose parentage has shown some signs of resistance to canker. Interestingly, in the spring of this year an emergency thinning was undertaken to harvest candidate red pine trees to replenish local supplies of utility poles following the devastating ice storm in March 2025.

The next stop, the Little Tract, again named after an original owner, was as close as one could imagine to being classified as 'old growth' given tree sizes, ages, composition, and understory vegetation. Of note is that in the 1990s over 35 American chestnuts were planted in the tract and by all appearances are doing very well. Native American chestnut, whose primary range was in the eastern United States and southern Ontario, was almost entirely eradicated due to an invasive blight.

The next stop, the Thomson property, provided a backdrop to the story of the Thomson/Somerville families whose lineage in the area goes back at least four generations. A legacy of those years of determination and very hard work is Somerville Nurseries Inc., headquartered

in nearby Everett. We were graciously welcomed to this property by John Thomson, patriarch of this magnificent hardwood property that has been carefully managed by Greg Greer for decades.

After a very hefty lunch in nearby Simcoe County at the Earl Rowe Provincial Park the group continued on to visit the Beattie Pinery which is now a Provincial Nature Reserve. It is one of the most mature, least disturbed, and healthiest white pine, red pine, and sugar maple upland forests in southern Ontario. This 68-hectare forest contains many white pine well over 100 years of age.

The last stop of the day was back to the Main Tract north of Mansfield. This was the first property bought by Dufferin County in 1930 and at 606 ha is by far the largest. There are numerous hiking trails throughout the actively managed maple-oak and pine plantations. Its history includes a 1930s relief camp for young men and a young offenders detention camp from the 1970s to the early 1990s. These young men learned forestry skills as well as life skills.

After a full day with much seen and learned the group returned to the Museum of Dufferin at 4:00pm with all in agreement that this had been a very educational and entertaining day spent in the woods…and on the bus!

Much of the credit for spearheading this tour goes to Terry Schwan, dedicated forester and history buff (also an FHO Board member). Excellent guidance, historical information and anecdotes and advice were provided by Dufferin County Forester Kevin Predon, recently retired County Forester Caroline Mach, and local forestry consultant and keeper of vast stores local knowledge, Greg Greer.

Forest History Ontario is particularly grateful for the generous financial support from the County of Dufferin without which this tour would not have been possible.

It was announced that the 7th field tour is being planned for Simcoe County in 2026, so stay tuned.

Concolor fir in the Simmons Tract.

Caroline Mach.

Greg Greer.

Kevin Predon.

Red Pine Poles in the Randwick Tract.

BRINGING A FOREST TO A CITY

CELEBRATING 25 YEARS OF AN URBAN TREASURE

By Bryan Code and Megan Smith, Algoma Chapter

This past spring, Algoma Chapter members were pleased to participate in a celebration of a small urban forest located at the Roberta Bondar Building in downtown Sault Ste. Marie. The celebration was to mark a quarter-century since the Millennium Forest first took root.

Situated on the grounds of the Roberta Bondar Building sits a small urban treasure. The forest may be small, but the efforts to establish it were not, and there is a unique story behind the Millennium Forest.

Millennium Forest at the Roberta Bondar building in Sault Ste. Marie (May 2024).

BACKGROUND

The Roberta Bondar Building, constructed by the Ontario government, opened in 1991 to house government ministries and agencies which were relocated from Toronto to Sault Ste. Marie. Among them was the Ministry of Natural Resources, specifically parts of that ministry responsible for forest management, fire management and aviation services.

The relocation brought many new professionals to the city – foresters, ecologists, fire scientists and others charged with the responsibility of managing Ontario's forests. As the year 2000 approached, some employees wondered how to celebrate the new millennium.

The green lawn outside the building was a stark contrast to the millions of hectares of Crown forests that were the focus of their daily work. It seemed like the perfect place to establish a small urban forest – one representing Ontario's Boreal Forest and the other representing the Great Lakes – St. Lawrence forest.

ESTABLISHING THE FOREST

Establishment of the Millennium Forest took place from May 8 to 12, 2000 and was supported by many local organizations. Over 50 volunteers participated throughout the week to transform the site into a young forest. Sod was removed and replaced with plant species common to the two forest ecosystems. For Boreal forest vegetation, transplanted material came from sites near the Sault Ste. Marie airport, and for Great Lakes - St. Lawrence forest vegetation, sites were found north and west of the city. Not only were trees and shrubs planted, but metre-square patches of ground vegetation were also carefully relocated to the site to mimic conditions found naturally. Vegetative mats were cut and placed in one metre fabricated frames and delivered by trucks to the planting site. Larger trees were donated by the Ontario Forest Research Institute.

Since then, the forest has been allowed to develop as naturally as possible and most of the tree species and understory vegetation has survived their transplanting 25 years ago. Within the forest are tree species representative of the Boreal Forest like jack pine, trembling aspen, white birch, and white and black spruce. You will also find tree species of the Great Lakes - St. Lawrence forest such as white and red pine, red oak, and sugar and red maple. Birds and other wildlife occupy the area. A beaver has also shown a healthy appetite for the forest, managing to chew down numerous deciduous trees to take into the nearby St. Mary's River.

THE CELEBRATION

To commemorate 25 years, Forest History Ontario (FHO), the Northeastern Ontario Section of the Canadian Institute of Forestry (CIF), and the Ministry of Natural Resources (MNR) organized a celebration on June 5, 2025, which also aligned with World Environment Day. Events included an unveiling of a new educational resource, a ceremonial tree planting, and a gathering at the Roberta Bondar Pavilion across the street.

Group photo of the Millennium Forest celebration in Sault Ste. Marie on June 5th, 2025.

One goal of bringing the forest to the city, was to serve as a long-term education and environmental resource for the community. As such, a new informational plaque was added to the site to mark the 25th anniversary. Visitors can scan a QR code to read about the history of the Millennium Forest and to learn about the tree species on site. To add to the diversity of the forest, an eastern hemlock was planted to mark 25 years.

The celebration at the Roberta Bondar Pavilion provided a platform for forestry-related organizations to engage with the local forestry community and learn from like-minded conservation organizations in the area. The Algoma Chapter was one of ten exhibitors on hand to promote our initiatives and engage the public. A big thank you to the organizers for including OWA in the celebration.

Bryan Code, OWA Algoma Chapter Board member made a poignant comment at the conclusion of the event:

"I have lived most of my life here in the Sault, and sadly, was unaware of this amazing natural model. The scope of the community contribution to the project 25 years ago was truly exceptional."

Learn more about the Millennium Forest

En savoir plus sur la Forêt du Millénaire

SCAN HERE

scannez ici

Left to right: Peter Henry (MNR), Fraser Dunn (FHO), and Bob Elliott (CIF), representing each of the organizations that hosted the event.

Left to right: OWA Algoma Chapter Directors Bryan Code, David de Geus and Geoff Meakin.

ONTARIO WOODLOT ASSOCIATION
10 - 4 Campus Dr.
Kemptville, ON K0G 1J0

CANADA POSTES
POST CANADA
Postage paid Port payé
Publications Mail Poste-publications
40038034

CONTACT OWA:
10 - 4 Campus Dr.,
Kemptville, Ontario, K0G 1J0
Tel: 613-713-1525
info@ontariowoodlot.com
www.ontariowoodlot.com

Upcoming Issues of *The Ontario Woodlander*

Our Winter 2025 issue will include the detailed proceedings of the International Model Forest Network (IMFN) Global Forum that took place at Kemptville Campus in our Lower Ottawa Valley Chapter this past May. A selection of articles highlighting the presentations and field tours offered during our annual Woodlot Tour and Conference that was held concurrently with the IMFN Global Forum, will also be included. For many of the 400 participants mingling and networking at these two overlapping events, with the timely thematic focus "Act Locally… Think Globally", it was the experience of a lifetime! The reviews and feedback have been completely positive. This issue will be a must read for anyone who was not able attend this year, providing a comprehensive summary of all that happened! It will also be a wonderful keepsake for all who did make the trek to Kemptville.

SUBMISSION DEADLINES

Issue:	Deadline:
Spring	Feb 1, 2026
Summer	May 1, 2026
Fall	August 1, 2025
Winter	November 1, 2025

We encourage members to submit articles for publication, classified ads, questions or comments. Your feedback is encouraged and always welcomed. Please submit to the address listed in the masthead, to the left.

ADVERTISING INFORMATION

As a service to OWA members, limited space will be made available for forest management related, non-commercial ads. For example, to find a forestry contractor to do some work, buy or sell a piece of forestry machinery. The classifieds are available to members at no charge (maximum of 30 words).

Print and digital advertising space is also offered to commercial enterprises.

For information contact:
info@ontariowoodlot.com

FOLLOW THE OWA ON SOCIAL MEDIA:

Ads placed in The Ontario Woodlander do not imply OWA endorsement of these products or services. We encourage readers to ask questions and act as informed consumers.