

Acknowledgements

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**FEDERATION OF
NOVA SCOTIA
WOODLAND
OWNERS**



FREYA FORESTRY



**HARRY FREEMAN
& Son limited**

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Executive Summary



Tolerant hardwoods, Walden, NS

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Forest certification is gradually becoming more commonplace throughout the Maritimes and around the world. Forest certification was developed as a means to allow people to choose forest products coming from well-managed forests, thereby helping to promote responsible forestry, and giving recognition to those who take good care of their woodlands.

This is a guide to certification under the Forest Stewardship Council (FSC) program. The FSC is an international, non-profit organization that promotes responsible forest management around the world. Part of the strength of the FSC is that while the organization is international, all of the forest management work happens at a local level. FSC-certified woodland owners in Nova Scotia have a certification that is recognized around the world, but the process to get the certification is based on a standard of best practices that is specific only to the forests of the Maritime Provinces.

The Mersey Tobeatic Research Institute created this guide to help woodland owners gain a better understanding of FSC forest certification, and to provide answers to some common questions woodland owners might ask when considering forest certification, and whether to join a group of certified woodland owners.

Specifically, this guide attempts to answer the following questions:

- What is forest certification, and what is the Forest Stewardship Council?
- What benefits can certification offer to woodland owners?
- What does a woodland owner have to do to become certified?
- What are the benefits to joining a group of certified woodland owners?

This guide also provides an introduction to the basic ecology of Nova Scotia's Acadian Forest, and to forestry practices that can help to maintain or restore its natural characteristics.

Please Note:

The Mersey Tobeatic Research Institute is solely responsible for the content of this guide, and the guide has not been reviewed or endorsed by FSC Canada.

The FSC Principles and Criteria are continually under review, and the version in this publication may not be current. Please check the FSC Canada website, or contact the Mersey Tobeatic Research Institute, for the current version of the FSC's Principles and Criteria.

The logo for the Mersey Tobeatic Research Institute is located in the top right corner of a dark red horizontal bar. It features the text "Mersey Tobeatic" in a serif font above "Research Institute" in a smaller sans-serif font. To the right of the text is a stylized white graphic of a tree or plant with a curved base.**About the Mersey Tobeatic Research Institute**

The Mersey Tobeatic Research Institute, based in Kempt, Nova Scotia, is a non-profit co-operative founded to advance collaborative research, monitoring and management that promotes sustainable use of natural resources and biodiversity conservation in the Southwest Nova Biosphere Reserve. Following the UNESCO designation of the Southwest Nova Biosphere Reserve in 2001, the Mersey Tobeatic Research Institute was incorporated in 2004 through a partnership that included Parks Canada, Bowater Mersey Paper Company, local universities, provincial government agencies, municipalities, other non-profit groups and community members. With seed funding from Parks Canada, the Mersey Tobeatic Research Institute hired staff to help its volunteer board of directors develop a strategic plan, launch collaborative education & research projects and purchase a field station in 2006. The Mersey Tobeatic Research Institute works closely with landowners, industry, government agencies and other research partners to provide a variety of services and direct a number of activities and projects related to biodiversity and ecosystem monitoring, and environmental research, education and management.

1 - What is Forest Certification?



White Birch firewood

© JAMIE SIMPSON

Forest certification is no more, or less, than an independent confirmation of a landowner's good forest management. Certification is market-based and participation is voluntary.

Forest certification was developed in the early 1990s in response to growing concern about the sustainability of forestry practices, especially those in tropical countries where rainforests were (and are) disappearing at an alarming rate. Forest certification is now a topic of global interest, and has become common practice for many forest product companies and forest management organizations around the world.

As with organic agriculture certification, forest certification ideally allows customers to choose products coming from well-managed lands. Lumber and any other forest product coming from a certified forest can be given a label by which customers can identify and trust the process behind the certification.

Several certification organizations are active in the Maritimes. These include the Canadian Standards Association (CSA), the Sustainable Forestry Initiative (SFI), and the Forest Stewardship Council (FSC). As well, the Atlantic Master Logger Certification Program provides recognition for professional forest workers.



Harvested firewood

© ASHLEY NOTO

What are the On-the-ground Implications of Forest Certification?

“How would certification change how I manage my woodland?” This is often the first question woodland owners ask when considering certification for their lands. Many woodland owners might be surprised to hear that they can continue to manage their land much in the same way as they always have, with only minor tweaks or improvements. Often, certification is more about validating a woodland owner's good practices rather than finding fault with these practices.

Nonetheless, there are several requirements that woodland owners should be aware of when considering FSC certification for their land.

1. Management plans are required, and must include a detailed description of the woodland and the goals and forestry activity plans of the owner. Plans need to be tailored to meet the requirements of the FSC Maritimes Standard.
2. Woodland owners must commit to eliminating use of herbicides and other pesticides. Some allowance is provided for major outbreaks of insects and to control invasive exotic vegetation, if no other method is reasonable.
3. Forest harvesting and silviculture activities must be designed to promote natural forest conditions (age of trees, canopy closure) with tree species appropriate to the site. Generally, this means promoting mature forest and shade-tolerant tree species by using partial harvesting techniques.
4. Plantations that don't resemble the natural forest must be limited to no more than 10% of the woodland area. See Section 5 for more information on what's allowed with respect to plantations. Note, Christmas trees are considered to be agricultural products, so they are not included as part of a woodland for certification purposes.
5. Key wildlife habitats must be conserved, such as forest cover near streams and other watercourses, standing and fallen deadwood and trees with nest cavities and hawk and eagle nests.

2 - Forest Stewardship Council



FSC certified lumber

© DAN HUTT

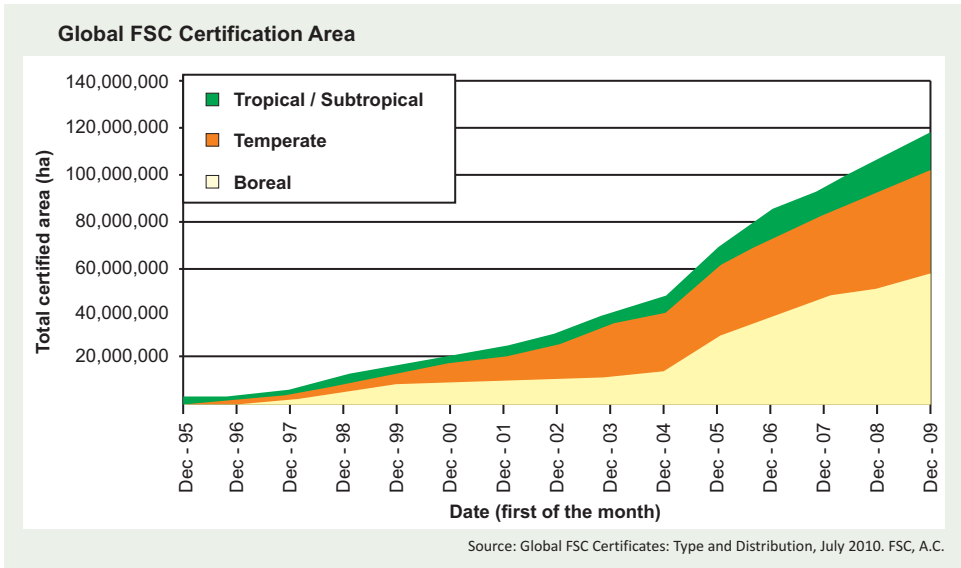
The Forest Stewardship Council (FSC) was founded in 1993 by people from twenty-five countries representing environmental, economic, social and aboriginal interests. These people came together to develop a way to encourage responsible forest management through the buying and selling of forest products. Their vision for the FSC, both then and now, is to promote ecologically appropriate, socially beneficial and economically viable forest management. They created the FSC as a global, non-government, not-for-profit organization.



Today, there are FSC-certified forests in 79 countries, and over 183 million hectares of certified forest throughout the world, which is roughly 6.5 per cent of the world's productive forest area. FSC has developed an international labelling scheme for forest products that provides assurance that the product comes from a well-managed forest that is independently certified to the FSC's principles of forest stewardship. The World Wildlife Fund currently considers the FSC to be the most credible forest certification label available.

The FSC head office in Bonn, Germany, is responsible for creating the policies that guide and define the FSC, and for ensuring consistency in the application of FSC certification. FSC does not perform the on-the-ground work of forest certification; rather, FSC accredits independent companies or organizations, known as 'certification bodies' to certify forest operations.

While the international office of the FSC is responsible for overall policy direction, the operational side of the organization is handled by National Initiatives. FSC Canada is one of fifty FSC National Initiatives around the world.



Chain of Custody

‘Chain of Custody’ is an important element of certification – it ensures a connection between the forest where trees are cut, and the customer who purchases a finished product. It is the method by which wood from certified forests is tracked from the forest to the finished product.

The Mersey Tobeatic Research Institute chose the FSC for its woodland owner certification project for several reasons. First, the FSC was the only system with a standard specific to the Acadian Forest Region of Nova Scotia when the Institute started the project. Second, the FSC provides for group certification of owners of smaller woodlands. Finally, the FSC is globally endorsed as the most environmentally responsible forest certification scheme available, and is most closely aligned with the Institute’s mandate to promote sustainable use of natural resources and biodiversity conservation.

The Mersey Tobeatic Research Institute’s goal with forest certification is to promote sustainable forestry practices on small private woodlands. The Institute believes that forest certification can be a tool to help promote and recognize responsible forest management. FSC certification for woodland owners complements the range of conservation activities currently undertaken by the Institute, including habitat conservation, community outreach and biodiversity research and monitoring.

FSC Standards and the Principles and Criteria

A global standard for forest management could never account for the regional differences in forest ecology, economies and social conditions. For this reason, the FSC encourages countries or regions to develop their own local FSC standard for forest certification. Once a regional FSC standard is approved by the FSC, such as the Maritimes FSC Standard, it becomes the standard by which woodland owners are evaluated. If a regional standard is not yet in place, a certification body can use a generic standard as a stop-gap measure until a regional standard is created and approved.

The common thread uniting the various regional standards throughout the world is the FSC's Principles and Criteria. The Principles and Criteria apply to all FSC certifications the world over, thereby ensuring a level of consistency from one certification to the next.



Old growth Yellow Birch, Maitland Bridge

© ALIAN BELLIVEAU

The Principles and Criteria define FSC's approach to forest management, and cover the following ten facets of forest management:

1. **Compliance with Laws and FSC Principles**
Woodland owners must comply with all relevant laws and regulations regarding forestry and land management.
2. **Tenure and Use Rights and Responsibilities**
Woodland owners must have clear title to the land they are managing.
3. **Indigenous Peoples' Rights**
Woodland owners must be aware of any nearby First Nations communities, and any traditional uses they may have in the area. This Principle is generally addressed by the Group Certification manager.
4. **Community Relations and Workers' Rights**
Woodland owners must ensure that employees are fairly treated.
5. **Benefits from the Forest**
Woodland owners must promote a diversity of economic, environmental and social benefits when managing their land. The Group Certification manager helps in addressing this Principle.
6. **Environmental Impact**
Woodland owners must ensure the health of their lands by maintaining or restoring natural forest conditions over most of their woodland, and ensuring that soils and watercourses aren't damaged by forestry practices. Rare plants and animals and their habitats must be protected.
7. **Management Plan**
Woodland owners must have an up-to-date management plan that includes their long-term objectives for the property and the means of achieving these objectives.
8. **Monitoring and Assessment**
Woodland owners must from time to time monitor the results of their management activities. The Group Certification manager can assist in meeting this Principle.
9. **Maintenance of High Conservation Value Forests**
Woodland owners must determine if their properties contain any forest with

exceptionally high ecological value, and ensure that any such forest areas are not compromised by forestry activities. The Group Certification manager can assist in determining sites of high conservation value forest.

10. Plantations

Woodland owners must limit the amount of land in plantations to no more than 10%. Plantations are planted or otherwise manipulated areas that do not resemble the natural forest. Not all plantations of trees, thus, qualify as a 'plantation' under the Maritime Standard (see section 5 for more detail on the definition of a plantation). Christmas trees are considered agricultural products and are not addressed by FSC certification.

For each of the ten Principles there is a 'big picture' guide to forest management, as well as a number of Criteria that define the specific aspects of forest management that must be evaluated. For example, Principle 5 states,

“Forest management operations shall encourage the efficient use of the forest's multiple products and services to ensure economic viability and a wide range of environmental and social benefits.”

Under Principle 5, there are six Criteria; criterion 5.3, for example, states,

“Forest management should minimize waste associated with harvesting and on-site processing operations and avoid damage to other forest resources.”

A regional FSC standard, such as the Maritime FSC Standard, is created within the framework of the FSC Principles and Criteria, and provides direction for how each Criterion is to be interpreted and applied in a given region. This is done by adding 'Indicators' to each Criterion. To continue the example from above, Indicator 5.3.1 of the Maritimes FSC Standard states,

“All harvested merchantable and marketable timber is utilized, unless left on-site to provide site-specific environmental benefits, as defined by the owner/manager.”

In this way, the Principles, Criteria and Indicators are increasingly more specific and relevant to the on-the-ground management of a woodland property within any given regional forest type.

FSC in the Maritimes

A group of people from Nova Scotia, New Brunswick and Prince Edward Island formed the Maritimes FSC Standard Working Group in 1996. These people represented environmental, economic, social and First Nations interests, and over the course of seven years created the Maritimes Regional FSC Standard. It was very much a trail-blazing exercise, and not without substantial disagreement over issues such as clearcutting, intensive silviculture and pesticide use. Compromises were reached, and in 2003 the Standard was ratified by the FSC.

According to FSC policy, regional standards are reviewed every five years, and a revised Maritimes Standard was approved in 2008. Titled Certification Standards for Best Forestry Practices in the Maritimes Region, the FSC Maritime standard applies to the Maritime Provinces: Nova Scotia, New Brunswick and Prince Edward Island, all of which fall within the Acadian Forest Region.

The Maritimes Standard recognizes that the natural character of the forest in the Maritimes has been altered by past and present land uses, including land clearing for agriculture, high grading (removing only the highest value trees) and clear-cutting.

In many cases, such practices have led to

a loss of natural diversity and long-term economic value.

To reduce the loss of diversity and restore ecological health to the natural Acadian Forest, the Maritimes Standard requires forestry operations to promote a diverse and site-appropriate mix of native species. The Standard also requires harvesting to be guided by the levels and extents of natural forest disturbance. These requirements are discussed in detail in later sections of this guide.



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In 2008, FSC also ratified a modified version of the Maritimes Standard that would apply to forests that can be defined as small or as areas with low-intensity harvesting. This modified version of the Standard recognizes that certain requirements relevant to large or intensively managed lands are not applicable to the scale of operation typical on woodlots in the Maritimes. The Maritimes Standard for Small and Low-Intensity Managed Forests (SLIMF) is used for evaluating most woodlots or groups of woodlots in Nova Scotia, and is available at the FSC Canada website (<http://www.fsccanada.org>).¹

¹ Small forests are defined as less than 1,000 hectares; low-intensity harvesting is defined as less than 20% of mean annual increment, and less than 5,000 m³ annually. For producers of non-timber forest products, small forests are defined as less than 50,000 ha.

3 - Costs & Benefits of FSC Certification



Tractor and loader

© JAMES ROUTER

While demand for FSC certified wood is increasing globally, few certified woodlot owners are able to secure premiums for their certified wood. Some woodlot owners nonetheless see benefits in pursuing certification. Some find that they have guaranteed market access: certain mills will seek out any wood they have to sell. Others appreciate the satisfaction of having their good woodlot management confirmed and recognized through certification.

Many woodlot owners find that they learn more about their land and best management practices as they go through the certification process, especially regarding wildlife habitat, low-impact harvesting, and long-term health of their woodland.

Also, those who sell value-added products in niche markets can use certification to help market their products, and some charge a modest (10-20%) premium for certified products. When given the choice, consumers generally choose eco-labelled products over other equally priced products. Landowners with FSC-certified woodlots can market firewood, logs and lumber milled on the property as FSC-certified products. If any additional manufacturing is carried out to the wood, however, then a chain-of-custody certificate is also required before the products can be marketed as certified.

Joining a group of certified woodlots also provides benefits. Such groups often offer field days for members to get together and learn from each other, sharing ideas, successes and technical advice, while viewing on-the-ground results of various woodlot management strategies. Groups may also offer their members services such as management plan writing at reduced costs, and may help to market woodlot products, sometimes pooling products from several woodlots to facilitate sales. Groups may also offer training opportunities and business planning support.

For those woodland owners who are uncertain about the work quality and honesty of contractors and buyers and are hesitant to manage their woodlands for timber value,

certification may provide reassurance that harvests and sales will be independently monitored by a knowledgeable third party and supported by a trusted network of like-minded peers. Group managers should be able to recommend approved contractors whose work meets FSC standards.

Participation in a certification program also provides evidence to qualify for Nova Scotia's Forest Resource Property tax classification and for Revenue Canada's Intergenerational Transfer Tax Credit. As well, group certification benefits local communities by generating a local and sustainable supply of certified wood that can be sold to mills and to local value-added wood product businesses.

Of course, certification costs money. Costs include the initial certification, annual audits, and full re-evaluations every five years. Pursuing certification through a group of woodlot owners is a good way to significantly reduce the cost of certification. There is usually a fee to join the group, but it is far less than the cost of an individual woodlot certification. As well, the group manager takes on the responsibility of meeting a number of the certification requirements, thereby reducing the paper-work for group members.

Markets for FSC Products

Several mills in south-western Nova Scotia have received FSC chain-of-custody certification, which means they can buy certified wood from woodlot owners, manufacture it, and then sell products bearing the FSC label. These mills include Bowater Mersey Paper Co. Ltd., Harry Freeman & Sons Ltd., J.A. Turner & Sons Ltd. and Logs to Lumber Co. Ltd. and Taylor Lumber Company Ltd. There may be potential for agreements between mills and a group of certified woodland owners, such as exists currently between the Nova Scotia Landowners and Forest Fibre Producers Association, the Federation of Nova Scotia Woodland Owners and the NewPage Port Hawkesbury mill. As of 2011, NewPage pays an additional \$2.00 per tonne for FSC-certified wood.

Groups of certified woodland owners might also capitalize on the "buy green and local" trend by developing niche markets for local timber and non-timber forest products. The FSC-certified Massachusetts Woodland Co-op, for example, has created their own brand for locally grown FSC-certified timber products, thereby encouraging and supporting local small businesses.

There is a possibility that carbon credits will become a viable "product" for woodland owners, and FSC certification could provide a mechanism to verify a woodlot's carbon worth. The Eastern Ontario Model Forest program is currently exploring carbon market opportunities for woodlot owners.

Woodland Owners Considering FSC Certification

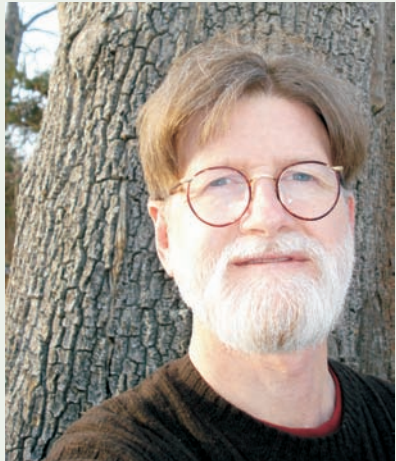
Dan Pittman

“As far back as I can remember I've always wanted to work with the land, to have a woodlot to work on,” says Dan Pittman. Pittman's time spent on his grandmother's farm until age 14 has stuck with him all his life, and, several years ago, inspired him to purchase approximately 200 acres of woodland near Caledonia in Queens County. *“It's about walking the talk, about putting my money where my mouth is,”* continues Pittman. *“I want to make ecological forestry happen on the ground, and not just theorize about doing it – that's one reason why I bought the land, and why I'm thinking about FSC certification.”*

Pittman sees certification as a way to join forces with other like-minded woodland owners. *“I see it as a way to help build relationships,”* explains Pittman, *“to build a community of woodlot owners that can share ideas and resources.”* Pittman believes that an FSC certification group not only helps to bring woodland owners together, but also government, the forest industry and non-government organizations like the Mersey Tobeatic Research Institute. *“FSC certification can get a lot of people from different backgrounds speaking the same language,”* says Pittman, *“and I see a lot of value in that.”*

Aside from some firewood cutting, Pittman doesn't yet do a lot of timber harvesting on his woodland. As an avid hunter, as well as a certified hunting and fishing guide, Pittman uses his land mostly for hunting and other outdoor recreation. But Pittman looks forward to doing more woodlot work, and believes that a certification group could help to develop marketing opportunities that do not exist for individual owners. *“I'm excited about figuring out how I can use my woodlot to generate economic activity – about supporting rural economic development,”* says Pittman.

Pittman doesn't have any hesitation when it comes to meeting the FSC Maritimes Standard. He's reviewed the Standard and says, *“there's nothing in the Standard that surprises me - I'm either already doing or planning to do this anyway, certified or not.”* After a bit of reflection, Pittman does say that he wonders about planting tree species that normally grow south of the



Dan Pittman

Woodland Owners Considering FSC Certification

Acadian Forest. *“Considering predictions for global warming I might want to try out some new trees – those that are just south of us, like hickory, walnut and white oak,”* says Pittman. He does note that the Maritimes Standard allows for 5% of the woodlot to be non-native species, which should be enough for him to satisfy his desire to experiment with bordering tree species that may expand their range northward. As well, the Standard is up-dated every 5 years, which would allow for adjustments on account of climate change.

Pittman also notes that the cost of certification could be an issue if the fee is high, and suggests that is one reason why a group needs to have a lot of members. *“The more people that join, the cheaper it's going to be,”* says Pittman. He also suggests that while market access and premiums for certified wood cannot be guaranteed, strategically aggregating product across woodlots to meet demand can make all the difference. *“Financial returns will be uneven so it really comes down to other benefits,”* says Pittman. *“It's about working with your neighbours, with everybody pulling together for the common good. The journey can be worth more than the destination.”*

The leadership of a certification group is also important for Pittman. *“It can't be a heavy top-down approach, and I don't want to see the group co-opted for someone else's purpose,”* says Pittman. *“Small woodlot owners need to be actively engaged, with peer-to-peer networking, group solidarity and mutual support being the critical success factors. As the most directly affected persons, woodlot owners must retain control for me to take the process seriously.”* Pittman recognizes that certification might not be perfect, but says *“if I want to improve it, I have to be a part of it. The only way is to jump in and get involved.”*

Jim Crooker

“Why do I like the woods so much? I guess it's just in my blood,” says Jim Crooker. *“I never have a bad day in the woods.”* Crooker's love for the woods started early in life. As a child he worked alongside his father, cutting hemlock trees for railway ties, and has felt the pull to the woods ever since. Crooker bought his first woodlot before he bought his first car, and since then has acquired some 850 acres of land in the South Brookfield area, east of Bridgewater. He inherited some land that was originally deeded to his great great grandfather. *“He was the first person of European descent to own this land,”* comments Crooker.

Crooker is a retired school teacher, and chooses to “pick away” at his woodlots as he has time between tending the cattle he keeps and growing their hay and grain. *“I have trouble finding people to work on my land, so I just take my time with it,”* say Crooker. He focuses on cutting hemlock, spruce, pine and oak logs. *“I take out the poorer stems, those with porcupine*

Woodland Owners Considering FSC Certification



Jim Crooker

damage or forked tops. But if it's a good quality tree, and I can still reach my arms around it, then I leave it to grow," explains Crooker. In the process of cutting logs, Crooker says that there's always some pulpwood and firewood that gets cut as well. *"By the time you have a few loads of logs ready, you'll have your winter's firewood too."*

Crooker plans to have his woodland certified under the FSC Maritimes Standard, provided that the cost isn't unbearably high, and will likely join a certification group to accomplish this. *"I figure it's a good way to connect with other woodland owners, and to have access to courses and workshops that the group might put on for its members,"* says Crooker. *"And I'd much rather take a workshop somewhere close by than have to travel to Truro or some place,"* continues Crooker. He also enjoys the thought of seeing how other group members work with their forestlands.

"When you're working away on your own," says Crooker, *"you don't have time to get out and compare what you're doing with what others are doing."*

Crooker is also interested in the potential financial benefits that certification might offer. *"I think there will be premiums paid for certified wood; I know there are some premiums now, and there will likely be more mills offering premiums in the future,"* says Crooker. He speculates that a certification group might be in a good position to explore the possibility of carbon credits for its members as a sort of non-timber forest product. Finally, Crooker suggests that achieving FSC certification for his land will help him be ready for future changes in government policy. *"I know I won't have to worry too much about meeting whatever new regulations the Department of Natural Resources brings in."*

There isn't much in the Maritimes FSC Standard that gives Crooker cause for concern. *"No, I don't see any problem with that. I try not to clearcut, and if I was 90 years old I still wouldn't cut all the good stuff,"* says Crooker. *"Some people think they get a piece of land and they can do anything they want with it, but I never really bought into that. I figure you get a piece of land to use for a while – and then you leave it the best you can, whether you pass it on to your children or someone else."*

Woodland Owner Profile:

Phil Clark: Nova Scotia Landowners and Forest Fibre Producers Association

Phil Clark has been working on his 400 acres of forest for over 35 years. *"I always try to do the right thing in my woods, to the best of my knowledge,"* says Clark. *"I make patch cuts here and there, taking out the poorer quality trees, promoting quality,"* continues Clark. He also plants some seedlings when necessary, including red and black spruce, some sugar maple, red oak and white ash. *"I also have some protected areas on my property – protected because I say so,"* adds Clark.



Phil Clark

Clark was among the first four woodlot owners to be certified under the Nova Scotia Landowners and Forest Fibre Producers Association, in 2005. Did he have to change how he manages his land? *"Nope – no changes whatsoever. I was already doing what the certification required."*

Clark says he doesn't see much direct financial benefit from certification, but he notes that he can sell his wood easily thanks to the FSC designation. *"I get right to the head of the queue – it's nice to know that when I have a load of wood ready, the mill will take it, and I can get paid quickly."*

Clark notes that the NewPage pulp mill in Port Hawkesbury does pay a premium for wood from certified woodlot owners, but the money goes to the NS Landowners and Forest Fibre Producers Association to help cover the cost of the certification. The Association provides certification for free to participating woodland owners, and does not charge a membership fee.

Clark runs a small sawmill, and sees some opportunity with the FSC certification label for his products. *"I know I can't compete with the big guys with my small mill, so I don't even try. What we need are niche markets, value-added markets, and certification could help with that. It might even help to draw some younger people into this sort of work,"* adds Clark.

Clark stresses the need for better marketing for FSC products. *"There's people out there who would want to have a piece of wood from a forest that's well cared for. But I don't have time to do the marketing – that's where we could use some help."*

Does Clark plan to continue working in his woodlot and keep his certification? *"Oh yes, no doubt about that. Certification is something I believe in. And I have a great lifestyle – I'm not getting rich, but I sure enjoy what I'm doing."*

4 - Steps to FSC Certification



Felling a tree, Prest FSC property

© DAN HUTT

Below are steps along the path to attaining FSC certification for a woodlot. Although these are numbered, the path to certification isn't necessarily straight, and most landowners will find themselves jumping among the various steps, learning as they go.

Step 1. Evaluate pros and cons

As with any major decision, the first step in choosing certification is to evaluate the costs and benefits. Section 7 below describes some of the reasons why landowners may choose certification, and what the costs of certification may be. Of course, it's a good idea to discuss costs and potential benefits directly with a group certification manager, as well as with woodlot owners who have already gone through the process.

Step 2. Contact a group certification manager

A group certification manager can provide specific details for joining a particular group, including fees to join and services the group offers to members. A woodlot owner may wish to contact several groups and evaluate which is the best fit. The current groups active in Nova Scotia are listed on page 52.

Step 3. Self-assessment

With the help of a group manager, a landowner should review the requirements of the FSC Maritimes Standard, and be reasonably confident that she or he is capable of meeting the key requirements of the Standard. Section 8 below provides an overview of some of these key requirements. If the landowner intends to use a contractor to carry out work, the pool manager should be able to recommend suitably trained operators.

Step 4. Apply to join a group

A landowner must apply to join a resource manager's pool of woodlot owners. The group manager will evaluate the woodlot owner's management practices, and identify any potential barriers to certification. Any barriers have to be addressed before a landowner joins a group.

Step 5. Join and pay any applicable fees

Once a woodlot owner is accepted, he or she can join the group, sign a Memorandum of Understanding that defines the roles and responsibilities of the landowners and the group manager, and pay any fees that may be required.

Step 6. Audits

Members of certified groups will be audited from time to time to ensure they continue to meet the requirements of the Maritimes FSC Standard. Official auditing is done by an independent assessor, who will audit a sample of the pool's members every year. All members of the pool are usually assessed at least once every five years. As well, the manager of the pool will conduct 'internal' audits of the members of the pool to ensure continued conformance with the Maritimes FSC Standard, particularly during harvesting activities.



Red Maple swamp, Kempt, NS

©ALAIN BELLIVEAU

Range of options to meet the Maritime Standard

There is no cookie-cutter formula to meet the Maritimes Standard. Various techniques and approaches to woodland management can satisfy the requirements of the Maritimes Standard. Some woodland owners choose to do very little direct management, while others harvest wood and carry out other forestry activities frequently. Both approaches, plus the range of options in between, can be acceptable under the Maritimes Standard.

For example, some woodland owners choose never to clearcut to conserve biodiversity and protect water systems. Others may choose to clearcut in specific circumstances. Provided that a clearcut can be solidly justified as the best way to restore the natural forest to the site, then it can still fall within the requirements of the Maritimes Standard.

Similarly, some woodland owners rely solely on natural regeneration as part of their low-impact woodlot management. Others plant tree seedlings following harvesting. Intensely managed plantations can be acceptable so long as they do not occupy more than 10% of the property's forest area.

What's not acceptable under the Maritimes Standard? Ultimately, it's up to

the certification auditors to make this call, but inappropriate clearcutting, harvesting more than the forest can sustain, converting more than 10% of the land to excessively non-natural forest conditions, and long-term reliance on pesticides are all activities that are not permitted under the Standard.

What is acceptable? Harvesting trees in a manner that maintains or promotes the natural forest cover for the area, planting trees as a way to restore species that have been lost from the site, and thinning trees to encourage late-successional species appropriate to the site are all examples of acceptable practices under the Maritimes Standard.



White Pine bud, Prest FSC property

How can a woodland owner determine the natural forest cover for his or her property? It's not always easy, but a guide to Forest Ecosystem Classification produced by the Nova Scotia Department of Natural Resources can certainly help (see section 8 for more information about the Forest Ecosystem Classification). Looking at nearby areas with less-disturbed forest can also provide clues. Often, a group certification manager or other consulting forester can provide advice on the natural forest cover as well.

Woodland Owner Profile:

Beth McGee: Acadian Forest Keepers

Beth McGee's passion for wilderness and all things forestry was kindled from an early age. However, her hands-on involvement in woodland management came only recently, when her father handed her the responsibility for the family's 1,430 acres of woodlands.



Beth McGee

McGee's father, Dr. Wilfred Creighton, renowned forester and Deputy Minister of Lands and Forests (now Natural Resources) from 1949-1969, began acquiring land in 1937, gradually amassing a sizable holding.

"Dad harvested some wood most years from the woodlot," says McGee. *"He learned from an elderly German forester that by being careful in his selection of wood to be harvested he could 'tickle' the woods forever and always have wood for the future."* Creighton, who lived to be 104, was well-known for his commitment to promoting all values that the forest has to offer, including clear water, tourism, wildlife and local employment as well as timber.

McGee joined the Nagaya FSC certification group (now called Acadian Forest Keepers) in 2005 to meet other like-minded woodland owners. One of the benefits was to have her and her father's good and long-time management recognized and confirmed. She related to Nagaya's 'lead by example' approach to forest management, and liked the independence of the group manager and woodlot owner members. *"Nagaya promoted leading-edge forest management, and it's good to be a part of that,"* says McGee.

Being a member of the group also gives McGee the chance to connect with and learn from other woodland owners. *"It's been a huge learning-curve for me,"* says McGee. *"Being part of the Forest Keepers group is good for networking with colleagues and getting advice on how to best tend my lands."* McGee also finds that FSC-certified mills are very interested in buying her wood products thanks to the FSC certification, and she also receives a small premium from some mills for her wood.

"Due to extensive loss of trees and damage to standing trees during Hurricane Juan the forests need time to recover," says McGee. *"I mostly see my role as tending, not taking. I'm excited by how much young yellow birch is coming up in my woods. I know I won't live to see them grow big and old, but it's kind of like watching grandchildren grow up – there's a lot of satisfaction in that."*

5 - Key Themes of the Maritimes FSC Standard



Processors at work

© HOWARD MARTIN & JANET MACQUARRIE

Although the Maritimes FSC Standard may seem a little intimidating to some landowners, it essentially boils down to being a good steward of the land, being a good employer and being a good neighbour. Landowners who take care of their land, and care about their communities, workers and neighbours will have little problem meeting the Standard.

This section provides an overview of five key themes of the Maritime FSC Standard, but landowners can also consult the Standard directly for complete information (www.fsc.canada.org). Woodland owners who join certification groups can rely on the group manager to explain and interpret the Maritime Standard, and to answer any questions they may have about the Standard.

1. Pesticide use

Pesticides include insecticides, herbicides and fungicides, and can be chemical or biological. Landowners who use pesticides on their woodlots must demonstrate a commitment to eliminating the use of pesticides in their forests, and have in place a plan and timeline to reduce and eliminate the use of chemical herbicides. Some exception can be given in cases of severe insect outbreaks and invasive exotic species.

2. Management plan

Certification requires woodland owners to have a written management plan; the following is a summary of the elements to be included:

- a) Owner's objectives
- b) Description of the woodlot's forest resource, and a basic description of adjacent lands
- c) Description of management system, based on ecology of the woodland's forest, and justification of harvesting practices and equipment to be used
- d) Rationale for rate of harvest and selection of species to be harvested
- e) Plan to monitor forest growth

- f) Provisions for identifying and protecting species-at-risk and areas with old-growth forest or exceptional cultural importance
- g) Maps showing the woodlot's forest stands, planned management activities and woodlot boundaries

The management plan must also describe the owner's plan to restore the woodlot's natural forest characteristics (if need be), such as tree species, age diversity and deadwood abundances. Plans must also be updated at least every five years, taking into account changes in the woodlot's forest conditions.

3. Silviculture and harvesting

Certification requires woodlot owners to base silviculture and harvesting decisions on protecting or restoring the natural forest characteristics for the land. For much of Nova Scotia, this means using partial cutting methods such as small gap or patch harvesting to promote tree species that form the site's mature, late-successional forest. As described in Section 5, this often means promoting trees such as red spruce, hemlock, white pine, sugar maple, yellow birch and (healthy) beech.

Clearcutting is generally not the best method to promote natural forest conditions in Nova Scotia. However, clearcutting and other even-aged management can be allowed under the FSC Maritime Standard if used to restore the natural forest type for the land. Such situations can include natural forest types dominated by jack pine, black spruce or balsam fir, and sites with over-mature white spruce, catastrophic insect infestation or wind throw. However, clearcutting must be justified as a means to restore the natural forest condition to the land.



Boundary line, Victory, NS

© ALAIN BELLIVEAU



© PICEA FORESTRY CONSULTING



Woodlot owner Jeremy Frith © PAM LANGILLE
pruning Yellow Birch, Cape Breton



Clearcut , Queens County © DAN HUTT

Under the Maritime FSC Standard, tree plantations that do not resemble the natural forest for the land must be limited to no more than 10% of the woodlot area. Tree diversity, age diversity, and standing and fallen dead trees are all factors used to determine whether or not a plantation resembles the natural forest.

Given this, areas with planted trees do not automatically count as plantations. Provided that a planted area resembles the natural forest for the site in terms of species diversity, age diversity and deadwood abundance, then the area does not count towards the allowable 10% in plantations.

If a woodlot consists of more than 10% of plantation, then some of the plantation area must be actively managed to promote characteristics of the natural forest. This can be accomplished by increasing species and age diversity over time through partial harvesting and possibly fill-planting in gaps created by harvesting. In some cases, plantation areas can be left to naturally develop more diversity as trees and other species natural to the site gradually take the place of the planted trees.

For the purposes of FSC certification, Christmas tree farms are treated as agricultural land, rather than forest land, so are considered to be outside the scope of FSC certification.

The woodland owner must also establish allowable harvest rates that are sustainable within the growth limits of the forest, and within the context of its ecological health. The Group Certification manager can help with this requirement. The Group Certification manager, for example, may

utilize land capability classification to determine annual growth rates for different stand types, and then set aside part of that growth (say 30%) to provide for deadwood and increased volume growth.

Another method is to base the annual harvest rate on a combination of standing volume and the most appropriate harvest type; that is, if a 20% selection harvest is recommended for a one-acre stand with 30 cords per acre, then the allowable harvest is six cords for that stand for that year. In this way, the allowable harvest rate may go up and down from year to year, depending on the woodland's standing volume and the recommended treatments.

4. Relations with Community, Workers, Neighbours and First Nations

Landowners are expected to treat any employees fairly and ensure they have adequate training and equipment to work safely. Forest workers must be aware of applicable health and safety laws and regulations, and have the opportunity to participate in management decision-making.

Landowners are also expected to communicate with their neighbours 30 days before undertaking major operations within 30 metres of a boundary line or within 100 metres of a dwelling. Landowners must consider any concerns neighbours have with planned forestry operations.

Any traditional uses of the land by local communities or local First Nations must be identified, and the effect of forest operations on these uses must be evaluated. The same applies to areas with special cultural significance to First Nations communities.

5. Rare Features

Landowners with rare ecological features on their land must ensure these are conserved. Such features can include rare, threatened or endangered species and their habitat, rare habitat types or areas of old natural forest. The Mersey Tobetic Research Institute has a user-friendly landowner guide to rare and threatened species in Nova Scotia. Visit <http://www.speciesatrisk.ca/SARGuide/> to view or obtain a copy. The Institute also has an active old forests project, part of which includes developing management plans with woodland owners to help restore ecologically valuable characteristics of old forests.



Old growth forest research, Eleven Mile Lake

© ALAIN BELLIVEAU

6 - FSC Groups and their Policies & Procedures



Otter Ponds Demonstration Forest

© DAN HUTT

Certification can be prohibitively expensive for landowners to obtain individually. To address this problem, FSC allows groups of landowners to be certified collectively, as a 'pool' of landowners, under the direction of a group manager. The group manager holds the certification certificate, and is responsible for ensuring that all members of the pool meet the requirements of certification. The group manager is audited yearly, along with a sample of pool members.

Generally, woodlot owners pay a yearly fee to belong to a certified pool and are expected to meet the requirements of the FSC Standard. In return, the group manager handles much of the paper work, and deals directly with the certification auditors. Group managers often also provide management advice, access to training, and opportunities for group members to get together to share their woodlot experiences and knowledge. Usually, membership in a pool is limited to a defined geographic area.

Resource managers usually require participating landowners to sign a contract that clearly defines the various roles and responsibilities for both the landowner and the resource manager. Separate contracts may also define the responsibilities of any others involved in the certification process, including loggers or foresters working on certified properties, and mills who agree to purchase certified wood.

At minimum, these contracts indicate a commitment by the landowner to FSC Principles and Criteria and the local standard, and a commitment by the resource manager to ensure that the certification certificate remains in good standing. Landowners must also commit to having an up-to-date management plan, maintaining their boundary lines, and informing neighbours of proposed harvesting activities, while resource managers commit to maintaining records, pursuing market opportunities and perhaps negotiating with mills on behalf of pool members. Contracts usually also define the procedures for members to join and to leave the pool, the grounds for expelling members from the pool, and the methods for resolving any disputes that arise.

Contracts also outline the resource manager's responsibility to ensure that any corrective action requests issued following an audit of the pool are satisfactorily addressed. Corrective action requests are issued by auditors if they find that a pool member does not meet the FSC Standard. When corrective action requests are issued, the resource manager has a set time to address the problem before the auditor does a follow-up visit.

In addition to the contracts, a resource manager may also have in place various 'Standard Operating Procedures' that give guidance for creating management plans, carrying out silviculture activities, marking and harvesting trees, building roads, ensuring wildlife habitat etc.

Group Certification in Action: Four Examples

1 - Massachusetts Woodland Co-op (www.masswoodlands.coop)

Sixty landowners currently make up the Massachusetts Woodlands Co-op, collectively owning over 12,000 acres of FSC-certified woodlands. Landowners, foresters and mill operators came together to form the Massachusetts Woodlands Co-op in order to further their common goal of sustaining local forests and wildlife habitat, while supporting the local economy and making the most of an abundant resource.

With the help of grant aid and a multitude of partnerships, the Massachusetts Woodlands Co-op operates as a business and returns profits to members. While harvesting revenues do not yet cover all of the certification costs, the Co-op hopes to achieve financial self-sufficiency within three to five years. The Massachusetts Woodlands Co-op has received Chain-of-custody certification for their own brand of locally processed "HomeGrown Wood," targeting local markets, and the group is pleased to help keep money circulating locally through this program.



Wildlife cavity

© ALAIN BELLIVEAU

2 - Picea Forestry Consulting and Acadian Forest Keepers (www.piceaforestry.ca)

Acadian Forest Keepers is an independent pool of FSC-certified woodlot owners from across the Maritimes. The members share a desire to protect and restore natural Acadian Forest, a belief that “healthy forests make healthy communities” and a long-term perspective on forest management. According to the group’s manager, members of Acadian Forest Keepers seek to increase the social, ecological and economic value of their forests not only for their own benefit but also for future generations.

Originally known as Acadian Forest Families, the pool was formed in 1999 by resource manager William McKay of Nagaya Forest Restoration Ltd. The pool has grown to 30 members owning nearly 4,500 hectares (11,000 acres) of forest. In 2010, Mr. McKay transferred management of the pool to Patricia Amero, RPF, and Sandy Hyde of Picea Forestry Consulting. Amero and Hyde describe themselves as experienced ecosystem managers who specialize in building and caring for healthy, resilient forest communities.

The Acadian Forest Keepers group offers members several options within its FSC certification program, including Forest Management Certification (with Maple Non Timber Forest Product Endorsement), Chain of Custody Certification and Controlled Wood Certification. Members of the Acadian Forest Keepers group pay an annual fee to cover the costs of maintaining the FSC certification, and the group continues to enjoy controlled growth.

Members of Acadian Forest Keepers say that the mutual support that members provide to each other and the active sharing of information and ideas are important positive aspects of their group. They also enjoy the chance to participate in an annual gathering of members and the group’s staff, which combines an opportunity to come together in community with a variety of learning experiences.



Old growth forest, Dennis Boot Lake

© ALAIN BELLIVEAU

3 - Nova Scotia Landowners and Forest Fibre Producers Association

The Nova Scotia Landowners and Forest Fibre Producers Association (NSLFFPA) was created in 1979 to negotiate wood sale agreements with Stora Koppaberg (now NewPage) on behalf of its members. In 2005 the Association began its FSC certification initiative for any woodland owners of at least 10 hectares of forest located within 250km of the NewPage mill in Port Hawkesbury.

By 2007 the Association had 30 woodland owners in its certification group, owning 484 hectares of land. In the last several years the Association has expanded rapidly and at time of writing, the Association has 110 woodland owners in its certification group, representing approximately 11,500 hectares of FSC-certified land. The Association plans to increase its certification group to 200 woodland owners by 2012.

The Association does not charge a membership fee, and offers free certification and free management plans to members. The Association is currently funded through a grant from the provincial government, and through bonuses paid by the NewPage mill for certified wood.

4 - The Federation of Nova Scotia Woodland Owners (FNSWO)

The Federation of Nova Scotia Woodland Owners is a non-profit organization created to educate, inform and lobby on behalf of small-private woodland owners. They currently have close to 23,000 hectares of forest under their Canadian Standards Association (CSA) woodlot certification program. In late 2010, the FNSWO collaborated with MTRI to develop and implement an FSC program for small-private woodland owners. The initial target was to have a 2000ha of forest FSC certified by July 2011. There are annual membership fees for both programs, and the FNSWO receives a bonus from NewPage for certified wood. Fifty percent of the bonus is used for program maintenance, while the remaining fifty percent is paid to the landowner via the FNSWO.

7 - The Acadian Forest: An introduction



Fall colours, Kempt

© ALAIN BELLIVEAU

The Acadian Forest region includes the Maritime provinces and much of Maine, parts of northern New England and Quebec's Gaspé Peninsula. It is an area of transition between two larger forest types, the Northern Hardwood Forest to the south, and the Boreal Forest to the north.

As such, the Acadian Forest combines elements of each of these forests, creating a blend of softwood and hardwood trees found nowhere else. In its natural state, the Acadian Forest is one of the most richly diverse temperate forests in the world.

Broad international range of the Acadian Forest



SOURCE: THE NATURE CONSERVANCY / NATURE CONSERVANCY OF CANADA

Red spruce is a characteristic tree of the Acadian Forest; nowhere else does this species attain a greater prominence, and is sometimes referred to as this forest's signature tree. Other common trees of the Acadian Forest include sugar maple, yellow birch, American beech, white ash, red maple, eastern hemlock and white pine (which are at the northern end of their range), and white birch, trembling aspen, balsam fir, tamarack, white spruce and black spruce (which are at the southern end of their range). In all, there are approximately 32 species of trees that make up the Acadian Forest.



Red Spruce regeneration under a canopy gap



Red Spruce regeneration in a selection-harvested woodlot



Red Spruce

© J. SIMPSON

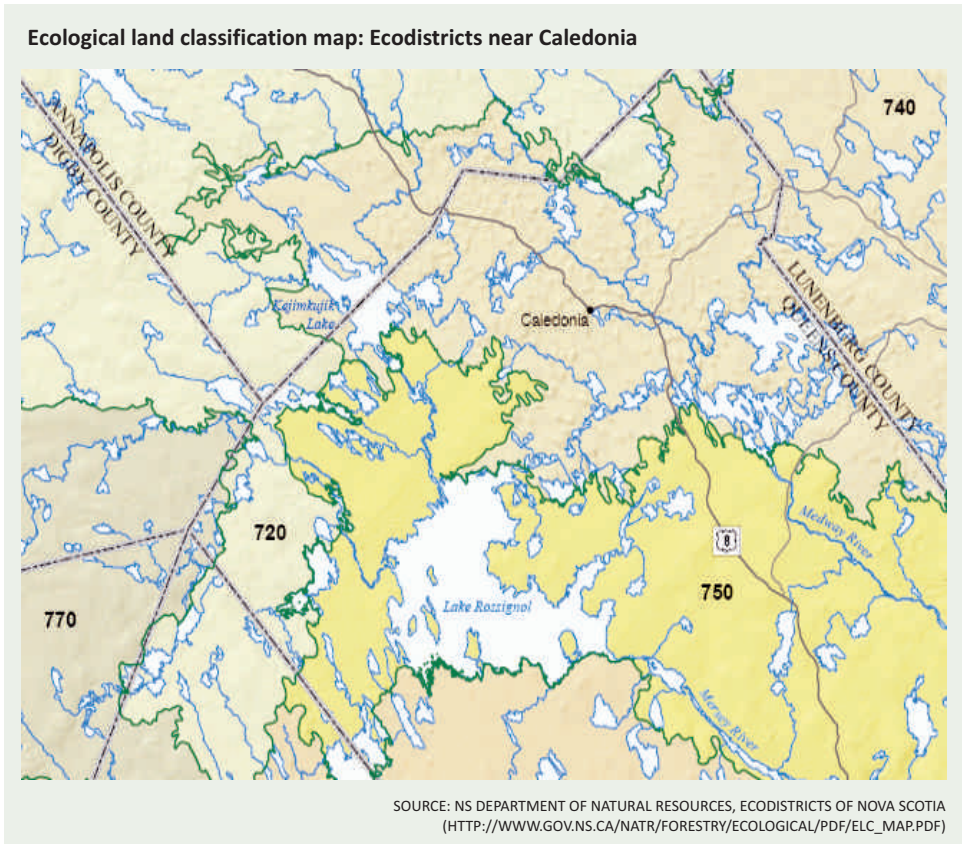
The Acadian Forest is anything but uniform. From one end of the Maritimes to the other, there are dozens of distinct associations of trees and other plants. Some areas might tend towards sugar maple, beech and yellow birch; another area might support red spruce and balsam fir. Even a single woodlot may contain several different types of tree communities. The forests of the Maritimes are almost as variable as its weather.

This diversity in the natural mix of tree species across the Maritimes is shaped by many factors that are not easily teased apart. Randomness plays a part: what seeds or seedlings might be ready to grow when the death of a tree opens a gap in the forest canopy? Competition among trees and browsing by animals can also shape the mixture of trees for an area.

On a regional scale, physical factors such as soil type, elevation and topography, along with climatic factors such as minimum temperature and rainfall, determine where different species can grow. Taken together, these physical and climatic factors are used by forest

scientists to create an approximate map of tree communities in a process known as ecological land classification (ELC). An ELC map can be a useful tool when determining the appropriate species of trees to promote on woodlots that have been highly altered by past uses. The ELC map for the entire province, and descriptions of each region within the map, can be found on the NS Department of Natural Resources' website (<http://www.gov.ns.ca/natr/forestry/ecological/ecolandclass.asp>).

The ecodistricts in the classification map below include LaHave Drumlins (740), Rossignol (750), South Mountain (720) and Western Barrens (770).



On a smaller scale, differences in soil richness, moisture and depth, and even the direction of slope, give an individual woodland distinct associations of trees and other plants. The following chart shows how trees tend to grow in certain combinations of soil richness and

moisture. The chart also shows how certain plants are associated with certain soil richness and moisture levels, and thereby help to indicate the natural forest type for the site.

		Low Fertility		SOIL FERTILITY		High Fertility		
Dry Soil		Pines Black spruce Reindeer lichen Rhodora Mayflower Prince's pine Huckleberry Bearberry Common juniper Sweet-fern Teaberry		Oak Beech Bristly clubmoss Running clubmoss Witch hazel		Dry Soil / High Fertility conditions do not occur in Nova Scotia		
	Soil Moisture		Balsam fir Red spruce Yellow birch Bluebead lily Bunchberry Evergreen wood-fern Ground pine New York fern False-lily-of-the-valley Fly honeysuckle Partridgeberry Starflower Goldthread Twinflower Stair-step moss		Sugar maple Yellow birch Beech Beaked hazel Beech fern Christmas fern Hobblebush Lady's fern Nodding trillium Shining clubmoss Striped maple White baneberry Wood sorrel Evergreen wood fern Rose twisted stalk False Solomon's seal		Sugar maple White ash Elm Ironwood Alternate-leaf dogwood Bellwort Enchanter's nightshade Jack-in-the-pulpit Meadowrue Ostrich fern Silvery spleenwort Wood goldenrod Wood nettle Sweet cicelyl	
		Wet Soil	Black spruce Tamarack Bog aster Cinnamon fern Creeping snowberry Crested woodfern False holly Labrador-tea Mayflower Goldthread Speckled alder Sphagnum mosses		Balsam Fir Red Maple Cedar Bog aster Cinnamon fern Crested wood-fern False holly Jewelweed Marsh fern Sensitive fern Speckled alder Sphagnum mosses Goldthread Red-osier dogwood		White ash Red Maple Blue flag Dwarf raspberry Jewelweed Lady's fern Meadow rue Sensitive fern Woodland horsetail Oak fern Wood nettle Speckled alder Sphagnum mosses	
SITE INDICATOR PLANTS IN NOVA SCOTIA								

Forest Disturbance

As the saying goes, the only constant in life is change, and this applies well to the Acadian Forest. Wind, insects, disease, old age, competition and other disturbances are always at play in the forest, creating numerous gaps in the forest canopy as trees decline and die. Younger trees take advantage of the increased light and grow to fill gaps in the canopy, if they can do so before neighbouring larger trees close the gaps from the sides. The result is a fine patch-work of different-aged trees, sometimes growing in multiple layers, from seedlings to saplings to full grown trees, all in the same area.

In the Acadian Forest, this pattern of small-scale disturbances is common, and the majority of the forest is naturally uneven-aged in the absence of clearcutting or land clearing. Over time, gaps open and close in the forest canopy, creating a constantly shifting mosaic of tree ages throughout the forest.

In some areas, the soil is too thin, too nutrient poor, too dry or too wet to support the growth of trees that would be otherwise typical for the area. Stands of black spruce, tamarack and / or jack and red pine might be found growing on such soils. In these cases, natural disturbance usually tends to create larger gaps in the forest canopy that create patches of even-aged forest at times.

Occasionally, larger-scale disturbances such as fires, insect outbreaks and windstorms kill trees over tens or hundreds or even thousands of hectares. Such events



Natural regeneration

© JAMIE SIMPSON



Girdled Maple in thinned Yellow Birch

© JAMIE SIMPSON



Red Spruce fill planting

© JAMIE SIMPSON

Woodland Owner Profile:

Kevin Veinotte: Acadian Forest Keepers

Kevin Veinotte has been working with his 450 acres of forest and farmland most of his life, but his roots on his land go far deeper. Veinotte's land near New Germany has been in his family for 160 years now. *"I'm the seventh generation to work this land,"* says Veinotte, *"and I don't want to be the one to screw it up!"* he adds with a laugh.

Veinotte brought his 330 acres of woodland into the Nagaya pool (now the Acadian Forest Keepers) in 2003. Veinotte notes that at the time Nagaya was the only option available, but he adds that he likes the group because it maintains a higher forest management standard than even the current FSC Maritimes Standard. *"With the Nagaya group, clearcutting is still inappropriate, and I like that,"* says Veinotte. *"But don't get me wrong,"* adds Veinotte. *"We cut a lot of wood. We aim to cut 65,000 board feet a year, and that keeps two guys busy full-time every winter."*

Did he have to change anything to get certified? *"No – nothing changed for us,"* says Veinotte. *"And the paperwork is not too bad either. It's pretty much just common sense. I've been audited by the FSC certifiers, and they just look over my bills of sales, and walk in the woods to see where we've been working."*



Kevin Veinotte

© DNR

were rare in the natural Acadian Forest, estimated to occur some 300-1200 years apart in the pre-settlement forest. When they do occur, large-scale disturbances result in even-aged forests, where the trees start growing at more or less the same time. Gradually, the action of small-scale disturbances once again converts even-aged forest to uneven-aged forest.

Because life in the forest is well-adapted to the forest's natural disturbance pattern, many landowners base forest harvesting on this pattern as a low-risk approach to promote a healthy forest while still cutting trees.

Forest Succession

A disturbance such as a major fire, windstorm or clearcut can dramatically change the composition of the forest. Where smaller-scale disturbances lead to only minor shifts in a forest's tree composition, large disturbances can alter the growing conditions to a point where many of the original tree species cannot grow. In these cases, trees and other plants

"I just want to leave the woodlot better than when I started," says Veinotte about his management approach. Veinotte designs his harvesting to promote a healthy, multiple-aged and multiple-use forest. *"We're back in the woodlot all the time,"* says Veinotte, *"and we don't want to see a bunch of clearcuts there."*

Veinotte reports that the FSC certification has some direct benefit for his woodlot business. He gets a small bonus from some mills for his wood, and he knows that other mills will always take his wood because it's certified. *"Especially with the lower value material,"* explains Veinotte, *"it's nice to know that I won't be refused when I've got wood to go."* As well, he hopes to purchase a small sawmill before too long, and believes that the FSC label will help with marketing lumber that he may saw himself. Veinotte wasn't sure how his Christmas tree plantation would fit in with the FSC certification. In the end, the auditors told him that the Christmas trees were considered to be an agricultural product rather than a forest product, so were outside of the FSC certification process. Veinotte did get his Christmas trees certified under an organic agriculture certification program, and was the first person to ever received organic certification for Christmas trees.

Veinotte enjoys the camaraderie of the Acadian Forest Keepers group, and intends to stay a part of the group. *"There's lots of communication back and forth within our group,"* says Veinotte. *"We share ideas and try to answer each other's questions – there's always lots of learning going on. And sometimes someone in the group will let us all know about a piece of land for sale, for example, or knows of someone looking for a certain wood product that one of us might have for sale. It's nice to have a bunch of like-minded people all part of a group – you can do a lot with that."*

that are adapted to grow well in large openings tend to take over the site. Known as 'pioneer' or early successional species, these trees and plants have short life spans, grow and multiply quickly, and rapidly occupy recently disturbed forestland. Alder, pin and choke cherry, tamarack, white spruce, poplar, grey and white birch, raspberry and fireweed are examples of early "successional" trees, shrubs and herbaceous plants.

While these species do well in full sunlight, they do not tolerate the shady conditions found under their own canopy. Their dominance in a particular area is necessarily short-lived unless another major disturbance once again creates a large opening. In the absence of a major disturbance, trees that are adapted to grow with less sunlight can take root under and gradually replace the pioneer trees. These later-successional trees include red spruce, sugar maple, eastern hemlock and American beech, and are known as shade-tolerant species.

An example of forest succession in the Maritimes is often seen on old fields and pasturelands that are allowed to return to forest. White spruce (and white pine and tamarack



Fire damage at Big Dam Lake

© ALAIN BELLIVEAU

in western Nova Scotia) commonly occupies such sites as it competes well with grasses; as the white spruce trees mature and start to die, trees with greater shade tolerance, such as red spruce, white ash, sugar maple and yellow birch, can be seen growing up under the declining white spruce trees.

In some places, an abundance of balsam fir can also be an early successional step along the way to a more mature forest of eastern hemlock and red spruce.

Like many ecosystem processes, forest succession is not often neat and orderly – there are numerous variations and exceptions to the trend depending on the natural forest type for the site, the severity of the disturbance, the condition of the surrounding forest, and what seeds happen to be in abundance at the time of the disturbance.



Yellow Birch sapling under declining old field White Spruce



Sugar Maple and Yellow Birch seedlings under declining White Spruce stand

8 - Getting to Know Your Woodland



Old growth along stream, Albany New

© ALAIN BELLIVEAU

Woodlands and the Landscape Context

A woodland can be thought of as one piece of a large and intricate puzzle. Other woodlots, agricultural lands and urban areas are other pieces of the puzzle that collectively form the wider landscape.

By taking a landscape perspective, a landowner can see how her or his property might be affected by other land uses in the area, and whether the property contains unique features in the region. For example, if a woodlot contains old forest, it can be useful to know how far the old forest extends into the surrounding landscape so that several landowners can work together to conserve the old forest and the ecological values they provide. Or, a woodlot might contain the only habitat in the landscape for a certain rare species. Similarly, if a landowner has a watercourse running through his or her land, it can be useful to know how the up-stream lands are being managed, as this may impact the downstream quality of the watercourse.

Aerial photographs provide snapshots in time of the landscape condition, and as such provide useful information for a woodlot owner. Geographic Information System (GIS) maps can also yield an abundance of useful information about how one property relates to the wider landscape. Organizations such as the Mersey Tobeatic Research Institute or private contractors can help landowners to learn how their woodland fits within the surrounding landscape by using GIS mapping programs. Resource managers under an FSC certification program may also be able to provide landscape information to woodland owners.

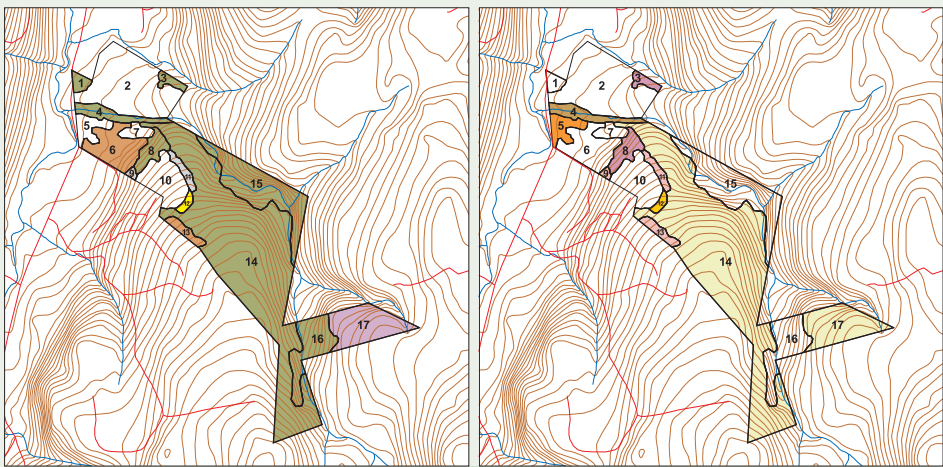
Forest Ecosystem Classification

As discussed above, soil moisture and soil nutrient levels influence where tree species tend to grow. With this knowledge, forest researchers have collected information on soil moisture and nutrients and the associated types of trees and other vegetation from hundreds

of sample sites across Nova Scotia. By compiling and analyzing this information, the Nova Scotia Department of Natural Resources is creating a guide to the various forest community types found across the province. Visit the NS DNR website for the current version of the Guide (<http://www.gov.ns.ca/natr/forestry/ecological/forest-class.asp>).

The Forest Ecosystem Classification Guide can be a useful tool for woodlot owners who wish to learn what types of soils and tree communities are present on their land, and how tree communities on their land may evolve with time. It can also be used to help determine which trees would be appropriate to plant on a given site, and which trees to favour during thinning or harvesting in order to nudge the forest towards a more natural mix of trees for the site. The Guide also contains information on approximate natural levels of standing and fallen deadwood for a given forest ecosystem type.

Using the Guide, however, requires some knowledge of soil types and the ability to identify tree and other plant species in order to work through the identification keys. An FSC certification program manager can put landowners in touch with forestry professionals who have been trained in Forest Ecosystem Classification. Woodland owners who wish to learn more about the guide can attend a training session, or educate themselves using vegetation and soil guides. A soils guide for Nova Scotia can be found at the following website: <http://gov.ns.ca/natr/forestry/reports/NS-Soils.pdf>.



9 - Forest Management



Selection cut, Mile Tree Lake

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“I have read many definitions of what is a conservationist... but I suspect that the best one is written not with a pen, but with an axe.... A conservationist is one who is humbly aware that with each stroke he is writing his signature on the face of his [or her] land.”

Aldo Leopold, A Sand County Almanac, 1949

Management Planning

If done well, managing a woodlot can help to promote a healthy, productive and resilient forest: healthy in terms of wildlife habitat and water quality, productive in terms of soil quality and economic value, and resilient in terms of ability to adapt to climate change and natural disturbances.

A good first step in working with a woodlot is to create a plan, and the first step in creating a plan is to get to know the woodlot. To gain FSC certification, a woodland owner is required to have a management plan. Walking a woodlot's boundaries and existing trails helps give the owner a sense of what's on the land – its trees and topography and watercourses. Enlisting the services of a forester, forest technician or forest ecologist can be helpful, unless the owner is already familiar with general forest ecology and woodlot management techniques.

Many woodlot owners don't write down their management plans, but rather keep them in their heads. This approach works just fine in many cases, especially for experienced woodland owners who carry out their own work on the land.

A written management plan can be useful, though, for a number of reasons. A plan helps a landowner clearly communicate her or his goals and values for the property to others, thereby preventing miscommunication. Plans also record the condition of a woodlot, thereby acting as a snapshot in time that can be looked at in the future to see how a woodlot has changed, or the effect of work done on the land. Plans also contain maps of trails, roads, waterways and other features of the woodlot. If harvesting or silviculture activities are

Woodland Owner Profile:**John Moloney: Nova Scotia Landowners and Forest Fibre Producers Association**

Not far from the community of Mabou on Cape Breton Island, John Moloney has been working his 500 acres of farm and woodland most of his life. It was his parent's land before him, and he's kept the family tradition of working the farm and harvesting from the property's 350 acres of forestland.

"I'm making a living from it, with a combination of the farming and woodlot work," says Moloney. "And I guess you can say that I like everything about this work. You can't beat it. I grew up with the farm and the woods, and I've never had to move away like others have."

Moloney was one of the first woodlot owners to receive FSC certification under the Nova Scotia Landowners and Forest Fibre Producers Association in 2005. "A few of us were asked if we wanted to volunteer to try it out – to be the guinea pigs for it. It wasn't a hard thing to do, and there was no cost to it."

Moloney noted that while the idea of certification might seem a little off-putting, in reality it wasn't too onerous. "I had to get an up-dated management plan, but that was a plus in my view," says Moloney. "The plan for FSC certification is a little more involved, a little more detailed than my previous plan. But otherwise, I haven't had to change from what I've been doing all along."

Focusing on leaving what needs to grow, and cutting what needs to be cut, is Moloney's basic management approach. "I'm always just picking away at my woodlot. I never go in to cut a whole bunch at once. I focus on cutting the mature trees, the ones that are close to getting red rot, or butt rot in them," says Moloney. He also takes a long-term view when planning what to cut, always thinking at least five or ten years ahead.



John Moloney

planned for the property, a plan keeps track of when and where these are to be carried out.

Although there are many variations of woodlot management plans, all plans should answer the following questions: What are the owner's goals for the woodlot and what does he or she value about the woodlot? What is the current condition of the woodlot (diversity, abundances and ages of trees)? Where are features such as boundaries, trails, streams, fields and forest stands / ecosystems located? What actions are recommended to achieve goals for the woodlot, and what is the timeline for the recommended activities?

Moloney hasn't seen any financial benefit from having the FSC certification, but he thinks there could be potential to use the FSC label if he starts milling and selling some lumber from his property. "Especially if I get into the higher-end cuts of lumber, then the FSC label could be valuable to help market my lumber," notes Moloney.

While he's never had a problem selling his wood, Moloney notes that there could come a day when the mill starts to favour wood coming from FSC-certified properties. "It could be that those that aren't certified get left out in the cold," says Moloney.

Does that seem unfair? "Well, no, I don't see anything wrong with that. We have to have a driver's license if we drive a car, and a hunting license if we want to hunt a deer. As long as the rules are moderate and reasonable, then any moderate person can live with it," says Moloney.

Moloney supports certification because he believes it can help make better forest management become common place. "At one time, people didn't know about protecting an eagle's nest, or people would just drive through a swamp. But now, people think differently, and that's a good thing," says Moloney. "Gradually, certification can help to get a majority of people doing better in the woods. That's the benefit as I see it," Moloney adds.

Moloney also suggests that certification can help in the on-going debate on forestry issues. "It's kind of a moderator in the debate," says Moloney. Take clearcutting for example; with the FSC certification, it can help show when clearcutting is appropriate, and when it's not."

As for the future of certification, Moloney cautions that it has to become financially sustainable on its own. "There's government money into it now, but it's only good if it's something that's going to be around for a while. You see things like this come and go, but I hope this certification pans out."

When asked how to address woodlot owners' concerns about certification, Moloney says that "it's important to have a chance for people to get together, such as with a hall meeting. Something that's happening on your land can be a little off-putting, so a meeting gives a chance to get all the misunderstandings out of the way right off the bat. We had a meeting when we first got involved with certification, and it worked for me."

Thinning and Harvesting Trees

Cutting trees, whether by thinning or harvesting, shapes the character of a woodlot. If done well, cutting trees need not compromise the health and ecological integrity of a woodlot.

There are three main themes of responsible tree cutting in the FSC Maritime Standard: (1) promoting the natural diversity of late-successional tree species for a given area; (2) working within the natural range of forest disturbance for an area; and (3) maintaining key wildlife habitat features.

1. Which tree species to promote?

As mentioned previously, the distribution of trees across the Maritimes tends to follow certain patterns that are largely affected by changes in climate and soil conditions. However, this pattern has been highly altered in many cases by lumbering and agriculture.

Deciding which trees to promote is part science and part art: essentially, it is discovering what the woodlot 'wants to be'. The Ecological Land Classification map and the Forest Ecosystem Classification Guide for Nova Scotia provide an estimate of which species grow where, and are good places to start. Looking at nearby mature forests can also help show which species are common to a certain area. A careful look at the woodlot itself is also important: late-successional tree species are often present in low numbers among an abundant growth of pioneer species, sometimes as seedlings or saplings.

The chart below³ shows which tree species have declined and which have increased in abundance since European settlement. Generally, trees that have been reduced in abundance should be promoted when carrying out harvesting or thinning activities.

Species generally reduced in abundance		Species that tend to be over-abundant
Red Spruce White Pine Red Pine Eastern Hemlock Yellow Birch Black Ash White Ash Eastern white Cedar ⁴	Red Oak Ironwood Black Cherry Sugar maple American Beech (healthy) American Elm (healthy)	Balsam Fir* Tamarack* Jack Pine* White Spruce* Black Spruce* Red Maple* White Birch Grey Birch Aspen species (Poplar) Pin and Choke Cherries
*These species form a mature forest stage in certain habitats (high-elevation or low fertility or excessively wet or very dry sites), but are generally over-abundant outside these areas.		

2. Natural disturbance harvesting

Harvesting based on natural levels of forest disturbance is an approach to minimize the potentially-harmful effect of forest cutting. It's based in the idea that forest life is well adapted to the extent and frequency of natural disturbances, so harvesting that approximates natural disturbances should have less of a negative effect on the forest ecosystem.

As natural disturbances in the Acadian Forest are mostly small and frequent, harvesting based on natural disturbance should usually create only small gaps in the forest canopy, as

³Canadian Forest Service, Atlantic Region

⁴Species at risk in Nova Scotia

might be created by the death of one or several trees. Selection harvesting and crop tree release cutting usually fall within the range of natural disturbances by retaining roughly 60-80% of the forest's canopy intact following the harvest.

Large natural disturbances were historically rare in the Acadian Forest ^{5,6}. However, past land use practices have created forests that are more vulnerable to large disturbances, such as stands of white spruce growing on old agricultural land, and stands of balsam fir on clearcut areas. Such stands may be vulnerable to insect outbreaks and windstorms. Landowners may wish to clearcut such areas, or carry out patch or strip harvesting or planting to encourage more diversity of species and ages within such stands.

3. Wildlife Habitat

Life in a working woodlot can be best conserved by protecting key forest habitats. As well as ensuring an intact forest canopy, these key habitats include (a) deadwood, both standing and fallen, (b) watercourses (including seepage sites and vernal pools), (c) soil and the forest floor and (d) species at risk sites and raptor nests.



Lightning damage, Maitland Bridge

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⁵ Mosseler, A., J. A. Lynds, and J. E. Major. 2003. Old-growth forests of the Acadian Forest Region. *Environ. Rev.* 11(S1): S47–S77

⁶ Loo, J. and N. Ives. 2003. The Acadian forest: historical condition and human impacts. *Forestry Chronicle* 79 (3): 462-474.

Deadwood

Deadwood is sometimes called the 'life of the forest'. Scientists have found that a well-decomposed log can have more living cells in it than when the tree was alive. When standing, dead and partially dead trees provide habitat for woodpeckers, which excavate nest holes in them, and for numerous other cavity-nesting critters such as barred owls, chickadees and flying squirrels. Woodpeckers create a new nest cavity every year, leaving behind homes for all the other wildlife species that rely on tree cavities for nesting and shelter.

As deadwood decomposes, it provides food and shelter for a myriad of forest wildlife species, from salamanders to fungi to nitrogen-fixing bacteria. As deadwood returns to the soil, it provides nutrients for new growth and organic matter to help build productive soil. With time, standing dead trees fall to the ground to become “coarse woody debris” and serve a valuable ecological role on the ground.

The FSC Maritime Standard requires landowners to maintain large fallen trees and standing dead trees sufficient to maintain wildlife habitat and forest productivity. While the Standard does not specify specific numbers of dead trees to leave, or volumes of downed deadwood to maintain, ensuring that your woodland always has at least six standing dead trees or cavity trees per acre is a reasonable amount. Some wildlife species require large-diameter dead trees, so the larger the deadwood the better.



Downed woody debris, Sporting Lake

© ALAIN BELLIVEAU

Landowners interested in more specific numbers can consult the Department of Natural Resource's Forest Ecosystem Classification guide (see section 8 for more details on this guide). The Classification guide provides average number of standing dead trees and amounts of fallen deadwood for each of the different forest types in the province.

As well, landowners can consult forest management guidelines published by the Greater Fundy Ecosystem Research Group⁷. For clearcuts, the Research Group recommends leaving a one-hectare island of uncut forest for every 20 hectares of clearcut. The Research Group also recommends leaving eight potential nesting trees, and eight standing dead trees per hectare, as well as the tops and branches of harvested trees. For selection harvesting, the Research Group recommends leaving as many snags as can be safely left.

No matter which harvesting method is used, the Research Group recommends leaving at least half the amount of downed deadwood that would be there naturally. Natural amounts of deadwood can range from approximately 9 to 25 cords of material per acre, so half this amount would mean leaving between 4.5 and 12.5 cords per acre (between 40 and 110 cubic metres per hectare). This is roughly the equivalent of 2 to 6 large trees-worth of downed deadwood per acre.

⁷www.unbf.ca/forestry/centers/fundy/documents/GFE_Guidelines.pdf



Beech cavity, Northfield

© ALAIN BELLIVEAU



Wildlife cavity, Low Landing

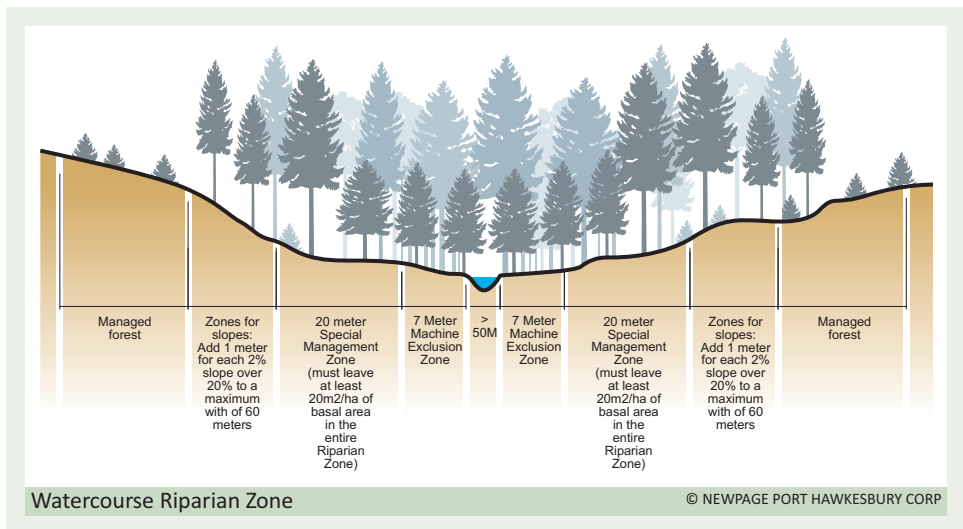
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Watercourses

Watercourses are another critical habitat for forest life. Numerous species live in a woodlot's streams and ponds, for all or part of their lives. Many other species travel through the forest along waterways, attracted to the abundance of food they provide. Songbirds, for example, are attracted to the abundance of food found in forest along waterways. In all, approximately three-quarters of forest wildlife either depend upon or prefer habitat close to water^{8,9}.

The forest area next to a waterway is called the riparian zone, and is that part of the forest that influences and is influenced by a watercourse. The necessary width of a riparian zone varies from species to species, and with the intensity of harvesting outside of the riparian zone. Forest songbirds were found to require a riparian zone at least 100 metres wide on either side of rivers or streams^{10, 11, 12} and wildlife are found to most heavily use an area within 200 metres of watercourses.¹³

In Nova Scotia, the current required riparian zone is a minimum of 20 metres on watercourses that are more than 50cm wide, with incremental increases to the zone when



⁸ Bancroft, B. and D. Crossland. 2010. A Natural Balance: Towards a Natural Resources Strategy, Research Addendum, Phase II, Natural Resources Strategy, NS Department of Natural Resources. Pg 34.

⁹ Elliott, C.A. 1994. Managing Riparian Habitat for Songbirds, Raptors and Small Mammals. R&D Report No. 9 Proceedings of the Symposium on Riparian Zone Management. Canadian Forest Service Pg 71-82.

slope beside the watercourse are steeper than 20%. Woodland owners can cut trees within this zone, provided that they do not create gaps in the canopy larger than 15 metres across, and that basal area is not reduced below 20 square metres per hectare. For many sites, this means leaving approximately two-thirds of trees standing. As well, machinery is not allowed to be driven within 7 metres of watercourses, except at appropriate stream crossings.



Hemlock culvert, Lake Rossignol

Water crossings can negatively impact the health of watercourses if improperly constructed (or worse, not used at all). The Nova Forest Alliance (www.novaforestalliance.com) publishes a manual of best practices that includes details on proper watercourse crossings, and the Nova Scotia Department of Natural Resources has several publications on roads and watercourse crossings (www.gov.ns.ca/natr/education/woodlot/modules/module11/appendixA.asp).



Undisturbed riparian zone



Inadequate buffer in a riparian zone

¹⁰ Elliott, C.A. 1994. Managing Riparian Habitat for Songbirds, Raptors and Small Mammals. Proceedings of the Symposium on Riparian Zone Management R&D Report No.9 CFS: 71-82.

¹¹ Lambert, J. D., and S. J. Hannon. 2000. Short-term effects of timber harvest on abundance, territory characteristics, and pairing success of ovenbirds in riparian buffer strips. *The Auk* 117(3): 687-698.

¹² Hodges, M.F. Jr., and D.G. Kremetz. 1996. Neotropical Migratory Bird Communities in Riparian Forests of Different Widths along the Altamaha River, Georgia. *Wilson Bull.* 108(3): 496-506.

¹³ Brinson, M.M., B.L. Swift, R.C. Plantico, and J.S. Barclay. 1981. Riparian Ecosystems: their status and ecology. USDI Fish and Wildl. Serv., Biological Services Program, FWS/OBS. 81/17: 127-154.

Forest Soils

Although largely unseen, a forest's soil contains a complex ecosystem of life that is essential to the health and productivity of the forest. The upper-most layer of the soil – the forest floor layer – is the veritable stomach of the forest. Thanks to the action of countless species of bacteria, insects and fungi, all living matter, once dead, is gradually broken down and returned to the soil, fueling the nutrient cycle and building healthy soil.

Poor forestry practices can damage soil and reduce the productivity of the forest. Woodlot owners can promote healthy soil by keeping machinery away from wet or compactable soils, building properly designed roads, ensuring adequate deadwood, and promoting a diversity of tree species, especially hardwoods. With their deep root systems, hardwood trees bring nutrients from soil depths to the surface; as well, the litter-fall from hardwoods is less acidic than litter-fall from softwoods, and therefore helps maintain a less acidic and more productive forest soil. More information on forest soils and identifying erosion and compaction risks can be found in Forest Soil Types of Nova Scotia (<http://gov.ns.ca/natr/forestry/reports/NS-Soils.pdf>).



Logging track, Prest FSC property

© DAN HUTT

Species at Risk and Significant Habitat

Finally, woodland owners can help to ensure that 'species at risk' – those threatened due to dangerously small populations – are conserved by learning about their habitat needs, and protecting these habitats if they occur on their properties. Woodland owners can contact the Mersey Tobeatic Research Institute for an informative landowner's guide to habitats of species at risk and how to conserve them. Similarly, landowners can help conserve birds such as hawks, owls and eagles by learning to identify their nests, and ensure that trees with these nests, and a buffer of surrounding forest, are not cut down.

Species At Risk - Contact MTRI for a complete list, their habitats and how you can help protect them.

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© RALPH HOCKEN

© ROB CAMERON



Blanding's Turtle

© ALAIN BELLIVEAU



Olive-sided Flycatcher

© MEGAN CROWLEY



Boreal Felt Lichen

© SCOTT WALLIS



Monarch Butterfly

© SEABROOKE LECKIE



Sweet Pepperbush

© ERICA NEWTON



American Marten

© LAWRENCE BENJAMIN



Rusty Blackbird



Eastern Ribbonsnake



Eastern White Cedar

Other Important Species

© ALAIN BELLIVEAU (UNLESS NOTED OTHERWISE)



Downy Woodpecker



Foxberry

© BILL ENGLISH



Pitcher Plant



Wood Frog



Mayflower



Eastern Smooth Green Snake



Barred Owl



Wood Turtle

© MARK PULSIFER



Downy Rattlesnake Plantain



Christmas Fern



Hemlock Varnish Shelf Fungi



Red-tailed Hawk

10 - Resources



Organizations

Association for Sustainable Forestry: www.asforestry.com
Administers funding for silviculture treatments on woodlots in Nova Scotia.

Ecology Action Centre: www.ecologyaction.ca
Provides information about forestry and land conservation issues in Nova Scotia.

INFOR: www.infor.ca
New Brunswick-based clearing house of information on woodlot management, including maple syrup and Christmas tree production. INFOR has a number of low-priced publications on woodlot management available for sale.

Forest Stewardship Council, Canada: www.fscscanada.org
Contains information on FSC certifications, products and standards in Canada

Macphail Woods Ecological Forestry Project: www.macphailwoods.org
An excellent source of practical information on woodlot management, including information on growing trees and shrubs, enhancing wildlife habitat and implementing low-impact harvesting.

Mersey Tobeatic Research Institute: www.merseytobeatic.ca
Provides information on biodiversity and endangered species, as well as courses and lectures on a variety of topics of interest to landowners.

Nova Forest Alliance: www.novaforestalliance.com
One of Canada's model forests; its website contains a number of publications of interest to woodland owners.



EMAN plot

© ASHLEY NOTO

Nova Scotia Department of Natural Resources:

www.gov.ns.ca/natr/

Publications, programs and educational opportunities of interest to woodland owners can be found on this site. The Department offers a home study course for woodland owners. See:

<http://www.gov.ns.ca/natr/forestry/ecological/forest-class.asp> for DNR's Forest Ecosystem Classification guide.

Nova Scotia Woodlot Owners and Operators Association:

www.nswooa.ca

One of several woodland owner organizations in Nova Scotia.

University of Maine Cooperative Extension:

extension.umaine.edu

Contains a wealth of practical information for woodlot owners. This information is accessed by scrolling to their Natural Resources section, and then clicking on the topic of interest.

Certification Groups

Acadian Forest Keepers:

<http://acadianforest.weebly.com/>

Federation of Nova Scotia

Woodland Owners: www.fnswo.ca

Nova Scotia Landowners and Forest Fibre Producers

Association: www.nslffpa.org

Books and other publications

Components of a Backyard Wildlife Habitat

Coverstone, Nancy. (no date)
Bulletin #7137. University of Maine
Cooperative Extension.

A well-written, illustrated and easy-to-understand guide to creating and promoting a variety of wildlife habitats; available on the University of Maine Cooperative Extension website.

Contractors & Operators Best Management Practices Manual

Nova Forest Alliance. Stewiacke, Nova Scotia.

The Best Management Practices Manual was developed by forest contractors and operators and covers topics such as harvesting, wildlife management and road construction. Contact info@novaforestalliance.com to order a copy.

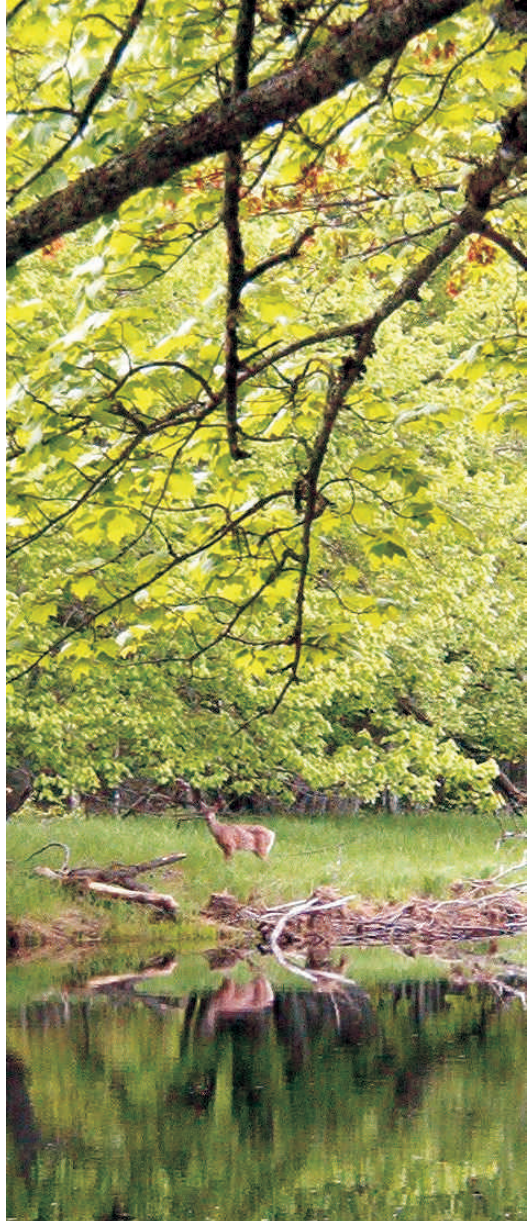
Deadwood – Living Forests: The Importance of Veteran Trees and Deadwood to Biodiversity

Dudley, Nigel, and Daniel Vallauri. 2004. World Wildlife Fund, Gland, Switzerland.

Highlights the problems caused by extreme cases of deadwood removal, as have occurred in some European forests; available on the internet.

Forest Management Guidelines to Protect Native Biodiversity in the Greater Fundy Ecosystem.

Betts, M.G. and G.J. Forbes (ed). 2005. Greater Fundy Ecosystem Research Project, Fredericton, NB.
A set of forest management guidelines to maintain native biodiversity based on scientific studies within the region.



White-tailed Deer, Mersey River

© PAT LAWSON

Low Impact Forestry: Forestry as if the Future Mattered

Lansky, Mitch (editor). 2002. Maine Environmental Policy Institute. Hallowell, Maine.

A compendium of practical information on implementing low-impact forest harvesting, including reviews of harvesting equipment, options for paying loggers and discussion of the economics of low-impact forestry.

Restoring the Acadian Forest: A guide to forest stewardship for woodlot owners in the Maritimes.

Simpson, J. 2008.

Four East Publications, NS.

A resource for landowners on forest ecology and woodlot management in the Acadian Forest region.

Silvics of North America: 1. Conifers; 2. Hardwoods

Burns, Russell M., and Barbara H. Honkala, tech. coords. 1990. Agriculture Handbook 654. U.S. Department of Agriculture, Forest Service, Washington, DC

The two volumes (one for hardwoods and one for softwoods) comprise a useful and comprehensive resource on trees and forest management. The book is available on the internet at

http://www.na.fs.fed.us/spfo/pubs/silvics_manual/table_of_contents.htm.

Trees of Canada

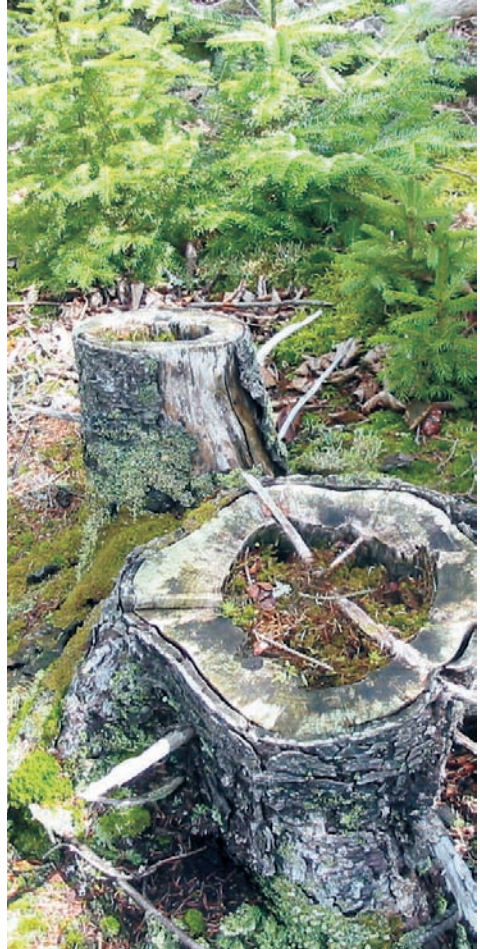
Farrar, John Laird. 1995. Fitzhenry Whiteside Ltd. and the Canadian Forest Service: Ottawa.

An excellent reference on the characteristics of trees growing in Canada, and includes colour photos and helpful notes on differentiating similar species.

Weeds of the Woods

Blouin, Glen. 1992. Goose Lane Editions, Fredericton, NB.

Illustrated with numerous colour photographs and provides a wealth of information on common Acadian Forest shrubs and small trees, including notes on identification, their use by wildlife, their use as food and medicine by European settlers and First Nations people.



Butt rot in old stumps

© JANE BARKER

Glossary¹⁴

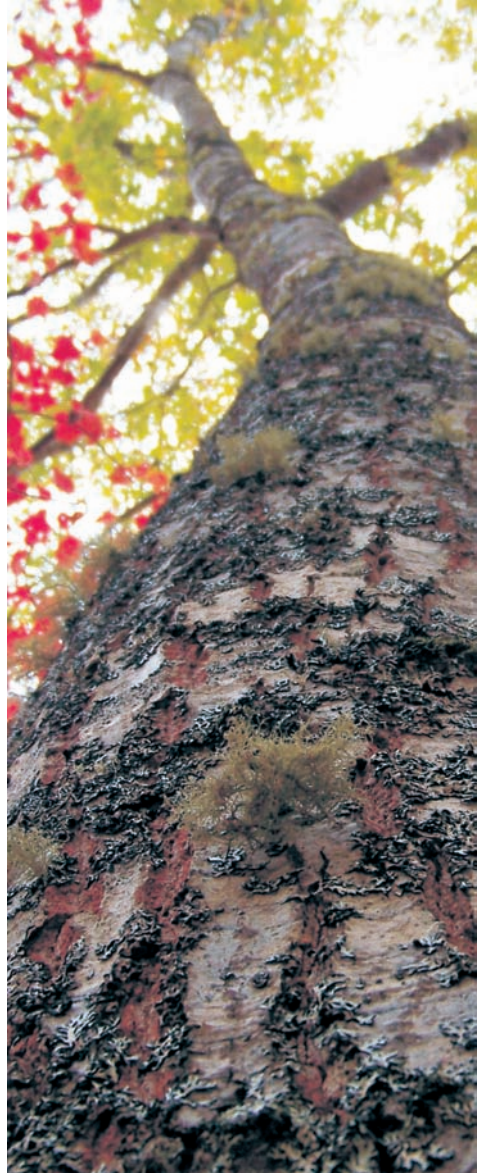
Acadian forest region: a forest region encompassing New Brunswick, Nova Scotia, and Prince Edward Island, most of Maine, and parts of New York, New Hampshire and Vermont. It is a transition forest between the Boreal forest and the Northern hardwood forest, and contains a diverse collection of trees, shrubs and other plants. It is characterized by red spruce, yellow birch, balsam fir and sugar maple. It is classified as an endangered forest type by the World Wildlife Fund.

Afforestation: conversion of non-forest land to forest land, which may occur by natural regeneration, seeding or planting.

Biodiversity (biological diversity): the variety and interconnectedness of life, including all species of plants, animals, and other organisms, the genes they contain, and the ecosystems and ecological processes of which they are a part.

Boreal forest: the northernmost and coldest forest zone in the Northern Hemisphere, forming a continuous belt 1,000 km in north-south width across North America, Europe, and Asia. It is the most extensive vegetation zone in Canada.

Bryophytes: non-vascular land plants (mosses and liverworts).



Red Oak, Big Rocky Lake

© ALAIN BELLIVEAU

¹⁴ Sources include A Natural Balance: Towards a Natural Resources Strategy (NSDNR); and FSC Maritimes Standard

Category 7 (Forest Quality Improvement):

One of the silviculture categories under the Forest Sustainability Regulations. This category includes three subcategories: (a) Crop Tree Release, (b) Crop Tree Pruning and (c) Selection Management.

Canopy closure: the extent to which the upper layer of foliage in a stand or forested area reduces the passage of sunlight to lower levels, or screens the view of the sky.

Chain of custody: the channel through which products are distributed from their origin in the forest to their end-use.

Clearcutting: a silvicultural system in which an area of trees is cleared at one time. Clearcutting results in the establishment of a new even-aged stand of trees which can be naturally or artificially created. From an ecological perspective, a clearcut is an opening in the forest canopy large enough to potentially change the successional stage of the harvested area through increased light and other environmental changes.

Closed canopy: a forest canopy that is dense enough that the tree crowns fill or nearly fill the canopy layer so that direct light does not reach the forest floor.

Coarse woody debris: logs, stumps and tree limbs on the forest floor in various states of decomposition. Coarse woody debris provides habitat for many wildlife species.

Ecological landscape classification: a hierarchical mapping of forest ecosystems based on factors such as climate, soil, bedrock and vegetation. Levels within an



Hairy Woodpecker, Northfield

© ALAIN BELLIVEAU



Indian Pipe, Northfield

© ALAIN BELLIVEAU

ecological landscape classification are 'ecoregion', 'ecodistrict' and 'ecosite'.

Ecological integrity: the quality of a natural, unmanaged or managed ecosystem in which the natural ecological processes are sustained, with genetic, species and ecosystem diversity assured for the future.

Ecosystem: a community of organisms and their physical environment, functioning together as an intra-dependent unit.

Endangered species: a species in danger of extinction throughout all or a significant portion of its range.

Even-aged management: silvicultural systems in which stands have an even-aged structure, e.g., clearcut, shelter-wood cut, seed-tree cut.

Even-aged stand: a stand of trees in which the age differences among trees are small, usually less than 10 to 20 years. Even-aged stands result from disturbances such as wildfires, clearcuts, seed tree cuts and shelterwood cuts.

Exotic species: a species not native to the area in question.

Forest ecosystem classification (FEC): a site-level description of ecosites, vegetation communities and soil types designed for operational level planning. It can be used to help determine the natural mature forest condition for a site.

Geographic information system (GIS): A computer-based system to capture, store,

analyze, manage and present data that are linked to location; it is a merging of cartography and database technology.

Integrated pest management (IPM): a method of pest control that relies on a combination of approaches to reduce damage of pests to the forest rather than relying solely on spraying of pesticides. A goal of IPM is to reduce the environmental impacts of pest management.

Irregular group shelterwood: a partial harvest method resulting in a stand with varied tree heights and ages due to cutting of small groups of over-story trees to create various sized openings equivalent to one or more tree lengths. Sufficient tree canopy is retained to shelter the resulting natural regeneration. Opening sizes depend on the regeneration requirements of the preferred tree species and other objectives.

Landscape: a geographical mosaic composed of interacting ecosystems resulting from the influence of geological, topographical, soil, climatic, biotic and human interactions in a given area.

Natural disturbance regime: a pattern of disturbances that shape an ecosystem, resulting in an ecological pattern over space and time. A specific natural disturbance regime is closely associated with the natural community in which it occurs.

Natural forest: forest areas where the principal characteristics and key elements of native ecosystems such as complexity, structure and diversity are present.



Beech, Morris Island

© ALAIN BELLIVEAU



Clear Beech, Big Rocky Lake

© ALAIN BELLIVEAU



Eastern White Pine bark

© JANE BARKER

Non-timber forest products: all forest products except timber, including other materials obtained from trees, such as resins and leaves, as well as any other plant and animal products.

Old-growth forest: forests characterized by (1) trees that are large and old for the site, (2) trees species that are late-successional for the site, (3) an abundance of large standing and fallen dead trees, (4) an abundance and diversity of ground vegetation, (5) uneven ground, (6) often, although not exclusively, a diversity of tree ages, and (7) little or no evidence of human disturbance.

Pesticide: any substance, preparation or organism (including insecticides, herbicides and fungicides) used to protect plants or wood or other plant products from harmful organisms, and to control organisms with harmful or unwanted effects.

Pioneer species: species that colonize previously un-colonized land, usually leading to ecological succession. Pioneer species often colonize clearcut areas and previously-farmed or pastured lands.

Plantation: As defined in the FSC Maritimes Standard, 'plantations' are forest areas lacking most of the principal characteristics and key elements of native ecosystems, which results from planting, sowing or intensive silvicultural treatments. For the purposes of the FSC Maritime Standard, plantations exist when some or all of the following stand characteristics are maintained in a highly altered state or eliminated:

- a) tree species diversity (especially deciduous species and/or other



Hemlock bark

© ALAIN BELLIVEAU

- noncommercial species);
- b) stand diversity (e.g., patchiness, presence of small openings, variability in tree species diversity, density and/or canopy layers);
- c) stand structures and associated habitats resulting from pathogens or physical damage (e.g., forked stems, hollow boles, dead tops);
- d) early successional habitats (e.g., berry patches, areas dominated by brush and herbaceous species)
- e) presence of mature and old trees; and
- f) coarse woody debris.

Restoration: in terms of forest management, a process of allowing and encouraging ecosystems or habitats to develop a full range of forest characteristics, including structure and species composition, indicative of a mature natural forest for a given site.

Riparian zones: the area next to a watercourse that influences and is influenced by the watercourse. Forested riparian zones are heavily used by wildlife and tend to connect the landscape for wildlife, protect aquatic habitats and offer terrestrial habitats.

Shade-intolerant species: plant species that cannot tolerate low-light conditions; shade-intolerant tree species tend to dominate early-successional forest types.

Shade-tolerant species: plant species that can tolerate low-light conditions; shade-tolerant tree species often dominate climax forests (e.g., red spruce, hemlock, beech, sugar maple).



Hemlock, Dennis Boot Lake

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Cup Lichen, Harry Lake

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Lichens, mosses at Low Landing

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Silviculture: the techniques and systems of managing forest vegetation to meet human needs.

Snag: a standing dead tree or portion thereof.

Species at risk: species about which concern exists regarding their viability at regional, provincial or a national scale.

Stand: a community of trees possessing sufficient uniformity in composition, constitution, age, arrangement or condition to be distinguishable from adjacent communities.

Structural diversity: the diversity of forest structure, both vertical and horizontal, that provides a variety of forest habitats for forest life. The variety results from layering of the canopy and die-back, death and decay of trees. In aquatic habitats, structural diversity results from the presence of a variety of structural features such as logs and boulders that create a variety of habitats.

Succession: a series of changes in ecosystem structure, function and species composition over time, in which one group of organisms succeeds another potentially leading to a climax stage with long-term stability.

Threatened species: a species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

Uneven-aged management: a forest harvesting system that maintains or promotes stands of trees with differing ages (generally greater than 10 to 20 years), including

selection cutting and irregular shelterwood cutting.

Uneven-aged stand: a stand with a mix of trees belonging to three or more distinct age classes, generally greater than 10-20 years apart.

Value-added processing: A manufacturing process which increases the value of the product above a normal or basic level; a manufacturing process that converts a commodity product, including logs, into a non-commodity product that requires some specialization to produce.

Watershed: An area of land that feeds a particular stream, river, lake or other waterbody.

Wetland: lands transitional between terrestrial and aquatic systems where the water table is at or near the surface, or the land is covered by shallow water at some time during the growing season. Wetlands are characterized by poorly drained soils and predominantly hydrophytic or water tolerant vegetation.

Wildlife: generally considered to include any species of amphibian, bird, fish, mammal, reptile or plant found in the wild, living unrestrained or free-roaming and not domesticated.



Portable mill

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