



Kathy Beaton, Canadian Forest Service, Atlantic Region

Peter Salonijs of the Canadian Forest Service using a planting spade to mix soil and cut existing roots prior to planting a container-grown seedling.

Tree Planting Tips

- Avoid sites that are extremely wet, or which have very acid or heavy soils.
- Plant on the tops and sides of mounds, not in depressions.
- Find or create spots that are appropriate for the species in terms of soil and sunlight.
- Trees and shrubs planted to restore diversity to a woodlot can be scattered widely throughout.
- Areas with a thick forest floor layer of leaves or moss should be scuffed with a boot or shovel prior to planting.
- A spade can be driven into the ground a few times to create a mixture of organic and mineral soil free of living roots.
- Be wary of spots with a lot of grasses, weeds, or woody shrubs, as these can compete with trees for sunlight and moisture.
- For seedlings grown in containers, dig a straight-sided hole about 30cm (12in) deep for every 20cm (8in) of root depth, and at least 2 to 3 times the diameter of the root mass.
- Loosen earth on the sides of the hole to allow easier growth of a transplant's roots.

- If the seedlings were not grown in a container (bare-root stock), place a ball of topsoil in the hole and spread the roots over the mound. If planting container stock, simply place some topsoil at the bottom of the hole and set the transplant on top of it.

- Plant the tree at the same soil depth or slightly higher than it grew in the nursery.

- Tamp around the planted seedling to remove air pockets; having all roots in contact with forest soil encourages quick root growth. Avoid fertilizing seedlings in order to encourage strong outward root growth. Some species such as hemlock and yellow birch may benefit from some wet, rotten wood placed in the hole at planting time. This may provide the plants with necessary moisture, especially on old field sites that have reduced organic matter in the soil.

- If planting in an old field, mulch around the tree with leaves or wood chips to help suppress weeds and keep moisture in the soil.

- Soaking roots in a slurry of wet soil the night before planting can help increase survival rate.
- If not all are planted in one day, an option is to bury the roots of remaining bundles of seedlings in a moist, sheltered spot overnight.

Container stock:

- Keep containers well-ventilated, moist and out of direct sunlight; seedlings should be planted within a few days.
- Seedlings in mesh-covered plugs should be planted with the mesh intact.

- Ideally, container stock should be planted before roots have filled the pot. If this has already happened, some of the larger roots can be gently pulled away from the root ball.

PLANTING OLD FIELDS

Abandoned or unused agricultural fields are common in the Maritimes. Years of agricultural use typically have changed the soil composition and structure of these old field sites. Some sites have a soil condition known as hardpan, caused by decades of ploughing to the same depth, which limits proper drainage and rooting. Coarse woody

debris, nutrients and soil organic matter may also be in short supply.

Plants common on abandoned fields – known as pioneer species – are able to withstand these demanding conditions, so they play an important role in rejuvenating such sites. With time, fields that are not mowed or otherwise kept open will eventually fill with pioneer species. These early successional plants protect the soil from erosion, bring nutrients up from deep soil layers, and build organic matter. They also provide shade and increase moisture levels, creating suitable humid microclimates for late-successional species and providing valuable food and nesting sites for wildlife. Many of the pioneer trees grow fast and have relatively short lives, so they provide a relatively quick source of standing and fallen deadwood. White spruce is a common component in this succession, along with species such as tamarack, white birch, poplar, cherry, alder, white pine and willow.

Alder shrubs: An old field benefactor

Specked alder and green alder are two native shrubs that often colonize old-field sites. Although often unpopular with landowners because of their tenacious growth, their presence is actually

beneficial to the soil and wildlife. Alders add nitrogen to the soil through a special relationship with bacteria on their roots that take nitrogen from the air and transform it into a form usable by plants. Further, alders create shade that hinders the growth of grasses while keeping moisture levels high for shade-tolerant tree species. Common winter birds such as American goldfinch, pine siskin and common redpoll feed on the seeds while ruffed grouse eat the buds and catkins. American woodcock use alder patches both as a source of earthworms and as a place for their mating ritual; snowshoe hare and moose browse on the twigs and beavers use the bark for food and the wood to build dams. Because alders cannot tolerate shade, they last only until taller trees overtop them. Therefore, a field with pockets of alders is an excellent place to plant trees that are moderately to highly tolerant of shade such as red spruce, hemlock, sugar maple, white pine, white ash and yellow birch.

Thoughts on planting ...

“The idea with restoration planting is to get species back in the forest with minimum investment, which means getting individuals into the landscape to serve as seed trees.”

Peter Salonijs, Canadian Forest Service, Atlantic Region, 2006 ¹⁶

“A plantation consists of even-aged trees of one species growing in rows. There is only one dense layer of leaves to catch the sun’s energy. Below that layer nothing grows. It is a dead zone. In contrast, in a forest there are many layers, including shade-tolerant species that grow below that canopy. Many species can grow in a forest, not just the one chosen for present economic use.... In a forest, where different species thrive because each has a slightly different optimum for light, acidity, drainage, temperature, and minerals, each spot of ground gets exploited by the one best suited for that niche, and through diversity, one’s “investment portfolio” is more secure in case a species chosen now no longer brings top dollar fifty years from now.”

Bernd Heinrich, The Trees in my Forest, 1997

“There has already been public outcry over the clear-cutting and the spraying, but... tree plantations are much more insidious and ultimately more damaging than either.... [T]ree planting is often pictorially advertised on television and in national magazines by focusing on cupped caring hands around a seedling. But forests do not need this god-like interference. Planting tree plantations is permanent deforestation.”

Bernd Heinrich, The Trees in my Forest, 1997

Providing Habitat

BIRDS AND THE WOODLOT

For many, a walk in a woodlot would not be complete without the sound and sightings of forest birds – the calls of chickadees in winter, the faithful arrivals of songbirds in spring, the early-morning orchestra of bird songs in summer, and, for some, the traditional hunting of grouse in fall.

In addition to enriching woodlot enjoyment, though, birds are an integral part of healthy forest ecosystems. Here's how:

- Birds help to keep populations of damaging insects in check. Warblers, for example, consume almost twice their body weight in insects daily to survive and feed their young.
- Chickadees and nuthatches stash seeds and nuts throughout the forest to sustain them through the winter. While most are eaten, some are forgotten and are left to grow. Red oak seedlings appear in unexpected locations thanks to the similar habits of blue jays. As well, seeds eaten by birds often pass unharmed through their digestive tracts, and are then 'planted' along with a little fertilizer as the birds move about the forest.
- Woodpeckers excavate nest cavities in dead and dying trees. These are single-use nests – woodpeckers create a new one each year. This

A Warbler's Nest

Black-throated blue warblers fly from Central America and the Caribbean to eastern North America each spring to breed and raise their young. The male searches for a very specific habitat - a 1 to 2 hectare (2.5 to 5 acre) patch of forest that contains yellow birch and hobble bush (*Viburnum alnifolium*) - where the female builds the nest. She gathers strips of yellow birch bark and weaves them together, joining the strips of birch bark with sticky strands of spider webs. She then lines the nest with moose hair collected from the surrounding forest to help keep the eggs warm.

leaves numerous relatively dry and safe homes for other cavity dwellers the following season, including chickadees, nuthatches, owls, wood ducks and golden eyes, as well as mammals such as flying squirrels.

A bird-friendly woodlot

Each species of forest bird tends to have its own specific habitat niche in the forest. Blackburnian warblers, for example, nest in high forest canopy. Ovenbirds nest on the forest floor. Red-wing crossbills feed on the cones of softwood trees, while black-throated green warblers feed on insects found in hardwood trees. Cavities and woodpecker holes

Birds and Budworm

Every spring numerous species of birds migrate from Central and South America to the Acadian Forest. An appetite for the Acadian Forest's abundant insect life is one reason these songbirds make their long journey. Although insects are part of a healthy forest, some have the potential to overwhelm a forest if not kept in check by predators such as birds and bats. When kept in check by predators, insect damage in a naturally diverse forest is usually kept to manageable levels. Insect outbreaks occur from time to time, but birds help mitigate the severity of outbreaks, and increase the time between outbreaks.

The spruce budworm is an infamous insect in the Maritimes for its role as a disturbance force in some parts of the Acadian Forest. Budworm outbreaks have been documented over the past 200 years, and tend to occur on a 35-year-cycle in areas prone to outbreaks. The spruce budworm's favourite food is the young needles of balsam fir trees, but it will also feed on white, black and red spruce (in order of preference). Stands with high proportions of balsam fir and spruce provide perfect feeding grounds for the spruce budworm and are heavily damaged during budworm outbreaks.

Bay-breasted warblers, Cape-May warblers, Canada warblers, blackburnian warblers and golden-crowned kinglets all have been known to mitigate the damage done by spruce budworm, both during and between outbreaks, by eating budworm pupae and larvae. Woodlots owners who welcome these birds to their woodlots will be rewarded for their hospitality.

Creating Urban Habitat:

A visit with Bill Freedman by Flora Cordis Johnson

In the dappled shade beneath a group of native birches, glossy leaves of mayflower mix with delicate sprays of creeping snowberry. A few steps away, delicate blooms of wild rose nestle against the yellow flowers of cinquefoil. Nearby spikes of white meadowsweet cozy up to the twinned golden trumpets of a honeysuckle shrub.

Squeezed between a parking lot on one side and a neatly trimmed lawn on the other, Freedman's urban yard may be small, but it stands out like an oasis in the midst of the city streets of Halifax. Though it is only about 100m² counting front and back yards, its lush growth brings to mind the under-story of an Acadian Forest woodlot, and for good reason. The tiny property is full of woodland plants that are native to eastern Canada, but are rarely found in urban environments.

Freedman is a Professor in the Biology Department at Dalhousie University and the author of several textbooks about environmental science, as well as hundreds of scientific papers and reports. He has devoted his career to studying the effects of human activities on natural environments – effects that are mostly detrimental.

Freedman answers the front door of his home, located beside the downtown campus of Dalhousie University, with a polite inquiry about any difficulty in finding his house. However, his grin acknowledges how hard the property would be to miss. This oasis of native plants in a desert of asphalt and lawns is a part of his conservation ethic. "This is a bit of my own direct-action environmentalism," he says with pride.

The Urban Environment

Ecologists didn't pay much attention to city landscapes until recently, Freedman explains. His own research was, and still is, devoted primarily to the natural ecosystems of eastern Canada, but a few years ago he also became interested in the relatively new field of urban ecology. Now, he is convinced that urban environments will play an important role in determining the planet's ecological future. "I realized that I should do something useful where I and most other people live."

Freedman is particularly concerned about ecological damage caused by the spread of invasive non-native plants. "As an ecologist and an environmental scientist, I know that one of the biggest problems affecting native biodiversity today is alien, invasive species – species

that are brought from far away to places where they are not native," he says. "I realized that I should try to eliminate these invaders where I live."

To do this, and to set an example for others, Freedman decided to progressively remove the plants on his property that came from continents other than North America, replacing them with species native to this continent. Plants such as Japanese knotweed, dandelion, purple loosestrife, and many others were brought to North America by accident and by horticulturalists who appreciated them for their hardiness and adaptability. But these alien plants have escaped into the wild where their strengths allowed them to invade natural habitats, crowding out indigenous plants and depriving native animals of suitable habitat.

Gardening with native plants

As an ecologist doing fieldwork in eastern and northern Canada, Freedman is often in a position to "rescue" native plants that would otherwise be destroyed by road building, residential development, power lines or clearcuts. About six years ago, he started salvaging plants that were destined for destruction. Initially, he planted a group of seedling birches in his front yard that are now 2.5m (8ft) tall, later adding some native shrubs to what had been a lawn. Three years ago, he killed the grass by putting down three to five sheets of wet newspaper and covering that with bark mulch. "I've been making a lot of progress since then," he explains.

The lawn has now vanished and the non-native shrubs are gradually being removed, both replaced by a dense cover of native plants. Several large trees will stay a while longer due to the risky expensive removal. However, in 2003, Hurricane Juan helped him out by blowing down a large, non-native linden tree. Bill used the stump as the base for planting an eastern hemlock, a rock polypody fern and some pearly everlasting – all of which are native species.

Freedman takes a rather casual approach to garden planning, and many plants are placed wherever a suitable spot is available in the small yard. It is hard to follow a detailed plan when working with whatever species happen to come his way. However, some areas are zones for plants of acidic habitats and others for those that need more calcium-rich soil. For example, a shady area near the house is a fern garden while a brighter area has herbaceous perennials that include tall, hardy natives such as aster, goldenrod and fireweed.

Maintaining a Native Garden

Probably the most significant obstacle facing any gardener, especially with native plants, is the control of aggressive non-native species that can easily take over a garden. This problem is especially severe in heavily developed areas because some non-native species will spread into a native garden from surrounding properties, as do the pervasive alien weeds, such as chickweed, plantain and yellow oxalis.

Freedman says his biggest problems among these invaders are goutweed and creeping bellflower. Exotic lawn grasses are also a problem and will keep invading as long as his neighbours have lawns. Freedman removes the weeds by hand since herbicide use is not permitted in Halifax, and he plans to periodically put down additional layers of mulch to smother the alien weeds.

There is a risk that some of his native plants may also prove to be too aggressive for the small space. For instance, hay-scented fern has to be controlled and may be destined for complete removal, as it is threatening to engulf a foamflower and several other smaller native wildflowers. He is also controlling the expansion of grass-leaved goldenrod, northern bush honeysuckle, and a recent planting of staghorn sumac, all of which have a reputation for spreading. "I have to weed aggressively, if I want to maintain all of the plants that I want to be present," he says, noting that this is a price he willingly pays in order to maintain a high level of native diversity in such a small growing space.

Other than the weeding, though, Freedman's native garden requires little care. He supplies lime to a few plants that favour alkaline soil, such as the shrubby cinquefoils. He also waters the moisture-loving plants, such as ferns, during dry weather because he wants them to stay green all summer. If he failed to water, they would die back naturally, as they do in the wild, and then return the following spring.

According to the ecologist, the most challenging part of gardening with native plants is knowing their natural growth patterns and ecological requirements. However, that too has its rewards. "One of the benefits of this type of activity is that if people do this kind of naturalization and they do it well and responsibly, they'll also be learning more about native plants and their habitats," Freedman notes. "They will be learning about nature, and then they will have more empathy for the native and natural world."

Urban Transformation

Freedman acknowledges that a small urban garden isn't going to have much of an impact on planetary trends. At best, he sees his garden is a "demonstration project" that might inspire people that see it as an interesting and worthwhile thing to do. If these people go on to follow this example, he believes that the naturalization of urban properties could be "transformative." Freedman envisions a future in which the urban jungle could be converted into an urban forest – a future in which so many properties are naturalized that the native urban plantings would merge together into what he calls "continuous naturalized habitats."

If enough city gardens become naturalized, Freedman hopes that many native animals previously driven from cities will be able to return and even breed in urban areas. He maintains a cavity tree for birds and has placed deadwood on the ground to create habitat for moisture-loving species. As a result, his relatively new garden already hosts a variety of native birds, as well as rare red-backed salamanders. He believes that the variety of native animals would increase substantially if enough properties are naturalized. "The connection isn't well-documented," he says, "but it seems reasonable to assume that this would be the case. If a lot of people were to undertake native plant cultivation, I think we would have a transformative event."

Public education is key to this urban transformation, says Freedman. In 2003, he founded the Canadian Environmental Literacy Project, which provides environmental teaching materials free of charge to educators via a website at <http://celp.ucis.dal.ca/>. As a member of the Board of Directors of the Nature Conservancy of Canada, he works hard outside of his academic job to protect natural ecosystems, leading to his receiving a Canadian Environment Award for Conservation in 2006.

"If you want to construct a facsimile of an Acadian Forest in an urban area then a lot of people have to be working in concert," he says. "But if they do this, it can certainly work out. There's absolutely no reason why it couldn't."

Invasive Non-Native Plants

A mature Acadian Forest is fairly resistant to invasion by most non-native plants, says Bill Freedman. However, younger forests and some wetlands are at risk from non-native invaders. Plants that present the biggest danger include the following:

- Common buckthorn and glossy buckthorn, *Rhamnus cathartica* and *R. frangula*, are shrubs or small trees that tend to grow so thickly that native species are not able to regenerate in their vicinity. These buckthorns were originally introduced to North America as ornamentals.
- Japanese knotweed, *Polygonum cuspidatum*, is a large non-woody perennial that spreads quickly, forming dense thickets up to 3m (10ft) in height. It tolerates a wide range of conditions, including full shade, and is extremely difficult to eradicate. Although it is often found near water and is regarded as an especially severe threat in riparian areas, it can also tolerate drought. Japanese knotweed was probably introduced to North America as an ornamental in the late 1800s and also has been planted for erosion control.
- Creeping buttercup, *Ranunculus repens*, is a low-growing, spreading perennial with attractive yellow flowers. It requires moist soil, but is otherwise tolerant of a wide range of growing conditions. Although it is now regarded as a weed throughout much of the world, some historical accounts state that it was originally sold in North America as an ornamental.
- Purple loosestrife, *Lythrum salicaria*, is a tall perennial with attractive purple flowers. It invades wetlands, forming thick stands that eliminate native vegetation and destroy wildlife habitat. It was introduced to the north-eastern United States and Canada in the 1800s as an ornamental and medicinal plant. Although the sale of purple loosestrife is now prohibited by law in many parts of North America, it is still sometimes found for sale in nurseries.
- Garlic mustard, *Alliaria petiolata*, is a biennial herb with leaves that smell like garlic when crushed. It tends to invade lowland forests that otherwise would host native wildflowers such as spring beauty and trillium, resulting in the eradication of these native plants. The foliage is also believed to be toxic to the eggs of some native butterflies. It was probably introduced to the United States in the mid-1800s for either food or medicinal uses.

Detailed information on invasive species can be found at the website of the Plant Conservation Alliance's Alien Plant Working Group: <http://www.nps.gov/plants/alien/index.htm>.

in dead and dying trees provide shelter for many more. Thus, the best way to ensure a diversity of forest birds is to encourage a natural mix of deciduous and conifer trees and to provide an abundance of potential woodpecker trees. Following are specific ideas for promoting a bird-friendly woodlot:

Keep mature forest

One of the most dramatic changes in the Acadian



Blackburnian warbler; a predator of spruce budworm larvae

Forest is the extensive loss of old forest. As a result, bird species that require mature forest are declining in numbers throughout the Maritimes. Woodlot owners

can help these birds by allowing forests on their land to mature, and by using harvesting practices that maintain elements of existing mature forest.

Promote mixed-wood forest

A mix of softwood and hardwood trees ensures a diversity of habitats for a wide variety of forest birds. In the Acadian Forest, naturally pure stands of either softwood or hardwood are rare, and so should not be encouraged.

Maintain intact areas of forest

Large areas of uninterrupted forest provide birds with access to food, nesting materials and mates. Healthy genetic diversity depends on large numbers of birds of each species living within mating distance of each other. Larger forest areas support greater numbers of individual birds, thus more robust pools

“Reliance on bird boxes requires the placement of many types and sizes of nest boxes at various heights and densities throughout the forest. The boxes must be constructed, installed, cleaned and replaced periodically. The cost would be formidable and the results probably less successful than if snags were present.”

*USDA Forest Service, Wildlife Habitats
in Managed Forests*

of genetic diversity. Woodlot owners can consider working with adjacent owners to maintain forest patches as large as possible.

Ensure standing dead and dying trees (snags)
Large dead and dying trees provide the raw material for woodpeckers to create tree cavities. As woodpeckers move on to a new tree each season, previous nest cavities are available for the numerous other forest species that depend on tree cavities for nesting and shelter.

Spring quiet time

Spring and early summer is breeding and nesting time for birds and their most vulnerable time of the year. Harvesting should be avoided during this time to give birds time to rear their young.

Leave thickets

Chestnut-sided warblers and other birds nest in young, thick tree growth. Leaving a few un-thinned patches will provide habitat for these species.

Promote food trees and shrubs

Allowing shrubs to grow in old fields provides birds with abundant food sources. Shrubs such as serviceberry, hawthorn, high-bush cranberry and wild apples are important food sources for birds.

Privacy for raptors

Raptors such as eagles, osprey, goshawks, harriers and hawks like privacy around their nests. Avoid harvesting, thinning and road-building within 100 metres of nests during spring and early summer.

BUILDING BIRD AND BAT BOXES

Bird nest boxes

Placing bird nest boxes in a woodlot can replace shelter that is normally provided by standing dead trees. Nest boxes are easily built using wood scraps or rough lumber and, if constructed properly, last for over a decade. Plans for a basic nest box can be found on the internet, and the individual requirements of species that utilize nest boxes are provided in Appendix B.

Tips for building bird boxes:

- The outsides of boxes may be left natural, stained or painted. Leave the interior unfinished. Use wood that is naturally rot resistant such as cedar, tamarack or hemlock.
- The inside of the entrance board should be rough or have wire mesh stapled to it to give birds a grip when climbing out of the box.
- Birds do not need a perch outside the entrance hole. Perches are aids to predators.
- The box should be accessible for cleaning at the end of the nesting season. The roof should be detachable to make for easy cleaning.
- A groove cut along the underside of the roof overhang helps to prevent rain from entering the box.
- Owls, woodpeckers, flickers and ducks like to have a layer of wood chips or shavings (no sawdust) piled 2-6cm deep at the bottom of the box. Most other birds add their own nesting materials.

Nest Boxes Aren't Just for the Birds

Nest boxes also provide homes to mammals such as fishers (a member of the weasel family) and flying squirrels.

Owls and Old Forests

Reprinted from an article by the Nova Scotia Nature Trust

Twenty-five years ago, Bernard Forsythe, a naturalist from the Gaspereau Valley, noticed many barred owls in the woods. However, he couldn't find any sign of nesting, despite the abundance of meadow voles and short-tailed shrews, their favourite foods. He did a bit of reading and found out that the owls nest in big trees – trees with large enough cavities to house an adult owl and its young. The owls he saw couldn't nest and reproduce because big trees were scarce in the Valley. His solution? He built 20 nest boxes, and attached them to trees. Sure enough, the next year there was not a single vacancy. The Barred Owls, and a few other animals as well, moved into the boxes and have been nesting in them ever since. One female owl has been returning to the same box for 16 years! Had some big trees been left, this situation would not have arisen and the owls would not be depending on Mr. Forsythe for a place to nest. Unfortunately, not all habitat once provided by old forests can be artificially replaced.

Tips for installing nest boxes:

- Boxes can be attached to fence posts, poles, living or dead trees, as well houses, barns or sheds.
- A piece of wood added to the rear wall of the box provides an area for screwing or nailing the box to a support.
- The box can be hung from the limb of a tree, using hooks screwed to the top or sides of the box, and hung so it leans against the trunk of the tree.

Tips for keeping unwanted residents and predators out of bird boxes:

- Place boxes high up, or attach a guard to the trunk, to prevent access from the ground. A guard can be created using a two-foot wide strip of metal or plastic wrapped around the trunk in the shape of an inverted cone.
- Starlings and sparrows nest earlier in the spring than most other species. To prevent them from claiming the boxes, cover the entrances until other species arrive.
- Raccoons may be attracted to waterfowl nest boxes. Raccoons can be deterred by placing a

guard on the tree as described above, but one that is at least one metre (three feet) wide. Cutting an oval-shaped entrance hole and ensuring the box has adequate depth also helps to discourage predators from raiding nest boxes.

Bat houses

Bats are a valuable species to have in a woodlot. They are well known for their ability to control insect populations, eating half their weight in insects every summer night. Installing houses can attract bats to a woodlot by providing them with roosting accommodations. Houses also encourage bats to stay out of barns and attics.

There are numerous plans for bat houses available on the internet, and a number of companies sell pre-built bat houses in stores and online. Bat boxes provide homes for several species, including big brown bat, eastern red bat, hoary bat, little brown myotis and northern myotis, all of which are common in the Acadian Forest. Following are tips to consider when building or purchasing a bat house.

- Bat houses should have chambers at least 50cm (20in) tall, and a width of at least 35cm (14in). The chambers should not be more than 2.5cm (1in) wide.
- While single-chamber houses are adequate, houses with multiple chambers are generally more effective because bats like to roost in large, tightly packed groups.
- Pressure treated wood should not be used to construct a bat house as it contains chemicals harmful to bats. Wood that is naturally rot resistant such as cedar, tamarack or hemlock can be used instead.
- The wood on the inside of the box should be rough or have plastic mesh attached to it to give the bats a grip on the interior surface of the house.
- Exterior-grade fasteners should be used.
- Bat Conservation International (www.batcon.org) is a good resource to learn more about bats and building bat houses.



Left to right: nest boxes for saw-whet owls, flying squirrels, waterfowl (wood duck, hooded merganser, common goldeneye), barred owls and fishers

Tips for bat house placement:

- Bat houses should be placed where they receive direct sunlight for a large part of the day in order to give them sufficient heat. If a bat house is not inhabited within two years, consider relocating the house to a sunnier, more sheltered area. Placing more than one bat house in an area allows bats to choose among houses to select the one with the better temperature.
- Bat houses should be mounted at least 4 metres (12 feet) above ground, ideally on a pole or a corner of a barn, shed or house. Houses mounted on trees are more difficult for bats to find, and are more easily accessed by predators. Two single-chamber houses can be mounted back to back on one pole.
- Bats need daily access to water, so prefer a house that is placed within a half kilometre of a pond, stream or other water source.
- Bats are most likely to inhabit a bat house that is located in an area where they are already known to roost.

STONES, BRUSH AND DEADWOOD

Using materials on-hand, there are a number of practical projects that woodlot owners can undertake to supplement wildlife habitats on their properties, thereby increasing the diversity and abundance of wildlife in a woodlot.

Stone piles

Stone piles make excellent habitats for small mammals, amphibians and reptiles. They are easily constructed by piling rocks of easily-movable size into a mound at least a few feet wide and a foot or so high. Flat rocks on top of a pile provides a platform for sunbathers, such as snakes and turtles.

Brush piles and fences

Treetops and limbs (creating during tree harvesting or pruning) gathered into piles or fence-like rows provides habitat for many species of forest wildlife, including small mammals, amphibians, reptiles, insects and birds. The types of creatures inhabiting a brush pile or fence changes over time as it slowly decomposes. Large branches or rocks can be used as the base layer to allow space for tunnels, nests and drainage of excess moisture, and the total height should be at least a metre (a few feet) high.

Deadwood

Over 50 species of birds and mammals and thousands of species of mosses, liverworts, plants, fungi, insects and bacteria rely on dead trees for shelter, nest sites, food and protection from predators. An excellent way to increase wildlife habitat is increasing the amount of deadwood in a woodlot by girdling a few trees per hectare, if the woodlot lacks in deadwood. Girdling is a simple technique for creating deadwood. This is done by using an axe, hatchet, chainsaw or a specially designed girdling tool (examples can be found on the internet) to cut a complete ring around a tree through the bark and into the wood of the tree. This stops the flow of nutrients from the leaves to the roots.

Trees killed by girdling are utilized first by primary excavators (woodpeckers, insects), and eventually by a tremendous variety of insects, birds, and small mammals. Large trees are more useful to wildlife than small trees, and poplar and white birch are particularly favoured by birds that excavate nest cavities.

Long-term Planning



CHAPTER 4:

LONG-TERM PLANNING

Finding Revenue

SILVICULTURE FUNDING

Funds are available in each of the Maritime Provinces to subsidize silviculture work on woodlots. In New Brunswick, most of these funds are administered by seven regional woodlot marketing boards, each of which has an individual funding program; the source of most of this funding in New Brunswick is the Department of Natural Resources. Current rates and qualifying activities can be obtained by contacting the appropriate marketing board; some marketing boards post this information on websites. Some wood-buying companies in New Brunswick pay bonuses for wood cut according to approved management plans, and marketing boards can provide information on these programs as well. In Nova Scotia, silviculture money is provided by both the Department of Natural Resources and large wood buyers, and is administered by the Association for Sustainable Forestry and various forest industry companies; in PEI, silviculture funding is from

Progressive PEI

In 2008, the PEI government introduced a progressive silviculture funding program that earmarks 50% of silviculture funding for activities that enhance natural forest growth.¹ Previously, 90% of funds were put toward growing softwood plantations. Part of the rationale for this move is to increase the province's value-added wood products industry.



Cabin rentals in Cape Breton: a non-timber woodlot revenue source

public funds and is administered by the provincial government.

The bulk of silviculture funding has traditionally been earmarked for activities that promote even-aged growth of softwood trees, including mechanical site preparation, plantations, chemical vegetation control and pre-commercial thinning. However, funding is available in some regions for activities that enhance the value of natural forest, including releasing crop trees, fill planting, pruning, selection and other 'alternative' harvesting and some forms of thinning.

OTHER REVENUE SOURCES

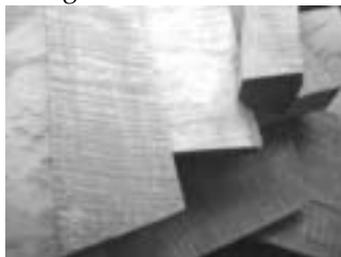
Project funding

Some government and private funding organizations provide money to groups that are working to improve the environment. In some cases, groups of woodlot owners may qualify to receive funding from these organizations to carry out conservation projects. The North Mountain Old Forest Society (a group of woodlot owners in Nova Scotia), for example, received funds from Environment Canada's EcoAction funding program to restore elements of natural Acadian Forest on degraded woodlots in their region.

Another example is the Pollett River Watershed Project in New Brunswick. Funding from the Fundy Model Forest enables a project coordinator to work with participating woodlots owners to create and implement management plans that conserve and promote old forest habitat and other ecologically important features of their woodlots. Additionally, the group is securing markets to sell firewood from well managed woodlots at a premium price.

Non-timber revenue sources

Some woodlot owners are making money from their land in ways aside from or in addition to selling timber. Gig Keirstead, one of the woodlot owners profiled in this book, provides educational tours to school children, sells maple syrup and pancake breakfasts, and maintains skiing and snowshoeing trails that people can pay to use. Other woodlot owners rent out cabins. A couple in Cape Breton, for example, has built a 'village' of cabins nestled into a mature hardwood forest, and rents the cabins to visitors, who must hike, snowshoe or ski to reach them.



Figured maple destined for instruments

Oris Thomas

Sugar Moon Farm in Earltown, NS, is another example.

Owners Scott and Quita Gray collect sap from their sugar maple woods and make maple syrup over a wood-fired evaporator fuelled with hardwoods harvested from their woodlot. Sugar Moon Farm has a restaurant serving maple breakfasts but also attracts visitors by offering them the chance to hike, ski or snowshoe through the woodlot. At times, visitors can go for a wagon or sleigh ride courtesy of the draft horses the farm also uses for logging. Other nature-based activities such as bird watching and hiking could potentially be accommodated in many woodlots.

Some woodlot owners produce and sell products such as Christmas wreaths and trees, ground hemlock (*Taxus canadensis*, for the production of a cancer treatment drug), materials for crafts and food items such as fiddleheads, mushrooms and berries. Some woodlot owners maintain small nurseries and sell native tree seedlings and other plants. Woodlots offer numerous possibilities for the creative mind.



Band-saw mill

Jamie Simpson

While non-timber services and products are not often considered to be traditional sources of woodlot income, the woodlot is a key ingredient in each of them. In some cases, non-timber revenue sources may be more lucrative than harvesting trees.

Value-added manufacturing

Some woodlot owners increase earnings by adding value to raw materials, a strategy sometimes called "value added." Tom and Lori Miller, who are among the woodlot owners profiled in this book, produce

and market walking sticks cut from young stands of hardwood trees, among other endeavours. Mike and Marc Spence, also profiled in this book, add value to trees they harvest by milling, kiln drying and shaping them into valuable finished products, such as flooring, wood for instrument and furniture makers, and interior trim for houses.

Sorting and cutting logs for optimal value

The sale price of logs can sometimes be increased simply by ensuring that harvested trees are cut and products are sorted in order to optimize their value. Especially when selling hardwood logs, woodlot owners may benefit from the help of someone skilled in getting the highest value from harvested trees. In an example from New Brunswick, a woodlot owner was offered a total price of \$12,250 for 7 truck loads of hardwood logs from one mill.² However, with the help of a wood products marketing board staff person, the logs were sorted by grade and then sold to 3 different mills for a total price of \$26,156, proving that smart sorting can be worth the effort.

"We have been trying to make the forest fit the mills. What we need to do now is manage the forest for the health and vigour of naturally occurring species and design an industrial strategy to make best use of and maximize employment from the products of this natural forest."

*Andrew Clark,
logging contractor and Past-President of the
New Brunswick Federation of Woodlot Owners*

Woodlot Certification

Forest certification is following the lead of organic agriculture certification: ideally, it allows customers to choose products that come from well-managed lands. As with organic agriculture certification, products from certified forestry operations are given a mark 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, the Sustainable Forestry Initiative, and the Forest Stewardship Council. As well, the Atlantic Master Logger Certification Program provides recognition for professional forest workers. In the Acadian Forest region, the standard for certification under the Forest Stewardship Council (FSC) is generally considered to require more commitment to maintaining and promoting the natural Acadian Forest than other certification organizations.

Costs and benefits

While demand for FSC certified wood is increasing, few certified woodlot owners are able to secure premiums for their products. Some woodlot owners (including some profiled in this book) 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. Those who sell value-added products in niche markets use certification to help market their products, and some charge a modest (10%) premium for certified products. Others appreciate the satisfaction of having their good woodlot management confirmed and recognized through certification.

Certification costs money. To reduce the expense to woodlot owners, some certification systems have developed initiatives to certify groups of woodlot owners. The Forest Stewardship Council has a resource manager program under which one person is responsible for ensuring good management on a pool of woodlots. The Nagaya company, profiled below, is an example of a Certified Resource Manager.

What is Chain of Custody?

Chain of custody is the method by which wood from certified forests is tracked from the forest to the finished product. Chain of custody gives customers assurance that a product marked as certified comes from a certified forest. Only the Forest Stewardship Council and the Canadian Standards Association include chain of custody tracking as part of their certification systems.

Certification case study: Nagaya Forest Restoration Ltd.

William McKay of Dieppe NB began Nagaya Forest Restoration Ltd. in 1999 to work with woodlot owners who are interested in restoring social, ecological and economic values to their forests and communities. McKay accomplishes this, in part, by providing woodlot owners with an opportunity to have their woodlots certified at a reasonable cost under Nagaya and the Forest Stewardship Council.

Twenty-five woodlot owners, owning some 3,200 hectares (8,000 acres) and spread across the Maritime Provinces, pay annual fees of approximately \$300 to belong to the Nagaya pool of FSC-certified woodlots. Because the cost of certification is spread among the group, the fee is much less than the \$4,000 to \$5,000 that a woodlot owner might have to pay as an individual applicant. The fee covers the cost of the yearly, third-party audit of the forestry practices of the group, which is a condition required to use the FSC label.

To join Nagaya, prospective members must demonstrate that their woodlot practices are based on a desire to work with the Acadian Forest to restore some of the natural characteristics that have been lost because of past land uses. Perhaps because of this prerequisite, McKay finds that members of Nagaya invariably share a strong tie with their woodlots, and a desire to leave them in the best shape possible for future generations.

Members of Nagaya can receive technical advice with woodlot management from McKay on issues such as writing management plans and choosing appropriate harvesting methods to encourage desired tree species. Members can also market and sell wood using the FSC label; some owners are able to charge a small premium (10%) for their wood. Perhaps most importantly, McKay offers opportunities, such as an annual woodlot field-day, that provide time and space for members to share and discuss ideas, and to see the on-the-ground results of different woodlot management strategies.

McKay's group includes three manufacturers in addition to the 25 woodlot owners. One of these is J.A. Turner & Sons Ltd, which is a medium-sized

mill that can produce 15,000 board feet of lumber per day; other members can produce trim, moulding and a variety of other products. With this production capacity, and a base of woodlots providing certified logs, McKay can offer architects a package of lumber and other wood products sufficient to build a house. A house can now be built, finished and partially furnished with Nagaya/FSC certified products. This ability to provide customers with a diversity of products from local, well-managed woodlots, McKay explains, is the source of their strength. "People are hungry for local," says McKay. "They want to know they are directly supporting good forestry with their purchases, and that they are supporting Maritime families and communities. We're providing them with an on-the-ground demonstration of what's possible."

Working with Land Trusts

Spending time with a property often engenders a lasting connection. The relationship grows as we come to know the land – its topography, trails and woods-roads; a brook or perhaps a hilltop; a favourite tree or rock bluff. It grows as we watch a property's subtle changes, season to season and year to year. Hard to say why exactly, but we grow attached to certain places, and this inspires some to protect their land from development or other changes. Landowners who wish to see their land protected well into the future may consider working with a land trust organization.

Land trusts

Land trusts are non-profit, non-government charitable organizations that work with landowners to protect environmentally important lands. Because they are long-lived institutions, trusts can protect properties for many generations – "in perpetuity" is the phrase often used. If a trust ever did close, protected lands would be transferred to another land trust.

There are some 80 land trusts operating across Canada, including four province-wide trusts in the Maritimes, along with the Atlantic chapter of the national Nature Conservancy of Canada and several smaller trusts dedicated to specific regions within

the Maritimes. Each type of trust has its strengths: bigger trusts tend to have greater resources; a smaller trust might have fewer funds, but offers benefits that stem from its ties to local communities.

Land trusts must focus their efforts where they can do the most good. Thus they generally limit their work to properties with such features as important wildlife habitat, rare species sites, uncommon ecosystems or undeveloped coastline. Land trusts can help to protect land in several ways:

- Land donation

Often the easiest way to protect land is to donate it to a land trust. If the trust agrees, the property is transferred to the trust and protected in perpetuity as a nature preserve.

- Bargain sale

Sometimes land trusts buy properties. If a landowner sells a property to a land trust below market value, the landowner receives a charitable tax receipt for the balance of the fair market value of the land.

- Shared title or life estate

Under a shared title agreement, the landowner maintains certain rights to use the land (in non-destructive ways); when the landowner dies, full title to the land is transferred to the land trust.

- Donation by bequest

A landowner can also choose to leave a property to a trust in his or her will, provided the chosen land trust agrees.

- Conservation easements

Conservation easements are discussed next in more depth.

Conservation easements

A conservation easement is a legal tool to ensure the protection of a property according to the wishes of the landowner, while allowing the owner to retain ownership of the property. Because a conservation easement is legally-binding, and is attached to the deed of the property, any future owner of the property must abide by the conditions of the easement.

Upon signing a conservation easement, a landowner essentially gives up certain rights to the property. For example, the conservation easement might prohibit any future subdivision of the property, or perhaps any commercial development of the land. Easements often define certain ecological features of the property that must be protected. In return, the landowner can rest assured that the land trust will watch over the property in perpetuity, making sure the land is managed according to the stipulations in the conservation easement.

Because each conservation easement is tailored to the property and its owner, they allow for flexibility in how the property can be managed. Of special interest to woodlot owners, some land trusts have developed working forest (or working woodlot) easements specifically for landowners who wish to see their careful woodlot management continue beyond their personal ownership. The accompanying box item describes one such working forest conservation easement.

Costs and benefits

The potential costs and benefits of a land protection project vary immensely from project to project. It is important to discuss the specifics of a potential project with the land trust, an accountant and a lawyer. The primary benefit of the arrangement is the assurance that the land will be protected. However, for Canadian residents other benefits may include the following:

Property tax

Landowners no longer pay property tax on land that is donated. Because the donor can still visit and enjoy the property, some people regard this as a win-win situation.

Capital gains tax

Through the Ecological Gifts Program, the Canadian government eliminates capital gains taxes on donations of ecologically sensitive lands.

Charitable tax receipt

Donations of land, conservation easements and bargain sales to a land trust qualify for charitable tax receipts for income tax purposes, although

to varying degrees. The value of the donation is determined by a qualified property appraiser.

Estate planning

The estate of the land donor will receive a receipt for the value of any donation by way of a will, which may provide benefits to inheritors of the estate.

The costs of working with a land trust include the time needed to explore options and to investigate tax and legal issues. Financial costs may include legal fees, the cost of an appraisal, survey, ecological assessment and management plan, and the necessity of endowing a stewardship fund to help cover the future cost of protecting the land. Land trusts can sometimes help to cover these costs, but the landowner may be asked to make a contribution toward them.

Working with a land trust

Landowners interested in working with a land trust should start by listing specific long-term conservation goals for their property, and then researching the options available from land trusts operating within their region. The next step is to invite a land trust staff person to visit the property to help to determine its ecological value. The landowner should be as specific as possible when describing her or his conservation ideas to a land trust.

Although specific steps toward a successful project will vary, generally they include sending a letter to the land trust that formally states (a) the nature of the offer to the land trust, (b) the owner's expectations of the land trust and (c) the owner's expectations for the future use of the land. If the trust decides to go ahead with the project, then appraisal, legal and possibly survey work will begin. Eventually a new deed to the land will be created, reflecting the nature of the donation, and the land trust will issue a charitable tax receipt to the donor. This process can take from six months to more than a year. But this is time well spent: perpetuity is a long time – it is important to get it right.

Land trusts in the Maritimes

Nature Trust of New Brunswick
P.O. Box 603, Sta. A
Fredericton, NB E3B 5A6
Phone: (506) 457-2398
Fax: (506) 450-2137
Email: ntnb@nbnet.nb.ca
www.naturetrust.nb.ca

Nova Scotia Nature Trust
Box 2202
Halifax, NS B3J 3C4
Phone: (902) 425-5263
Fax: (902) 429-5263
Email: nature@nsnt.ca
www.nsnt.ca

New Brunswick
Community Land Trust
180 St. John St.
Fredericton, NB E3B 4A9
Tel: (506) 461-5521
Fax: (506) 458-1044
E-mail: nbclt@nbnet.nb.ca
www.nbclt.org

Nature Conservancy of Canada
Atlantic Regional Office
924 Prospect Street, Suite 2
Fredericton, NB E3B 2T9
Tel: (506) 450-6010
Toll-free: 1-877-231-4400
Fax: (506) 450-6013
Email: atlantic@natureconservancy.ca
www.natureconservancy.ca

Island Nature Trust
Box 265
Charlottetown, PEI
C1A 7K4
Phone: (902) 566-9150
Fax: (902) 628-6331
Email: intrust@isn.net
www.peisland.com/nature

A WORKING-FOREST CONSERVATION EASEMENT

In the early 20th century, a family from Ohio began amassing acreage on the peaceful St. Croix River in southwest New Brunswick. They built a lodge and travelled there each summer to fish, hunt, relax and enjoy the river. Eventually they acquired nearly 3,000 acres of woodland, including river frontage, streams and an entire lake. Having developed a strong connection to the area over the course of three generations, the family decided it was time to ensure their vision of land conservation would be preserved into the future.

The family first donated 340 acres containing rare plants and river frontage to a provincial land trust, the Nature Trust of New Brunswick. The family then approached the same organization to develop a working forest easement for 2,313 acres, containing their summer lodge. Over the next few years, a botanical survey identified 11 plants and 6 bryophytes rare to the province, a detailed forest management plan was created for the entire woodlot and a baseline report documented the property's current condition. In 2006 the owners and the Nature Trust signed an easement allowing low-impact forestry and limiting future development to a small area around the current building site. The Nature Trust also developed a guide to best forestry practices on working forest easements.



Land protected by a working forest conservation easement

Margo Sheppard

As holder of the conservation easement, the Nature Trust must visit the property regularly to ensure that forestry activities, building development and other land use conform to the easement. The Trust also reviews forest management plans and reports from foresters overseeing forestry activities.

Other options

Lands trusts are not an option for everyone: land trusts have limited resources, and must focus on properties with the most significant environmental values. If the land trust route does not look promising, there are other options to consider.

Other non-profit organizations

Non-profit organizations other than land trusts sometimes work with landowners on conservation projects. Ducks Unlimited is one example.

Working with governments

Many municipal parks and public gardens exist thanks to gifts of land to governments. Even some larger parks, including Baxter State Park in Maine (Mount Katahdin) are the result of private donations of lands to government. Governments may be willing to take on a property that land trusts are not able to, especially if doing so will result in a benefit to the local community. An opportunity might exist for those owning land next to an existing park or protected natural area. Governments may be willing to trade for, buy or accept a donation of lands that could be incorporated into an existing park system.

Restrictive covenants

A legal option known as restrictive covenants exists for landowners who subdivide and sell property, or who own several properties in close proximity. Covenants are legally binding requirements placed on the property deed to restrict its use.

To exercise this right, a landowner must retain ownership of at least one property, which becomes the dominant property. The dominant property is said to receive benefits from subordinate properties, which are subject to the restrictive covenants. Many landowners selling building parcels use this option to restrict the type of buildings and land uses allowed on lots sold. In the same way, restrictive covenants can be used to achieve conservation goals.

Ten Woodlot Owner Profiles



CHAPTER 5:

TEN WOODLOT OWNER PROFILES

David Thompson: Working With What You've Got

“You have to have vision. I started with cut-over woods, and some day down the road there'll be big red spruce and hardwood here,” states David Thompson. “I just hope I get to cut a few of them,” Thompson adds with a laugh. Located in Elmsville, in south-western New Brunswick, Thompson started in 1973 with a woodlot that had been largely cut-over in the 1960s. “It was mostly fir thickets when I bought it, not much more than head-high,” explains Thompson. With a combination of thinning and limited harvesting, Thompson has steadily improved the quality of his 175 acres by encouraging a diversity of high value trees.

WOODLOT MANAGEMENT STRATEGY

‘Leave the best’ is Thompson’s mantra when choosing which trees to cut. “It’s pretty much common sense,” Thompson says. “You look at what you’ve got in a particular area and work with it – the woodlot tells me what to do. I concentrate on taking out the balsam fir and poorer quality stems of other species; I leave the good stuff to grow.” By following this strategy, Thompson has improved the quality of his woodlot with each thinning and harvest, and is gradually shifting the species composition from predominantly balsam fir to predominantly red spruce mixed with yellow birch, white ash and sugar maple. “I’ll always have some fir, but before long it’ll be a minor component in the woodlot.”

Thompson uses single tree and patch harvests to break the cycle of regenerating balsam fir and shade-intolerant hardwoods. “I’m figuring out how to make the transition from all this even-aged, low

value stuff to a diversity of ages of high-quality trees,” says Thompson. “Sometimes it’s amazing when you open these stands up a little – you really start to see what’s there – the red spruce and hardwood – maybe a few cedar and the odd hemlock. What looks like a pure fir stand actually has a lot of potential when you look closely. I know I can come in here and cut and still have something after I’m finished,” explains Thompson. Thompson points out a recently cut fir stand and shows off the red spruce and yellow birch scattered throughout. The older red spruce are heavy with seed cones. “Hopefully these spruce will regenerate where I’ve cut the fir.”

“I know one thing: if I cut hard, I’d just be getting back more of the same – thick, even-aged fir – and that’s what’s happening all around me on other woodlots,” Thompson says with frustration. Thompson draws attention to the sound of a wood harvester machine working on a nearby property. “I have to listen to that thing all day, starting at 6 in the morning,” says Thompson. “He’s cutting everything



Thompson loading wood

Jamie Simpson

he can sell, on a woodlot that was cut hard back in the '70s – just to keep making payments on all the machinery. At the end of the day I bet he's not going home with any more money in his pocket than I am, but look at the difference in what's left. Is that good for the environment or society?"

Promoting a diversity of species makes sense to Thompson. He mentions his experience with the spruce budworm in the 1970s. "Sure, the budworm hit here, but it seemed like anywhere I had hardwood mixed in with the softwood there was almost no budworm damage. Even in softwood areas, the healthy spruce pretty much survived."

Horsepower

Thompson uses a horse to haul trees from the stumps to central yards, and then a horse-drawn trailer equipped with a hydraulic loader to forward wood to the roadside. "If I was dealing with a bigger volume of wood, I might upgrade, but this works for me. With this system I keep my costs very low," comments Thompson.

Thompson likes the results he gets using horses. Although he cuts almost year-round, there is little evidence of ground disturbance or damage to standing trees. "I think it'd be hard to do this good of a job with anything other than a horse," offers Thompson. "I can snake through and pick out the fir and leave the spruce and other stuff." Scattered branches and tops from cut trees and occasional narrow trails are the only sign of Thompson's harvesting operation. "See, you don't have to destroy the woods to do it."

FOR THE LOVE OF IT

Thompson is the first to admit that cutting pulpwood doesn't get anybody rich: "I scratch out a living." Thompson comments that the prices paid for pulpwood are so low that essentially he gives his wood away for free. "The money covers my basic wages, but nothing more. It's my wood, but I don't get anything extra for it. I just wish the economics of it worked out a little better. Most people get a raise – in my case, pulpwood prices went down, and so I'm making less money than I was a few years ago for every cord I cut. I could go out and get a better-

paying job, but I like the woods work. It's a lifestyle I suppose."

The less tangible benefits are likely what keeps Thompson working in the woods – he walks to his work every morning, and can sit by his woodstove during lunch break. And most importantly, he sees the results of his efforts every time he walks through his woods. "I have to be careful when I go for a walk on the property," Thompson says playfully. "All I can think about is which trees I'll be cutting next, and which I'll leave to watch grow." Thompson points out several old beech that show no sign of beech bark disease – their bark is smooth except for occasional black bear claw scars: "these I'll just watch grow."

Thompson laments the abuse that his woodlot, like so many others, has seen in the past. "If only others had just picked away at the woodlot – then I could pick away at it – people could keep picking away forever – I'd be making a better living and you'd still have a forest. I suppose I could be cutting a lot heavier – I'd be a little wealthier, but I just can't do that."

"The big trick is thinking a few generations down the road," says Thompson. "We see 50-year old trees and think we've got a mature forest – even I do that. But we should be thinking about 150-, 200-year-old trees. Thompson points out a small section of his woodlot containing the oldest trees on his property. "Look at the red spruce, yellow birch and white ash here – they're maybe a hundred years old. This is what we should have all over, instead of young fir thickets."



Clearcut operation next to Thompson's woodlot

Gwenyth Wilbur

Gig Keirstead and Denise Howlett: Beyond Timber Products

When Gig Keirstead says he is retired you have to suppress a smile. Between harvesting wood, providing educational tours, running his outdoor recreation business and tending his maple sugaring operation, Keirstead and his family have much more than a hobby on their hands. His 400 acres keep him as busy as he ever was when working full time as a teacher.

If variety is the spice of life, then Keirstead is definitely on the right track. "One of the biggest lessons we've learned in running a successful woodlot business," stresses Keirstead, "is that you have to diversify your products." And diversify he has. In addition to cutting wood, Keirstead now uses his woodlot as a base for a thriving outdoor education and recreation business. Here's what this family business offers:

Cross-county skiing and snowshoeing trails

With a life-long passion for outdoor recreation, Keirstead and his wife Denise Howlett naturally thought of developing groomed cross-county ski tracks and snowshoe trails for public use. They also have all the necessary equipment available for visitors to rent.

School group tours

As a former teacher, Keirstead welcomes school groups to his woodlot. With the help of interpretive signs that he and a former school class developed, Keirstead teaches school children about the species and dynamics of the Acadian Forest. By showing students the areas where he's cut trees, Keirstead demonstrates how his method of harvesting is restoring a more natural and more valuable forest. He keeps busy two days a week each fall by hosting 50 to 80 visits to his woodlot by groups of schoolchildren.

Sugar bush

Keirstead and his family run a 225-tap maple sugar operation. Although the sugar bush is relatively small in terms of commercial production, Keirstead makes the most of the spring season when the sap runs. He teaches school groups about maple syrup

production, provides guided tours of the operation, and sells a full pancake and syrup breakfast.

Woodlot harvesting

Making money from harvesting the woodlot has been a challenge. "In doing this type of woodlot work, you have to cut a lot of lower quality material," Keirstead acknowledges. In the fall and winter months, he cuts tree-length studwood and firewood (mostly balsam fir and white birch) using a tractor and logging winch. As well, Keirstead recently hired a local portable sawmill operator to mill some of the larger trees that are cut. However, timber sales account for only 1/6th of gross woodlot income now that they have diversified into the increasingly successful recreational ventures.

WOODLOT STRATEGY

Keirstead's woodlot management strategy is to promote a healthy, valuable forest that resembles the pre-settlement forest as much as possible. Like many Acadian Forest woodlot owners, Keirstead knows he has more balsam fir than would occur naturally. "I think it probably has a lot to do with the spruce budworm spraying back in the '70s; if it wasn't for the spraying, a lot of these fir would have died out or been out-competed by red spruce, yellow birch and sugar maple. But now we've got all this fir that isn't much good for anything," he comments. As a result, much of the harvesting



Keirstead and his sugaring cabin

Jamie Simpson

focuses on removing balsam fir and encouraging a more natural and valuable species mix.

Walking through his woodlot, Keirstead points out a recent group selection cut, approximately 20m (60ft) across. "I was worried I had opened this up too much when I cut the fir here, but sugar maples are seeding in fine," he says. Cutting mostly the poorest quality trees, he uses a combination of single-tree and group-selection cutting to break up even-aged stands and promote species such as sugar maple, red spruce, yellow birch and white ash, while reducing the abundance of balsam fir and white birch. He leaves the few ironwood trees, also known as hop hornbeam, scattered throughout the woodlot for the diversity they add, and makes sure he does not cut the few clear, disease-free beech trees he is proud to have on his property.

Among the trees he will never cut are a couple of dozen massive, old-growth sugar maples that have been spared over the years because of the sweet sap they provide for making maple syrup. "These are my legacy trees," he explains. "I could never cut one of these. Imagine how the pre-settlement forest looked, with trees this size all over."



Tamera Heikalo

Keirstead also leaves any dead or near-dead trees for use by wildlife and makes sure that there is plenty of coarse woody debris on the ground. He even occasionally uses the front-end loader on his tractor to make brush piles for wildlife out of logging slash. When asked if he girdles any trees to create deadwood, he answers wryly, "Well, no, I haven't; if only I could train the porcupines to go after the trees I don't want...."

Using the silviculture funding available through his local marketing board, Keirstead had part of his woodlot pre-commercially thinned. He made sure the contractors knew to cut balsam fir first, and to leave the red spruce, sugar maple, yellow birch and cedar. However, he does not want to see the thinned areas remain even-aged. When the trees are large enough for a commercial thinning, Keirstead will cut gaps large enough to encourage a new age class of younger trees to grow. "I think I should be able to see at least one more age class develop before I kick the bucket," he says with a smile.

Keirstead believes it does not make any sense for silviculture funding to reward woodlot owners for carrying out even-aged, clearcut-based harvesting. He feels strongly that the money should be spent on what he calls 'alternative harvests' that will increase the economic and ecological value of a woodlot.

The recreational and educational aspects of his woodlot business are directly tied to his desire to promote sound Acadian Forest management. Without education, he feels people will not know enough to want to restore and protect the original forest. "People need to have a connection to the forest," he says.

In the long-term, Keirstead hopes to protect his land by signing a conservation easement with a land trust organization that will ensure his vision of woodlot management continues indefinitely. "We're really only here for a short time compared to the life of the forest," he says. "I involve my family as much as possible, and hope they'll carry on my goals for the woodlot after I'm gone."

In the meantime, it is obvious Keirstead gets a lot of satisfaction from spending time in his woodlot

and running a successful woodlot business. As he says, “Anyone can be a landowner; it’s something else to be a steward of the land. I’m happy to know this woodlot will be better when I’m done. Besides, working with the woodlot is just plain fun.”

Woodlot thoughts from Gig Keirstead

Deer and Regeneration

“Deer are relatively new to the Acadian Forest ecosystem and can be a big problem with respect to getting desired regeneration.”

Markets

“Markets are horrible. In doing this type of woodlot work, you have to cut a lot of low quality material. You can’t ask a woodlot owner to work day after day for nothing.”

Silviculture Funding

“We need to move silviculture funding away from even-aged, clear-cut type management and toward silviculture treatments that promote the natural Acadian Forest.”

Long-term Management

“Ensuring our management goals continue after we’re gone is a huge challenge. Involving my children in managing our woodlot is one way, and working with a land trust is another potential avenue to meet this challenge.”

“As a former teacher, I’m frustrated to think some kids don’t know what a natural forest is. If you’ve never seen one, you’re not going to miss it. Many of us are brainwashed into believing that a woodlot means nothing more than wood fibre. But there are so many other values – like quality timber, recreation, and educational opportunities. Also, people don’t want to talk about spirituality, but there’s definitely something special about a woodlot. This is where I come on Sundays.”

- Gig Keirstead

Whaelghinbran Farm: Thirty Years of Restoration Forestry

Clark Phillips and his partner Susan Tyler have worked their 325 hectare (800 acre) farm and woodlot property – known as Whaelghinbran (‘whale-ghin-bran’) Farm – since the early 1970s. Over these years, they have maintained a consistent approach to forest management: “We try to mimic what would happen naturally; we try to figure out where the forest wants to go and then give it a boost in that direction,” Phillips says.

Thirty years of pursuing this vision allows the couple to see the results of their efforts. Phillips points out a wooded hillside and ridge on the far side of their property. “Over the years we’ve noticed this ridge and skyline have changed,” he notes. “Thirty years ago, it was mostly white spruce and poplar, and now, as a result of our harvesting, you can clearly see the white pine and red spruce.”

The Land

Located a short distance east of Sussex, New Brunswick, on the south branch of the Kennebecasis River, Whaelghinbran is typical of the Maritime landscape. Much of it was farmed during the late 1800s and early 1900s, and then allowed to revert to forest. The remainder was periodically harvested for logs and firewood. “When we started,” Clark says, “the predominant hardwood was poplar – it’s very common on abandoned farmland. As for conifers, we had a lot of white spruce and balsam fir.”



Susan Tyler and Clark Phillips

George Fullerton

Given the abundance of fir and white spruce and the threat of spruce budworm, Phillips says he was advised in the 1970s to clearcut some of the woodlot. However, he knew they would lose the white and red pine and red spruce that were scattered throughout the woodlot if they clearcut. "Luckily, we didn't listen to the advice, and look at what we have now - lots of red spruce and white pine. If we had clearcut, we would have more of the same pioneer-type species - poplar, fir and white spruce," he points out.

MANAGEMENT PHILOSOPHY

Phillips analyzes tree health, age and vigour before cutting, as well as the expected lifespan for each species. With this information he creates a harvesting plan that leaves the strong, healthy trees from species with a long life potential, and focuses on cutting shorter-lived species such as poplar, fir and white spruce.

Harvesting at Whaelghinbran tends to be less intensive than conventional selection harvesting where an average 25% to 30% of the tree canopy is removed. "Our partial cuts typically remove 10% to 15% of the canopy cover," explains Phillips, who argues that larger cuts would result in a flush of raspberries and pioneer tree species in the open areas.

This light harvesting has yielded impressive results for Phillips and Tyler. A walk through the woodlot reveals plentiful white pine and red spruce regeneration growing in the dappled sunlight of selection-harvested areas. The couple is careful to maintain a partial canopy over the white pine until they are at least 6m (20ft) tall in order to reduce the risk of white pine weevil and blister rust damage.

HARVESTING AND SELLING WOOD

Phillips and Tyler have used a variety of harvesting equipment over the years, including horses, farm tractors, cable skidders and short-wood forwarders. Regardless of the harvest method or equipment used, they try to employ local contractors and workers.

Because they have a relatively large and increasingly diverse woodlot, they pay close attention to markets and adjust their annual harvest to provide the

best return. If the market for poplar is depressed, they can focus on softwood. If softwood is in low demand and the price is falling, then they look for hardwood markets. In this way, they have been able to consistently rely on wood harvests for part of their annual income.

The Woodlot Community

Phillips and Tyler have been important contributors to their southern NB community, both as organic farmers and proponents of woodlot restoration. They have actively promoted alternatives to the prevailing silviculture practices of clear-cutting, planting and pre-commercial thinning, citing successes with uneven-aged and multiple species forest management on the Whaelghinbran woodlot.

Phillips served on the board of directors for the Southern New Brunswick Wood Co-op and worked hard to establish the forest management committee, later serving as a committee member and as Chair. In recognition of their successful woodlot management, the couple was awarded 'Woodlot Owner of the Year' by the Southern New Brunswick Wood Marketing Cooperative in 2006.

What the Future Holds

Phillips and Tyler have a deep love for the land they have come to know so well and want Whaelghinbran to continue to be managed in the future by the same sustainable practices they have used. Since none of their family is interested in taking over the farm and woodlot, they are working with the New Brunswick Community Land Trust on a conservation agreement. The farm and woodlot would be sold to the Land Trust for a minimal cost and, in turn, the Land Trust would continue to manage the woodlot and farm to meet the long-term conservation goals that the couple has worked toward over the past 30 years.

The group is also studying the opportunity of developing a learning centre on the property to promote, demonstrate and teach the techniques and benefits of restoration forestry. If all goes as planned, the woodlot Phillips and Tyler have managed so carefully will continue on its restoration path, while providing a steady source of lumber and other forest products.

FOR THE BIRDS: THE IMPORTANCE OF POPLAR

Although Phillips and Tyler focus on regenerating long-lived, shade-tolerant tree species, the relatively short-lived poplar also plays an important role in their management strategy. Because much of the woodlot is relatively young, the lack of cavity and snag trees limits wildlife abundance and diversity. Therefore, the couple has left many of the large-toothed and trembling aspens standing in order to benefit wildlife. Annual seed production by poplars provides food for numerous forest birds, while the relatively soft wood makes the poplars ideal cavity trees, providing shelter for numerous birds and small mammals. Once on the ground, the large diameter poplar trees contribute coarse woody debris that helps to protect and build the soil. As Phillips points out, “We recognize that you have to leave something for the birds – the dead and dying trees – these would just likely get culled from a sale anyway.”

“Our philosophy is that this woodland can be managed to achieve a mixed-aged and mixed-species forest that provides a variety of ecological benefits common to older growth Acadian Forest, and still allows us to harvest individual and small groups of trees to provide an income.”

Clark Phillips



Tamara Heikalo

Passion of Jean Guy Comeau: Woods and Wildlife

Retired from a career in the pulp and paper industry, Jean Guy Comeau indulges a fulltime passion for woodlots, wildlife and the Acadian Forest on his 900 acres of land in the Nelson-Miramichi area on the Southwest Miramichi River. “It’s a long term project,” says Comeau. “I figure it will take at least 150 years to accomplish what I want on my woodlots, to get a natural species and age mix established. That presents a problem for me,” Comeau continues with a smile, “because I plan to live for only 100 to 125 years.”

LIFE-LONG LEARNING

His forest education began while working with his family as a boy, cutting and peeling pulpwood along the Miramichi River in the 1950s. It continued with the time he spent in the woods hunting, fishing and trapping. “If you are a keen observer,” says Comeau, “you can learn many things from the forest. My learning continues every day I am in the woods. I watch where the animals lay, where they eat and what kind of trails they move on at different times of year. Although I don’t understand all the things that I witness with wildlife, I try to do my part. There is so much that we don’t understand about the forest. Our current cumulative knowledge covers only a small part of 1% of what goes on in the forest.”

WOODLOT MANAGEMENT

Comeau relishes taking ‘a path less traveled’ when it comes to woodlot management. “When I first saw my Barnaby River woodlot,” says Comeau by way of example, “I knew in my heart that it was a very special place, and that I had to buy it. When I told my friends, they said ‘Are you crazy? It’s just a big swamp with some little black spruce and a few poplars.’” Comeau bought the woodlot nonetheless, and succeeded in conserving the property’s excellent moose habitat, and made a little money to cover his expenses by carefully cutting some of the trees.

Comeau uses a combination of single tree, strip and patch cuts to gradually encourage a more natural

"What I do with my chainsaw does not fit with the type of silviculture that is required for straight forward fibre management. The way I manage my woodlot costs me. But in the long run I believe my woodlot will be far more productive than where softwood rotations are repeated.

"I believe that repeating rotations of fir will deplete the soil to the point that after three generations the soil will not be able to support good tree growth. For our soils to be productive we need a hardwood and softwood mix, so my goal is to develop the woodlot so that it reflects the species mix of the Acadian forest."

Jean Guy Comeau

mix of species and age classes on his woodlands. Part of this goal is to reduce the proportion of balsam fir, which he harvests for studwood and logs. "But I am careful to not make large openings because I will get shrubs and fir regeneration," cautions Comeau. "If I keep openings small I will get more red spruce, white and red pine, and tolerant hardwood regeneration."

Deciding where and when to harvest trees is done only after careful consideration and observation of his woodlots at different times of the year. A patch of balsam fir might be left because it provides cover for yellow birch seedlings. Older trees might be left for their seed production and wildlife value. Comeau encourages any white pine, yellow birch, spruce and hemlock found scattered in his woodlands so that they might spread throughout his woodlot. "These are remnants of the Acadian Forest," asserts Comeau. "They are the future here."

POLITICS AND WOODLOT ORGANIZATIONS

His rural heritage gives Comeau a sharp insight into the challenges faced by woodlot owners to secure just prices for wood and access to wood markets, as well as silviculture support. To address these issues, he helped found the Northumberland County Wood Producers Association and the Forest Products Marketing Board, and he volunteers his time on the boards of these organizations to encourage woodlots owners to act together.

Comeau believes woodlot owner organizations can help owners carry out sustainable management by ensuring markets for wood produced during thinnings at a price that covers expenses. "Without the financial incentive there is no incentive to put energy into working a woodlot. Access to fair forest products markets is key to successful woodlot management," says Comeau.



Jean Guy Comeau with grandchildren Dominik and Cayden

Lecca-Ann Comeau

Involvement with the politics of selling wood has often resulted in a great deal of frustration. Comeau remembers when his woodlot owner organization worked for nearly a year to reach a deal with the Weyerhaeuser mill to sell them poplar. The Department of Natural Resources eventually appointed an arbitrator to facilitate an agreement that would be binding on both parties. Comeau recalls the outcome with some bitterness. "After the arbitration, the mill unilaterally announced that it would not follow the decision to purchase wood through the organization, and would only purchase private woodlot wood by direct contracts."

Black Spruce Success

Contrary to prevalent practices, Comeau decided not to clearcut his stands of mature black spruce. Instead, Comeau carried out partial harvests in these stands using strip cuts and small patch cuts. This harvesting strategy ensured that mature black spruce trees were maintained to provide shade as well as cover and travel corridors for wildlife. Through careful harvest planning, Comeau succeeded in maintaining forest cover and establishing almost cost free new black spruce seedling growth within the harvested areas.

Contrary Mind

"I had different occasions when foresters would come on this woodlot, and they would say that I should not be wasting my time running around cutting the dying trees. They said I should clearcut the woodlot and then plant. I knew that if I cut the woodlot I would get a lot of raspberries and other plants that nature provides when large openings are created, and then I would be advised to spray and kill the growth to 'protect' the planted trees. I have had foresters on my woodlot, but many times I do not agree with their recommendations, because they want to promote management where fibre is the primary objective.

"A forester came to my woodlot in 1981 or '82 to give me some advice about a stand I had that was mostly fir and was killed by the spruce budworm. The forester said to me, 'Mr. Comeau, you should just run a bulldozer through that mess, knock it down and plant it with softwood; then you would have something.' The more he talked the more of my money he wanted to spend. We would have to buy seedlings. It would have to be sprayed to kill raspberries and shrub and grass at least twice. So after he was done talking I said I don't think so; I will let nature handle it and see what happens. The forester didn't think I was very smart, not taking advantage of his great opportunity.

"So I watched the area very carefully. I watched the fir stubs fall down and the raspberries grow up. After a few years, I noticed lots of moles and voles in that area; then I saw rabbits once in a while eating away at the grass and the small plants. Then one day I saw a fox sneaking around catching the mice and voles. I watched that fox working around and then I heard the cry of a rabbit and I knew that the fox had got a good meal from my waste land.

"Then a year or two later I saw the tracks of a doe around the area, and knew she was browsing in the area and raising a fawn. So I kept a sharp eye out and after a few weeks I spotted the doe and her fawn and I watched them. A fawn is like any baby, the easiest meal is its mother's milk. But the doe, she knows she has to show her baby how to get its own meal from the forest. I watched the doe lick the plants that are good for fawns, the small tender plants. She just licked them, then the curious fawn would sniff what mama had licked. During this lesson, the fawn would try to nurse, but the doe would move and not let the fawn suckle. Then after a while the fawn started to nibble on the scented foliage. That whole lesson was something to see, right there in that waste land that I had.

"As time went by the area seeded in from the sides and from seeds carried in by wildlife and maybe from dormant seeds that were in the ground. About fifteen years after the forester said to run the bulldozer through it, the area is now covered with young trees, some of them 20 feet high. All I did was watch it."

Jean Guy Comeau



Restoring Diversity and Making a Living

Marc Spence and his brother Mike own and manage some 1,000 acres of forestland near the village of Baie Verte in south-eastern New Brunswick. Most of the land has been in their family since it was granted to British settlers following the expulsion of the Acadians in 1755, and has been variously farmed and logged since. Roughly 70% of the property is regenerating old farmland with tamarack, white spruce and balsam fir, ranging from 20 to 100 years old. The remainder is 100- to 200-year-old red spruce forest with scattered sugar maple, yellow birch, white pine, white birch and red maple.

A COMMON WOODLOT VISION

Marc and Mike share a similar vision for their woodland properties. Both want to see big, valuable trees on the property, and a forest that resembles the pre-settlement condition. “I push Mike a little on the environmental stuff,” says Marc with a smile, “but he knows what’s right and wrong in the woods; he knows what good woodlot management is. We both want higher volume trees of higher value. We know the species we’ve lost are the high value ones: white pine, red spruce, red oak, sugar maple, beech, and white and black ash.”

Marc and Mike tend to cut mature trees – trees close to their natural death – mostly white spruce, balsam fir and tamarack. “We don’t cut much hardwood or white pine because we’re trying to encourage these species to come back. The hardwoods also help reduce the acidity of the soil,” says Marc. When harvesting, Marc and Mike take single trees or open small patches up to 30 metres (100ft) diameter, depending on which species they are encouraging to regenerate.

Mike was once a professional wood cutter for an industrial forestry company, but eventually quit on account of poor practices he witnessed. Marc remembers stories from those times: “One day Mike and his crew stopped cutting short of a ravine and river, in order to protect the watercourse. A company forester – who now holds a senior position in the company – told them to go back and cut it

clean to the edge of the water.” The final straw might have been when Mike was sprayed during an aerial pesticide application. “He watched songbirds falling out of the trees around him, flapping on the ground. Mike brought home a bagful of dead and dying birds to show the government wildlife people,” Marc recounts.

Protecting the Forest Ecosystem

The Spence brothers tread lightly in their woodlands. They cut a small amount of the annual growth, approximately 0.5% of total volume per year. “This ensures we’re no-where close to over-cutting, and it’s all we need to keep our business busy,” explains Marc. “And we do 90% of our harvesting, stand thinning and road building in the winter to lessen disturbance on the forest ecosystems, aquatic systems and wildlife populations. Our degraded forest gets a chance to heal – there is time and space for the forest just to be a forest.”

Given the low harvest levels and abundance of old-aged balsam fir and white spruce, the Spence brothers have no problem with deadwood supply. “The fellow doing the FSC certification inspection checks that criterion off pretty quickly,” says Marc. “We have a wealth of deadwood.”



Marc Spence

Jamie Simpson

Knowing the Forest Past

Marc uses a variety of information sources to piece together a picture of the forest prior to the past 250 years of forest cutting and agriculture. “I remember a story my grandfather told about hemlock on a near-by hill that took three men to encircle with their arms. It was a patch of forest the Acadians hadn’t cut, but was cut by subsequent immigrants for farmland. Hemlock is now virtually non-existent in this area.” Red oak too seemed not to occur in the area until Marc found a red oak grove on a nearby island. A hedgerow on Marc’s property contains remnants of massive yellow birch and their offspring: “nobody planted yellow birch in the hedgerow – they’re a legacy of the past forest.”

Having worked as a botanist, Marc is familiar with botanical studies that piece together the pre-settlement forest. Marc himself studied pollen records preserved in the bottom of local bogs that date back hundreds of years, and that show the presence of hemlock, yellow birch and other typical old forest species. “It all adds up to paint a picture of the pre-settlement forest that’s a lot different from what we’ve got today.” With a general idea of the pre-settlement forest, Marc chooses planting locations by looking at soil variations. “In sandy soil, for example, I plant spruce, pine and oak. I keep it pretty simple. I’ve even planted red oak in run-out old field clayey soil and they’re 8-10 feet high now and doing just fine.”

MAKING A LIVING AND LONG-TERM PLANNING

The Spence brothers realized early on that they could realize a greater return, and use less wood, by milling high-quality logs they cut on their land. “We knew it would be a waste of time selling wood to the company mills, except for the low-grade stuff. Only a low volume / high value strategy in the forest and at the mill allows us to realize any real financial return from our woodland and avoid the over-harvesting / high-grading trap,” Marc explains.

The low volume and high value approach gives the Spence brothers a bit of economic freedom. “This strategy,” Marc offers, “means we don’t have to

cut much wood and so we don’t need to finance any high-volume, expensive machinery. We need chainsaws, a few log trailers, a 60 horse-power tractor with a loader for the long haul from the log pile to the mill, and a well-trained horse for the short haul from the felling area to the log pile.”

The brothers kiln-dry most of their milled wood in a 2,000 cubic foot dehumidification kiln. They then plane, edge and shape the lumber to the customer’s specification. “Our custom orders are enough to keep us busy.” Marc is happy with the product they sell: “We charge the same for it as at the store, and it’s much better quality.”

“And,” Marc adds, “our lumber is not subsidized by you the public. I don’t want to sound like I’m ranting, but government does everything it can to keep the big mills afloat with taxpayers’ money. When you buy from us, you get the real thing for the real price.”



Pam Langille

FSC Certification

The Spence brothers obtained the Forest Stewardship Council stamp of approval in 2004 on their woodland and wood processing operation. “We don’t get a premium yet for our certified products, but it’s still something I believe in. Ideally, FSC certification should result in the same deal as fair trade coffee – it should help support local communities by recognizing good land use. For us, it helps demonstrate that we are running a cost-effective, efficient and ecologically-sound operation on our land.”

Long-Term Planning

Like many woodlot owners, Marc wishes to see his property managed according to his restoration vision beyond his lifespan. To accomplish this desire, Marc and his wife worked with the New Brunswick Community Land Trust to create a working woodlot conservation easement for their property. The legally-

binding agreement ensures that any subsequent owner of the property will follow a course of woodlot management similar to that practiced by the Spence brothers.

The Big Picture

As a former director of the South East New Brunswick Woodlot Marketing Board, Marc is keenly aware of the economic difficulties woodlot owners face. "The economics create a situation where it is often not worth cutting trees unless you can cut a lot, possibly cutting everything. The woodlot owner and contractor are stuck in the low value / high volume trap that works against sound ecological forest management and the long-term supply goals for the industry," says Marc.

Part of the problem, Marc believes, lies with the prices paid by forest industries for wood on public land. "They're contentiously low," Marc says. "The result is that the mills get large amounts of low-priced wood from public lands, and our woodlot marketing associations end up with little power to bargain with the mills over wood prices."

NURSERIES AND SEED TREES

"These aren't timber trees, these are seed sources," asserts Marc as he points out trees he has planted on his property over the past 20 years. "Creating a seed source for old forest species - getting them scattered throughout the woodlot - is maybe the most important forest restoration action I can take."

The property now boasts well-established hemlock, cedar, yellow birch, red oak, white and black ash and beech, all of which had been largely eliminated from the local landscape. The older ones are as thick as his arm and over 10 metres (30 feet) tall, growing under the light shade of poplar and spruce trees. "The beech might get hit by the beech bark disease, but maybe the disease will miss them here. Even if they get the disease, it probably won't kill them, and they'll have a presence on the land again."

Browse damage by deer is a problem with hardwood seedlings. "I hide my plantings all around the property," explains Marc, as he points out a patch of red oak planted in the middle of a wild rose

bush clump. "It's my nursery survival strategy," Marc says with a smile. "The deer leave these ones alone." Marc cultivates small nursery areas in old pasture land with a tractor, and plants half a dozen or so seedlings in each cultivated patch. "I wait until they're up at least 6 feet before transplanting them to other parts of the woodlot. At that height they've got a decent chance to survive the deer."

Marc restores other plants to his woodlot by transplanting soil plugs from remnant stands to areas with impoverished plant diversity. "I'm looking for a more complete plant association," says Marc as he points out Canada yew, blue-bead lilies and a variety of ferns dispersing from recent soil plug transplants.

"I remember watching mature second growth and old growth timber cut down by a forestry company and turned into monoculture tree plantations. It's not right for the forest or society. As we lose the diverse forest ecologies, we lose the potential for a diverse forest economy."

Marc Spence

Tom Miller: A Passion for the Forest

"Our provincial tree in Nova Scotia is the red spruce. But the way we plant Norway spruce in this province, I think it should be changed to Norway Spruce."

Tom Miller

"This is just how crazy I've become," says Tom Miller, pointing at a massive blown-down white spruce on his woodlot. "I just love to see this - it's a big mess, but it makes great habitat, and it'll be a source of deadwood for a long time. A few years ago I would have considered this a waste. It's funny to hear myself call a fallen tree 'good'."

Since his first jobs in the woods, Miller says he has undergone a 180 degree change in his approach to forestry. "When I started out, I was part of the problem. I was a planter and big into thinning. We were taught to be little Swedes, trying to grow a boreal forest here in the Maritimes. But eventually the light bulb went on; I realized that what we have here

is Acadian Forest, and it's very different from the boreal forest."

Miller has spent his working life in the woods. He graduated from the Maritime Forest Ranger School in Fredericton, NB in 1976, and then started a job with Scott Paper. He soon realized he preferred

working for himself, so after two years started his own silviculture contracting company. He ran the business for 15 years before he and his wife decided to focus efforts on their own 200 hectares (500 acres) of land near New Glasgow, Nova Scotia.

WOODLOT WORK

Seeing the Forest

Miller's first step in his approach to the forest is to take a close, careful look at what's growing on his woodlot. During a tour of his woodlot, Miller points to a typical example of a young forest growing on abandoned farmland: "It looks like a bunch of white spruce and alder. But, when you look closely, you starting seeing potential - here's an oak, here's a red spruce, an ash. There aren't many, but they're there."

Miller draws attention to another area of his woodlot that is predominantly 10m (30ft) high poplar and grey birch. "I passed by here for years when hunting, and figured that's all it was - poplar and birch," he says. "But one day I took a closer look and, now that I've thinned it, you can see there's yellow birch, sugar maple and white ash scattered through it. I've actually got Acadian Forest coming along here."

Miller uses these examples to stress that it's easy to have preconceived notions about the forest. "I've learned not to prejudge a site. I know I have to take a real close look to see what's going on in a woodlot - you definitely can't do it from a truck. Many times I've been cutting in white spruce and balsam fir



Pam Langille

Tom Miller and an old-growth yellow birch

stands, and start finding hemlock, red spruce and maybe white pine, and I think 'Hey, it's not all bad - there's potential here.'"

Connecting the Patches

Miller focuses on connecting the 'epicentres of restoration' when planning work on his woodlot. "Epicentres are patches of good forest you find here and there, patches with the species you want to promote. The goal is to eventually join these patches up - to encourage the epicentres of Acadian Forest to spread outward through the rest of the woodlot," he explains.

To encourage natural regeneration of species like red spruce, hemlock, sugar maple, yellow birch and white pine, Miller cuts gaps in the canopy that create more light and space for the preferred species. He points to one of the first areas he cut on his woodlot; an area where he originally could barely see through the dense growth. "I started taking out the trees I didn't like - some fir, some white spruce - the poor quality trees. Now it's mostly hemlock, yellow birch and red spruce, with the odd sugar maple." The result is a flourishing example of an epicenter of Acadian Forest.

Tree Lessons

Miller continues to learn lessons from the forest. He recently cut competing trees away from a few flat-topped, stunted red spruce and white pine that



Joanne Cook

Miller and his wife Lori (immediately right of Tom) accepting a Woodlot Owner of the Year award

looked far from promising, and was startled by the results. "I used to cut trees like these for a couple sticks of pulpwood, thinking they didn't have potential to grow. But I thought, 'what the heck - I'll leave these for now'. That was five or six years ago, and look at their beautiful tops. They're growing just great now."

Planting and Pruning

Miller prefers working with natural regeneration rather than using under-plantings, saying: "I've planted a lot of trees, and built wire fences around them, but it takes a lot of effort to keep the deer from eating them. I'm keener to work with natural regeneration. The natural pine seedlings on my woodlot seem to grow a lot better than the planted ones anyway."

Pruning, on the other hand, is an activity Miller is quite fond of, combining active trimming with letting nature help out. "I like to start pruning some of my best trees when they're no more than about 3 inches diameter, and then let them get fat," he says. In his hardwood stands, Miller promotes self-pruning by letting the trees grow fairly densely. "I don't really thin the hardwoods until they're at least firewood size and that keeps them growing straight and discourages side-branching," he notes.

Clearcutting

Despite his preference for low impact forestry practices, Miller does not view clear-cutting as a black and white issue. Rather, he occasionally incorporates small clearcuts into his management

Miller's Red Pine Plantation

"After Ranger School I dreamed of having a nice red pine plantation. So when we bought this property with its few acres of red pine plantation, it was a dream come true. I became a brush-burning fool - pruning the trees and burning the brush; I wanted it park-like. But then I started learning about the Acadian Forest and restoration, and asked myself what the heck I was doing. So I started cutting and girdling a few trees and releasing the white ash that was starting to grow up under the pine. The standing dead pine are starting to get woodpeckers in them, and that's what I want to see. Eventually this will be Acadian Forest again; you can already see the yellow birch and hemlock and red spruce coming in along the edges."

Tom Miller

plans. For instance, a 5 to 6 acre clearcut of old white spruce will open the way for shade-intolerant hardwood growth that he'll use as a nurse crop to encourage the growth of species like hemlock and red spruce. "What I am against," stresses Miller, "is indiscriminate clearcutting. Clearcutting red spruce and hemlock - there's no thought to that." As an example, he describes a recent clearcut of mixed forest near his property: "What these cutters did was an abomination. They said they just didn't know what to do with the stand, so they cleared it."

Making it Pay

Miller admits it is a struggle to make a living from a degraded woodlot. "There's no money in this work," he says. "I get a little money for the trees I cut, and sometimes some silviculture funding. But it's not much." However, he adds value to his wood harvest by milling the best logs into lumber. While this helps to generate income, Miller points out that the real reward of his labour today is the future potential of his woodlot.



Tamara Heikalo

"If I want to promote the Acadian Forest, I have to leave the big trees," Miller points out. "We have to let the forest grow. I'm not talking about 50-year rotations; I'm talking 250-to 300-year old trees," he clarifies. "Once you have mature forest, then you can pick away at it each year, taking out high value stuff." Meanwhile, Miller still takes occasional silviculture jobs to pay the bills, which also gives him a chance to see "all the travesties going on in the woods."

His goal is to make his entire living from his own property by adding value to the small trees that he harvests. "We've got 500 acres - surely I can make a living with it. There are a lot of options," continues Miller, "but I know pulpwood's not one. In my opinion, pulpwood is dead. And biomass is not the answer either. Will anyone make any more money selling biomass than they will pulpwood? I don't think so."

Certification

Since the woodland is certified under the Forest Stewardship Council, Miller is able to charge a small premium on the lumber he sells. Certification also ensures a ready market for his round-wood. "I have no trouble selling wood to NewPage - they take all I can give them now that I'm FSC certified," he says. Because of his dedication to restoring the Acadian Forest, he did not have to change much to achieve the certification stamp. "I did on occasion cross a small stream on the property with my skidder," he admits, "and I don't do that any more."

Woodlot Wildlife

Miller uses some of his limited spare time to improve his woodlot to benefit local wildlife. Promoting wild apple trees by releasing them from competing vegetation is one passion: "We've got over 60 wild apple trees growing well on my property now. It's worth the effort because they're so good for wildlife." Building brush fences is another major effort that he feels pays off. Miller makes brush fences by piling tops and branches from trees he cuts into rows about a metre high. "With the brush fences, I'm trying to emulate fallen trees, and provide good habitat. We even put brush fences near the house, and within the first year we had double the number of bird species at our feeder."

A Life-long Passion

An interest in forest management and the viability of family-run woodlots led Miller to join the Nova Scotia Woodlot Owners and Operators Association in 1981. In 2000, he became president of the Association. "I was a reluctant president, very reluctant," recalls Miller. "But one day I thought, 'I'm going to run with this; I'm just going to really get into it and do things that I want to do, like promoting Acadian Forest restoration.' Not a day went by that I didn't think about the Association; it took up a lot of time and energy."

Part of his dedication to NSWOOA was the chance to promote a positive alternative to the prevailing forest management approach. For instance, the Association began hosting Field Day events on members' woodlots to provide a chance for on-the-ground discussion and sharing ideas. "There's so much negative stuff when it comes to forestry - everyone saying 'don't do this, don't do that'. I rather talk about doing good work - about doing low impact forestry and restoration work - I don't like saying 'don't do' anything."

Miller recounts a time he visited a small patch of old growth Acadian Forest in south-western Nova Scotia. "It was like walking into a cathedral, the trees - standing and fallen - were so massive. I'd never seen anything like it, and it really affected me. It made me pretty despondent because it dawned on me that this and a few other scattered patches are all that's left of the original forest here. To think what we've lost."

His work to promote change in forestry practices has earned Miller a reputation. "People have even called me an environmentalist. Somehow I've become an environmentalist," Miller says with an ironic laugh. "But I consider that an honour," he adds quickly. His work has also earned him recognition with the provincial government. The Province honoured Miller and his wife Lori with the Nova Scotia Woodlot Owners of the Year award in 2005.

Moving Ahead

Miller suggests that good woodlot management could be encouraged by redirecting some of the

money government spends on silviculture. He thinks that the province should spend 10% of silviculture funding on practices that restore the Acadian Forest, suggesting it should be law that the money has to be spent. He is sure that as people start to see the results of restoration-based woodlot management, they will want to see more of it.

What sustains his interest in the Acadian Forest? "Restoring a forest feels good, and it looks good;" he insists, "the rest is just nonsense. The more I learn about restoration, the more I like it."

Wade Prest: The Value of Woodlots and Woodlot Owners

"The natural Acadian Forest should be the blueprint we manage toward, rather than trying to create a better forest than Mother Nature, as some foresters believe they can."

– Wade Prest

Wade Prest of Mooseland Nova Scotia runs a busy harvesting operation and a small lumber mill on his 1,900 acres of woodland, nearly half of which is certified under the Forest Stewardship Council.

Prest is a passionate advocate for private landowners, arguing that woodlot owners should not only be rewarded for restoring their land, but also recognized as critical partners in promoting a healthy forest and forest economy. To this end, Prest devotes much of his time and energy to exploring techniques for restoring the Acadian Forest while keeping woodlots financially viable.

A CONTINUING EDUCATION

A forester by training, Prest pays close attention to natural forest processes and the sometimes unexpected consequences of his work in the woods. A rare event like Hurricane Juan, for example, offered Prest a chance to observe the long-term viability of his cutting practices. The hurricane blew down many of his carefully managed stands, especially the softwood he had thinned to industry standards. "I've proven myself wrong lots of times," he says. "Nature doesn't always work how you think, and we often miss the subtleties in the forest system."

"The riparian zone is pretty much irrelevant on my woodlots; I basically manage everything like a riparian zone."

Wade Prest

Thinning

After the Hurricane Juan experience, Prest decided that uniform commercial thinning opens a stand too much, predisposing it to wind damage. As a result, he no longer follows the standard procedure. "Instead of a uniform thinning," he explains, "we focus on releasing crop trees by removing only poorly formed trees that can be sold as logs. The small stuff – the pulpwood – we leave standing unless it's in direct competition with a crop tree."

Although far from uniform and "messy" looking to some, the resulting stands are well-stocked with crop trees that have enough space to grow. There are fewer canopy gaps than in commercial thinning, but the gaps created are large enough to encourage seedling growth and a new age-class of trees. The new technique still meets requirements for silviculture funding, while having other financial benefits. "The logs we sold paid our wages and something for the chainsaws and other equipment, and the silviculture fund money gave me a little toward stumpage," he states. "The operation wouldn't have paid if we had done a standard commercial thinning."



Wade Prest

Minga O'Brien

"It took me a while to get over the notion that I'm a bad citizen when I leave a few logs on the ground to increase the amount of deadwood in my forest – even though they're poorly formed ones that the mill likely wouldn't take anyway."

Wade Prest

Prest felled the trees manually with a chain saw, and his son used an all-terrain vehicle to skid the logs to the road-side. It was a method that worked well given the particular stand and location. Because harvesting was done after the ground was frozen, the operation had a low environmental impact on the area. "We skidded 20 tonnes of logs out of that stand," says Prest happily, "and there's barely a bit of moss disturbed. And in five years I'll come back and take out higher quality logs."

Pre-commercial Thinning

Prest has also had less-than-ideal results from some of his pre-commercial thinning work. In spite of being thinned at an early age, the balsam fir trees in one stand appear close to dying at just 35 years of age. "Balsam fir in this region of Nova Scotia just doesn't have that many years to live, especially on marginal sites," he points out. "I don't think it was worth the effort to thin these fir, given they won't make much more than pulpwood." The red spruce in the stand, however, are doing well, and Prest figures it would have been a better use of time and silviculture money to simply promote the red spruce, and not bother with the balsam fir.

Instead of relying on thinning, Prest now prefers to create conditions that reduce the need to thin regenerating species. "By leaving a little shade," he explains, "the weaker trees will fall back before long. Pre-commercial thinning costs a lot of money, and in some cases it's really not worth it – there's no need to waste money cutting inconsequential trees." When Prest does thin, he waits until the trees are at least six metres (twenty feet) high. He finds that the strong trees are easier to identify at this stage, and that letting the trees grow together encourages self-pruning and good form.

Planting

Prest is not a fan of plantations, especially regretting those that he created on his own property in the past. With help of government funding, he had planted a portion of his property with Norway and black spruce in the mid 1970s. He also spent time and money cutting back competing vegetation and treating hardwood stumps with herbicide spray. He shakes his head when he thinks of the wasted efforts he put into the plantations. "Despite all of my time and taxpayers' money, these 30 year-old plantations are basically worthless," he notes. "The trees have poor form – they're short with a heavy taper, many have forked tops and all are heavily branched, and those are the ones the white pine weevil or porcupines didn't get."

Prest questions the wisdom of investing government money in plantations. "All the taxpayers' money that went into these plantations – was it worth the cost to society, to our economy?" asks Prest. Simply doing nothing would have been the more economically (and ecologically) sensible choice, he thinks. He points out balsam fir, red maple and yellow birch scattered throughout the plantation. Despite his initial efforts to kill them off, he now realizes that they are the most valuable trees growing on the sites. "The best thing I can do with these plantations," he continues, "is leave them so I don't forget what a bad idea it was!"

Growing Yellow Birch

"I've seen old growth yellow birch trees with long, clear stems, and that's what I want to grow on my land," says Prest. To accomplish this he cuts a gap in the canopy for yellow birch saplings to grow into, but makes sure he leaves enough shade to discourage side branching and forked stems. He also plans his cutting and tree removal carefully in order to protect regeneration of desired tree species. Promoting yellow birch growth for high-value logs is one reason Prest likes to maintain canopy cover. "Sure, you might be able to get yellow birch to regenerate after a clearcut, but it's unlikely they will be well-formed trees with potential for valuable logs," he notes.



Tamara Heikalo

"Plantations are not economically sustainable for society."

Wade Prest

FOREST POLITICS

Prest is often frustrated by the way the government and the forest industry treat woodlot owners. "You want to do your civic duty, to stand up for what's right, but I realized that there are forces more powerful than what's right and what's wrong. I've come to the conclusion that woodlot owners are just obstacles in the minds of industry and government," he says.

Prest points to the example of the 2003 Jaakko Poyry report in New Brunswick, an industry-supported study that argued for a more intensive approach to forest management. The report's recommendations included doubling the annual allowable cut of trees in the province, a move that many believed would be devastating to both the forest and the long-term economic health of the region. "People came out in droves to speak against the demands of the forest industry," he says, "but, as far as I can tell, industry got what it wanted in the end, and the government just let people forget that they ever protested against the industry."

The High Volume, Low Value Trend

Prest has seen a gradual decline in the economic value of woodlots in the Acadian Forest causing higher volume harvesting of low value wood. He believes this trend towards quantity over quality prevents woodlot owners from managing their woodlots the way they would like. Instead, they are forced to compete with contractors harvesting wood fibre on sites that would otherwise be uneconomical to harvest. "This leads to the fact that the benefits of owning land are being taken out of the hands of private ownership," explains Prest, "and transferred to big companies, and this is not good for the forest or society."

REWARDING GOOD MANAGEMENT

Prest is well aware of the financial challenge woodlot owners face. He acknowledges the reality that restoring a forest is not likely to pay in the short term, yet also recognizes the long-term value of a healthy Acadian Forest to woodlot owners and society. In light of this, he thinks there should be economic incentives to encourage good woodlot practices. "We need a mechanism to reward and compensate woodlot owners for taking care of the forest, to let them know how valuable they and their woodlots are to society," says Prest.

Carbon Storage – A Possible Economic Incentive

Carbon credits may be one way to reward woodlot owners who pursue forest restoration, Prest suggests. Forests remove carbon dioxide from the atmosphere and store the carbon for long periods of time, potentially centuries. Therefore, industries could offset the carbon they are producing by

Measuring Yield

How reliable are forest growth and yield studies? Wade Prest suggests they do not show the whole picture because they do not account for potential loss of fertility when the site is repeatedly clearcut. "The land has a lot of nutrients stored in reserve, but this nutrient legacy is depleted when a forest is clearcut," he explains. "Forest growth studies don't account for this loss; they assume the land will keep producing the same growth indefinitely."

paying for the units of carbon sequestered, or stored, in trees. Woodlot owners who are actively working to restore the Acadian Forest, or who are simply allowing their forests to grow, could be compensated for not cutting their trees. Because the Acadian Forest has been heavily cut in the past, it is highly degraded in terms of total biomass per unit of land, so it has a large potential for growth and carbon accumulation.

Prest recognizes that working out the logistics of a carbon credit system for woodlot owners is daunting. Not only would it require a method to evaluate carbon storage, but there would also need to be checks to discourage liquidation harvests that nullify the positive effects of carbon storage. However, he believes the potential benefits of carbon credits make figuring out the logistics worthwhile: “If woodlot owners could be compensated for storing carbon, it would add some economic sense to forest restoration,” he emphasizes.

Intangible Benefits

At the root of his ideas about restoration forestry, is the belief that woodlots offer their owners a lot more than wood. For Prest, they are a unique opportunity for families to spend time together. With a bit of basic training and a safety-conscious attitude, woodlot management can become a shared activity done in a healthy environment. “Take the

Woodlot Advice: Simple management and focused effort

“Simple approaches can help maintain opportunities for woodlot owners to do work themselves. Take for example a neighbour’s recent harvest. His strategy was simple: he cut most of the mature balsam fir out of a stand of red spruce, hemlock and white pine, and hauled it out tree-length with a skidder. It was a very simple technique using simple equipment, but resulted in a good job. Focused effort is another important factor to keep in mind when working on a woodlot. Pick twenty trees per acre with good potential and focus effort on these trees, rather than trying to manage every tree. I focus on trees and areas with high potential so that my efforts go a lot further.”

– Wade Prest

kids and spend the day outside,” he says. “Enjoy sitting by a fire and eating lunch together; a day working on a woodlot together is good exercise and it brings families together.” Prest sees no reason why a family cannot take on a variety of woodlot activities. He also stresses that managing a woodlot fosters a vitally important connection between the owner and the land. “And a stewardship ethic,” he continues, “is impossible without a feeling for the land, without connecting with the land.”

Bob Bancroft and Alice Reed:

Walking the Talk

The Acadian Forest and its wildlife are a passion in life for Bob Bancroft. With numerous lectures and magazine articles on the topic to his credit, along with regular appearances on the Maritime Noon program of CBC Radio, Bancroft is a recognized voice on wildlife conservation in the Maritimes. But Bancroft does not just talk about wildlife conservation and forest restoration; he takes his own advice to heart. Along with his wife, Alice Reed, Bancroft is painstakingly restoring a 23 hectare (56 acre) woodlot to provide the best habitat possible for local wildlife.

“You have to walk the talk,” Bancroft insists. “We drive a hybrid car to help reduce carbon in the atmosphere. And it irks me when I go to an environmental meeting and see Styrofoam cups.”

In his own woodlot, their mission is equally clear as Bancroft and Reed put what they preach into practice. At their kitchen table, the two pull out management plan maps for their property. The maps are covered with colour-coded symbols that document their actions: where they have improved streams and created pools for amphibians and other aquatic wildlife, the location and species names of some 600 trees they have planted this year, and where they have placed nest boxes and created other wildlife habitats.

“This isn’t an ordinary management plan,” Bancroft notes. “We don’t have any short-term commercial ambitions for the woodlot. We started with a typical



Flying squirrel

Tamara Heikalo

‘crappy’ woodlot, and we’re working with what we’ve got to bring back a more natural forest.”

Fifty or sixty years ago their woodlot was mostly farmland. The small streams running through the property were degraded (eroded banks and build-up of silt) by loss of forest cover, and a wetland area was virtually destroyed by pastured animals. In short, it was a classic case of a degraded Acadian Forest woodlot. Since then, a thick, even-

aged forest with little species diversity has grown on the nutrient-depleted soil.

WATER COURSES, TREE DIVERSITY AND WILDLIFE HABITAT

Water

Just a few years ago, the pond and nearby marsh that are located near the Bancroft home were trampled and degraded from years of farm animals pasturing in the area. Now, the pond boasts four species of fish, including sea-run speckled trout that have moved in via a stream that flows into the nearby ocean. Numerous birds and other wildlife, including mink and otter, also frequent the restored marsh habitat.

“Restoring aquatic ecosystems should go hand-in-hand with forest restoration,” Bancroft asserts. An important part of his aquatic restoration work was the installation of ‘digger’ logs in a stream that flows into his pond. Digger logs are placed perpendicular to the flow of the stream to create pools and mini-waterfalls, which in turn improves the aeration of

the stream and helps to clear out accumulated silt. As a result, the stream is much more inviting to spawning trout that need oxygen-rich water and a silt-free stream bottom in which to lay their eggs.

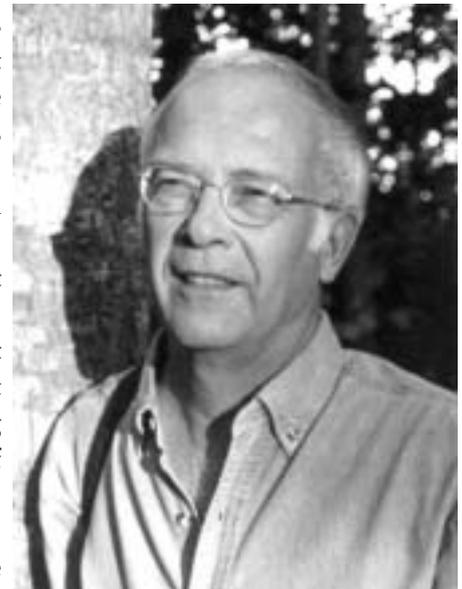
Bancroft points out small seasonal pools he has created for frogs and salamanders, so they will be safe from predatory fish. “One of the biggest things a woodlot owner can do for wildlife is to add in water,” stresses Bancroft. “If you already have a machine there for road work, for example, it doesn’t take very long to add a few strategically placed pools.”

Tree diversity

As with many Maritime woodlots, Bancroft’s property consists of young, even-aged trees dominated by balsam fir, poplar, red maple and white birch. However, hints of the previous forest remain. Bancroft points out the occasional yellow birch, hemlock, white ash, white pine and red spruce. “I keep these trees as valuable seed sources and create gaps in the surrounding forest for their progeny, he explains.” The gaps that Bancroft creates by cutting small patches of trees also help a more natural, multiple-aged forest to grow.

To speed up the restoration process, Bancroft and his wife plant a variety of native species that have been reduced in abundance due to farming and logging. The young trees include yellow birch, hemlock, white pine, red spruce and red oak. “We’ve also planted black ash along one of our streams in an attempt to re-introduce this species to the area,” says a hopeful Bancroft.

“We’re not re-creating the forest instantly, but we’re putting back some of the pieces... eventually, the trees we



provided by Bob Bancroft

are planting will help bring back a more natural Acadian Forest.”

Browsing by deer and other animals is a serious threat to planted trees, so Bancroft protects each planted tree with a wire cage made from purchased chicken wire. The 1.3m (4ft) high enclosures give seedlings a chance to get established before being chewed by animals. “They’re not cheap when you consider protecting a few hundred trees, but it’s worth it. Otherwise, we would likely lose most of what we’ve planted,” he explains.

Bancroft points out several dozen 2m to 3m (6.5 to 10ft) tall red oak trees, planted in gaps in the overhead canopy. “These are trees we planted this year. They’re expensive at this size. Alice gave them to me as a birthday gift,” Bancroft says with a grin.

Wildlife habitat

Mature forests don’t grow overnight. In the meantime, Bancroft points out, there is a lot woodlot owners can do to improve the habitat for wildlife. “Think about what’s missing, how the woodlot can be improved,” he advises. “It’s important to think about creating habitat until the forest itself generates habitat structures.”

Bancroft and Reed have successfully created wildlife habitat on their property. A few examples follow:

- Bird boxes

“We noticed barred owls visiting our property, and realized they were probably looking for a place to nest. We put up a nest box for them and they moved in almost immediately.”

- Hollow logs

“Firewood suppliers occasionally have large hollow logs, which have little monetary value but are highly valuable as wildlife habitat if placed in a woodlot lacking such

structures. We asked a fellow delivering firewood to drop a few off for us and I’ve hauled them into the woodlot.”

- Brush piles

“We created a brush pile recently, and the very next day we saw a snowshoe hare using it; talk about instant gratification!”

- Rock piles

“We found three kinds of snakes in one rock pile alone. Amazing!”

- Girdled trees

“We are pretty sure we have black-backed woodpeckers on our property, so we really want to make sure we have adequate habitat for the black-backed and other woodpeckers. They need standing dead trees, so we girdle a few of the trees we would want to cut anyway, and this creates perfect habitat for them and many others.”

- Forest floor deadwood

“In a few areas we’re managing for four-toed salamanders [a rare species in the Maritimes]. We make sure there is abundant deadwood on the forest floor in these areas; the salamanders need the deadwood to survive.”

Spreading the word

Outside of his woodlot restoration, some of his most satisfying accomplishments have come from talking with others. “One of the largest farmers in the region came to one of my talks; he went home and immediately moved his fences 50 feet back from the water and started planting to re-create the riparian forest. He did it because he recognized the tangible benefit of doing so. I’ve also talked with my neighbours. They’ve had harvesting contractors knocking on their doors; so far they’ve kept their woods from being clear-cut. It’s important to get together with your neighbours to talk about your woodlots.”

Inspiration from elders

Why undertake this restoration work? Bancroft’s answer is straightforward. “It just feels like the right thing to do. We’re part of a much bigger picture - we’re doing what we can to live within nature, to restore a little of what we’ve lost in terms of the Acadian Forest and wildlife.”

Always Learning

“Absolute rules are not good; you need flexibility. I don’t do the same thing everywhere on the woodlot. This helps keep the woodlot diverse by trying different approaches here and there. I’m always learning. One time I cut some trees near a sharp-shinned hawk nest; I learned the hard way that it was a mistake. The hawk couple left after I thinned and didn’t return.”

Bob Bancroft

Bancroft pulls out a photograph of an enormous elm tree. “We found this giant in a ravine in Cape Breton - it took four of us to reach around it,” he recalls. “We’ve forgotten what our forests used to be - this elm is a remnant of the massive trees that used to make up our Acadian Forest. Now it’s time to let some of the trees become elders again.”

Windhorse Farm: Long-term Woodlot Management – 168 Years and Counting

“The Forest is the Product”

– Jim Drescher

A walk in the woods at Windhorse Farm provides inspiration for anyone with an interest in long-term forest management. This 40 hectare (100 acre) woodlot, located near New Germany Nova Scotia, was managed for 150 years by successive generations of one family that cared about its long-term value. The Wentzell family started with old growth Acadian Forest in 1840, and, over generations, cut slow-growing trees to give space to faster growing trees. The result was a woodlot with an abundance of large, old, healthy trees, and a volume of standing wood likely similar to what the Wentzells started with in 1840.

Since acquiring the Wentzell homestead farm and woodlot in 1990, Jim Drescher and his wife Margaret have continued the Wentzell management approach. Taking the good management of the Wentzell family a step further, they have endeavoured to increase the abundance and quality of wildlife habitat on the land, and to increase the economic return from any trees cut on the property.



Jim Drescher

Jamie Simpson

Deadwood

From a forest health perspective, Jim Drescher realized that the woodlot was somewhat lacking in standing and fallen deadwood. The Wentzells’ management was too efficient in this way, resulting in smaller volumes and less diverse distribution of deadwood than Drescher considered desirable based on his observations of untouched, natural forest. The importance of deadwood in nutrient and water cycling, Drescher notes, is better known today. “We also know,” says Drescher, “that deadwood provides food and cover for almost half of the animals in the Acadian Forest. For these reasons, deadwood is the driver of ecosystem health, so it is our main focus in the woodlot.”

“Restoring deadwood is a good example of the ‘coming together’ of science and ethics,” Drescher continues. “Science shows us that loss of deadwood from the forest system leads to an unravelling of the ecosystem - it’s detrimental ecologically; also, it’s unethical to reduce deadwood because of the harm (read ‘death’) it brings to so much of the wildlife that lives in the forest. Through our management techniques, we are increasing the level of deadwood, understanding that the forest itself, including the entire interdependent web of life, is the primary product. Earning a livelihood must fall within the boundaries of ecosystem health, in a real way - not just for show.” One of the Windhorse ecoforestry slogans is “Dead wood is the life of the forest.”

The Dreschers’ solution was to decrease the annual harvest from the woodlot to 30% of the annual growth increment in order to allow more trees to grow old and die naturally. They also girdled many trees which were considered to have low economic value but high ecological value as standing deadwood. In some cases, slab wood from their sawmill operation was taken back into the forest and left in linear piles to mimic large rotting logs. “These slab walls provide excellent habitat,” reports Drescher. “In winter, you can see the rodent tracks running in and out of them - veritable rodent highways; in summer you can dig in them and find loads of salamanders.”