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Creating Healthy Forests

By Cutting Firewood

Islanders have used fuelwood for centuries because of availability, cost and efficiency. While this harvest has played an important role in our development, it has often had unintended but negative impacts on the forest in general and the shade tolerant hardwood species in particular. These impacts were caused by harvesting with little or no preplanning, continuous harvest pressure over many decades, fragmenting forest stands into smaller and smaller blocks, and a steady process of hy-grading (taking the best and leaving the rest).

Today, higher energy costs combined with concerns over climate change have led many Islanders to re-examine firewood as a renewable and environmentally friendly heating option.

Woodland Notes #5 examines how land owners can cut firewood by employing basic forest management concepts to improve the overall health and productivity of their forests, achieve a variety of goals, and create new high value product opportunities.

Pre-harvest: Planning is Critical!

So it sounds simple enough, but how do you chose which trees to cut and which to leave? What kinds of growing conditions are best for the desired trees and are they found in this woodlot? Are there habitat concerns for the area or potential to produce non-timber forest products too and if so, how do you deal with them?

The best way to answer these questions and meet your goals is to develop a forest management plan before you do anything. A good plan matches your goals with an assessment of your forest's current condition and its capabilities and limitations. The process includes a an assessment of stand size, health, soils, drainage and productivity, species composition, road locations, as well as an appraisal of different habitats, special environmental zones, and trees or stands which have high commercial or wildlife potential.

A good plan also recommends suitable management and harvest systems for each area of the forest and when to use them. Each recommendation is based on the stand's health, age, quality and species, and is designed to help you meet your goals in a planned and practical manner. Whether you harvest your own fuelwood or contract out the harvest, understanding how the harvest method will be applied to the specific conditions in your forest will help you to meet your objectives.

Getting Started

Any tree can be used for firewood but some species provide higher heat values per cord then others. While sugar maple or beech provides plenty of heat during a cold February night, they probably produces too much for a mild May evening, so wood with a lower heat value per cord should suffice. By tailoring the heat capabilities of each species to your seasonal heating needs you can use a wider range of trees from your forest.

There are several factors which you need to consider when cutting firewood including creating a trail system, which type of system to use on which sites, tree marking, creating side-shade and conserving or enhancing diversity.

Trails

Your plan should identify stands with fuelwood potential and recommend treatments specific to each one. Once you decide where to work, you need to place your roads and haul trails. Good trails allow equipment and workers into the stand so that they can efficiently cut and extract the wood. Trails also provide corridors for safe felling and emergencies, and can offer recreational access after the harvest has finished.

Extraction Trail

When laying out the trails you should avoid:

- Steep slopes and wet areas such as streams and vernal (seasonal) ponds,
- Nesting, denning, and other environmentally sensitive areas, and
- Large dead trees which could break off and injure the workers.

Trails should have a good line-of-sight in order to ensure visibility and safety, and be wide enough to allow extraction equipment into the site to remove the wood without damaging the residual (standing) trees.

Harvesting in winter when the ground is frozen can limit damage to sensitive forest soils. However, deep snow, icy ground, and high winter winds may make this impractical for manual felling operations.

Harvesting Systems

There are several suitable harvest systems depending on site conditions such as soil and drainage and what species are growing there already. Most forest management systems focus on removing deformed or low value trees while encouraging the growth of tall, straight trees for other high value uses. This same philosophy is true for fuelwood management systems too — you need to focus on using the low value assets while creating conditions suited to high end products.

For upland hardwood stands with rich, well drained soils and a high percentage of shade tolerant species as Sugar Maple, Beech and Yellow Birch, Commercial Thinning or Selection Cutting systems should work well. The two systems focus on retaining shade to prevent the establishment of unwanted species and to encourage desirable species to reach up tothe canopy.

Wet lands, dry sites, and nutrient poor soils will often contain species which are shade intolerant or only moderately shade tolerant such as Red Maple, White Birch, and Eastern Larch. These sites will produce usable fuelwood and can be managed to produce higher value products too. However, these species usually require more sunlight in order to develop, so they are often best suited to openings created with the Strip Cut or Patch Cut systems. For more information on these and other harvest systems suited to Island forests, refer to Woodland Notes # 3: Harvest Choices for Island Forests.

Regardless of the system used, the harvest should focus on removing and using:

- Low value or undesirable species;
- Crooked or deformed trees;
- Damaged or diseased trees; and,
- Multiple stems growing from one stump.

At the same time, the land owner should examine the residual trees (those left standing for future uses). The species you leave standing, along with the genetic traits of the individual trees, will be reflected in their seedlings, so your decisions will have an influence on the forest for many generations to come. Select residual trees for qualities such as:

- Species - shade tolerant species often have high economic and environmental values;
- Form - tall and straight trees with few lower branches can produce high value wood products;
- Health - removing diseased trees should help to improve the overall health of the stand.

Crooked versus straight yellow birch

Disease versus clean beech

Side Shade

Many hardwood species such as Sugar Maple and Yellow Birch also require a high degree of side shading in order to get them to grow tall and straight. Side shade pushes the tree up towards openings in the canopy. If too much light reaches the sides of the tree trunk, it will develop new side branches creating a bushy or "lawn-like" tree. Branches can ruin a tree's potential for higher value products and make felling and limbing more difficult, so sometimes you may have to leave poor quality trees or low value species to serve as spacers in the stand. Once the canopy has closed in again, the trees left for side shade can be harvested or felled to create coarse woody debris and wildlife habitat.

Marking

Trees selected for removal should be marked with spray paint to clearly identify them to the cutter. Marking plays two roles; first, it will help you to insure that only the right trees are cut, and second, it can be used to lay out trails to get the firewood out easily and safely.

Trees marked for harvest should be sprayed on their base and at eye level with a bright durable paint because you can see the paint on the stump long after the stem portion has been removed. Even the best cutter will occasionally damage a residual tree when felling so losing a few trees in this manner is usually quite acceptable. However, marking at two levels allows you to keep track of these losses and maintain a measure of quality control.

Tree marking for retention

Wildlife and Diversity

Anything you do for your forest, including doing nothing at all, has an influence on some of the plants and animals which reside there. Each species has its own unique set of needs so your decisions will have beneficial, neutral or negative influences on different species. It is important to understand that there is no one type of forest or forest management process that can meet the needs of everything which could possibly live in your woodlot. However, when harvesting for firewood you can make decisions which benefit a host of creatures by ensuring the conservation of key ecological attributes which are common to many different forest habitats.

Diversity

One of the easiest ideas to implement is ensuring that the post harvest area has a suitable balance of different tree and shrub species. In the Acadian Forest, most stands contain a mixture of tree species, sizes and ages. As you shift the composition of the stand to a greater mixture of desirable species try to ensure you retain a natural tree balance when the trees are marked for harvest. Openings in the stand will encourage the regrowth of new tree seedlings which will lead to the creation of a broader age structure in the stand as well. Stands which contain a mixture of trees and ages are often better able to respond to problems related to weather, insects and diseases, and may be better prepared for potential climate changes.

Denning and Nesting Sites

Survey the stand for indications of nesting or denning sites. While adults can move to another location to feed, young chicks and pups usually cannot, so protecting their needs during the breeding season is critical. Look for large nests or hollow tree cavities and evidence of feeding debris such as bones, fur, feathers, cones and seed husks. If you find signs of recent activity, delay the harvest to another season or create an adequate buffer around the area to protect the animals while they raise their young.

Snag Trees and Coarse Woody Debris

If safety allows, leave a few large dead or dying trees standing. As they decline and fall apart, these old trees release the energy and nutrients they have stored up over their lifespan. This release provides cover, food, and nesting sites for many different forest creatures from fungi and bacteria, to bats, raccoons and eagles.

Good quality snag tree

However, standing dead trees should be situated well away from trails and marked prior to harvest to ensure that manual fellers and visitors remain at a safe distance.

Eventually the old tree will fall to the ground where it continues to play a role in the ecological cycle of the forest. As the old tree (often called Coarse Woody Debris) decays over the next few decades, it will provide a variety of ecological services to the forest environment. You can also create coarse woody debris by felling a few large but low-value trees across the site and leaving them on the forest floor to slowly decay.

Getting Help

The Province offers a variety of services to land owners who want to manage their wood land for any number of reasons and uses. The Forest Enhancement Program www.gov.pe.ca/go/fep offers advice and financial assistance for the development of a forest management plans suited to the needs of the owner and the capabilities of their forest. This program also offers tree marking incentives to identify quality trees, trails, and areas of special interest. You can also call or visit your local forest district office for more information on the FEP and the other services available PEI land owners

Forest District Offices

Eastern Forest District Office
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Tel: (902) 961-7296
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