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Spring 2019

# What Will My Woods Look Like? Before and After Timber Harvesting

Department of Agriculture, Conservation and Forestry

Maine Forest Service

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# WHAT WILL MY WOODS LOOK LIKE?

## *BEFORE AND AFTER TIMBER HARVESTING*

# The Maine Forest Service

The Maine Forest Service was established in 1891 to ensure Maine's citizens the greatest economic and social benefits from the trees and forestlands of the state.

The primary responsibilities of the Maine Forest Service include:

**To develop** through information, education and formal publications a greater public awareness and appreciation of forests as Maine's basic economy and renewable resource;

**To provide** advice and assistance in forest management to woodland owners;

**To maintain and improve** the scenic beauty, wildlife habitat and recreational values of Maine;

**To encourage and promote** appropriate forestland management practices;

**To protect** Maine's forests from fire, insects, diseases, and other natural enemies; and

**To enforce** Maine's forestry laws and rules by preventing violations, intervening with potential problems and, as a last resort, taking enforcement action.

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*Before and After Timber Harvesting*
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The harvests shown in this book were conducted by woodland owners working with a team that included licensed foresters and professional loggers, as well as other natural resource professionals. The Maine Forest Service applauds the exemplary work done in each of these examples.

The majority of photographs were taken by Pam Wells. Additional photography supplied by Maine Forest Service staff; Maine Department of Inland Fisheries and Wildlife; and Pat Sirois, Maine SFI. Special thanks to the Penobscot Experimental Forest for the historic shelterwood pictures on pages 24 and 25.

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**Fox**

**Black-throated blue warbler**

**Palm warbler**

**Bobcat**

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# Introduction

At a conference panel discussion for woodland owners, a consulting forester in the audience asked the question “What do landowners look for in their forest management plans?” One of the panelists replied, “You know, basal area and minimum stocking recommendations are all well and good, but what I really want to know is, what will my woods look like?” From that comment, this effort was born.

This booklet attempts to answer that question with a series of paired photos, each taken from the same, or nearly the same, location and direction, before and after a timber harvest. The sets are identified by the type of harvest activity (thinning, patch cut, etc.) and includes a short generic description of the type of woods concerned.

There are several parts to the captions for each photo. The first is how a woodland owner might view their woods and express their goals for their land. The next is how a forester might describe the pre-harvest stand and post-harvest results, written in the forestry profession’s language. Then the logger’s view, which is often through an operational lens but also considers forest health and aesthetics. Finally, a statement of likely wildlife outcomes, which are often a higher priority for landowners than other silvicultural objectives. The hope is that linking the photos with the various points of view will serve as a “translator” that will help both professionals and landowners understand each other better. With this understanding, there may be a greater willingness for woodland owners to carry out the recommendations of their resource professionals, and a greater probability that foresters and loggers can deliver good results to their customers.

The forest scenes were chosen to be familiar and representative of family woodlands in Maine. Most of the woodlots shown are open to the public; it’s always better to visit the sites in person if possible. The landowner names, locations and contact information for most of these lots are included at the end of the booklet.

The type of harvesting equipment used is noted, but is not meant to be a recommendation of one logging system or another. As always, it’s the person who runs the machinery that makes the final result what it is.

Our hope is that landowners, loggers, and foresters take this book and talk about what they see, like, and understand before the job starts. Which, we also hope, will lead to more and better applied silviculture in the form of sustainable timber harvesting.

# Thinning and Crown Release of Crop Trees

**Natural white pine sawtimber stand**

## BEFORE

**Woodland Owners' View**

There are too many big pines here. Some need to come down so that the others can grow better. There is a lot of unwanted fir here but if the stand is thinned, a few years from now more pine seeds will come.

**Logger's View**

There is good road access to this stand, and the trees have sufficient volume and value to make a viable partial cut. Seeing the ribbons on the trees to leave will make it more efficient for the operator. Since the younger fir are not desirable to save, there will be plenty of room for grapple skidders to maneuver without damaging the trees to keep.

**Forester's View**

This medium sawtimber-sized white pine stand is too dense; crowns are closed in and the stand is not achieving optimum growth. The established but suppressed fir understory is not a good replacement. Recommend thinning to release the crowns of the best crop trees on three or four sides. Then let the stand grow for a while, as long as the dominant timber trees continue to add volume and value. When the time comes to regenerate the stand, harvesting within a year of a good cone crop should increase the amount of white pine in the next forest.

# Thinning and Crown Release of Crop Trees

**Natural white pine sawtimber stand**

## DURING

**Woodland Owners' View**

The feller buncher has a saw at the bottom of the yellow metal part. It's like a huge sawmill blade. The operator cuts a tree using the saw, then uses the grips on the front to put it closer to the feller buncher. After enough logs are on that space, the operator moves them to a pile of logs which a skidder then takes to a log yard.

**Equipment Used**

Tracked feller buncher, grapple skidder, and loader/slasher on landing.

**Logger's View**

Modern mechanical harvesting equipment allows well-trained operators to see what they are doing, and make good decisions as they cut the designated trees. Boom-mounted saw heads like this reduce the equipment impact by reaching out without driving to the stem that's being cut.

# Thinning and Crown Release of Crop Trees

**Natural white pine sawtimber stand**

## AFTER

**Woodland Owners' View**

The trees are spaced wide apart and wind or insect disease could be a problem in the future. In addition, the width of each tree is small in terms of how strong each tree might be if a big wind came through. On the other hand, each tree now has a lot of light and the crowns can get wider quickly. It is a risk to do wide spacing but it might help in the future growth of the trees.

**Forester's View**

Residual stand is in great shape as far as mechanical damage from equipment is concerned. The basal area may be a little below the optimum stocking table guideline; however, the stand is still intact and growth should take off. Keep an eye out for disease or insect damage. The stand may be susceptible to wind damage for a few years, but these dominant trees have already adapted to wind stress over the years. Unless some unforeseen damaging factor comes into play, grow these trees to a target financial maturity size, perhaps 24" dbh or greater.

# Thinning and Crown Release of Crop Trees

**Natural white pine sawtimber stand**

## AFTER 5 Years

**Woodland Owners' View**

The pines are growing bigger crowns and wind has not taken any trees down. There are a lot of new saplings under the pines which include balsam, spruce, red pine, and white pine. While it was a risk, the trees are happy with their sunlight.

**Wildlife Outcomes**

This stand now has two well established vertical layers, below 6'and above 30'. Over time, the mid-story layer (6-30') can become established, which will attract birds such as the black-throated green warblers.

**Forester's View**

It is amazing how quickly healthy pine responds to more sunlight. These crowns have really expanded in only five years, and the stand has held up during some pretty strong wind events. The understory regeneration, while not part of the original plan, is a welcome hedge, in case it becomes necessary to remove the overstory. But for now, let it grow.

# Thinning

## White pine plantation in an old field

## BEFORE

**Woodland Owners' View**

This is an old field where pine trees were planted many years ago. Some of the trees need to be taken down so that the remaining trees can have more light, water, and minerals. In other words, remove the competition and the trees left will grow better and faster.

**Logger's View**

This is not a big money-maker, mostly pulpwood to cut, but at least it's flat, relatively dry ground, without many rocks. Should be easy going for almost any logging equipment.

**Forester's View**

This 60+ year old white pine plantation is overstocked, well above the B-line, 100% crown closure, no understory or mid-story, and growth well below potential. It should be thinned to optimum stocking of higher quality future crop trees, to increase future value of the stand.

**Equipment Used**

Tracked feller buncher, in-woods cut-to-length processor, and forwarders.

# Thinning

**White pine plantation in an old field**

Yellow-spotted salamander

## AFTER one year…

**Woodland Owners' View**

The remaining trees are big enough in width and close enough to each other to help with wind problems. While there's more sun coming through the crowns now, over time, the branches will take over the open space. Another thinning might be needed in the future.

**Logger's View**

The weather held and so did the market, so this cut went okay. Wound up cutting it in winter because the access road needed to be frozen for heavy trucks to use.

**Forester's View**

Basal area is now optimum. Recommend checking periodically over the next 10-15 years for full crown closure, at which time another thinning may be appropriate.

**Wildlife Outcomes**

Because some branches and medium woody material remain on the forest floor, salamanders and small mammals will have protective cover. The overstory canopy is still mostly closed which provides forest habitat for many species.

# Thinning II

## Naturally established white pine pole stand

## BEFORE

**Woodland Owners' View**

Too many trees in this stand. The small pine seedlings aren't getting enough light in order to grow bigger and better. If some of those competing trees are removed, the remaining trees will grow wider and taller.

**Logger's View**

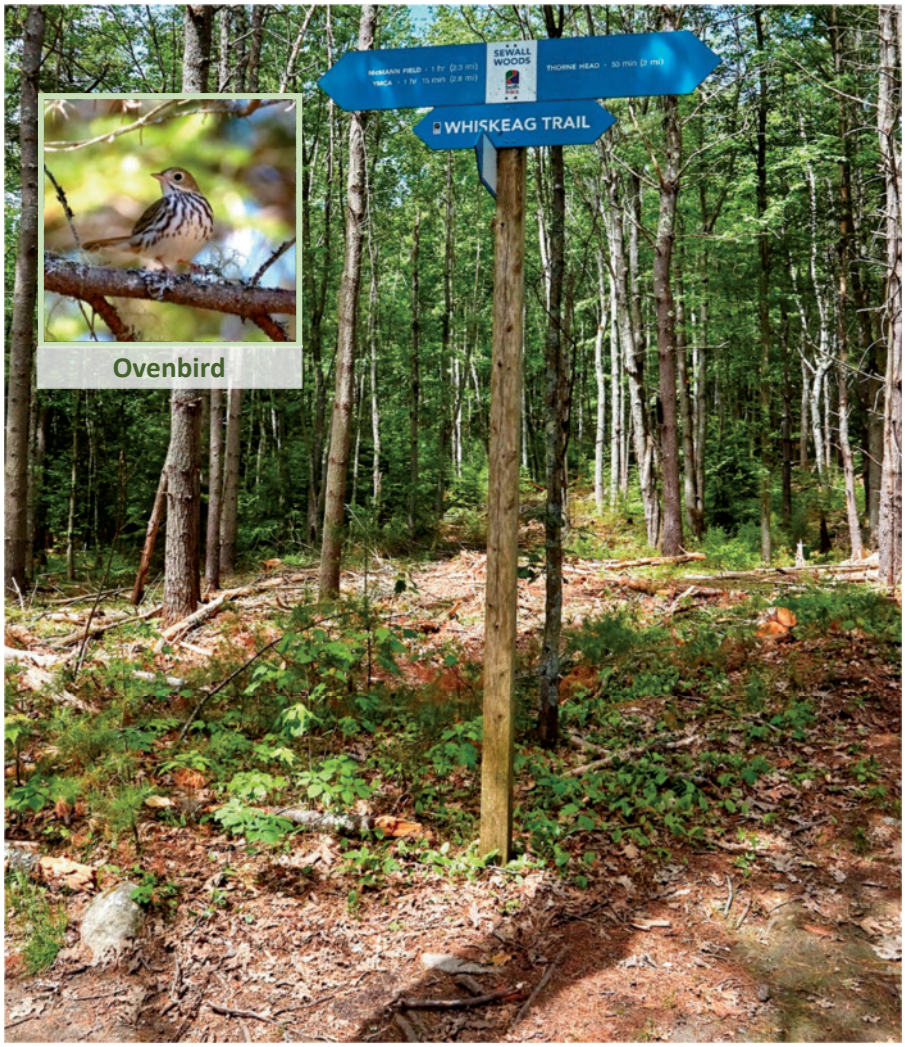
One reason loggers invest in cut-to-length systems is so they can handle small trees like these economically. It helps a lot that the hiking trails are well-marked, so the equipment trails can be planned around them.

**Forester's View**

The stand is overstocked, slowing growth of white pine sawlog crop trees; the stand stock table is well above the B-line. Barely established pine seedlings are suppressed, need to be released.

# Thinning II

## Naturally established white pine pole stand




Ovenbird

## AFTER

### Woodland Owners' View

This thinning allows more sun and space for the top of the trees. The pine seedlings will show up in a few years. And, it looks like the ground and soil are intact.

### Equipment Used

In-woods cut-to-length processor; six-wheeled forwarder.

### Forester's View

The light thinning from below provides more crown space for crop trees. It's likely that some seedlings will be released, even though that's not the primary reason for the harvest. Moderate amount of medium-sized woody material on the ground for habitat and soil protection.

### Wildlife Outcomes

Ovenbirds could be nesting in ground litter. Black-throated blue warblers and Blackburnian warblers also like these conditions.

# Thinning and Weeding

**Natural hardwood pole stand**

## BEFORE

**Woodland Owners' View**

There are too many saplings in this stand and too much is beech. The choice would be to thin out the beech, unless they are healthy beech, and then save sugar and red maple, birch and other high valued hardwoods.

**Logger's View**

This is a marginally commercial operation. With mechanical equipment and a good biomass chip market, the landowner might get a minimal amount of stumpage and the job gets done. If this was done with hand crews the landowner would have to pay for the work, except for a little bit of firewood that could be sold.

**Forester's View**

This sapling/pole stand is overstocked and has a high percentage of beech with beech bark disease. Recommend thinning to favor sugar and well-formed red maple, birch and other high-value hardwoods; and weeding out most of the beech, but leave dominant healthy beech for mast.

# Thinning and Weeding

**Natural hardwood pole stand**

## AFTER

**Woodland Owners' View**

The quantity of saplings in the stand is really good. Over time, they will grow larger and while running a sugar house is an option, there will be other wood options to think about like birch, red maple, and beech products.

**Equipment Used**

Three-wheeled feller buncher, small grapple skidder, chipper.

**Forester's View**

The residual stand is close to optimally stocked with potential sawlog stems of valuable species. The option for sugaring exists, but different management decisions will need to be made for that in the future.

**Wildlife Outcomes**

With a still fairly closed upper canopy, scarlet tanagers and wood thrushes may be seen and heard here.

# Thinning and Crown Release

**Hardwood pole and small sawtimber stand**

## BEFORE

**Woodland Owners' View**

There are too many trees in this stand. It's crowded with maple and oak. If the stand has some of the trees removed next to the best trees, then the remaining trees will grow better and faster.

**Logger's View**

This size wood is ideal for a mechanical harvester and small chipper. Flat, old field ground like this is pretty easy on the fuel tank, too. Looks like a good opportunity.

**Forester's View**

A typical old field grown up to oak and maple, in this case. The stand is overstocked. Recommend bringing down to B-line and favoring the best pole and sawlog quality red oak, maples and birch, releasing crowns on two to three sides.

# Thinning and Crown Release

**Hardwood pole and small sawtimber stand**

## AFTER

**Woodland Owners' View**

Much better to see through for hunting and just walking around the rest of the year. The remaining trees are going to benefit from the extra light and space.

**Equipment Used**

Three-wheeled feller buncher, small grapple skidder, commercial chipper.

**Forester's View**

Now the stand is near optimum stocking; residual stand damage is negligible, and the remaining crop trees should increase in growth and value over the next cutting cycle. Look at this again in about ten years.

**Wildlife Outcomes**

Scarlet tanagers and other songbirds prefer predominantly oak stands with a fairly closed upper canopy.

# Improvement Harvest I

**Mixed wood pole stand**

## BEFORE

**Woodland Owners' View**

The management plan says to do an "improvement cut" in this area. There are too many trees. There is a concern about invasive pests, so "fewer trees" is better for this stand.

**Logger's View**

The rolling terrain is not a problem for most logging equipment. Since winter weather in this part of the state can be quite variable, it's good to have high ground to work on, and work around the few lower wet areas, saving them for when it gets cold enough to freeze a side trail. The way the wood is marked, the crew can efficiently cut a good volume of wood, with good value at the mills.

**Forester's View**

This is a pole sized and larger stand of mixed wood, about two-thirds softwoods such as hemlock, fir and spruce, with one-third birch, maple, oak and other hardwoods. The presence of hemlock woolly adelgid in the area reduces the potential future value of the hemlock. The stocking is above optimum, and the most valuable trees need more crown space to grow. Recommend the removal of less desirable trees, primarily to improve composition and quality. Reduce basal area by approximately 40%. Marking the trees to remove to fulfill this prescription will make it easy for the loggers to know what to cut and plan their work accordingly.

# Improvement Harvest I

**Mixed wood pole stand**

## AFTER

### Woodland Owners' View

It does look better, more orderly and easier to see through. Branches were left on the trail. Loggers do that on purpose, to keep from making any big ruts, which is good. It won't harm the roots of the remaining trees.

### Equipment Used

In-woods cut-to-length processor and forwarders; small cable skidder for trees that are too big for the processor to handle efficiently.

### Forester's View

The loggers did a nice job laying out this harvest. They cut the marked trees and concentrated most of the equipment activity placing the limbs and tops in one main trail. No discernible damage to the residual stems. The percentage of hemlock in the stand is reduced, but the woodland owner still needs to keep an eye out for hemlock woolly adelgid.

### Wildlife Outcomes

Mechanized harvesting equipment makes it easier to safely manage snags and hazards while leaving downed and decaying wood in the forest, which benefits a wide range of wildlife species.

# Improvement Harvest II

**Mixed wood forest**

The next three sets of pictures also show differing views of the same **Improvement Harvest** in the same stand.

According to the U.S. Forest Service, the definition of an **Improvement Harvest** is: The removal of less desirable trees in a stand of poles or larger trees, primarily to improve composition and quality.

# Improvement Harvest III

**Mixed wood forest**

# Improvement Harvest—Looking Up

**Mixed wood forest**

## BEFORE

**Woodland Owners' View**

During warmer months, there are so many trees and leaves that there isn't much sunlight getting through. Because of that, the trees won't grow as well. If a thinning happened, then the remaining trees would have more light and resources. They will grow better and faster without the competition.

**Forester's View**

When the leaves are out, canopy closure for this stand is nearly 100%. A thinning and improvement cut will open space around the crowns of the best crop trees, allowing them to increase growth and future value.

# Improvement Harvest—Looking Up

**Mixed wood forest**

Chestnut-sided warbler

## AFTER

**Woodland Owners' View**

The remaining trees are now going to have more sunlight. They are "released" which means the competing trees have been removed.

**Equipment Used**

In-woods cut-to-length processor and forwarders.

**Forester's View**

The remaining crop trees have been released, and with no damage to the crowns. The white pines especially, and the hardwood too, will make good use of the additional sunlight starting next growing season.

**Wildlife Outcomes**

Small upper canopy gap openings (less than two acres) are beneficial to certain songbirds, such as the chestnut-sided warbler.

# Overstory Removal

## Spruce stand

## BEFORE

**Woodland Owners' View**

There are a lot of red spruce and other species under the bigger trees. They probably came in after cutting some of the bigger trees in the past. Since the tall trees are ready to be cut and sent to a mill, and there are a lot of saplings underneath, it's time to take the top off.

**Logger's View**

This would be a tough one for a man with a chainsaw. Luckily, mechanized equipment is built for this sort of work.

**Forester's View**

There is a well-established understory of advanced regeneration, mostly red spruce, probably started after a previous partial harvest. Since the overstory trees are at or near financial maturity, recommend removing the overstory to fully release the next age class.

# Overstory Removal

## Spruce Stand

Lynx

Snowshoe hare

## DURING and AFTER

### Woodland Owners' View

Still a lot of little trees crowded in there so it would be difficult to walk through the area easily. The forest owner could take out some of the little trees so that the remaining trees will grow faster. In the long term, nature will do it eventually.

### Equipment Used

Feller buncher and grapple skidders.

### Forester's View

Though there was some inevitable damage to understory trees during the logging operation, there are still more than enough stems to fully occupy the site. Perhaps this landowner will pay for some non-commercial thinning, to improve growth of the next stand. Natural competition will eventually do the same thing, but it will take a lot longer.

### Wildlife Outcomes

Mourning warblers like to nest near the ground in dense vegetation. Snowshoe hare also like this low cover, which means that lynx and other cats may also be in the vicinity.

# Historic Shelterwood

**Spruce stand**

1) 1955: Natural spruce/fir stand

## Shelterwood through time

Shelterwood is a silvicultural method of regenerating new forest stands by harvesting all mature trees in an area in a series of 2 or more cuts occurring within 10-20 years.

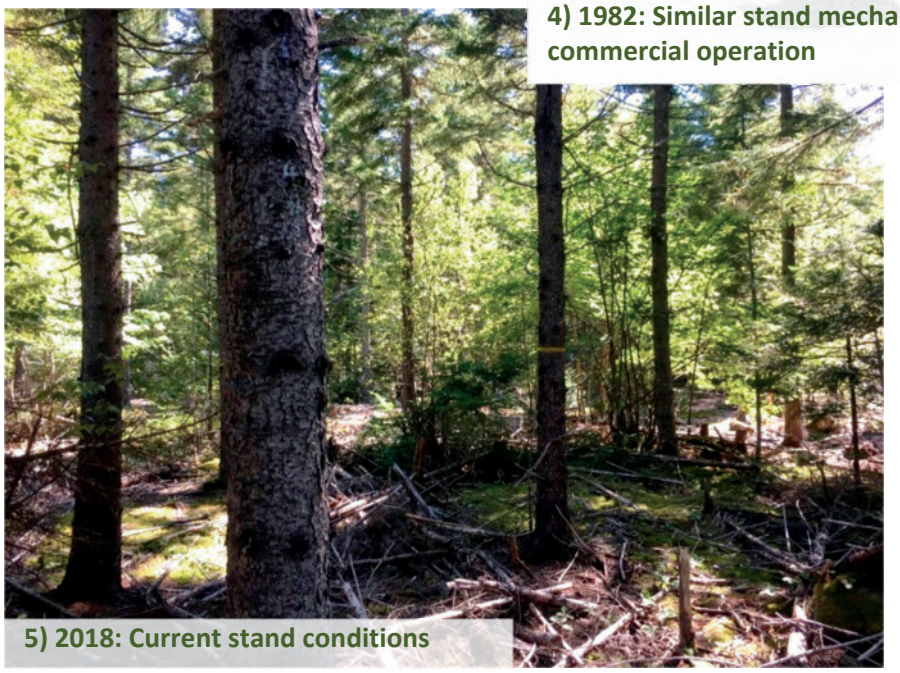
2) 1962: After 1st entry shelterwood cut

# Historic Shelterwood

## Spruce stand

3) 1982: Several years after the final overstory removal cut, naturally regenerated with spruce

4) 1982: Similar stand mechanically spaced in non-commercial operation



5) 2018: Current stand conditions

# Reclaiming Gap and Thinning

**Old clearing in mixed wood with natural old field succession**

## BEFORE

**Woodland Owners' View**

This was an old clearing where hardwood saplings are creeping in. The saplings aren't valuable wood and they are shading the white pine seedlings. Let's make the opening larger.

**Logger's View**

Easy terrain, good access, short yarding distance makes up somewhat for the small volume and low commercial value of the trees to be cut. It's part of a larger job, which helps the economics overall.

**Forester's View**

Old clearing where forest succession is slowly closing in from edges. Low value hardwood stems are suppressing a few white pine seedlings. Recommend expanding the opening to regain the canopy gap wildlife feature, and to regenerate higher value species such as pine.

# Reclaiming Gap and Thinning

**Old clearing in mixed wood with natural old field succession**

## AFTER

### Woodland Owners' View

This stand has been opened up as a "patch cut." Low valued tree species have been removed and space has been given to white pine trees. The tops of the trees will get wider over the next 10-15 years and shade will return.

### Equipment Used

In-woods cut-to-length processor; six-wheeled forwarder.

**Magnolia warbler**

### Forester's View

A half-acre patch cut has been opened up for regeneration and early successional habitat; low value stems removed to give more sunlight and growing space to higher value white pine sawlog trees; expect the crowns to fill in over the next 10-15 years, and seedlings (hopefully white pine) to establish in the patch cut.

### Wildlife Outcomes

American woodcock, eastern wood peewee and olive-sided flycatchers are likely to use the gap now. If pine or other softwood seedlings fill it in over time, magnolia warblers might find it attractive.

# Patch Cut with Retention

**Young sapling stand**

## BEFORE

**Woodland Owners' View**

Each bird species like a particular kind of tree and/or stand. Woodcock like open spaces where they can easily fly for their courtship dance. This stand is over grown with too many saplings so something needs to happen.

**Logger's View**

Small stems like these aren't real money-makers, but by cutting all of them in a small area next to the haul road, and using what markets there are for biomass chips, this work can be done without having to charge the landowner anything.

**Forester's View**

This stand could be non-commercially thinned, but since there is a lack of open ground and low cover in this forest, and the landowner has a specific wildlife objective of managing for woodcock, a small patch cut (less than five acres) is in order.

**American woodcock**

# Patch Cut with Retention

**Young sapling stand**

## AFTER

**Woodland Owners' View**

Well done job. The pine trees will grow larger and will make seeds to regenerate the stand. In the meantime, woodcock have happily returned to this area.

**Equipment Used**

Tracked feller buncher, grapple skidders, and commercial chipper.

**Deer**

**Forester's View**

Very clean patch opening. Retaining the handful of pine trees to grow larger will bring more income during a later harvest, meanwhile providing a valuable seed source for the regeneration of the patch. This will be an early successional stand surrounded by an otherwise mid-successional forest.

**Wildlife Outcomes**

Besides woodcock, many other species will use this opening. Raptors and other predators will hunt it; songbirds such as the chestnut-sided warbler will provide low cover for snowshoe hare and other small mammals, which in turn are food for lynx, bobcat, etc. Deer and moose will browse along the edges eventually.

# Patch Clearcut

**Young aspen pole and small sawtimber stand**

## BEFORE

**Woodland Owners' View**

There used to be a lot more partridge around here. One of the management goals is to bring them back.

**Logger's View**

Popple on flat high ground is usually a productive combination. The patch clearcut prescription will be even more so.

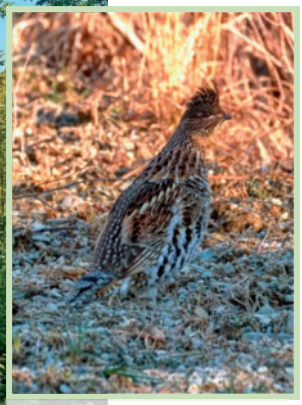
**Forester's View**

Clearcut a total of 20 acres of the stand to create early successional habitat in +/- 5-acre patches, focused on areas where mature aspen is present. The patches will regenerate primarily with aspen and will maintain that species as a component within the stand. Several high-quality stems should be left in each patch for future wildlife benefits and as legacy trees.

# Patch Clearcut

**Young aspen pole and small sawtimber stand**

Two growing seasons after harvest



Ruffed grouse

## AFTER

### Woodland Owners' View

It was fun to have a tour group come take a look right after the harvest was done. Can't wait to go bird hunting next year, it should be great!

### Equipment Used

Tracked feller buncher, grapple skidders.

### Forester's View

As expected, two growing seasons and the aspen regeneration is too thick to see through. This early successional habitat will add diversity to the older woods around it.

### Wildlife Outcomes

Dense, young growth of a recently harvested aspen stand protects ruffed grouse from predators, especially from hawks and owls. Flower buds on mature male aspen trees are a life-saving food when snow cuts off ground feeding. Because grouse rely on both young and mature aspen, ideal habitat consists of small 5- to 20-acre aspen patches all close together but of different ages. American woodcock, chestnut-sided warbler and field sparrow also benefit greatly from young aspen stands. White-tailed deer rely on aspen throughout much of the year for both food and cover.

# Non-Commercial Thinning

## Hardwood sapling stand

## BEFORE

### Woodland Owners' View

There are way too many saplings and tree species in this stand. And it's not certain what species is going to win over time. While it does cost the owner to do this, in the end, it's worthwhile to choose what species to save and how the stand will look over time.

### Logger's View

Nothing to sell in the current market. Not worth bringing in any large, expensive equipment. Best to do this with hand-held brush saws, and charge by the hour or the acre.

### Forester's View

The stand is heavily stocked with sapling trees. Although natural thinning will occur over time, there is no guarantee that the most desirable species and stems will win out. Entering the stand now to thin and weed will improve the future stand composition.

# Non-Commercial Thinning

**Hardwood sapling stand**

## AFTER

**Woodland Owners' View**

Birds and other wildlife will still use this area. Right now the trees are small, but since they now have better light and more room, they will grow faster.

**Equipment Used**

Gas-powered brush saw.

**Forester's View**

Selected potentially valuable hardwoods are growing faster now the competition is gone. The next thinning may be commercial, depending on markets.

**Wildlife Outcomes**

Many wildlife species love this type of stand, including hawks, squirrels, and sometimes moose.

**Gas-powered brush saw**

**Broadwing hawk**

# Invasive Tree Removal and Thinning

**Oak pine mature sawtimber**

Tracked feller buncher

## BEFORE and DURING

**Woodland Owners' View**

These woods are way too thick for overall health, and there's an invasive species that's taking over—Norway maple! They need to be cut so the pines and oaks have room to grow.

**Logger's View**

This will be good wood to cut from an economic point of view—it's mostly large diameter, tall, and a lot of sawlog quality—even the Norway maple logs can be sold for more money than pulpwood! Also, the short yarding distance is a plus. On the other hand, the high visibility and aesthetic importance to the landowner means some extra care will be needed to handle brush and limbs, and maybe even grind some stumps. Having a chipper for this job is a must.

**Forester's View**

The stand is overstocked, which reduces growth on valuable sawlog oak and pine. Norway maple is taking growing space from desirable native trees. A sanitation and thinning cut will remove the invasive species and release crowns of the most desirable trees on two or three sides.

# Invasive Tree Removal and Thinning

**Oak pine mature sawtimber**

## AFTER

**Woodland Owners' View**

Very pleased with the care taken by the logging crews. There are a lot of good sawlogs left in this stand. Need to keep an eye out for any new invasive plants and insects.

**Equipment Used**

Tracked feller buncher, grapple skidder, loader/slasher, and commercial chipper.

**Forester's View**

Optimum stocking of high value sawlogs trees; the growth and value of this stand will increase relatively quickly. Need to keep an eye for insects, disease and windthrow, and be ready to salvage if significant damage occurs. There is also a good chance that Norway maple and other invasive plants will again try to take over the stand; vigilance is recommended.

**Wildlife Outcomes**

Wood thrush and other songbirds like the high, mostly closed canopy.

# Harvesting Near a Recreational Trail

**Natural small sawtimber pine stand**

## BEFORE

**Woodland Owners' View**

There are too many trees in this place. It's dark. If a few trees—maybe about half—come out, the tops of the rest of the trees will be able to get sun and grow faster and it will be brighter for hiking and biking.

**Logger's View**

With careful planning, equipment trails can be located away from the recreation trail, with a minimum of intersection. Using mechanical harvesting equipment, controlled felling will keep tops and limbs off the recreation trail too. There will probably be some clean-up work to do by hand, though, especially where the trails cross. This could factor into the stumpage price.

**Forester's View**

Overstocked, near 100% crown closure in this stand. Growth on valuable timber trees is slowing; crowns need to be released on two or three sides. Recommend a low thinning and crown release, removing 40-50% of the basal area.

Tree frog

# Harvesting Near a Recreational Trail

**Natural small sawtimber pine stand**

Blue-spotted salamander

## AFTER

### Woodland Owners' View

More sun in there, and it's nice to see more through the woods! There's nothing in the way on the bike trail, and the forest is still standing! The loggers did a great job cleaning up where needed; the amount they paid for the wood was very fair, all things considered.

### Equipment Used

In-woods cut-to-length processor, and four-wheeled forwarders.

### Forester's View

The stocking is now nearly optimum for good growth and vigor in the residual stand. Should check conditions for another thinning and spacing, when the crowns close back in again, probably in ten years.

### Wildlife Outcomes

The relatively small amount of wood down on the ground will still provide some habitat for beneficial insects, small mammals, salamanders, and ground-nesting birds. The relatively dense evergreen canopy cover will keep snow depth down in the winter, which helps deer and other wildlife.

# Roads and Landings

**Woods road, mixed woods stand**

## BEFORE

**Woodland Owners' View**

There are too many bushes and saplings on this old road. In order for the loggers to get in here and make a place to work, the road needs to be more accessible, and less appealing for the folks who have been dumping trash there!

**Logger's View**

It will take a few extra pieces of equipment here—probably a bulldozer and an excavator—to get this road ready for hauling; need to make some landing areas too. Might need a load or two of gravel, depending on how it goes when the road is opened up.

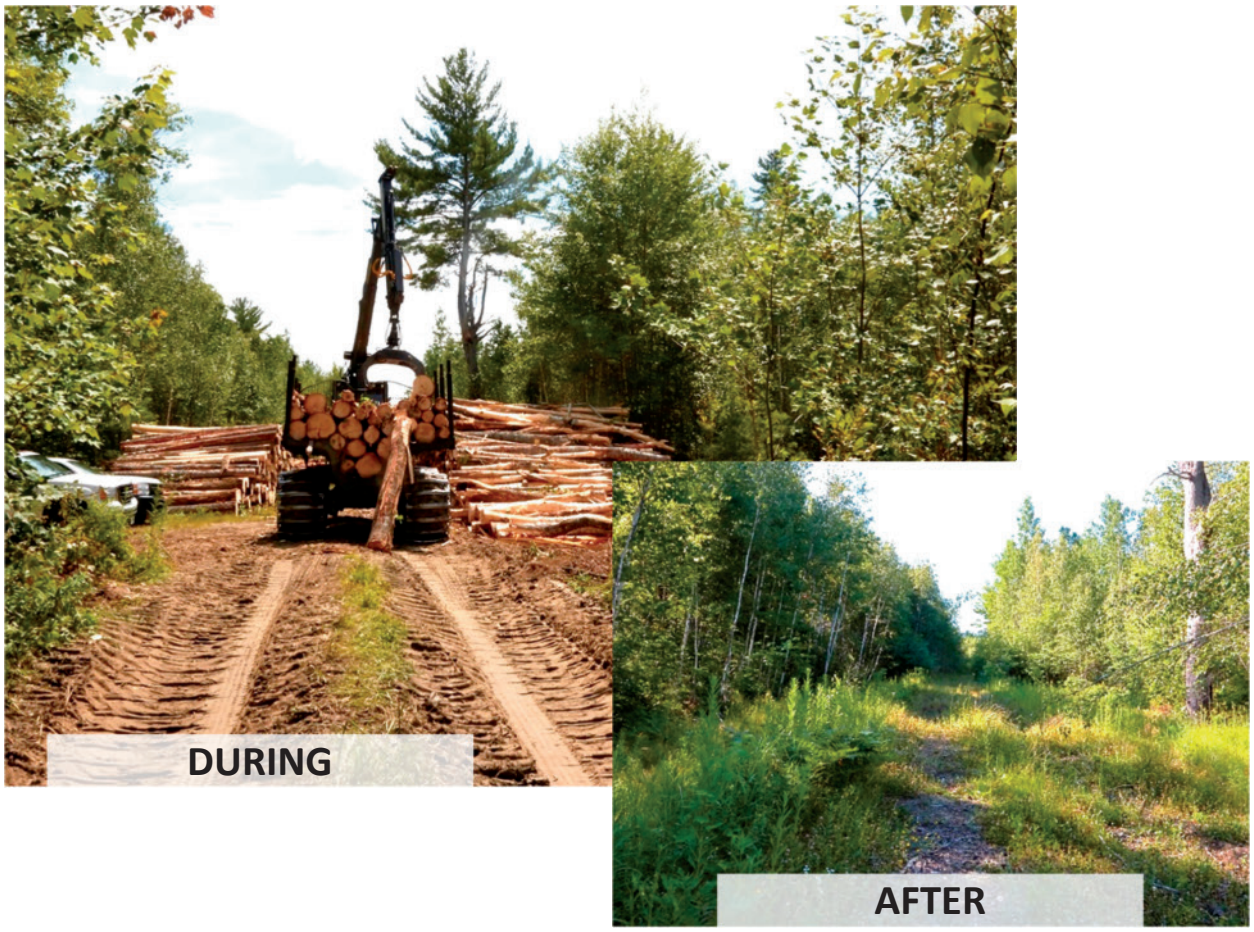
**Forester's View**

Vegetation needs to be cut back along the roadside and ditches, in preparation for using the road to yard and haul wood and make it otherwise passable for log trucks.

**Owl**

# Roads and Landings

**Woods road, mixed woods stand**




## DURING and AFTER

**Woodland Owners' View**

This crew really knows how to run that equipment! They handle a lot of wood in a day. The loggers hauled off the small amount of trash. It's amazing how quickly nature will come back in, even after all that equipment moving around. This is nice walking now.

**Logger's View**

The road is holding up great! Hope the weather holds and the mill doesn't cut back on delivery quotas! This is how landings should be closed out, all tidied up and ready for the next harvest. Hope the landowner calls the same logger back for that.

**Forester's View**

Great utilization, sorting the more valuable sawlogs on the left from the pulp and firewood on the right. The wood that was cut was all hauled away and paid for. The road is in better shape than when work started, and the landowners have re-established access to their land.

**Wildlife Outcomes**

Opening provided by roads and landing are valuable to many species. The low vegetation along the edges provides cover to small mammals. The tall pine provides an excellent perch for owls, hawks and other raptors, drawn by small prey like mice and voles.

# Landing and Woodyard Area

**High visibility and aesthetic value**

## DURING

**Woodland Owners' View**

The crew is doing a great job of keeping mud and tracks off the driveway, and keeping the equipment in a specific area. They know how important aesthetics are, because it was talked about before the work started.

**Logger's View**

It can be tricky sometimes, but a good logging crew can balance the need to have enough room for the equipment to work with keeping things neat and tidy.

**Forester's View**

Excellent utilization and sorting of wood products for various mills, which means the landowner is getting a good return for the wood.

# Landing and Woodyard Area

**High visibility and aesthetic value**

## AFTER 18 months

**Woodland Owners' View**

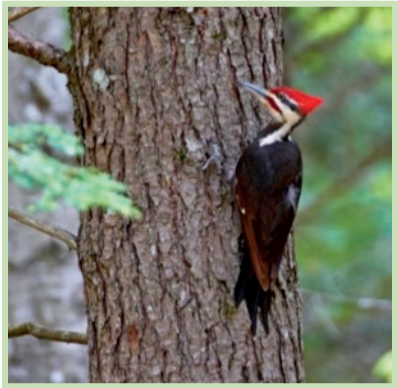
Agreed ahead of time to take care of the seeding and planting trees, using some of the stumpage income received. The results are excellent.

**Equipment Used**

Medium sized bulldozer with blade for smoothing ground after other equipment was moved off.

**Forester's View**

The landing was graded and smoothed after logging was completed for aesthetics as well as to prevent invasive plant regrowth. This space can be used again for future harvesting operations, as long as it is regraded and reseeded again.



**Pileated woodpecker**

# Landowners, locations and contact information for these woodlots

THINNING AND CROWN RELEASE OF CROP TREES (pages 4-7)
Wells Demonstration Tree Farm, Milford and Greenfield
Pam and Bryan Wells
http://wellsforest.com/
pwells@oakleafs.com

THINNING (pages 8-9)
Yankee Woodlot, Skowhegan
Somerset County Soil & Water District
Joe Dembeck, Executive Director
207-474-8323; info@somersetswcd.org

IMPROVEMENT HARVEST I, II, III, and LOOKING UP (pages 16-21)
Woods Road Community Forest, Falmouth
Amanda Stearns, Open Space Manager
Parks and Community Programs Department
207-699-5312; openspace@falmouthme.org

OVERSTORY REMOVAL (pages 22-23)
Frye Mountain Wildlife Management Area, Montville and Knox
Maine Department of Inland Fisheries & Wildlife, Lands Management Program, Sidney
Ryan Robicheau, Wildlife Management Section Supervisor
Ryan.robicheau@maine.gov

HISTORIC SHELTERWOOD (pages 24-25)
Penobscot Experimental Forest, Bradley and Eddington
U.S. Forest Service, Northern Research Station
Andrew Richley, Forester; 207-866-7255
Laura Kenefic, Research Forester and Silviculturist
Maren Granstrom, University of Maine graduate student

THINNING II and RECLAIMING GAP (pages 10-11 and 26-27)
Sewall Woods Preserve, Bath
Kennebec Estuary Land Trust
Carrie Kinne, Executive Director
207-442-8400; info@kennebecestuary.org
https://www.kennebecestuary.org/sewall-woods-bath

PATCH CUT WITH RETENTION (pages 28-29)
See “Thinning and Crown Release of Crop Trees” above

PATCH CLEARCUT (pages 30-31)
Jamies Pond Wildlife Management Area, Manchester, Farmingdale and Hallowell
Maine Department of Inland Fisheries & Wildlife, Lands Management Program, Sidney
Eric Hoar, Lands Management Biologist
leigh.e.hoar@maine.gov

NON-COMMERCIAL THINNING (pages 32-33)
See "Thinning and Crown Release of Crop Trees" above

INVASIVE TREE REMOVAL AND THINNING (pages 34-35)
Evergreen Cemetery Woodlands, Portland
Jeff Tarling, City Arborist
207-808-5446; jst@portlandmaine.org

HARVESTING NEAR A RECREATIONAL TRAIL (pages 36-37)
University Forests, Old Town
Keith Kanoti, Charlie Koch, and Robin Avery, Managers
207-944-6841; keith.kanoti@maine.edu

ROADS AND LANDINGS (pages 38-39)
See "Harvesting Near a Recreational Trail" above

LANDING AND WOODYARD AREA (pages 40-41)
See "Invasive Tree Removal and Thinning" above

# Glossary of forestry terms

**Access road—**a primary roadway that connects secondary woods roads and trails with year-round, usually public road system.

**Acre—**a unit of land equal to 43,560 square feet; a square parcel of land approximately 208.5 feet on each side.

**Aesthetics—**the forest value, rooted in beauty and visual appreciation, affording inspiration, contributing to the arts, and providing a special quality of life.

**All-aged stand—**see Uneven-aged stand.

**Annual rings—**see Growth rings.

**Aspect—**the compass direction toward which a slope faces.

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**Basal area—**the cross-sectional area of a tree 4 1/2 feet above the ground; most commonly used as an indicator of stand density and expressed as square feet per acre. A tree with a 14" diameter has a basal area of just over one square foot.

**Basal area factor prism—**an instrument used by Foresters to determine the stocking of the forest.

**Best management practices (BMPs)—**voluntary guidelines developed by the Maine Forest Service and Land Use Planning Commission (LUPC), determined to be the most effective and practicable means of minimizing erosion and sedimentation of water bodies (streams, ponds, lakes, rivers, etc.) from logging activities.

**Biltmore stick—**a tool calibrated to measure tree diameters and heights, and to measure board foot volume in standing trees and logs of varying lengths.

**Biological diversity or biodiversity—**the variety of life in all its forms and all its levels of organization. Biodiversity refers to diversity of genetics, species, ecosystems, and landscapes.

**Biomass—**often the lowest value forest product. Usually consists of stems, branches, bark, etc., that cannot be marketed in any other way. Chipped and used as fuel.

**Blaze—**to remove an area of bark from a tree, usually with an axe, to make a semi-permanent mark. commonly used, with paint, to indicate boundary lines.

**Blowdown—**any area where trees have been thrown or broken by the wind. See Windthrow.

**B-line—**a theoretical line on a stand stocking table that indicates ideal combinations of average dbh, stand density and number of trees per acre for optimum growth

**Board foot—**unit for measuring wood volume in a tree, log, or board. A board foot is 1 foot by 1 foot by 1 inch, but any shape containing 144 cubic inches of wood equals one board foot. Usually used for sawlog material only. A common symbol is MBF, which designates one thousand board feet.

**Bole—**the trunk or main stem of a tree.

**Boom—**metal sections on harvesting equipment that allow operators to reach wood and trees at some distance from the machine. saws or loading grapples can be boom-mounted.

**Breast height—**4-1/2 feet above ground level. See Diameter at breast height.

**Browse—**twigs, shoots, and leaves of woody plants used as food by woodland mammals such as deer, moose and snowshoe hare.

**Brush saw *aka "clearing saw"***—a hand-operated power saw designed to cut seedling and sapling stems at or near ground level without bending down

**Buck—**to saw a felled tree into shorter lengths. A skilled logger knows the markets and can increase the value of the tree by bucking it to fit the available markets.

**Buffer strip—**a narrow zone or strip of land, trees, or vegetation bordering an area. Common examples include visual buffers, which screen the view along roads, and streamside buffers, which are used to protect water quality. Vegetation left along a stream, lake or wetland to protect aquatic life and water quality. Buffer strips filter sediment, provide food, maintain water temperature, and may increase diversity within a landscape.

**Bumper tree—**trees alongside skid trails used as pivot points to turn a load of logs, usually resulting in severe injury to the bumper trees. In skid trail layout, bumper trees are left in place to protect high-quality trees from skidding damage.

**Butt log—**a log cut from the bole immediately above the stump.

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**Canopy—**the more or less continuous cover formed by tree crowns in a forest.

**Chipper—**logging equipment used to process logs or trees into chips, suitable for mulch, biomass fuel or paper making.

**Clearcut—**a forest harvesting practice in which most or all trees are removed from a site. Clearcuts are used for immediate commercial purposes, for regeneration of future forests, and to create early successional wildlife habitat. Clearcuts in Maine are defined by state statute to be a minimum of 5 acres. See also Gap and Patch cut.

**Codominant tree—**a tree that extends its crown into the canopy and receives direct sunlight from above but limited sunlight from the sides. One or more sides of a codominant tree are crowded by the crowns of dominant trees. See also Crown classes.

**Commercial clearcut—**a harvest cut that removes all merchantable timber from the area. See High grading.

**Commercial thinning—**harvests which are aimed primarily at controlling the growth of stands through adjustment in stand density. Trees removed are useful and of value for some purpose. Income from the sale or use of products produced exceeds costs associated with harvesting and removing timber.

**Community—**a collection of living organisms thriving in an organized system through which water, energy, and nutrients cycle.

**Competition—**the struggle between trees, and other plants, to obtain sunlight, nutrients, water, and growing space.

**Composition—**see Stand composition.

**Conifer—**commonly called softwoods or evergreens. Although there are exceptions, most coniferous trees produce seeds in cones and keep their needles through the winter.

**Consulting forester—**an independent professional who provides services to private woodland owners. Services may include expert advice, preparation of Woodland Management Plans, appraisal of timber value, and planning and oversight of timber harvesting. Consulting Foresters do not have direct connections with firms that buy wood products, but are retained by woodland owners as their agents. See Forester.

**Contract—**a formal, written, legally binding form of communication (agreement). In forestry, a contract is recommended between a landowner and a logger before harvesting timber, and between a landowner and a forester for any work expected to exceed several hundred dollars.

**Conventional logging—**a harvesting system where trees are felled with a hand-operated chain saw, and yarded with a tractor or skidder equipped with a winch. See also Mechanized logging.

**Cord—**a unit of volume used in measuring wood products. A standard cord occupies 128 cubic feet of space and contains approximately 85 cubic feet of wood. It is commonly described as a close piled stack of wood 4 feet high, 8 feet long, with sticks 4 feet in length. A cord is the legal measure of fuelwood volume in Maine.

**Cordwood—**small diameter or low-quality wood suitable for firewood, pulp, or chips. Cordwood is not suitable for sawlogs.

**Crook—**a tree defect characterized by a sharp bend in the main stem.

**Crop tree—**those trees in a stand that best embody a desired value or attribute, usually the highest timber quality trees in a stand. Crop trees may be selected from an immature stand and grown to an optimal size before harvesting. Crop tree values such as wildlife habitat or aesthetics can also be considered.

**Crotch—**see Fork.

**Crown—**the live branches, twigs, and foliage of a tree.

**Crown classes—**a classification of the position of an individual tree's crown relative to the rest of the forest canopy. See Codominant, Dominant, Intermediate, Overtopped, and Suppressed.

**Crown closure—**the percentage of a given area covered by tree crowns.

**Crown ratio *aka "live-crown ratio"*—**the ratio of the length of live crown of a tree to its total height. Live crown ratio is usually expressed as a percentage of total height.

**Crown spacing—**removing competing trees to provide additional growing space for the crowns of desired stems

**Cruise—**a systematic, statistically valid forest inventory used to obtain qualitative information about the forest. A cruise is often the first step in developing a Woodland Management Plan; the estimate obtained in such a survey.

**Cull—**trees or logs which are rejected, or volumes deducted in log scaling because of a defect.

**Cutting cycle—**the period of time between major harvests in a stand, usually determined by the type of management being practiced, the condition and type of the forest, and the growing conditions of the soil.

**Cut-to-length—**a mechanical harvesting system where trees are cut and processed into various product length in the woods, then moved to yard or landing. See also Processor and Forwarder.

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**Deciduous—**shedding or losing leaves annually. Trees such as maple, ash, cherry, and larch are deciduous.

**Deed—**a legal document used to transfer title in real property from one person to another.

**Defect—**any irregularity or imperfection on a tree, log, or other wood product that reduces the volume of usable wood or lowers its durability, strength, or utility value. Defects may result from knots and other growth conditions and abnormalities; from insect or fungus attack; or from logging, or other processing procedures.

**Den tree—**a tree with holes or cavities suitable for birds or mammals to nest in.

**Diameter at breast height (dbh) —**standard measurement of a tree's average diameter, outside the bark, taken at 4 1/2 feet above the ground.

**Diameter-limit sale—**a timber sale in which all trees over a specified diameter may be cut. Most Maine forests are even-aged and small diameter trees are as old, although not as vigorous as the larger stems. Diameter-limit sales often result in high grading. This type of cutting is not usually regarded as wise, long-term forest management as it can cause the loss of stand vigor from the removal of the fastest-growing trees.

**Dimension lumber—**wood products that are sawn from logs. Hardwood dimension lumber is often used in the manufacture of furniture or other products. Softwood dimension lumber is most commonly used in construction, furniture, and other products.

**Disturbance—**a change in forest cover caused by natural or human causes. Common forest disturbances in New England include clearing for agriculture, abandonment of agricultural fields, windstorms, ice storms, fire, flood, logging, mining, and development.

***Dominant*—**trees whose crowns extend above those of surrounding trees which capture sunlight from above and on one or more side of the crown. See also Crown classes.

**Downed woody material *aka "downed woody debris"*—**limbs, branches, and boles that have fallen to the forest floor, where they contribute to wildlife habitat, ecological structure, and overall biodiversity. Can be large, medium or fine size classes.

**Duff—**forest litter of organic debris (in various stages of decomposition) on top of the mineral soil.

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**Ecology—**the study of interactions between organisms and their environment.

**Ecosystem—**organisms and the physical, chemical, and biological factors that make up their environment.

**Edge—**the boundary between two ecological communities, for example, field and woodland. Edges often provide habitat for certain wildlife species.

**Endangered or threatened species—**a species is endangered when the total number of remaining members may not be sufficient to reproduce enough offspring to ensure survival of the species. A threatened species exhibits declining or dangerously low populations but still has enough members to maintain or increase numbers.

**Epicormic branching—**branches that grow out of the main stem of a hardwood tree from dormant buds produced under the bark, usually in response to damage or an increase in light. Severe epicormic branching increases knottiness and reduces lumber quality.

**Even-aged stand—**a stand in which most trees originated around the same time (i.e. the age difference between the oldest and youngest trees is minimal, usually no greater than 10 to 20 years.) Even-aged stands result from cutting of all the trees in a stand within a relatively short period of time, major natural disturbances (such as fire), or reversion of cleared land to forest.

**Even-aged management—**managing a forest or forest stand to produce a forest of trees of the same relative age. Even-aged management techniques include intermediate treatments, clearcuts, patch clearcuts, and shelterwood cuts.

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**Felling—**the cutting of standing trees.

**Feller buncher—**harvesting machine that cuts standing trees and can accumulate and carry or place more than one stem at a time. Can be tracked, rubber-tired, or combination of the two.

**Filter strip—**an area of forest adjacent to a water body where measures are taken to limit disturbance of the forest floor (natural vegetation, soil, and forest litter, or fallen leaves and branches) to prevent erosion during or after timber harvesting.

**Financial maturity—**a conceptual condition describing a tree that has reached its optimum timber value, because of species, size, form and soundness, and other attributes. Sometimes same as biological maturity, but often not.

**Flagging—**the act of temporarily designating the location of a road, trail, or boundary by hanging strips of colored plastic on trees or stakes.

**Forest—**a biological community dominated by trees and other woody plants.

**Forest management—**the application of sound forestry principles and practices to the operation of the woodlands.

**Forest Management Plan *aka "Woodland Management Plan" or "FMP"*—**a written document, based on landowner objectives and resources on the ground, which guides future activities to care for the land and accomplish the landowner's objectives over the long term. Plans may consider many resources including wildlife, recreational opportunities, aesthetics, timber, water, soil, wetlands, unique features, and cultural resources.

**Forest types—**associations of tree species that have similar ecological requirements. Some common forest types in Maine are spruce-fir, northern hardwoods, pine-oak, and poplar birch. Often types are simplified into hardwood, softwood, and mixed wood.

**Forested wetland—**an area dominated by woody vegetation taller than 20 feet where soil is at least periodically saturated or covered by water.

**Forester—**a professional, usually with a college or university degree, trained in forestry and forest management. In Maine, all practicing foresters must be licensed by the state.

**Forestry—**the art, science, and craft of tending woodlands to derive benefits for humans and other species

**Fork—**a tree defect characterized by the division of a bole or main stem into two or more stems.

**Form *(with reference to a tree)*—**the degree of taper between diameter at the tip of a 1 foot stump and diameter at the top of the first 16-foot log.

**Forwarder—**harvesting machine that moves logs and/or parts of trees from the woods to the yard or landing, without dragging the wood on the ground. Can be rubber tired, tracked or a combination of the two. See also Cut-to-length.

**Forwarding—**bringing trees and or logs from one place in the woods to another, usually the yard or landing.

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**Gap—**a canopy opening generally less than 2 acres in size. Gaps create particular habitat conditions that are often beneficial to certain songbirds and other wildlife.

**Girdle/girdling—**the removal or killing of a ring of bark around the tree stem so that the flow of carbohydrates from crown to roots is blocked. The roots die and the whole tree is killed. Usually used to create a snag for wildlife habitat or to eliminate the influence of a large tree's presence in the canopy without felling the tree.

**Grade—**the rise or fall in ground level over 100 feet of horizontal distance, expressed as a percentage

**Grade log—**the designation of the quality of a manufactured piece of wood or of logs.

**Group selection—**a method of regenerating uneven-aged stands of trees by removing/ harvesting trees in small groups or patches. Group selection typically encourages the reproduction of tree species that are somewhat to moderately tolerant of shade.

**Growing stock—**trees capable of producing at least one 12-foot sawlog now or in the future.

**Growth rings—**the layers of wood a tree adds each growing season. These rings frequently are visible when a tree is cut and can be used to estimate its age and growth rate.

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**Habitat—**the ecosystem in which a plant or animal lives and depends on for cover, breeding sites, food, and water.

**Hardwoods—**a general term encompassing broadleaf, deciduous trees.

**Hardwood type—**a forest in which hardwood tree species comprise at least 75% of the stand.

**Harvest—**the cutting, felling, and removal of forest timber or other forest materials.

**Harvester—**a person or machine who carries out a harvest.

**Herbaceous vegetation—**low-growing, non-woody plants, including wildflowers and ferns, in a forest understory.

**High grading—**an exploitive logging practice that removes only the best, most accessible, and valuable trees from a stand, leaving lower-quality trees to grow into a lower quality forest. High grading should be distinguished from even-aged management in which mature and immature trees are removed to aid regeneration.

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**Improvement cut—**an intermediate cut made to improve the overall growth rate, form, quality, health, or wildlife potential of the residual trees or stand.

**Increment borer—**an auger-like tool with a hollow bit designed to extract cores from tree stems for the determination of age and growth rate.

**Intermediate tree—**trees with crowns that extend into the canopy with dominant and codominant trees. These trees receive little direct sunlight from above and none from the sides. Crowns generally are small and crowded on all sides. See also Crown classes.

**Intolerance—**see Tolerance.

**Introduced species—**a nonnative species that was intentionally or unintentionally brought into an area by humans.

**Invasive species—**plants or insects, usually non-native, that have insufficient natural checks and balances to prevent them from displacing native species.

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**Landing—**a cleared area within or adjacent to a timber harvest where logs or tree length material are processed, piled, stored and loaded for transport to a sawmill or other facility.

**Landowner objectives—**goals that landowners have for the current and future use of their property. They are deliberately thought out and defined in order to formulate a course of action to accomplish them.

**Legacy tree(s) —**a tree or trees that represents an earlier age cohort or land use, such as open grown pasture trees that have been surrounded by second growth. Contributes to wildlife habitat, seed source, cultural/historical features, and overall diversity.

**Liquidation harvesting—**the purchase of timberland, followed by the removal of most or all commercial value in standing timber and prompt resale of the land. This is generally viewed as inconsistent with accepted principles of forest management.

**Loader—**harvesting equipment that can pick up individual or small bunches of logs or trees in a bucket and move them from the ground to a truck or other vehicle, and vice versa.

**Log—**a section of the main stem of a tree, varying in length and minimum diameters according to local market standards, that is usually sawn into lumber. As a verb, log refers to the process of harvesting, extracting, and transporting logs to a mill.

**Log grading—**the assignment of a quality class to a log.

**Logger *aka "professional timber harvester"*—**an individual who harvests timber for a living.

**Log rule or scale—**a method for calculating wood volume in a tree or log by using its diameter and length. The international 1/4-inch rule is the legal rule in Maine

**Log scaling—**the estimation of the board foot volume to be sawn from a log. A log scale volume is an accepted form of measurement in log marketing.

**Lopping—**cutting tree tops and branches from felled trees, to bring them closer to the ground. Lopping can increase visibility, improve the forest's appearance, reduce fire danger, and speed up the rotting and return of nutrients to the soil after harvesting.

**Lump-sum sale—**a timber sale in which a total price for all standing trees to be harvested is contracted, based on their estimated total value. The lump sum is set before the wood is removed and typically paid in a single payment. See also Unit sale.

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**Marking *aka "timber marking"*—**the practice of indicating by paint or other visible, semi-permanent means, trees which are to be cut or are to remain after harvesting. A common practice is to mark trees to be harvested twice—once at eye level and once at the base. Marking may also be used to designate trees for other treatments, such as pruning.

**Mast—**fruits, nuts and seeds, of trees and shrubs that serve as food for wildlife. "Hard mast" refers to nuts such as acorns, beechnuts, or hazelnuts. "Soft mast" refers to fruits such as cherries, wild apples, and various berries.

**Mechanized logging—**a harvesting system where feller bunchers or processors, along with grapple skidders or forwarders, are used to cut and yard trees. Loggers are usually able to work off the ground in enclosed cabs when employing this system. See also conventional logging.

**Merchantable height—**the point on a tree stem to which the stem is salable.

**Mid-story—**the level of forest canopy that includes the crowns of suppressed and intermediate trees; the part of the canopy at a height from 6 to 30 above ground level

**Mixed wood type—**forest stands occupied by a mixture of softwood and hardwood tree species. Neither hardwood nor softwood tree species occupy more than 75% of the tree stocking.

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**Natural regeneration—**seedlings from natural seeding or sprouts and other plants representing vegetative reproduction.

**Niche—**the physical location and functional role of an organism within an ecosystem and how it interacts with other species.

**Nongame wildlife—**species that are typically not hunted, either by common practice or by state wildlife laws. Examples include songbirds, eagles, amphibians, insects, etc.

**Nonindustrial private forestland (NIPF) —**woodland owned by a private individual, group, or corporation not involved in wood processing. Fifty-five percent of Maine's forests are in this category.

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**Objectives—**see Landowner objectives.

**Old-growth forest—a** wooded area that has no evidence of harvest or alteration by humans. An old-growth forest often has large individual trees, a multilayered crown canopy, and a significant accumulation of large woody material, including snags and fallen logs.

**Optimum stocking—**a condition in which trees are spaced so that they fully use the growth potential of the site. See Stocking.

**Overmature—**a quality exhibited by trees that have declined in growth rate because of old age and loss of vigor.

**Overstocked—**a condition in which trees are so closely spaced that they compete for resources and do not reach full growth potential.

**Overstory—**the level of forest canopy that includes the crowns of dominant, codominant, and intermediate trees; the part of the canopy at a height of 30 feet and above

**Overstory removal—**see Shelterwood.

**Overtopped—**the situation in which a tree cannot sufficiently extend its crown into the overstory and receive direct sunlight. Overtopped trees that lack shade tolerance lose vigor and die. See Suppressed.

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**Pallet log—**a low-grade hardwood log suitable for producing low-grade products such as pallets.

**Patch cut—**removal of all trees within designated small areas in the harvest area. Areas are larger than those cut in a group selection method harvest, generally greater than 2 acres. An even-aged management technique. See also Clearcut and Gap.

**Pesticide—**any chemical used to control undesirable insects, vegetation or animals, or to guard against or treat a forest health problem.

**Plantation—**a stand of trees, usually all of the same species, that has been deliberately planted with seedlings at a pre-determined spacing.

**Poles—**trees that are between 4 and 10" dbh.

**Pole stand** a stand of trees where pole sized trees predominate.

**Pre-commercial treatments *aka "non-commercial treatments" or "net-expense treatments"*—**forestry operations that require investment of time, labor and/or money, such as cleaning or weeding stands to remove trees that have little or no economic or market value. Pre-commercial treatments can improve species composition and increase the quality, growth, and vigor of remaining trees.

**Prescription—**a course of action recommended to bring about a desired change in a forest stand.

**Processor *aka "in-woods processor"*—**a harvesting machine that can fell, delimb and buck trees into various product lengths, then pile them for further transport. Can be tracked or rubber-tired, or a combination of the two. See also Forwarder and Cut-to-length.

**Pruning—**the act of sawing or cutting branches from a living tree. In woodland management, pruning is done to promote the growth of clear wood free of knots, from which more valuable, knot-free boards can be sawn. Pruning is usually done in conjunction with thinning.

**Pulp/pulpwood—**wood suitable for use in paper manufacturing.

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**Reforestation—**the establishment of a forest through artificially planted seed or seedlings. The vast majority of forests in Maine reforest naturally without need for planting.

**Regeneration—**the process by which a forest is reseeded and renewed. Advance regeneration refers to tree seedlings that are established before the existing forest stand is removed.

**Release—**the process by which young stands of desirable trees, not past the sapling stage, are freed from the competition of undesirable trees that threaten to suppress them. Can also refer to opening one or more sides of a dominant tree's crown, to allow more room for growth.

**Residual stand—**the trees remaining uncut (and hopefully undamaged) following any cutting operation.

**Retention—**the practice of keeping some trees from the previous stand during and after regeneration harvests. See also Legacy tree.

**Riparian zone—**a strip of variable width, depending on the riparian functions identified, where special management considerations may be advisable to maintain or enhance those functions. Riparian functions can include protecting bank and channel stability, maintaining shade and inputs of vegetation to the water, carrying water to the surface, maintaining water quality, and providing wildlife habitat.

**Roadside sale—**a timber harvest in which trees are harvested, brought to a place accessible to a log truck, and are sold from that location.

**Rot—**a tree defect characterized by woody decay in a standing tree or log.

**Rotation—**the number of years required to grow a stand to a desired size or maturity. See even-aged management.

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**Salvage cut—**the removal of dead, damaged, or diseased trees to recover maximum value prior to deterioration.

**Sanitation cut—**removal of diseased, damaged, over-mature, or undesirable stems from a stand.

**Sapling—**a tree from 1 to 4 inches in diameter.

**Sapling stand—**a stand of trees where sapling sized trees predominate.

**Saw—**a tool for cutting wood. can be motorized (gas or electric powered chainsaw) or not (hand pruning and shaping saws). can be hydraulically operated, as on heavy equipment.

**Sawlog—**a log of sufficient size and quality to be sawed economically on a sawmill for use in lumber and other products.

**Sawlog tree—**a standing tree that contains at least 1 sawlog.

**Sawtimber—**trees greater than 10" dbh; not necessarily sawlog quality. Can be further broken into small, medium and large size classes.

**Sawtimber stand—**a stand of trees where sawlog sized trees predominate.

**Scale stick—**a calibrated stick used to estimate wood volume in a log.

**Scaling—**the process of measuring the dimensions of individual logs or trees. The measurements are used to estimate the volume of the logs or trees by applying them to a log rule or tree volume table.

**Scarification—**the disturbance of the forest floor to expose areas of mineral soil. This is done to prepare a seedbed and encourage establishment of desired species of tree seedlings.

**Sealed-bid sale—**a lump sum or unit timber sale, usually offered with the assistance of a consulting Forester, in which buyers submit secret bids.

**Seed tree—**a mature tree left uncut to provide seed for regeneration of a harvested stand.

**Seed-tree harvest—**the felling of all the trees in an area except for a few desirable individuals that provide seed for the next forest. An even-aged management technique.

**Seedling—**trees that are less than 3 feet tall.

**Selection harvest—**a method of harvesting in which individual trees or small groups of trees are removed to regenerate new seedlings and maintain an uneven-aged forest. Selection harvests are used to manage species that do not need high levels of sunlight to regenerate and survive in the understory.

**Selective harvesting—**often used as a "catch all" for all types of partial cuttings. It is an exploitive cutting and often used to describe high grading, liquidation harvests, and diameter limit cutting. Who is doing the selecting and what criteria are they using?

**Shelterwood harvest—**a method of regenerating new, even–aged stands by harvesting all mature trees in an area in a series of two or more cuts occurring within 10-20 years. One or more cuts leave merchantable trees to provide shade and protection for the establishment of forest seedlings. The second or third cut, or final removal, removes the remaining mature trees to give the regenerated trees full sunlight.

**Silviculture—**the art and science of growing and tending forest trees.

**Single-tree selection—**removal of single trees distributed throughout a harvest area.

**Site—**the combination of biotic, climactic, topographic, and soil conditions of an area that determines the character and productivity of forest stands.

**Site index—**a measure of the quality and potential productivity of a site based on the height of dominant trees at a specified age (usually 50 years), depending on the species.

**Site preparation—**treatment of the forest floor and/or understory vegetation of an area to facilitate natural or artificial reestablishment of a forest stand. Site preparation can include mechanical clearing, burning, or chemical (herbicide) vegetation control.

**Skid—**to drag logs or trees either wholly or partially on the ground.

**Skidder—**a generic term for a machine (usually rubber-tired) with a cable winch or grapple, used to drag trees and/or logs out of the forest.

**Skidding—**the act of moving trees from the site of felling to a leading area or landing. Tractors, horses, or specialized logging equipment can be used for skidding. Skidding methods and operator skill vary significantly, and as a result differ in their efficiency and impact on soils and the remaining stands.

**Skid road/skid trail—**an unsurfaced single-lane road used by skidders and other extraction equipment to access forest products for transport from the harvest area to the yard or landing.

**Slash—**bark, branches, uprooted stumps and other woody material left on a site after logging, road construction or land maintenance.

**Slasher—**logging equipment used to buck one or more stems into various product lengths, usually located at a yard or landing, in conjunction with a loader.

**Snag—**dead standing trees, often with tops broken off. Snags serve as perches, lookouts, and provide important food and cover for a wide variety of wildlife species.

**Softwood—**used to designate all coniferous (cone-bearing species) as a class, including pines, hemlock, larch or hackmatack, spruces, balsam fir, and cedar.

**Softwood type—**a forest in which softwood tree species comprise at least 75 percent of the stocking.

**Spring pole—**saplings or smaller trees that are bent over by a larger felled tree. They can be under extreme tension and are dangerous.

**Sprout—**a tree growing from a cut stump or previously established root system.

**Stand—**a group of forest trees of sufficiently uniform species composition, age, and condition to be considered a homogeneous unit for management purposes. See also Forest types.

**Stand composition *aka "species composition"*—**the varying percentages of tree species, sizes and ages, within a designated stand.

**Stand density—**the quantity of trees per unit area, usually evaluated in terms of basal area, crown cover and stocking.

**Stem** see Bole.

**Stewardship—**the act of taking care of your land for the long term. Leaving your property in better condition than you found it.

**Stewardship plan—**see Forest Management Plan or Woodland Management Plan.

**Stocking—**a measurement of how fully the trees in a forest stand occupy the available growing space of the site, expressed in terms of trees per acre, basal area per acre, volume per acre, or percent of crown closure. Stands are often classified as understocked, well-stocked or overstocked.

**Stocking table—**a graphic representation of stocking conditions for various species at various average diameters at breast height and stems per acre.

**Stratification—**the tendency of competing trees and shrubs in a developing stand to separate into different layers. The stratification of a stand can provide distinct niches for wildlife. See Canopy, Understory, and Herbaceous vegetation.

**Stream channel—**a channel between defined banks created by the action of surface water and characterized by the lack of terrestrial vegetation or the presence of a bed, devoid of topsoil, containing waterborne deposits or exposed soil parent material or bedrock.

**Streamside management zone—**a forested area beside a stream or other body of water which is managed to protect or enhance the values associated with the water body, such as water quality, aquatic and other wildlife habitat.

**Stumpage—**the value of standing trees in a forest.

**Stumpage price—**the price offered or paid for standing forest trees.

**Stumpage sale—**a timber sale arrangement where a fee is paid to the landowner for the standing trees, accompanied by the right of the buyer to harvest the trees from the property under agreed conditions.

**Stump height—**the distance from the ground to the top of the stump. Good logging practice dictates that stumps be as low as possible (preferably as low as 12 inches) to reduce waste and to minimize visual impact on the logging site.

**Succession—**the natural replacement of one plant (or animal) community by another over time in the absence of disturbance. Generally broken into early, mid- and late condition classes.

**Suppressed—**a tree condition characterized by low growth rate and low vigor as a result of competition with overtopping trees. See also Overtopped and Crown classes.

**Sustainability—**the ability of the natural environment to supply goods and services to humans for the indefinite future.

**Sustained yield—**an idealized forest management objective in which the volume of wood removed equals growth within the total forest over an appropriate period of time.

**Sweep—**a tree defect characterized by a gradual curve in the main stem.

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**Thinning—**a partial cut in an immature, overstocked stand of trees used to increase the stand's value by concentrating future growth on individuals with the desired characteristics.

**Thinning from below—**a thinning that removes suppressed, intermediate and some co-dominant stems.

**Timber stand improvement (TSI)—**any practice that increases the rate of growth or improves composition or quality in a developing stand of trees, thus enhancing its potential value. Pruning, thinning, and weeding are considered TSI.

**Timber trespass—**the negligent cutting or removal of trees on a property without landowner permission.

**Tolerance—**a tree species' ability to grow and thrive in shade.

**Trails—**travel pathways for various purposes such as recreational activities, or yarding trees and wood products. can be a wide range of sizes and capacities, depending on the purpose. usually connects to access or secondary woods roads.

**Trim allowance/trim—**the extra 4 to 6 inches left on a bucked log to allow logs with end checks, pulls, or slanting buck cuts to be trimmed to standard lumber lengths.

**Twitch—**see Skid.

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**Understocked—**a stand of trees so widely spaced that crown closure will not occur; such stands typically do not fully occupy the site nor can they achieve the site's full growth potential.

**Understory—**the smaller vegetation (shrubs, seedlings, saplings, small trees) within a forest stand, occupying the vertical zone between the mid- or overstory and the herbaceous plants of the forest floor, typically from ground level to 6 feet in height.

**Uneven-aged stand—**an area of forest composed of trees of similar species, in which trees of several age classes are represented. See All-aged stand.

**Unit sale—**a timber sale in which a separate price is agreed upon for multiple species/product combinations, and payments to the landowner are based on the actual measurements of wood products shown in mill receipts. Payments under a unit sale typically occur within an agreed-upon time frame for wood trucked since the last payment.

**Utilization—**the processing and merchandizing of harvested trees into wood products.

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**Veneer log—**a high-quality log of a desirable species suitable for conversion to veneer. Veneer logs must be large, straight, of minimum taper, and free from defects.

**Vernal pool—**an ephemeral body of water that fills in the spring, holds water for at least 10 days, and dries up by fall some or all years and that does not contain fish. Vernal pools are extremely important habitat for a variety of amphibians and reptiles.

**Vertical structure—**refers to occurrence of horizontal layers of tree limbs and canopy at varying heights. Contributes to wildlife habitat features and ecological niches. See understory, mid-story, and overstory.

**Virgin forest—**see Old-growth forest.

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**Water bar—**a small earth berm or dam constructed at an angle across a skid road or trail to direct surface water to a stable vegetated surface or filter strip.

**Watershed—**a region defined by patterns of stream drainage. A watershed includes all the land that contributes water to a particular point of interest on a stream, river, lake, or coastal feature.

**Weeding—**the removal of all plants competing with a crop species, regardless of whether their crowns are above, beside or below those of the desirable trees. Removal of diseased, damaged, and poor quality trees.

**Well-stocked—**the situation in which a forest stand contains trees spaced widely enough to prevent competition yet closely enough to utilize the entire site.

**Wetlands—**ponds, freshwater swamps, marshes, bogs and similar areas that are inundated or saturated by surface or groundwater at a frequency and for a duration sufficient to support, and which under normal circumstances do support, a prevalence of wetland vegetation typically adapted for life in saturated soils. Wetlands may be either freshwater or tidal.

**Wildlife habitat—**the native environment of an animal. Habitats ideally provide all the elements needed for life and growth: food, water, cover and space.

**Windfirm—**the ability of the root system of a tree to withstand wind pressure and keep the tree upright.

**Windthrow—**a tree felled by wind. Windthrows, also known as blowdowns, are common among shallow-rooted species, and is usually a naturally occurring, small scale disturbance.

**Wolf tree—**a large older tree with a spreading crown and little or no timber value, but often having great value for wildlife. The same function as a snag, except the tree is still alive and possibly producing mast.

**Woodland—**see Forest.

**Woodland Management Plan *aka "Forest Management Plan" or "FPM"*—**a written document, based on landowner objectives and resource conditions on the ground, which guides future activities to care for the land and accomplish landowner objectives over the long term. Plans may consider many resource values including wildlife, recreational opportunities, aesthetics, timber, water, soil, wetlands, unique features, and cultural resources.

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**Yard—**see Landing.

**Yarding —**bringing trees or logs from the woods to the yard or landing.

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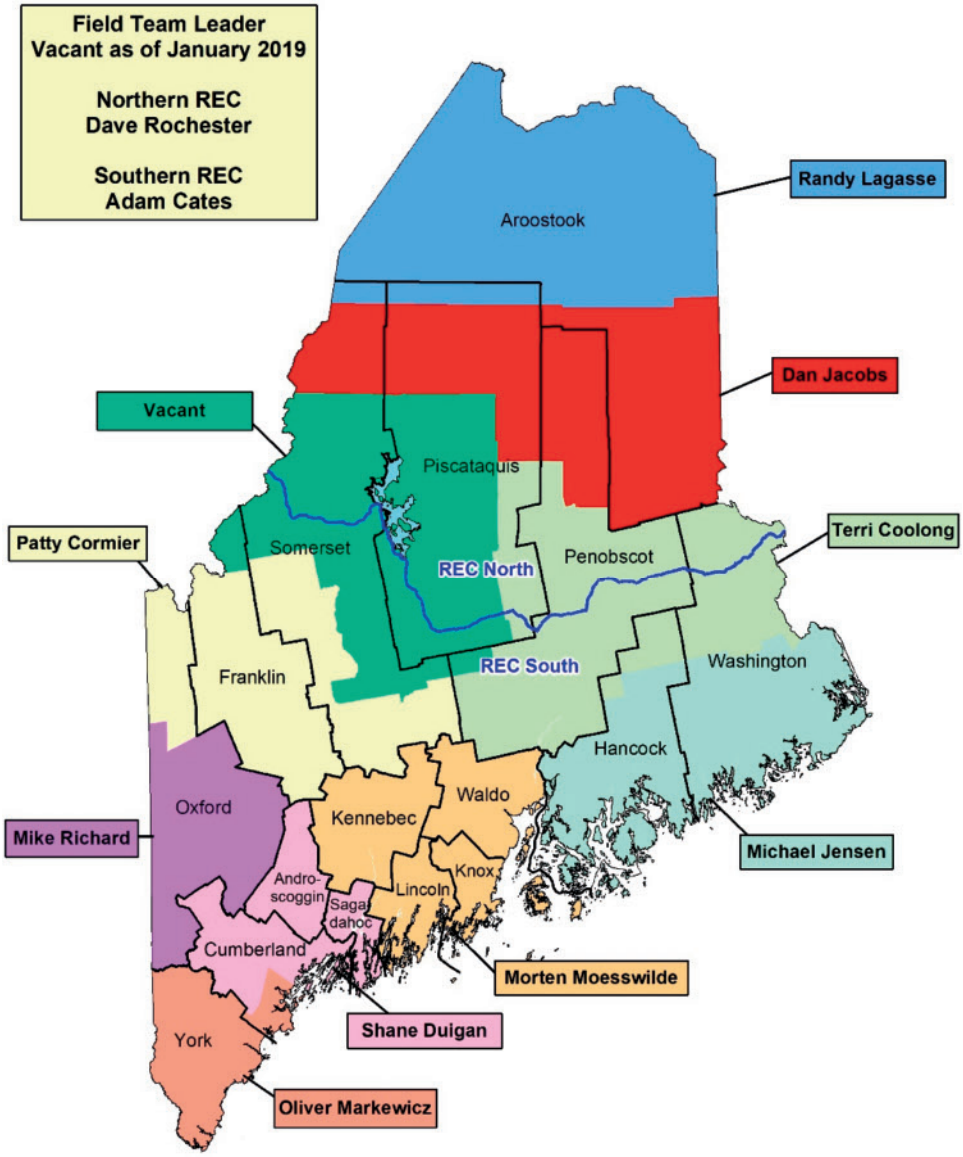
Note: adapted from the Pennsylvania State University Cooperative Extension bulletin "Forestry Terminology."

## Notes –

# Maine Forest Service
# Professional Forester Field Team




**Do you have questions about your woods?** The Maine Forest Service provides free advice and technical assistance to Maine's family woodland owners. The following link can be used to find your district forester:
http://www.maine.gov/dacf/mfs/policy_management/district_foresters.html.

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