



## **FORESTRY FOR MAINE BIRDS Virtual Folder**

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# A WOODLAND OWNER'S GUIDE TO Forestry for Maine Birds

*Forestry for Maine Birds (FFMB) is a new approach to managing woodlands. It helps foresters, loggers and family woodland owners like you see the forest "for the birds" when designing and implementing management strategies.*







Members of the Young Birders Club searching for woodland birds.



Large birds like owls and ravens use the tops of large trees for their stick nests.

A Wood Thrush patiently incubating eggs.



# Why Use FFMB in Your Woodland?

Woodland owners like you can help improve habitat for wildlife. In fact, you are the key to helping bird populations in decline recover, and to keeping common birds common. Eighty-six thousand families in Maine own more than five million acres (almost a third of Maine's total woodland acreage), in parcels as small as 10 acres. No matter the size, each woodland managed for wildlife habitat makes a difference.

## WILDLIFE HABITAT

FFMB management enhances the physical features of your woodland, such as downed logs and multiple layers of vegetation that provide hiding places and sources of food not just for birds but for many other species of wildlife.

## HEALTHY FORESTS

FFMB management helps make your woodland resilient so it can withstand intense rain events, windstorms, emerging pests, and other threats to forest health.

## FLEXIBILITY

FFMB works with most other goals and objectives you might set as a woodland owner, from creating recreational opportunities to harvesting timber to maintaining value.

## LEGACY

Your sustainably managed woodland maintains its long-term value for future generations and heirs. It also protects clean air and water and a host of other important values that benefit future generations.

## FINANCIAL ASSISTANCE

You may be eligible for funds to help with stewardship plans, habitat enhancements, and forest improvement projects.

FFMB workshop attendees looking at forest features and singing birds.



Photos: © Ariana van den Akker, © Amanda Mahaffey, © Dave Boltzest, © Stuart Oikawa



# Why is FFMB important?

Even with Maine's more than 17 million acres of woodland habitat, populations of our woodland birds are in decline. For some species, the declines are as great as 80% over the last four decades. We also have fewer woodland species now, with current Breeding Bird Surveys recording about 20% fewer species compared to the surveys conducted in the late 1960s.

## WHAT DO BIRDS NEED?

More than 100 bird species make their home in Maine's woodlands. Birds may live here year-round, breed in the summer, or rest and refuel on their way to breeding and wintering grounds. Maine's woodlands can help these populations recover by providing the three things they need to survive:

**Food** Abundant insects, spiders, caterpillars, seeds, nuts, and fruit are found on Maine's diverse tree and shrub species.

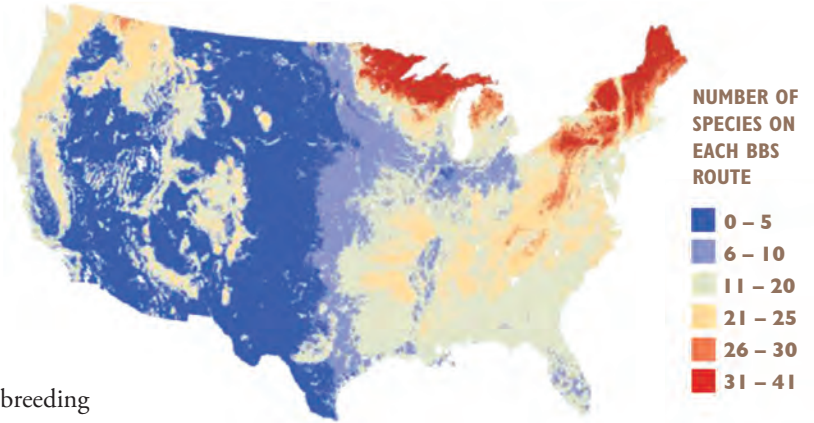
**Cover** Dense vegetation and physical structures such as downed logs, branches, and leaf litter help birds hide from hungry predators.

**Territories** Birds need their own space, with very specific habitat requirements, in order to build nests and raise young.



### CANADA WARBLER: THE POSTER BIRD FOR DRAMATIC DECLINES

Canada Warblers, one of the most at-risk forest songbirds in the Northeast, nest on or near the ground in forests dominated by deciduous trees (Northern Hardwoods) or a mix of deciduous and coniferous trees (Northern Mixedwoods). A key habitat feature for Canada Warblers is dense woody vegetation in the understory (1–6' from the forest floor).



The Northeast forests are home to a large number of bird species. The red area on the map shows the richest mix of forest bird species in the U.S., as measured by USGS Breeding Bird Survey Data 2004–2006, Goetz et. al, 2014

## THREATS TO FOREST SONGBIRDS

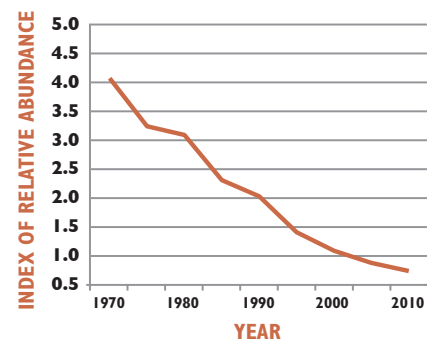
There is no simple answer to the question of why forest songbirds have declined, but many issues continue to threaten their future.

**Habitat Loss** Development and expanding agriculture reduces the acreage of forest across the globe, affecting both long-distance migrants and Maine's resident birds.

**Fragmentation** Roads, development, forest management, and agriculture fragment large blocks of contiguous forest into smaller blocks, reducing habitat quality.

**Climate Change** Ranges are shifting northward, meaning new competitors for limited habitat. Earlier flowering and fruiting and more extreme storms challenge bird survival.

**Balance of Younger and Older Forest** Timber harvesting has already altered the ages and sizes of trees across the landscape, making older forests harder to find.



Breeding Bird Survey data show Canada Warbler populations in the Northeast have consistently declined 4–7% per year over the last four decades.





# FFMB Priority Species

FFMB has identified 20 forest bird species of highest conservation priority based on declining populations, growing risks and threats, or the relatively high proportion of their global populations found in the Northeast. We have the opportunity to make a difference in the future of these species by improving the forest habitat where they live and breed right here in Maine. If we can help these priority species, we will also help many other wildlife species that make their home in the Maine woods.

The following pages include written descriptions of habitat, natural history, and songs for 16 FFMB priority species, four for each of the Forest Habitat Associations included with FFMB (see page 9), as well as a generalized habitat features diagram (see below) and a few sentences describing desirable habitat conditions.

## BIRD IDENTIFICATION

Bird identification can be challenging, but there are many great resources to help get you started. In addition to printed guides (*Sibley Guide*, *Peterson Field Guide*, *Field Guide to Birds of North America*), smart phone apps such as Merlin and Audubon Birds have songs for each species, and some even share what birds have been reported near you. Visit the FFMB webpage ([maineaudubon.org/ffmb](http://maineaudubon.org/ffmb)) for links to more bird identification resources, and to a set of printable “trading cards” that you can take in the field.



Over 800,000 people watch wildlife in Maine every year, spending almost \$800 million annually.

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## GLOSSARY OF TERMS

See pp. 9–11 for more detailed definitions

**Canopy** All vegetation >6' high

**Dead Woody Material** Branches and logs on the forest floor

**Gaps** Openings in the forest canopy

**Leaf Litter** Accumulated leaves on the forest floor

**Hardwoods** Deciduous trees that lose leaves in fall

**Midstory** Vegetation from 6–30' high

**Overstory** Vegetation over 30' high

**Snags** Standing Dead Trees

**Softwoods** Coniferous trees with needles

**Understory** Vegetation 1–6' high

## FFMB BIRD GUIDE

### KEY TO HABITAT FEATURES

**LAYERS** Light gray lines divide overstory (>30'), midstory (6–30'), and understory (<6'), and are not to scale.

**BIRD** Layer where bird typically seen and/or where male typically sings.



**NEST**  
Typical nest type and height.

Illustration: © Dawn Morgan



# FFMB BIRD GUIDE NORTHERN HARDWOODS

## Yellow-bellied Sapsucker



Uses larger snags or live trees with inner decay to excavate nesting cavities. Often excavates a series of sap wells in live tree trunks that attract insects over time. Territories up to eight acres in size. Found statewide and year-round. Drums an irregular series of taps that sound like Morse code, slowing at the end.

### DESIRABLE CONDITIONS

Older stands with snags; live aspen, poplar, alder, birch with heartwood decay.



## Chestnut-sided Warbler



One of the birds in most dramatic decline in the Northeast. Nests <6' from the ground in dense small tree stems or shrubs. Typically found in young hardwood forest, often after intense cutting has removed most or all of the overstory. Song is a fast *please-please-please-to-MEET-cha*. Found statewide.

### DESIRABLE CONDITIONS

Overstory gaps with dense young growth in understory; low or no canopy vegetation.



## Veery



Nests on the ground in a cup of dead leaves, bark and mud. Lays light blue eggs. Prefers damp forests. Territory size variable, but usually less than an acre. Song is flute-like and ethereal, like a marble spiraling down a drainpipe: *VEER-Veer-Veer-veer*. Found statewide.

### DESIRABLE CONDITIONS

Medium-density canopy; dense understory vegetation; abundant leaf litter; healthy forest wetlands.



## Mourning Warbler



Nests low or on the ground amid dense vegetation. Feeds in understory on beetles, spiders and other insects. Will use cut-over areas for up to ten years as young trees regenerate. Loud ringing musical song, *teedle-teedle, turtle-turtle*, the last pair of notes lower. Found in northern and central Maine.

### DESIRABLE CONDITIONS

Dense understory vegetation and saplings; small gaps in forest canopy.





# FFMB BIRD GUIDE NORTHERN MIXEDWOODS

## Magnolia Warbler



Well-concealed nests usually less than 10' high in dense conifer vegetation. Sings and feeds in the midstory up to 30' high. Maintains small territories (<2 acres). Feeds on a variety of caterpillars, including spruce budworm. Song a short, weak whistled *weta, weta, WETEEA*. Found statewide.

### DESIRABLE CONDITIONS

Small gaps in the overstory that promote dense young conifer growth in the understory.



## Blackburnian Warbler



Nests in and sings from top of tall canopy. Eats spiders, beetles, and moths. Territories 1–3 acres in size. Song is thin and wiry, increasing in speed and rising to the limits of hearing, *sleet-sleet-sleet-sleet-sleetee-sleeeee*. Found statewide.

### DESIRABLE CONDITIONS

Older forests with larger, taller conifers (>40'); dense overstory and midstory vegetation; large (>250 acre) forest blocks.



## Canada Warbler



Has experienced dramatic declines over last 40 years. Nests on the ground near mossy hummocks, root masses or downed logs. Prefers moist woods. Song with introductory chips, *I'm -IN -here-but-you-CAN'T-SEE-ME*. Found statewide.

### DESIRABLE CONDITIONS

Downed woody material (a "messy" forest floor); medium dense vegetation in the canopy; dense understory and midstory vegetation; healthy soils and wetlands.



## Black-throated Blue Warbler



Nests in the fork of a sapling or shrub within dense understory vegetation. Feeds and sings in the midstory. Diet largely moth and butterfly larvae. Song a thick buzzy *I'm-so-la-zeee* with rising endnotes. Found statewide.

### DESIRABLE CONDITIONS

High-density overstory; medium-dense understory, especially hobblebush and small hardwood saplings; less dense vegetation in the canopy; large (>250 acre) forest blocks.





# FFMB BIRD GUIDE NORTHERN SOFTWOODS

## Northern Parula



Prefers moist older forests, where it nests in hanging bunches of bearded lichen, usually near water. Eats insects and spiders, but occasionally berries or seeds. Song a series of one or more rising buzzy notes: *bzzzzzzz-zip* or *bz-bz-bz-zip*. Found statewide.

### DESIRABLE CONDITIONS

Tall trees with dense overstory vegetation, especially spruce, fir and hemlock; healthy bearded lichen; large (>250 acre) forest blocks.



## Boreal Chickadee



Nests in old woodpecker cavities and natural cavities, or may excavate new cavities in snags, stumps or rotten branches. Song is a raspy, buzzy *zick-a-zee-zee*, like a Black-capped Chickadee with a sore throat. Year-round resident of Northern Maine.

### DESIRABLE CONDITIONS

Older stands with tall red spruce and balsam fir; abundant snags; dense vegetation in the canopy.



## Black-throated Green Warbler



Nests less than 10' high, but feeds and sings in overstory. Gleans insects from small branches and needles. One of the most common warblers, the song is an easily recognizable buzzy *zee-zee-zee-zoo-zee*. Found statewide.

**DESIRABLE CONDITIONS** Older forests with large, tall trees and dense vegetation in the canopy and understory; multiple layers of vegetation; softwood patches in hardwood stands, especially Eastern hemlock.



## Black-backed Woodpecker



Robin-sized woodpecker. Excavates cavities in relatively sound, tall conifer snags, rarely in live trees. Also chips away bark in search of wood-boring beetles. Large territories of more than 300 acres in Quebec. Uncommon year-round resident in Northern Maine.

### DESIRABLE CONDITIONS

Older forests with larger, taller conifer snags; medium- to high-density vegetation in the canopy.





# FFMB BIRD GUIDE OAK-PINE FORESTS

## Ovenbird



Prefers forest interiors with deep leaf litter on the forest floor, where it builds a domed nest. Territories can be large (up to 3.5 acres). One of the most recognizable songs, a loud and distinct staccato *teacher-teacher-teacher-teacher*. Found statewide.

### DESIRABLE CONDITIONS

Larger blocks (>250 acres) of mature forest with tall trees and a vigorous hardwood canopy (for leaf litter production).



## Scarlet Tanager



Nests and sings from the top of the canopy. Eats a wide variety of insects and spiders. Territories vary widely in size (1–12 acres). Song a hurried, burry, repetitive warble similar to a robin, often without pauses. Call a distinct chick-burr. Found statewide.

### DESIRABLE CONDITIONS

Larger, taller hardwood trees, particularly oak; dense vegetation in the canopy; blocks of contiguous forest (>40 acres).



## Northern Flicker



Excavates cavities in snags or dead branches. An important “keystone” species because cavities later used by many other wildlife species. Uses a wide range of forest types and age classes. Prefers open, wetter areas with dense grass and/or ground cover. Feeds primarily on the ground on ants and other invertebrates. Found statewide.

### DESIRABLE CONDITIONS

Larger snags; live aspen, alder, and birch with heartwood decay; open forest with sparse vegetation.



## Wood Thrush



Slightly smaller than a robin. Nesting success decreases in forest blocks less than 250 acres in size. Prefers wetter soils and decaying leaf litter. Song is flute-like *ee-oh-lay-ee*, usually going up in pitch and ending in a sound like shattering glass. Found statewide.

### DESIRABLE CONDITIONS

Older, taller trees with dense canopy vegetation; forest floor with medium-density midstory vegetation; large blocks of interior forest (>250 acres).





# Managing Forests “With Birds in Mind”

Now that you are familiar with some of the forest birds that are the focus of the FFMB approach, it's time to learn more about the habitat features they are looking for in your woodlands. The following pages highlight nine different habitat features important to not only these birds, but to many other species of birds and other wildlife. Some of the features are simple and easy to create or enhance. Others are more complex and may take years or even decades to create. Below each feature is a list of birds that key in on that habitat feature for singing, breeding, feeding or nesting.

## FOREST HABITAT ASSOCIATIONS

To manage your woodland for birds, one of the first things you need to know is what kinds of trees are growing there. A great resource for learning more about Maine's tree species is the Maine Forest Service's guidebook, *The Forest Trees of Maine* (visit [www.maineforestservice.gov](http://www.maineforestservice.gov) to obtain a copy). Many birds key in on particular types of trees (softwood or hardwood), or even on particular species (oaks, pines, firs, etc.). FFMB uses four Forest Habitat Associations as a simple way of classifying forest types.

**Northern Hardwood** Dominated by deciduous trees including sugar maple, red maple, ash, basswood, yellow birch, and American beech. The hard mast or tree nuts produced by beech and oak are an important food source for wildlife.

*Black-throated Blue Warbler, Chestnut-sided Warbler, Mourning Warbler, Northern Flicker, Ovenbird, Scarlet Tanager, Veery, Wood Thrush, Yellow-bellied Sapsucker*



**Northern Mixedwood** Neither hardwoods nor softwoods dominate. Typical tree species include red maple, white and yellow birch, hemlock, balsam fir, and red spruce. May be a transition between Northern Hardwood and Northern Softwood Associations.

*Black-throated Blue Warbler, Blackburnian Warbler, Canada Warbler, Magnolia Warbler*



**Northern Softwood** Characterized by mixtures of coniferous trees including red spruce, white spruce, black spruce, and balsam fir. Found on cooler sites such as valley bottoms, high-elevation areas, and along the coast.

*Bay-breasted Warbler, Black-throated Green Warbler, Black-backed Woodpecker, Blackburnian Warbler, Boreal Chickadee, Magnolia Warbler, Olive-sided Flycatcher, Northern Parula*



**Oak-Pine** Typically dominated by red oak and white pine, along with red maple, hemlock, and aspen. Most Oak-Pine sites cleared 200–300 years ago for fields or pasture.

*American Woodcock, Black-throated Blue Warbler, Blackburnian Warbler, Eastern Wood-Pewee, Mourning Warbler, Northern Flicker, Ovenbird, Scarlet Tanager, Veery, Wood Thrush, Yellow-bellied Sapsucker*





## COVER

Forest vegetation at various heights provides forest birds with places to nest, food to eat, material for building nests, and cover from predators.

### OVERSTORY (>30')

*Scarlet Tanager, Blackburnian Warbler, Northern Parula, Olive-sided Flycatcher*

### MIDSTORY (6–30')

*Magnolia Warbler, Wood Thrush, Eastern Wood-Pewee, Black-throated Blue Warbler*

### UNDERSTORY (<6')

*Ovenbird, Chestnut-sided Warbler, Mourning Warbler, American Woodcock*



Birds look at the species and density of vegetation in the three layers (under, mid, and overstory) to decide if the forest habitat is suitable for their needs.

## GAPS

Small gaps in the overstory vegetation allow more light to reach the forest floor, helping young trees and other understory plants regenerate and grow. Gaps are good habitat for insects, an important food source for birds.

*American Woodcock, Canada Warbler, Chestnut-sided Warbler, Eastern Wood-Pewee, Magnolia Warbler, Mourning Warbler, Olive-sided Flycatcher*



Young forest



Older forest



Forestry for Maine Birds workshop participants assess the habitat quality and bird life in a forest gap.

## TREE SIZE

Many forest birds prefer certain sizes of trees for feeding, nesting and resting. Younger forests generally have smaller trees, often growing in dense patches with little or no overstory. Older forests with overall larger trees usually have multiple layers of vegetation and many other structures like snags and downed woody material (see next page).

### YOUNG FOREST, <20 years old, trees <5" diameter

*Chestnut-sided Warbler, Magnolia Warbler, Mourning Warbler*

### INTERMEDIATE FOREST, 20–70 years old, trees 5–10" diameter

*Canada Warbler, Magnolia Warbler, Veery*

### OLDER FOREST, >70 years old, trees >10" diameter

*Bay-breasted Warbler, Northern Parula, Ovenbird, Scarlet Tanager, Wood Thrush*



## SNAGS

Woodpeckers, and a few other forest birds, excavate nesting cavities in standing dead and decaying trees known as snags. Many can excavate in live trees with sections of dead or dying wood. Many other wildlife species (including bats, flying squirrels, wood ducks, and small mammals) use the cavities in subsequent years. Snags are also often riddled with bark- and wood-boring beetles, an important food source for forest woodpeckers.

*Black-backed Woodpecker, Boreal Chickadee, Northern Flicker, Yellow-bellied sapsucker*

**Pileated Woodpeckers use larger snags to make large cavities that are used by many other species over time.**



## DOWNED WOOD

Dead wood (logs and branches on the forest floor) provides perching, hiding and drumming places for birds. Dead wood is a source of insects for birds and other wildlife, and also holds soil in place and replenishes soil nutrients as it decomposes.

*Canada Warbler, Mourning Warbler, Veery, Wood Thrush*

**Ruffed Grouse drum on dead logs on the forest floor to attract mates in the spring.**



## LEAF LITTER

A rich layer of moist deciduous leaf litter is home to an array of insects that make up a significant source of food for birds and other wildlife. Decomposing litter also recycles nutrients back to forest soils. A broad array of wildlife also uses leaf litter for dens, nests, camouflage, and cover.

*American Woodcock, Mourning Warbler, Ovenbird*

**Ovenbirds create domed nests of leaf litter that are camouflaged on the forest floor.**



## WATER

Forests near wetlands, streams, rivers, ponds, lakes, and coastal waters support high concentrations of forest birds and other wildlife including salamanders, frogs, beaver, mink, and otter, as well as tree-nesting waterfowl, large raptors, upland mammals, and bats. In more heavily developed landscapes, these forests often form the core of larger forest blocks and provide a network of travel corridors that are critical to wildlife.

*American Woodcock, Canada Warbler, Northern Flicker, Northern Parula, Veery, Wood Thrush*

**Vernal pools, or seasonal forest wetlands, provide food for wildlife as well as nutrients for forest soils.**



## NATIVE BIODIVERSITY

Introduced exotic species can affect native plant and animal communities by outgrowing and outcompeting natives, reducing insect and plant diversity, depleting food sources for wildlife, and altering habitat. Invasive species may severely affect the numbers and types of forest trees that survive and thrive in our state. To learn more about invasive identification, visit the Maine Forest Service and the Maine Natural Areas Program ([www.maine.gov](http://www.maine.gov)).



**Invasive pests like emerald ash borers have recently entered Maine and can devastate ash populations statewide.**



**Invasive shrubs like glossy buckthorn (*Frangula ulnus*) impede native tree regeneration without benefit to birds.**



# What's In Your Woodland?

Ever wonder how a bird sees a forest? Here's a quick and easy way to recognize the habitat features that are important for birds (and other wildlife as well). Having an idea of what habitat features you have (or don't have) in your woods will help start the conversation between you and your forester or other land management professional about your vision for the future of your woods. This "assessment tool" uses your two hands, so is always accessible in the field! Each of your fingers represents a different habitat feature. We suggest looking for each feature in multiple places

throughout your woods to get a general idea of conditions across the property. Each time you do an assessment, stand in one place, turn around, and look as far as you can see to note current conditions. You can also make notes of the features you see as you walk through your woods. The FFMB website ([maineaudubon.org/ffmb](http://maineaudubon.org/ffmb)) has more information, including a worksheet you can use to record your results. So check out the picture below, and get ready to take your "handy" assessment tool out to the woods for a bird's eye view!

**1 Gaps** Can you find small openings (from 100' x 100' up to 2 acres) in the forest overstory? How many, and how big are they?

**Cover** For each layer, what are the dominant tree species? When you look up through each layer, does it have high cover (leaves block out >70% of the sky) or low cover (leaves block out <30% of the sky) or medium cover (in between)?

**2 Overstory** (>30')

**3 Midstory** (6'-30')


**4 Understory** (1-6')

**5 Water** As you walk through the stand, note the presence of any streams, ponds or wetland areas, including vernal (or seasonal) pools.

## Ask Your Forester...

to do a more in-depth assessment of the habitat features in your woods. Your forester can use this information to develop a plan of management activities that will:

- Create a mix of the three vegetation layers over space and time in order to provide habitat for priority bird species (and other wildlife), and produce healthy forest growth.
- Create small gaps (less than two acres) in the canopy, strategically placed near the edges of larger forest blocks.
- Retain as many standing snags and cavity trees as possible, where safe to do so. The bigger the snag, the better!
- Leave some broken tree tops, limbs and large fallen logs on the ground, including after timber harvests.
- Keep trees with big healthy crowns to promote thick leaf litter on the ground.
- Maintain high canopy cover in buffer areas around water bodies, preferably going beyond minimum state standards.



**7 Snags** Count the number of dead or dying trees over 6' tall. Do you have more than one or two? Are any larger than 12" in diameter?

**6 Tree Size/Age** Are your woods dominated by older/larger trees, younger/smaller trees, or ones in between?

**8 Large Downed Wood** Look on the ground for logs or large branches over 6" in diameter and over 4' long, and standing snags less than 6' tall. Do you have many, or just a few?

**9 Small Downed Wood** Look on the ground for tops of trees or piles of twigs or small branches. How many piles can you find?

**10 Leaf Litter** In hardwood stands, estimate the thickness of the dead leaf layer as adequate (over 1.5") or inadequate (less than 1.5").

- Identify invasive plants, and apply appropriate control measures, including washing equipment to reduce the spread of invasive species.
- Use Best Management Practices (BMPs) to protect water quality by limiting soil compaction and erosion from roads and trails, including those used for timber harvesting and other heavy equipment.
- Encourage native tree and shrub species desirable for wildlife, including those that will thrive in a changing climate.

- Work with loggers who are familiar with FFMB techniques and understand the way you want your woods to look after harvest.

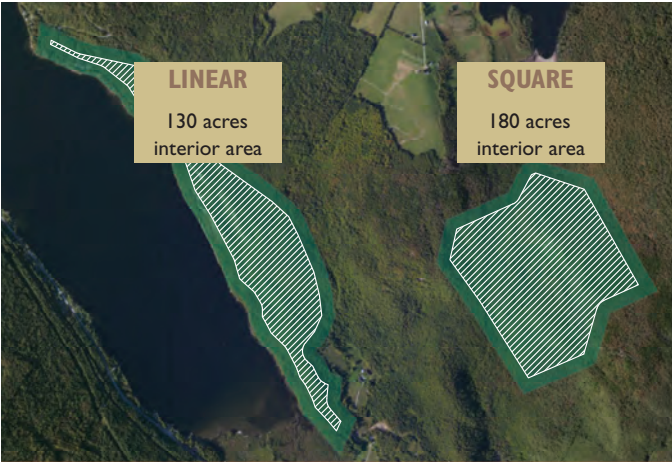




# What's Around Your Woodland?

Even though they are small, birds often “think big.” Some species, including Wood Thrush, Scarlet Tanager, Ovenbird, and Veery are area-sensitive. Although they use only an acre or two as their nesting territory, the birds consider the landscape around that territory when deciding where to nest. Some birds produce more young when they nest in larger blocks of forest.

The landscape around a woodlot can influence what type of management will benefit birds.



STATISTIC TYPE	LINEAR SHAPE	SQUARE SHAPE
Total Block Area	250 acres	250 acres
Setback from Edge	250 ft	250 ft
Interior Block Area	130 acres	180 acres
Interior Block % of Total Block	52%	72%

Managing for square blocks of forest retains interior forest habitat and reduces the amount of edge.



Northern Parulas make their nests in bunches of bearded lichen, a habitat feature associated with older, undisturbed softwood forests.

## FOREST BLOCK SIZE AND SHAPE

The size and shape of a forest block matters to many bird species. Long, thin blocks of forest have less interior forest, and more forest edge, compared to square blocks the same size. Edges have different microclimates and are entry points for invasive species, predators, and nest parasites.

If you have a large enough woodland, maintain larger forest blocks (>250 acres). Talk to a forester about shaping harvest areas to reduce edge effects and maintain interior forest habitat.

## DISTRIBUTION OF AGE CLASSES ACROSS THE LANDSCAPE

Maintaining different ages of forest across the landscape is important for providing a broad array of habitat for all wildlife species. Historically, older woods dominated the Maine landscape, with smaller patches of younger trees growing back after natural disturbances such as wind events, pests, or diseases. Older forests have many features that are a focus of FFMB management.

If you do not own thousands of acres, you can still use your woodland to balance the landscape around you. Use a tool such as Google Earth to look at the land around your property. If your woodland is surrounded by mature forest, consider light management that keeps your forest intact and maintains large forest blocks. If you are near the edge of a larger forest block, consider creating small gaps to regenerate young forest. While you cannot control what's beyond your property, you may be able to talk to neighbors and coordinate activities. More formal and detailed landscape assessment tools are part of the FFMB Forester Guidebook ([maineaudubon.org/ffmb](http://maineaudubon.org/ffmb)).

Talk to your forester about the woods around your property and about ways you might be able to provide habitat features not common in the surrounding landscape. FFMB guidance is for 50% or more of the landscape in older forest in the 2,500 acres around a stand or a property.



# Next Steps

Family woodland owners like you can help provide the habitat features birds and other wildlife need to survive and reproduce long into the future. After reading through this guide, we hope you are excited to manage your woodland “with birds in mind.” Here are a few next steps to help you get there.

## GET TO KNOW YOUR WOODLAND.

Go outside and see your woodland from a bird’s perspective. Is it “messy,” with lots of logs and branches scattered on the ground? Are there abundant snags? Are there occasional gaps in the canopy? Can you find three layers of vegetation? Do you see any invasive plants or evidence of disease? Looking at an aerial photo, is your woodland part of a larger forest block? Does it provide a forest type that is lacking in the surrounding landscape?

## TALK TO A FORESTER.

Start with your local Maine Forest Service District Forester (call 207-287-8430, e-mail [forestinfo@maine.gov](mailto:forestinfo@maine.gov), or visit the [maineforestservice.gov](http://maineforestservice.gov) website). District Foresters can walk your woodland with you and help you make informed decisions about your land. District Foresters can refer you to a list of private consultants who provide woodland-related services such as writing forest management plans and overseeing timber harvests. You can also find professionals who have been to an FFMB workshop on the FFMB website ([maineaudubon.org/ffmb](http://maineaudubon.org/ffmb)).

## SET YOUR OBJECTIVES AND MAKE A PLAN.

Your long-term goals should guide the creation of any management plan. Your goals may include recreation, wildlife, or aesthetics as well as timber values. Sharing your goals along with your habitat assessment with a forester is a good way to start developing a management plan.

## SHARE YOUR PLAN AND YOUR KNOWLEDGE OF FFMB.

While managing “with birds in mind” on your property is a great way for you to contribute to bird conservation, helping to spread the word to friends and neighbors will make an even bigger difference. Point interested friends and neighbors to the FFMB website ([maineaudubon.org/ffmb](http://maineaudubon.org/ffmb)). They can attend a landowner workshop or visit a demonstration forest where FFMB management has taken place. By sharing your knowledge of FFMB with others, you will help increase the acreage of quality forest habitat for birds and other wildlife in Maine.



The best way to learn about your woodland is to get outside and look around at habitat features.



Foresters are key to helping you move forward with forest planning and management.



While birds are the focus of FFMB activities, many other wildlife species, including red-backed salamanders (left) and American martens (above), can benefit from FFMB management.



# Resources

## FOR MORE INFORMATION ABOUT MANAGING YOUR WOODLAND “WITH BIRDS IN MIND”

Additional Forestry for Maine Birds resources can be found at [maineaudubon.org/ffmb](http://maineaudubon.org/ffmb), including information about upcoming FFMB workshops and events, additional FFMB resources like the Forester’s Guidebook, a list of foresters who have taken FFMB workshops, and worksheets that go with the habitat assessment outlined in this guide.

The Maine Forest Service home page ([maineforestservice.gov](http://maineforestservice.gov)) has links for finding your local District Forester, more information on invasive species, and the Forest Trees of Maine guide. Be sure to also check the “Woodland Owners” page for many more excellent resources, including links to the Woods Wise Incentive Program, which promotes woodland stewardship across Maine.

The USDA Natural Resources Conservation Service in Maine also has several assistance programs for landowners. These programs change from year to year, but typically include assistance for wildlife-related management activities. Visit [www.nrcs.usda.gov](http://www.nrcs.usda.gov) for more information or call the NRCS state office in Bangor at 207-991-9100.

## About Forestry for Maine Birds

FFMB began in 2014 as a collaborative effort of Maine Audubon, the Forest Stewards Guild, the Maine Forest Service, and the Maine Department of Inland Fisheries and Wildlife. Expertise and financial support was provided by Northern Forest Conservation Services, Forest Synthesis, and the Maine Outdoor Heritage Fund. The program was adapted from Vermont’s “Foresters for the Birds” program, developed by Audubon Vermont and the Vermont Department of Forests, Parks, and Recreation.



**ForestSynthesis**







# Managing Your Woodlot with Birds and Wildlife in Mind

Want to learn more about how to improve the overall health of your forest? Birds can help! Birds are great indicators of your woodland's condition because they need a variety of trees and other forest features to successfully breed and raise their young. For that reason, birds provide a natural gauge of how your actions are affecting the quality of your woods and its inhabitants.

It may surprise you to learn that Maine is home to some of the highest diversity of forest breeding bird species in the continental United States. Your woodland can help play a critical role in conserving Maine's "baby bird factory" and reducing population declines. You can play an active role by managing your woodland "with birds in mind." And there's an added benefit—what's good for birds is good for other wildlife and timber as well. Providing habitat conditions desired by forest birds also supports other wildlife such as bobcats, flying squirrels, and red-backed salamanders.



With careful planning, you can have productive woodlands that provide wood for you and your family, and also provide habitat for many of the bird and other wildlife species that call Maine home. A forester or wildlife biologist can help determine which actions are most suitable for the unique conditions on your property.

## Here are some actions you might take on your land and why they are important:

- **Inventory and map your land for important habitat features. Learn which resources already exist on your land.** Take your mapping even further by looking at the landscape beyond your property lines to understand how your land fits into the big picture. From this perspective, you can view your woodlands in such a way to ensure that your forests have a diverse age structure. A small portion of young forests, a larger portion of intermediate-aged forests, and an even larger portion of mature forests is ideal. A professional can help you distinguish between different age structures. Google Earth and Google Maps are great sources of free, aerial imagery. MyLandPlan.org also provides the tools you need not only to map and journal about your woodland but to set management goals, communicate with natural resource professionals, and find additional support.
- **Manage for a variety of tree and shrub species, ages and sizes.** This will help provide habitat for a larger variety of bird species, as each one uses different parts of the forest for feeding, nesting and raising young. Additionally, promoting a variety of tree and shrub species uncommon to the surrounding landscape will allow your woodland and its inhabitants to be more resilient to change and disturbances. To maximize diversity, create multiple forest layers with shrubs and trees of different ages and sizes wherever possible; support a variety of tree and shrub species in the forest understory, midstory, and overstory; and





include softwood patches in hardwood stands. If your forest is part of a landscape that lacks older forests—which a forester can help you determine—try to have the majority of your forest in mature or relatively mature. Older, structurally diverse woodlands can often look messy to us, but remember: complex, messy forest structure attracts and supports a wide diversity of life in your woods. “Messy is good!”

- **Leave dead and dying wood standing for food and nesting, and leave other dead woody material on the forest floor for food and shelter.** Snags (standing, dead trees) and downed trees serve as resting and nesting sites as well as food sources for many Maine birds. Other species like raccoons, flying squirrels, bats, porcupines, and wood ducks also use tree cavities for nesting or denning. Birds of prey use snags as hunting viewpoints. Fallen logs serve as drumming sites for ruffed grouse and provide a home for salamanders, snakes and shrews. Piles of finer woody material (branches, treetops) on the ground provide shelter and food for small birds and can help protect young trees from browsing by deer and moose. Leaf litter is used for building nests by ground-nesting birds like the ovenbird.
- **Grow native trees and shrubs that are suited to the site, including those that produce fruits, seeds, or nuts.** These trees provide a great food source for birds and other wildlife living on or passing through your land. They will be especially important during fall migrations and during winter months for birds that remain year-round. Examples of food trees include serviceberry, black cherry, raspberry, and dogwood. You can also encourage the growth of white pine, hemlock, and other evergreens to provide important cover for wintering birds. A forester can help you determine which native species may be best suited for your site
- **Restore and maintain habitat around wetlands and along streams and creeks.** The wet edges along waterways are referred to as riparian areas. Many birds use riparian habitat during both migration and breeding season. In addition, up to 80% of Maine’s wildlife species use riparian habitat during some or all of their life cycle. Riparian areas that are at least 100 feet wide provide baseline needs for some songbirds, but wider areas are preferable. Areas that are 250-600 feet wide provide ideal nesting habitat and travel corridors for wood thrush, wood ducks, wood turtles, and bobcat. Any harvesting in riparian areas should be done carefully to minimize soil and water disturbance; to retain large snags, shade and nesting trees; and to maintain a full tree canopy. Larger trees provide nesting and perching sites for tree-nesting ducks and large raptors, keep streams cool for cold-water fish like brook trout, and eventually are a source of woody material on the ground and in streams as they die and fall over.
- **Identify and maintain unique habitats such as wetlands, vernal pools, rare animal sites, old growth stands, and deer wintering areas.** In addition to riparian areas, wetlands, vernal

pools, rare plant and animal habitat, old growth stands, and deer wintering areas are highly valuable forest habitats. A forester or wildlife biologist will be able to help you identify these unique habitats. To help conserve overall landscape biodiversity, consider leaving some of these habitats as no-harvest areas and manage others with very light-touch harvesting. To learn more about light-touch harvesting recommendations, check out the University of Maine’s Biodiversity in the Forests of Maine.



- **Create small forest openings, if they are lacking on landscape, to encourage young trees, shrubs, and grass that can provide cover, nesting sites, and food sources.** Small gaps in older forests create optimal habitat for a variety of bird and other wildlife species that feed and nest in areas with little or no canopy cover. These small gaps should include younger and smaller tree and shrub species as well as grasses. They should be less than 2 acres in size to avoid breaking woods into small forest patches.
- **Create piles of brush and branches to shelter and feed birds and other wildlife.** You can create brush piles by stacking downed tree limbs and branches. These piles are a great source of shelter for many animals that call your woods home, especially during the winter. They also provide a haven for insects that are a food source for many birds.
- **Remove invasive plants because they don't support native wildlife.** Many invasive plants have fewer insects and fruits with lower nutritional value than natives, which is especially troubling for the thousands of migratory birds passing through Maine in need of nourishing food for their journeys. What's more, non-native, invasive plants often out-compete and reduce the presence of important native plants. Native plants provide a nutritious food source in the form of fruit and seeds, are home to other tasty treats like caterpillars and spiders, and provide a safe space for birds to build their nests.
- **Where possible, create and enhance large (at least 250 acres) forest blocks with unbroken canopy cover and minimal roads.** In areas lacking large forest tracts with intact cover, these blocks have the potential to support a greater variety of birds. Avoid breaking up forest patches. You can maximize "unbroken" forest habitat by considering how much edge your forest has compared to the interior forest area. Circular and square forest patches provide more unbroken forest habitat than oblong or rectangular shaped forest because there is less edge habitat surrounding the same amount of interior habitat.
- **Thin your woods or conduct a harvest to enhance bird and other wildlife habitat.** Thinning removes less desirable trees from your woods. Like thinning a patch of carrots in your garden, the goal is to promote the growth of select trees by decreasing the density of surrounding trees. As a result, competition among trees for soil nutrients and sunlight decreases, encouraging growth of the remaining trees. Healthy larger trees produce higher quality timber and are used by many bird species of conservation concern and other wildlife populations as well.
- **Create transition zones (soft edges) to avoid drastic changes between wooded and non-wooded habitat using vegetation that gradually increases in size.** An edge is a place where two different types of habitats meet. Softer edges have a transition zone with a gradual change in vegetation height. Predators and nest parasites are the greatest threat to birds within 150 feet of the forest edge. Soft edges with transition zones help keep birds nesting near the forest edge safer by creating a buffer between wooded and non-wooded habitat.





- **Conduct harvests during winter or dry soil conditions to avoid disturbing amphibian and bird breeding seasons (April to mid-July).** Maine amphibians and birds breed throughout the spring and early summer. Conduct your harvest and other potentially disruptive activities during winter when the ground is frozen or during late summer/fall when the soil is dry. Similarly, conduct operations that require soil disturbance to promote species such as white pine outside of the breeding season window and on dry soils. This will minimize disturbances to the soil, to young amphibians as they emerge from breeding pools in mid-summer, and to birds nesting and raising their chicks.
- **Learn to identify Maine's 20 priority birds.** Maine Audubon has identified 20 forest bird species of high conservation priority based on declining populations, growing risks and threats, and/or the relatively large portion of their global populations found in the Northeast. While many other forest bird species are at risk and in decline, these 20 species use a variety of different forest types and habitats for feeding and nesting, and are relatively simple to identify by sight and/or sound. Woods composed of a mix of vegetation and other habitat characteristics will not only provide for these 20 species of birds, but also for many more birds and other wildlife species that call the Maine Woods home.
- **Talk with your neighbors about working together for birds and other wildlife.** Help spread the word about how to maximize benefits for birds and other wildlife across the landscape and beyond the boundaries of your own land. Perhaps you and your neighbors can provide a broader variety of habitats by working together to create necessary bird and wildlife habitat across your landscape. By getting your neighbors involved, you can connect one forest block to another, reconnect streams, and better protect wetlands (including vernal pools) that cross property lines. Your combined efforts will have an even bigger impact on Maine's birds and other wildlife.

For more information please contact Maine Audubon at (207) 781-2330 or [info@mymainewoods.org](mailto:info@mymainewoods.org) or visit our website at [www.mymainewoods.org](http://www.mymainewoods.org).

This fact sheet was synthesized from informational materials created by Audubon Vermont, Maine Audubon, and the University of Maine, including:

Audubon Vermont & Vermont Department of Forests, Parks, and Recreation. (2012). *Managing your woods with birds in mind: A Vermont landowner's guide*. Huntington, VT: Audubon Vermont.

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**My Maine Woods is a partnership between Maine Audubon and the American Forest Foundation.**

# What's In Your Woodland?

Ever wonder how a bird looks at the woods? Here's a quick and easy way to recognize the habitat features that are important for birds (and other wildlife as well). Having an idea of what habitat features you have (or don't have) in your woods will help start the conversation between you and your forester or other land management professional about your vision for the future of your woods. This "assessment tool" uses your two hands so it's always accessible in the field! Each of your fingers represents a different habitat feature. We suggest looking for each feature

in multiple places throughout your woods to get a broad idea of conditions across the property. Each time you do an assessment, stand in one place, spin around, and look as far as you can see to note current conditions. You can also make notes of the features you see as you walk through your woods. The FFMB website ([maineaudubon.org/ffmb](http://maineaudubon.org/ffmb)) has more information, including a worksheet that you can use to record your results. So check out the picture below, and get ready to take your "handy" assessment tool out to the woods for a bird's eye view!

**1 (thumb) — Gaps** Can you find small openings (from 100' x 100' up to 2 acres) in the forest overstory? How many and what size openings?

**Cover** For each layer, what are the dominant tree species? When you look up through each layer, do they have high cover (leaves block out >70% of the sky) or low cover (leaves block out <30% of the sky) or medium cover (in between)?

**2 (index finger) — Overstory** (>30')  
**3 (middle finger) — Midstory** (6'-30')  
**4 (ring finger) — Understory** (1-6')

**5 (pinkie) — Water** As you walk through the stand, note the presence of any streams, ponds or wetland areas, including vernal (or seasonal) pools.

**7 (index finger) — Snags**  
 Count the number of dead or dying trees over 6' tall. Do you have more than one or two? Are any larger than 12" in diameter?

**8 (middle finger) — Large Downed Wood** Look on the ground for logs or large branches over 6' in diameter and over 4' long, and standing snags less than 6' tall. Do you have many, or just a few?

**9 (ring finger) — Small Downed Wood** Look on the ground for tops of trees or piles of twigs or small branches. How many piles can you find?

**6 (thumb) — Tree Size** Are your woods dominated by older/larger trees, younger/smaller trees, or ones in between?

**10 (pinkie) — Leaf Litter** In hardwood stands, estimate the thickness of the dead leaf layer as adequate (over 1.5") or inadequate (less than 1.5").

## Ask Your Forester...

to do a more in-depth assessment of the habitat features in your woods. Your forester can use this information to develop a plan of management activities that will:

- Create a mix of the three vegetation layers over space and time in order to promote habitat for priority bird species (and other wildlife), and healthy forest growth.
- Create small gaps (less than two acres) in the canopy, strategically placed near the edges of larger forest blocks.

- Retain as many standing snags and cavity trees as possible, where safe to do so. The bigger the snag the better!
- Leave some broken tree tops, limbs and large fallen logs on the ground, including after timber harvests.
- Keep trees with big healthy crowns to promote thick leaf litter on the ground.
- Maintain high canopy cover in buffer areas around water bodies, preferably going beyond minimum state standards.

- Identify invasive plants, and apply appropriate control measures, including washing equipment to reduce the spread of invasive species.
- Use Best Management Practices (BMPs) to protect water quality by limiting soil compaction and erosion from roads and trails, including those used for timber harvesting and other heavy equipment.
- Encourage native tree and shrub species desirable for wildlife, including those that will thrive in a changing climate.

- Work with loggers who are familiar with FFMB techniques, and understand the way you want your woods to look after harvest activities.





# Forestry for Maine Birds

maineaudubon.org/ffmb

## PRIORITY SPECIES

Maine is a haven for breeding birds. We have more forest species breeding here in Maine and the Northeast than in any other part of the country.

Many forest birds come to Maine every summer from South America or the southern U.S. to nest and raise their young. Why do they come so far? Because we have extensive, diverse forests; abundant food; and long days for gathering food.

Many of these songbirds are of conservation concern. For some, a large percentage (12-32%) of their global population breeds here. Others have declined dramatically in the past 10-50 years. Still others have limited ranges in the U.S. and are found only in these northern forest types.

This mural features a few of the many species that have been identified as priority species for conservation from a variety of state and national bird conservation programs.

## MATURE FORESTS

Older forests look messy – they are multistoried with lots of living and dead trees of varying sizes and ages. The ground is uneven, with thick layers of dead leaves, branches, and fallen trees. Big, old, tall trees cover most of the sky, but there are small gaps in the canopy where old trees have fallen over and young seedlings and saplings are growing up.

Lots of tree trunks, branches, leaves and needles means lots of places for birds and other wildlife to find food, shelter, and nest sites. Over 70% of Maine's vertebrates use mature forests, including many of our migratory songbirds.

Historically, mature forests covered 80-90% of the landscape in Maine, but today mature forests are hard to find – forests with trees over 150 years old cover only 1% of the landscape and most of Maine's forests are much younger (less than 60 years old).

## WHAT ALL BIRDS NEED

**Cover:** Dense vegetation and piles of brush provide places to hide from predators.

**Food:** Insects are high in protein needed by growing baby birds.

**Nest Sites:** Each species chooses a different spot, from treetop to ground and trunk to outer limb, and everything in between.

**Territories:** Males attract mates and defend their territories by singing from perches. In forests with abundant cover, food and nest sites, territories are smaller and more species and individuals can live there.

## WHAT SOME BIRDS NEED

**Woodpeckers:** large dead trees

**Black-throated Blue Warblers:** hobblebush or other low shrub

**Northern Parulas:** old man's beard lichen

**Scarlet Tanagers:** tall oak trees and a closed canopy

**Canada Warblers:** thick shrubs near water

**Thrushes:** thick leaf litter

**Peewees:** small gap openings

## HOW WE CAN HELP

Many birds are in trouble around the world from the loss of breeding, migrating, and wintering habitat; pesticide use; invasive species; mortality from cats, windows, towers, and tall lighted buildings; and a changing climate. But don't be discouraged – you CAN help!

## IN YOUR BACKYARD

- Plant native shrubs and trees that will provide cover, food and nesting sites.
- Provide water for drinking and bathing.
- Set up nesting boxes for cavity nesters.
- Keep your cat indoors.
- Avoid pesticides; use organic fertilizers.
- Conserve energy to reduce your climate change impacts.

## IN YOUR COMMUNITY

- Lead your neighbors in a campaign to plant native shrubs and trees and to conserve energy at your local town hall, community center and/or school.
- Join your local land trust or conservation commission to create and care for a town forest and protect existing mature forests.
- Accompany a naturalist on a bird walk.
- Buy organic and sustainably-grown food from local farmers and fishermen.

## AROUND THE WORLD

- Buy shade-grown or bird-friendly coffee and chocolate to protect wintering habitat.
- Buy furniture, flooring, and toys made from sustainably harvested wood.
- Support renewable energy projects to reduce global impacts from climate change.

MAINE  
AUDUBON



## AVIAN SUPER-HIGHWAY

Migration is risky. Along the way birds need places to rest and feed to build up their strength for the next flight. Sometimes their breeding, migrating or wintering grounds have been altered or have disappeared altogether. Sometimes they get blown off course by a big storm. Some birds make it and some don't. Here are the tales of three different species with three very different migratory pathways.

**American Woodcock**  
Maine populations travel to and from the Gulf States in a broad band along the Eastern Flyway. They are a "short-distance" migrant that travels during the night at a leisurely pace, singly or in small flocks.

**Scarlet Tanager**  
Tanagers are "long-distance" migrants that fly in stages from Maine across the Gulf of Mexico to wintering grounds in northwestern South America. They typically migrate at night over several weeks.

**Blackpoll Warbler**  
Blackpolls are a small warbler with a very big migration! They breed in boreal forests stretching from northern Maine across Canada and into Alaska. In the fall, most blackpolls fly east to Maine and the Canadian Maritimes, where they jump out over the Atlantic Ocean to fly south to Puerto Rico or northern South America. The flight over open water averages 1,864 miles and takes up to 88 hours nonstop. Before leaping out, the Blackpoll nearly doubles its body weight. During spring, blackpolls fly slowly up through Central America or the Caribbean and across the Gulf of Mexico before heading north along either the Atlantic or Midwest Flyways.



# HABITAT

March - May 2014 Volume 30, Number 3

## Seeing the Forest for the Birds Engaging Landowners in Conservation

Every summer, Maine's forests come alive with an incredible and diverse mix of songbirds. Blackburnian Warblers perch and sing from high in spruce trees. Black-throated Blue

**“Large blocks of mature forest, where most of our ‘responsibility species’ breed, are dwindling, especially in northern Maine.”**

Warblers nest and feed in hobblebush shrubs underneath a dense canopy of tall maple and birch trees. Canada Warblers build their nests hidden in nooks and crannies on the forest floor. Ovenbirds build a nest that looks like, well, an oven, and endlessly sing “*teacher, teacher, teacher*” in their distinctive, surprisingly loud voice.

Historically, Maine has been home to an amazing diversity of forest birds. They came here because the forest offered a variety of places to nest and feed, from tall trees to shrubs, from cavities in dead trees to upturned root balls in the understory. That variety of nest sites, along with a smorgasbord of insects and long summer days, made Maine's forests a breeding mecca for songbirds.

But this richness of forest birds is not guaranteed. Regional population declines for many species are a concern. Many of these birds remain “common” in Maine, but because the majority of their global population resides in our region, we have a responsibility to ensure their overall numbers stay strong.

“We know that Maine's forests are changing,” says Sally Stockwell, Director of Conservation at Maine Audubon. “Large blocks of mature forest, where most of our ‘responsibility species’ breed, are dwindling, especially in northern Maine.” In the 1970s, 30-40% of our northern forest was in large patches of older, mature trees and a variety of both horizontal and vertical structures met a lot of forest birds' needs. But this mature forest is disappearing. Today, only about 16-18% of our northern forest is in this older, mature stage, and much of this land is in smaller, fragmented patches surrounded by younger forests that have been harvested. This is bad news for





## Engaging Landowners cont.

### A Conservation Project with Global Impact

Maine Audubon's Forest Birds Project is part of a global conservation initiative launched by National Audubon.

The goal of this ambitious project is to work with communities throughout the Western Hemisphere to maintain bird habitat along multiple bird flyways.

Each year, more than 10 billion birds use major flyways to travel up and down the hemisphere.

the birds that depend on mature forest habitat for nesting, feeding and roosting.

#### What is Maine Audubon doing?

This spring, Maine Audubon will launch the Forest Birds Project, an exciting initiative that brings together a diverse group of land managers, foresters and scientists. Together, we will develop forest management plans to improve breeding habitat for Maine birds of conservation concern. The project is funded by Toyota TogetherGreen, and is part of a larger Atlantic Flyway initiative spearheaded by National Audubon.

Maine lies at the northern end of the Atlantic Flyway in the United States, an important route for eastern forest birds. The goal of the Atlantic Flyway initiative is to improve and increase protection of forest blocks

comprising 35 million acres of forest-bird breeding habitat through permanent protection, improved stewardship and intentional management. Because Maine has the largest unfragmented block of forest on the eastern seaboard, we have an especially important role to play as the "breeding factory" for many of these migratory birds. That's why Maine Audubon will be reaching out to land managers and foresters to help landowners manage their forests "with birds in mind."

This forest bird conservation model was first developed by Vermont Audubon and the Vermont Department of Forests, Parks and Recreation, where it has enjoyed incredible success reaching hundreds of land managers and foresters in the past several years. Maine Audubon will build on their success and adapt the program for Maine.

#### First Steps

At the end of January, Maine Audubon staff met with 15 foresters and forest professionals from around the state to draft guidelines for forest management practices that benefit forest-breeding birds. The group started with a review of two dozen forest birds whose populations in Maine are on the decline, are of significant ecological value or are a 'responsibility species' for the state. The list of birds, and their varied forest habitats, will guide the group in determining which forest management practices to recommend.

With the help of the Forest Guild, a description of the target bird species and options for bird-friendly harvesting will be compiled into a *Foresters for the Birds* handbook. The handbook will also provide tools and methods for assessing bird habitat

conditions before planning logging activities, and will explain the rationale behind the recommendations. A draft of this handbook will be field tested with foresters and land managers at workshops around the state.

#### Working with landowners

Maine Audubon's goal is to reach at least 50 foresters this spring to introduce them to *Foresters for the Birds* tools and materials that can help them work with landowners on their forest management practices. According to the Maine Forest Service, most small woodlot owners are interested in managing their forests for multiple benefits (not just timber harvesting) and wildlife and birds are high on the list. Our program can be used by any landowner enrolled in a sustainable forestry certification program to help meet one of

the core certification requirements—protecting biodiversity.

Next fall, Maine Audubon will host two forums, where the public will hear firsthand about the initiative and how they can get involved with this important conservation project. In addition, we will continue to seek funds to host more workshops in coming years, working not only with foresters, but also small woodlot owners, land trusts, municipalities and others interested in learning how to manage forests with birds in mind.

With dozens of bird species that rely on Maine's forests for breeding, this project will have large-scale and long-term impact, helping to ensure that Maine's forests will remain alive with the music of our songbirds for generations to come.

## How Songbirds Use the Forest



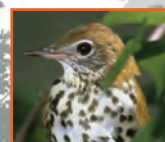
#### Scarlet Tanager

Prefers mature oaks/maples  
Feeds in high closed canopy  
Nests in trees over 50 ft.



#### Eastern Wood-pewee

Perches under closed overstory  
Feeds in midstory gap openings



#### Wood Thrush

Nests in trees over 50 ft.  
Hides in dense midstory  
Feeds in thick leaf litter



#### Blackburnian Warbler

Prefers trees older than 50 yrs  
Uses bearded lichen for nesting  
Sings from tree tops

**OVERSTORY**  
**>30'**

**MIDSTORY**  
**6-30'**

**UNDERSTORY**  
**<6'**



#### Black Throated Blue Warbler

Requires closed overstory  
Nests in dense understory



#### Canada Warbler

Prefers moist, mixed wood forest  
Dense Understory &  
Dense Midstory  
Nests on/near ground

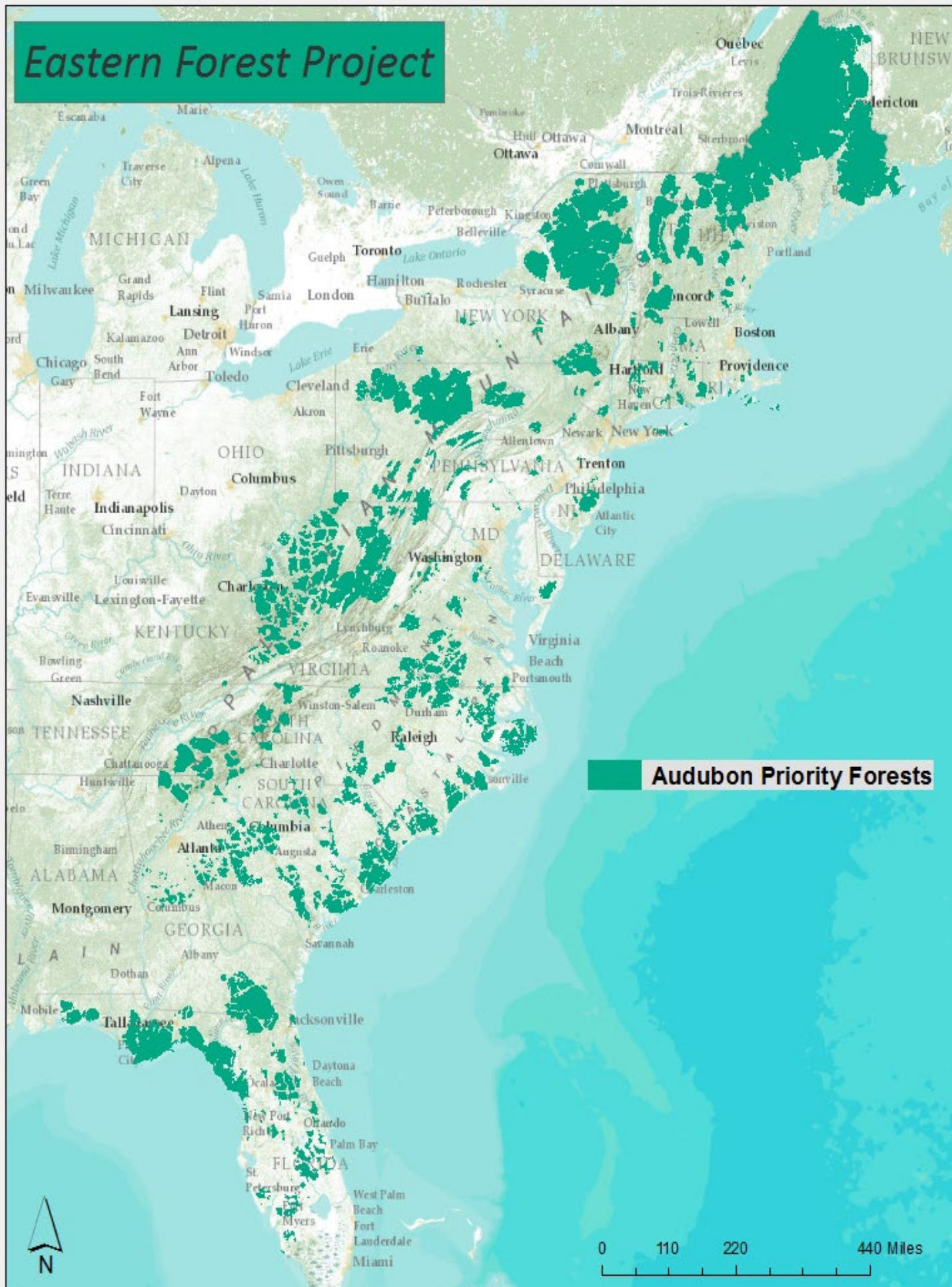


#### Black Backed Woodpecker

Nests in cavities of mature, dead trees  
Eats bark-boring insects



# Eastern Forest Project





# HABITAT FEATURES: WHICH BIRDS USE THEM AND WHY

**SNAGS** Woodpeckers excavate nesting cavities in snags or in live trees with sections of dead or dying wood. Many other wildlife species (including bats, flying squirrels, wood ducks, and small mammals) use the cavities in subsequent years. Snags are riddled with bark- and wood-boring beetles, an important food source for wildlife. *Northern Flicker, Yellow-bellied Sapsucker, Black-backed Woodpecker, Boreal Chickadee*

**DOWNED WOOD** Dead wood (logs and branches on the forest floor) provides perching, hiding, and drumming places for birds. Decaying wood is a source of insects for birds and other wildlife to eat, holds soil in place, and replenishes soil nutrients as it decomposes. *Canada Warbler, Mourning Warbler, Veery, Wood Thrush*

**LEAF LITTER** A rich layer of moist deciduous leaf litter is home to an array of insects that are a significant source of food for birds and other wildlife. Decomposing litter also recycles nutrients back to forest soils. Many different kinds of wildlife use leaf litter for dens, nests, camouflage, and cover. *American Woodcock, Mourning Warbler, Ovenbird*

**VEGETATION LAYERS AND COVER** A variety of canopy layers, from the shortest understory regeneration to the tallest super-canopy tree, provides multiple places to nest, material for nest building, cover to hide from predators, as well as food (fruit, buds, insects, etc.) for forest birds.

**OVERSTORY** (>30') *Scarlet Tanager* **MIDSTORY** (6–30') *Wood Thrush* **UNDERSTORY** (1–6') *Chestnut-sided Warbler*

**TREE SIZE** Many forest birds prefer certain sizes of trees for feeding, nesting, and resting. Older forests with overall larger trees usually have multiple layers of vegetation that support many species and breeding pairs. *Northern Parula, Bay-breasted Warbler, Boreal Chickadee, Black-backed Woodpecker*

**SOFTWOOD INCLUSIONS** Pockets of softwood in a mix of hardwood trees provide an additional layer of habitat structure, especially for birds that are looking for a mix of hard and softwood species. *Black-throated Green Warbler, Blackburnian Warbler, Canada Warbler*

**CANOPY GAPS** Openings in the canopy from one-quarter acre (roughly 100' x 100') to two acres (roughly 300' x 300') create good conditions for regeneration. The shrubby growth in these gaps is home to abundant insects, and several bird species are adapted to feed in these openings, or to nest in the dense regeneration they create. *Chestnut-sided Warbler, Eastern Wood-Pewee, Olive-sided Flycatcher*

**SHORELAND (RIPARIAN) AND WETLAND FORESTS** Forests along streams, rivers, ponds and lakes have high concentrations of wildlife. More than 80% of Maine's wildlife species use these areas at some point in their life cycle. These forests also provide travel corridors for moving wildlife, and can provide the nucleus of large forest blocks that are critically important for species needing interior forest habitat. *American Woodcock, Canada Warbler, Northern Parula, Veery*

**NATIVE BIODIVERSITY** Introduced exotic plants reduce native biodiversity and can reduce the availability of food sources that birds, especially migrants, rely on. Exotic pests invading our forests and new diseases can kill tree species that are important to birds and other wildlife.

photo: MNRC



Photos: (left to right, top to bottom): *Scarlet Tanager*, Doug Hitchcox; *Ovenbird*, Peter Caulfield; *Wood Thrush*, Fyn Kynd; *Northern Flicker*, Scott Knecht; *Chestnut-sided Warbler*, Frode Jacobsen; *Mourning Warbler*, Tom Benson; *Veery*, Bill Benish; *Yellow-bellied Sapsucker*, Richard Fournier; *American Woodcock*, Fyn Kynd; *Eastern Wood-Pewee*, Brad Carlson; *Canada Warbler*, Ken Janes; *Black-throated Blue Warbler*, Richard Fournier; *Bay-breasted Warbler*, Laura Gooch; *Northern Parula*, Peter Caulfield; *Black-throated Green Warbler*, Richard Fournier; *Blackburnian Warbler*, Sue Barth; *Magnolia Warbler*, Diane St. Jacques; *Black-backed Woodpecker*, Karen Hooper; *Boreal Chickadee*, Peter Caulfield; *Olive-sided Flycatcher*, Joe Wing

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## A Logger's Guide to Forestry for Maine Birds

Maine loggers make forest management happen. They decide how, where, and when to operate heavy equipment, and ultimately, how the woods will look when the job is done. Loggers, working with foresters, can also help landowners understand how a “messy” forest, with well-distributed slash and safe snags, creates places to nest, eat, and rest for songbirds and other wildlife. Thoughtful logging protects soil and helps ensure a strong and healthy future forest.







## HABITAT FEATURES: WHAT YOU CAN DO

### 1 SNAGS: THE BIGGER, THE BETTER!

Where operationally SAFE to do so:

- Keep snags and decaying trees
  - Look for large dead limbs and broken tops
  - Retain Aspen and Poplar as preferred species
- Aim for at least 6/acre
- Aim for at least one >18" DBH and at least 3 >12" DBH

### 2 DOWNED WOOD: MESSY IS GOOD!

- Communicate with the landowner about the wildlife benefits of a "messy" forest
- Leave tops and low-value logs
- Avoid crushing downed logs
- Haul back or scatter tops and limbs
- Look at snags as future downed wood

### 3 LEAF LITTER

- Retain some healthy hardwood canopy
- Limit risk of introducing invasive earthworms

### 4 COVER

- Promote crown growth in three layers: overstory (>30'), midstory (6–30'), and understory (1–6')
- Consider the leaf cover you're leaving behind in each layer, including regeneration

### 5 TREE SIZE

- Leave some trees of various heights to increase stand structural diversity
- Leave some larger trees as wildlife trees and future high-quality snags

### 6 SOFTWOOD INCLUSIONS

- Retain wind-firm clusters or individual softwoods in hardwood or mixedwood stands and in clearcut or overstory removal situations
- Manage canopy to maintain deep softwood crowns and good regeneration

### 7 CANOPY GAPS

- Limit total gap area to <20% of stand area in any 20-year period
- Create a mosaic of gaps of different sizes (1/4 to 2 acres in size)
- Protect and promote regeneration

### 8 SHORELAND and WETLAND FORESTS

- Apply Maine's Best Management Practices for Water Quality
- Follow the Vernal Pool Habitat Management Guidelines
- Increase buffers where possible to increase benefits to wildlife
- Retain as much canopy cover as possible if harvesting within the buffer area
- Prevent ruts, especially in riparian buffers

### 9 INVASIVE SPECIES CONTROLS

- Learn to identify invasive plants and insects and their signs
- Share information about invasive species with landowners
- Work with a forester to determine the best outcome for a stand
- Pressure-wash equipment before moving between jobs



# Assessment Data Form for Stands (Long Version)

Landowner \_\_\_\_\_ Date \_\_\_\_\_

Forester \_\_\_\_\_ Weather \_\_\_\_\_

ID for stand,TBD by forester.	ID for plot and/or GPS point if using,TBD by forester.	Forest Type helps determine which birds might be present. Use one of the Common Forest Types listed below or use an alternative classification system that provides similar level of detail.
<b>Stand ID</b>	<b>Plot ID or GPS</b>	<b>Forest Habitat Association</b>

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Forest Habitat Association	Common Forest Types	Comments
Northern Hardwoods	Northern Hardwoods (beech-birch-maple and variants) Aspen-birch (early successional)	May include up to 25% softwoods
Northern Mixedwoods	Northern Hardwood/Hemlock Northern Hardwood/Spruce-Fir Hemlock (in patches)	Transitional between northern hardwoods and northern softwoods

Forest Habitat Association	Common Forest Types	Comments
Northern Softwoods	Spruce-Fir, Spruce-Hemlock Northern White pine/Mixed Conifer Northern White Cedar Aspen-birch (early successional)	May include up to 25% hardwoods
Oak-Pine	Northern Red Oak Red Oak- Mixed Hardwoods Red Oak-White Pine-Red Maple, White Pine Hemlock and Hemlock-Oak-Pine Aspen-birch (early successional)	May range from pure oak-dominated hardwoods to mixed hardwood and softwood stands

Stand Structure Class describes the general structure of a stand. FFMB species in general prefer more complex vertical and horizontal structure. FFMB promotes a mix of these classes across the landscape, with particular attention to older classes (4 and 5).

## Stand Structure Class (circle one number)

Young	1	Regeneration	0-10 years old, <1" DBH
	2	Sapling	1-4" DBH, 10-30' midstory >80% cover, <30% overstory cover*
Intermediate	3a	Intermediate Single-aged	5-10" DBH, 30-70% overstory cover, midstory cover <30%
	3b	Intermediate Two-aged	5-10" DBH, 30-70% overstory cover, midstory cover >30%
Older	4	Maturing/Small Sawtimber	>70% canopy cover**, overstory trees 10-16" DBH dominant
	5	Older Complex/Large Sawtimber	>70% canopy cover, overstory trees >16" DBH dominant. Multiple canopy layers common

\* layer cover is the percent of the forest floor covered by the vertical projection of each vegetation layer (overstory, midstory, etc.)

\*\* canopy cover is the overstory and midstory combined.

Where FFMB species are found depends in part on the structure and arrangement of the live vegetation within the forest. Some species prefer a closed canopy, where little sun reaches the forest floor and understory vegetation is sparse. Other species prefer an open canopy with very dense understory or ground cover, and still other species use small gap openings within a broader closed canopy.

### OVERSTORY (>30')

Dominant Species	Layer Cover	Composition	Canopy Height	Gaps Present?
	Very Low (<5%) Low (5-30%) Medium (30-70%) High (>70%)	H (>75% HW) HS (50-75% HW) SH (50-75% SW) S (>75% SW)	0-10' 10-30' 30-60' >60'	Y or N How many? _____ Approx. size? <.25 acres 0.25-0.5 acres 0.5-1 acres 1-2 acres >2 acres
List in order of relative dominance. In hardwoods, be sure to note softwood inclusions, even if only a minor component.	Estimate % of forest floor covered by the vertical projection of the overstory layer and circle one. See guide below.	Circle one.	Height range of dominant and co-dominant trees. Circle one.	Estimate how many per acre or % of stand with gaps. Note the average gap size.

### MIDSTORY (6-30')

Dominant Species	Layer Cover	Composition	CANOPY COVER (>6')
	Very Low (<5%) Low (5-30%) Medium (30-70%) High (>70%)	H (>75% HW) HS (50-75% HW) SH (50-75% SW) S (>75% SW)	Very Low (<5%) Low (5-30%) Medium (30-70%) High (>70%)
Same as above but for midstory layer.	Same as above but for midstory layer.	Same as above but for midstory layer.	The percent of the forest floor covered by the vertical projection of all vegetation over 6' (overstory cover + midstory cover – overlap).

### UNDERSTORY (1-6' woody material)

Dominant Species	Layer Cover	Layer Cover
	Very Low (<5%) Low (5-30%) Medium (30-70%) High (>70%)	Very Low (<5%) Low (5-30%) Medium (30-70%) High (>70%)
Same as above but for understory layer.	Same as above but for understory layer.	For ground cover layer.

Guidance for estimating % cover/closure (view up through layer to sky):





The dead components within a forest stand are important to many FFMB species, as well as to other forest wildlife. The insects attracted to dead and decaying wood can provide an abundant food source, and the structure of dead wood in the forest (especially snags) provides nesting and resting sites. Litter and other fine woody material on the forest floor provides foraging opportunities, and for some species, places to nest.

SNAGS/CAVITY/DECAY TREES:	COARSE WOODY MATERIAL (CWM)	FINE WOODY MATERIAL (FWM)	HARDWOOD LEAF LITTER
# Small (<9" DBH): _____	High, >20 pieces (abundant throughout, difficult to walk in places)	High, >5 piles	Adequate (>1.5" thick during spring and summer)
# Medium (9-12" DBH): _____		Medium, 1-4 piles	
# Large (12-18" DBH): _____		Low, none	Not Adequate (<1.5" thick during spring and summer)
# Very Large (>18" DBH): _____			Not Applicable (S stands)
Count # >6' tall: Snags = standing dead/dying tree Cavity = alive/dead tree w/nest holes; Decay = live trees with decay or cull sections suitable for cavity excavation	Count # logs/branches on forest floor >6" diameter and >4' in length or standing <6' tall. Circle one.	Count # piles of small branches/tops/slash. Circle one.	Estimate average leaf litter layer thickness. Circle one.

Invasive plants outcompete native plants, and do not provide the same ecological benefits to FFMB species or other wildlife. The fruits of many invasive plants are not as nutritious as native plants, and in fact, for birds, some act as diuretics. Exotic insects may contribute to significant decline or death of some tree species.

Forested wetlands provide important habitat for many FFMB species. Food may be more abundant in these wetlands, and the structurally complex forest floor around these wetlands provides good nesting and hiding places.

INVASIVE PLANTS	INSECTS AND DISEASE	RIPARIAN AND FORESTED WETLANDS
Species: _____ % Cover: _____		
List in order of relative dominance. Estimate % of forest floor covered by each species.	Record evidence of damaging pests or pathogens.	Note if present in the area.



# Stand Assessment Data Form (Short Version)

Landowner \_\_\_\_\_ Lot \_\_\_\_\_ Date \_\_\_\_\_ Ground Conditions \_\_\_\_\_

Forester \_\_\_\_\_ Stand(s) \_\_\_\_\_ Weather \_\_\_\_\_

Stand ID	Plot ID or GPS	Forest Habitat Association	Stand Structure Class

## Overstory (>30')

Dominant Species	% Cover	Composition	Canopy Height	Gaps?
------------------	---------	-------------	---------------	-------

## Midstory (6-30')

### Canopy Cover

Dominant Species	% Cover	Composition	% Cover
------------------	---------	-------------	---------

## Understory (1-6')

### Ground Cover

Dominant Species	% Cover	% Cover
------------------	---------	---------

## Snags/Cavity/Decay Trees

### Coarse Woody Material

### Fine Woody Material

### Hardwood Leaf Litter

# Small : _____	# Large _____
# Medium: _____	# Very Large: _____

## Invasive Plants

## Insects and Disease

## Riparian and Forested Wetlands

Species	% Cover:
---------	----------

Notes \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# Forest Habitat Association Table

From the management plan table sheet, calculate acres or percentage of property in each stand structure class. For stands not assessed by FFMB, calculate from forest cover type maps or other stand cruise data.

STAND STRUCTURE CLASS*	NORTHERN HARDWOOD	NORTHERN MIXEDWOOD	NORTHERN SOFTWOOD	OAK-PINE	TOTAL
1 Seedling					
2 Sapling					
3a Intermediate Single-aged					
3b Intermediate Two-aged					
4 Maturing/Small Sawtimber					
5 Older/Complex Large Sawtimber					
Total					

Comments:

Property-wide habitat management recommendations:

\* For definitions, see page 53 of *Forestry for Maine Birds: A Guidebook for Foresters Managing Woodlots "With Birds in Mind."*



## Property Summary

## Management Plan Table

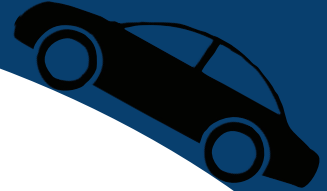
Tally the area, habitat association and structure class for each stand across the property.

[illegible]



StreamSmartMaine.org

*Connecting fish  
and wildlife habitat  
while protecting roads  
and public safety*



## What is Stream Smart?

Stream Smart is a training program and resource for anyone responsible for constructing road-stream crossings. The goal of Stream Smart is to connect fish and wildlife habitat while protecting roads and public safety and to prepare for the large and frequent storm events that have been washing out roads around the state and the northeast.

## Who Benefits?



FISH

Brook trout and other fish need to move up and down the stream.



WILDLIFE

Mink and other wildlife need to follow the fish.



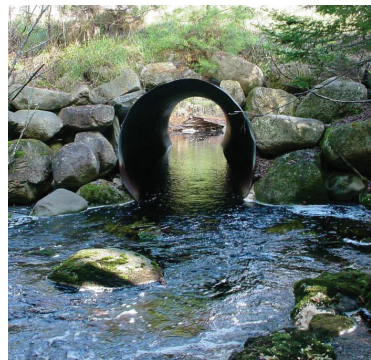
PEOPLE

People need healthy streams and safe roads.

## The Problem



Perched and undersized culverts fragment stream habitat and restrict movement of fish and other wildlife.

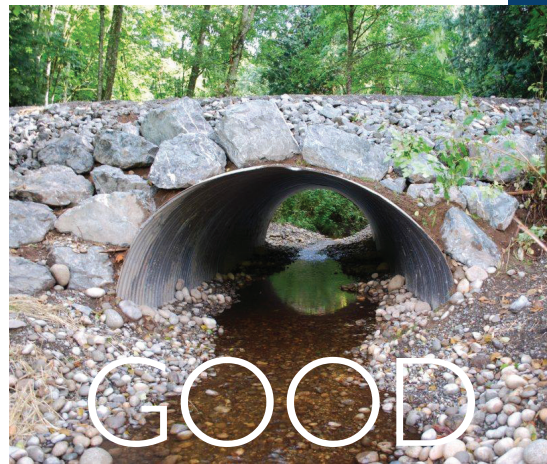


Roads vulnerable to washouts and flooding.

**StreamSmartMaine.org**

Visit the Stream Smart website to learn about implementing a Stream Smart road crossing and to access guidance documents, resources, videos and contact information.





# 4 Stream Smart RULES OF THUMB

## 1. SPAN THE STREAM

Crossing should at least span the entire width of the natural stream.

## 2. SET THE ELEVATION RIGHT

Crossing should match natural stream elevation.

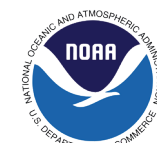
## 3. SLOPE MATCHES THE STREAM

Crossing stream bed should match slope of the natural stream.

## 4. SUBSTRATE IN THE CROSSING

Crossing stream bed should be made up of natural streambed materials.

MAINE  
AUDUBON



US Army Corps  
of Engineers  
New England District



## THE GOLDEN RULE

Let the stream act like a stream.  
Make the road invisible to the stream.

**Forestry for Maine Birds  
Workshop Evaluation**

Location of Workshop: \_\_\_\_\_ Date: \_\_\_\_\_

***Please complete both sides of this evaluation!***

***Feel free to add extra detail or comments to any answer. Your honest feedback helps us to constantly improve our programs – Thanks!!***

**In the ranking system below: 1= horrible and 10= excellent/ exceeded expectations.**

1) *How would you rate the workshop overall?*

1-----2-----3-----4-----5-----6-----7-----8-----9-----10

2) *What were the highlights of the program?*

3) *Were there any weaknesses (if yes, please explain)?*

4) *How would you rate the presenter(s)?*

1-----2-----3-----4-----5-----6-----7-----8-----9-----10

5) *How would you rate the facilities/field site?*

a. *Facilities:* 1-----2-----3-----4-----5-----6-----7-----8-----9-----10

b. *Field Site:* 1-----2-----3-----4-----5-----6-----7-----8-----9-----10

6) *How much did you already know about the following topics **before** the workshop:*

a. *Identifying forest birds:*    ☐ none   ☐ a little   ☐ some   ☐ a lot

b. *Global importance of Maine forests for birds:*   ☐ none   ☐ a little   ☐ some   ☐ a lot

c. *Characteristics of high quality bird habitat:*   ☐ none   ☐ a little   ☐ some   ☐ a lot

d. *Assessing bird habitat:*    ☐ none   ☐ a little   ☐ some   ☐ a lot

e. *Managing woodlots “with birds in mind”:*    ☐ none   ☐ a little   ☐ some   ☐ a lot

f. *Riparian and wetland habitat values for wildlife:*   ☐ none   ☐ a little   ☐ some   ☐ a lot

g. *Stream Smart crossings:*    ☐ none   ☐ a little   ☐ some   ☐ a lot

***Please turn over for more!***



*How much did you learn about the following topics **during** the workshop:*

- a. Identifying forest birds:    ☐ none   ☐ a little   ☐ some   ☐ a lot*
- b. Global importance of Maine forests for birds: ☐ none   ☐ a little   ☐ some   ☐ a lot*
- c. Characteristics of high quality bird habitat:    ☐ none   ☐ a little   ☐ some   ☐ a lot*
- d. Assessing bird habitat:    ☐ none   ☐ a little   ☐ some   ☐ a lot*
- e. Managing woodlots “with birds in mind”:    ☐ none   ☐ a little   ☐ some   ☐ a lot*
- f. Riparian and wetland habitat values for wildlife: ☐ none   ☐ a little   ☐ some   ☐ a lot*
- g. Stream Smart crossings:    ☐ none   ☐ a little   ☐ some   ☐ a lot*

7) *Are you likely to use the information you learned today? If so, how?*

8) *What would you tell someone who was considering taking this workshop?*

9) *How did you find out about the workshop?*

10) *Is there anything else you would like to tell us?*

**Let’s stay in touch! We have lots of great information and opportunities for foresters, loggers and landowners like you. Please provide us with the following information if you’re interested in learning more:**

**Name:** \_\_\_\_\_

**E-mail :** \_\_\_\_\_

**Phone :** \_\_\_\_\_

**Address:** \_\_\_\_\_

*Thank you!*