

## Birds with Silviculture in Mind



### Focal Birds Pocket Guide *for* Massachusetts Foresters

Identification tips, ecological information, and management options for 17 priority forest bird species

Recreated by Mass Audubon from *Birds with  
Silviculture in Mind: Birder's Dozen Pocket Guide  
for Massachusetts Foresters* ©2014.

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## Introduction

This guide is designed to assist foresters who are interested in silviculture that integrates timber and bird habitat management in Massachusetts. Information provided here is intended to support the creation of a bird habitat plan that adds to and enhances a Stewardship plan. Following the bird habitat plan will result in the implementation of on-the-ground, stand-level, management practices that can benefit breeding bird populations while producing timber products.

This guide has been adapted from the Vermont Foresters for the Birds project in consultation with Audubon Vermont. The original Vermont Foresters for the Birds Toolkit was a collaborative project between the Vermont Department of Forests, Parks, and Recreation and Audubon Vermont. This document was created by staff at Mass Audubon, the Massachusetts Department

of Conservation and Recreation, and the Massachusetts Woodlands Institute for use in Massachusetts.

In this guide, we provide considerations and tips for silvicultural options that have the potential to benefit the Focal Bird species, along with information on bird identification and habitat requirements. This guide is intended to be used in conjunction with its companion document: *Managing Forests for Trees and Birds in Massachusetts: A Guide to Habitat Assessments and Silvicultural Practices*.

We assume users of these documents have experience in silviculture for timber production and an interest in managing for bird habitat as well. Our purpose is to provide relevant bird information, and guidance on integrating bird habitat management concepts with accepted and widely applied silvicultural treatments.

## Focal Birds

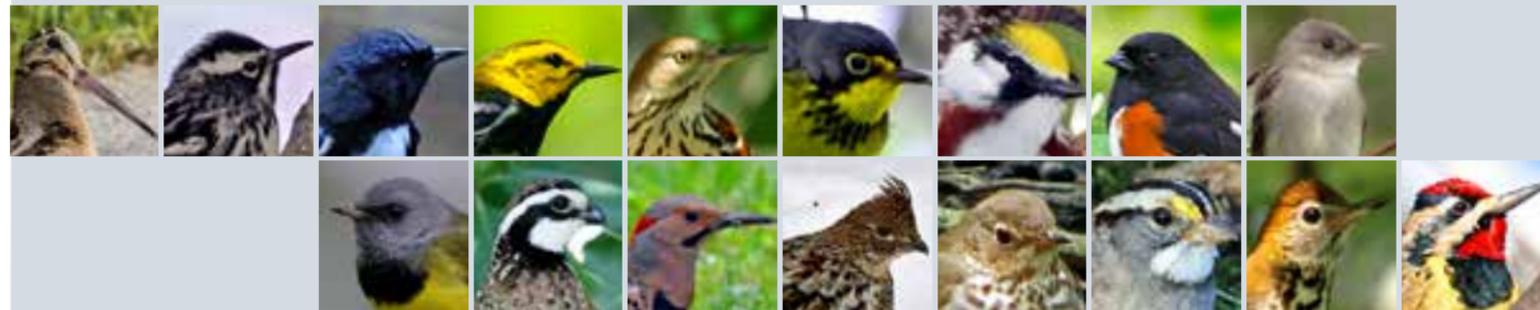
The Focal Birds are a great starting place for novice birders. They are also an excellent entry point for those who are interested in managing forests in Massachusetts with birds in mind, and help to connect silvicultural practices with important components of forest bird habitat. The 17 species featured in this guide were selected because they:

Are a conservation priority in the region, or statewide.

Are relatively simple to identify by sight and/or sound.

Collectively use a wide range of forest types and conditions.

Are likely to respond positively to some common silviculture practices.



## How to use this guide

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Small enough to fit in your pocket, this guide is designed to be a quick field reference that can be used during forest inventory, timber harvest, and operations. It is not a comprehensive field guide or a complete guide to the life history of these 17 species. This is also not a silvicultural guide. Instead, it is intended to provide a concentrated dose of bird-by-bird information that is of interest and value to those who manage forests in Massachusetts and want to do so with birds in mind.

### **ID Tips**

Describes the most distinctive and identifying field marks for males of the species during breeding season. Note that coloration and patterning can vary between males and females, juveniles and adults, and breeding and non-breeding adults.

### **Song**

Describes the most common male song that is used during breeding season to attract a mate and/or defend a territory. Birds often sing more than one song, and individuals may have their own variations or regional dialects. Males and females also often have other vocalizations or calls that can be recognized with additional practice.

### **Habitat**

Describes the preferred, highest quality breeding habitat of the species where it is likely to have the greatest reproductive success. Birds often use lower quality habitat when high-quality habitat is not available. Species may also change their habitat preferences during different life stages and seasons, such as after fledging, before and after breeding, and during migration.

Drawings of habitat features important to each species are provided, along with a simple breeding habitat schematic that highlights important attributes for a quick visual reference. A key to these habitat icons can be found at the end of the guide on pages 50-51.

### **Territory**

Refers to the area a male defends during the breeding season. Territory size is often dependent on the quality of the habitat, with smaller territories being possible in higher quality habitat. During the breeding season, some species may restrict their movements to stay entirely within their territories. However, most species require a larger area than their territory for foraging. Although potentially very useful for making management decisions, these area requirements are often difficult to calculate since they are dependent on so many variables.

### Food

Refers to the main diet and foraging habits and habitats of the species during the breeding season. Diets and foraging habits can vary during different life stages and seasons, such as after fledging, before and after breeding, and during migration.

### Silvicultural Considerations

The *Desired Condition* describes the forest habitat condition that is most desirable for each species and is followed by a table of tips and considerations for silvicultural options that have the potential to create or enhance habitat for the species. This section is meant to be used as a quick reference for foresters in the field who would like ideas for how to protect or enhance habitat for particular species or are wondering how a particular treatment may impact a species.

### Non-Native Invasive Plant Species

Non-native, invasive plants, such as bush honeysuckles, buckthorn, autumn olive, and Japanese barberry, present a variety of threats to forest health in Massachusetts. Although some species of native forest birds successfully use these shrubby, woody plant species as nesting sites and eat their fruits, the fruits generally have low nutritional value and the invasive plants reduce the diversity of other nesting and foraging options. In some cases, nest success has been shown to be lower in non-natives than in native vegetation. Overall, non-native, invasive plant species degrade the quality of native forest bird habitat in our region. Consideration and control of non-native, invasive plant species should be a management objective for every forester practicing in Massachusetts, and may affect opportunities for implementing silvicultural treatments discussed in this publication and its companion document.

### Notes on Massachusetts editions

In 2014 the Massachusetts team adapted the Vermont Foresters for the Birds documents to address the conservation needs in forests of Massachusetts west of the Connecticut River. In 2016 the program expanded statewide, and this edition includes a few additional Focal Birds to better represent the conservation needs of each region. Also, silvicultural options have been simplified and grouped into three levels of harvest intensity, giving foresters more flexibility to achieve timber and habitat management goals as they see fit. Suggestions within each category of harvest intensity are listed under Compatible Silvicultural Treatments.

### References

Fish, J., W. Sweetser Ferris, P. Grima, J. Morse, S. Sylvester, F. Clark, M. Downey, D. Hutcheson, A. Wright-Hunter, M. Servison, J. Walsh, and W. Petersen. 2014. "Birds with Silviculture in Mind: Birder's Dozen Pocket Guide for Massachusetts Foresters." Mass Audubon, Massachusetts Department of Conservation and Recreation.

Hagenbuch, S., K. Manaras, J. Shallow, K. Sharpless, J. Shallow, and M. Snyder. 2011. "Birds with Silviculture in Mind: Birder's Dozen Pocket Guide for Vermont Foresters." Audubon Vermont and the Vermont Department of Forests, Parks and Recreation.

The bird identification and habitat information in this guide was taken primarily from *The Birds of North America*, a web resource managed by the Cornell Lab of Ornithology. The information in the *Silvicultural Considerations* section reflects our own application of the research in bird habitat requirements and their responses to silviculture, along with our personal knowledge developed from field experience. By nature, research of these topics is ongoing, and there are still many unanswered questions. This information represents our best estimate of how silvicultural treatments will influence and benefit the Focal Birds. We anticipate that recommendations will evolve as our understanding of how birds respond to silvicultural treatments advances.

Please contact Mass Audubon for a complete list of references used in the creation of this guide.

### Acknowledgements

*Funding for adapting this publication to Massachusetts was provided through the DCR Working Forest Initiative.*

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*Thanks to all of the foresters participating in the Foresters for the Birds program, who provided feedback on the original document.*

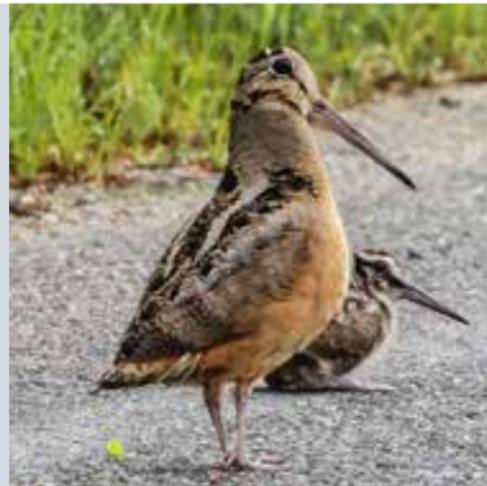
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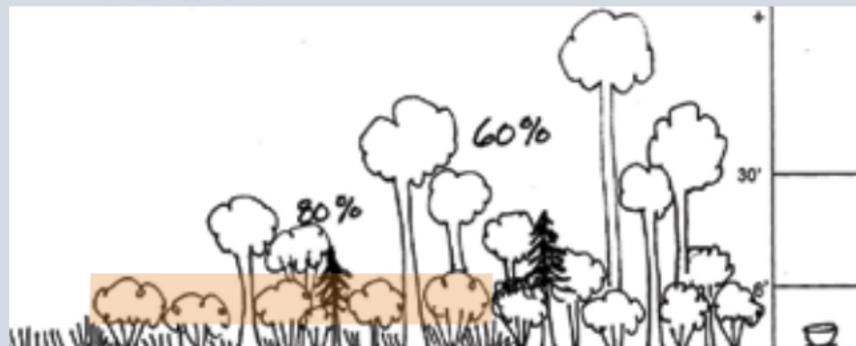
# American Woodcock

AMWO



SE C W

*Scolopax minor*



**ID Tips** A plump bird with a long bill, no neck, and short legs; mottled cryptic coloration.

**Song** A nasal beeping *peent* heard mostly at dusk; also twittering wing sound when in flight.

**Habitat** Hardwood or mixedwood forest matrix with a mix of openings and young forest in early stages of regeneration. Uses habitats in the following categories depending on activity, time of day, and season: see opposite page.

**Territory** Males defend peenting areas in singing grounds with spacing between birds  $\geq 150$  feet. Birds form small clusters in other habitats and are not territorial.

**Nest** Scrape on ground in dead leaves.

**Food** Primarily earthworms; also eats various insects and larvae, snails, millipedes, centipedes, spiders, and seeds.

## Silvicultural Considerations

**Desired Condition** Maintain or create hardwood or mixedwood forest matrix with a mix of openings and young forest in early stages of regeneration, preferably near an alder swale or other shrub wetland.

Due to the complexity of the habitat requirements and options for management, for silvicultural guidelines please refer to the Woodcock Conservation Plan prepared by the Wildlife Management Institute available at [www.timberdoodle.org](http://www.timberdoodle.org).

Management decisions will be based on existing conditions

	Habitat
Singing grounds	Forest openings, fields, and regenerating fields that are at least 0.5 acres in size and less than 300 feet from diurnal cover. Here males perform display and courtship activities in the spring.
Diurnal Cover	Hardwood or mixedwood forest with moderately open canopy (about 60% cover) and dense shrub layer (about 80% cover). Prefers sites with alder, birch, and aspen species near singing ground with moist soil and an abundance of earthworms.
Nocturnal Cover	Regenerating fields and pastures at least 3-5 acres in size with shrubby, dense cover for roosting.
Nesting and brood-rearing habitat	Young, dense hardwood sapling stands near singing grounds and diurnal cover with moist soil and an abundance of earthworms.

## Black-and-White Warbler

BAWW



⊙ ⊕ SE CW

*Mniotilta varia*



**ID Tips** Body streaked with bold black and white stripes; black wings highlighted by two wide, white wing-bars.

**Song** Males sing a high, thin, mechanical, repetitive song of *weesa weesa weesa weesa*. Typically lasts 3 seconds.

**Habitat** Partially open mature or second-growth hardwood and mixedwood forests with 70% canopy cover; also uses swampy forests. Requires high density of large (>12.6" DBH) trees and a dense understory (0'-5' layer). Likes a high density of hardwood saplings and is negatively associated with pine saplings. Uses early successional habitat during post-fledging period.

**Nest** Open cup on ground against shrub, tree, rock, or stump; well-hidden. Composed of dry leaves, coarse grass, strips of inner bark, pine needles, and rootlets; lined with finer grasses, mosses.

**Food** Like a nuthatch, forages mainly for insects and caterpillars along the trunks and limbs of trees.

### Silvicultural Considerations

**Desired Condition** Maintain or create hardwood or mixedwood forest matrix with a mix of openings and young forest in early stages of regeneration (<20 years old), preferably near an alder swale or other shrub wetland.

- ⚠ Forest fragmentation should be avoided.
- ⚠ As a breeding species, typically absent from woodlots under 18.5 acres.

Management decisions will be based on existing conditions

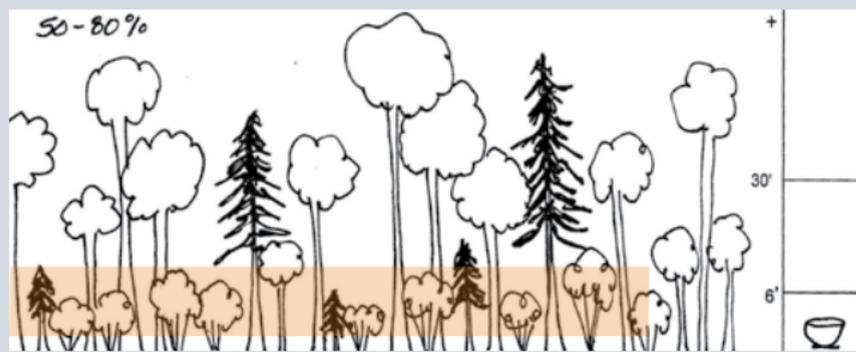
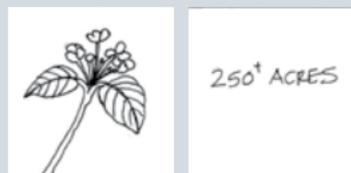
Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
<b>Option 0</b> Do nothing	<ul style="list-style-type: none"><li>• Increase dead woody material</li><li>• Control invasive plants</li></ul>	
<b>Option 1</b> Low intensity	<ul style="list-style-type: none"><li>• Crop Tree Release – canopy gap formation</li><li>• Variable Retention Thinning</li></ul>	Increase number of large-diameter trees in the stand, create small patches of regeneration.
<b>Option 2</b> Moderate intensity	<ul style="list-style-type: none"><li>• Shelterwood with Reserves</li></ul>	Results in dense regeneration that may be used during the post-fledging period. Best used to regenerate hardwoods or mixedwoods.
<b>Option 3</b> High intensity	<ul style="list-style-type: none"><li>• Clearcut with Retention</li><li>• Clearcut with Reserves</li></ul>	Results in dense regeneration that may be used during the post-fledging period. Retain legacy trees.

## Black-throated Blue Warbler

BTBW



*Setophaga caerulescens*



**ID Tips** Deep blue on top with black mask and throat; white wing-patch “handkerchief.”

**Song** A thick and buzzy *I’m-so-la-zeee* with endnote rising.

**Habitat** Large, continuous tracts (250+ acres) of hardwood or mixedwood with 50%-80% canopy cover and a dense understory (0’-5’ layer) of hobblebush and/or small saplings of sugar maple, American beech, striped maple, and softwoods.

**Nest** Open cup of bark strips held together with spider web and saliva placed in the fork of a sapling or shrub in 0’-5’ layer.

**Food** Insectivorous, feeding largely on moth and butterfly larvae and adults.

### Silvicultural Considerations

**Desired Condition** Maintain or create hardwood and mixedwood stands with 50%-80% canopy cover and a dense understory (0’-5’ layer).

Management decisions will be based on existing conditions

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
<b>Option 0</b> Do nothing	<ul style="list-style-type: none"><li>• Increase dead woody material</li><li>• Control invasive plants</li></ul>	
<b>Option 1</b> Low intensity	<ul style="list-style-type: none"><li>• Crop Tree Release with Gap Formation</li><li>• Small Group and Single Tree Selection</li><li>• Variable Retention Thinning</li></ul>	Keep group width <2x the canopy height, protect advanced regeneration.
<b>Option 2</b> Moderate intensity	<ul style="list-style-type: none"><li>• Small Group Selection</li><li>• Shelterwood with Reserves</li><li>• Expanding Gap Shelterwood</li></ul>	Greatest increase in understory density occurs between seed and removal cuttings. Maintain >50% canopy cover.

# Black-throated Green Warbler

BTNW



CW

*Setophaga virens*



250+ ACRES



**ID Tips** Bright yellow face, olive head and back; black throat drips down sides onto white belly; two white wing-bars.

**Song** To attract females, males sing zee-zee-zee-zoo-zee (also known as *I'm-black-throated-green*); to defend territorial boundaries zoo-zee-zoo-zoo-zee (also known as *trees-trees-murmuring-trees*).

**Habitat** Prefers large, continuous tracts (250+ acres) of closed-canopy (>80% cover) softwood or mixedwood forests. Often strongly associated with red spruce in boreal forests and with eastern hemlock in non-boreal forests.

**Territory** Average of 1.6 acres in hemlock-beech forest in New York. Smaller in dense, softwood stands than in mixed-wood stands.

**Nest** Open cup placed in crotch of shrub or within a group of thin vertical stems, typically 3-10 feet off ground.

**Food** Insectivorous; gleans from small branches and needles on conifers.

## Silvicultural Considerations

**Desired Condition** Maintain or create well-stocked, uneven-aged mixedwood and softwood sawtimber stands with >80% canopy cover.

- ⚠️ BTNW avoids road edges and forested openings up to ~650 feet from edge or opening.
- ⚠️ Consider attempting to regenerate softwoods on sites dominated by red maple that may be present as a result of heavy softwood cutting in the past.
- ⚠️ Retain softwood inclusions in hardwood stands; favor red spruce and eastern hemlock.

Management decisions will be based on existing conditions

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
<b>Option 0</b> Do nothing	<ul style="list-style-type: none"> <li>• Increase dead woody material</li> <li>• Control invasive plants</li> </ul>	
<b>Option 1</b> Low intensity	<ul style="list-style-type: none"> <li>• Crop Tree Release with Gap Formation</li> <li>• Single Tree Selection</li> <li>• Variable Retention Thinning</li> </ul>	Enhance weak softwood component or regenerate new softwood. Enhance uneven-aged structure.

# Brown Thrasher

BRTH



🎯 + SE  
*Toxostoma rufum*



**ID Tips** Approximately robin-sized, but more slender with a long tail and short bill. Rufous brown above, and thick dark streaks below. Note the two white wing-bars.

**Song** In the same family as mockingbirds and catbirds, the song is similar. The large repertoire of short phrases are sung back-to-back and repeated twice. *Plant a seed, plant a seed, bury it, bury it, cover it up, cover it up.*

**Habitat** Dense thickets, hedgerows, overgrown clearings within large areas of mixedwood. Dry scrub understory as found in the pine forests in the southeast region of the state. Requires leaf litter to forage in.

**Nest** A bulky cup placed on the ground at the base of a shrub or tree, or low in a fork or tangle of vegetation, usually below 7 feet.

**Food** Primarily beetles and other insects; also fruits and nuts. Forages on ground in leaf litter.

## Silvicultural Considerations

**Desired Condition** Maintain or create areas with 10%-30% canopy cover, and high density of woody stems in the understory. Area should be  $\geq 2.5$  acres.

Management decisions will be based on existing conditions

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
<b>Option 0</b> Do nothing	<ul style="list-style-type: none"> <li>Increase dead woody material</li> <li>Control invasive plants</li> </ul>	
<b>Option 2</b> Moderate intensity	<ul style="list-style-type: none"> <li>Shelterwood</li> <li>Shelterwood with Reserves</li> </ul>	Ideal habitat will occur when 10%-30% canopy cover occurs.
<b>Option 3</b> High intensity	<ul style="list-style-type: none"> <li>Clearcut with Retention</li> <li>Clearcut with Reserves</li> </ul>	Retain native shrubs for nesting structure.

# Canada Warbler

CAWA

SECW

*Cardellina canadensis*



**ID Tips** Necklace of black stripes on bright yellow throat and belly; complete white eye-ring.

**Song** Often has soft introductory chips, then *I'm-IN-here, but-you-CAN'T-SEE-ME*.

**Habitat** Most abundant in moist, mixedwood forests with a 50%-70% canopy cover and dense understory (0'-5') and midstory (6'-30'). Often found in swamps, riparian areas, and upland forests with mossy hummocks, root masses, and downed logs.

**Nest** Open cup on or near ground on mossy hummock, stump or log, or upturned tree roots.

**Food** Flying insects and spiders.

## Silvicultural Considerations

**Desired Condition** Maintain or create mixedwood stands with 50%-70% canopy cover, a dense understory (0'-5') and midstory (6'-30'), and an uneven forest floor.

- ⚠️ Leave as much woody debris on-site as possible, and do not disturb tip-ups or logs in or near wet areas during harvest.
- ⚠️ Avoid operating in forested wetlands and riparian areas.
- ⚠️ Retain softwood inclusions in hardwood stands.

Management decisions will be based on existing conditions

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
<b>Option 0</b> Do nothing	<ul style="list-style-type: none"> <li>• Increase dead woody material</li> <li>• Control invasive plants</li> </ul>	
<b>Option 1</b> Low intensity	<ul style="list-style-type: none"> <li>• Crop Tree Release with Gap Formation</li> <li>• Group and Single Trees Selection</li> </ul>	Openings of at least 1 acre in size are more likely to attract a nesting pair.  Most appropriate in hardwood or mixedwood stands.  Desired condition may persist for several years post-removal cuttings.
<b>Option 2</b> Moderate intensity	<ul style="list-style-type: none"> <li>• Expanding Gap Shelterwood</li> <li>• Shelterwood with Reserves</li> </ul>	Retain native shrubs for nesting structure, and small scattered trees for singing perches.

# Chestnut-sided Warbler

CSWA

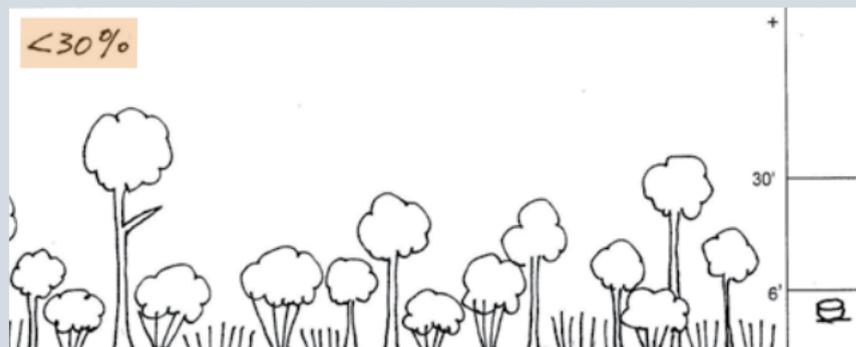


SECW

*Setophaga pensylvanica*



<30%



**ID Tips** Yellow crown, black moustache stripe, and chestnut sides following contour of wings; tail held cocked above wingtips.

**Song** Fast *Please-please-pleased-to-meet-cha* with emphatic ending.

**Habitat** Young (5-15 years old) hardwood forest with <30% canopy cover and dense shrubs and saplings 3-10 feet high for nesting and foraging. Some larger saplings used as singing perches and to obscure nests.

**Territory** 2-2.5 acres.

**Nest** Open cup placed in crotch of small shrub or within a group of small-diameter, vertical stems less than 6.5 feet off the ground.

**Food** Insectivorous; prefers caterpillars and fly larvae.

## Silvicultural Considerations

**Desired Condition** Maintain or create well-stocked hardwood seedling/sapling stands  $\geq 1$  acre in size with <30% canopy cover.

⚠ Areas that will be maintained as open-canopy, early successional habitat should be cut on a 7-10 year cycle.

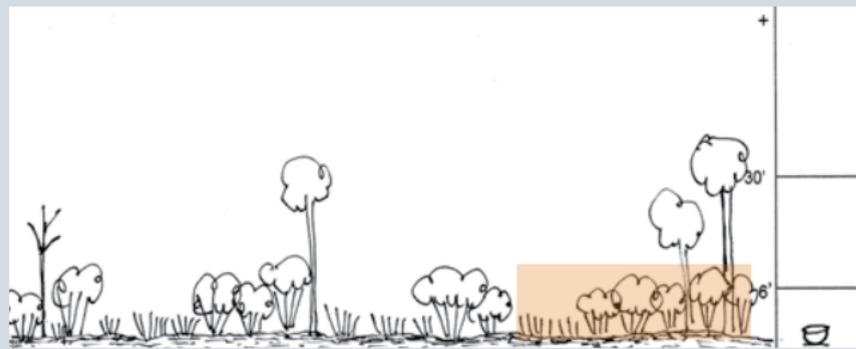
Management decisions will be based on existing conditions

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
<b>Option 0</b> Do nothing	<ul style="list-style-type: none"> <li>Increase dead woody material</li> <li>Control invasive plants</li> </ul>	
<b>Option 2</b> Moderate intensity	<ul style="list-style-type: none"> <li>Small Group Selection</li> <li>Shelterwood with Reserves</li> <li>Shelterwood</li> </ul>	Openings of at least 1 acre in size are more likely to attract a nesting pair.  Most appropriate in hardwood or mixedwood stands. Desired condition may persist for several years post-removal cuttings.
<b>Option 3</b> High intensity	<ul style="list-style-type: none"> <li>Clearcut</li> <li>Clearcut with Reserves</li> </ul>	Retain native shrubs for nesting structure, and small scattered trees for singing perches.



⊙ + SECW

*Pipilo erythrophthalmus*



**ID Tips** Bold, sooty black above and on throat; warm rufous sides and white belly. Shows white in the tail in flight.

**Song** Song is a loud *drink-your-teeeea!* lasting about 1 second. Call is a bold *che-wink*.

**Habitat** Occupies early successional open or edge habitats; requires dense brushy understory (0'-5' layer) and well-developed litter layer. Open-canopy (~20% cover) woodlands required.

**Territory** 0.65 acres in pine barrens in southeastern Massachusetts; 4 acres in moist oak forests and 3 acres in dry pine-oak forests in New Jersey.

**Nest** On or near ground in brushy cover or low in a shrub. Open cup made of bark strips, grapevine bark, twigs, dead leaves, and leaf stems. Lined with fine grasses, rootlets, or animal hair.

**Food** Omnivorous; seeds, fruits, and invertebrates. Often scratches noisily through leaf litter.

**Silvicultural Considerations**

**Desired Condition** Maintain young forest habitat with few standing trees and dense brushy understory. This species will benefit from larger (>5 acres), more complete cuts.

⚠ Areas that will be maintained as open-canopy, early successional habitat should be cut on a 7-10 year cycle.

Management decisions will be based on existing conditions

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
<b>Option 0</b> Do nothing	<ul style="list-style-type: none"> <li>Increase dead woody material</li> <li>Control invasive plants</li> </ul>	
<b>Option 2</b> Moderate intensity	<ul style="list-style-type: none"> <li>Shelterwood with Reserves</li> </ul>	Gaps and/or open midstory create foraging opportunities
<b>Option 3</b> High intensity	<ul style="list-style-type: none"> <li>Expanding Gap Shelterwood</li> <li>Shelterwood with Reserves</li> </ul>	

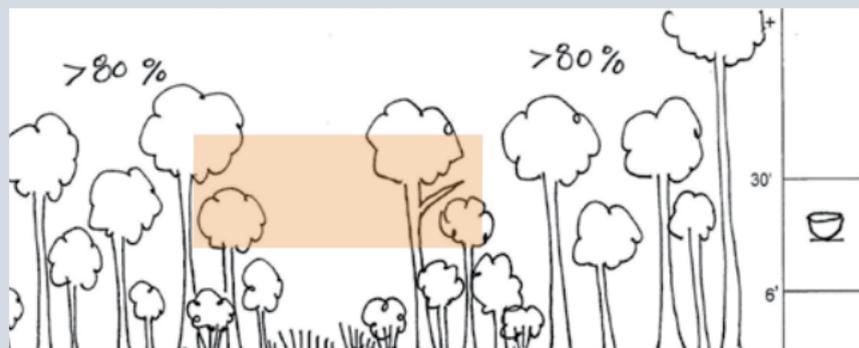
## Eastern Wood-pewee

EAWP



SE C W

*Contopus virens*



**ID Tips** A flycatcher; slender, small headed, and grayish-olive above with dull, white wing-bars; “sallies” for insects (flying out from perch and then back again).

**Song** Plaintive *pee-ahh-weee*.

**Habitat** Hardwood forests with closed (>80%) canopy cover and open midstory (6'-30' layer) near openings and edges.

**Territory** Variable: 1.4-3.1 acres in lowland forest in Illinois and average of 19.3 acres in forest stands in Wisconsin.

**Nest** Shallow cup of woven grass covered on outside with lichens placed on the horizontal limb of a tree.

**Food** Insectivorous; primarily catches flying insects taken in the air on forays from a prominent perch.

## Silvicultural Considerations

**Desired Condition** Maintain or create hardwood pole/sawtimber stands with >80% canopy cover, gaps, and open midstory (6'-30' layer) near forest openings and edges.

Management decisions will be based on existing conditions

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
<b>Option 0</b> Do nothing	<ul style="list-style-type: none"><li>• Increase dead woody material</li><li>• Control invasive plants</li></ul>	
<b>Option 1</b> Low intensity	<ul style="list-style-type: none"><li>• Crop Tree Release with Gap Formation</li><li>• Variable Retention Thinning</li></ul>	Gaps and/or open midstory create foraging opportunities
<b>Option 2</b> Moderate intensity	<ul style="list-style-type: none"><li>• Expanding Gap Shelterwood</li><li>• Group and Single Tree Selection</li></ul>	

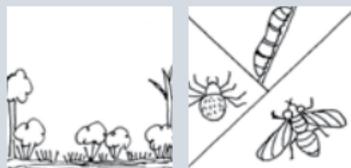
# Mourning Warbler

MOWA



+ W

*Geothlypis philadelphia*



**ID Tips** Olive green on the back and wings, rich yellow below. Both sexes have a gray hood covering the head, and the males have a black breast.

**Song** A rhythmic and rolling *chirry chirry chirry, chorry chorry*. A series of *chirry* phrases always come before the *chorry* phrases, and are higher pitched.

**Habitat** Colonizes sites 1-3 years post-disturbance, declining after 10 years, with a dense undergrowth of mixed trees, fern and *Rubus*. Most nesting sites are in higher elevations (>1,000 ft), and on a slight slope. Canopy cover <50%.

**Territory** 1-2 acres.

**Nest** Open cup with fine roots, grasses, and hair lining an outer shell of bark, leaves, grasses, and weed stalks. Generally placed on or near ground.

**Food** Insectivorous; forages while hopping among branches, usually less than 10 feet high.

## Silvicultural Considerations

**Desired Condition** Maintain or create conditions with <50% canopy cover and a dense understory of brambles, ferns, and mixedwood tree regeneration. If possible, treatment areas should be 10 acres or greater, but will respond positively to smaller treatments.

- ⚠ Management in forests with a spruce or fir component is especially desirable.
- ⚠ Areas maintained as habitat should be treated on a 7-10 year cycle.

Management decisions will be based on existing conditions

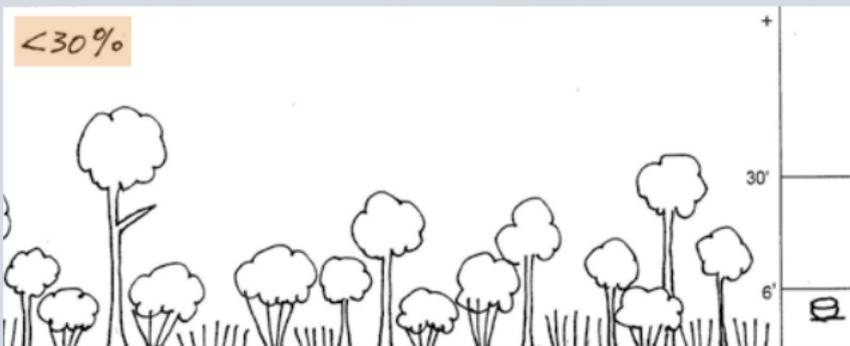
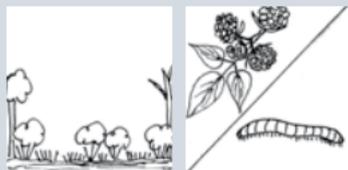
Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
<b>Option 0</b> Do nothing	<ul style="list-style-type: none"> <li>• Increase dead woody material</li> <li>• Control invasive plants</li> </ul>	
<b>Option 2</b> Moderate intensity	<ul style="list-style-type: none"> <li>• Shelterwood, Shelterwood with Reserves</li> <li>• Patch Selection</li> </ul>	Good habitat can exist in many stages of shelterwood when canopy cover is <50%
<b>Option 3</b> High intensity	<ul style="list-style-type: none"> <li>• Clearcut</li> <li>• Clearcut with Reserves</li> <li>• Clearcut with Retention</li> </ul>	

# Northern Bobwhite

NOBO



🎯 + SE  
*Colinus virginianus*



**ID Tips** A small (10 inches), ground-dwelling, round chicken-like bird with short legs and a short tail. Body intricately marked with browns and rusty reds, and a striking, bold pattern on the head.

**Song** An emphatically whistled *bob white*, with the second phrase often ascending in pitch.

**Habitat** A mosaic of small (2-12 acres) patches of various early successional habitats including small fields with brushy edges and hedgerows, open pine oak forests with shrubs and herbaceous cover, all within the same 30 acres or so.

**Territory** Social. Family groups form flocks during the breeding season, and larger coveys of usually 10-15 individuals during the rest of the year.

**Nest** A scrape or depression in the ground lined with grasses and dead vegetation. An arch of weeds and grasses are woven above to conceal it.

**Food** Leaves and seeds, supplemented by insects.

## Silvicultural Considerations

**Desired Condition** Create open conditions with <50% canopy cover in upland pine and mixedwood stands in close proximity to fields and brushy areas. Frequent disturbances (1-5 years) to small patches of the understory from mechanical treatments or prescribed fire is desirable.

- ⚠️ Allow the corners and edges of fields to grow into natural brushy cover.
- ⚠️ Some woody cover is essential to keep the ground in some areas snow free for foraging.
- ⚠️ Prescribed burns can be particularly important to rejuvenate herbaceous vegetation.

Management decisions will be based on existing conditions

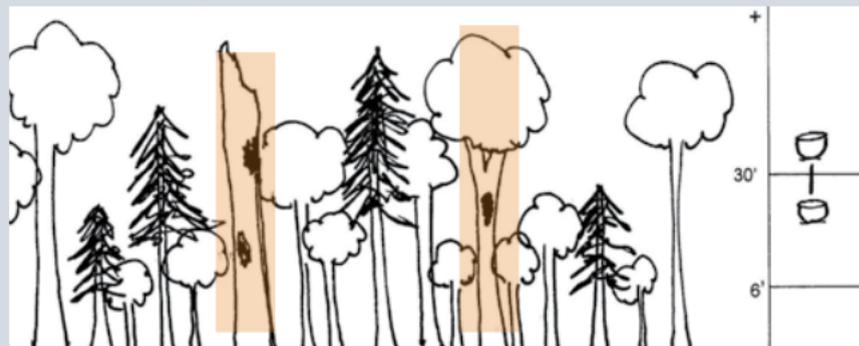
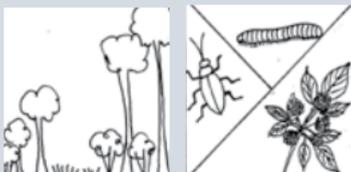
Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
<b>Option 0</b> Do nothing	<ul style="list-style-type: none"> <li>• Increase dead woody material</li> <li>• Control invasive plants</li> </ul>	
<b>Option 2</b> Moderate intensity	<ul style="list-style-type: none"> <li>• Small Group Selection</li> <li>• Shelterwood, Shelterwood with Reserves</li> <li>• Expanding Gap Shelterwood</li> </ul>	
<b>Option 3</b> High intensity	<ul style="list-style-type: none"> <li>• Clearcut with Reserves</li> <li>• Clearcut with Retention</li> </ul>	Retention of some trees is important to keep snow off the ground for foraging.

# Northern Flicker

NOFL



SEC  
*Colaptes auratus*



**ID Tips** A large woodpecker with a gray-brown head. Body has attractive black spots, bars, and scallops over an olive yellow background. Shows a flashy white rump in flight.

**Song** Primary vocalizations are a loud, emphatic *peah*, and a rapid *kikikikikikiki* (similar to Pileated Woodpecker, but sustained for longer and not descending at end).

**Habitat** Forest edge and open woodlands. These areas include flooded or burned areas with many snags, woodlots, and settled areas in suburbs, small towns, or even cities. Included as a Focal Bird to represent cavity nesters in the central and southeast ecoregions.

**Territory** Defends a small area around nest site, but not food resources. Density of breeding pairs largely related to the density of snags and cavity trees.

**Nest** A bed of woodchips within a tree cavity, usually in a dead tree or dead portion of tree.

**Food** Insects, mostly ants. Will also eat fruit and seeds, especially in the winter.

## Silvicultural Considerations

⚠ Generally avoids deep mature woods.

**Desired Condition** Create snags  $\geq 13$  inches DBH in open woodlands and forest edges. Retain any existing snags.

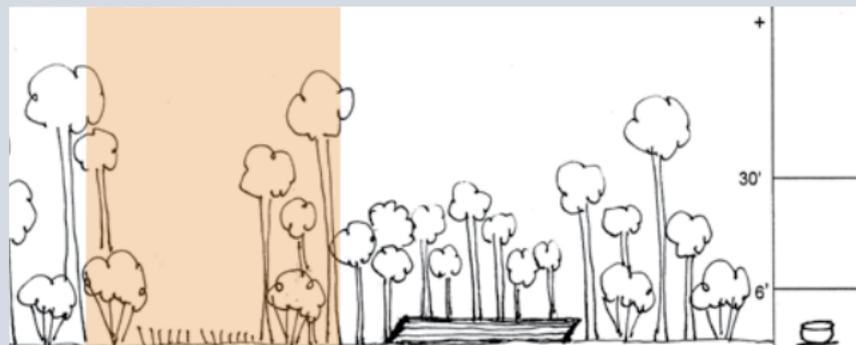
Management decisions will be based on existing conditions

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
<b>Option 0</b> Do nothing	<ul style="list-style-type: none"> <li>Increase dead woody material, especially snags</li> <li>Control invasive plants</li> </ul>	
<b>Option 2</b> Moderate intensity	<ul style="list-style-type: none"> <li>Shelterwood, Shelterwood with Reserves</li> <li>Patch Selection</li> </ul>	Retain cavity trees and snags. Create snags where lacking.
<b>Option 3</b> High intensity	<ul style="list-style-type: none"> <li>Clearcut</li> <li>Clearcut with Reserves</li> <li>Clearcut with Retention</li> </ul>	Retain cavity trees and snags. Create snags where lacking.

**Ruffed Grouse** (also known as Partridge) RUGR



⊙ + SECW  
*Bonasa umbellus*



**ID Tips** Chicken-sized game bird; intricately patterned with dark bars and spots on either a reddish-brown or grayish background; tail thinly barred with one thick black bar near the tip; crested head.

**Song** In spring male produces a low, rhythmic “drumming” sound on downed timber.

**Habitat** Closely associated with quaking aspen; brushy, mixed-age woodlands, successional to mature hardwood and mixed forests. Dense understory (0'-5' layer) and fairly open herbaceous ground cover needed for hens with broods. Males require drumming sites in dense hardwood saplings. More mature woodlands used in winter.

**Nest** An excavated bowl on dry ground under dense cover at the base of a tree or solid object; lined with bits of vegetation; very often near opening and close to a water source.

**Food** Insects, fruit, leaves; buds of birch, aspen, hazel, hophornbeam, and cherry in winter.

**Silvicultural Considerations**

⚠ Requires presence of small clearings (<1 acre).

**Desired Condition** Maintain or create hardwood or mixedwood forest matrix with a mix of openings and young forest in early stages of regeneration (<20 years old). Retain downed logs for drumming sites.

Management decisions will be based on existing conditions

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
<b>Option 0</b> Do nothing	<ul style="list-style-type: none"> <li>Increase downed woody material</li> <li>Cut a large aspen to get root sprouts</li> <li>Control invasive plants</li> </ul>	
<b>Option 1</b> Low intensity	<ul style="list-style-type: none"> <li>Crop Tree Release with Canopy Gap Formation</li> <li>Variable Retention Thinning</li> <li>Small-Group and Single-Tree Selection</li> </ul>	Retain some aspen, cherry, and birch when present.
<b>Option 2</b> Moderate intensity	<ul style="list-style-type: none"> <li>Expanding Gap Shelterwood</li> <li>Shelterwood with Reserves</li> </ul>	Retain coarse woody material in gaps for drumming. Regenerate aspen if present.
<b>Option 3</b> High intensity	<ul style="list-style-type: none"> <li>Clearcut</li> <li>Clearcut with Reserves</li> </ul>	Locate near open, mature woods.



⊕ SECW

*Catharus fuscescens*



**ID Tips** Tawny-brown above, weakly spotted on breast; least spotted of all the thrushes.

**Song** Flute-like and ethereal; ball spiraling down a tube; call an emphatic *veer!*

**Habitat** Damp, hardwood forest with intermediate (30%-80%) canopy cover and a dense understory (0'-5' layer). Often associated with riparian areas, regenerating forests, and beaver wetlands.

**Nest** Cup of dead leaves, bark, and mud-like leaf mold lined with fine fibers placed on ground or in a low shrub or brush pile.

**Food** Insects, spiders, centipedes, pill bugs, and fruits. Primarily forages on the ground, but also in the foliage.

**Silvicultural Considerations**

**Desired Condition** Maintain or create hardwood stands with 30%-80% canopy cover and a dense understory (0'-5' layer) proximate to wetlands and/or riparian areas.

- ⚠️ Maintain closed-canopy buffers along beaver ponds, wetlands, and riparian areas.
- ⚠️ Leave as much slash, stumps, tip-ups, and woody debris on-site as possible to provide shelter and nest sites; delimb trees where felled.

Management decisions will be based on existing conditions

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
<b>Option 0</b> Do nothing	<ul style="list-style-type: none"> <li>• Increase dead woody material</li> <li>• Supplemental planting of soft mast</li> <li>• Control invasive plants</li> </ul>	
<b>Option 1</b> Low intensity	<ul style="list-style-type: none"> <li>• Crop Tree Release with Gap Formation</li> <li>• Group and Single Tree Selection</li> </ul>	Take all opportunities to protect advanced regeneration.
<b>Option 2</b> Moderate intensity	<ul style="list-style-type: none"> <li>• Expanding Gap Shelterwood</li> <li>• Shelterwood with Reserves</li> </ul>	Greatest increase in understory density occurs between seed and removal cuttings. Encourage coppicing if appropriate to enhance understory.

# White-throated Sparrow

WTSP



⊙ ⊕ CW

*Zonotrichia albicollis*



**ID Tips** White throat with yellow in front of eyes; white and black or buff and brown stripes on head; gray chest.

**Song** Clear whistled, *Poor Sam Peabody Peabody Peabody*.

**Habitat** Softwood and mixedwood forests containing young forest openings with <50% canopy cover and dense understory (0'-5' layer) for cover.

**Territory** 0.5-2.5 acres in Ontario. Males are known to forage in a surrounding area at least three times the size of defended territories

**Nest** Open cup placed on or just above ground along the edge of an opening.

**Food** Primarily insects, greens, and fruits foraged from vegetation (low shrubs and lower branches of conifers) and on the ground; also seeds. Prefers to forage along the edges of openings near dense cover.

## Silvicultural Considerations

**Desired Condition** Maintain or create uneven-aged mixedwood and softwood sawtimber stands containing openings with <50% canopy cover and dense understory (0'-5' layer).

- ⚠ Leave as much slash, stumps, tip-ups, and woody material along edges of openings as possible to provide cover.
- ⚠ Maintain closed-canopy buffers along beaver ponds, wetlands, and riparian areas.
- ⚠ Retain softwood inclusions in hardwood stands.
- ⚠ Areas that will be maintained as open-canopy, early successional habitat should be cut on a 7-10 year cycle.

Management decisions will be based on existing conditions

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
<b>Option 0</b> Do nothing	<ul style="list-style-type: none"> <li>• Increase downed wood, including piles of fine woody material</li> <li>• Supplemental planting of soft mast</li> <li>• Control invasive plants</li> </ul>	
<b>Option 2</b> Moderate intensity	<ul style="list-style-type: none"> <li>• Small Group Selection</li> <li>• Expanding Gap Shelterwood</li> <li>• Shelterwood, Shelterwood with Reserves</li> </ul>	Locate groups to release advanced softwood regeneration in hardwood stands. Desired shelterwood condition exists between seed and removal cuttings.
<b>Option 3</b> High intensity	<ul style="list-style-type: none"> <li>• Clearcut with Patch Retention</li> </ul>	White-throated Sparrow is more likely to use retained patches than harvested openings. Retain at least a 0.5-acre patch for every 10 acres harvested.

# Wood Thrush

WOTH

⊙ + SE CW

*Hylocichla mustelina*



**ID Tips** Brown back, heavily spotted on white breast; large thrush a little smaller than an American Robin.

**Song** A flute-like *ee-oh-layyy*, ending in a sound like shattering glass.

**Habitat** Interior and edges of hardwood and mixedwood forest. Prefers stands with canopy >50 feet in height, a diversity of hardwood tree species, moderate midstory closure and shrub density, shade, fairly open forest floor, moist soil, and decaying leaf litter.

**Territory** 0.2-7 acres.

**Nest** Open cup of leaves and grasses lined with mud, placed on lower limb of a tree or shrub 10-13 feet off the ground and well-hidden among leaves in a shady area.

**Food** Mostly soil invertebrates; some fruits. Primarily forages on ground in leaf litter or on semi-bare ground under forest canopy.

## Silvicultural Considerations

**Desired Condition** Maintain or create well-stocked, uneven-aged, sawtimber hardwood stands with >80% canopy cover and moist leaf litter.

- ⚠ WOTH are area sensitive. In a heavily forested (90+%) landscape, a patch of at least 70 acres is needed for successful breeding. Larger patches are needed in less forested landscapes.
- ⚠ Avoid disturbance and desiccation of leaf litter and soil conditions; consider operating in winter.

Management decisions will be based on existing conditions

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
<p><b>Option 0</b> Do nothing</p>	<ul style="list-style-type: none"> <li>• Increase dead woody material</li> <li>• Promote or plant soft mast</li> <li>• Control invasive plants</li> </ul>	
<p><b>Option 1</b> Low intensity</p>	<ul style="list-style-type: none"> <li>• Crop Tree Release with Gap Formation</li> <li>• Small Group and Single Tree Selection</li> <li>• Variable Retention Thinning</li> </ul>	Favor or retain a diversity of hardwood species.

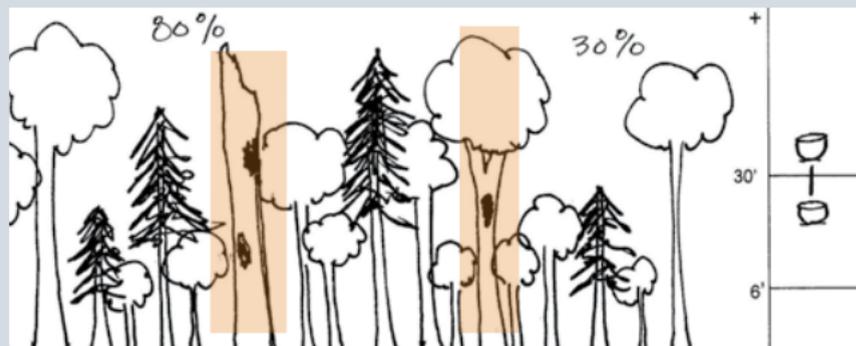
# Yellow-bellied Sapsucker

YBSA



W

*Sphyrapicus varius*



**ID Tips** Messy barring on back; yellowish wash across belly. Vertical white stripe on side distinguishes it from other woodpeckers.

**Song** Drum burst of 5 rapid taps followed by gradually slowing double taps; call a *QUEEah*.

**Habitat** Hardwood and mixedwoods with high percentage of intolerant species, especially aspen and birch. Requires hardwood trees with central decay column for nest cavities.

**Territory** Variable. Average of 5 acres in Ontario.

**Nest** Cavity in dead or live tree with central decay column. Prefers quaking aspen  $\geq 13$  inches DBH infected with the heartwood decay fungus *Fomes igniarius var. populinus*.

**Food** Sap from a diversity of woody plant species, insects, inner bark and cambium layers, fruits, and seeds. Drills and maintains sap wells along trunk below crown and above lowest living branches.

## Silvicultural Considerations

**Desired Condition** Maintain or create hardwood and mixedwood sawtimber stands with 30%-80% canopy cover, and some dead and dry or live hardwood trees with central decay for nest sites.

- ⚠️ Retain as many live and dying aspen and birch  $\geq 13$  inches DBH as possible — particularly along forest edges. Leave snags and cavity trees in clusters or in untreated areas.

- ⚠️ Recruit dry snags through girdling if suitable snags for nesting are lacking.
- ⚠️ Don't cut all large, unmerchantable trees and retain some large, healthy trees that are not hollow or damaged to develop into suitable nest trees in the future.

Management decisions will be based on existing conditions

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
<b>Option 0</b> Do nothing	<ul style="list-style-type: none"> <li>• Increase downed woody material</li> <li>• Create snags through girdling</li> <li>• Control invasive plants</li> </ul>	13+ inch DBH
<b>Option 1</b> Low intensity	<ul style="list-style-type: none"> <li>• Variable Retention Thinning</li> </ul>	Retain existing and potential future nest trees; consider girdling 13+ inch DBH UGS to recruit snags.
<b>Option 2</b> Moderate intensity	<ul style="list-style-type: none"> <li>• Shelterwood</li> <li>• Shelterwood with Reserves</li> </ul>	Desired condition exists between seed and removal cuttings when canopy is 30%-80% closed.
<b>Option 3</b> High intensity	<ul style="list-style-type: none"> <li>• Clearcut with Patch Retention</li> </ul>	Retain existing and potential future nest trees along edges of cut and reserves.  Retain existing and potential future nest trees along edges of cut and retained patches.

## Focal Species Disturbance Associations

Natural Disturbance Regime	Management Objective	Canopy Cover	Deciduous to Mixed Forest	Coniferous to Mixed Forest
Stand-replacing disturbances >2.5 acres in size	Maintain patches of young forest, 5-15 years old, >2.5 acres in size	Open (0%-30%)	Eastern Towhee Chestnut-sided Warbler Mourning Warbler Ruffed Grouse American Woodcock† Brown Thrasher Northern Bobwhite† Northern Flicker	Mourning Warbler Northern Bobwhite†
Canopy gaps and pockets of regeneration 0.25-0.75 acres in size	Create canopy gaps to encourage dense regeneration in pockets 0.25-0.75 acres in size	Intermediate (30%-80%)	Black-and-white Warbler Black-throated Blue Warbler Canada Warbler Eastern Wood-pewee Ruffed Grouse Veery Wood Thrush Northern Flicker	White-throated Sparrow Canada Warbler
Small and infrequent disturbances that maintain an average of >80% canopy cover	Minimize gap size and frequency. Favor large, old trees and snags. Maintain >80% average canopy cover in the stand.	Closed (80%-100%)	Black-and-white Warbler Black-throated Blue Warbler Canada Warbler Eastern Wood-pewee Wood Thrush Yellow-bellied Sapsucker	Black-throated Green Warbler



\* Focal Birds are grouped according to habitat features they strongly associate with. They may be found in a wider variety of conditions than shown here.

† These species require other nearby habitat types in addition to early successional forest.



## Key to Symbols

### Caution!

A consideration or tip that is especially important for this species.

### State of the Birds Ranking

Using the data from the Massachusetts Breeding Bird Atlas 2, Mass Audubon assigned conservation status ranks to the bird species that breed in Massachusetts.

-  Species is likely decreasing in Massachusetts. Continued action/monitoring needed
-  Species is showing a strong decline in Massachusetts. Conservation action urgent.

### Massachusetts Conservation Species of Greatest Conservation Need

A bird species that has been identified by the Massachusetts Division of Fisheries and Wildlife as being in greatest conservation need in the state of Massachusetts due to rarity, population decline, and/or vulnerability to habitat loss from threats such as fragmentation, forest succession, invasive species, and/or conversion.

#### Focal Birds also Listed as Massachusetts Species of Greatest Conservation Need include:

American Woodcock	Mourning Warbler
Black-and-white Warbler	Northern Bobwhite
Brown Thrasher	Ruffed Grouse
Canada Warbler	White-throated Sparrow
Eastern Towhee	Wood Thrush

### Regions

-  Atlantic Coastal Pine Barrens
-  Northeastern Coastal Zone
-  Northeastern Highlands

## Key to Habitat Feature Icons

### Forest Type



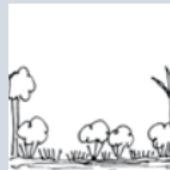
hardwood



mixedwood

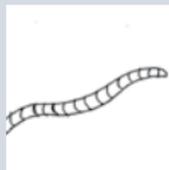


softwood



early successional/  
young forest

### Food



earthworms



moths and  
butterflies



caterpillars



crickets



grasshoppers



spiders



flying insects



beetles



fruits/soft mast



soil  
invertebrates



sap and  
cambium

### Associated Wood Species



alder; birch  
and aspen



quaking aspen



hobblebush



eastern hemlock  
and red spruce



oak

### Other



requires multiple  
habitat types near  
each other



area sensitive;  
requires large  
forested patches



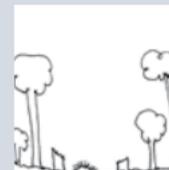
forested  
wetlands



riparian areas



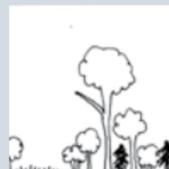
beaver wetlands



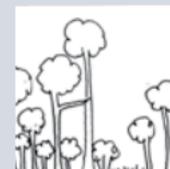
uneven forest  
floor



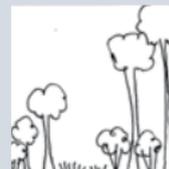
1+ acre  
opening in  
forest matrix



singing perch  
in opening



perch on edge  
of opening



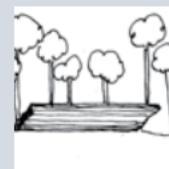
opening/edge



thick leaf litter



snag or  
cavity tree



drumming log

## Atlantic Flyway Eastern Forest Priority Birds Breeding in Massachusetts

This list contains forest bird species that have been determined by the National Audubon Society to be of conservation priority in the Northern Forest Biome and the Eastern Deciduous Forest Biome in the Atlantic Flyway. These species are included because they have a large proportion of their global population within one of the biomes and may be declining in their breeding range. Massachusetts is part of both the Northern Forest Biome and the Eastern Deciduous Forest Biome.

Colors correspond to the species Massachusetts State of the Birds ranking.

- No Action – Strong Increase
- No Action – Likely Increase
- Monitor to Ensure Stability
- Continued Action/Monitoring Needed
- Conservation Action Urgent
- Not enough information to rank

### Young Hardwood and Mixedwood Forest

- American Woodcock\*
- Canada Warbler\*
- Chestnut-sided Warbler\*
- Magnolia Warbler
- Mourning Warbler\*
- Nashville Warbler
- Northern Flicker\*
- Ruffed Grouse\*
- White-throated Sparrow\*
- Eastern Towhee\*
- Least Flycatcher
- White-eyed Vireo
- Blue-winged Warbler
- Carolina Wren

### Mature Hardwood and Mixedwood Forest

- American Redstart
- Blackburnian Warbler
- Black-throated Blue Warbler\*
- Black-throated Green Warbler\*
- Blue-headed Vireo
- Chimney Swift
- Eastern Wood-Pewee\*
- Northern Parula
- Ovenbird
- Purple Finch
- Scarlet Tanager
- Veery\*
- Wood Thrush\*
- Yellow-bellied Sapsucker\*
- Black-and-white Warbler\*

- Northern Saw-whet Owl
- Dark-eyed Junco
- Red-shouldered Hawk
- Tufted Titmouse
- Red-bellied Woodpecker
- Pine Warbler

### Boreal/High Elevation Forest

- Blackpoll Warbler
- Yellow-bellied Flycatcher

### Wetlands and Watercourses

- Alder Flycatcher
- Swamp Sparrow
- Louisiana Waterthrush

\* Focal Birds

To learn more about these species, check out the Massachusetts Breeding Bird Atlas 2, found at [www.massaudubon.org/birdatlas/bba2](http://www.massaudubon.org/birdatlas/bba2).

