Silviculture with Birds in Mind

Birder's Dozen Pocket Guide for Rhode Island Foresters

A project of the Rhode Island Woodland Partnership, Managed by the Rhode Island Resource Conservation & Development Council (RI RC&D Council)

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Cover photos: Bird photos are cited throughout this guide. "Oak Leaves" background photo by Filip Patock, Flickr Creative Commons.

The Forestry for Rhode Island Birds project was adapted from pocket guides made for the original Vermont Foresters for the Birds project; the adapted Massachusetts guide, Focal Birds Pocket Guide for Massachusetts Foresters; and the Maine guide, Forestry for Maine Birds.

Relevant parts of those guides have, with permission, been used as part of the Forestry for Rhode Island Birds project, and authorial information for each of these guides is listed here:

Original Vermont Project: Hagenbuch, S., Manaras, K., Shallow, J., Sharpless, K., & Snyder, M. (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.

Massachusetts Proejct: Ferris, W. S., Fish, J., Grima, P., Ritterson, J., Servison, M., Walsh, J., & Wright-Huntere, A. (2016). Birds with Silviculture in Mind: Focal Birds Pocket Guide for Massachusetts Foresters. Mass Audubon, Massachusetts Woodlands Institute, and Massachusetts Department of Conservation and Recreation.

Maine Project: Gallo, S., Bryan, R., Mahaffey, A., Morrill, R., Morgan, D., Shultz, A., ... & Wiley J. (2017). Forestry for Maine Birds: A Guidebook for Foresters Managing Woodlots "With Birds in Mind. Maine Audubon.

This guide was also written with reliance on the key sources listed below. Other sources have been cited throughout the document.

- Cornell Lab of Ornithology. All About Birds [Online Database]. Retrieved August 2018, from www.allaboutbirds.org.
- Rhode Island Nature Conservancy, Rhode Island Department of Environmental Management, and the University of Rhode Island. (2015). Rhode Island Wildlife Action Plan. Retrieved from http://www.dem.ri.gov/programs/fish-wildlife/wildlifehuntered/swap15.php.
- National Audubon Society. Guide to North American Birds. Retrieved August 2018, from https://www.audubon.org/field-guide/bird/pileated-woodpecker.

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INTRODUCTION

The Rhode Island Birder's Dozen is made up of twelve forest birds that have been identified by the Rhode Island Woodland Partnership. They represent priority habitat types of conservation need in Rhode Island and were selected with the assistance of ornithologists from the University of Rhode Island, the Rhode Island Bird Atlas 2.0, the North American Breeding Bird Survey (BBS), and the Audubon Society of Rhode Island, and in consultation with the 2015 Rhode Island Wildlife Action Plan and data collected from neighboring New England states. These twelve species were selected because they:

Are simple to identify by sight or sound; Collectively use a wide range of forest types and conditions for feeding and for breeding; Are showing a decline in their global breeding populations or are at risk for decline; and Are supported by large tracts of contiguous forest.

The silvicultural options discussed in this document have the potential to affect a wide diversity of forest birds and other wildlife. The Rhode Island Birder's Dozen will be used as species reference points to describe forest management tactics that can support populations of many other species and sustainable woodlot management in Rhode Island.

HOW TO USE THIS GUIDE

This guide is designed to be a field reference that can be used during forest inventory and timber harvest. It is not a comprehensive field guide to the life history of these twelve species, nor is it a comprehensive 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 Rhode Island and want to do so with birds in mind.

The profiles of each species in the Rhode Island Birder's Dozen will include tips on identification; a description of the male bird's most common song during mating season; a description of the species' preferred habitat and territory, including food and nesting preferences; a discussion of the conservation status of the species; and silvicultural considerations that can create habitat for each species.

The following information is included for each bird species:

Identification

Describes the most distinctive and identifying field marks for males of the species during breeding season. Note that coloration and patterning often 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.

Habitat & Territory

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 uses and preferences during different life stages and seasons, such as after fledging, before and after breeding, and during migration. The Habitat Type and Features tables for each species were developed and reviewed by our team of ornithologists. 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 staying 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 a large number of factors.

Nest
Describes the type of nest used by the species and the common location of the nest in the species' preferred habitat.

Food
Refers to the main diet and foraging habitats and habits of the species during the breeding season. Birds' diets and foraging habits often vary during different life stages and seasons, such as after fledging, before and after breeding, and during migration.

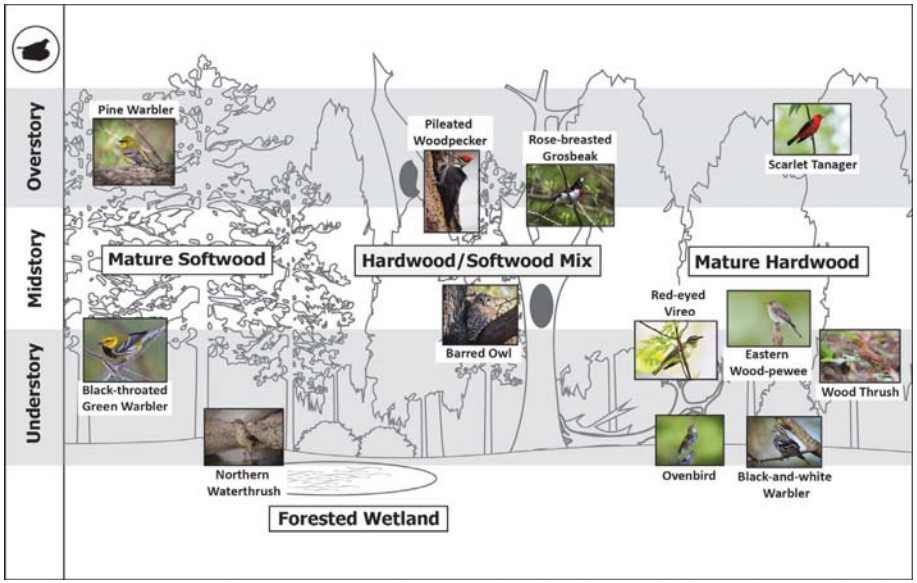
Conservation
Discusses the conservation status of the species, in Rhode Island and the broader New England region. Describes particular threats to species. See Table 25 for population trends for the Rhode Island Birder's Dozen according to the North American Breeding Bird Survey (BBS).

Silvicultural Considerations
Although birds are affected by both the landscape and stand-level changes and management choices, this guide is intended to inform choices made by foresters at the stand-level. The Desired Future 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 on how to protect or enhance habitat for a particular species or are wondering how a particular treatment may impact a species.

Habitat Diagrams
These visualizations of bird habitat show each bird's preferred habitat type, preferred canopy cover (0-30%, 30-80%, or 80-100%), whether the bird utilizes the understory, midstory, and/or overstory, whether the bird prefers large tracts of forested land, and the approximate part of the forest structure where the bird nests. The visuals also show the presence of snags, cavity trees, and water features when appropriate. Habitat Diagrams are color-coded according to the birds' forest type preferences (see key). These were inspired by diagrams appearing in Vermont Foresters for the Birds project; the Focal Birds Pocket Guide for Massachusetts Foresters; and the Forestry for Maine Birds guide. Bird and tree images based on free graphics from Vecteezy.com.

Where in the Woods Are the Rhode Island Birder's Dozen? *Photos in the diagram on the next page appear with credits throughout this pocket guide.*

WHERE IN THE WOODS ARE THE RHODE ISLAND BIRDER'S DOZEN?



Profiles of the Rhode Island Birder's Dozen

SPECIES 1: BARRED OWL

(STRIX VARIA) [BDOW]

Resident Species in Rhode Island

Identification

Large owl with dark brown coloring, white mottling, and a yellow beak. Their undersides have dark vertical brown stripes. These owls have round heads, no ear tufts, and rounded tails.

Song

Not a songbird but makes a distinctive hooting call of 8 to 9 notes in the pattern of “who cooks for you?” that sounds through the forest.

Nest

Barred Owls nest in tree cavities, ranging from 20-40 feet off the ground. They may nest in stick platform nests built by other animals.

Food

Hunt small mammals like squirrels, chipmunks and mice, various birds, amphibians, insects and fish. They hunt mostly at night but occasionally during the day, descending on their prey from an elevated perch.

Image Credit: Scott Martin

Conservation

Has an increasing population in New England and the Mid-Atlantic states according to the North American BBS (see Table 25). Predation from the more aggressive Great Horned Owl is one of the most significant threats to the Barred Owl.

Habitat & Territory

Barred owls make a year-round home most often in mature hardwood forest or mixed forest habitat near water features. They prefer to nest in large tracts of mature forest with tall trees (>19” DBH), habitat most suited to tree cavities and a diversity of small prey.

Table 1: Silvicultural Options for the Barred Owl

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
No Action	Increase dead woody material Control invasive plants	
Low-Intensity Harvest	Variable retention thinning	Increase the number of large diameter trees in the stand and increase the number of snags and cavity trees.
Moderate-Intensity Harvest	Shelterwood with reserves	Retain and recruit large diameter snags and cavity trees for the Barred Owl. Results in dense regeneration that can be used to regenerate mixed hardwood and softwood forest.

Silvicultural Considerations

Desired Future Condition: Prefers contiguous tracts of mixed hardwood and softwood forest with intermediate canopy gaps, large diameter trees, snags and cavity trees, and water features.

Figure 1: Barred Owl Habitat Diagram

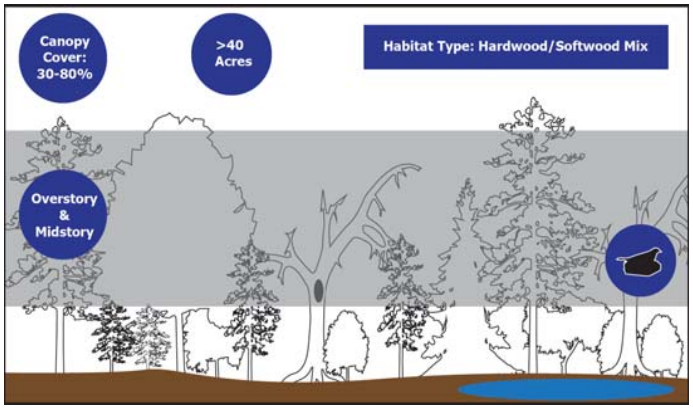


Table 2: Habitat Type and Features Preferred by the Barred Owl

Habitat Type	Hardwood/ Softwood Mix (primary)
Habitat Features	Intermediate (30-80%) Contiguous Forest Blocks (>40 acres) Utilizes Canopy Utilizes Midstory Snags/Cavity Trees Large Diameter Trees Water Features

SPECIES 2: BLACK-AND-WHITE WARBLER

(MNIOTILTA VARIA) [BAWW]

Migratory Species in Rhode Island

Identification

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 weesa. Typically lasts 3 seconds.

Nest

Open cup on ground under broken canopy against shrub, tree, rock, or stump; well-hidden and prefers to nest in damp areas. 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.

Image Credit: Scott Martin

Conservation

Classified as a species of greatest conservation need in Rhode Island and a common nesting species in the state. Nest most commonly in western Rhode Island, most densely in southwest near the Connecticut border. This bird is impacted by forest fragmentation and a useful indicator species when developing plans to protect tracts of contiguous forested habitat. They are also sensitive to some organic pesticides. Audubon's Birds and Climate Change Report lists the Black-and-white Warbler as "climate threatened" and predicts that their summer range will experience an 83% shift from 2000 to 2080 given predicted climate changes in North America (2015).

Habitat & Territory

Partially open mature or second-growth hardwood and mixed forests with 50-80% canopy cover and 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.

Table 3: Silvicultural Options for the Black-and-white Warbler

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
No Action	Increase dead woody material Control invasive plants	
Low-Intensity Harvest	Crop tree release with gap formation Variable retention thinning	Increase the number of large diameter trees in the stand, create small patches of regeneration.
Moderate-Intensity Harvest	Shelterwood with reserves	Results in dense regeneration that may be used in the post-fledging period. Best used to regenerate hardwoods or mixed forests.

Silvicultural Considerations

Desired Future Condition: Maintain or create hardwood or mixed 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, BAWW are typically absent from woodlots under 18.5 acres.

Figure 2: Black-and-white Warbler Habitat Diagram

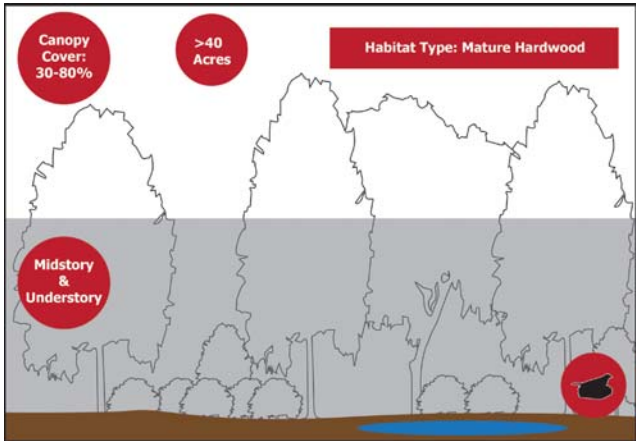


Table 4: Habitat Type and Features Preferred by the Black-and-white Warbler

Habitat Type	Mature Hardwood (primary) Hardwood/ Softwood Mix (secondary)
Habitat Features	Intermediate Canopy (30-80%) Contiguous Forest Blocks (>40 acres) Utilizes Midstory Utilizes Understory Woody Debris

SPECIES 3: BLACK-THROATED GREEN WARBLER

(SETOPHAGA VIRENS) [BTNW]

Migratory Species in Rhode Island

Identification

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

Song

A buzzy, ringing song that males sing persistently during breeding season. 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).

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.

Image Credit:
Dan Pancamo, Flickr Creative Commons

Conservation

Has a decreasing population in New England and the Mid-Atlantic states. Audubon's Birds and Climate Change Report lists the Black-throated Green Warbler as "climate threatened" and predicts that their range will experience a 97% shift from 2000 to 2080 given predicted climate changes in North America (2015).

Habitat & Territory

Prefers large, continuous tracts (>250 acres) of closed-canopy (>80% cover) softwood or mixed forests. Often strongly associated with red spruce in boreal forests and with eastern hemlock in non-boreal forests. Average of 1.6 acres in hemlock-beech forest in New York. Smaller in dense, softwood stands than in mixed stands.

Silvicultural Considerations

Desired Future Condition: Maintain or create well-stocked, uneven-aged mixed and softwood sawtimber stands with >80% canopy cover. This bird avoids forest edges that border non-forested areas, preferring to remain ~650 feet from edge or opening.

Table 5: Silvicultural Options for the Black-throated Green Warbler

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
No Action	Increase dead woody material Control invasive plants	
Low-Intensity Harvest	Crop tree release with gap formation Single tree selection Variable retention thinning	Use to enhance weak softwood component and establish new softwood regeneration. Use to enhance uneven-aged structure.

Consider attempting to regenerate softwoods on sites dominated by red maple which may be present as a result of heavy softwood cutting in the past. Retain softwood inclusions in hardwood stands; favor eastern hemlock.

Figure 3: Black-throated Green Warbler Habitat Diagram

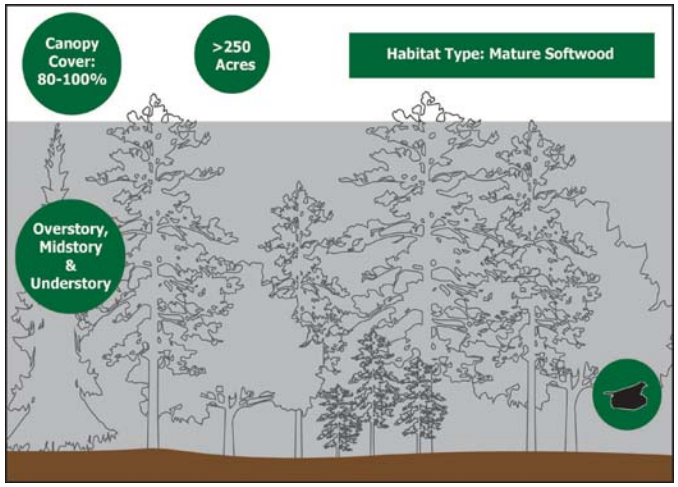


Table 6: Habitat Type and Features Preferred by the Black-throated Green Warbler

Habitat Type	Mature Softwood (primary) Hardwood/ Softwood Mix (secondary)
Habitat Features	Closed canopy (80-100%) Large Contiguous Forest Blocks (>250 acres) Utilizes Canopy Utilizes Midstory Utilizes Understory Large Diameter Trees

SPECIES 4: EASTERN WOOD-PEWEE

(CONTOPUS VIRENS) [EAWP]

Migratory Species in Rhode Island

Identification

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.

Nest

Shallow cup of woven grass covered on outside with lichens placed on the horizontal limb of a tree. Usually 15-70 feet off of the ground.

Food

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

Image Credit:
Kelly Cogan Azar, Flickr Creative Commons

Conservation

Has a decreasing population in New England and the Mid-Atlantic states according to the North American BBS (see Table 25).

Habitat & Territory

Hardwood forests with intermediate or open canopy cover and open midstory (6-30' layer). Variable: 1.4 – 3.1 acres in lowland forest in Illinois and average of 19.3 acres in forest stands in Wisconsin. Prefers patch size of at least 4.5 acres.

Table 7: Silvicultural Options for the Eastern Wood-pewee

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
No Action	Increase dead woody material Control invasive plants	
Low-Intensity Harvest	Crop tree release with gap formation Variable retention thinning Small group (<0.3 ac) and single tree selection	Gaps and/or open midstory create foraging opportunities.
Moderate-Intensity Harvest	Expanding-gap shelterwood Small group (0.5 – 0.75 ac) selection	

Silvicultural Considerations

Desired Future Condition: Maintain or create hardwood pole/sawtimber stands with open to intermediate (0-80%) canopy cover and gaps. Promote open midstory (6-30' layer) near forest openings and edges.

Figure 4: Eastern Wood-pewee Habitat Diagram

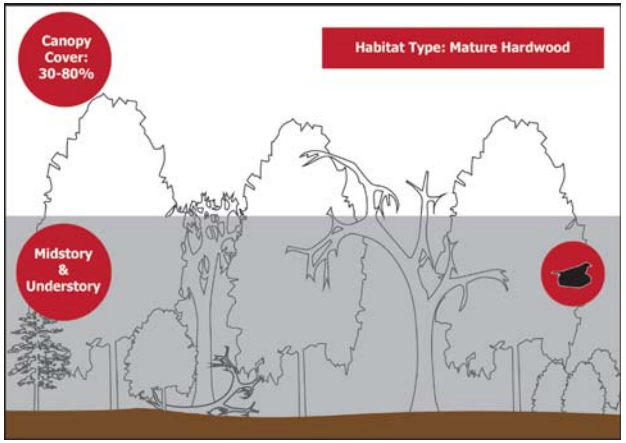


Table 8: Habitat Type and Features Preferred by the Eastern Wood-pewee

Habitat Type	Mature Hardwood (primary) Mature Softwood (secondary) Forested Wetlands (secondary) Hardwood/Softwood Mix (secondary)
Habitat Features	Intermediate (30-80%) Utilizes Clearings/Gaps/Edges Utilizes Midstory Utilizes Ground/Leaf Litter Soft Mast (sumac, apple, serviceberry) Snags/Cavity Trees

SPECIES 5: NORTHERN WATERTHRUSH

(PARKESIA NOVEBORACENSIS) [NOWA]

Migratory Species in Rhode Island

Identification

A small bird with a brown back, white belly with brown stripes, and a white or yellow eye stripe. It is often easier to detect this bird by sound rather than sight, as their habitats are characterized by dense understory and difficult for surveyors to access.

Song

A loud and ringing song characterized by a steady burst of notes on a single pitch followed by a jumble of notes on a lower pitch.

Nest

A cup of moss and leaves placed in a small cavity on the ground, as in under a fallen log or within the roots of an upturned tree.

Food

Forages for food on the ground and in shallow water, eating insects and occasionally spiders, snails and small fish.

Image Credit: Scott Martin

Conservation

Classified as a species of greatest conservation need in Rhode Island with an increasing population in New England and the Mid-Atlantic states according to the North American BBS (see Table 25). The Northern Waterthrush can be a useful species around which to plan forested wetland conservation activities, as they are a moderately common bird that requires tracks of healthy habitat to thrive during breeding season in Rhode Island.

Habitat & Territory

Breeds in thickets near surface water, including streams, ponds, swamps, and bogs. Prefers dense cover near ground level. Nest primarily in closed-canopy hardwood or softwood wetlands that have a dense

They nest most often in the western part of the state, often in inaccessible habitats like in the Great Swamp Management Area or in coastal thickets.

Table 9: Silvicultural Options for the Northern Waterthrush

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
No Action	Increase dead woody material Control invasive plants	
Low-Intensity Harvest	Variable retention thinning Crop tree release with gap formation	Maintains closed canopy and preserves water features. Promote increase in understory density. Leave as much slash, stumps, tip-ups, and woody debris on-site as possible as shelter and nest sites.

understory of shrubby plant species like Spicebush and Mountain Laurel and mounds of sphagnum and sedges. Beaver activity can negatively impact habitat for these birds.

Silvicultural Considerations

Desired Future Condition: Forested wetland with intermediate to closed canopy cover and access to leaf litter, soft mast, and woody debris.

Figure 5: Northern Waterthrush Habitat Diagram

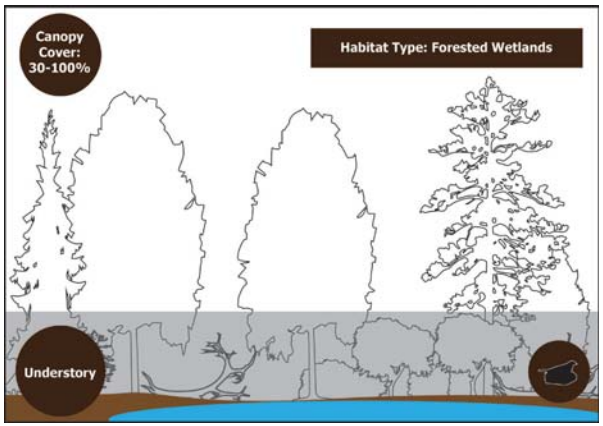


Table 10: Habitat Type and Features Preferred by the Northern Waterthrush

Habitat Type	Forested Wetlands (primary) Mature Hardwood (secondary) Hardwood/Softwood Mix (secondary)
Habitat Features	Closed canopy (80-100%) Intermediate (30-80%) Utilizes Clearings/Gaps/ Edges Utilizes Ground/Leaf Litter Soft Mast (sumac, apple, serviceberry) Woody Debris Water Features

SPECIES 6: OVENBIRD

(SEIURUS AUROCAPILLA) [OVEN]

Migratory Species in Rhode Island

Identification

Large warbler, olive-green above, white below, with dark streaked spots on lower throat, breast and sides, conspicuous eye ring, and orange-brown crown bordered with black stripes.

Song

A loud and distinct staccato song pizza, pizza, pizza (or teacher-teacher-teacher).

Nest

Domed or oven-shaped nest of dead leaves and plant fibers, lined with grass, placed on the forest floor with a side entrance. Nest in thick leaf litter on open forest floor at least 60 feet from forest edge.

Food

Forest invertebrates, captured when foraging in the leaf litter on the forest floor.

Image Credit: Scott Martin

Conservation

The Ovenbird is extremely abundant in Rhode Island. It has a decreasing population in New England and the Mid-Atlantic states according to the North American BBS (see Table 25).

Habitat & Territory

Older, larger contiguous tracts of hardwood or mixed forest with 60–90% canopy cover, trees >3" DBH, and canopy heights >50 feet. Prefers areas with less ground cover, sparse growth of shrubs, small trees, and deep leaf litter. Prefers large mature forest patches >250 acres where breeding success is higher. Territory size ranges from 1.0 – 3.5 acres.

Table 11: Silvicultural Options for the Ovenbird

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
No Action	Increase dead woody material Control invasive plants	Anything that preserves or increases litter would be beneficial for this species.
Low-Intensity Harvest	Variable retention thinning Crop tree release with gap formation Small group (<0.3 acre) and single tree selection	Leave plenty of downed wood in these sites.
Moderate-Intensity Harvest	Small group (0.5 – 0.75 ac) selection Expanding gap shelterwood	

Silvicultural Considerations

Desired Future Condition: Mature mesic or dry forest with open ground cover and thick deciduous leaf litter (DeGraaf et al., 2006).

Figure 6: Ovenbird Habitat Diagram

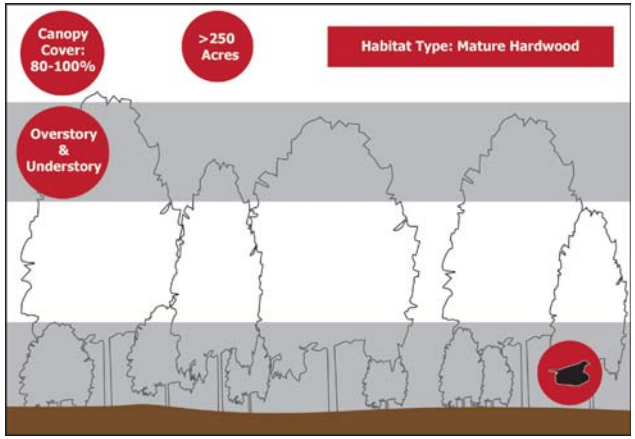


Table 12: Habitat Type and Features Preferred by the Ovenbird

Habitat Type	Mature Hardwood (primary) Mature Softwood (secondary) Hardwood/ Softwood Mix (Secondary)
Habitat Features	Closed Canopy (80-100%) Utilizes Clearings/ Gaps Large Contiguous Forest Blocks (>250 acres) Utilizes Canopy Utilizes Understory Utilizes Ground/ Leaf Litter

Image Credit:
Ellen & Tony, Flickr Creative Commons

SPECIES 7: PILEATED WOODPECKER

(DRYOCOPUS PILEATUS) [PIWO]

Resident Species in Rhode Island

Identification

A large bird, about the size of a crow, with black feathers with white stripes down its face and neck and a bright red crest. Male birds have a red stripe on their cheeks.

Song

A deep, loud drumming call and a shrill, whinnying call. Can be heard pecking sharply at dead trees and logs. A loud, flicker-like cuk-cuk-cuk-cuk-cuk, rising and falling in pitch and volume.

Nest

Usually excavates a nest cavity in a large diameter (> 28" DBH) dead or dying tree within a stand of mature hardwood or softwood trees, preferring tall trees >50 feet, often near streams. Can also nest in dead trees in younger stands or even in cities.

Food

Preferred food is carpenter ants; will eat other ants, beetles, larvae, and insects in addition to some wild fruit and nuts. Will excavate dead trees in search of ants and other insects for food, occasionally visiting bird feeders for seeds.

Conservation

Classified as a species of greatest conservation need in Rhode Island. There has been an increase of these birds in the state, including in the Great Swamp Management Area and Lincoln Woods, likely due to the aging of state forests. Main threats to this bird are loss of mature forest, including habitat conversion caused by development.

Habitat & Territory

Prefers late successional hardwood forest, especially mature oak forest, or a mix of hardwood and softwood forest with dense crowns, tall trees, high snag densities, and mature stands. Can be spotted at all heights of the forest, nesting high in the trees and foraging below. This woodpecker is a keystone species – the rectangular holes left behind by these birds are taken over as shelter by species including swifts, owls, ducks, bats and pine martens.

Table 13: Silvicultural Options for the Pileated Woodpecker

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
No Action	Increase dead woody material Control invasive plants	Maintain closed canopy forest.
Low-Intensity Harvest	Variable retention thinning Small group (<0.3 ac) and single tree selection	Maintain closed canopy. Increase the number of large diameter trees in the stand and increase the number of snags and cavity trees.

Silvicultural Considerations

Desired Future Condition: Closed canopy, contiguous tracts of forest land with snags, cavity trees, and large diameter trees (>28" DBH). Consider leaving dead or dying trees or snags on the property in order to attract Pileated Woodpeckers. The birds prefer these trees for foraging, roosting, and nesting.

Figure 7: Pileated Woodpecker Habitat Diagram

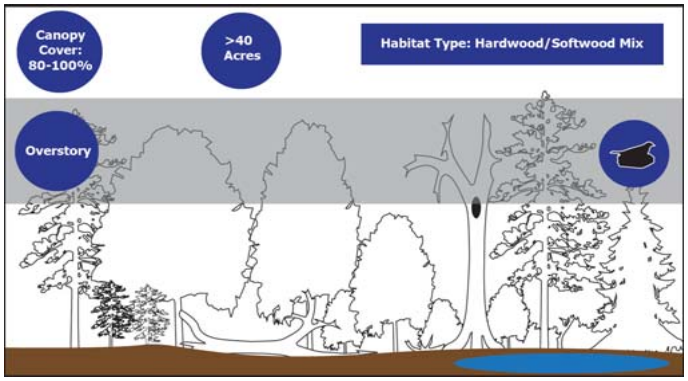


Table 14: Habitat Type and Features Preferred by the Pileated Woodpecker

Habitat Type	Hardwood/ Softwood Mix (primary) Mature Hardwood (secondary) Mature Softwood (secondary)
Habitat Features	Closed canopy (80-100%) Contiguous Forest Blocks (>40 acres) Utilizes Canopy Snags/Cavity Trees Large Diameter Trees Water Features

SPECIES 8: PINE WARBLER

(SETOPHAGA PINUS) [PIWA]

Migratory Species in Rhode Island, with some overwintering

Identification

Small, hefty birds, about the size of a sparrow or smaller. Adult males are yellow in color with olive backs, whitish bellies, and white wing bars on gray wings. They can be difficult to spot, as they usually stay high in the tree canopy in their preferred pine forest.

Song

A fast trill of 10-30 high notes on one pitch, similar to a Chipping Sparrow. The males may sing throughout the year, even during migration.

Nest

Build their cup-shaped nests high in pine trees, usually obscured among the needles and cones.

Image Credit: Scott Martin

Food
A bark forager – hopping along the tops and middles of pine trees and picking at the bark and needles in search of caterpillars, arthropods, beetles, grasshoppers, bugs, ants, bees, and flies. They also eat pine seeds and some fruit in colder months.

Conservation
Has an increasing population in New England and the Mid-Atlantic states according to the North American BBS (see Table 25). Audubon lists the Pine Warbler as "climate endangered" and predicts that their summer range will experience a 72% shift from 2000 to 2080 and shrink by 22% in that time given predicted climate changes in North America (2015).

Habitat & Territory
Prefers eastern pine forests, with tall pines and little undergrowth, but can also be found in mixed pine-deciduous forests.

Table 15: Silvicultural Options for the Pine Warbler

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
No Action	Increase dead woody material Control invasive plants	
Low-Intensity Harvest	Variable retention thinning Small group (<0.3 ac) selection	Mature pines are favored, avoids thick, young stands. Young pines require light from larger openings to grow. Prefers a more open understory and midstory.

Silvicultural Considerations
Desired Future Condition: Prefers intermediate to closed canopy mature pine forest with access to gaps and edges.

Figure 8: Pine Warbler Habitat Diagram

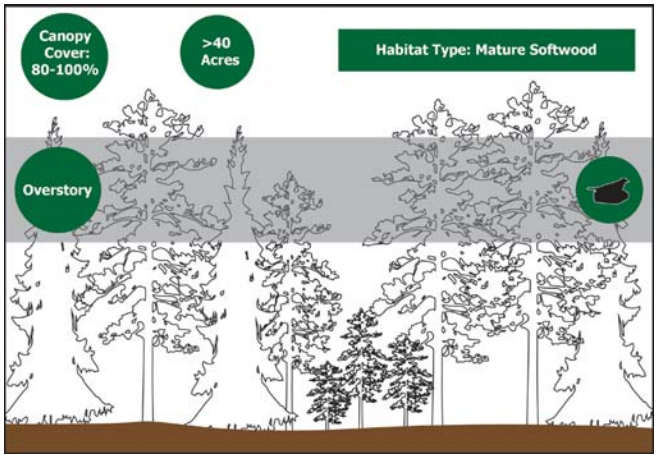


Table 16: Habitat Type and Features Preferred by the Pine Warbler

Habitat Type	Mature Softwood (primary) Hardwood/ Softwood Mix (secondary)
Habitat Features	Closed Canopy (80-100%) Contiguous Forest Blocks (>40 acres) Utilizes Canopy

Image Credit:
Tom Murray, Flickr Creative Commons

SPECIES 9: RED-EYED VIREO

(VIREO OLIVACEUS) [REVI]

Migratory Species in Rhode Island

Identification

A small bird with an olive green back, a white belly, and distinctive red eyes. Its long angular head has a grey crown and black and white stripes around the eyes.

Song

A song of broken and slurred notes with alternating down-slurs and upswing sounds; robin-like phrases sounded repeatedly.

Nest

An open cup placed in the fork of a tree or shrub in the forest mid-story or under-story. The nest is usually placed far enough away from the tree trunk to provide a 360-degree view and between 10 and 15 feet off the ground.

Food

They eat insects, small snails, fruit and seeds, foraging in the mid-story and canopy. Their diet changes with the seasons – they eat more invertebrates, especially caterpillars, during the summer and more fruit and seeds as migration approaches.

Conservation

Extremely abundant in Rhode Island. It has a decreasing population in New England and the Mid-Atlantic states according to the North American BBS (see Table 25).

Habitat & Territory

Breed in mature hardwood and mixed interior forests with moderate to dense shrubby understory. They nest most often away from the forest edges near small canopy openings.

Table 17: Silvicultural Options for the Red-eyed Vireo

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
No Action	Increase dead woody material Control invasive plants	
Low-Intensity Harvest	Small group (<0.3 ac) and single tree selection Variable retention thinning Timber stand improvement	Maintains >80% canopy cover.

Silvicultural Considerations

Desired Future Condition: Intermediate to closed canopy, mature hardwood forest with soft mast and woody debris.

Figure 9: Red-eyed Vireo Habitat Diagram

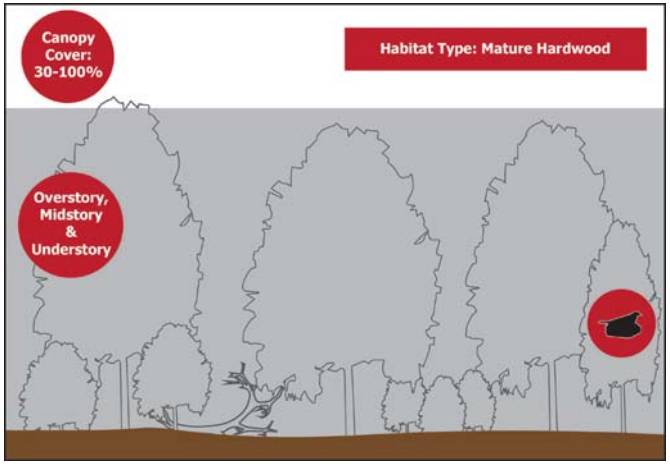


Table 18: Habitat Type and Features Preferred by the Red-eyed Vireo

Habitat Type	Mature Hardwood (primary) Hardwood/ Softwood Mix (secondary)
Habitat Features	Closed canopy (80-100%) Intermediate (30-80%) Utilizes Clearings/ Gaps Utilizes Canopy Utilizes Midstory Utilizes Understory Soft Mast (sumac, apple, serviceberry) Woody Debris

SPECIES 10: ROSE-BREASTED GROSBEAK

(PHEUCTICUS LUDOVICIANUS) [RBGR]

Migratory Species in Rhode Island

Identification

Medium-sized bird with a large triangular bill, mostly black coloring, a white belly, and a bright rose-red breast.

Song

A rich, whistled song of rising and falling notes that is similar to that of the American Robin.

Nest

Nest is a flimsy cup placed in vertical fork or crotch of sapling, in either deciduous or mixed forests, in openings up to 50 feet off the ground.

Food

Forest invertebrates, captured in the leaf litter on the forest floor. They forage on insects, fruit and seeds, especially in the breeding season.

Image Credit:
Kelly Colgan Azar, Flickr Creative Commons

Conservation

Classified as a species of greatest conservation need in Rhode Island. It has a decreasing population in New England and the Mid-Atlantic states according to the North American BBS (see Table 25). They are not encountered frequently in the state, but overall more common in northeastern Rhode Island and rarely seen in metropolitan areas, on the coast, or on Block Island.

Habitat & Territory

Breed in moist deciduous forests and mixed deciduous/coniferous interior forests. Gravitate towards second growth forests, most common in regenerating woodlands, shrubby forested edges/open woods and they prefer swampy areas over dry forest. Fruit availability will attract this species.

Table 19: Silvicultural Options for the Rose-breasted Grosbeak

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
No Action	Increase dead woody material Control invasive plants	
Low-Intensity Harvest	Variable retention thinning	
Moderate-Intensity Harvest	Shelterwood with reserves	

Silvicultural Considerations

Desired Future Condition: Forest edges, dense hardwood thickets and sapling stands, brushy fields (DeGraaf et al., 2006).

Figure 10: Rose-breasted Grosbeak Habitat Diagram

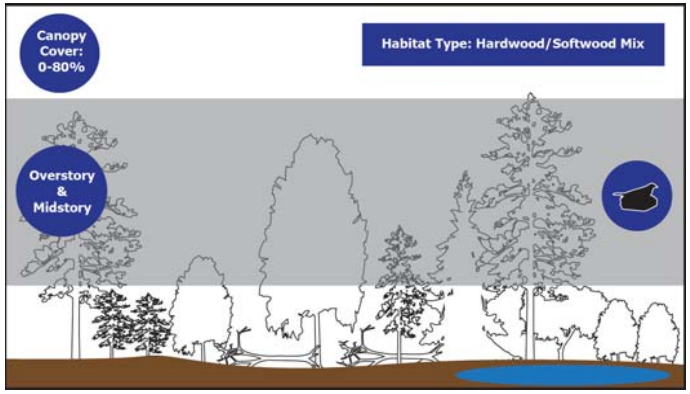


Table 20: Habitat Type and Features Preferred by the Rose-breasted Grosbeak

Habitat Type	Hardwood/ Softwood Mix (primary)
Habitat Features	Intermediate (30-80%) Open (0-30%) Utilizes Overstory Utilizes Midstory Soft Mast (sumac, apple, serviceberry) Woody Debris Water Features

SPECIES 11: SCARLET TANAGER

(PIRANGA OLIVACEA) [SCTA]

Migratory Species in Rhode Island

Identification

A bright red body, black wings, and a black tail during the summer months. Males molt to female yellowish-green body colors after breeding, but retain black wings and a black tail. Medium sized and fairly stocky with wide and rounded bills.

Song

A raspy, robin-like song – "like a robin with a sore throat." Their call is a harsh and abrupt "chick-burr" sound.

Nest

Flimsy, shallow cup located away from the trunk on a horizontal branch. Nest >50 feet above the ground in mature deciduous trees, with a preference for hardwood, especially oak trees.

Food

Insects and some fruit are main components of their diet. They eat flying and non-flying adult insects, insect larvae, and spiders.

Image Credit:
Kelly Colgan Azar, Flickr Creative Commons

Conservation

Classified as a species of greatest conservation need in Rhode Island. Will nest throughout Rhode Island but nesting populations are found most densely along the Connecticut border, including in Arcadia Management Area, Durfee Hill Management Area, George Washington Management Area, and near the Cumberland Reservoir. Population is most impacted by habitat fragmentation, when pressure increases from Brown-headed Cowbirds taking over their nests and threats from predators increase. Audubon lists the Scarlet Tanager as "climate threatened" and predicts that their range will experience a 93% shift from 2000 to 2080 and shrink by 26% in that time given predicted climate changes (National Audubon Society, 2015).

Habitat & Territory

Breeds in interior mature hardwood forests, with a preference for mature oak forests and sizable tracks of forest with large trees and >80% canopy cover. In areas >70% forested, the Scarlet Tanager needs a patch of >40 acres to breed and a larger patch in less forested landscapes. They breed most

Table 21: Silvicultural Options for the Scarlet Tanager

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
No Action	Increase dead woody material Control invasive plants	Maintain closed canopy forest.
Low-Intensity Harvest	Crop Tree Release with Gap Formation Variable Retention Thinning Mixed Intermediate Treatments	Favor oaks, maples, and yellow birch for crop tree management. Desired condition likely to persist 5+ years post-treatment. Provide a mix of large and small trees.

successfully in contiguous forest tracts >250 acres (Lambert, 2017). These birds will tolerate a mixture of hardwood and softwood (mixed deciduous-evergreen forest) for breeding.

Silvicultural Considerations

Desired Future Condition: Well-stocked, uneven-aged, hardwood sawtimber stands with >80% canopy cover.

Figure 11: Scarlet Tanager Habitat Diagram

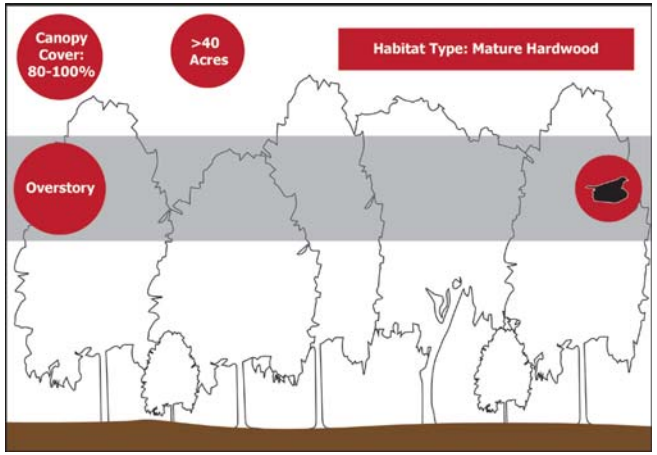


Table 22: Habitat Type and Features Preferred by the Scarlet Tanager

Habitat Type	Mature Hardwood (primary) Hardwood/ Softwood Mix (secondary)
Habitat Features	Closed Canopy (80-100%) Contiguous Forest Blocks (>40 acres) Utilizes Canopy

SPECIES 12: WOOD THRUSH

(HYLOCICHLA MUSTELINA) [WOTH]

Migratory Species in Rhode Island

Identification

A brown back and a heavily spotted white breast. It is a large thrush, a little smaller than an American Robin.

Song

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

Nest

Open cup of leaves and grasses lined with mud, placed on lower limb of a sapling or shrub, 8-13 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.

Conservation

Listed as a species of greatest conservation need in Rhode Island. Population declined in New England and the Mid-Atlantic States (see Table 25).

Image Credit: Kelly Colgan Azar, Flickr Creative Commons

Decline linked to disrupted breeding habitat (Rushing et al., 2016). Particularly threatened by fragmented tracts of forest that increase usurpation from the brown-headed cowbird and disrupt breeding habitat. Found nesting across Rhode Island usually away from the highlands of northern RI. Not found on the immediate coast, does not nest on Block Island, and is scarce on the Narragansett Bay islands. Audubon lists the Wood Thrush as "climate threatened" and predicts that their summer range will experience an 82% shift from 2000 to 2080 and shrink by 30% in that time given predicted climate changes (2015).

Habitat & Territory

Interior and edges of upland hardwood and mixed forest. In a heavily forested landscape (>70% cover), habitat includes medium-sized blocks (~200 acres). In landscapes with little forest (40% cover), needs blocks of >350 acres for good habitat (Rosenberg et al., 2003). Breeds most successfully in contiguous tracks of forest >250 acres (Lambert, 2017; Rosenberg et al., 2003). Prefers stands with canopy >50 feet in height, a diversity of hardwood tree species, moderate mid-canopy cover, high shrub density, shade, fairly open forest floor, moist soil, and decaying leaf litter. Territory size ranges from 0.2 to 7 acres.

Table 23: Silvicultural Options for the Wood Thrush

Silvicultural Options	Compatible Silviculture Treatments	Tips and Considerations
No Action	Increase dead woody material Promote or plant soft mast Control invasive plants	
Low-Intensity Harvest	Crop Tree Release with Gap Formation Single Tree and Small Group Selection Mixed Intermediate Treatments Variable Retention Thinning	Favor or retain a diversity of vigorous hardwood species.

Silvicultural Considerations

Desired Future Condition: Well-stocked, uneven-aged, sawtimber hardwood stands with >80% canopy cover and moist leaf litter. WOTH are area sensitive and need larger patch sizes for successful breeding when landscape-level forest cover is low. Avoid disturbance and desiccation of leaf litter and soil conditions and consider operating in winter.

Figure 12: Wood Thrush Habitat Diagram

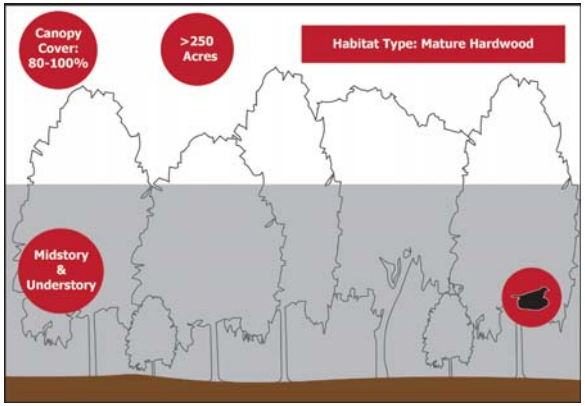


Table 24: Habitat Type and Features Preferred by the Wood Thrush

Habitat Type	Mature Hardwood (primary) Hardwood/Softwood Mix (secondary)
Habitat Features	Closed Canopy (80-100%) Contiguous Forest Blocks (>250 acres) Utilizes Midstory Utilizes Understory Utilizes Ground/Leaf Litter Soft Mast (Rubus, apple, serviceberry)

MORE INFORMATION ABOUT THE RHODE ISLAND BIRDER'S DOZEN

Every spring, more than 2,500 amateur birders and professional biologists volunteer across the country to participate in the North American Breeding Bird Survey (BBS). At least six different survey routes have been undertaken in Rhode Island by the BBS in the past, although development and traffic along survey routes in Rhode Island has hindered the data collection process in recent years (RI Wildlife Action Plan, 2015). BBS trends referenced in this guide can be found in Table 25 below (Sauer et al., 2017). A comprehensive Rhode Island Bird Atlas 2.0 is currently being developed to document breeding bird and winter bird activity across the state. As of February 2019, the Rhode Island Bird Atlas 2.0 has collected avian abundance data from 3,705 point count stations within the state and 165 atlas blocks. This information gives researchers an understanding of the population and distribution of bird species; point-count numbers indicate species population and block numbers indicate how distributed or concentrated a species is within the state. For example: compared to the Scarlet Tanager, data collection by Atlas researchers suggest that the Pine Warbler has a relatively large population in the state (point-count numbers) but are isolated due to habitat availability (block numbers) with a patchy population within the state. In contrast, the Scarlet Tanager is found in a larger percentage of Atlas blocks but at fewer point count stations, suggesting a widespread but smaller population. The data generated will also be used to perform a change analysis with the first RI Bird Atlas, completed in 1987. In addition, 50 to 500 meter transects placed in oak and coniferous forest as well as maritime habitats have been sampled for fall migrants for three consecutive seasons. These data provide information on how migrant birds utilize Rhode Island for stopover habitat during the fall. Data on winter bird abundance and distribution has also been collected at all 165 atlas blocks within the state. These data will be used to produce maps of our overwintering bird populations. The following table provides information from the BBS and preliminary results from the RI Bird Atlas 2.0 for each of the Rhode Island Birder's Dozen species.

Contact Information:
Breeding Bird Survey: Visit the North America Breeding Bird Survey website for more information at www.pwrc.usgs.gov.
Rhode Island Breeding Bird Atlas 2.0: Contact Charles Clarkson, RIBA2.0 Coordinator, at www.ribirdatlas.com.

Table 25: The Rhode Island Birder's Dozen – Habitat and Population Trends

Common Name	Scientific Name	Habitat Type	Secondary Habitat Type	Status in RI	Annual rate of change 1966-2015*	Presence in RI Breeding Bird Atlas Blocks (%)	Presence in Point Count Stations for RI Breeding Bird Atlas (%)
Barred Owl	Strix varia	Hardwood/ Softwood Mix			1%	18%	1%
Black-and-white Warbler	Mniotilta varia	Mature Hardwood	Hardwood/ Softwood Mix		-3%	55%	8%
Black-throated Green Warbler	Setophaga virens	Mature Softwood	Hardwood/ Softwood Mix	Abundant in white pine forests in RI	0%	26%	3%
Eastern Wood-pewee	Contopus virens	Mature Hardwood	Hardwood/ Softwood Mix		0%	76%	15%
Northern Waterthrush	Parkesia noveboracensis	Forested Wetlands			1%	37%	2%
Ovenbird	Seiurus aurocapilla	Mature Hardwood	Hardwood/ Softwood Mix, will use Mature Softwood	Extremely abundant in RI	-1%	81%	32%

**Breeding Bird Survey (BBS) Trends for New England/Mid-Atlantic States*

(continued on the next page)

Table 25: The Rhode Island Birder's Dozen – Habitat and Population Trends

Common Name	Scientific Name	Habitat Type	Secondary Habitat Type	Status in RI	Annual rate of change 1966 - 2015*	Presence in RI Breeding Bird Atlas Blocks (%)	Presence in Point Count Stations for RI Breeding Bird Atlas (%)
Pileated Woodpecker	Dryocopus pileatus	Hardwood/ Softwood Mix		Population increasing rapidly in RI as forests mature	4.2%	41%	1%
Pine Warbler	Setophaga pinus	Mature Softwood			2%	35%	28%
Red-eyed Vireo	Vireo olivaceus	Mature Hardwood	Hardwood/ Softwood Mix	extremely abundant in RI	-1%	93%	31%
Rose-breasted Grosbeak	Pheucticus ludovicianus	Hardwood/ Softwood Mix			-3%	47%	2%
Scarlet Tanager	Piranga olivacea	Mature Hardwood	Hardwood/ Softwood Mix	Common in forests throughout RI	-1.7%	72%	13%
Wood Thrush	Hylocichla mustelina	Mature Hardwood	Hardwood/ Softwood Mix		-3%	75%	11%

**Breeding Bird Survey (BBS) Trends for New England/Mid-Atlantic States*

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