

## **Appendix 9**

### **Focus Species Forestry**

Focus Species Forestry is a methodology developed by Rob Bryan (Maine Audubon) and many others that seeks to integrate timber and biodiversity management into single prescription. I applied the principals outlined in this methodology to formulate the individual stand recommendations outlined in the main body of this document. The following pages are excerpts from the Focus Species Forestry document that pertain to the habitat and Focus Species found in the Rines Forest as well as the worksheets developed specifically for the Rines Forest.

# Focus Species Forestry

## A Guide to Integrating Timber and Biodiversity Management in Maine



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**Third Edition—March 2007**  
Published by Maine Audubon in cooperation with:

Maine Department of Conservation  
Professional Logging Contractors of Maine, Master Logger Program  
Small Woodland Owners Association of Maine



## Acknowledgements

The Focus Species Forestry Project is a partnership of Maine Audubon, the Maine Department of Conservation, the Professional Logging Contractors of Maine, and the Small Woodland Owners of Maine. This manual was prepared with the support of grants from the Maine Outdoor Heritage Fund and the William P. Wharton Trust. Additional support for workshop presentations has been provided by members and friends of Maine Audubon, the Professional Logging Contractors of Maine, the Small Woodland Owners Association of Maine, the Davis Conservation Foundation, the Home Depot Foundation, and the Wendling Foundation.

### Focus Species Forestry Advisory Committee

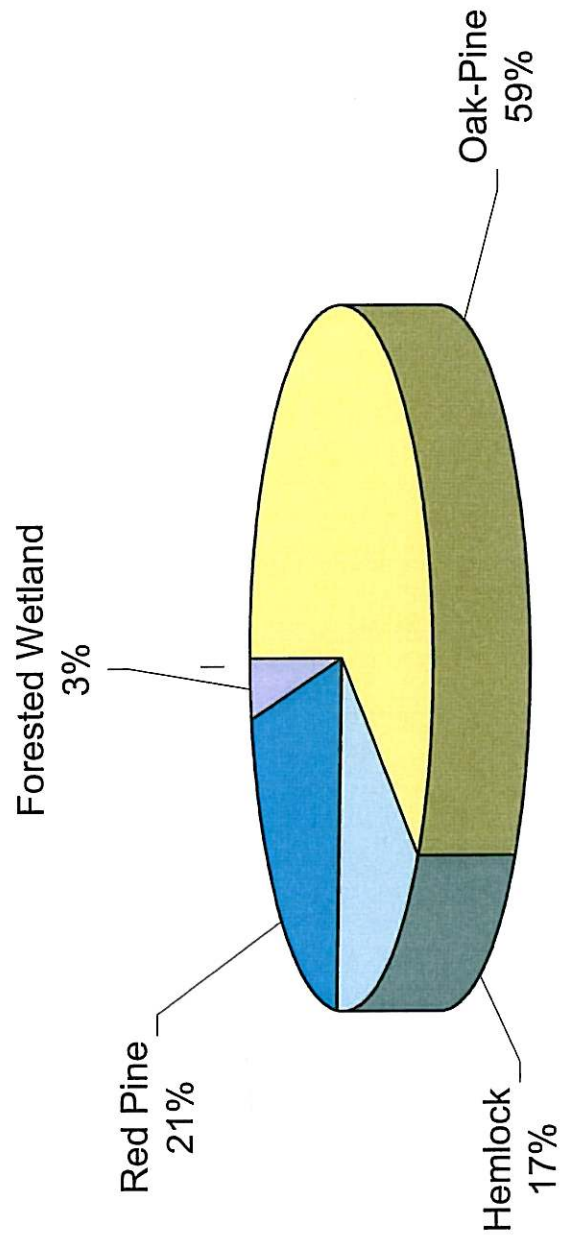
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In addition to the advisory committee, the following individuals generously provided helpful comments on the manual:

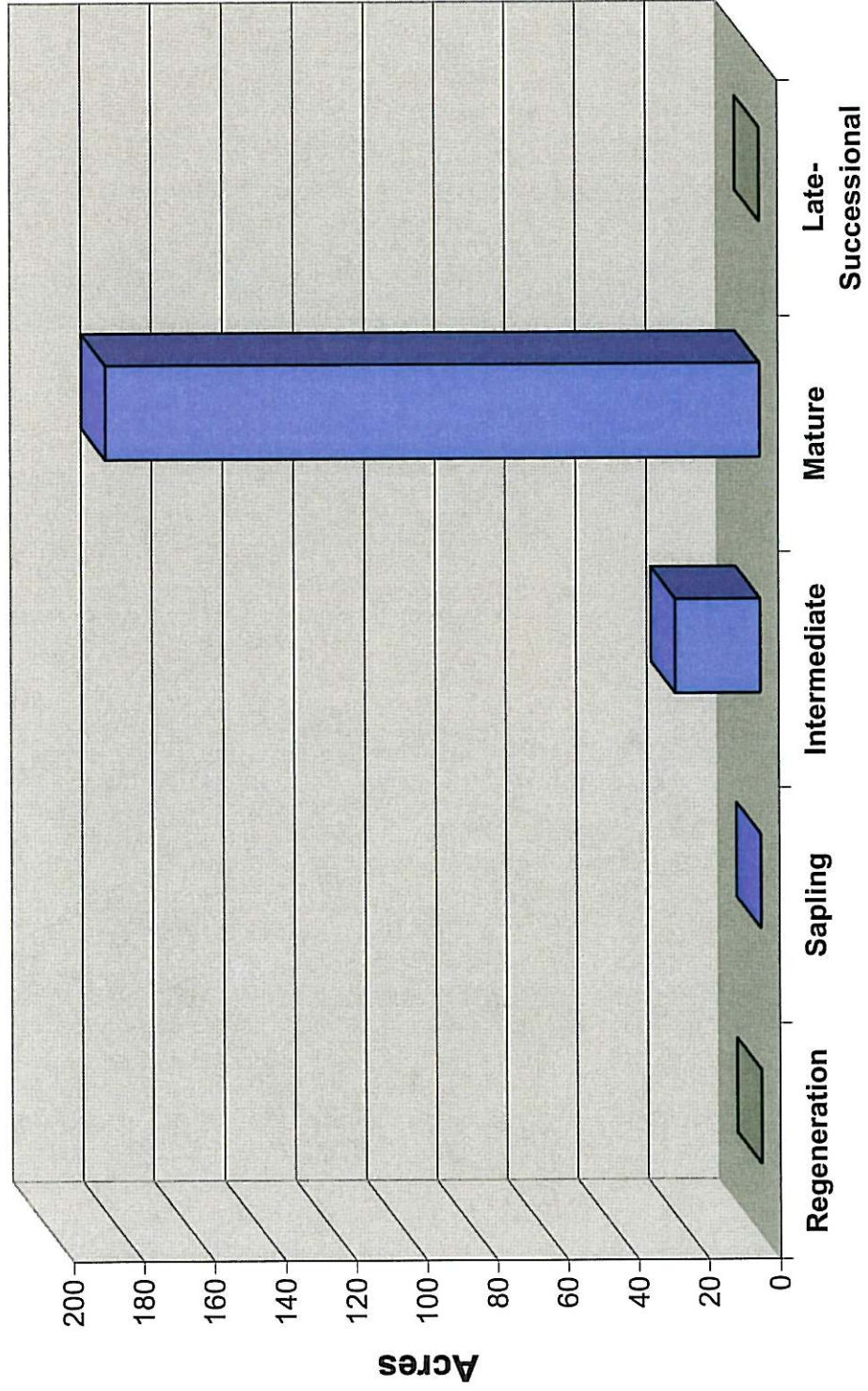
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## Rines Forest Ecosystem Summary



# Rines Forest Stand Development Stage Summary



Dev. Stage	Species & (Region)	Species ?	Check if ecosystem or special-value habitat present or enter acres (focus habitats shaded)								Summary of Management Objectives and Recommendations				
			A-B	NH	O-P	HE	S-F	NWC	R&W	VP					
Early Succession	Ruffed grouse	?	F	F	P									<ul style="list-style-type: none"> <li>• CSW, possible</li> <li>• ET, yes</li> <li>• SH, no...maybe long term</li> </ul>	
	Chestnut-sided warbler	?	F	F	P										
	Eastern towhee (S)	Y			C/P										
	Snowshoe hare		F	F					F						
Mature	Northern goshawk							P							<ul style="list-style-type: none"> <li>• NG, yes</li> <li>• PW, yes</li> <li>• BO, yes</li> <li>• WT, present and recorded</li> <li>• BTBW, no</li> <li>• RB S, yes</li> </ul>
	Pileated woodpecker	Y				C	C				C				
	Barred owl	Y				C/P	C/P								
	Wood thrush (S)	Y				C	C								
	Pine Warbler	Y				C/P									
	B.T. blue warbler														
	Redback salamander	Y				C/P	C/P								
	Fisher (S)					C/P	C/P								
LS	Late-successional lichens						?								
Riparian & Wet	Beaver														<ul style="list-style-type: none"> <li>• Beaver, not really</li> <li>• WT</li> <li>• BT</li> <li>• NDS, yes</li> </ul>
	Northern waterthrush														
	Wood turtle														
	Brook trout										P				
VP	N. Dusky salamander	Y													<ul style="list-style-type: none"> <li>• Yes, if VP's found</li> </ul>
	Spotted salamander														
	Wood frog														

Legend	<p data-bbox="131 144 191 1938"><b>A-B:</b> Aspen-Birch; <b>NH:</b> Northern hardwoods; <b>O-P:</b> Oak-Pine; <b>HE:</b> Hemlock; <b>S-F:</b> Spruce-Fir; <b>NWC:</b> Northern White Cedar; <b>R&amp;FW:</b> Riparian and Forested Wetland; <b>VP:</b> Vernal Pool.</p> <p data-bbox="212 144 300 1938"><b>C:</b> currently present or potentially present as indicated by habitat; <b>F:</b> Future, through long-term habitat management; <b>P:</b> Potentially present if targeted management actions taken by landowner. <b>D</b> – may decline if habitat management not implemented Management for Focus Species will benefit other species and ecological conditions associated with these ecosystem types and development stages.</p>
Habitat Key	
Focus Species	



<b>Focus Species Management</b>	
<b>Overview</b>	Obtaining adequate regeneration in oak-pine forests usually requires some form of shelterwood management or group-selection harvesting. In the case of white pine, timing harvests to coincide with an abundant seed year is recommended, while maintaining partial shade through the sapling phase is important to minimize weevil damage. In mixed oak-pine stands, white pine regenerates well, due in part to the light shade offered by oak canopies and perhaps the digging action of gray squirrels. On moist and rich soils, where red maple and hemlock tend to be more aggressive, maintaining pine or oak dominance may be impossible.
<b>Single-tree and Group Selection</b>	<ul style="list-style-type: none"> <li>✓ Light single-tree selection is unlikely to maintain oak-pine except on very dry sites.</li> <li>✓ Crop-tree management (see Appendix 3) focusing on the best trees combined with group selection may be used to maintain mature forest conditions. Locate groups where there are patches of advanced regeneration. Large groups will provide small patches of early successional habitat.</li> </ul>
<b>Shelterwood, Small Patch Cuts, and Clearcuts</b>	<ul style="list-style-type: none"> <li>✓ The shelterwood system is probably the best method for regenerating and cultivating oak-pine. A regeneration harvest should occur approximately 30 years before crop trees are expected to mature. When regeneration is established, maintain the overstory below 40% crown cover to discourage shade-tolerant competitors but provide enough shade to limit pine weevil damage. A heavy shelterwood cut will also provide habitat for early successional species.</li> <li>✓ Patch cuts (2-5 acres) and occasional small clearcuts will provide ideal nesting habitat for young-forest birds and browse for hare, rabbits, and deer. Low-value stands may be a good opportunity to use this approach.</li> </ul>
<b>Other</b>	<ul style="list-style-type: none"> <li>✓ Maintain and encourage oak mast trees for bear, deer, turkey, squirrels, and mice.</li> <li>✓ Follow recommendations for snags, cavity trees, and downed woody material and other stand-level guidelines (Section 7).</li> <li>✓ Refer to landscape-level guidelines (Section 8).</li> <li>✓ Mature hemlock is often indicative of sites that were not cleared for crops or permanent pasture. These sites add plant and wildlife diversity to the forest and should be maintained in a mixed-species composition if possible.</li> </ul>

**References:** DeGraaf et al. 1992, DeGraaf and Yamasaki 2001, Flatebo et al. 1999, Lancaster et al. 1978, Sampson et al. 1983, Seymour 1994

# Eastern Hemlock

## Identification

Eastern hemlock in pure or mixed stands is the dominant species. Depending on the region of the state and surrounding forest type, associates may include red oak, white pine, birches, maples, spruce, cedar, or fir.

## Ecology

Eastern hemlock typically occurs in patches of 50 acres or less within oak-pine, northern hardwood, and spruce-fir ecosystems. The hemlock wooly adelgid, an exotic insect that has devastated hemlock forests from Appalachia to central Massachusetts, has now spread into southern Maine.

## Wildlife

Hemlock provides important food, cover, and nesting habitat for many species. Black bears use hemlock for denning and cubs climb them for escape cover. Hemlock stands provide important deer wintering cover in much of the Northeast. Blackburnian and black-throated green warblers are strongly associated with hemlock in mixed hemlock-hardwood forests.



<b>Rare Species</b>
None
<b>Rare Natural Communities</b>
None

<b>Focus Species</b>	
<b>Mature Forest</b>	<b>Late-successional Forest</b>
American marten (North region) Fisher (South region) White-tailed deer (North region) Pileated woodpecker Barred owl Wood thrush Redback salamander	No species currently known due to limited research

## Focus Species Forestry

# Eastern Hemlock

Focus Species Management	
<b>Overview</b>	Hemlock's greatest wildlife value is as a mature forest component of the landscape. Its deep crown provides excellent cover while frequent and profuse cone crops provide abundant food for many birds and small mammals. Management should strive to maintain stands in a mature condition through periodic light regeneration harvests. Individual trees and groups within northern hardwoods and oak-pine provide important food and cover and should be maintained and encouraged. Hemlock regenerates best on partly shaded, scarified soil.
<b>Single-tree and Group Selection</b>	<ul style="list-style-type: none"> <li>✓ Both approaches are well suited to maintaining mature forest conditions and are consistent with natural disturbance patterns.</li> <li>✓ Small-group selection (0.1 acre or less) can be used to regenerate hemlock while creating within-stand patchiness.</li> </ul>
<b>Shelterwood and Clearcut</b>	<ul style="list-style-type: none"> <li>✓ Researchers recommend a 2- or 3-stage shelterwood with 70-80% canopy cover with scattered gaps.</li> <li>✓ If the shelterwood system is used, be sure to retain the overstory in a two-aged system or maintain mature hemlock cover nearby.</li> <li>✓ Clearcutting is not recommended in hemlock forests.</li> </ul>
<b>Other</b>	<ul style="list-style-type: none"> <li>✓ Follow recommendations for snags, cavity trees, and downed woody material and other stand-level guidelines (Section 7).</li> <li>✓ Maintain hemlock inclusions in other forest types. In northern Maine it is not uncommon to find old-growth legacy trees in excess of 200 years old.</li> <li>✓ Refer to landscape-level guidelines (Section 8). Use hemlock stands to help build and maintain mature and late-successional components of the landscape.</li> </ul>

**References:** Carey 1993, DeGraaf et al. 1992, DeGraaf and Yamasaki 2001, Eyre 1980, Flatebo et al. 1999, Goerlich and Nyland 2000, Kenefic and Seymour 1999, U.S. Forest Service and Vermont Agency of Environmental Conservation 1973

# Riparian and Wetland Forest

## Identification

Riparian and wetland forests as defined here include forests that contain or are adjacent to seasonal or permanent standing water, including small pools, seeps, intermittent and perennial streams, rivers, ponds, lakes and coastal waters. Forest types may include wetland and floodplain communities as well as upland forest ecosystems described in this manual (e.g. oak-pine, northern hardwoods, spruce-fir) that border rivers, streams, and lakes.



## Ecology

Riparian and wetland forests provide several major functions, including minimizing downstream flooding, filtering runoff and protecting water quality, maintaining cool water temperatures for fish, providing the energy for the base of the aquatic food web in the form of fallen leaves, and providing logs that create cover for fish and invertebrates and a substrate for aquatic algae.

## Wildlife

These forests support an unusually high concentration of animals that includes tree-nesting waterfowl (wood duck, common goldeneye, hooded merganser, and common merganser) and other birds, as well as aquatic and semi-aquatic animals such as beaver, otter, mink, and moose. Large pines provide important nesting and loafing sites for bald eagle and osprey. Upland mammals such as deer, bobcat, coyote, and bats frequently use shorelands for denning, travel corridors, and feeding zones. In southern Maine's developing landscape, wetland and shoreland forests often form the nucleus of large forest blocks and a network of travel corridors that are critical to many species. Up to 80% of Maine's vertebrate wildlife species use riparian habitat during some or all of their life cycle.

Rare Species
Bald eagle, Blanding's turtle, spotted turtle, box turtle, Atlantic salmon, bald eagle More than 20 rare plants, 4 insects, 2 freshwater mussels and 1 fish
Rare Natural Communities
Hardwood river terrace, hardwood seepage forest, silver maple floodplain forest, cedar-spruce seepage forest

Focus Species <sup>1</sup>
Beaver Pileated woodpecker Northern waterthrush Wood turtle Northern dusky salamander Brook trout

<sup>1</sup> Focus species vary with water body type. See management table on following page.

# Vernal Pools

Rare Species
<ul style="list-style-type: none"> <li>• Blanding's turtle (Maine threatened) and spotted turtle (Maine endangered) may be found in vernal pools in York and Cumberland counties</li> <li>• Four-toed salamander, ribbon snake, and wood turtle (all Maine special concern) may also be found in vernal pools statewide</li> <li>• Several rare plants are associated with vernal pools in southern Maine</li> </ul>



Apply the following guidelines at minimum when two or more indicator species or more than 20 egg masses have been observed.

Focus Species Management <sup>1</sup>		
Vernal Pool Depression	Vernal Pool Protection Zone 0-100 ft.	Amphibian Life Zone 100-400 ft.
<ul style="list-style-type: none"> <li>✓ Identify and flag the pool boundary during the spring wet season or by using dry-season indicators.</li> <li>✓ Do not disturb the pool depression with equipment, slash, or sediment.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Maintain an average 75% canopy cover of trees over 20-30 ft. tall to protect young amphibians leaving the pool.</li> <li>✓ Harvest in frozen or dry conditions to prevent rutting and protect habitat of soil-dwelling salamanders.</li> <li>✓ Maintain abundant coarse woody debris used as feeding habitat and cover by amphibians.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Maintain a minimum of 50% canopy cover of trees over 20-30 ft. tall and keep openings below one acre.</li> <li>✓ Harvest in frozen or dry conditions to minimize soil disturbance.</li> <li>✓ Maintain abundant coarse woody debris.</li> </ul>

<sup>1</sup> For more information on identification and management of vernal pools see: *Maine Citizens Guide to Locating and Describing Vernal Pools* and *Forestry Habitat Management Guidelines for Vernal Pool Wildlife in Maine*. Both are available from Maine Audubon, Conservation Department (207-781-2330).

**References:** Calhoun, A.J.K. 2003; Calhoun, A.J.K. and P. deMaynadier 2004

**Habitat Use:** The habitat-use chart<sup>3</sup> identifies the specific ecosystems and development stages that are focus habitats for the species as well as and other habitats that it uses.

**Focus Habitat:** For most species listed, a focus habitat is one that provides the best overall habitat conditions for the species. For a few, the focus habitat is one that is used for only part of the year but is essential for the species' survival. Examples of the latter include wintering areas for deer in northern Maine and vernal pools that are used seasonally by wood frogs and spotted salamanders.

- ✓ Where a species focus habitat includes two or more development stages, attempt to provide at least half of the area in the older development stages.
- ✓ Small-diameter intermediate stands may provide early successional habitat, while larger-diameter intermediate stands are likely to provide habitat for many mature-forest species.
- ✓ Although all mature forest species will do equally well in late-successional habitat, late successional is only listed as a focus habitat when it is a required habitat for a species.

**Other Habitat:** "Other habitat" is habitat commonly used by a species, but it is used less frequently or is less critical (e.g. non wintering habitat for deer) than a focus habitat. The "other habitat" needs of a given species are taken care of by other focus species. For example, spruce-fir is listed as "other habitat" for pileated woodpecker. Management for black-backed woodpecker and American marten, both spruce-fir focus species, will also provide habitat for the pileated woodpecker in that forest type.

**Habitat Use Modifiers:** Some species are most likely to be found in certain forest types only when certain habitat conditions are found.

Habitat Use Modifiers	
<b>Mx</b>	A coniferous component in hardwood forests or deciduous component in softwood forests is important
<b>U</b>	Identifies when a species requires understory saplings or shrubs
<b>C</b>	Requires or is strongly associated with snags or cavity trees

<sup>3</sup> The format of the habitat use chart was adapted from charts that first appeared in the U.S. Forest Service publication *New England Wildlife: Habitat, Natural History, and Distribution* (DeGraaf and Rudis, 1986). Habitat uses in this guide represent the author's synthesis of current literature and input from the advisory committee.

# Barred Owl

**Distribution:** Alberta to Newfoundland, south to Florida and east Texas; also British Columbia, south to northwestern California

**Maine Focus Region:** Statewide

**Home Range:** 200-900 acres

**Food:** Primarily mice; also other small mammals, birds, snakes, salamanders, frogs, and crayfish. Hunts from low branches, often at edge of forest openings.

**Special Habitat Needs:** Extensive mature deciduous or mixed forest with large (>20 in.) cavity trees

**Management:**

- ✓ Maintain a landscape with extensive mature forest; uneven-aged management is probably best unless long even-aged rotations are used to create large areas of mature forest.
- ✓ Manage for large snags and cavity trees.
- ✓ Small openings may attract foraging owls.



**Comments:** The barred owl's “*Who cooks for you, who cooks for you-all?*” may be heard throughout the year but is most common during the late winter/early spring breeding season. Managing for the large cavity trees and forest-dominated landscapes used by barred owls will help ensure adequate habitat for other species that prefer mature deciduous forests.

**Habitat Use:**

Forest Ecosystems																Special-value Habitats												
Aspen-Birch				Northern Hardwoods					Oak-Pine					Hemlock		Spruce-Fir				N. White Cedar		Riparian/Wetland Forest	Vernal Pool					
R	S	I	M	R	S	I	M	L	R	S	I	M	L	I	M	L	R	S	I	M	L	I	M	L	C	C	C	
						C	C	C			C	C	C		C	C			C	C	C	C	C	C	C	C	C	

- R Regeneration and seedlings
- S Saplings and small poles
- I Intermediate-aged forest
- M Mature forest
- L Late-successional forest
- Mx Mixed conifer-deciduous
- U Understory present
- C Cavity tree or snag

- Focus habitat
- Other habitat
- Little/no use

**References:** Boone and Krohn 1998, DeGraaf and Yamasaki 2001, Sibley 2000, Terres 1991

# Pileated Woodpecker

**Distribution:** British Columbia to Nova Scotia, south to Florida, east Texas, and northern California

**Maine Focus Region:** Statewide

**Home Range:** 100-200 acres

**Food:** Insects in decaying wood, particularly carpenter ant colonies in decaying trees

**Special Habitat Needs:** Large (>20 in. diameter) cavity trees for nesting; dead or decaying deciduous trees or conifers for feeding

**Management**

- ✓ Maintain mature forest stands.
- ✓ Maintain an abundance of large snags and live trees with decaying wood in managed stands (see Section 7).



**Comments:** Pileated woodpeckers frequently excavate large rectangular feeding cavities (2-3 in. wide by 4-6 in. high) in live trees, often low on the bole where ants are present in decayed wood. This large, crow-sized woodpecker with black body, white underwings, and loud “*kuk kuk kuk kuk*” call is readily identified by sight, sound, or sign of feeding activities. Because the pileated, like most other woodpeckers, usually excavates a new nest cavity every year, an abundance of potential cavity trees is important. Bats, marten, fisher, barred owls, flying squirrels, raccoons, and other animals will benefit from cavities excavated by pileated woodpeckers. Wood ducks, goldeneyes, hooded mergansers, and common mergansers nest in large cavities excavated by pileated woodpeckers near streams and ponds.

**Habitat Use:**

Forest Ecosystems																Special-value Habitats										
Aspen-Birch				Northern Hardwoods				Oak-Pine				Hemlock				Spruce-Fir				N. White Cedar		Riparian/Wetland Forest	Vernal Pool			
R	S	I	M	R	S	I	M	L	R	S	I	M	L	I	M	L	R	S	I	M	L	I	M	L		
			C				C	C	C			C	C	C	C	C			C	C	C	C	C	C	C	

- R Regeneration and seedlings
- S Saplings and small poles
- I Intermediate-aged forest
- M Mature forest
- L Late-successional forest
- Mx Mixed conifer-deciduous
- U Understory present
- C Cavity trees, snags, or decaying trees
- Focus habitat (dark grey box)
- Other habitat (medium grey box)
- Little/no use (white box)

**References:** Boone and Krohn 1998, DeGraaf and Yamasaki 2001, Sibley 2000, Terres 1991



# Wood Thrush

**Distribution:** Breeding-season resident of eastern deciduous woodlands from southern Quebec to the Gulf Coast

**Maine Focus Region:** South

**Territory:** Up to 7 acres

**Food:** Predominantly insects in summer, plus berries and other small fruits in fall, winter, and spring

**Special Habitat Needs:** Cool, moist, mature closed-canopy deciduous and mixed forests with well developed shrub-sapling layer. Found at greatest densities in forest patches greater than 200 acres, with a sharp decline in abundance in patches less than 100 acres in size.



**Management:**

- ✓ Maintain mature northern hardwood and oak-pine forest and encourage understory development with group or single-tree selection.
- ✓ On large ownerships shelterwood management may be appropriate if mature forest goals are met at the landscape level. See landscape management guide (Section 8).

**Comments:** This robin-sized thrush with spotted breast and rusty head is readily identified by its distinct flute-like “ee-o-lay-ee” call on spring and summer evenings or in the early morning. It is frequently seen in low shrubs or scratching in the leaf litter for insects and other food. Numbers observed during the breeding season in Maine are declining. Nesting success increases with the percent of forest in the landscape. The wood thrush winters in Mexico and Central America. Many mammals and plants characteristic of extensive mature forest will benefit from wood thrush management. Because the wood thrush feeds mostly on or near the ground, it is vulnerable to predation by domestic cats. The hermit thrush, which is characteristic of mixed hardwood-conifer forest throughout Maine, has similar habitat requirements and is also negatively impacted by habitat loss and fragmentation.

**Habitat Use:**

Forest Ecosystems																Special-value Habitats										
Aspen-Birch				Northern Hardwoods					Oak-Pine				Hemlock			Spruce-Fir				N. White Cedar		Riparian/Wetland Forest	Vernal Pool			
R	S	I	M	R	S	I	M	L	R	S	I	M	L	I	M	L	R	S	I	M	L	I	M	L		

- R Regeneration and seedlings
- S Saplings and small poles
- I Intermediate-aged forest
- M Mature forest
- L Late-successional forest
- Mx Mixed conifer-deciduous
- U Understory present
- C Cavity tree or snag
- Focus habitat (dark grey)
- Other habitat (light grey)
- Little/no use (white)

**References:** Boone and Krohn 1998, DeGraaf and Yamasaki 2001, Hagan et al. 1997, Rosenburg et al. 2003, Sauer et al. 2003, Sibley 2000, Terres 1991

**Focus Species Forestry**

# Chestnut-sided Warbler

**Distribution:** Alberta to New Brunswick, south along the Appalachians to Georgia

**Maine Focus Region:** Statewide.

**Territory:** 1-3 acres

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

**Special Habitat Needs:** Dense early successional hardwoods up to 10 ft. tall with less than 35% overstory canopy closure. Prefers forest patches in excess of 250 acres.



**Management:**

- ✓ Use group selection to create patches averaging 1 acre in size, or shelterwood or clearcut harvests, to create nesting habitat for chestnut-sided warblers.
- ✓ Balance early successional habitat with requirements of mature-forest species at the property or landscape level. See landscape management guidelines (Section 8).

**Comments:** Males defend their territory by singing from tall saplings and residual overstory trees while the female incubates 4-5 eggs in the brush below. John James Audubon considered this one of the rarest birds in the east during the early 1800s, but timber harvesting and regrowth of farmland have made it a relatively common species. Management for the chestnut-sided warbler will benefit other species that use early successional hardwoods, such as moose, woodcock, white-tailed deer, nighthawk, willow flycatcher, eastern bluebird, Tennessee warbler, and mourning warbler. The chestnut-sided warbler's loud "*pleased pleased pleased to meet-ya*" may be confused with the magnolia warbler during the spring and early summer breeding season when the two species may be found together in mixed hardwood-conifer stands.

**Habitat Use:**

Forest Ecosystems																Special-value Habitats										
Aspen-Birch				Northern Hardwoods				Oak-Pine				Hemlock				Spruce-Fir		N. White Cedar		Riparian/Wetland Forest	Vernal Pool					
R	S	I	M	R	S	I	M	L	R	S	I	M	L	I	M	L	R	S	I	M	L	I	M	L		

- |                              |                            |               |
|------------------------------|----------------------------|---------------|
| R Regeneration and seedlings | Mx Mixed conifer-deciduous | Focus habitat |
| S Saplings and small poles   | U Understory present       | Other habitat |
| I Intermediate-aged forest   | C Cavity tree or snag      | Little/no use |
| M Mature forest              |                            |               |
| L Late-successional forest   |                            |               |

**References:** Boone and Krohn 1998, DeGraaf and Yamasaki 2001, Hagan et al. 1997, King 2003, Sauer et al. 2003, Sibley 2000, Terres 1991

# Pine Warbler

**Distribution:** Southern Ontario and southwest Quebec, south to Texas and Florida

**Maine Focus Region:** Statewide

**Territory:** 1-3 acres, possibly larger with low pine density

**Food:** Adult and insect larvae, spiders

**Special Habitat Needs:** Stands with relatively mature to mature white pine or pitch pine

**Management:**

- ✓ Manage for intermediate or mature white pine or pitch pine in pure or mixed stands as a component of the forest.



**Comments:** The irregular trill of the pine warbler may be heard high in the canopy during the spring breeding season from late April through July. The only vertebrate in our region that is dependent on pines, pine warbler density declines as the percent of hardwood increases in the canopy or the understory. White pines also make good roost trees for wild turkeys in oak-pine forests. Long-eared and northern saw-whet owls, red-breasted nuthatch, hermit thrush, solitary vireo and red squirrel may also be found in stands where pine warblers are present.

**Habitat Use:**

Forest Ecosystems															Special-value Habitats											
Aspen -Birch				Northern Hardwoods				Oak-Pine				Hemlock			Spruce-Fir				N. White Cedar		Riparian/Wetland Forest	Vernal Pool				
R	S	I	M	R	S	I	M	L	R	S	I	M	L	I	M	L	R	S	I	M	L	I	M	L	M,L	
									WP	WP	WP	WP				WP	WP	WP	WP				WP			

- |   |                            |    |                         |  |               |
|---|----------------------------|----|-------------------------|--|---------------|
| R | Regeneration and seedlings | Mx | Mixed conifer-deciduous |  | Focus habitat |
| S | Saplings and small poles   | WP | White pine required     |  | Other habitat |
| I | Intermediate-aged forest   | U  | Understory present      |  | Little/no use |
| M | Mature forest              | C  | Cavity tree or snag     |  |               |
| L | Late-successional forest   |    |                         |  |               |

**References:** Boone and Krohn 1998, DeGraaf and Yamasaki 2001, Hagan et al. 1997, Sauer et al. 2003, Sibley 2000, Terres 1991, <http://www.natureserve.org/explorer/>

# Eastern Towhee

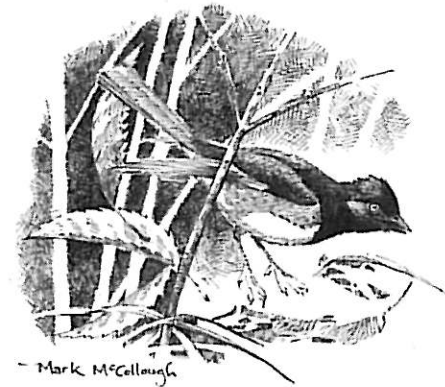
**Distribution:** Breeding-season resident from Minnesota and southern Quebec to southern Maine, south to the Gulf of Mexico

**Maine Focus Region:** At its northern range limit in Maine, this species is a priority species only in the South

**Territory:** 1-6 acres

**Food:** Scratches in leaf litter for seeds, insects and snails

**Special Habitat Needs:** Prefers dry, early successional or regenerating forests with a dense, brushy understory



**Management:**

- ✓ Adaptable to a range of management techniques that result in dense regeneration, including heavy selection, shelterwood, or clearcut harvests.

**Comments:** The eastern towhee is declining due to loss of the brushy, early successional forest that they prefer. This large sparrow with rusty sides is often heard scratching in the dry leaves of pine-oak forests. In the spring and early summer the male announces his presence with a loud “*DRINK your teeeeeee.*” Its call is a loud “*che-WINK.*” Towhees winter from southern New England to the Gulf of Mexico. Other early successional species such as ruffed grouse, eastern and New England cottontail rabbits, and chestnut-sided warblers may be found in young stands inhabited by eastern towhees.

**Habitat Use:**

Forest Ecosystems																Special-value Habitats										
Aspen-Birch				Northern Hardwoods				Oak-Pine				Hemlock				Spruce-Fir				N. White Cedar		Riparian/Wetland Forest	Vernal Pool			
R	S	I	M	R	S	I	M	L	R	S	I	M	L	I	M	L	R	S	I	M	L	I	M	L		

- R Regeneration and seedlings
- S Saplings and small poles
- I Intermediate-aged forest
- M Mature forest
- L Late-successional forest
- Mx Mixed conifer-deciduous
- U Understory present
- C Cavity tree or snag

- Focus habitat
- Other habitat
- Little/no use

**References:** Boone and Krohn 1998, DeGraaf and Yamasaki 2001, Hagan et al. 1997, Sauer et al. 2003, Sibley 2000, Terres 1991

**Focus Species Forestry**

# Northern Dusky Salamander

**Distribution:** Southern Quebec, south to Alabama; apparently absent northeast of Presque Isle, Maine

**Maine Focus Region:** Statewide

**Home Range:** Variable, 15-500 sq. ft.

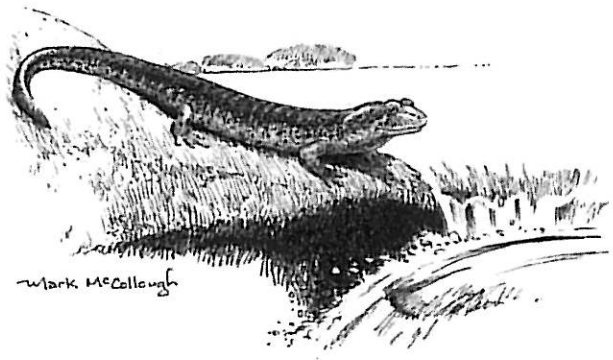
**Food:** Feeds mainly at night on small aquatic or terrestrial insects, crustaceans and other invertebrates

**Special Habitat Needs:** Cool, clear seeps; intermittent streams or small perennial streams. Found under rocks or logs at water's edge or in the bed of nearly dry streams.

**Management:**

- ✓ Use Maine Forest Service Best Management Practices to avoid stream sedimentation and maintain streamside vegetation for shade, cover, and habitat for adult forms of aquatic insects.
- ✓ See riparian and wetland forest recommendations (Section 5).

**Comments:** Dusky salamanders are found high in the watershed above the range of brook trout and other fish. They are about 2.4-4.3 in. long, gray or brown, and frequently mottled. Duskies are frequently found in the company of two-lined salamanders but, unlike the two-lined, are intolerant of warm water and sediment. In the western mountains region, northern spring salamanders may be encountered more frequently than duskies in headwater streams. Dusky salamanders winter 12-20 in. below ground near streams. Insects associated with these small streams are prey for birds, and the cool, clear water sustains streams lower in the watershed that are critical for trout and other fish.



**Habitat Use**

Forest Ecosystems																	Special-value Habitats									
Aspen-Birch				Northern Hardwoods				Oak-Pine				Hemlock			Spruce-Fir				N. White Cedar		Riparian/Wetland Forest	Vernal Pool				
R	S	I	M	R	S	I	M	L	R	S	I	M	L	I	M	L	R	S	I	M	L	I	M	L		

- R Regeneration and seedlings
- S Saplings and small poles
- I Intermediate-aged forest
- M Mature forest
- L Late-successional forest
- Mx Mixed conifer-deciduous
- U Understory present
- C Cavity tree or snag

- Focus habitat
- Other habitat
- Little/no use

**References:** Barbour et al. 1969, DeGraaf and Yamasaki 2001, Maine Forest Service 1992, Markowski 1999

**Focus Species Forestry**

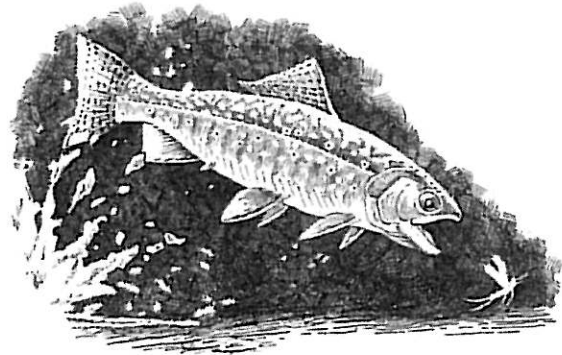
# Brook Trout

**Distribution:** Newfoundland to Manitoba, south along the Appalachians to Georgia

**Maine Focus Region:** Statewide

**Food:** Aquatic insect larvae and adults, especially when young, shifting to a higher percentage of fish with maturity

**Special Habitat Needs:** Cool, silt-free, and well-oxygenated water below 65° F



**Management**

- ✓ Use Maine Forest Service Best Management Practices to avoid stream sedimentation and maintain streamside vegetation for shade, cover, and habitat for adult forms of aquatic insects.
- ✓ See riparian and wetland forest recommendations (Section 5).

**Comments:** This brightly colored native fish is an indicator of good water quality. Maine’s wild brook trout fishery, the best in the United States, is threatened by development, illegal fish stocking, increased access to remote streams and ponds, and poor harvesting practices.

**Habitat Use:**

Forest Ecosystems																Special-value Habitats										
Aspen-Birch				Northern Hardwoods					Oak-Pine				Hemlock			Spruce-Fir				N. White Cedar		Riparian/Wetland Forest	Vernal Pool			
R	S	I	M	R	S	I	M	L	R	S	I	M	L	I	M	L	R	S	I	M	L	I	M	L		

- R Regeneration and seedlings
- S Saplings and small poles
- I Intermediate-aged forest
- M Mature forest
- L Late-successional forest
- Mx Mixed conifer-deciduous
- U Understory present
- C Cavity tree or snag
- Focus habitat
- Other habitat
- Little/no use

**References:** Boone and Krohn 1998, DeGraaf and Yamasaki 2001, Maine Forest Service 1992, Witham 1999

**Appendix 10**  
Forest Stewardship Council  
Background