

Quick Start to...

Healthy Forests: A Bird-based Silvicultural Guide for Forestry Professionals

Overview:

A common misconception is that forest management on behalf of birds is ill-aligned with goals related to the production of timber and other forest products. With only minor adjustments, however, sustainable forestry practices enhance bird habitat, while still meeting financial and recreational goals. Furthermore, sustainable forestry on behalf of birds often attracts new clients for consulting foresters, drives landscape-scale management on public lands, and opens new sources of funding.

Management Actions:

To have the greatest impact on a suite of forest birds, quality habitat is needed at both the stand and landscape scales. The goal is to create a variety of successional and developmental stages within the forested landscape and a diversity of key habitat features at the stand-level.

Within Stands--Vertical structural diversity refers to the layering of vegetation at multiple heights in a stand. Stands with high vertical structural diversity have overstory, midstory, and understory vegetation layers composed of trees, shrubs, herbaceous plants, and vines. This vertical structure provides different birds with places to nest, perch, forage, seek cover, and raise young. Vertical structure is critical to many species of birds, such as the Wood Thrush and Black-throated Blue Warbler, and is among the most common missing features in Pennsylvania forests.

One easy technique to mimic the vertical structure found in older, uneven-aged forests is group tree selection, where areas of timber from 0.25 to 1.5 acres are selectively removed to open the canopy. Group openings need to be strategically placed (juxtaposed) to create areas large enough to support nesting habitat and cover, but not so close that they are functionally small overstory removals. Group openings should be one times the height of adjacent trees or variable in size based on the shade tolerance of the preferred tree species (e.g., sugar maple = $\leq 1x$ tree height, oak = $1.5x$ tree height, and tulip poplar/black cherry = $2x$ tree height).

For landscapes (approximately 2,500 acres or a 1-mile radius) with > 70% forest cover, look for opportunities to:

Diversify forest age classes within the landscape, such that 10-20% of area is in a young forest condition and the remainder is in mature and intermediate age classes. Young forest can be created through overstory removal or multi-entry shelterwood cuts.

Enhance habitat quality within mature forest by creating vertical structure through group tree selection methods or other means of opening the canopy to mimic natural disturbance and encourage understory development. Exclude or control deer and treat invasive and interfering vegetation as necessary to achieve intended goals.

Ensure that patch cuts to create young forest are 5-50 acres, irregular in shape, and forest edges are "feathered" so that young forest grades into older forest without forming a hard boundary.

For landscapes with < 70% forest cover:

Identify the surrounding cover types, and if there appears to be ample young forest habitat (> 20%), retain mature forest and focus on treatments that improve within-stand structural complexity.

If there is less than 10% young forest cover in the landscape, and if the forested parcel you are managing is relatively large (at least 200 acres to accommodate area sensitive forest species), patch cuts that create young forest may be feasible. See above regarding patch cuts.

If forest fragmentation is high and the landscape is less than 40% forested, focus on reforestation, restoring connections among forest patches, and improving within-stand structural diversity.

Forest Age Class	Forest Habitat Structure for the Age Class	Silvicultural Options to Create or Improve Desired Conditions	Species That May Use This Habitat for Nesting
YOUNG Even-aged < 10 years old	0–30% open canopy High stem density of young trees and shrubs Reserve trees from previous stand can be: <ul style="list-style-type: none"> Distributed equally Clustered in patches Distributed, but concentrated in some areas 	Clearcut, seed tree, or shelterwood methods > 5 acres in size (clearcuts)	Acadian Flycatcher* American Goldfinch American Redstart American Woodcock Baltimore Oriole Black-and-white Warbler* Blackburnian Warbler* Black-billed Cuckoo Black-throated Blue Warbler* Black-throated Green Warbler* Blue-winged Warbler Broad-winged Hawk* Brown Thrasher Canada Warbler Cerulean Warbler* Chestnut-sided Warbler Eastern Towhee Eastern Whip-poor-will* Golden-winged Warbler Hooded Warbler* Northern Flicker* Olive-sided Flycatcher Prairie Warbler Purple Finch* Rose-breasted Grosbeak* Ruffed Grouse Scarlet Tanager* Veery Willow Flycatcher Wood Thrush* Worm-eating Warbler Yellow-billed Cuckoo Yellow-throated Vireo*
*species that may use habitat created by a shelterwood for nesting, but unlikely to use a clearcut or seed tree cut site			
Mature - Intermediate 10–50 years old Maturing Even-aged	Commonly 100% closed canopy Few canopy gaps present Midstory and understory vegetation limited or absent Few herbs, shrubs in understory	Create canopy gaps to promote regeneration Crop tree release Pre-commercial thinning Patch cuts 0.25–10 acres	Few birds will use this forest habitat for breeding due to lack of structural diversity; however, if canopy gaps are created and vertical structural diversity is increased over time, then many of the birds listed below in the mature forest habitat category may use it.
Mature >50 years old) Older, even-aged (> 100 years old) Mature, uneven-aged	> 70% canopy cover Small canopy gaps at dispersed locations Vertical structure developing Midstory and understory vegetation developing Herbs and shrubs increasing in the understory Small canopy gaps at dispersed locations Overstory, midstory and understory vegetation present Herbs, shrubs and advanced tree regeneration in understory Vertical structure modest in even-aged High vertical structure	Group selection (uneven-aged), or thinning (even-aged) Create canopy gaps similar to individual tree fall Maintain trees of large diameter Retain a component of snags and cavity trees Maintain or increase DWM Clearcut, seed tree, or shelterwood methods in even aged. > 5 acres in size (clearcuts) Convert to two-aged by thinning or patch cutting (0.25 - 10 acre patch size) Group selection Maintain trees of large diameter Retain a component of snags and cavity trees Maintain or increase DWM	Acadian Flycatcher American Redstart Black-and-white Warbler Blackburnian Warbler Blackpoll Warbler Black-throated Blue Warbler Black-throated Green Warbler Broad-winged Hawk Brown Creeper Canada Warbler Cerulean Warbler Cooper’s Hawk Downy Woodpecker Eastern Wood-Pewee Hooded Warbler Kentucky Warbler Least Flycatcher Louisiana Waterthrush Northern Flicker Northern Goshawk Northern Saw-whet Owl Prothonotary Warbler Purple Finch Red-bellied Woodpecker Red Crossbill Red-shouldered Hawk Rose-breasted Grosbeak Scarlet Tanager Sharp-shinned Hawk Wood Thrush Worm-eating Warbler Yellow-throated Vireo