

A photograph of a blue and white striped bird, likely a Blue-headed Vireo, perched on a thin brown branch. The bird has a blue head, a white breast, and blue and white streaked wings. It is looking to the left. The background is a soft-focus green, suggesting a forest setting with other branches and leaves.

**SCIENCE-BASED
HABITAT CONSERVATION
FOR FOREST BIRDS**



Audubon

Conservation Milestones



Habitat
Conservation



Climate
Action



Policy



Community
Building



Wings Over Working Lands

Working lands represent one of the best hopes for conservation.

These parcels of forests, ranches, and farms add up to roughly a billion acres—or about half the land in the entire Lower 48 states.

Audubon collaborates with landowners, land managers, government agencies, and private industry across the hemisphere to increase the quality of habitat on publicly and privately managed lands to benefit flagship bird species.

Wings Over Working Lands Conservation Strategy: Forest Conservation

Forest Conservation:

- Protect
- Manage
- Advocate

Eastern US: forests dominate the landscape

- Breeding, migratory stopover, and wintering habitat



Flight Plan Priority Forest Birds: NY & CT

American Woodcock

Bicknell's Thrush

Black-billed Cuckoo

Broad-winged Hawk

Canada Warbler

Cerulean Warbler

Eastern Whip-poor-will

Golden-winged Warbler

Mourning Warbler

Olive-sided Flycatcher

Prairie Warbler

Prothonotary Warbler

Red-headed Woodpecker

Rose-breasted Grosbeak

Rusty Blackbird

Scarlet Tanager

Willow Flycatcher

Wood Thrush

Yellow-billed Cuckoo

Yellow Warbler





Breeding Habitat for Forest Birds

Loss of quality habitat

- Forest fragmentation
 - Increased forest “edge”
- Non-native and interfering vegetation
- Deer overabundance
- Middle-aged forests: homogenous structure
- Forest pests
- Climate change



Quality Habitat for Forest Birds

- Diversity is key to benefit a suite a forest birds
- Landscape and stand-level habitat conditions

Forest Succession and Birds



Time 

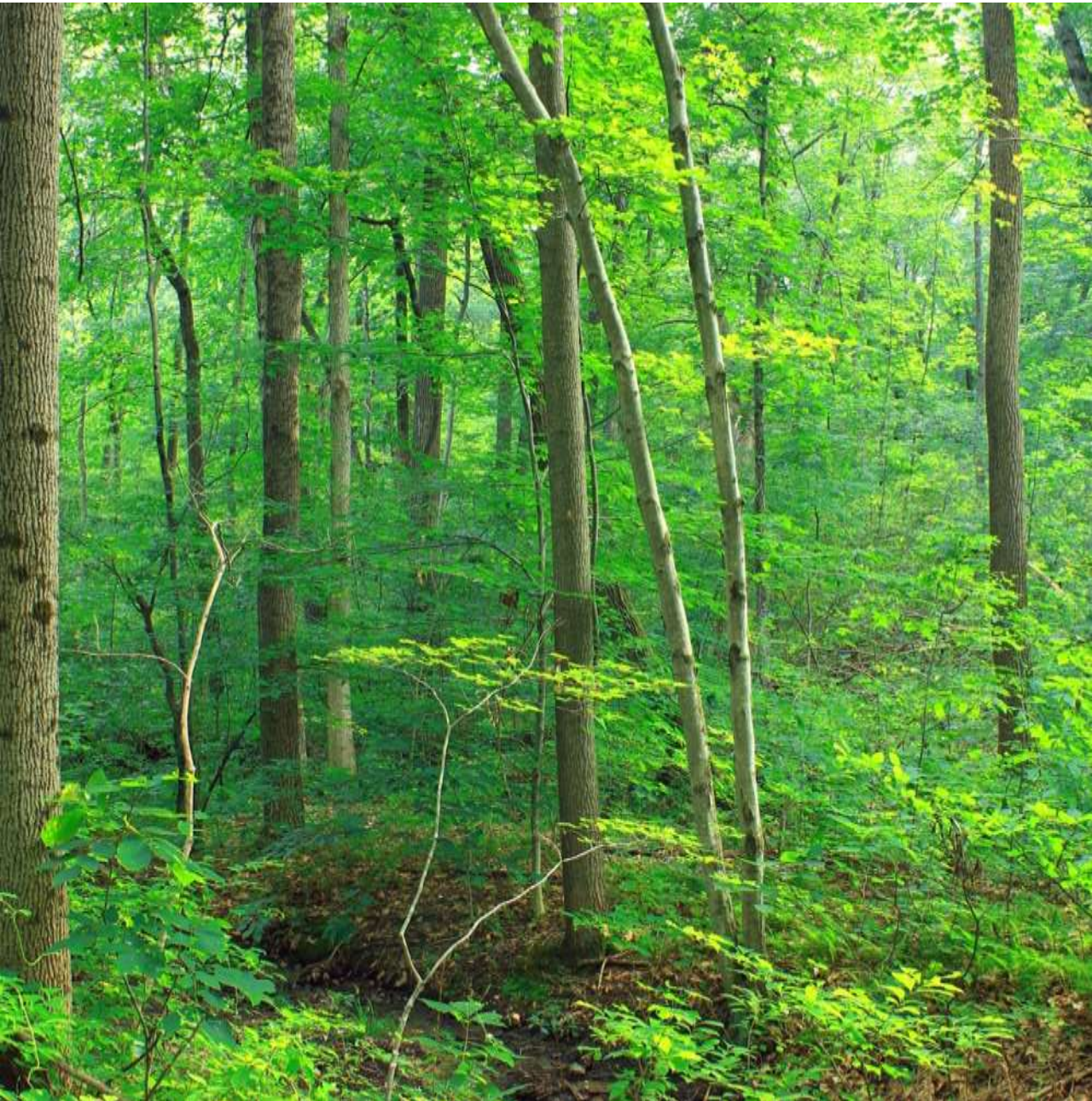
“Patch trading”





Landscape-level Habitat Conditions: Forest Age Class Diversity

- Young age class: 5-10% within mature forested landscape
- Full breeding cycle habitat needs (nesting and post-fledging periods)
- Stop-over habitat during migration



Stand Level Habitat Conditions

- Vertical structural diversity
 - Understory (0-10')
 - Midstory (10-30')
 - Overstory (30'+)
- Native, non-invasive plants
- Large diameter trees
- Softwood inclusions
- Dead standing and cavity trees
- Downed woody material
- Riparian buffers
- Leaf litter



Wood Thrush (*Hylocichla mustelina*)

- 7-8 inches long, slightly smaller than a robin
- Mostly insectivores, will eat fruit
- Woven cup nest made of grass, leaves, mud and small stems placed on lower to mid level branches
- **60% population decline since 1966**



Wood Thrush *Hylocichla mustelina*

Abundance

Estimates of relative abundance for every week of the year animated to show movement patterns. Relative abundance is the estimated number of individuals detected by an eBirder during a traveling count at the optimal time of day for each species.

RELATIVE ABUNDANCE



WEEK OF THE YEAR January 4



Modeled area (0 abundance)
No prediction

eBird data from 2005-2020. Estimated for 2019.

Fink, D., T. Auer, A. Johnston, M. Strimas-Mackey, O. Robinson, S. Ligocki, W. Hochachka, C. Wood, I. Davies, M. Iliff, L. Seitz. 2020. eBird Status and Trends, Data Version: 2019; Released: 2020. Cornell Lab of Ornithology, Ithaca, New York. <https://doi.org/10.2173/ebirdst.2019>

Wood Thrush Breeding Habitat

Nesting:

- Deciduous/Mixed mature forest
- Large forest tracts (> 200 acres)
- Tall and relatively closed canopy (>50 feet, >70% canopy cover).
- Vertical structure diversity, nest in mid-story
- Moist leaf litter

Post-fledging phase:

- Need robust understory or young forest

Challenges:

- Forest loss and fragmentation, lack of age class and structural diversity, interfering vegetation, deer overabundance, climate change



Wood Thrush Migration

Stopover habitat:

- Southern Appalachian Mountains and Gulf Coast
- Young and/or structurally diverse mature forest, and forest edges

Challenges:

- Inadequate stopover habitat
 - Fragmented forests
 - Lack of nutritious food
- Migrate at night
 - Light pollution and disorientation
 - Building collisions



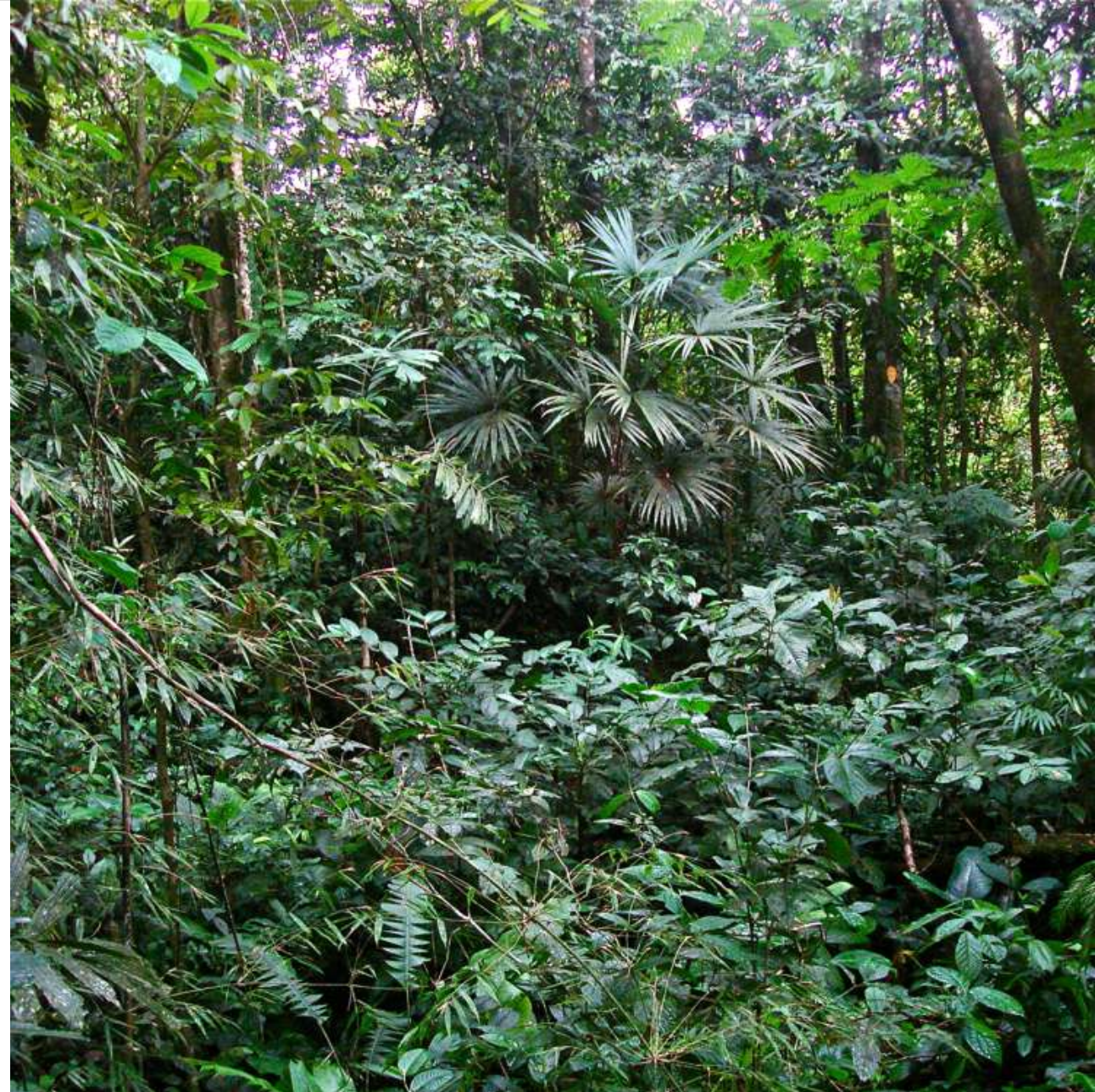
Wood Thrush Wintering Habitat

Habitat:

- Lowland, tropical evergreen forests on the Gulf-Caribbean side of Mexico and Central America
- Similar conditions as breeding habitat – diverse vertical structure
 - Shade-grown coffee

Challenges:

- Forest loss and fragmentation, climate change, unsustainable development



Demonstration forests

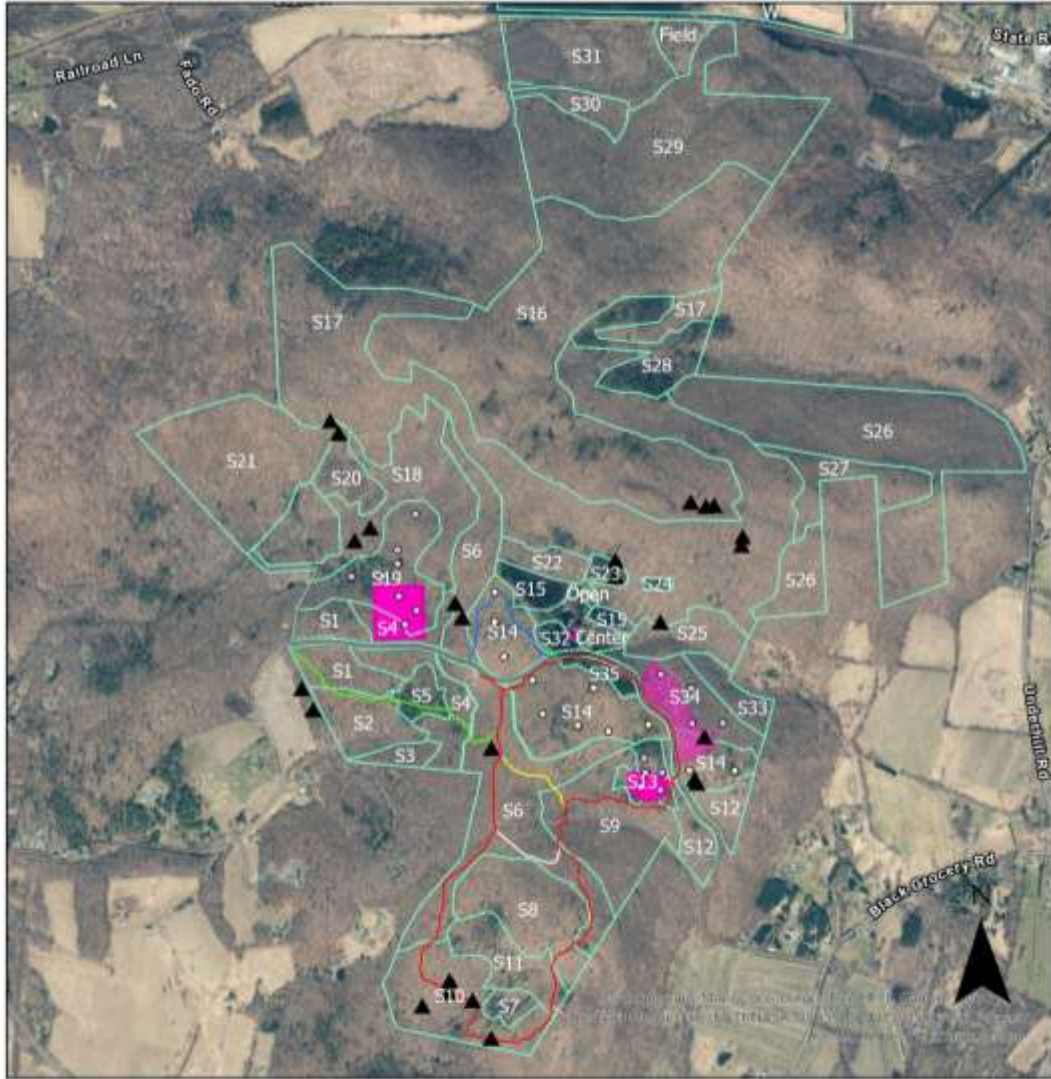
Each site is unique, but all demonstrate diverse forest conditions that provide quality breeding habitat for a suite of forest birds

- Age class diversity and structural complexity meets changing habitat needs from nesting to post-fledging stages

Monitoring programs: evaluate progress

Engage key audiences that will replicate similar management on the properties they own or manage, increasing conservation impact for birds





- Forest Management Demonstration Areas
- ★ Nature Center
- veg survey
- stand14vegplots

Rheinstrom Hill Audubon Sanctuary Forest Management Demonstration Site

- 1,039-acre, even-aged forest with overabundant deer population; lack of young forest in the landscape
- Forest stewardship plan written by professional forester
- Forest management began in 2015 with a 2-acre pilot site. 15 acres have been managed using irregular shelterwood harvests
- Deer exclosures installed to protect regeneration
- Monitor: deer population, deer browse impact, bird response to management, recovery of managed stands using basal area, and do seedling counts in managed areas
- *Flight Plan Priority Species supported here: Wood Thrush, Scarlet Tanager, American Woodcock, Rose-breasted Grosbeak, Yellow-billed Cuckoo*

Forest Regeneration

**Pre-management
(2013)**



**Post-management
(2015)**

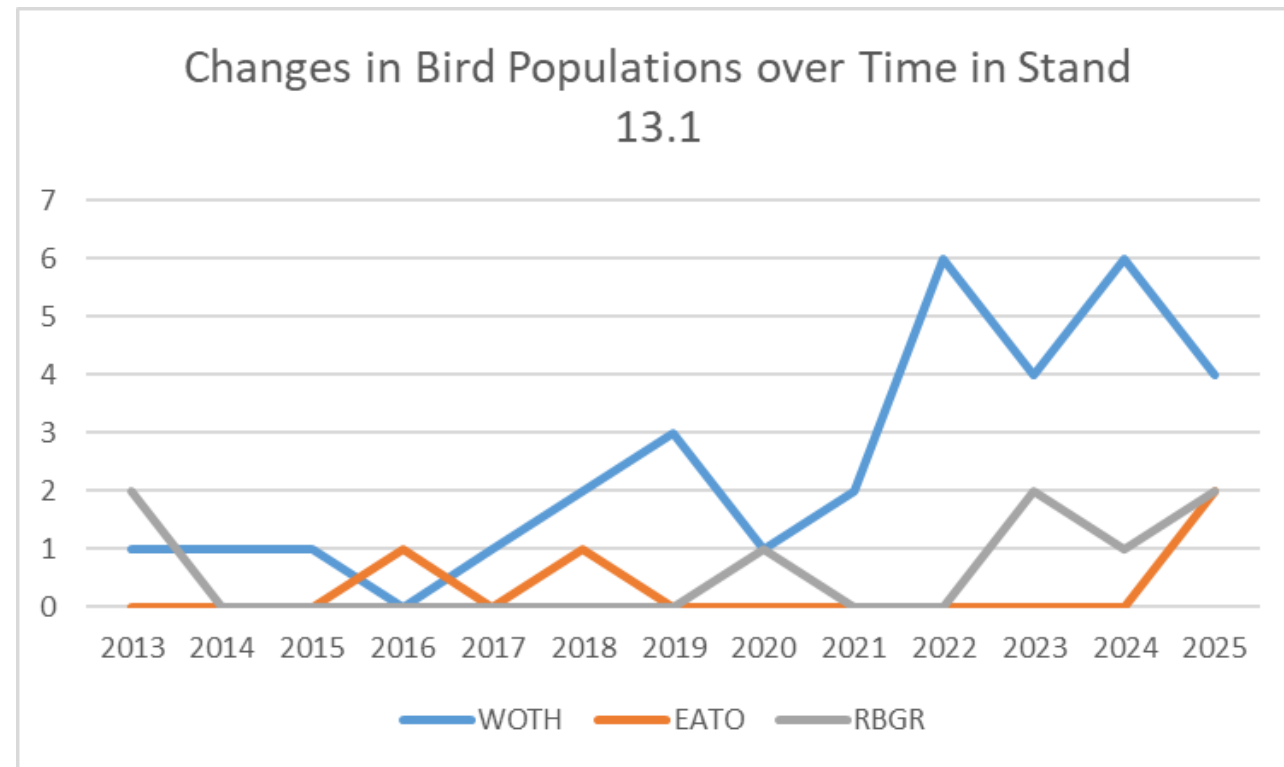


**10 years post-
management (2025)**



Impacts of the Demonstration Forest

- Forest bird abundance and species richness increased, including Wood Thrush
- Successful forest regeneration in the managed areas with increased tree diversity
- Influenced 1,000s of acres of forest management through education programs with landowners, foresters, municipalities, land trusts, and other forest managers
- Partner with the local high school forestry class; students learn forestry data collection and applications throughout the semester





Bent of the River Audubon Center

A 700-acre sanctuary, that includes wildflower meadows, shrubby habitats, interior forests and upland wetlands.

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Althea's Meadow
Photo: Glen Somogie



Junior Forest Technicians 2025.
Photo: Robin Ladouceur

Regional Impact: *Research-driven Community Science and Partnerships*

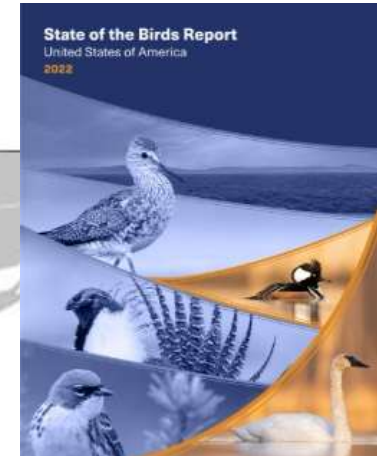
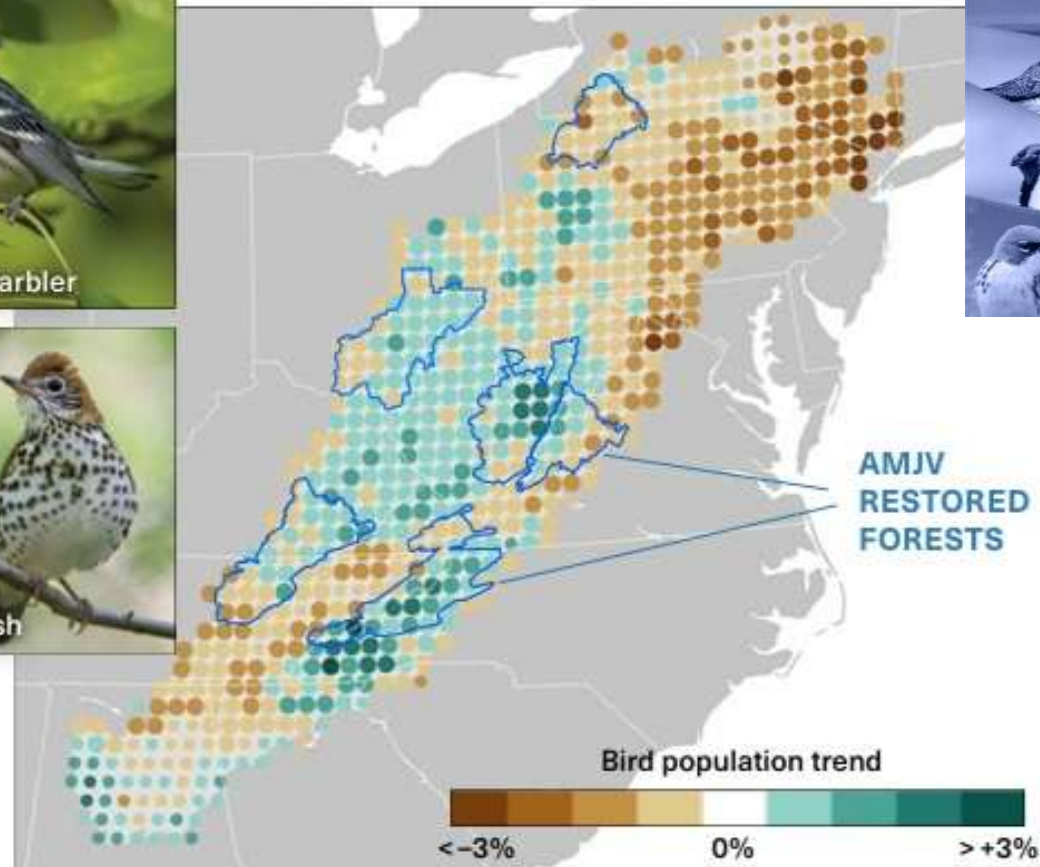
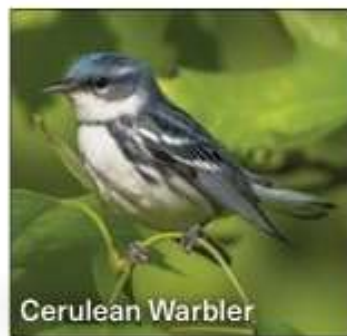
- **Volunteer Bird Banders and Territory Mappers**
- **Engaging School Systems and Local Communities**
- **Junior Forest Technicians**
- **Demonstration Site for Partners**
- **Habitat Assessments and Management Advice for Land Trusts**

Wood Thrush Project Pilot at Bent of the River Center and Sanctuary

- Motus, breeding bird, and vegetation monitoring
- Forest management plan written by an Audubon endorsed foresters (plan goals: bird habitat, climate adaptation and mitigation, flood damage restoration, demonstration sites for education and training). Funding for plan secured from CLCC
- Forest management implementation: initial planning underway, management cost estimates provided by professional logger (attended an Audubon forester training!), applying to CLCC to secure funding
- Planning educational forest bird program to engage regional conservation partners, followed by an invite to a daylong training about bird-friendly forestry and the Wood Thrush Project
- Pilot endorsement program with regional conservation partners

Two Birds Making a Comeback

Over the last 50 years and across their ranges, the long-term population trends for Cerulean Warbler and Wood Thrush show declines of about 60%. But within the last decade, both birds are showing signs of stabilization—a lesser decline of about $-0.03\%/year$ for Cerulean Warblers and a slight increase of $+0.68\%/year$ for Wood Thrush. The Appalachian Mountains Joint Venture (AMJV)—a partnership of over 50 federal, state, and nonprofit organizations from Alabama and Georgia to New York—is leading the way to bend the loss curve for these declining birds, with forest management projects that restore the age and structural diversity of hardwood forests in the region. Some of the biggest local Cerulean Warbler and Wood Thrush population increases are occurring in AMJV work areas, which also benefit other songbirds and wildlife species as well as overall forest health.



FOREST RESTORATION WORKS FOR BRINGING BACK BIRDS

In areas where the Appalachian Mountains Joint Venture has helped restore forests, data from eBird show remarkable increases in numbers of Cerulean Warbler and Wood Thrush. Source: Cornell Lab | eBird 2007–2019.