

2023
**APPALACHIAN
MOUNTAINS
JOINT VENTURE
PARTNERSHIP YEAR IN REVIEW**



Celebrating the Contributions of AMJV Partners to Bird Conservation



Dear AMJV Partners,

We're excited to present our 2023 AMJV Partnership Year in Review.

First, you may have noticed that this publication has had a slight name change, adding the word *Partnership* to the title. Both our AMJV Mission and Vision statements assert the importance of partnerships, and all of you, our partners, are certainly at the core of our bird conservation efforts. While the purpose of our Year in Review has always been to highlight the successful and incredible work of the AMJV partners, we wanted to make this change in the title to really emphasize that.

This has been a very exciting year of growth and new directions for the AMJV. We welcomed Dr. Ashley Peele to the AMJV staff last August as our Community Science and Engagement Coordinator to build new opportunities to incorporate citizen science and community engagement into our bird conservation efforts. We finalized 3 new state-level agreements with the West Virginia, Kentucky, and Virginia offices of the USDA Natural Resources Conservation Service (NRCS), totaling almost \$1.3 million. These agreements are providing forestry training assistance to NRCS staff and forestry professionals, outreach to private landowners to increase enrollment in Farm Bill programs, and monitoring capacity to help quantify the conservation impacts of our efforts with NRCS on private lands conservation. The agreement with WV NRCS also adds two Private Lands Wildlife Foresters to the AMJV staff that were hired in 2024. We embarked on the development of a new 5-year strategic plan that not only sets the conservation goals of the AMJV Partnership over the next five years, but also helps us further unify and empower our partners to be successful on the ground. Finally, we're embracing new and exciting opportunities, including expanding our efforts in the coal fields region of the AMJV geography while partnering with socio-economic and community development coalitions working in that region to incorporate economic, work force, and community development goals into our conservation efforts.

Many thanks to the AMJV staff, board members, and *especially* our partners for taking these new and exciting steps with us as the scope of our work and our partnership grows. I am excited for the directions they take us in 2024!

Thank you!

Todd Fearer
Coordinator, Appalachian Mountains Joint Venture

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AMJV STAFF



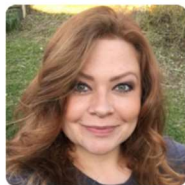
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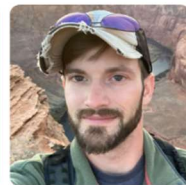
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AMJV MISSION & VISION

Our **mission** is to restore and sustain viable populations of native birds and their habitats in the Appalachian Mountains Joint Venture (AMJV) region through effective, collaborative partnerships.

Vision - Partners working together for conservation of native bird species in the Appalachian Mountains region to attain:

- Fully-functioning ecosystems with sustainable populations of the region's native avifauna, guided by state, regional, national, and international bird plans
- Effective delivery of habitat conservation through adaptive management and guided by a conservation approach consisting of biological planning, conservation design, delivery of conservation actions, evaluation, and research
- Success in capitalizing on funding opportunities relevant to partnership priorities
- An engaged Management Board, representative of the diverse landscape and effective partnerships in the Appalachian Mountains

INTRODUCTION

The [AMJV Partnership](#)—which consists of over 55 state and federal agencies, conservation organizations, and universities throughout 12 states in the Appalachian Region (Figure 1)—is focused on preserving, managing, and restoring diverse, healthy forest habitats in the region to benefit not only birds, but the diversity of Appalachian plants and wildlife.

Partner updates in this 2023 Partnership Year in Review reflect the two overarching themes of the [AMJV Strategic Plan \(2018-2023\)](#). [Theme 1: Dynamic Healthy Forest Landscape](#) goals, which focus on creating a dynamic, healthy forest landscape in the Appalachian Region, are supported by projects within the [six focal landscapes](#): Allegheny Highlands (PA/NY); Greenbrier/Alleghenies (WV); Southeastern Ohio; Cumberlands (KY/TN); Southern Appalachian High Country (NC/TN/VA); and Virginia Highlands as part of the [AMJV Focal Landscape Initiative](#) and also by state and regional projects that occur outside of those boundaries. [Theme 2: Full Annual Cycle Conservation](#) goals, which focus on full annual cycle conservation of birds, are supported by both domestic and international research and conservation efforts completed by various AMJV partners that contribute to the long-term sustainability of AMJV bird populations across their full life cycle.



Figure 1. The AMJV Partnership covers a 12-state region.

NEW JERSEY

Response of Golden-winged Warblers and Invasive Plants to Forest Management in New Jersey

Sharon Petzinger, Senior Zoologist, New Jersey Fish and Wildlife's Endangered and Nongame Species Program

Golden-winged Warblers (GWWA) are listed as state-endangered in New Jersey and their breeding populations have been declining in the state and throughout the region. Their nesting habitat requires large tracts of deciduous forest that contain canopy gaps greater than 10 acres—large enough to allow shrubs, saplings, and herbaceous vegetation to grow. In New Jersey, however, the lack of fire and other disturbances that would open the forest canopy (beavers, silviculture) has resulted in most of the forests in the GWWA breeding range having closed canopies. In fact, in New Jersey natural succession has caused the loss of more GWWA nesting habitat than development over that last 20 years.

Efforts to use silviculture to open the forest canopy (Figure 2), which would in turn restore habitat suitable for nesting GWWA, began around 10 years ago in New Jersey. Because it takes about five years for a site to become suitable for nesting habitat after treatment, few locations currently contain suitable nesting habitat and those that do either are now lacking the necessary herbaceous vegetation (Figure 3), have too little forest and/or too much residential development and agriculture in the vicinity, or are no longer near existing populations of breeding GWWA. That said, many of the treated sites that meet all of the requirements to be suitable nesting habitat have not only been successful in recruiting breeding GWWA but are more likely to recruit breeding GWWA than power lines and shrubby wetlands that meet those same requirements.



Figure 2. Male Golden-winged Warbler in a site managed in New Jersey to open the forest canopy. Photo by John Parke



Figure 3. Female Golden-winged Warbler in New Jersey nesting on the ground in herbaceous vegetation. Photo by Sharon Petzinger

Implementing silviculture to open the forest canopy in New Jersey has been slow and laborious, especially on public lands, due to the many regulations and policies placed on forest management planning and implementation as well as continued pushback from individuals who do not support these efforts. Because of that, only about 10 acres per year on state lands and 20-30 acres per year on private lands are being managed to open the forest canopy and create suitable nesting habitat for GWWA. Even with successful recruitment of breeding GWWA, the small amount of land managed for nesting habitat is not enough to reverse population declines. Add to that the 5-year lag in a site becoming suitable for nesting after treatment and New Jersey’s breeding population may still become extirpated in less than 10 years.

One of the arguments against using silviculture to open the forest canopy in New Jersey is that it will create conditions for invasive plants, such as Japanese stiltgrass and barberry, to take over. Invasive plants can dominate a forest understory, especially in areas with overabundant deer, and prevent native shrubs, saplings, and herbaceous vegetation from growing. While invasive plants can provide some structure to the understory, they are not a good food source for wildlife, especially birds like GWWA that rely on caterpillars for food. It becomes more difficult to control invasive plants when they occupy more than 5% of an area. Based on rapid vegetation assessments at 54 sites managed for open-canopy forests and 34 unmanaged shrubby wetland sites in New Jersey, less than 70% of the managed sites had greater than 5% invasive plant cover while more than 70% of the unmanaged shrubby wetland sites had greater than 5% invasive plant cover. In fact, shrubby wetland sites averaged around 16% invasive plant cover while managed sites averaged 5% or less (Table 1).

Table 1. Average percent invasive plant cover and % of sites with >5% invasive plant cover for each type of site where bird surveys were conducted in 2023.

Site Type	Number of Sites	Average Invasive Plant Cover	% of Sites with > 5% Invasive Plant Cover
Unmanaged Shrubby Wetlands	34	15.9%	73.5%
Managed for Open-canopy Forest – Private Land	35	5.1%	31.4%
Managed for Open-canopy Forest – Public Land	19	3.1%	15.8%
Total	88	8.9%	44.3%

In conclusion, forest management to open the forest canopy and allow the regeneration of oak/hickory forests in addition to herbaceous vegetation and shrubs should continue and be

expanded, provided the amount of forest in the young forest stage (less than 20 years post-harvest) does not exceed 20% of the forested landscape at a given time. Without the maintenance of existing and/or creation of new open-canopy forests that allow native shade-intolerant saplings, shrubs, and herbaceous vegetation to grow in New Jersey, the GWWA will continue to decline as natural succession and other threats to this habitat type take hold.

NEW YORK

Forest Management on New York State Wildlife Management Areas

Beth Cooper, Fish & Wildlife Technician, New York State Department of Environmental Conservation
Sandy Van Vranken, Wildlife Biologist, New York State Department of Environmental Conservation

This work overlaps the Allegheny Highlands (PA/NY) Focal Landscape

New York State Department of Environmental Conservation (NYSDEC) continues to improve habitat for American Woodcock, Ruffed Grouse, Wild Turkey, Eastern Whip-poor-will, Golden-winged Warbler, and other wildlife on Wildlife Management Areas (WMAs) throughout New York, but this article focuses on work accomplished within the AMJV region.

Habitat management planning continues to be an integral part of our program. To date, 22 WMAs of the 33 located within the AMJV region have approved plans. One additional plan was completed in 2023 (Wolf Hollow WMA), while another four are in draft stage.

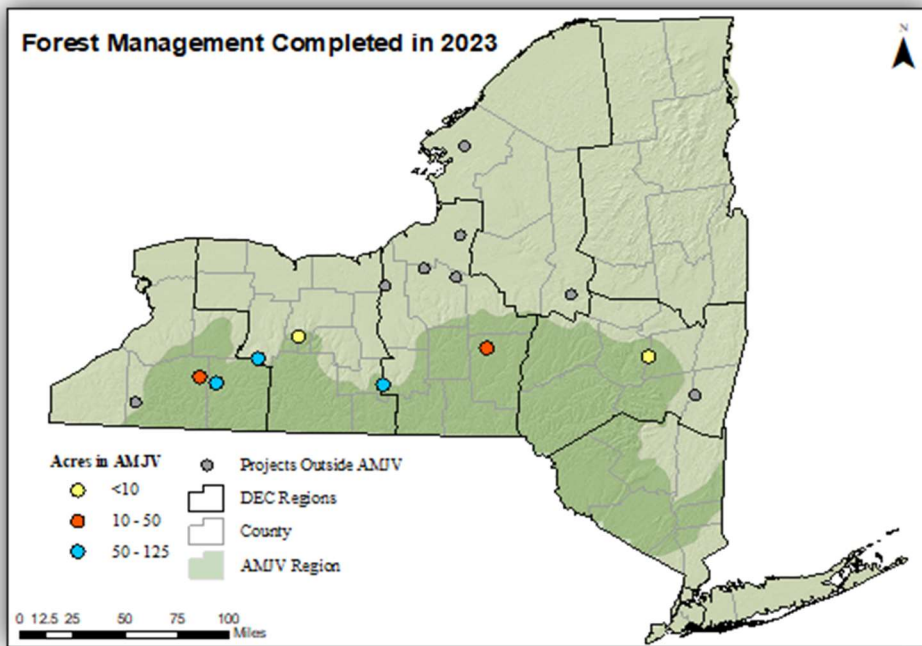


Figure 4. Locations of Wildlife Management Areas with forest management projects completed in 2023. Figure courtesy of New York State Department of Environmental Conservation

Several multi-year forest management projects were completed in 2023 (Figures 4, 5, & 6, Next page), resulting in 281 acres of young forest, 43 acres of shrubland, and 44 acres of timber stand improvement (TSI) on 7 WMAs. We also continued administering multiple active contracts for 547 acres of forest management—85% of which will result in young forest—which we expect to be completed within 3 to 5 years. An additional 920 acres of young forest, 63 acres of TSI, and 134 acres of shrubland habitat are currently in the planning stages.



Figure 5. (Left) A new half-mile accessible trail was completed at Partridge Run Wildlife Management Area. This trail loops through a developing forest management demonstration area, which also features an observation tower. The view from the tower overlooks an area being re-set to young forest - note the forestry mower in action! Photos courtesy of New York State Department of Environmental Conservation

Back to the wildlife! We conducted surveys on 10 WMAs, continuing our efforts to collect data on American Woodcock, Ruffed Grouse, Wild Turkey, and songbirds to evaluate wildlife response to management. Point counts detected an average of nearly 40 species per WMA, including several Species of Greatest Conservation Need: Black-billed Cuckoo, Brown Thrasher, Black-throated Blue Warbler, Blue-winged

Warbler, Canada Warbler, Louisiana Waterthrush, Prairie Warbler, Red-shouldered Hawk, Scarlet Tanager, and Wood Thrush. Since 2016, the detection rate of American Woodcock on WMAs has more than doubled (Figure 7)! We have yet to see a significant response from Ruffed Grouse or Wild Turkey, but it may take up to 10 years for suitable habitat structure to develop in project areas for these species.

Since 2015, we've completed over 1,460 acres of young forest, 310 acres of TSI, and 150 acres of shrubland on 16 WMAs across the AMJV region.

NORTH CAROLINA

The Motus Network Grows in Western NC, and Detections are Flying in!

Chris Kelly, Wildlife Diversity Biologist, North Carolina Wildlife Resources Commission

This work overlaps the Southern Appalachian High Country (NC/TN/VA) Focal Landscape



Figure 6. Drone shot of a 27-acre seed tree treatment that was part of a 125-acre project completed at Connecticut Hill Wildlife Management Area. Photo courtesy of New York State Department of Environmental Conservation

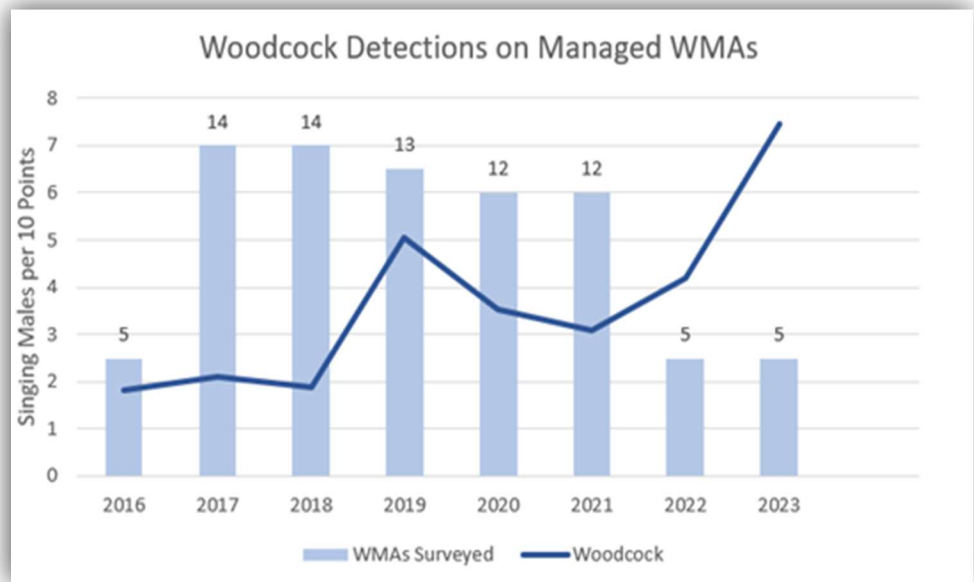


Figure 7. Surveys on New York State DEC Wildlife Management Areas show an upward trend in the detection rate of American Woodcocks heard “peenting” in the spring. Figure courtesy of New York State Department of Environmental Conservation

Migration season is extra exciting now that NCWRC has a growing Motus network in the mountains! In 2023, NCWRC’s first mountain Motus station on Little Scaly Mountain at The Mountain Retreat and Learning Center outside of Highlands, North Carolina, logged [16 detections](#)—3 during spring migration and 13 during autumn migration. Notable detections during fall 2023 migration included two Short-billed Dowitchers passing by (one 7/18, one on 7/24). From the [Motus.org](#) website, we can see that these two individuals were tagged in June up in Churchill, Manitoba, Canada by researchers at Trent University. That’s polar bear country! Their route took them to northern Ohio, along the Lake Erie shoreline, then down through central Ohio to western North Carolina. One continued to coastal Georgia.

The Pond Mountain Game Land Motus station (Figure 8) located in the very northwest corner of the state was operational by mid-April 2023 and logged [11 detections](#) during autumn migration. Both installations are “dual mode,” having antennas tuned to the 434 MHz frequency and the 166 MHz frequency.



Figure 8. The Pond Mountain Motus Station in Ashe County, NC. Antennas are mounted on a wood utility pole and the station’s battery is charged by a solar panel. The receiver box and battery are housed inside this old airplane hangar. Above, Kendrick Weeks of North Carolina Wildlife Resources Commission runs coaxial cables from the antennas through the side of the hangar building. Photo by Chris Kelly/NCWRC

station name on the Motus [Explore Stations](#) page and then clicking the green arrow in the bottom left corner of the map. Finally, the “Drones and Motus” tags listed in the table of Receiver Deployment Detections at The Mountain Retreat and Learning Center are not birds. They represent test NanoTags hung from a drone being flown by researchers at Highlands Biological Station who are examining detection range of the antennas.

Golden-winged Warblers from the 2022 Study Cohort Return to North Carolina *Chris Kelly, Wildlife Diversity Biologist, North Carolina Wildlife Resources Commission*

In spring 2023, NCWRC biologists continued with their contribution to the University of Maine’s study “Estimating the survival rate of Golden-winged Warblers for a range-wide integrated population model.” In April and May 2022, the NCWRC mountain bird crew captured and banded 22 Golden-winged Warblers in the Cheoah Mountains of Graham County. Twelve of these were fitted with NanoTags and the remaining ten were color-banded controls. Thus, the mountain bird crew’s task for May 2023—finding these individuals—was laid out for them the previous year. Resight surveys kicked off in late April 2023 just as the birds were returning from South America. Biologists completed extensive resight surveys, searching for returning individuals with the aid of visual searches, audiolures, and of course a radio receiver and yagi antenna to detect NanoTag signals (Figure 9). Although the number of Golden-winged Warblers on territory in the area was similar to recent years, most individuals were unbanded. Overall, the team found five returning birds, two of which were from the 2022 cohort and the other three from earlier cohorts (two from 2021 and one

Anyone can explore the [Motus website](#). NCWRC created simple animations of the tagged birds that passed our two mountain Motus stations. To enjoy these animations, click here: [Pond Mountain](#) or [The Mountain Retreat and Learning Center](#). To animate the migration tracks, click the green right arrow. Then watch the directional arrows on the map and the advancing dates to the right of the map. [Motus.org](#) notes that “these public animations have been created using broad filters based on theoretical flight speeds, logical geographic/time sequences, and at least 3 consecutive tag bursts at a single station. Individual tracks have not been inspected for accuracy.” For example, the detection of a Kirtland’s Warbler in Washington state is a false detection. Readers can also view animations by searching for the



from 2018). One of the two returning individuals from the survival study was a color-banded control bird, a male. The other was a female fitted with a NanoTag. These resighting rates are disappointing, but before jumping to conclusions, NCWRC biologists await the University of Maine’s analysis of the full range-wide dataset. The survival data are just one piece of a comprehensive Integrated Population Model which partners hope will highlight the critical factors limiting Appalachian Golden-winged Warbler populations.

Figure 9. (Left) Chris Kelly scanning for Golden-winged Warblers fitted with NanoTags in the Cheoah Mountains. Photo by Chris Kelly/NCWRC

OHIO

Forest Songbird Community Study in Southeastern Ohio

Carl Engstrom, Graduate Student, The Ohio State University

This work overlaps the Southeastern Ohio Focal Landscape

The first full season of fieldwork was completed in the spring and summer of 2023 on a project involving forest songbird communities in southeastern Ohio (Figures 10, 11, & 12). With close collaboration and funding support from the Ohio Division of Wildlife, the project is affording us the opportunity to continue long-term monitoring of Cerulean Warblers (and other focal species) in Southeast Ohio to better understand spatial and temporal changes in habitat over the last 15 years. In addition, we hope to identify landscape features and the impacts that the novel silvicultural techniques employed in the Adaptive Silviculture for Climate Change (ASCC) study at Vinton Furnace State Experimental Forest (VFSEF) may have on several species of conservation concern in the region (Cerulean Warbler, Ovenbird, Wood Thrush, Scarlet Tanager). During the field season, point count surveys were conducted at VFSEF and nearby Zaleski State Forest to assess forest



Figure 10. Deep ravines with rocky outcroppings are a prominent feature of Ohio’s unglaciated region in which the study sites are located. Photo by Carl Engstrom

bird community composition in the study area. Territory mapping surveys for the focal species were also performed on selected ASCC plots to understand how these species were distributed on the landscape. Additionally, nest searching and monitoring of Wood Thrush nests was conducted on the selected ASCC plots to help estimate the productivity of this species of concern. The second season of fieldwork will occur in the spring and summer of 2024 to add to our dataset and help answer the questions about the impacts of habitat and landscape features on this avian community.

Figure 11. (Below) Several Eastern Whip-poor-will nests were some of the cooler incidental discoveries made during the field season. Figure 12. (Right) Wood Thrush nest with young. Photos by Carl Engstrom



Grassland Birds at Appalachian Hills Wildlife Area

Joseph Lautenbach, Wildlife Biologist, Ohio Division of Wildlife

[Appalachian Hills Wildlife Area](#) (AHWA) was recently acquired by the Ohio Division of Wildlife (Figure 13). The AHWA is 54,525 acres located in portions of Morgan, Muskingum, and Noble counties in southeastern Ohio. Historically, much of the AHWA was mined for coal and was later reclaimed resulting in large grassland areas. Mining operations ceased and reclamation efforts were completed by 1995. Prior to purchase by the Ohio Division of Wildlife, the previous owner established grazing and haying contracts on the property. Land cover on the AHWA consists of 68% forest, 27% grassland/open lands, and 5% wetlands and ponds.



Figure 13. Appalachian Hills Wildlife Area was recently acquired by the Ohio Division of Wildlife. The wildlife area is 54,525 acres located in portions of Morgan, Muskingum, and Noble counties in southeastern Ohio. Photo courtesy of the Ohio Department of Natural Resources

In 2023, staff from the Ohio Division of Wildlife surveyed grasslands to obtain baseline information on grassland

and shrubland bird use and their response to three different management types: grazing, haying, and idle fields. Grasslands in the AHWA were planted during reclamation efforts and were primarily composed of cool-season grasses. Cattle are in pastures all year in grazed pastures. Hay fields are cut once annually after July 15, after most grassland bird nestlings have fledged. Idle fields have had minimal disturbance and considerable woody encroachment. In total, 120 point-count surveys were conducted, with 40 locations in each management type. We used distance sampling to estimate density and abundance of a variety of grassland birds.

The grasslands at AHWA support robust populations of obligate grassland birds. Species responses varied by management type (Table 2, Right). Overall, the wildlife area supports a robust population of Bobolink. Densities of male Bobolinks were similar between grazed and hayed fields. Across all management types, there were an estimated 4,952 male Bobolinks at the AHWA, likely supporting one of the larger populations of Bobolinks in Ohio.

Table 2. Estimated abundance of male birds by management type at Appalachian Hills Wildlife Area, Ohio, May and June 2023. There were 3,504 acres of grazed land, 1,678 acres of hayed land, and 1,032 acres of idle land surveyed by Ohio Division of Wildlife. An asterisk () indicates a Species of Greatest Conservation Need.*

	Graze	Hay	Idle
Species	Population Estimate	Population Estimate	Population Estimate
Bobolink*	3,247	1,663	42
Eastern Meadowlark*	1,256	318	159
Eastern Towhee	228	109	287
Field Sparrow	178	72	201
Grasshopper Sparrow*	2,133	227	0
Gray Catbird	111	27	156
Henslow's Sparrow*	415	1,258	611
Indigo Bunting	9	0	28
Prairie Warbler*	0	0	176
Red-winged Blackbird	1,116	861	253
Song Sparrow	789	195	183
Willow Flycatcher	259	180	121
Yellow Warbler	615	192	237
Yellow-breasted Chat*	57	22	74



Henslow's Sparrows (Figure 14) achieved their greatest densities in hay and idle fields, with very few birds using grazed fields. In contrast, Eastern Meadowlark and Grasshopper Sparrow abundance was greatest in grazed pastures. Our work builds on previous research with grassland birds, highlighting the importance of creating and maintaining structural heterogeneity in grasslands to support diverse grassland bird communities. Furthermore, haying and grazing practices in AHWA are cost-effective methods to control or slow invasive and aggressive woody plants that often encroach into grasslands on reclaimed surface mines.

Figure 14. (Left) Henslow's Sparrow, one of the grassland bird species that uses the Appalachian Hills Wildlife Area, perched on rattlesnake master plant (not taken at AHWA). Photo by Gerald D. Tang/Dreamstime.com and courtesy of American Bird Conservancy

Lake-crossing Behavior of Migratory Songbirds Project

Zoe Korpi, Graduate Student, The Ohio State University



Figure 15. White-throated Sparrow equipped with a Lotek NanoTag. Photo by Zoe Korpi

From March through May of this past year, the second and final field season of the Lake Crossing Project was completed. The aims of this project are to understand the lake-crossing behavior of migratory songbirds in Ohio and to predict the impact of Lake Erie offshore wind development on migratory songbirds. As part of this project, 118 digitally coded NanoTags were deployed on migratory songbirds (White-throated Sparrows (Figure 15), Swainson's Thrush, Magnolia Warbler, Tennessee Warbler, and Yellow-rumped Warbler) across Ohio with the help of project collaborators. Using the Motus Wildlife Tracking System, these birds were detected by automated radio telemetry stations as they flew through Ohio and towards their breeding territories in Canadian Boreal forests. Birds equipped with larger tags will continue to be detected during fall migration and as they return to their wintering range.

Additional work was also done on Motus infrastructure throughout the state with a focus on tagging sites and the lakeshore. This work ranged from general maintenance and upgrades to the installation of new towers (Figure 16). Expansion and maintenance of the existing Motus array will continue throughout the year.

Figure 16. (Left) Antenna installation for a Motus tower at Miami University in Oxford, Ohio. Photo by Zoe Korpi



PENNSYLVANIA

Cove Mountain Migratory Stopover Site Expansion
N. Scott Parkhill, Senior Forest Program Manager, Audubon Mid-Atlantic

In partnership with The Nature Conservancy (TNC), Audubon Mid-Atlantic expanded the migratory stopover habitat work at TNC's Cove Mountain Preserve in Marysville, PA. Phase 1 of this project saw the creation of a 1-acre canopy gap which was treated for invasives and planted with fruit-bearing shrubs to provide structural complexity and soft mast for fall migrants. Spring and fall monitoring efforts revealed increased abundance and diversity of Neotropical migrants as well as four species that do not breed in Pennsylvania, meaning the stopover site was occupied by species that were using it along their hemispheric journey.

In Phase 2, an additional four acres were identified for migratory stopover management. Pre-management monitoring during migration was performed in order to establish a baseline before management took place. In late fall of 2023, a direct seeding operation (Figure 17) took place where a large quantity of seeds were directly applied to the ground after leaf blowers gained access to the mineral soil by temporarily removing the leaf litter. In the spring of 2024, a low shade removal was completed to increase light to the forest floor, remove non-desired pole-sized birch, and promote complex, young forest habitat at the site.



Figure 17. Direct seeding at the Cove Mountain Migratory Stopover Site expansion. Photo by N. Scott Parkhill/Audubon Mid-Atlantic

This work is part of Audubon Mid-Atlantic’s work to implement its new blueprint for conservation work in the region. Over the next decade, Audubon plans to create at least 10 migratory stopover sites along the Kittatinny ridge in order to enhance the

landscape’s ability to provision migrating birds with the fuel they need to complete their hemispheric journeys in a world with ever-increasing pressures on migratory species. It is hoped that the experimental direct seeding at the new four-acre site will lend insights into how to achieve this management on private lands more affordably than seedling planting.

Recovering Pennsylvania’s Grassland Birds

*Stefan Karkuff, Avian Recovery
Biologist, Pennsylvania Game
Commission*

Grassland dependent bird species are at-risk nationwide due to steeply declining populations (53% declines since 1970)—largely attributed to habitat loss from intensive modern agricultural practices, incursion of invasive species, and land use changes. The Pennsylvania Game Commission (PGC) and partners have been working to address grassland declines through federal Farm Bill programs for over a decade. Likewise, the PGC has been managing native grassland habitat on many of its state game lands (SGLs) for decades. A recent study (Yeany 2022) evaluating Pennsylvania grasslands identified gaps in publicly available bird surveys for many SGLs.



Figure 18. Eastern Meadowlark, a Pennsylvania Species of Greatest Conservation Need. Photo by Jacob Dingel/Pennsylvania Game Commission

In 2023, the PGC set out to fill in survey gaps to help prioritize grasslands and grassland management. PGC staff and volunteers conducted grassland bird surveys at 19 SGLs across Pennsylvania. Game lands were selected based on two criteria: 1) sites with large openings greater than 100 acres of contiguous herbaceous cover and 2) sites with existing limited avian data (e.g., eBird). Each SGL survey was comprised of multiple survey points within large herbaceous openings and was visited twice during the breeding season. In summary, we detected a total of 114 species of birds, and more importantly 9 of 12 grassland Species of Greatest Conservation Need (SGCN) in Pennsylvania, including Eastern Meadowlark (Figure 18), Henslow's Sparrow, Grasshopper Sparrow, Bobolink, and Northern Harrier (a Pennsylvania-threatened species).

These surveys are a snapshot of grassland bird diversity on state game lands. The discovery of many grassland species from sites with few historical records is a testament to the current management activities—timely mowing, prescribed fire, and grassland establishment—all contribute to the open sight lines and vegetation structure these birds seek. These open landscapes should not be taken for granted, as privately owned grasslands (mainly hay and pasture lands) are sold for development or revert to forest. Perhaps more than any other group of birds, grassland birds are pushed across the state looking for suitable habitat that becomes harder to find. Though grasslands are a small component of Pennsylvania, their value grows exponentially as these rather inconspicuous birds continue to decline.

TENNESSEE

Founding of the Appalachian Conservation Institute and the Establishment of Avian Monitoring and Research

Quentin Miller, Associate Director, Appalachian Conservation Institute

The Appalachian Conservation Institute (ACI) is a newly established non-profit land conservation organization based in the South Cumberland Mountains (SOCUMOS) of Tennessee. ACI is on a mission “to serve as a leading example in conservation philanthropy through land protection, land restoration and scientific education”. We have the great fortune of protecting over 10,000 acres of land with a mosaic of habitat types (Figure 19). This mosaic includes mature oak hickory forests, remnant pine oak savannas, shrubby early successional forests, riparian hemlock groves, mountain bogs, cave karst systems and more.



Figure 19. A Turkey Vulture takes flight from Low Gap Point, an area protected by Appalachian Conservation Institute. Photo by Quentin Miller

In our first six months as an organization, we've made significant progress in our bird research program. In accordance with the USGS Bird Banding Project, we have carved out our mist net banding lanes and recently finished construction on our bird banding laboratory (Figure 20, Next page). This lab will allow the public to join us as we learn about the Neotropical bird species that are migrating to our area for the breeding season and those just stopping over for a longer journey ahead.

Additionally, the lab will serve as an entry point for the community to learn about the importance of our conservation and land stewardship efforts as ACI continues to grow. Bird banding operations are well underway for the year and so far, we have seen an incredible diversity of Neotropical bird species coming through this area including Scarlet Tanagers (Figure 21), Hooded Warblers, Indigo Buntings, Black-and-White Warblers, Cerulean Warblers, etc.



Figure 20. The Appalachian Conservation Institute Bird Banding Laboratory as it nears completion. Photo by Quentin Miller



Figure 21. A male and female Scarlet Tanager captured in ACI's nets. Photo courtesy of Quentin Miller



Figure 22. Installation of our survey plots for a long-term vegetation management plan on one of the largest bogs on the Cumberland Plateau. Photo by Zach Irick/SGI

ACI has also purchased a Motus tower and Motus tags that will be used to track a representative bird species for the SOCUMOS. We'll be attaching the tags to breeding Wood Thrush (*Hylocichla mustelina*) to better understand their life cycle history and migration patterns. The Motus tower we install on our property will join a growing network of towers across North America. This research project is a collaborative effort with multiple bird conservation organizations and is facilitated through the U.S. Fish and Wildlife Service.

As we've been conducting research and surveying our 10,000+ acres, we've identified critical ecosystems not commonly found in Tennessee.

We've enlisted the expertise of the Southeast Grasslands Institute (SGI) to monitor rare mountain bogs found on our property. One of our bogs is over three acres in size and is home to a thriving population of rare jointed spike sedge (*Eleocharis equestroides*), found growing along the perimeter of the bog. With the help of SGI, we will conduct a comprehensive botanical survey of all the plants found in our bogs to determine a long-term management plan to ensure their continued success (Figure 22, Previous page).

Finally, we've started the time-sensitive work of saving the imperiled eastern hemlocks (*Tsuga canadensis*) found on the property. The hemlocks found on our property are unfortunately afflicted by the hemlock woolly adelgid (*Adelges tsugae*) invasive species found across the Southeast. One of our first steps was to partner with Panther Creek Forestry and begin treating our remaining hemlocks (Figure 23). Hemlock groves are foundational to the forest; they provide a unique habitat for biodiversity and help stabilize the riparian banks they are commonly found in. ACI is excited to continue our restoration work in the coming months with prescribed burns that will restore historic pine oak savannas to the Cumberland Plateau.

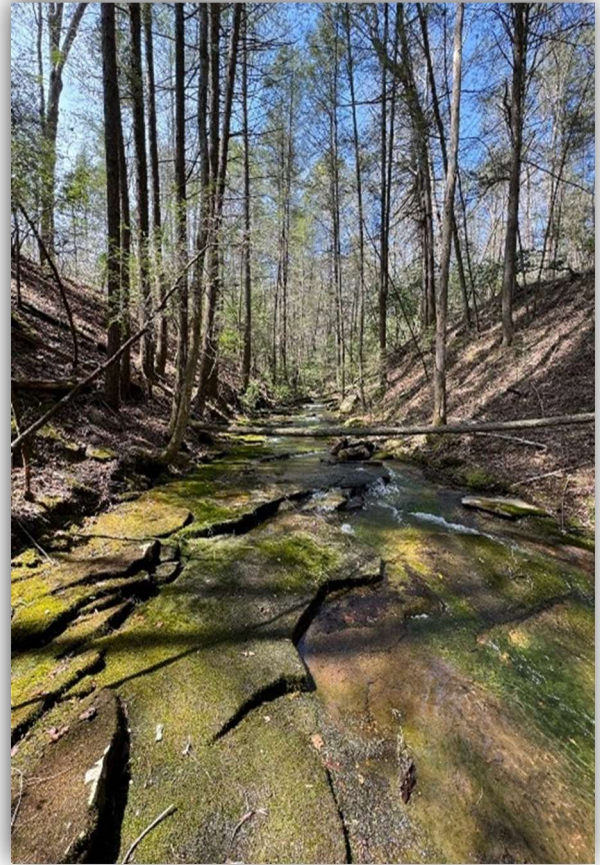


Figure 23. A hemlock grove along long creek undergoing treatment for hemlock woolly adelgid control. Photo by Quentin Miller

Tennessee River Gorge Trust Updates

Eliot Berz, Executive Director, Tennessee River Gorge Trust

During 2023, the Tennessee River Gorge Trust worked on a variety of projects ranging from land protection to bird research. Over the summer, the bird research team installed the first Motus tower in the Tennessee River Gorge which will track bird movements through radio tags (Figure 24). This tower will be utilized in a region-wide study on Wood Thrush migration in partnership with the US Fish and Wildlife Service and a long list of wonderful partners.

Figure 24. (Right) The Tennessee River Gorge Trust team installing a Motus tower. Photo by Eliot Berz/TRGT

At the tail end of 2023, TRGT also protected a 300-acre property on Aetna Mountain through fee simple ownership. This property is adjacent to an existing TRGT property (Figure 25, Next page) that hosts the Aetna Mountain



Trails. This land acquisition not only protects an at-risk area that is experiencing growing suburban sprawl, but also presents an opportunity to expand public access to the gorge and increase community engagement within our local conservation efforts.

Figure 25. (Right) Fall view of the Tennessee River Gorge. Photo courtesy of TRGT



VIRGINIA

The Virginia Grassland Bird Initiative

Meghan Schader, Land Trust

Bird Conservation Initiative

Program Assistant, Cornell Land of Ornithology

Sara Barker, Cornell Land Trust Bird Conservation Initiative Director, Cornell Lab of Ornithology

The [Piedmont Environmental Council](#), Smithsonian’s [Virginia Working Landscapes](#), American Farmland Trust, and Quail Forever continue to address the ongoing decline of grassland bird populations in northern Virginia through the [Virginia Grassland Bird Initiative](#) (VGBI), supported in part by [small grants](#) from the [Cornell Land Trust Bird Conservation Initiative](#). By working with landowners and producers, VGBI is implementing a suite of best management practices on working

landscapes with the following goals: (1) stem the tide of grassland bird declines in VA on private lands, (2) improve the resiliency of working landscapes, (3) and positively impact the livelihoods that depend upon those lands (Figure 26).

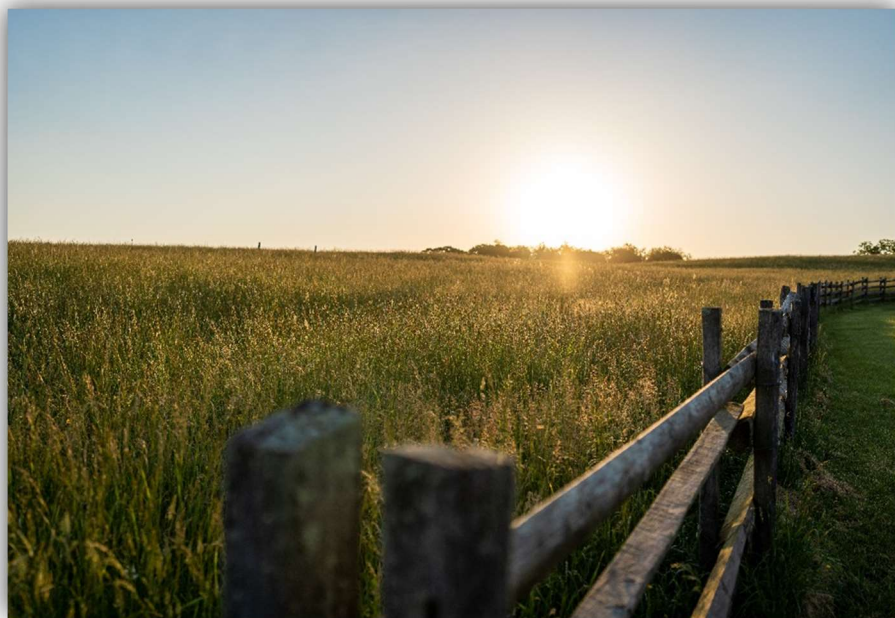


Figure 26. Grassland bird survey site in Fauquier County, VA. Photo by Hugh Kenny

In 2023, VGBI amplified the reach of its delayed haying and summer pasture stockpiling incentives program—previously underway across nine counties in the Piedmont—into five new counties within the Shenandoah Valley. These include the top four agricultural income-producing counties in the

state, where demand for conservation resources and technical assistance exceeds availability. The delayed haying option excludes haying from a portion of hayfields during the spring, while the summer pasture stockpiling option excludes livestock grazing from select pastures during that same time in order to store forage for late summer and early fall. These best management practices result

in grass fields being left completely untouched from mid- April through the end of June, which corresponds with the nesting season for grassland birds.

VGBI works with producers on the ground to implement these practices on the landscape, recruiting and training community scientists to conduct breeding bird surveys using [eBird](#), and attracting new landowners, farmers, and partnering organizations—including land trusts—into the program through a diverse suite of outreach events (Figure 27). VGBI is engaging with new partners, including the Alliance for the Shenandoah Valley and Shenandoah Valley Conservation Collaboration, to connect this incentives program with applicable producers in the Shenandoah Valley and tailor the program to best meet the needs of those farming communities. In 2023 alone, the VGBI team organized or participated in 45 events to promote grassland bird conservation and the incentives program.

In the spring of 2023, 19 properties totaling 948 acres enrolled in the incentives program; participating landowners received a payment of \$35/acre to adopt delayed haying and/or summer stockpiling practices. Additionally, 10 properties totaling more than 700 acres voluntarily adopted recommended practices without receiving incentive payments.

Complementary to the incentives program, VGBI has created a robust nest-box program for American Kestrels (Figure 28), an at-risk grassland falcon, that not only facilitates greater offspring survival, but also encourages landowners to build out more native habitat. The VGBI team also advises on a suite of additional best management practices that landowners and farmers can adopt to increase the diversity of birds and the habitats they need onto the landscape, which in turn lead to improvements in water quality, soil health, and ecosystem services. Many of these practices are directly linked to financial cost-share programs offered by state and federal agencies, including Soil & Water Conservation Districts and the USDA's Natural Resources Conservation Service.



Figure 27. An outreach event hosted by the Virginia Grassland Bird Initiative (VGBI). Photo by Hugh Kenny



Figure 28. Justin Proctor of Smithsonian's Virginia Working Landscapes and October Greenfield of the Piedmont Environmental Council (PEC) installing an American Kestrel box at PEC's Community Farm at Roundabout Meadows. Photo by Hugh Kenny

No Change Over the Last Decade in Golden-winged Warbler (*Vermivora chrysoptera*) Relative Abundance in Old Field Habitats in Highland County, Virginia

Lesley Bulluck, PhD, Associate Professor/Director, Graduate Program, Center for Environmental Studies, Virginia Commonwealth University

This work overlaps the Virginia Highlands Focal Landscape

In May/June 2023, the Center for Environmental Studies at Virginia Commonwealth University, with support from a private donor, conducted bird surveys on private lands in a Virginia hotspot for Golden-winged Warblers (GWWA) (Figure 29). Highland and northern Bath Counties are in the Virginia Highlands AMJV Focal Landscape. The goals of these surveys were to:

1. determine if the relative abundance of breeding GWWAs and the proportion of Blue-winged Warblers and Golden-winged/Blue-winged Warbler hybrids had changed since 2014 when surveys were last conducted,
2. expand survey efforts out from breeding areas identified in 2014 to include neighboring landowners and some new areas, and
3. assess what other priority species occur in the old field habitats adjacent to mature forests where most GWWAs occur in this region.

Across all survey locations in 2023, we observed 172 GWWA breeding males, and many more opportunistically between survey locations which were spaced in a grid 300m apart. Fifty-one percent of all surveyed points (137 of 266) were occupied by breeding GWWAs. Forty-seven percent (126 of 266) of points were surveyed in both 2014 and 2023, and the majority of new points were on adjoining or nearby private lands. Between 2014 and 2023, the overall mean change in GWWA relative abundance across points was 0, while numbers of GWWA across several sites increased or decreased by 1-2 birds. Hybrids and Blue-winged Warblers (BWWA) increased from being at 4.1% of the survey locations in 2014 to 7.9% in 2023. Breeding GWWA males were detected at 67 of 140 (47%) points surveyed for the first time in 2023.



Figure 29. Golden-winged Warbler. Photo by Mike Parr and courtesy of American Bird Conservancy

The relative stability of this population of GWWA over the last decade can be attributed to the region's high elevation (greater than 2500 ft) and early successional shrubland habitat on private working lands. Management of shrubs and forests on these private lands mimics natural disturbance that rarely occurs in this region, and results in a mosaic of early successional habitat within a primarily forested landscape. For the highest likelihood of success, efforts to create new GWWA habitat should focus on areas that are adjacent or in very close proximity (less than 1km) to

currently occupied sites in this region. Further, only 10 landowners support 2/3 of the GWWA observed in 2023; ideally this responsibility would be distributed across more landowners. Landowner listening sessions and outreach events are planned for the coming year to try and facilitate this.

One way that healthy forest landscapes have been characterized is that they simultaneously support GWWA, Cerulean Warbler, and Wood Thrush populations. Five out of 33 private properties surveyed meet this criterion. Additional priority species documented during our surveys include the following:

Grassland species: Bobolink (identified at 10 points), Grasshopper sparrow (6 points), Vesper Sparrow (1 point), and Eastern Meadowlark (18 points)

High elevation species: Veery (5 points), Hermit Thrush (6 points), Willow Flycatcher (17 points), Alder Flycatcher (3 points), Yellow-rumped Warbler (3 points), Magnolia Warbler (10 points), Canada Warbler (1 point), and Blackburnian Warbler (5 points)

Other priority species: Cerulean Warbler (13 points), Black-billed Cuckoo (10 points), Chimney Swift (5 points), and Ruffed Grouse (2 points)

The 2nd Virginia Breeding Bird Atlas – 2023 Summary

Sergio Harding, Nongame Bird Conservation Biologist, Virginia Department of Wildlife Resources

This work overlaps the Virginia Highlands and Southern Appalachian High Country (NC/TN/VA) Focal Landscapes

2023 was a seminal year for the 2nd Virginia Breeding Bird Atlas project, as it took several big leaps forward toward publishing the Atlas results as a website in the fall of 2025. The project is a partnership between the Department of Wildlife Resources, Virginia Society of Ornithology (VSO) and Conservation Management Institute at Virginia Tech. As of fall of 2023, it also receives

assistance from the AMJV, as Dr. Ashley Peele, who has worked on the Atlas since its inception, has transitioned to a position with the Joint Venture but continues to provide Atlas support.



Figure 30. Black-throated Blue Warbler—one of the breeding bird species in Virginia. Photo by Kenneth Cole Schneider, courtesy of Flickr Creative Commons

In 2023, review was completed of over 1.5 million breeding bird records reported by Atlasers, resulting in a database of over 722,000 records upon which data summaries and analyses were based (Figures 30 & 31). The latter resulted in occupancy models for close to 150 species; these models depict the current distribution of these species in Virginia. Occupancy models for the first Atlas, and occupancy change models between Atlases were also completed. Finally, abundance models based on point count data collected by Atlas technicians were finalized.

The Atlas team expanded in 2023 through funding by the VSO. Austin Kane joined in August 2023 as Managing Editor. She supervises two Species Account Authors who were hired in December 2023. The Authors, Ron Rohrbaugh and Megan Massa, will spend up to 6 months drafting accounts for over 200 bird species that were documented as breeders in Virginia through the Atlas (Figures 30 & 31). Both authors bring considerable knowledge of the life history, ecology, and habitat associations of birds in Virginia and beyond. Both also have the analytical skills to understand the complex modeling behind the distribution and abundance maps, and the writing skills to deliver meaningful interpretation of these results in a way that is accessible to non-technical audiences.

We look forward to a productive year in 2024, as we make headway in starting to build the Atlas website and in creating the narrative content that will reside there.



Figure 31. American Redstart—one of the breeding bird species in Virginia. Photo courtesy of Edward Post/Flickr Creative Commons

WEST VIRGINIA

Atlantic Flyway Council

Richard Bailey, State Ornithologist, West Virginia Division of Natural Resources

The Atlantic Flyway Council (AFC), founded in 1952, represents 17 U.S. states and the territories of Puerto Rico and the U.S. Virgin Islands, and 7 Canadian provinces and territories that work with their respective federal governments to manage migratory birds and their habitats in eastern North

America. In 2023, WVDNR staff chaired the Nongame Migratory Bird Technical Section (NMBTS) for the second of two years and coordinated a number of notable projects.



Figure 32. Peregrine Falcon flight. Photo by Joshua Galicki, courtesy of American Bird Conservancy

Following NMBTS submittal and approval of a recommendation in 2022 to develop a narrative and budget for a Conservation Delivery Specialist position, to be overseen by the NMBTS, the position was formally approved by

Council in March 2023. Hiring was completed in winter 2023, and work began at the beginning of 2024. Priorities for the position include coordination of Flyway-wide Colonial Waterbird monitoring bird-building collision support to state wildlife agencies, and a number of projects with high relevance to AMJV, including supporting coordinated nightjar monitoring and research.

Additional NMBTS accomplishments included development and submittal of a report to Council concerning the threat of bird-building collision mortality and potential Flyway actions to address the problem, Council approval of funding for the final phase of development of the Atlantic Flyway colonial waterbird database, submittal of comments to USFWS pertaining to changes to regulations governing Peregrine Falcon (Figure 32, Previous page) take for the purposes of falconry, and revisions to NMBTS bylaws.

Loggerhead Shrike Working Group

Richard Bailey, State Ornithologist, West Virginia Division of Natural Resources

This work overlaps the Greenbrier & High Alleghenies (WV) Focal Landscape

The Loggerhead Shrike Working Group was established a decade ago, and in recent years has been convening annual meetings to develop a species conservation plan. As a part of this process, WVDNR attended one in-person meeting and four virtual workshops in 2022 and 2023 to develop and finalize a Population Viability Assessment (PVA) for the species using the simulation software package “Vortex”, in partnership with IUCN, Wildlife Preservation Canada, academic institutions, and other state wildlife agencies. The model was developed through extensive consultation with species experts, including WVDNR staff, who band and monitor birds across the species’ eastern range, and a complex dataset of input parameters was assembled and used to construct the model. The final model identified subpopulations at greatest risk of extinction as well as key threats, such as mortality during migration.

Following completion of the model in 2023, the Working Group initiated final development of the species conservation plan, which included two additional workshops in Fall 2023. The Group met in-person in early 2024 to finalize inputs to the Plan. At the time of this article’s submission, final publication was expected in March 2024.

WVDNR staff banded nine shrikes in spring and winter 2023, all in the Greenbrier Valley region in southeastern West Virginia (Figure 33). Monitoring results hint at population stability, with six new occupied sites located. Feather samples were taken for continuing genetic analysis, which has previously indicated presence of up to three subspecies in West Virginia depending on time of year. Since 2014, 61 shrikes have been banded in the state.



Figure 33. WVDNR Avian Biologist Katie Garst holding a banded male shrike in Greenbrier County, WV. Photo by Richard Bailey

National Alliance of Forest Owners (NAFO) Workshop

Richard Bailey, State Ornithologist, West Virginia Division of Natural Resources

This work overlaps the Greenbrier & High Alleghenies (WV) Focal Landscape

The National Alliance of Forest Owners (NAFO) is a national advocacy organization representing companies that manage more than 44 million acres of private working forests. In West Virginia, the West Virginia Department of Natural Resources has partnered with NAFO, the National Council for Air and Stream Improvement (NCASI), Weyerhaeuser, the Sustainable Forestry Initiative, the AMJV, and the USFWS to increase collaborative conservation activities on industrial forestlands.

A kickoff workshop was held on July 18 – 19, 2023 in Lewisburg, West Virginia, with a focus on facilitating conservation efforts among WV NAFO landowners,

NGOs, and public agencies through open discussions related to on-the-ground management, research opportunities, and the significant role commercial forest landowners play in the conservation of at-risk species (Figure 34). The workshop included a meet-and-greet evening picnic at Greenbrier State Forest, followed by morning partner presentations and an afternoon field tour on the Weyerhaeuser property. The field component included two stops with presentations covering conservation opportunities for both terrestrial and aquatic wildlife.



Figure 34. Kieran O'Malley presenting on State Wildlife Action Plan and Species of Greatest Conservation Need conservation priorities during the field tour. Photo by Scott Warner



Figure 35. American Kestrel. Photo by Imran Ashraf/Shutterstock, courtesy of American Bird Conservancy

Engagement activities will continue in 2024, beginning with a commercial landowner stream restoration workshop in April followed by a terrestrial species workshop in September.

WVDNR-ACCA American Kestrel Nest Box Program

Katie Garst, Avian Biologist, West Virginia Division of Natural Resources

The West Virginia Division of Natural Resources (WVDNR) and the Avian Conservation Center of Appalachia (ACCA) are excited to announce a revitalized American Kestrel (*Falco sparverius*) (Figure 35)

nest box program, which provides free nest boxes to landowners with suitable kestrel habitat in West Virginia (Figure 36, Next page). To participate in the program, landowners must maintain and monitor the nest boxes they receive. Data from nest box monitoring is compiled by ACCA and shared with biologists at WVDNR and with a broader community of researchers through the Peregrine Fund's American Kestrel Partnership, and starting in 2024, through the [Cornell Lab of Ornithology's NestWatch](#) platform.

Primary program goals include installing nest boxes; educating and engaging enthusiastic, committed volunteers to monitor nest boxes; and collecting data that will not only help ACCA and WVDNR better understand kestrels in the Mountain State, but also contribute to efforts to determine the cause of long-term population declines. WVDNR and ACCA hope to learn more about which habitats and regions in the state support kestrels that successfully raise young.

An additional component of the program is banding nestlings before they fledge. Trained staff at ACCA visit nest boxes, remove nestlings, take measurements and place bands, before returning them to their boxes. Band recaptures or resights of banded birds can inform researchers where young disperse from their natal site.

Although the first iteration of the nest box program began over a decade ago, it had limited scope and impact due to insufficient staff and volunteer capacity. In 2023, both WVDNR and ACCA were able to hire additional staff whose job duties include the administration of the program. Katie Garst joined the WVDNR Ornithology program as an Avian Biologist, and Evan McWreath became the Director of Conservation Research at ACCA.

The relaunched program is better targeting outreach and nest box installations to areas of the state with the best kestrel habitat. To aid in identifying areas of optimal habitat, Meryl Friedrich, a GIS Analyst at WVDNR, utilized data from eBird along with other vegetation and land use datasets to produce a habitat suitability model for American Kestrels in West Virginia (Figure 37).



Figure 36. A program volunteer installing a new nest box. Photo by Cheyenne Carter

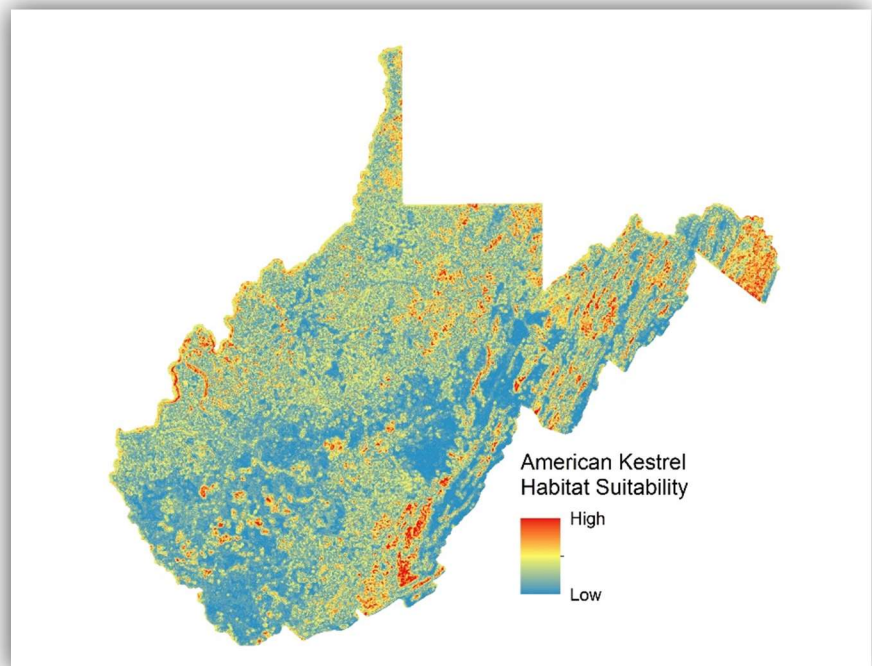


Figure 37. Predicted habitat suitability for American Kestrel in West Virginia represented as a continuous variable (0–1). Map by Meryl Friedrich, WVDNR

Updated education and outreach materials were also produced, including a recorded presentation to facilitate training new participants to monitor nest boxes. Online application forms were also developed to streamline and standardize the application process. In November 2023, ACCA and WVDNR held a meeting to receive feedback from both long-time program participants and those participating in the program for the first time in 2024. Based on feedback, ACCA will produce a newsletter and share other content throughout the year to increase engagement with program participants.

2024 will be a pilot year for the program, with outreach and monitoring efforts focused to north-central West Virginia. Currently there are 10 active participants maintaining 11 kestrel nest boxes in 5 West Virginia counties. If successful, the nest box program will be expanded to other areas within West Virginia as capacity allows.

WVDNR-NRCS Partner Biologist Program

Jane Capozzelli, Partner Bird Biologist, Natural Resources Conservation Service, West Virginia Division of Natural Resources

Daniel Rubianto, Partner Bird Biologist, Natural Resources Conservation Service, West Virginia Division of Natural Resources

Richard Bailey, State Ornithologist, West Virginia Division of Natural Resources

This work overlaps the Greenbrier & High Alleghenies (WV) Focal Landscape

Since 2012, West Virginia Division of Natural Resources (WVDNR) has been working with the USDA Natural Resources Conservation Service (NRCS) to jointly fund private lands biologists to implement Farm Bill programs to enhance habitat for priority songbirds (Figure 38). After 11 years, nearly 2 million dollars in financial assistance has been provided to landowners pursuant to 219 contracts.

Golden-winged Warbler

Partner biologists Jane Capozzelli and Jess Mehta worked hard to create habitat for Golden-winged Warblers (GWWA) on private lands. In 2023, they planned 260 acres of GWWA habitat (a 52.9 % increase from 2022), while disbursing \$123,290 of financial assistance funds for private landowners to create early successional habitat through NRCS. Through existing early successional habitat development work, private landowners created a total of 88 acres of GWWA habitat in 2023 (Figure 39, Next page).

Cerulean Warbler

Daniel Rubianto and Jane Capozzelli also worked hard to create habitat for Cerulean Warblers (CERW); in 2023 they planned 297 acres of CERW habitat (a 48.5% increase from 2022), while

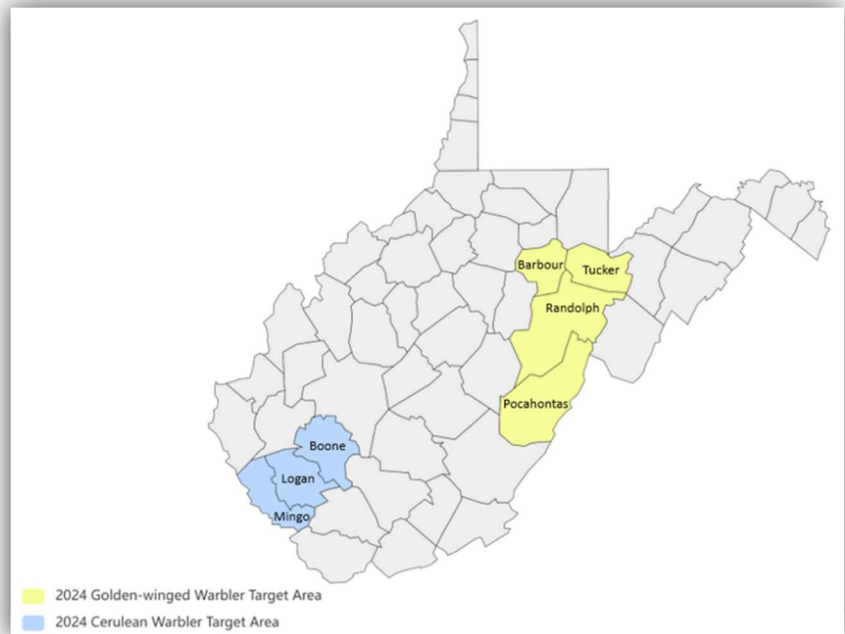


Figure 38. A map showing the target counties in West Virginia for mailers seeking to raise interest among private landowners for Golden-winged Warbler and Cerulean Warbler habitat management on their property. Map courtesy of West Virginia Department of Natural Resources



Figure 39. Creation of brush piles, stump sprouts, and residual crop trees in Pendleton County, WV conducted by BAK Enterprise (a local family-owned logging business) to create Golden-winged Warbler habitat. Photo by Jane Capozzelli



Figure 40. Area-wide thinning opened up growing space for white oaks and tulip poplars in Braxton County to create habitat for Cerulean Warblers. Photo by Daniel Rubianto

counties in West Virginia (Figure 41, Next page) to develop and test the means and efficacy of institutional landowner engagement in both implementation and monitoring of practices to improve conditions for declining bird species at a landscape scale. Our goal was to determine the effects of forest management as a shifting mosaic in an industrial forest landscape on avian communities with a focus on three focal species: Golden-winged Warbler (*Vermivora chrysoptera*; GWWA), Cerulean Warbler (*Setophaga cerulea*; CERW), and Wood Thrush (*Hylocichla mustellina*; WOTH), although the overall avian community (including game and night birds) was monitored. We randomly selected stratified survey points within the study site based on parcel age post clear-cut (0-15 years, 16-50

disbursing \$79,682 of financial assistance funding for private landowners to enhance their forestlands (Figure 40, Bottom left). Through ongoing habitat management projects, private landowners created a total of 160 acres of CERW habitat in 2023.

Improving Management Strategies Linked to Certification of Sustainable Forest Practices for Priority Songbirds in West Virginia

Robert M. Ryan, PhD Student, Davis College of Agriculture, Natural Resources and Design, Division of Forestry and Natural Resources, West Virginia University (WVU)

Christopher M. Lituma, Associate Professor, Davis College of Agriculture, Natural Resources and Design, Division of Forestry and Natural Resources, West Virginia University (WVU)

Cooperators: Weyerhaeuser Inc, Sustainable Forestry Initiative, Natural Resources Conservation Service, American Bird Conservancy, The Appalachian Mountains Joint Venture, National Alliance of Forest Owners, West Virginia Division of Natural Resources, US Fish and Wildlife Service, US Geological Survey, National Council for Air and Stream Improvement

Years Ongoing: 2020-Present

Degree Program: PhD

Expected Completion: May 2024

Funding: National Fish and Wildlife Foundation via the West Virginia Division of Natural Resources, US Geological Survey, and US Fish and Wildlife Service via the National Council for Air and Stream Improvement

Beginning in 2021, we partnered with Weyerhaeuser to survey their ~250,000 acres (~102,000 ha) of privately held land within Fayette, Greenbrier, and Nicholas

years, 51-100 years, greater than 100 years). From 2021–2023, we surveyed 452 avian point counts within 283 parcels totaling 11,058 acres (4,450 ha).

We used multi-species, 100-meter radius, 10-minute avian point counts conducted during the breeding season (May 15 – Jun 30). Point counts began half an hour before sunrise each day and ended by 11AM, or when a precipitous drop in singing individuals occurred. All points were surveyed twice each year. Every other week during 2021 and 2022 automated recording units (ARUs) were deployed at a subset of points and recovered the following week to supplement bird detections from in-person surveys. Damage from bears and moisture damaged enough ARUs during the first two years that none were used in 2023. We collected habitat data through vegetation surveys assessing ground cover, canopy density, tree species prevalence, tree size, and tree species density at all sampling points.



Figure 41. Example of forest edges on Weyerhaeuser property in West Virginia. Photo by Robert M. Ryan, WVU

From surveyed points, 1,793 individuals were recorded from 106 species detected. Among those species, 25 are Species of Greatest Conservation Need (SGCN) outlined in the 2015 West Virginia State Wildlife Action Plan. However, we only detected 11 Cerulean Warblers, thus we omitted Cerulean Warbler from our analyses. Across our survey periods we detected 24 Golden-winged Warblers, 115 Blue-winged Warblers (Figure 42), and 285 Wood Thrush.



Figure 42. Blue-winged Warbler. Photo by Michael Stubblefield, courtesy of American Bird Conservancy

Blue-winged Warbler occupancy was significantly positively related to percent of goldenrod (*Solidago* species) groundcover. For Wood Thrush, occupancy was positively related to mature forest edge length, but negatively related to young forest edge length.

We used single season occupancy models to account for detection probability and model occupancy of Golden-winged Warbler, Blue-winged Warbler, and Wood Thrush. We included landscape variables generated in ArcGIS at 250m. Landscape variables included things like forest type, elevation, and stand spatial configuration. We also included vegetation structure variables collected at the stand level. We found that, for Golden-winged and Blue-winged Warblers, elevation had a significant relationship with occupancy. For Golden-winged Warblers, the amount of shrubland core area within 250m was significantly positively related to occupancy.

Our research is ongoing, and we intend to expand our analysis to include additional SGCN. We intend to use these results to identify areas of conservation potential for each of our target species on the Weyerhaeuser property. Our goal is to create a management template that can be applied to other managed forest landscapes to aid in conservation and recruitment of species in decline.

REGIONAL

National Fish and Wildlife Foundation Central Appalachia Habitat Stewardship Program *Todd Fearer, Coordinator, Appalachian Mountains Joint Venture*

This work overlaps the Allegheny Highlands (PA/NY), Greenbrier & High Alleghenies (WV), Virginia Highlands, and Southern Appalachian High Country (NC/TN/VA) Focal Landscapes

In 2023 the National Fish and Wildlife Foundation’s Central Appalachia Habitat Stewardship Program awarded \$4.1 million to 10 new or continuing projects that will improve the quality and connectivity of forest and freshwater habitat and increase the distribution and abundance of fish, birds, and other wildlife. The 10 awards announced were matched by over \$3.7 million from the grantees, providing a total conservation impact of over \$7.8 million. Four of the selected projects, totaling almost \$1,600,000 in funds from NFWF and matched with almost \$1,600,000 from grantees, are focused on enhancing forest age and structural diversity and will benefit the suite of our

Appalachian Mountains Joint Venture (AMJV) priority forest birds.



Figure 43. Cerulean Warbler with caterpillar. Photo by Matt Felperin, courtesy of American Bird Conservancy

The AMJV is a partner on three of these projects. The Nature Conservancy is the lead for the project “Accelerating Creation of Late Successional Forest Habitat for Focal Bird Species (MD, PA, WV)” that will accelerate the implementation of late successional forest habitat management in Maryland, Pennsylvania, and West Virginia to increase critical habitat for Cerulean Warbler (Figure 43) populations. The Sustainable Forestry Initiative is leading the project “Increasing

Sustainable Forest Management Practices that Benefit Focal Bird Species in West Virginia,” which is the second phase of their efforts to expand sustainable forest management practices to new industrial landowners and adjacent family forest landowners in the Monongahela Forest focal geography of West Virginia to improve age and structural diversity that benefits focal bird species. The Ruffed Grouse Society and American Woodcock Society is the lead for the project “Planning and Implementing Dynamic Forest Restoration on State and Private Land in Western Virginia,” which includes work in our AMJV Virginia Highlands Focal Landscape to increase capacity for planning and implementing forest habitat management projects on state and private lands in western Virginia.

The AMJV continues to work with NFWF and all grantees to facilitate coordination and collaboration across all forestry projects to maximize their collective impact across the Central Appalachia region.

Todd Fearer, AMJV Coordinator, and Amanda Duren, AMJV Director of Conservation Partnerships, are part of the advisory team for this program.

The Central Appalachia Habitat Stewardship Program is a partnership initiative with funding contributed in 2023 from the USDA Natural Resources Conservation Service, U.S. Forest Service, Richard King Mellon Foundation, U.S. Fish and Wildlife Service, AstraZeneca and Cleveland-Cliffs. Created in 2017, the overall goal of the program is to improve the quality and connectivity of forest and freshwater habitat in order to increase the distribution and abundance of birds, fish, and other wildlife, as evidenced by a suite of species that collectively are indicators of forest and freshwater habitat condition. Specifically, the program seeks to improve the management of public and private forestlands to create large blocks with a mosaic of mixed-age forests that support a diversity of bird and wildlife species, especially targeting Golden-winged Warbler, Wood Thrush and Cerulean Warbler. The program also seeks to improve stream health by removing passage barriers, restoring riparian buffers, and improving water quality and hydrology to bolster populations of eastern brook trout, eastern hellbender, and native freshwater mussels.

Bird Use of Reforested Legacy Coal Mines in the Monongahela National Forest, WV

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Christopher Barton, Department of Forestry and Natural Resources, University of Kentucky

John Cox, Department of Forestry and Natural Resources, University of Kentucky

Jacquelyn C. Guzy, U.S. Geological Survey, Wetland and Aquatic Research Center (Florida)

Lauren Sherman, Department of Forestry and Natural Resources, University of Kentucky

Jeffery L. Larkin, Department of Biology, Indiana University of Pennsylvania

Todd Fearer, Appalachian Mountains Joint Venture/American Bird Conservancy

Steven J. Price, Department of Forestry and Natural Resources, University of Kentucky

This work overlaps the Greenbrier & High Alleghenies (WV) Focal Landscape

The Forestry Reclamation Approach (FRA) emphasizes best practices for the reforestation of mined landscapes, such as the planting of native trees and shrubs. Although the FRA is expected to benefit wildlife, no studies have empirically examined the effects of the FRA on avian species. This study aimed to identify which reclamation approaches and/or landscape features promote breeding songbirds, particularly mature forest avian guilds and species of conservation need. Point count surveys were conducted at the Mower Tract and Sharps Knob within the Monongahela National Forest (Figure 44). Differences in avian occupancy, species richness, and species abundance across four treatment types: 1) younger (2-5 years) FRA sites, 2) older (8-11 years) FRA sites, 3) non-FRA regenerated minelands, and 4) unmined, mature forests were assessed (Figure 45, Next page).

Figure 44. (Right) Rebecca Davenport examined bird use within the Monongahela National Forest while a graduate student at the University of Kentucky. Photo courtesy of Green Forests Work

We found that both FRA treatments had a higher species richness and occupancy of early successional nesting birds compared to the naturally regenerated and mature forest treatments. Furthermore, the FRA forest community assemblage included all the avian indicator species expected to inhabit an early successional red spruce-northern hardwood forest. These results suggest that after a decade, legacy mines



reclaimed using the FRA are progressing toward a native red spruce-northern hardwood forest that supports associated forest bird communities.

For more information see: https://uknowledge.uky.edu/forestry_etds/70/



Figure 45. Four treatment types: A) Younger (2-5 years) Forestry Reclamation Approach (FRA), B) older (8-11 years) FRA, C) non-FRA, naturally regenerated minelands (greater than 40 years), and D) unmined, mature forest at Sharps Knob. Photos courtesy of Green Forests Work

INTERNATIONAL

Reversing Bird Population Declines in 2023—Latin America & the Caribbean

Andrés Anchondo, Director of Migratory Bird Habitats in Latin America and the Caribbean (& BirdsPlus), American Bird Conservancy

American Bird Conservancy’s (ABC) program for migratory birds in Latin America and the Caribbean helps to ensure that stopover and wintering habitats are available where priority birds, such as the Wood Thrush (Figure 46) and Canada Warbler, need them most. This often involves helping to ensure that lands vital for people are also optimized for birds. For example, crops such as coffee and cacao can be planted and maintained in such a way that birds thrive there, too.

In 2023, we saw our efforts to encourage sustainable cacao production pay off with the launch of the Smithsonian’s Bird Friendly® cacao certification (Figure 47, Next page). ABC had worked to implement best management practices with partner Zorzal Cacao in the Dominican Republic and saw 17 of the company’s cacao-supplying farms become the first to receive the Smithsonian’s new certification (Figure 48, Next page). Habitats for birds, such as wintering Bicknell’s Thrush, are improving through these efforts.



Figure 46. (Right) American Bird Conservancy’s program for migratory birds in Latin America and the Caribbean helps to ensure that stopover and wintering habitats are available where priority birds, such as the Wood Thrush shown above, need them most. Photo by TX Agami Photo Agency/Shutterstock, courtesy of American Bird Conservancy

ABC and partners also planted more than 200,000 native and fruit trees in agricultural and ranching landscapes in Colombia, the Dominican Republic, Ecuador, Guatemala, Honduras, and Peru. These tree plantings have been undertaken in and around croplands and cattle pastures to create more



Figure 47. In 2023, ABC saw efforts to encourage sustainable cacao production pay off with the launch of the Smithsonian's Bird Friendly® cocoa certification. Photo courtesy of Smithsonian 2023 and American Bird Conservancy

migratory bird habitat and corridors. While the shade trees help crops and birds, the fruit trees increase sources of income for producers.

In addition, this year saw the launch of our BirdsPlus program, which brings a three-fold approach to maintaining and enhancing migratory bird habitat: Best Management Practices for working

lands; the BirdsPlus Fund, to encourage investment; and the BirdsPlus Index, which will measure the biodiversity benefits of farms using birds as indicators.

Demonstrating that bird conservation projects in tropical working lands can turn a profit, in 2018, we invested \$100,000 to restore 60 acres of cattle pastures with cardamom agroforestry in our Conservation Coast BirdScape (Guatemala). After reinvesting the first payment from our 2022 investment, ABC received an additional \$8,090 in 2023, which will be reinvested in more conservation. In Costa Rica, our project to restore cattle pastures with rubber-native tree plantations received a letter of support from Michelin. The company will provide the project with technical assistance to ensure its long-term sustainability to produce deforestation-free rubber that benefits birds and other wildlife.



Figure 48. (Right) ABC had worked to implement best management practices with partner Zorzal Cacao in the Dominican Republic and saw 17 of the company's cacao-supplying farms become the first to receive the Smithsonian's new certification. Photo courtesy of Zorzal Cacao and American Bird Conservancy

Motus Comes to Honduras!

Dave King, Research Wildlife Biologist, USFS Northern Research Station

On January 14, 2024, a team of Honduran researchers, led by PhD candidate David Murillo (Figure 49), established the first Motus tracking receiving station in the country of Honduras. The receiving station was deployed on a coffee farm belonging to Santos Acosta, a farm on which forest-conserving Integrated Open Canopy Coffee cultivation is being practiced (Figure 50). The deployment of this receiving station is an important development, since Honduras is recognized as a key wintering area for priority migrants including the Golden-winged Warbler, and also serves as a migratory pathway and stopover route for a range of other important birds, including the Cerulean Warbler.

This receiving station is also located within the newly established 12,603 km² Yoro Biological Corridor, an initiative led by the Mesoamerican Development Institute designed to connect 10 protected areas. It may also serve as a site for the collaborative full life-cycle study of Wood Thrush led by the U.S. Fish and Wildlife Service's Migratory Birds Program. David Murillo is currently pursuing his Ph.D. at the University of Massachusetts studying the conservation of migratory and resident bird species in coffee growing regions of Honduras, in collaboration with the US Forest Service Northern Research Station, with additional support from the National Science Foundation.

Figure 50. (Right) Coffee farmer Santos Acosta and his father Augustin connecting an antenna as part of the deployment of the first Motus receiver in Honduras. Photo by David Murillo

Developing Forestry Standards for Migratory Bird Conservation Using Motus

Dave King, Research Wildlife Biologist, USFS Northern Research Station

Jeffrey Ritterson, Field Biologist with the Massachusetts Audubon Society (Mass Audubon), and John Herbert, Director of Bird Conservation at Mass Audubon, recently deployed three Motus receivers on properties of their collaborating organization [Programme for Belize](#) (Pfb) (Figure 51, Next page). The purpose of this installation is to gauge the effects of sustainable



Figure 49. Researcher David Murillo configuring the receiver at the Motus station he set up with his team. Photo by Santos Acosta



forestry conducted by PfB on wintering Neotropical migrant birds, particularly the Wood Thrush, as well as to fill in gaps in the Motus network to increase the effectiveness of this international collaborative research and monitoring effort. This project is being supported by an award from the USFWS Migratory Bird Program through an award under the Neotropical Migratory Bird Conservation Act. Also collaborating on this project was Dave King of the USFS Northern Research Station in Amherst, MA.

Figure 51. (Right) A joint Mass Audubon/Programme for Belize team installs a receiver at a school in San Felipe, Belize. The school plans to incorporate migration tracking into their curriculum. Photo by Jeffrey Ritterson, Mass Audubon



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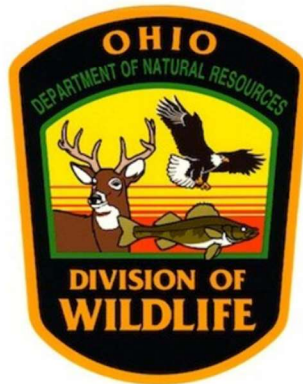




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