

## ***Southern Wings Online Guide User Vignette***

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**Scenario:** You are a biologist/administrator for a state fish and wildlife agency (to achieve consistency throughout the vignette, we will use Ohio Department of Natural Resources as an example). Your agency has identified full annual cycle conservation of migratory birds as a key priority, and is interested in contributing financially to a project in Latin America or the Caribbean via Southern Wings. This vignette will provide a comprehensive overview of how the Southern Wings Online Guide may be used to facilitate the decision-making process for both you and your agency when considering how to most effectively leverage your support of priority migratory birds.

**Step 1:** Open your web browser and navigate to <https://southern-wings.fishwildlife.org/>

**Step 2:** Click on either 'Online Guide' in the navigation bar on the upper right portion of the home page or the 'Browse Online Guide by State' button under the Quick Links section on the right side of the page. This will direct you to the landing page for the Guide. Scroll down to select 'Ohio' from the alphabetical list of states. Clicking on 'Online Guide' from anywhere on the Southern Wings website will navigate you back to this landing page.

**Step 3:** After selecting 'Ohio' from the alphabetical list of states, you are now on the state-specific landing page containing customized information for your priority migratory species. At the top of the page, you will find hyperlinks that jump to the four major sections of each state page; State Overview, Focal Species, Project Partners, and Resources.

**Step 4:** Scroll to the 'State Overview' section. Here you learn what information and which resources are included relevant to the migratory bird species of Ohio. This is essentially a Table of Contents for your state-specific landing page.

Scroll further to the first set of maps under the heading, 'Shared Stewardship Connections'. These maps highlight where 41 species of migratory birds that breed in Ohio are concentrated during the non-breeding season, and where the birds of Ohio are uniquely connected relative to other states. Clicking on the 'download' link for the map on the left side of the page (Shared Stewardship), you see that the migratory birds of Ohio are highly connected to two prominent non-breeding areas in Latin America; one in southeastern Mexico, northern Guatemala, Belize, and the Caribbean coast of Honduras, and the other in the Andes and foothills of Ecuador, Colombia, and Venezuela. These locations are areas in which conservation projects would be highly likely to impact Ohio-breeding birds.

Closing that map, you next click on the 'download' link for the accompanying map on the right side of the page (Shared Stewardship Uniqueness). You now see that the first region of high connectedness (in Mexico, Guatemala, Belize, and Honduras) is not very unique. This means that many other migratory birds from other states are also using those same locations. While conservation action in that area would impact Ohio-breeding birds, it would also impact the breeding birds of many other states as well. The second region, on the other hand (in Ecuador, Colombia, and Venezuela) remains highly unique. This means that not only will conservation action

in these areas impact Ohio-breeding birds, but the impact will be relatively focused on birds breeding in Ohio relative to other states. You conclude that targeted conservation action in the montane regions of Ecuador, Colombia, and Venezuela would uniquely support a high number of migratory birds breeding in Ohio.

**Step 5:** Closing the map, you proceed to scroll down to the next section, entitled 'Focal Migratory Species'. Embedded within this section is a concise data table containing conservation information for a selection of species. You learn that these species are Ohio-breeding migratory birds that have been identified by multiple groups and initiatives as focal species in need of conservation attention. Examining the table, you see that 11 species have displayed information, all of which were selected as Species of Greatest Conservation Need in the 2015 Ohio Wildlife Action Plan. Each column has an arrow button which can be used to sort by specific information. Using these buttons, you see nine of these species are also Continental Birds of Conservation Concern. Seven are listed as Tipping Point Species by Road to Recovery, meaning they have lost 50% or more of their population in the last fifty years and are on track to lose another 50% in the next fifty. You then decide to sort the table using the column showing the percentage of the global breeding population that nests in Ohio. The top-ranked species on the table is Cerulean Warbler; an estimated 11.37% of all Cerulean Warblers breed in Ohio. Wood Thrush and Blue-winged Warbler also show relatively high percentages, 8.19 and 8.12, respectively, but clearly the Cerulean Warbler is a species for which Ohio has strong responsibility. It is also a species listed across the board by all included entities; state SGCN, BCC, and R2R. You conclude that contributing to the full annual cycle conservation of Cerulean Warblers would be a strong complement to the work being done by your agency, on the breeding grounds, where over 1 in 10 nest.

**Step 6:** Scrolling further, you encounter a subsection labeled 'Multi-species Connections'. On the right side of the page, you see hemispheric-scale map with the outline of Ohio situated among many shaded hexagons. Reading the description of the map, you see that it displays the number of priority migratory bird species that connect each location (i.e., hexagon) to Ohio, as determined via scientifically collected movement data. This data includes information from bird banding encounters, automated radio telemetry like the Motus network, geolocator data, satellite and GPS tracking, and genetic markers, all collected from individual birds representing a variety of species but collated into one map. Downloading the image, you see that the darker the hexagon, the greater the number of species connecting that location to Ohio. Intuitively, there are many dark hexagons around the border of Ohio. But there are also strong connections between Ohio and parts of Central America and the Caribbean, and strong connections to northern Colombia and Venezuela. This map is further reinforcement that these areas are strongly linked to Ohio by the migratory species of birds connecting them together, and that Ohio shares responsibility for the conservation of these species with partners throughout the hemisphere. Dark hexagons identify areas where conservation work is likely to impact Ohio birds, demonstrated by the actual journeys of the birds themselves.

**Step 7:** Synthesizing the information you have learned to date, full annual cycle conservation opportunities most closely linked to the migratory birds of Ohio would focus on habitats in the foothills and mountains of northern Ecuador, Colombia, and western Venezuela. Projects that contribute specifically to the conservation of Cerulean Warblers would be particularly valuable, given the high responsibility the state has for the success of the species during the breeding

season. Closing the map, you scroll further to the section entitled ‘Focal Migratory Species Accounts’ and find a clickable dropdown menu for ten priority species; one of those species is Cerulean Warbler. By clicking on the ‘+’ icon next to its name, you find a subsection of more detailed information related to this species. In addition to reiterating the information displayed from the table above, you also find a description of the nonbreeding biome and habitat (tropical montane evergreen forests in Central and South American highlands, in the case of Cerulean Warbler). You also find a map similar to the ‘Tracking Connections’ map from above; however, this map has been modified to include only information from Cerulean Warblers instead of collated information from all migratory species, while still being specific to the state of Ohio. This time, lighter-colored hexagons represent a location used by an individual Cerulean Warbler, but that was not connected to Ohio. Darker hexagons represent locations used by a Cerulean Warbler which was also directly connected to Ohio. For this map, most of the hexagons are darkly colored, emphasizing how well-represented birds from Ohio are throughout the global range of the species. You do note that there are fewer dark hexagons in the southern Andes of Ecuador and Peru; this could indicate that those areas are not as useful to Cerulean Warblers from Ohio than the more northern Andes. Scrolling down, you encounter a list of conservation challenges faced by Cerulean Warblers across their full annual cycle. Following a link to the ‘Bird Migration Explorer’ at the end of the list, a new window opens on the website of the National Audubon Society listing those same conservation challenges. You scroll through the list of challenges and select ‘livestock management’. The map that is generated is once again hexagon-based; livestock management has a higher footprint on the landscape in darker hexagons, and a lower footprint in lighter hexagons. You notice that there are large areas of darker-colored hexagons throughout the montane regions of Ecuador, Colombia, and Venezuela, the same geography identified as having high connectivity to birds from Ohio. In addition to the map, you see that 193 species are collectively exposed to this challenge, based on the tracking data detailed from before. You scroll through the list of species to ‘Cerulean Warbler’. A time-lapse map loads and begins to play, showing the seasonal movements of Cerulean Warblers throughout the year, displayed as moving hexagons. Once again, these hexagons are colored by exposure to the selected conservation challenge of ‘livestock management’. Below the map is a bar showing exposure levels over time; exposure to this threat is relatively high from late September through March. This time period corresponds to the stages of their annual cycle where they are in migration and on the non-breeding grounds. Pausing the animation, you zoom in and hover the cursor over a variety of hexagons in the Colombian Andes. Circles appear in the hexagons; darker-colored circles indicate high exposure to the conservation challenge, while circle size corresponds to warbler abundance. Some of the hexagons have very large, dark circles. These would be priority areas to support work that ameliorates the threat of livestock management to Cerulean Warblers, especially warblers that may breed in Ohio. As noted by Audubon, in areas where tropical forest has been cleared, replanting trees into pastures can improve conditions for migratory birds. Connecting with partners focused on the reforestation of working lands in this geography should likely be a priority action for the conservation of this species.

**Step 8:** Closing the Bird Migration Explore, you are back on the Online Guide and see a list of projects facilitated by Southern Wings which benefit Cerulean Warbler, as well as a list of additional resources. Given that Colombia was a priority landscape identified by the mapping tools, you click on a project entitled ‘Improving Migratory Bird Habitat in Colombia’. This opens a PDF created by Southern Wings outlining the on-going projects available for contributions in 2024 – 25. Looking at

the Table of Contents, you click on the project name which takes you to the appropriate section. There you see that five partner organizations are working on this project; American Bird Conservancy, Corporacion VivoCuenca, Fundacion Ecologica Cafetera, Comite de Cafeteros de Caldas, and Central Hidroelectrica de Caldas. You also see that seven states have participated to date; Missouri, Indiana, Tennessee, Virginia, North Carolina, Kentucky, and Michigan. Reading the two-page description, you learn that American Bird Conservancy has been working in the central Andes region of Colombia since 2019, which is experiencing conversion of native vegetation to agriculture and pasture lands, and has focused their efforts in the Caldas Department. Within this geography, they engaged with groups already experiencing success helping to restore watersheds, implement best practices for coffee production, and provide outreach to local communities. You see that Cerulean Warbler is explicitly listed as a bird beneficiary, alongside 75 other migratory species, and you know that the work being done here is likely supporting Ohio-breeding warblers. The project has an ambitious goal of conserving 3,000 acres of habitat, planting at least 30,000 native trees, and engaging 80 coffee producers in conservation activities. You also see that, thanks to contributions from Southern Wings, in recent years more than 185,000 trees have already been planted in this area, with 10.5 miles of fencing installed to conserve over 2,000 acres of habitat for migratory birds, in addition to consistent engagement with coffee farmers. Connecting it all together, you see that this project would satisfy all the priority actions for Ohio breeding birds. It is based in an area with high connectivity and stewardship uniqueness to Ohio (the central Andes of Colombia), impacting a priority species for which Ohio has high responsibility (Cerulean Warbler), and addresses a known threat (agriculture and livestock management). You decide to write up this information for funding consideration. To help make your cases, you explore additional resources back on the Online Guide. The 'All About Birds' link takes you to the Cornell Lab of Ornithology species description page for Cerulean Warbler. The 'eBird Status and Trends' link open up the Cornell Lab of Ornithology Status and Trends account for the Cerulean Warbler. The first map that loads is an abundance map. Clicking on the 'Weekly' button toggles to an animated map of weekly relative abundance, showing the movement patterns of Cerulean Warblers across the annual cycle. The 'Trends' button toggles a map depicting the cumulative change in estimated relative abundance from 2012 – 2022 for Cerulean Warblers, broken down geographically. You see an option to select a specific region of interest and select 'Ohio' from the dropdown menu. This tells you that Cerulean Warblers have declined in abundance by approximately 5.3% since 2012. Looking at the map, it seems declines are especially prominent in the Appalachian regions. Across the United States, Cerulean Warbler abundance has declined by approximately 8.4% over the last ten years. Clearly, this is a species in decline and one that needs conservation attention. All of this information can be easily distributed to decision-makers in the agency, and helps make the case for conservation action.

**Step 9:** You would like more information about the partners that American Bird Conservancy works with to implement on-the-ground action undertaken by the focal project you identified. You find a table at the bottom of the page listing all of the partner organizations working in countries connected to Ohio by their shared species. Sorting by country, you see VivoCuenca listed, one of the partners on the focal project. You read their mission statement, see what species their work with and in what locations and habitats, which threats they address, and what actions they take. Clicking on the provided link takes you to their website, where you can explore more detailed information about their goals and mission, and read about their current projects.

**Step 10:** Congratulations, you have used the Online Guide to identify a project which will substantially contribute to the full annual cycle conservation of migratory birds important to Ohio! You send a message to Deb Hahn and Bradley Wilkinson that you are ready to support this project financially. Welcome to the partnership!