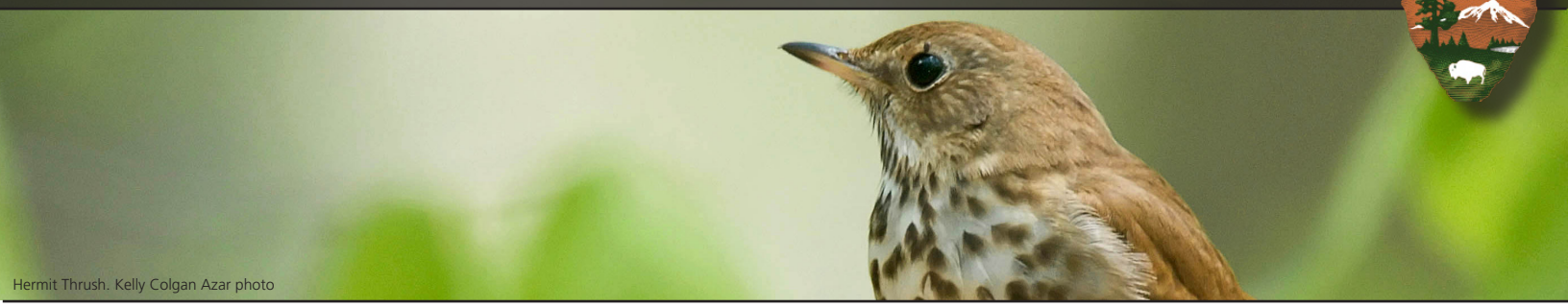


Hermit Thrush. Kelly Colgan Azar photo

Breeding Landbird Monitoring

Northeast Temperate Network

Program Brief

Right: Neotropical migrants, like this American Redstart, are especially sensitive to forest fragmentation which increases the prevalence of forest edges and results in higher rates of brood parasitism and nest predation. Laura Gooch photo.

Below: Every spring monitoring season, about two-dozen experienced volunteer 'citizen scientists' conduct early morning bird surveys at parks throughout NETN. NPS Photo.

The parks of the Northeast Temperate Network (NETN), excluding the Appalachian National Scenic Trail, include over 45,000 acres of diverse natural and cultural resources. They range across one forest biome, two avifaunal (relating to birds of a specific region) biomes, and four Bird Conservation Regions (BCRs). A BCR is an ecologically defined unit made up of landscapes with similar bird communities, habitats, and resource issues. This helps to provide a consistent framework for bird conservation projects and allows them to be custom tailored to support bird species throughout the heart of their ranges.

Why monitor landbirds?

Breeding birds are a high-priority vital sign for NETN parks.

Breeding landbirds (a general term used to describe relatively small, terrestrial birds, excluding raptors and upland game birds) are an important component of park ecosystems. Their high body temperature, rapid metabolism, and prominent position in most food webs make them good indicators of local and regional ecosystem health and change. It is also very likely that management practices aimed at preserving habitat for birds can have the added benefit of preserving entire ecosystems and their important and free ecosystem services (carbon sequestration, erosion control, rain dispersion, etc.).

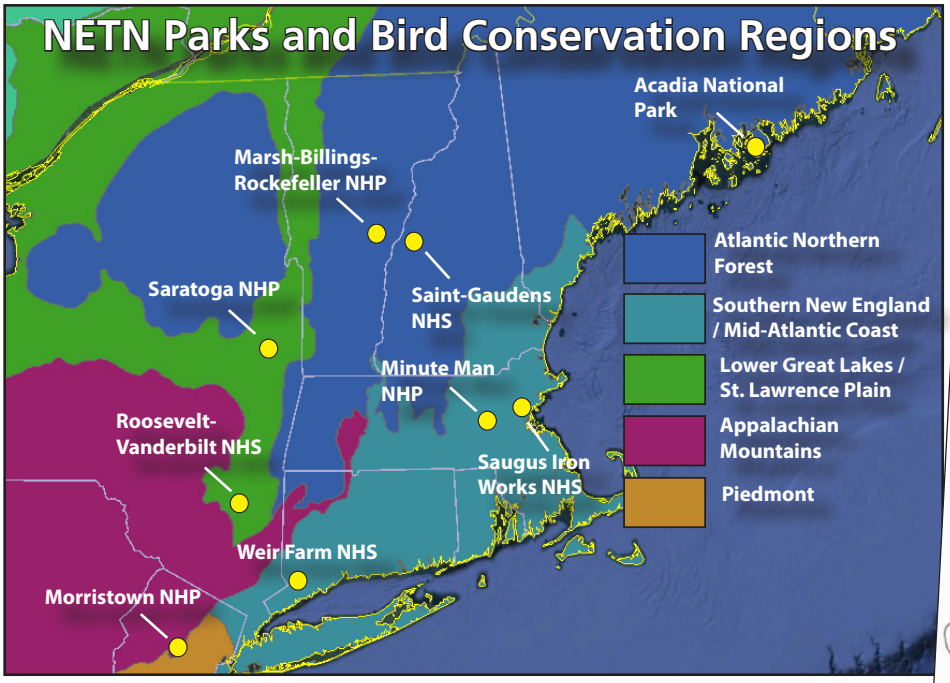
Birds are sensitive to habitat loss and forest fragmentation.

Forest fragmentation is widespread throughout much of the Northeastern U.S. Because of their relatively small size and land use histories, many NETN parks are especially impacted by fragmentation. Neotropical migrants (such as the Scarlet Tanager, Wood Thrush, and American Redstart) appear to be particularly vulnerable to this kind of habitat degradation. Habitat changes that result from deer browsing, invasive species spread/control, climate change, fragmentation, and silvicultural practices directly impact a park's avian community. Monitoring long-term patterns of bird composition and abundance relative to these stressors will improve understanding of their effects and help guide management actions within NETN parks.

How is the monitoring done?

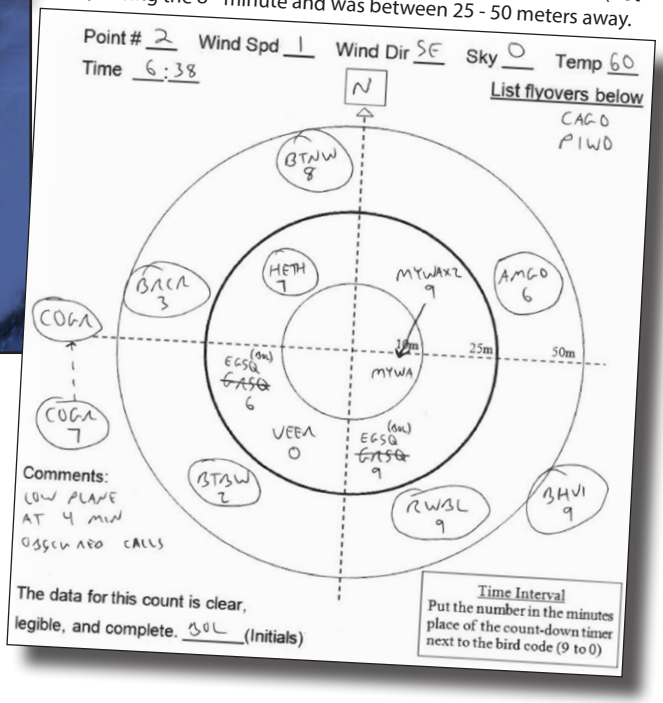
Volunteer citizen scientists are at the heart of the program.

During the breeding season (mid May through late June) and within the dominant forest habitat of each park, very talented and hearty volunteers bushwhack their way to study sites of between 5 and 10 point count stations (which can be viewed in Google Earth by visiting NETN's website and clicking the Google Earth Park Maps link). During a survey, they look and listen for birds at each station for 10 minutes and record them on field mapping cards. Counts are conducted early in the morning (about 5 AM)



Left: NETN parks reach across four BCRs. Birds do not abide by any political boundaries, and the arbitrary lines that divide states and countries do not necessarily reflect the differences between habitats, landscapes and resources. This is why the North American Bird Conservation Initiative has redrawn the map of North America into 67 BCRs as it applies to coordinated bird conservation needs.

Below: Field mapping card used by volunteers during the 10 minute point counts. A 4-letter bird species code, distance from observer, the minute it was detected, and whether or not it was a visual or auditory detection are recorded. For example, the marking nearest the North arrow indicates that a Black-throated Green Warbler was heard (not seen) during the 8th minute and was between 25 - 50 meters away.



and during proper survey conditions (calm to light wind and no more than a very light rain). Generally, these are the times and conditions when breeding birds are belting out their territorial and mating songs most vociferously, and is known in the bird-watching community as "the dawn chorus".

What is done with all that data?

Ecological Integrity Assessments give the skinny.

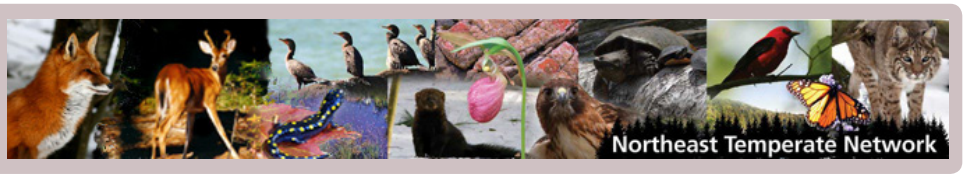
All the hard work that volunteers do gathering data in the field is only useful if it can be transformed into something that can be clearly understood by park managers, scientists, the public, and policy makers. This is done in part by presenting survey results in annual reports that provide basic interpretation of landbird status and trends. Reports include a list of the 10 most common species detected in each park and an assessment of the integrity of the park bird community based on several bird *response guilds* (groups of species that require similar habitat, food, or other elements for survival). Response guilds are effective indicators of habitat disturbance since changes in the availability of specific resources often manifests as population responses in species dependent on that resource. For example, the loss of snags in a forest stand can result in the decrease in the guild of bark-probing insectivores. The avian ecological integrity assessment consists of 13 guilds in three categories with each broadly categorized as "specialist" or "generalist." A specialist is a species with very specific habitat needs, or one that has a slow reproductive rate. The presence of a variety of specialist guilds generally indicates high-integrity habitat, while many generalist guilds indicates a low-integrity condition. The integrity categories are compositional (indicating species diversity), functional (highlighting ecological processes), and structural (related to the presence of important physical elements, like snags or a shrub layer). With species assigned to guilds, the proportional species richness of each guild is calculated, resulting in a rank of Good, Caution, or Significant Concern. "Good" represents acceptable or desired conditions; "Caution" indicates a problem may exist; "Significant Concern" indicates undesired conditions that may require management action. The proportional species richness is calculated as the number of species in the guild divided by the number of species in the breeding landbird community.

Below: Examples of some of the response guilds used to calculate the avian ecological integrity of NETN parks.

Biotic Integrity Element	Response Guild	Ratings (% Species Richness)		
		Good	Caution	Sig. Concern
Compositional:	Exotic Species	0%	0.5-7%	>7%
	Resident	< 28%	28 -41%	> 41%
Functional:	Bark Prober *	>11%	4 - 11%	< 4%
	High Canopy Forager *	> 12%	7 -12%	< 7%
Structural:	Canopy Nester *	> 35 %	29 - 35%	< 29%
	Shrub Nester	< 18%	18 - 24%	> 24%

* indicates a "specialist" guild.

More information:

For access to all annual reports, volunteer birder manuals, resource briefs for each park, and more - visit NETN's website and click on the Monitoring / Breeding Landbirds links. You can also "like" NETN on Facebook to keep up with all network monitoring activities.

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