Sorting Through the Morning Chorus

FBMP Reveals Short Distance Migrants Decline

By Steve Faccio

Since 1989, each June dozens of volunteer birders roll out of bed in the pre-dawn darkness—bleary-eyed if not eager—to census birds at their adopted woodland study site. Each birder, highly skilled in the identification of birds by sight and sound, makes his or her way by compass bearing and memorized landmarks to each of five listening stations where they count birds for 10 minutes. To date, more than 60 volunteers have participated in the Forest Bird Monitoring Program (FBMP), amassing a database of 40,134 individual bird records of 126 species in the process. With the primary goal of providing information on population trends and habitat associations of interior forest birds, the FBMP has grown from just 11 survey routes conducted that first year, to more than 30 in 2006. In addition, the National Park Service has contracted with the FBMP to coordinate breeding bird monitoring at eight National Parks in the Northeast Temperate Network—from Morristown National Historical Park in northern New Jersey to Acadia National Park in Maine.

Following the 2006 field season, an analysis of the 18 year FBMP dataset was conducted. Not surprisingly, the five most abundant species recorded at our study sites were Ovenbird (1.43 birds/point), Red-eyed Vireo (1.28), Black-throated Blue Warbler (0.55), Black-throated Green Warbler (0.54), and Hermit Thrush (0.50). Four of these five species were also among the most frequently encountered, with Ovenbird, Red-eyed Vireo and Winter Wren occurring at 90% of point count stations, followed by Hermit Thrush (77%), and Black-throated Green Warbler (67%).

The real "meat" of the analysis, however, were population trend estimates produced with the program *Estimating Equations*, the same statistical approach used to produce trends for the North American Breeding Bird Survey (BBS). Trend estimates were calculated for 48 of the most commonly detected species from 31 FBMP study sites (155 point counts) between 1989 and 2006. Overall, 26 (54%) species showed increasing population trends, while 22 (46%) species declined. Of these, eight species showed statistically significant trends, four of which increased and four decreased.

Among the significant declines were three short-distance migrants, including Vermont's state bird, the Hermit Thrush, along with Blue-headed Vireo and White-throated Sparrow. Wood Thrush, a long-distance migrant, also declined significantly over the 18-year period (see figure). Results from Vermont's 23 BBS routes corroborate three of these declines, with Hermit Thrush, Wood Thrush, and White-throat all declining significantly over the same time period. As a group, short-distance migrants (consisting of 13 species) also showed a significant decline of 3% per year.

Hermit Thrush, a bird that migrates to the southeastern U.S. during the winter, shows a decline of 6.3% per year according to Forest Bird Monitoring Program results. Photo © Bryan Pfeiffer/Wings Photography.

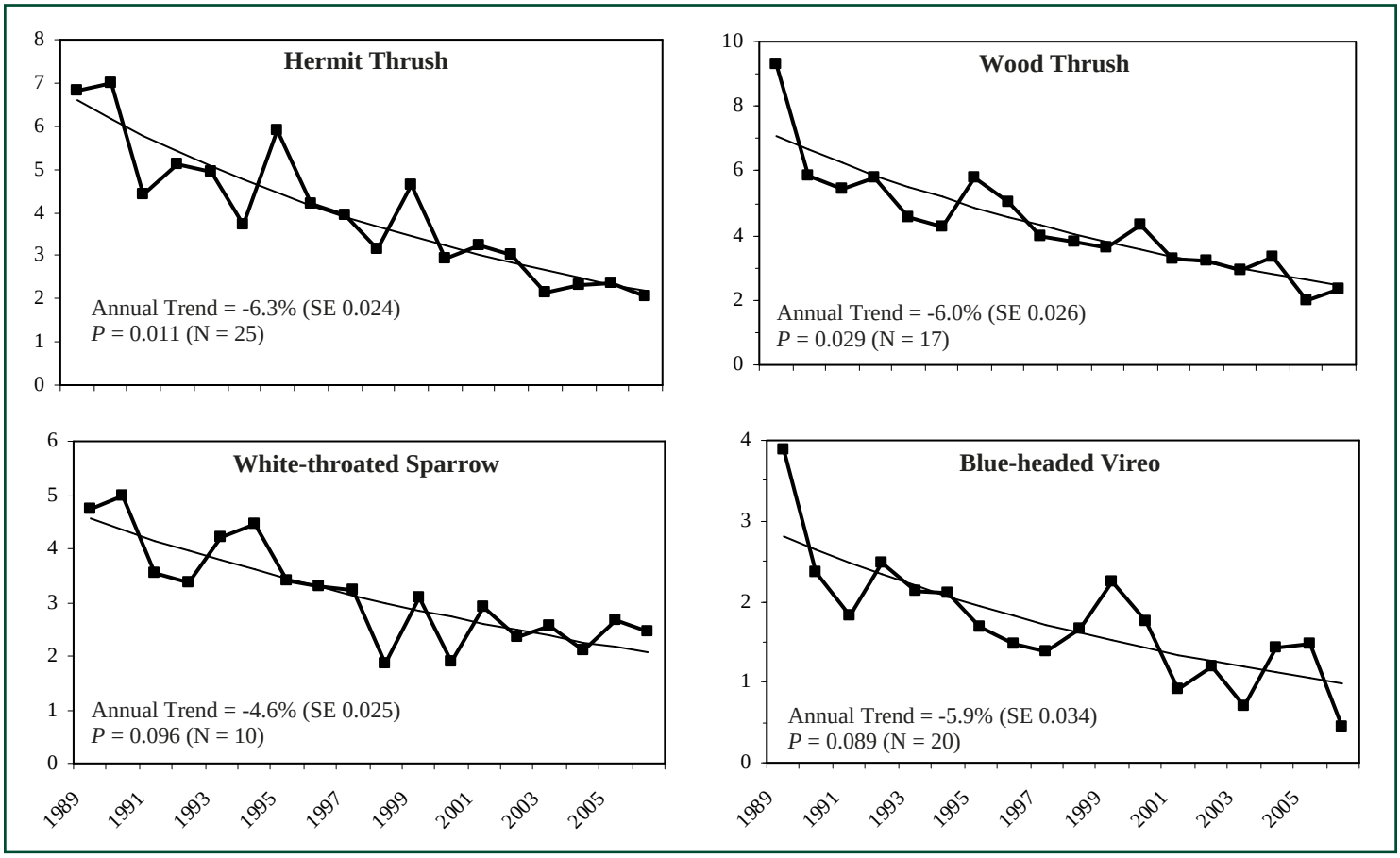
Although monitoring data such as these do not provide information about what may be driving population trends, several factors could be contributing to the long-term declines documented here, including deer overbrowse, soil calcium depletion due to acid rain, and habitat loss. In some forested areas of the Northeast, over browsing by white-tailed deer has greatly reduced the density of ground and understory vegetation. This has negatively impacted some ground-nesting birds, such as White-throated Sparrow and Hermit Thrush, which depend on dense ground cover for nest concealment and foraging.

Several studies have shown a strong relationship between acid precipitation, calcium depletion in the soil, and steep declines of European songbirds. In the U.S., Stefan Hames and his colleagues at the Cornell Lab of Ornithology showed that Wood Thrush were less likely to attempt to breed at sites receiving highly acid rain. Acid rain leaches calcium from the soil, thereby reducing the abundance of calcium-rich prey such as snails and millipedes, upon which many songbirds depend in order to obtain enough calcium to produce eggshells.

The declines of three short-distance migrants, and of this migratory group as a whole, suggest that overwintering habitat may be limiting breeding populations. The majority of short-distance migrants that breed in Vermont overwinter in the southeastern U.S., from the mid-Atlantic states to the Gulf Coast. Data from the U.S. Census Bureau indicate that the six-state region from Virginia to Florida, including Tennessee, had the largest population growth in the country between 1990 and 2000. While this doesn't provide a direct link to bird declines, the habitat loss and fragmentation that likely accompany such a population surge suggest that it may be a contributing factor.

The four species showing significantly increasing trends were not well-surveyed by the FBMP, and consequently our confidence in the biological significance of these results is limited. These include Baltimore Oriole (an edge species which was found only in low densities at seven study sites), Common Yellowthroat (a wetland species that was common only at a handful of study sites in forested wetlands), and White-breasted Nuthatch (a resident species whose early breeding season likely reduced its detectability on FBMP counts). In addition, Tufted Titmouse, a relative newcomer to Vermont, showed a 12.4% annual increase during the 18-year period at six study sites in the Champlain Valley, reflecting this southern species' expanded abundance and distribution in Vermont over the last 25 years.

Future plans for the FBMP include continued expansion by adding study sites and observers, protocol evaluation to coordinate with other monitoring programs for forest birds, and exploring methods to reduce observer bias. We also plan to utilize the most current statistical methods to analyze our growing dataset, including incorporating detectability and occupancy estimation procedures in order to improve population modeling and trend estimation. In addition, we will delve into our vegetation database to seek landscape patterns that may be affecting bird populations. While most of this work will involve computer time, many of us will look forward to those 4am alarm calls, signaling that it's time once again to silently sort through the morning chorus, one song at a time.



This figure shows population trends for four species exhibiting significant declines on Forest Bird Monitoring Program study sites between 1989 and 2006. 'SE' refers to standard error, 'P' is a measure of statistical significance, and 'N' is the number of study sites used to calculate the trend for each species.