

Connecticut State of the Birds 6:14–16

STATE OF THE FOREST BIRDSROBERT J. CRAIG¹

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Abstract. Connecticut's forest microhabitat variety is great, and this leads to higher bird diversity in forests than in any other terrestrial environment. To study this forest bird community, I conducted a systematic, quantitative summer-winter inventory of species to provide a view of population densities and distributions as well as of habitat affiliations, seasonal population shifts, diversity patterns and community responses to forest fragmentation. Over eight years, I observed that the community underwent profound shifts in composition in response to seasons, microclimate and structural habitat conditions. In a study of permanent residents, three of 10 species showed consistent, significant population declines, whereas one increased from summer to winter. Most species concentrated winter populations toward the coast. In a second study, diversity of wintering species strongly increased in regions of milder climates. Coastal forests appeared to be the state's principal winter reservoir for birds. In examination of other species' populations, some thought to be uncommon were surprisingly common and widespread, some declined since the 1970s and others increased over the same period. In order to maintain all bird species within Connecticut's forests it appeared that, at a minimum, all habitat types associated with forest must be represented in forest preserves.

From suburban Fairfield to rural Windham County, much of Connecticut's remaining open space is forested. Forest is, in fact, the state's principal natural environment.

Although the term forest is used to identify a general type of habitat, forests are in reality a highly variable collection of habitats. Forests dominated by oaks and hickories are most common in Connecticut, but in northern, more mountainous regions conifer-hardwood associations are present. On moist soils maples, beeches and ashes may predominate, in wet situations hardwoods occur separately or with conifers, and in dry areas, particularly along the Connecticut-Rhode Island border, pine-oak associations occur. Pure conifer cover is largely limited to stands of hemlock in ravines, planted stands and stands of white pines that develop on disturbed sites.

In addition to their variable composition, forests also differ in terms of such characteristics as age, tree diameter, understory density, soil moisture and degree of canopy openness. Combinations of these characteristics within three-dimensional forest environments yield numerous microhabitats in which

animal species can occur. Because microhabitat variety is great, animal diversity is higher in forests than in any other of Connecticut's terrestrial environments.

BIRDS ARE THE PREDOMINANT WILDLIFE GROUP WITHIN FOREST COMMUNITIES

The most diverse vertebrate group within forests is the birds, and numerous examples of microhabitat specialization among birds exist. The forest thrushes, for example, include the Hermit Thrush, a species of dry, conifer-hardwood forests and the Veery and Wood Thrush, species of moist, mixed deciduous forests. These latter species differ in more subtle ways, with the northerly-distributed Veery ranging into wetter locations and the southerly distributed Wood Thrush ranging into younger forests. The vireos similarly exhibit microhabitat specialization, with the northerly distributed Blue-headed Vireo associated with more coniferous, cooler forests, the Red-eyed Vireo associated with oak-dominated forests, the Yellow-throated Vireo associated with deciduous forest openings, the Warbling Vireo associated with forest borders and the White-eyed Vireo associated with early successional forest.

Because birds are the predominant wildlife

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group within forest communities, in 2001 I began a systematic, quantitative summer-winter inventory of species that has provided a first ever view of their population densities, population sizes, population distributions, habitat affiliations and seasonal population shifts. At the community level, the survey has provided the first data on regional patterns in diversity and on community responses to forest fragmentation. Knowledge of these basic biological patterns provides the basis for developing a regional conservation plan for forest birds.

Over eight years of intensive field surveys, I recorded nearly 100 species as resident members of a dynamic and variable community. This community undergoes profound shifts in composition in response to seasons, microclimate and structural habitat conditions. Although analyses of the vast quantities of data collected (50,172 bird observations and 19,980 habitat measurements) are still ongoing, certain aspects of the investigation are already complete.

BIRD POPULATIONS SHOW SEASONAL TRENDS

The first analysis (Craig 2011) concerned ten widespread, permanent resident bird species: the Downy Woodpecker, Hairy Woodpecker, Red-bellied Woodpecker, Blue Jay, Black-capped Chickadee, Tufted Titmouse, White-breasted Nuthatch, American Robin, Northern Cardinal and American Goldfinch. Some of these species are not thought of as forest residents, but field data demonstrated that they are all integral members of the forest bird community. For these ten species, I documented whether shifts occurred in summer to winter populations and in seasonal habitat use. Tufted Titmouse, Blue Jay and Northern Cardinal showed consistent, significant population declines, whereas the Black-capped Chickadee showed significant increases from summer to winter. The Red-bellied Woodpecker had a nearly significant winter population increase and five species showed no clear seasonal trend. In addition, populations of six of ten species became more concentrated from summer to winter at lower, southern elevations.

Aside from two species that shifted their seasonal populations based on canopy cover, few changes occurred in seasonal use of habitats. Despite observed population movements by most resident species, including those thought to be largely sedentary, the few clear and consistent shifts in association of species with forest habitat suggested that the principal factor related to seasonal population movement was wintering at lower elevations and latitudes. Doing so brought birds to locations with milder climates, which reduced their metabolic energy consumption.

In a second study done in conjunction with the U.S. Geological Survey (Craig and Klaver in review), evidence emerged that species diversity of especially wintering species also strongly increased in regions of milder climates. Coastal forests appeared to be the state's principal reservoir for winter bird populations.

In addition to these more thoroughly examined findings, the systematic surveys have yielded data that have begun to assist with understanding the population status of individual species. Previous attempts at elucidating the status and trends of local bird populations have been largely limited to interpreting data from the U.S.G.S. Breeding Bird Survey, which because of small samples for individual states and unquantified variation due to differing observers is problematic in interpretation. Such limitations have been overcome in the present study, which uses the variable circular plot technique, which has wide utility in evaluating landscape-level populations over a variety of terrains and has a well-developed theoretical underpinning that accounts for differential detectability of species.

EMERGING BIRD POPULATION TRENDS

Even at this preliminary state of population analysis, some patterns have emerged. For example, some species previously thought to be uncommon are, in fact, surprisingly common and widespread. For example, I estimate that 6,105 breeding male Cerulean Warblers and 10,675 male Acadian Flycatchers inhabit Connecticut's forests. A number of species also appear to have expanded populations over the last few decades. Based on my own data from the 1970s and 1980s, the Black-throated Blue Warbler has increased populations greatly and now numbers 41,712 males. Similarly, the Pine Warbler now numbers 63,748 males.

Comparison with my data from the 1970-80s also demonstrates that the Yellow-bellied Sapsucker has greatly expanded its range and numbers (22,980 now estimated statewide) and is now the commonest woodpecker in northwestern Connecticut. The Magnolia Warbler has also become well established as a breeder in northwestern and to lesser extent in eastern Connecticut, and the recently arrived Common Raven has grown its populations to 244 birds in summer and 559 in winter. Ravens now may be found from the state's highest mountains to near Long Island Sound. Other species that the data indicate have increased include the Cooper's Hawk, Northern Goshawk, Red-shouldered Hawk, Red-bellied Woodpecker, Yellow-throated Vireo, Tufted Titmouse, Eastern Bluebird, Gray Catbird, Yellow-rumped Warbler, American Redstart, Worm-eating Warbler and Northern Cardinal.

Species of more specialized habitats, like the wetland-dwelling waterthrushes vary from common to uncommon, with the widespread Louisiana numbering 23,337 and the more northerly distributed Northern numbering 4,190 males. In contrast, a species like the Eastern Towhee that has sparked conservation concern because of its association with disappearing successional habitats has a population of 65,315 males. This anomaly occurs because the towhee is not limited to successional habitat but also inhabits dry, mature forests with dense understories.

In contrast to species that have shown increases, comparison with data from the 1970-80s illustrates that the Least Flycatcher has largely disappeared from Connecticut's maturing forests, with only 3,830 males remaining. The Ruffed Grouse has similarly vacated forest habitat, and northwestern Connecticut is now its last, albeit marginal, stronghold. The Black-billed (411) and Yellow-billed Cuckoos (4,354) are also each represented by few males, although numbers vary widely from year to year, apparently in response to changing caterpillar populations. The very rarest forest breeders include the Golden-crowned Kinglet and White-throated Sparrow. Both these species are at their southern range limit in Connecticut. Other species that appear to have declined include the Eastern Wood Pewee, Blue Jay, Veery, Canada Warbler, Dark-eyed Junco, Baltimore Oriole and Purple Finch.

FOREST FRAGMENTATION STUDIES ARE AT AN EARLY STAGE

My studies on the effects of habitat fragmentation on the forest bird community are at their earliest stages, but some trends are already evident. Ground-nesting birds were sometimes largely or entirely absent from highly fragmented landscapes, particularly those near urban environments. Species that were abundant in more contiguous forests, like the Ovenbird and Veery, also were much less common in some fragmented forests. Only thorough analysis will verify such patterns, however.

In order to maintain all bird species within Connecticut's forest ecosystem, at a minimum all habitat types associated with forest must be represented. Active management like timber harvesting can be a useful tool in supplying some of these habitats. However, forest management alone is insufficient for meeting the needs of all species. The presence of many habitats is a function of landscape variables like soil moisture, soil type and topography. Hence, another key feature in a regional conservation plan is

the protection of tracts extensive enough to provide a variety of physical environments. Only extensive tracts are likely to provide the range of moisture regimes, soils, topographies, wetlands and other habitat variety necessary to support all species. Especially for those species that are present in low densities, extensive tracts are essential for protecting populations large enough to be self-sustaining.

LITERATURE CITED

- CRAIG, R.J. 2012. Seasonal shifts in population distributions and habitat use by permanent resident forest birds in eastern Connecticut. Bird Conservation Research, Inc. Contribution 17.
- CRAIG, R.J. and R.W. KLAVER. (in review). Landscape level diversity patterns in forest birds of southern New England. Bird Conservation Research, Inc. Contribution 16.