

1991

# Protecting forests for wildlife

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## Recommended Citation

Askins, R. A. 1991. Protecting forests for wildlife. *Connecticut Woodlands* 11: 21-22.

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## PROTECTING FORESTS FOR WILDLIFE<sup>1</sup>

By Dr. Robert Askins<sup>2</sup>

The subject of managing forests for wildlife is being viewed from a new perspective, a perspective that has developed primarily as a result of studies of forest-interior birds. Forest-interior birds are dependent to a large extent on how forest lands are managed. They are essentially forest specialists and are not normally seen in open areas such as the suburbs, open fields or meadows. In Connecticut and other parts of the northeastern United States, most forest-interior birds are members of one taxonomic group, the wood warblers.

### *Forest-Interior Species*

The wood warblers consist of a diverse group of species that are distinguished by their distinctive color patterns. Moreover, each species searches for food in a distinctive manner. In a typical forest in southern Connecticut you will find warblers at all heights in the vegetation. The black-throated green warbler moves through the forest canopy, where it catches insects by snatching them from the tips of leaves while hovering. In contrast, the cerulean warbler moves through the canopy slowly and deliberately as it picks insects off of leaves. The black-and-white warbler is found lower in the canopy. This species crawls around on the trunk and branches of trees, probing for insects in cracks and crevices in the bark. The American redstart is found in the subcanopy, where it flits quickly from branch to branch and tree to tree, fanning its tail to flush insects out of the foliage and catch them on the wing. The worm-eating warbler is usually found in the shrub layer, where it slowly and deliberately searches for well camouflaged insects on the leaves. Two species of warblers are found on the forest floor: the Louisiana waterthrush searches for both terrestrial and aquatic insects along streamsides, and the ovenbird walks along the forest floor, flipping over dead leaves to feed on the insects underneath.

These are a few of the many forest-interior species that search for insects in the deciduous forest. All of these species have particular feeding specialties and spend much of the summer searching for insects. They have a tremendous impact on insect populations; one study in New Hampshire demonstrated that they can remove more than a third of the caterpillars each week from the understory, which is enough to prevent caterpillar outbreaks. These

birds constitute an important component of the biological diversity of a deciduous forest, and they are probably crucial for the health and stability of the forest.

### *Forest Fragmentation*

While none of the above species are considered endangered or threatened, there is growing evidence that these species are declining in many parts of the eastern United States. This decline was first noticed in the mid-1970s as a result of several long term studies at sites in Connecticut, New Jersey, New York, Wisconsin, Georgia and Washington, D.C. The pattern was similar in all of the studies: a rapid, almost catastrophic decline in the number of forest-interior birds. These declines occurred in forest preserves, city parks, nature preserves and botanical gardens. All of these study areas are relatively small, isolated areas of woodland; most are smaller than 100 acres.

One hypothesis is that these declines have occurred as a result of forest fragmentation, a process in which a large area of continuous forest has been reduced to small remnant patches of forest. One problem with forest fragmentation is that the center of a small forest patch is close to the edge. Forest edge is a favorable habitat for many species of wildlife such as white-tailed deer, ruffed grouse and American woodcock. However, there is a growing evidence that forest edge has a negative effect on forest-interior birds. The forest edge is characterized by a high density of predators such as raccoons, opossum, dogs, cats, blue jays and American crows, all of which feed on the eggs and nestlings of birds. The predators can easily find the nests of forest-interior birds because most species build open nests on the ground or in the shrub layer.

The brown-headed cowbird is also abundant along the edge of the forest. This species is a parasite that often lays its eggs in warbler nests. The warblers raise the cowbird nestlings. The legitimate young are often pushed out of the nest by the cowbird nestling. If they remain in the nest, they usually starve to death because the larger cowbird nestling takes all of the food.

A study in Wisconsin shows that reproduction of forest-interior birds is much lower near the forest edge than in the forest interior because of higher rates of predation and cowbird parasitism near the edge. A rapid decline in populations of forest-interior birds has been documented primarily in areas that have undergone rapid urbanization, where small forest preserves have been surrounded by houses, shopping centers and other types of development. A steady increase in the proportion of forest edge, and a steady decline in the amount of forest "core" where nests are better protected from predators and cowbirds, may account for the decline in forest-interior species at these sites.

### *Tropical Habitat*

Nearly all forest-interior birds are long-distance migrants, overwintering in the West Indies, Mexico or Central America. All of these regions have been subjected to rapid deforestation during the past 40 years, the same period in which forest-interior bird populations have

<sup>1</sup> Keynote Address presented at the 1991 Annual Meeting of the Connecticut Forest and Park Association, June 10, 1991.

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been declining. These species spend more time in the tropics than in their temperate-zone breeding habitats. Hence, another logical explanation for the decline in these birds is the destruction of their winter habitat in the tropics.

If destruction of tropical habitat were responsible for the declines in forest-interior bird populations, declines would be expected to occur not only in small forest preserves, but also in large tracts of continuous forest. Studies over the past 40 years have not revealed a consistent decline in populations of forest-interior birds in Great Smoky Mountains National Park, which has more than 300,000 acres of almost unbroken forests. Similarly, several other large tracts have shown no decline in these species. At two sites at the White Memorial Foundation in Connecticut migratory forest birds have actually increased. These studies of bird populations in large tracts of forest suggest that the most severe declines in migratory forest birds have been caused by changes in land use in the northern breeding area rather than by destruction of tropical rain forests.

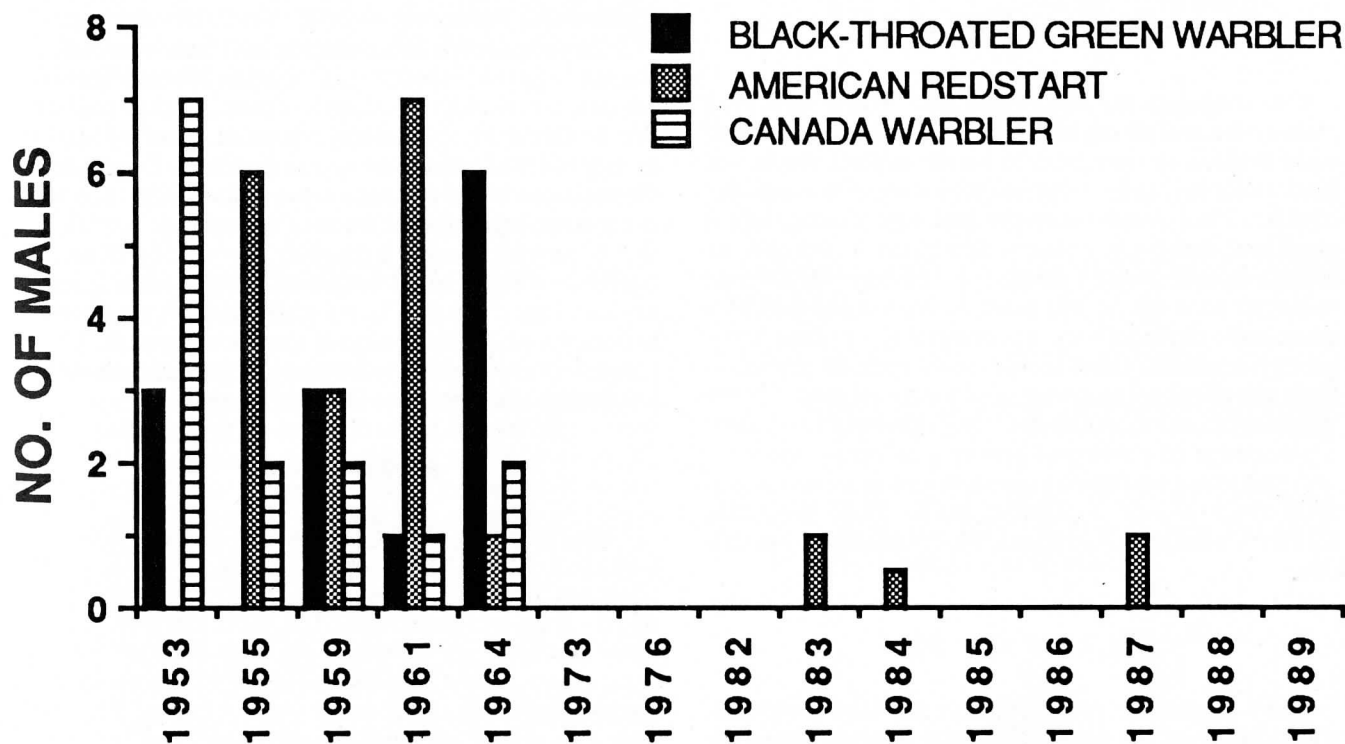
This conclusion is also supported by studies of forests of different sizes in a single region. During the 1980s my students and I conducted a study of this sort at 46 sites in New London County. The sites ranged in size from four acres to more than 6,000 acres. We determined the area of each forest, and measured a large number of vegetation variables, such as canopy height, number of tree species, shrub cover and tree cover. Among all of these variables, the best predictor of the number of forest-

interior birds was the area of the forest. More individual birds and more species were detected at survey points in large forests than at survey points in small forests. Moreover, some species of forest-interior birds were never found in small forests, even species that were frequently recorded in large forests.

The implication of these studies is clear. If we wish to maintain an entire community of forest birds, it is critical to maintain some large areas of unbroken forest. Although Connecticut is heavily wooded, many forested areas are fragmented and thus do not constitute favorable habitat for forest-interior birds.

### Effects of Forestry

The best hope for sustaining complete bird communities is in our larger state forests and parks, as well as on some tracts of private land that are large enough to support forest-interior species or that are contiguous with large preserves. Forestry can be compatible with maintaining favorable habitat for forest-interior birds, and logging in state forests is not necessarily a major problem. Birds can colonize an area fairly soon after timber harvesting, as soon as the canopy of the regenerating young forest begins to close. There will be a problem if harvesting is done in a checkerboard fashion, but proper planning to minimize the amount of forest edge and to provide for some large areas of unbroken forest should result in a diverse community of forest-interior birds.



Changes in the number of territorial males of three species of forest warblers at the Connecticut College Arboretum. From *Birds of the Connecticut College Arboretum: Population Changes over Forty Years*, Connecticut College Arboretum Bulletin No. 31.