GOLDEN-WINGED AND BLUE-WINGED WARBLERS AT STERLING FOREST: A UNIQUE CIRCUMSTANCE

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ABSTRACT — This survey documents the unusual long-term coexistence (at least 90 years) of Golden-winged and Blue-winged warblers in Sterling Forest. In this region both species use similar habitat but rarely hybridize.

INTRODUCTION

On 25 May, 1997 we conducted a survey of Golden-winged Warblers (*Vermivora chrysoptera*), Blue-winged Warblers (*V. pinus*) and their hybrids in Sterling Forest. Sterling Forest is approximately 20,000 acres of wetlands, and wooded, steep and rocky hills and valleys with pristine lakes and streams straddling the border of New York and New Jersey in Orange and Passaic counties. The largest unfragmented forest remaining in the New York / New Jersey Highlands, which stretch from the Delaware River, northeastward across the Hudson River to Connecticut, lies within Sterling Forest.

Golden-wings and blue-wings nested in this area early in the 1900's, as reported by Eaton (1914) in *The Birds of New York State.* The golden-wing account in *The Atlas of Breeding Birds of New York State* (Confer 1988) reported that both golden-wings and blue-wings still nested in this area, continuing a 90-yr pattern of coexistence. Skully (1997) documented that the long-term coexistence extended westward into contiguous Sussex County, New Jersey. This coexistence is surprising because Gill (1980) reported that there were no known areas where golden-wings and blue-wings coexisted for over 50 years. Since Gill's publication, the Sterling Forest region is still the only region with published data showing prolonged coexistence of these two species.

Frech and Confer (1987) showed that hybrids appeared to be rare in this area. Their study reported 7 golden-wings and 13 blue-wings, but no hybrids. They speculated that the low frequency of hybridization contributed to their coexistence. We conducted the current survey to provide further data on the coexistence of these two species and to observe if they utilize similar habitat.

METHODS

To detect birds we lured them to us by continuously playing Type II song, as defined by Gill and Murray (1972), at each of 32 roadside stops. At 31 of the roadside sites, we counted only those birds that we saw or heard while we stood near the car. We walked into one site of abandoned farmland with patches of herbs and shrubs.

OBSERVATIONS

We heard and/or saw 22 male Golden-winged and 22 male Blue-winged warblers. We saw 18 golden-wings and 12 blue-wings and no hybrids. Of the 30 visually identified birds, 29 appeared to have pure phenotypes. One blue-wing had yellowish wing bars, a characteristic indicative of introgression (Gill 1980). Four golden-wings and 10 blue-wings were only heard and these might have included a hybrid or the very rare individual of one species which sings the Type I song of the other species.

Combining results of a previous survey, no hybrids were detected out of 50 birds visually identified in 1986 and 1997. Hybridization is more common at other study sites. As examples, hybrids comprised 9% (22 of 241) of the territorial males in north-central New York (Confer and Larkin in press) and 17% (7 of 41) in the Delaware Valley (Gill 1997). A Chi-square 2 x 2 contingency test comparing the two New York samples showed a significantly lower frequency of hybridization at Sterling Forest ($\chi^2 = 4.67$, $p < 0.05\%$).

Hypothetically, the low rate of hybridization at Sterling Forest might occur because the two species were separated by use of different habitats. Frech and Confer (1987) noted that these two species frequently established overlapping territories in wet portions of the Sterling Forest region. Unpublished portions of the data from that study detected blue-wings at two dry, upland sites where there were no golden-wings. During this current survey of Sterling Forest, we sampled the distribution of golden-wings and blue-wings at 12 wet and 20 dry sites. Dry areas consisted of: 1) cleared right-of-ways with shrub growth under power lines generally bordered with mature forest, and 2) mature forests with openings and small amounts of shrub along the road shoulder. Wet areas consisted almost exclusively of stable alder swamps.

In this survey, the habitat occupancy by both species was virtually identical. We detected (by song and/or sight) 12 golden-wing and 11 blue-wing at 20 dry sites, and 10 golden-wing and 11 blue-wing at 12 wet sites. Our study shows that the density of both species in wet habitats and in dry habitats is about the same, in contrast to the previous, smaller survey (Frech and Confer 1987). The two species often occurred together at the same site. We detected 2 birds at each of 11 roadside sites, and 10 of these sites had one of each species. We walked into one abandoned farmland site which had two individuals of both species, both using similar habitat.

We detected 12 golden-wings at 20 dry sites (60% occupancy) and 10 golden-wings at 12 wet sites (83%). Both species occurred in slightly higher densities in wet sites. However, the difference in habitat occupancy within each species is not statistically significant. Differences in nesting success may occur among the habitats used by golden-wings, and further study of possible habitat effects could be valuable.

DISCUSSION AND CONCLUSIONS

The coexistence of golden-wings and blue-wings for at least 90 years appears to be unique to the region in and around Sterling Forest. The low rate of hybridization is also unique to this region. Apparently these populations have developed some reproductive isolating mechanism which greatly reduces hybridization and probably accounts for their prolonged coexistence. In this region both species nest in alder swamps and upland, shrub habitat. The nesting success of both species in these different habitats is unknown, but could provide critical guidance for habitat management at other sites. The geographic extent and numerical abundance of these populations with low hybridization is also unknown, although the zone of low hybridization extends westward into neighboring New Jersey (Skully 1997). The decline of the Golden-winged Warbler in the eastern portion of it's range is so extreme it has been designated a Priority Species by Partners in Flight and a Species of Management Concern by the U.S. Fish and Wildlife. Consequently, analyses and protection of this population should be a priority for Golden-winged Warbler studies.

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