

THE RAPIDLY CHANGING DISTRIBUTION OF THE GOLDEN-WINGED WARBLER (*Vermivora chrysoptera*) IN CENTRAL NEW YORK

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The Golden-winged Warbler (*Vermivora chrysoptera*) has disappeared from much of its former range. Thus, it has been classified as a species of special concern by the US Fish and Wildlife Service. Documentation of changes in its population is potentially useful in several ways. Management efforts may be instituted to maintain a regional population if it is shown to be declining, and analyses of this decline may clarify ecological concepts. In this paper we will describe our recent census data on the abundance of the Golden-winged Warbler and its congener, the Blue-winged Warbler (*V. pinus*), in central New York, and we will evaluate some of the data sources used to estimate Golden-winged Warbler abundance.

Statewide surveys of all bird species of New York have been compiled by Eaton (1914), Bull (1974), and Andrle and Carroll (1988). There is an exceptional amount of information on the Golden-winged Warbler in New York. This includes articles in *The Kingbird* (Short 1962, Frech and Confer 1987, Confer and Knapp 1979) and several publications by Ficken and Ficken (e.g., 1967, 1968). New census results described in this report add to our knowledge of the changing distribution and abundance of Golden-winged and Blue-winged Warblers and their hybrids in central New York.

From 1988-90 the first author, with the invaluable aid of various college student assistants, determined the number of singing male Golden-winged and Blue-winged Warblers, and their hybrids, in parts of central New York. During 1988-89 our survey covered a broad area. Over 300 sites were visited to determine if any birds were conspicuous. Of these sites, 45 were surveyed with moderate intensity — at least four up to about 50 person-hours per site. From this effort, we were reasonably confident of only the number of singing males at each site. During 1990 our survey was much more intensive but confined to just nine sites. With three observers, we spent from 60-120 person-hours at each site. With this additional time we were reasonably confident of the number of females present as well.

RESULTS

The tabulation of male Golden-winged and Blue-winged Warblers and their hybrids detected in 1988-89 are shown in Figure 1. Repeated counting of the same individual could occur, but the chance was minimized by visiting almost all different sites in each year. For the Ithaca area, the presence of a single male at the same site on consecutive years continues the decline as noted earlier (Confer and Knapp 1981). This decline correlates with the expansion of the Blue-winged Warbler. Gill (1980) noted that Golden-winged Warbler disappeared within 50 years of the arrival of the Blue-winged Warbler at many other locations, and events in Tompkins County are following the same pattern. This decline also correlates with a decline in the amount of early succession habitat available for nesting by Golden-winged Warbler. The degree to which the presence of the Blue-winged Warbler or the loss of habitat is

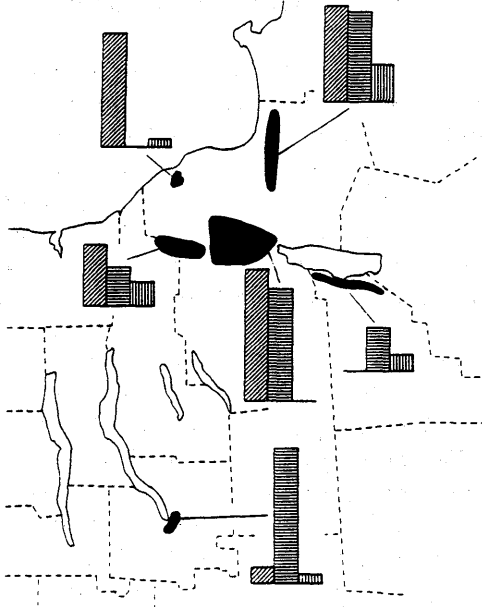


Figure 1. Abundance of Golden-winged and Blue-winged Warbler, and their hybrids, at study sites in central New York during 1988-89. Darkened areas encompass clusters of study sites for which counts are presented. Histograms show the number of Golden-winged Warbler (diagonal stripes), Blue-winged Warbler (horizontal stripes) and their hybrids (vertical stripes) at each cluster. The actual counts at the southern end of Cayuga Lake are 2 Golden-winged, 17 Blue-winged and 1 hybrid Golden-winged X Blue-winged Warbler; the other histograms are drawn to the same scale.

responsible for the decline of the Golden-winged Warbler is not known, but we continue to try to determine this.

The absence of Golden-winged Warbler in the area immediately south of Oneida Lake (Fig. 1) is an anomaly. This area has been intensively scoured by us and seems to have much suitable habitat. Golden-winged Warbler occurs within 20 miles to the west and northwest, but are certainly either very rare or absent in the area along State Route 31.

Of the areas we surveyed, only the area from approximately Oswego east to Mexico and south to Hannibal has far more Golden-winged than Blue-winged Warbler. During 1988-89 the ratio of Golden-winged Warbler males to Blue-winged Warbler plus hybrid males was 15:1 (94%). During 1990 in the same area the ratio of male and female Golden-winged Warbler to male and female Blue-winged Warbler plus hybrids was 30:10 (75%). The small size of this sample allows us only to suspect that a real decline in the proportion of Golden-winged Warbler has occurred in these three years. Over its entire range, there is a tendency for Golden-winged Warbler to occur farther north than the Blue-winged Warbler, as in Minnesota (Highsmith 1989) or Ontario (Mills 1987). However, in the most northern areas of New York that we surveyed, from Pulaski to Watertown within 5-10 miles of Interstate Highway 81, we located as many Blue-winged as Golden-winged Warblers.

DISCUSSION

Surveys that use other techniques provide data about the entire population, and such surveys must be continued. However, our intensive studies at a few sites have suggested various limitations in the accuracy of these broad surveys, which apply particularly to Golden-winged and Blue-winged Warblers and their hybrids.

The best documentation of changes in the abundance of the Golden-winged Warbler over its entire range comes from the U.S. Fish and Wildlife Service and its Breeding Bird Survey Routes. Data from these surveys during 1965-79 (Robbins *et al.* 1986), showed no overall change in the Golden-winged Warbler abundance for its entire range. However, when data from this source for 1966-87 is analyzed by physiographic regions, declines occurred in nine (of which five had statistical significance) of 11 regions while increases occurred only in the two northernmost regions of the range (Droege, *pers. comm.*). The declines are quite rapid, with exponential rates of -2 to -6% annually.

When conducting a Breeding Bird Survey the observer drives to 50 predetermined sites along a 24.5 mile route, and records all birds observed at each site for exactly three minutes while staying near the car. The census starts 30 minutes before sunrise. Due to these procedures, most birds are identified only by song. For Golden-winged Warbler, this may produce two kinds of errors. The first error associated with song identification occurs because almost all hybrids will be tallied as Golden-winged Warbler. Hybrids seem to sing as frequently, perhaps even more frequently, than either a pure Golden-winged or a pure Blue-winged Warbler. In the last two years of field surveys in central New York, I have located 21 "Brewster's" Warblers. One or two could have been the same individual bird observed in consecutive years. Summed for both years, 19 of 21 sang Golden-winged Warbler songs. Counting birds by song without visual confirmation of their identity will assign hybrids to one or the other species. In central New York this will exaggerate the count of Golden-winged Warbler.

The second error associated with song identification involves the virtual identity of the alternate song of Golden-winged and Blue-winged Warblers and their hybrids. During most of the breeding season all of these forms sing vigorously from about a half-hour before sunrise until sunrise (Highsmith 1989). During this time these birds sing a distinctive song which has been called Type 2 by Lanyon and Gill (1964). Unfortunately, the Type 2 song for both species and the hybrids sounds very similar. The first author of this paper, who has moderately good hearing and years of experience with these birds, under optimal conditions and when close to a singing bird probably can correctly distinguish Type 2 song of a Golden-winged Warbler from those of Blue-winged Warbler and their hybrids a little more than 50% of the time. On Breeding Bird Surveys, observers rarely have optimal conditions but feel compelled to identify each Type 2 song. Personal biases among observers may lead to the disproportional assignment of Type 2 to one species or the other.

These sources of error may not invalidate the population trends suggested by the Breeding Bird Survey data. It is possible that the effect of these errors is proportionally similar for different years and routes. If so, the relative change in the reported abundance of Golden-winged Warblers may truly reflect real changes in the population.

The most recent information for New York about the range of Golden-winged and Blue-winged warblers and their hybrids in New York is presented in *The Atlas of Breeding Birds in New York State* (Andrle and Carroll 1988). This atlas is a marvelous source of information. However, for all species the presentation of population data in the form of dots on a map limits the value of this information. As with most atlases, the dots indicate that one or more breeding birds were present in a censused area, which provides no information about the size of a population. Birders may try especially hard to confirm rare species. Consequently, dots for rare species may occur with misleading frequency.

The rapidity of range change for the Golden-winged Warbler is revealed by comparing the New York atlas map and our survey for the last three years (Fig 1). The range maps in the New York atlas are based on field observations from 1980-85. The map for the Golden-winged Warbler shows that it was found in ten sites in Tompkins County near the southern end of Cayuga Lake. In 1988-89 we surveyed this county. We visited almost all the sites which held Golden-winged Warbler during the atlas survey (as described to us by the regional atlas compiler, D. McIlroy) as well as all the sites described for this area as of 1976-78 (Confer and Knapp 1979). We also solicited information from the many birders in this area. From this effort we located two sites each with one male Golden-winged Warbler in Tompkins County. In 1989-90 we knew of only one site in Tompkins County with one male Golden-winged Warbler each year. At this site the male was paired with a Blue-winged Warbler and raised two hybrids and two Brown-headed Cowbird (*Molothrus ater*), an ignominious end for a beautiful species. Although a few undiscovered Golden-winged Warbler may still nest in Tompkins County, the atlas map with 10 dots in this county is already greatly out of date.

During 1990 we obtained preliminary data to test if the proximity of Blue-winged Warbler reduced the ability of Golden-winged Warbler to establish territories or if it altered the vegetative characteristics of the territories occupied by Golden-winged Warbler. The preliminary results suggest that the presence of Blue-winged Warbler does not prevent the establishment of nesting territories by the Golden-winged Warbler. However, it may be that the presence of Blue-winged Warbler drives the Golden-winged Warbler into territories with different vegetative characteristics. We hope to investigate these ideas further. If these

findings are verified, it could be that the Blue-winged Warbler eliminates the Golden-winged Warbler by driving them into inferior nesting habitat.

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