BREEDING LOCALITIES OF RED-WINGED BLACKBIRDS WINTERING IN NORTH AND SOUTH CAROLINA

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In an earlier paper (Stewart 1975) I reported the results of an analysis of banding and recovery records showing breeding localities of Common Grackles (*Quiscalus quiscula*) wintering in North and South Carolina. In the present paper I am making a similar analysis for the Red-winged Blackbird (*Agelaius phoeniceus*). The present paper is based on birds banded in South Carolina and on recoveries in North and South Carolina during the winter of birds earlier banded on their more northern nesting grounds. In preparing this paper I had information on the total numbers of Red-winged Blackbirds banded in the various states and provinces in the breeding range of the birds, an advantage I lacked in preparation of the earlier paper. The data used involved birds banded during the period 1950 through 1970 and recovered during the period 1950 until 20 October 1972.

METHODS

As in the earlier paper banding and recovery records were selected to represent nesting and wintering localities. In the present paper winter was defined as the period December through February, and the time on the nesting grounds was defined as the period May through September. Thus, birds banded or recovered during March, April, October, and November were eliminated from the analysis on the assumption that the reported contacts might have been made when the birds were on their northward or southward migrations.

With widely different numbers of birds banded, the probability of banded birds coming from different states and provinces varied widely; hence, the numbers of birds banded per recovery were determined. With use of recovery rates, percentages of the populations going from the various states and provinces to the Carolinas were calculated. The recovery rate of birds banded in South Carolina was used for a base, the banded birds trapped and released being eliminated from the count. Since recoveries were used only from three months of the year, when the birds were on their wintering grounds, one-fourth of the base rate was used as an expected recovery rate. To calculate the percentage of the population going to the Carolinas from a state or province, the number recovered was divided by the number banded times 100 to get the recovery rate, and the derived recovery rate was divided by the expected recovery rate times 100. To calculate the percentage of the winter population in the Carolinas coming from the different states and provinces, the recovery rate in the Carolinas was divided by the total recovery rate from all of the states and provinces times 100.

Although bird distribution is often considered relative to political boundaries, it is more properly associated with geographic regions; hence, the breeding grounds of Red-winged Blackbirds wintering in the Carolinas was divided into regions. Regions of states and provinces were indicated by closely similar recovery rates from adjacent states and provinces. Also, few birds were banded in some states and provinces, resulting in spotty sampling and indicating a need for grouping the states and provinces.

RESULTS

A total of 271,595 Red-winged Blackbirds were banded to yield 174 recoveries in North and South Carolina; thus, 1,561 birds were banded for each one recovered, or 0.06 percent of the 271,595 banded birds were recovered during the winter in North and South Carolina. Two additional birds were recovered in the Carolinas after being banded in Florida during the fall and winter.

In South Carolina 5,280 birds were banded, and 46 of these were recovered, showing a recovery rate of 0.9 percent. Thus, considering the fact that the time when the

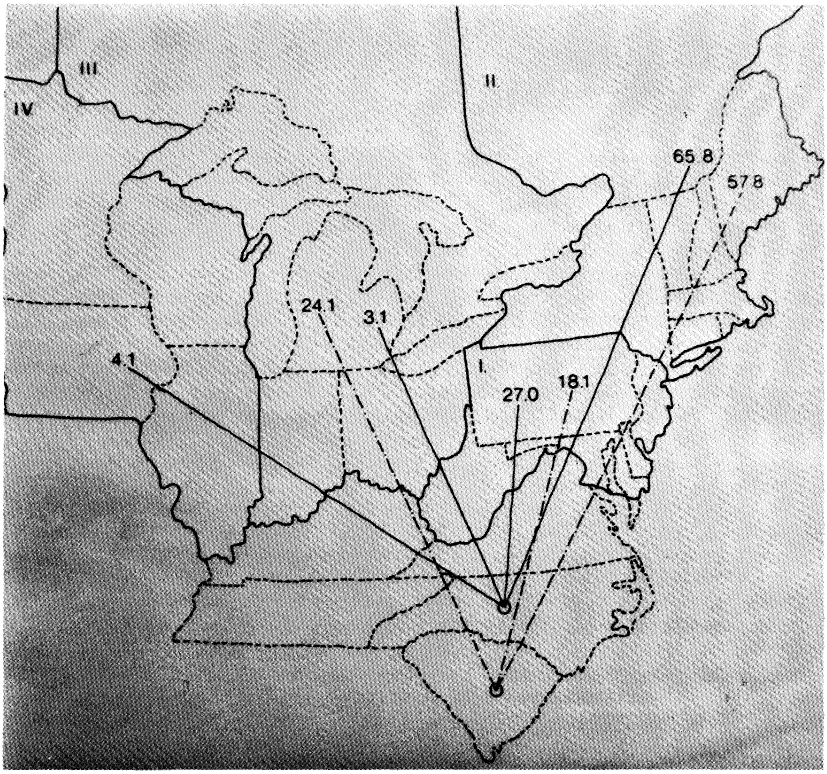

Fig. 1. Percentages of winter populations of Red-winged Blackbirds in North and South Carolina coming from different nesting regions. Regions are numbered with Roman numerals.

birds are on their wintering grounds is one-fourth of the total time they are susceptible to recovery, the recovery rate in North and South Carolina would be expected to be 0.225 percent if all of the 271,595 banded birds spent the winter in the Carolinas. The recovery rate of birds coming to North and South Carolina to spend the winter was 0.06 percent, indicating that about 26.7 percent of the 271,595 banded birds came to North and South Carolina to spend the winter or that 26.7 percent of the Red-winged Blackbirds on nesting grounds in the northern part of the eastern United States come to the Carolinas to spend the winter.

Figure 1 shows the percentages of winter populations of Red-winged Blackbirds coming to North and South Carolina from different parts of their nesting grounds. Of the winter populations in both Carolinas, 22.6, 61.8, 13.6, and 2.1 percent come from Regions I, II, III and IV, respectively. With the rate of recovery during the winter in the Carolinas of birds on nesting grounds in Region I being only slightly more than one-third of that of birds on nesting grounds in Region II, it is indicated that more Red-winged Blackbirds remain during the winter on their nesting grounds in Region I than in the more northen Region II, or perhaps migrate a shorter distance southward. Nearly eight times more Red-winged Blackbirds come to South Carolina than to North Carolina from Region III. With 3.1 percent of the winter population in North Carolina from

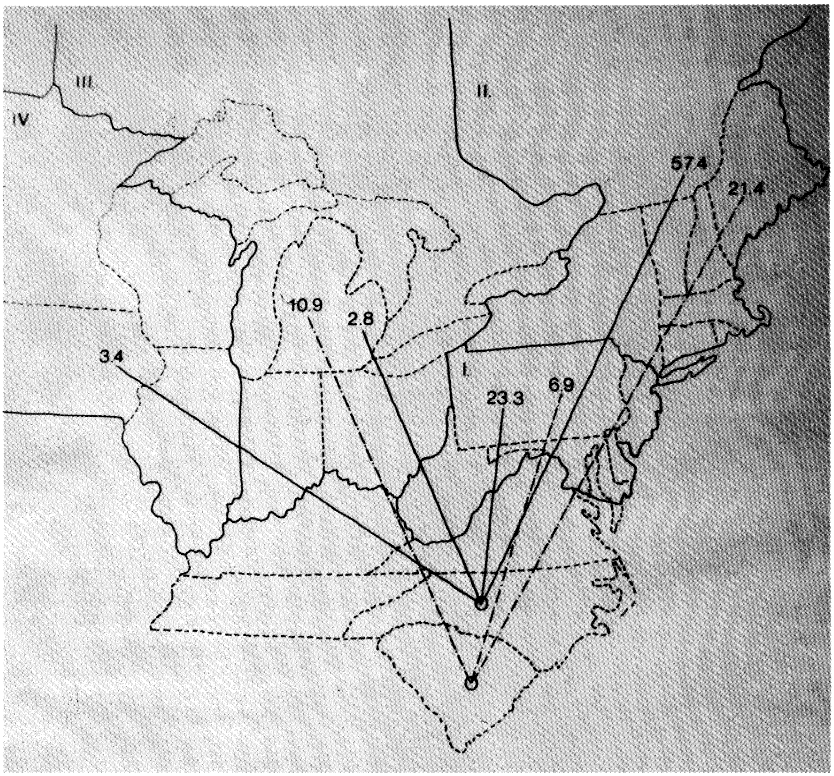

Fig. 2. Percentages of populations of Red-winged Blackbirds going from different regions on their nesting grounds to spend the winter in North and South Carolina. Regions are numbered with Roman numerals. The difference between the numbers shown in the various regions and 100 percent is represented by birds wintering elsewhere than in North and South Carolina.

Region III and 4.1 percent from Region IV, roughly the same percentages come to North Carolina from these two regions.

Figure 2 shows the percentages of populations of Red-winged Blackbirds leaving their nesting grounds in the different regions to go to North and South Carolina to spend the winter. Of Red-winged Blackbirds going from their nesting grounds in the different regions to spend the winter in North and South Carolina, 30.2, 78.8, 13.7, and 3.4 percent went from Regions I, II, III and IV, respectively. With 78.8 pecent of the Red-winged Blackbirds going from their nesting grounds in Region II to spend the winter in North and South Carolina, the Carolinas are the major wintering grounds for Red-winged Blackbirds from this region.

A total of 5,280 Red-winged Blackbirds were banded in South Carolina, but most of those recovered were banded during the migration season or winter. All of those banded during the winter were recovered during the migration season or to the northward during the nesting season. No recoveries are available from the 5,280 Red-winged Blackbirds banded in South Carolina to show whether South Carolina birds migrate southward after the nesting season or remain in the state throughout the year. Like-

wise, 302 Red-winged Blackbirds were banded in North Carolina without yielding a single recovery representing both the nesting and winter season. Also, 1,835 Red-winged Blackbirds were banded in Virginia, with only one recovered in the Carolinas. This one bird was banded during May in Virginia and recovered the following August in South Carolina, not indicating the whereabouts of its wintering grounds.

The only available evidence of migration of Red-winged Blackbirds nesting south of Maryland consists of two birds banded in Florida during February and November and later recovered in North and South Carolina during August and April, respectively. While only one of these two birds was taken during the time I have defined for the birds to be on their nesting grounds, they both indicate migratory movement south of the Carolinas. Too few recoveries are available of Red-winged Blackbirds banded during the nesting season in North Carolina, South Carolina, and Virginia and during the winter in Florida and Georgia to support a definitive statement on the migratory status of Red-winged Blackbirds nesting south of Maryland and West Virginia. Thus, new information on the migratory status of Red-winged Blackbirds nesting south of Maryland and West Virginia might lower the figures I have given for percentages of the winter populations coming to the Carolinas from the different regions; however, the relative percentages coming from the different regions should remain unchanged.

DISCUSSION

To indicate percentages of winter populations of blackbirds coming from different parts of their nesting ranges, Meanley (1971, p. 15) used percentages of banded birds coming to several south-central states without making adjustments for different numbers banded in different parts of the nesting ranges. Obviously the number of recoveries can be expected to increase with increasing numbers of banded birds available for recovery. Thus, 18 of the 68 (26.5 percent) recoveries taken in South Carolina were of birds banded in Ohio; whereas, after adjustment was made for the number banded in Ohio, 7.4 percent of the winter population in South Carolina was found to come from Ohio. Of the 271,595 Red-winged Blackbirds banded on their nesting grounds, 94,771 (34.9 percent) were banded in Ohio.

In this paper I have used recovery rates of banded Red-winged Blackbirds as an indication of proportions of populations of these birds on different parts of their nesting range going to North and South Carolina and as an indication of the proportions of winter populations in North and South Carolina coming from different parts of their nesting grounds. This use involves the requirement that the birds be similarly exposed to the probability of recovery in different parts of their range at different seasons of the year. Thus, such use clearly could not appropriately be made of banding recoveries of some species, notably ducks, which are recovered chiefly during the hunting season. While the requirement that the birds be similarly exposed to the probability of recovery in different parts of their range at different seasons of the year may not have been fully met in the banding data for Red-winged Blackbirds, the requirement seems to exist here more as a basis for difference of opinion than to support a decision against such use of the data.

Although numbers of birds banded on different parts of their nesting grounds must be taken into account when numbers of recoveries are used to determine percentages of a winter population coming from different parts of their nesting grounds, recoveries from different parts of the nesting grounds of birds banded on their wintering grounds can be used without adjustment for the number banded. It can simply be assumed that the sample of winter-banded recoveries shows the nesting distribution of the winter population. Thus, in use of banding recoveries to determine proportions of a winter population of birds coming from different parts of their nesting range, either adjustments should be made for different numbers banded in different parts of the nesting range or recoveries of birds banded on their wintering grounds should be used.

Meanley (1971, p. 12) estimated the average recovery rate of blackbirds to be about 1.5 percent, presumably including birds trapped and released at the original

banding stations two or more migration seasons after banding. Because such contacts at the original banding stations introduce a bias to which only part of the sample is exposed, I have sought a base for an expected recovery rate not exposed to this bias. The recovery rate which I used, based on birds banded in South Carolina, involved no birds trapped after banding at the original banding station.

SUMMARY

To determine the breeding localities of Red-winged Blackbirds wintering in North and South Carolina, an analysis was made of the recoveries of 174 banded birds, resulting from banding of 271,595 birds. It was determined that 26.7 percent of the Red-winged Blackbirds nesting in the northern part of the eastern United States spend the winter in North and South Carolina. Red-winged Blackbirds wintering in North and South Carolina come largely from the area north and northeast of Maryland. Of Red-winged Blackbirds coming to the Carolinas from the area west of Pennsylvania and Quebec, substantially more come to South Carolina than to North Carolina. More than three-fourths of the Red-winged Blackbirds on nesting grounds north of Pennsylvania spend the winter in the Carolinas.

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