ORIGIN, STRUCTURE, MOLT, AND DISPERSAL OF A LATE SUMMER RED-WINGED BLACKBIRD POPULATION

By Brooke Meanley

At the end of the nesting season red-winged blackbirds (*Agelaius phoeniceus*) in the Atlantic coast region congregate in large numbers in marshes. During the molting period, they roost in the marsh, and feed there on seeds of aquatic plants; they also make feeding raids on nearby grain fields. Often they are joined by common grackles (*Quiscalus guiscula*), brown-headed cowbirds (*Molothrus ater*), starlings (*Sturnus vulgaris*), and bobolinks (*Dolochonyx oryzivorous*). In many areas where they congregate at this season of the year, red-winged blackbird roosting populations are composed mostly of birds that have bred locally, and their offspring.

The origin, structure, and dispersal of a typical late summer red-winged blackbird population, and the relationship of molt to migration were studied during parts of 5 summers (1958 through 1962) at the Patuxent River marsh, Maryland.

THE STUDY AREA

The Patuxent River is a tributary of the Chesapeake Bay, lying between that great body of water and the Potomac River in southern Maryland. Its marshes are located along the major meander section of the river in Anne Arundel, Calvert, and Prince Georges Counties.

Field studies were conducted at two stations. Both stations were located in a Fresh Tidal Marsh community in Anne Arundel County, one near Hill's Bridge, and the other 4 miles downstream at Lyon's Creek.

The Fresh Tidal River Marsh community along the Patuxent is characterized by the richest mixture of marsh flora of any of the major marsh communities in the Chesapeake Bay region. A brief description of the plant community was given by Meanley (1961: 36-37). Wildrice (*Zizania aquatica*) is the dominant plant. The wildrice beds extend in a nearly unbroken tract for 5 miles along the fresh tidal zone. The mean tidal range along this section of the river is 2½ feet.

METHODS

Six thousand red-winged blackbirds were banded in the course of the study. Most of these were caught in mist nets placed along the borders of tidal guts (Fig. 1). Nets with a 1½″ mesh (=NEBBA Type A) were used, as the redwings were easier to remove than they would be using a net with a larger mesh (=NEBBA Type C). The larger mesh probably holds redwings better, but it takes much longer to extract the birds as they become much more entangled in the larger mesh. Approximately 1,500 redwings were caught in a decoy enclosure trap located nearby on the river bluff. The period of netting and trapping extended from about July 20 to October 1 each year.

Figure 1. Red-winged Blackbird Mist Netting Station, Patuxent River Marsh, Maryland.

Special netting was done throughout August in order to obtain a representative sample of the population for determining sex and age ratios; nets were placed so as to intercept birds along roost flightlines between 6:15 p.m. and 7:15 p.m., E.S.T. Because red-winged blackbirds segregate by age and sex to some extent during the day, it seemed possible they might also do so when roosting at night. Therefore, the method of intercepting the birds along roost flightlines seemed to be the best method for obtaining a representative sample.

The month of August was selected for sampling the population since at that time red-winged blackbirds are molting and migration therefore is unlikely. Banding studies of red-winged blackbirds in this area during late summer and early fall support this view.

Sex and age ratios were obtained from a sample of 1,409 birds in 1961, and 1,215 birds in 1962.

Methods used for sexing and aging specimens were similar to those suggested by Nero (1961: in *Bird Banding Manual*).

Origin of the Population

Our evidence indicates that the late summer population of blackbirds in the Patuxent marsh is mostly of local origin. Many red-winged blackbirds breed in the Patuxent marsh and elsewhere in the Patuxent Valley. The nesting season at this latitude for some red-winged blackbirds lasts until the middle of August. Many adult males have been observed on territory during the first week in August. The latest active nest containing eggs was found on August

14; and one with 5-day old young was found on August 18. A few females have been observed feeding bob-tailed fledged young during the last week in August. Thus, a segment of the breeding population is completing its nesting cycle at the time of the onset of molt, which for red-winged blackbirds begins in late July.

Five red-winged blackbirds banded as nestlings at the Patuxent Wildlife Research Center by Don P. Fankhauser and associates were recovered within 1½ to 3 months 20 to 25 miles south of the Center at the Hill's Bridge and Lyon's Creek netting stations (Table 1); and one nestling banded at Hill's Bridge, July 14, 1961, was recovered 1 mile south of the point of banding, August 16, 1961.

TABLE 1. NESTLINGS BANDED AT PATUXENT WILDLIFE RESEARCH CENTER AND RECOVERED 20 MILES SOUTH AT PATUXENT MARSH IN LATE SUMMER

Date Banded	Date Recovered	Interval from Banding to Recapture
May 31, 1961	August 1, 1961	62 days
June 1, 1961	July 26, 1961	56 days
June 1, 1961	September 5, 1961	96 days
June 5, 1961	August 22, 1961	78 days
July 21, 1961	September 5, 1961	46 days

There are no late summer recoveries at the Patuxent marsh of red-winged blackbirds banded on the nesting ground at distances of more than 25 miles. Nero (1956:7) reported that two adult males banded during the nesting season in a Wisconsin marsh were recovered in October 3 miles from the same marsh.

But, since it is the habit of most red-wings to return to the same breeding ground year after year, two spring recoveries in western Pennsylvania of birds banded at the Patuxent marsh the preceding August are indicative that not all the birds in the Patuxent marsh in late summer are of local origin.

Because of the nomadic nature of nonbreeding subadult male red-winged blackbirds, they could be expected to wander considerable distances prior to molt. Juveniles that fledge early also may wander. Packard (1936:33) banded two red-winged blackbirds at Cape Cod, Massachusetts, in April that were recovered in July and August the same year at Salem, New Jersey, on August 23. The absence of adequate food and cover is suggested by Packard as reasons for an early exodus from the Cape Cod area. Food and cover requirements are amply met in the wildrice marshes at Salem, New Jersey.

Annual Returns and Repeats

There are 21 examples of red-winged blackbirds returning to the Patuxent marsh after a 2-year interval. Eleven were taken within 2 weeks of the date banded the previous year, and three were taken on the same date 1 year later.

Of the many red-winged blackbirds banded and retaken during the depredations period in 1961, at least four remained in the same

feeding area for more than 1 month. One was banded August 8 and retaken September 26; another was banded on August 19 and recaptured October 9.

Structure

Sex Ratio — Williams (1940:274-276) reported the sex ratio (47.9 percent males and 52.1 percent females) in a sample of 119 nestling red-winged blackbirds. He further reported that 47 males and 47 females of this sample successfully fledged. It would therefore seem reasonable to assume that no significant change in the sex ratio occurs during the post-nestling period or at any other time of the year unless there is a differential mortality in the sexes, a possibility mentioned by Selander (1960:43). The combined adult-immature sex ratio of the Patuxent marsh population in August 1961 was 52.4 percent males to 47.6 percent females, in a sample of 1,409 red-winged blackbirds. In August 1962, the ratio was 57.8 percent males to 42.2 percent females in a sample of 1,215 birds (see also Table 2). The combined samples represent a departure from an expected 50:50 ratio that is significant at the 5 percent level (chi-square test). The difference in proportions of the sexes in the Patuxent marsh population may be related to the sampling method.

TABLE 2. SEX AND AGE RATIO OF RED-WINGED BLACKBIRDS AT PATUXENT RIVER MARSH, MARYLAND -- AUGUST 1961 AND 1962

Year	Size of Sample	Percentage Sex Ratio			Percentage Age Ratio		
		M:F	IM:IF	AM:AF	A:I	AM:IM	AF:IF
1961	1,409	52.4:47.6	46.6:53.4	59.6:40.4	44.4:55.6	50.6:49.4	37.6:62.4
1962	1,215	57.8:42.2	54.2:45.8	64.4:35.6	34.7:65.3	38.7:61.3	29.2:70.8

Age Ratio — The age ratio of the 1961 sample was 44.4 percent adults* to 55.6 percent immatures; in the 1962 sample the ratio was 34.7 percent adults to 65.3 percent immatures (Table 2). We do not know the reason for the variation in age ratios from one year to the next.

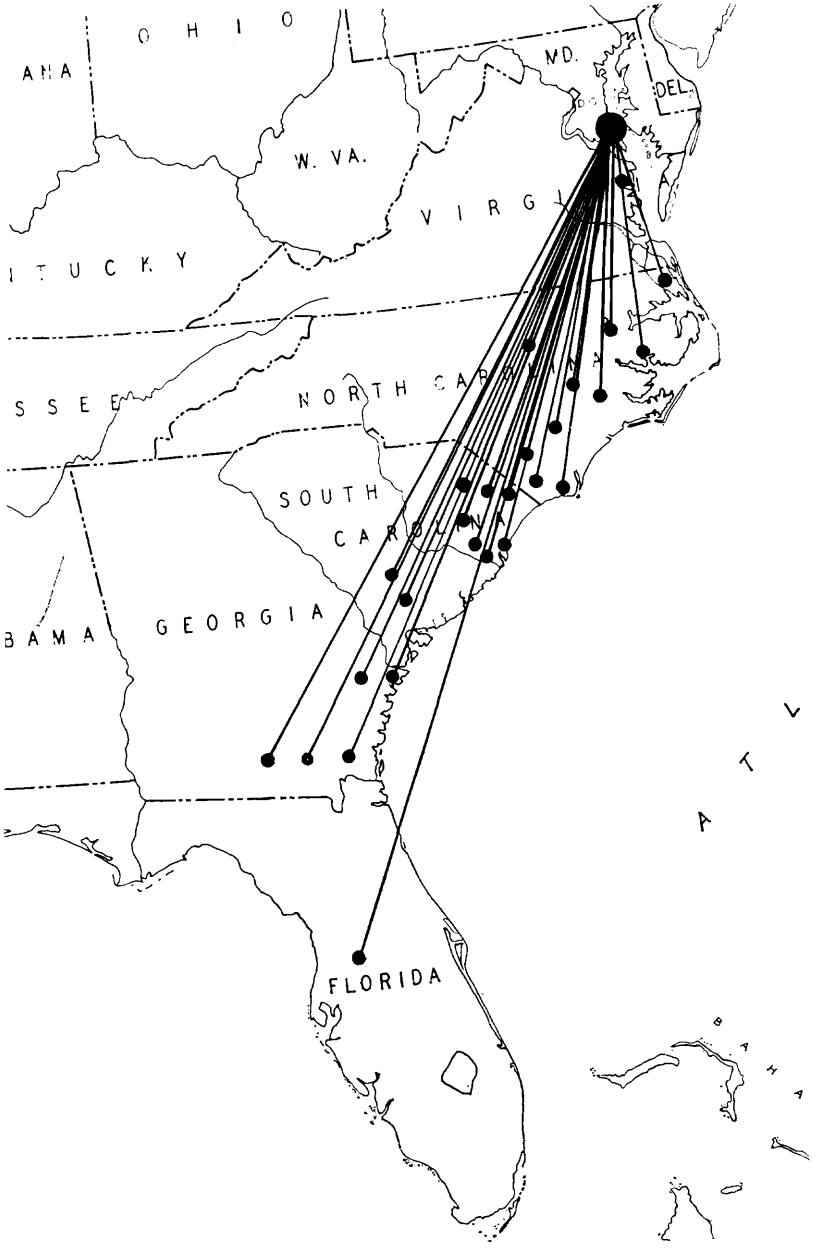
Since the population is a combined product of the breeding grounds of tidal marsh, upland field, and inland impoundments, and since these habitats vary in productivity, the sample drawn from the Patuxent marsh population may well be representative of the region, and so provide a measure of productivity.

The Relationship of Molt to Migration

The relationship of molt to migration of Patuxent red-winged blackbirds appears to agree with the findings of Dwight (1900: 126-128) and Tordoff and Mengel (1956:29-30) which indicate that most passerine birds molt prior to fall migration.

*Adults and subadults were grouped as one age class.

Figure 2. Winter recoveries of red-winged blackbirds banded in late summer at Patuxent River marsh, Anne Arundel County, Maryland.



The difference in the progress of molt of adults and young seems to be so slight that it probably has no influence on differential migration. Examination of a sample of molting birds from the Patuxent marsh on August 6 indicated that adults begin to molt only slightly ahead of young. Three adult males in a sample of five had one or more completely feathered new primaries (one had one, one had two, and one had five). No juvenile male in a series of 10 had a completely feathered new primary. Three juvenile males had half-feathered first and second primaries. The stages of primary feather molt were similar in females. A comparison of the development of molt in adults and juveniles was made at Eudora, Chicot County, Arkansas, September 13, 1961. Five of 13 adults had completely renewed primary feathers. All birds of the adult sample had five or more new primaries. Four of 13 juveniles had renewed primaries. Only two juveniles had fewer than five new primaries.

Dispersal

As the redwings approach the completion of molt in the latter half of September, they begin to move toward the wintering grounds. The main wintering ground of the Patuxent population is the South Atlantic Coastal Plain region from the Dismal Swamp in southeastern Virginia about to the Okefenokee Swamp in southeastern Georgia. Of 26 recoveries, 1 was from Virginia, 10 from North Carolina, 9 from South Carolina, 5 from Georgia, and 1 from Florida (Fig. 2). An additional recovery from near Tappahannock, Virginia, dated November 3, suggests the possible route of travel from the lower Patuxent River Valley to the Dismal Swamp area of Virginia and North Carolina. Similarly, 13 wintering-ground recoveries of birds banded by R. T. Mitchell, J. T. Linehan, and associates in a tidal marsh at Red Lion Creek, Delaware, in the late summer of 1957 and 1958, were all from the Coastal Plain of the South Atlantic States. It is probable, therefore, that red-winged blackbirds that feed and roost in the same marsh in late summer disperse over a wide area on the wintering grounds.

SUMMARY

A study of the origin, structure, dispersal, and molt of a late summer red-winged blackbird population was conducted from 1958 through 1962, at the Patuxent River marsh, Anne Arundel County, Maryland. Most of the 6,000 red-winged blackbirds banded during the study were caught in mist nets during the evening flight to their roost. Banding studies indicate that the late summer Patuxent marsh population is mostly of local origin; and that some individuals return to the marsh for several summers. Probably most individuals remain in the marsh for at least 1 month. The combined adult-immature sex ratio in August 1961 was 52.4 percent males to 47.6 percent females in a sample of 1,409 birds; and, in August 1962, the ratio was 57.8 percent males to 42.2 percent females in a sample of 1,215 birds. The age ratio of the 1961 sample was 44.4 percent adults to 55.6 percent immatures; in the 1962 sample, the ratio was

34.7 percent adults to 65.3 percent immatures. The period of molt is mainly from late July to late September; the height of molt coincides with the population peak in the marsh. The difference in the progress of molt of adults and young seems to be too slight to influence differential migration. The main wintering-ground of Patuxent marsh red-winged blackbirds is the South Atlantic Coastal Plain region from southeastern Virginia to southeastern Georgia.

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GENERAL NOTES

Chimney Swift Returns at Kent, Ohio, 1962 and 1963, with Notes on Nesting Success.—This report summarizes briefly return records in a colony of Chimney Swifts (*Chaetura pelagica*) on the campus of Kent State University for the 19th and 20th years of continuous observations. (I)-1962. While the first migrant swift was noted on 22 April 1962, the first resident swift did not return until 28 April. During that year, 40 returns were captured. They were banded in the following year-groups: 1954-1; 1955-2; 1956-1; 1957-5, 1958-6; 1959-9; 1960-6; 1961-10. As far as sex has been determined to date, there were 9 males and 10 females. Of the 40 returns, 18 nested in the same chimney in which they had nested the previous year, and 5 pairs of these birds were the identical mates as in the previous year. One of the former pairs was joined by an all-season visitor to form a threesome in shaft VI. One of the breeding birds in this group had nested in this same shaft the previous two years, and the other mate had roosted there briefly in 1961. Altogether there were 16 nesting groups on the campus. Eighteen of the birds were first recaptured in air shafts in which they had formerly nested while 5 others were recaptured in air shafts in which they had formerly roosted.