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# Seasonal movements of Red-winged Blackbirds banded in Brown County, South Dakota, 1961-1974

Jerome F. Besser, John W. De Grazio, and Joseph L. Guarino



From 1961 to 1974, biologists of the U.S. Fish and Wildlife Service studied means of developing methods to control blackbird damage to ripening field corn in Brown County, South Dakota. From late summer counts of blackbirds at roosting marshes on the Sand Lake National Wildlife Refuge in Brown County, annual populations were estimated at from 0.7 to 1.8 million birds between 1961 and 1969 (Besser et al. 1973). In the course of damage reduction studies, 23,561 Red-winged Blackbirds (*Agelaius phoeniceus*), the chief blackbird species damaging corn there, were banded. Here, we report the information obtained on the breeding and wintering areas and migration routes of these populations.

## Methods

The 23,561 Red-winged Blackbirds were banded in Brown County from April to October; 19,039 (80%) were banded in late summer (August-September) during the corn damage season (Table 1). Birds were captured with large decoy traps (Seubert 1963), cannon nets (Seubert 1963), the immobilizing chemical DRC-736 on chopped corn baits (Schafer et al 1967), mist nets in the roost and feeding areas, and territorial male traps (Bray et al. 1975), in decreasing order of numbers taken (Table 2). Colored plastic streamers were attached to leg bands of 17,794 (73.6%) of the birds by the method described by Guarino (1968). During June and July, an additional 2216 nestlings and fledglings were banded.

## Results and Discussion

Of the 23,561 birds banded, 119 (0.51%) were recovered (Table 3). The recovery rate was significantly higher ( $P = < 0.05$ ) for males than for females or young (0.58, 0.28, and 0.23%, respectively). Unlike other studies with tagged Red-wings (Guarino 1968, Royall et al. 1980), the recovery rate of streamer-tagged birds was not higher than that of untagged birds (0.49 to 0.55%; Table 4). Tagged birds captured with an immobilizing bait were recovered at about the same rate as trapped and netted birds (0.51 and 0.49%; Table 4.)

**Table 1. Red-winged Blackbirds Banded in Brown County, South Dakota, 1961-1974.**

Month banded	Number banded	% of total
April	416	1.8
May	390	1.7
June	2,194	9.3
July	591	2.5
August	7,426	31.5
September	11,613	49.3
October	931	3.9
Total	23,561	100.0

**Table 2. Method of capture of Red-winged Blackbirds banded in Brown County, South Dakota, 1961-1974.**

Method	Number	%
Decoy traps	11,869	50.3
Cannon nets	5,147	21.9
Immobilizing chemicals	2,740	11.6
Hand capture	2,216	9.4
Mist nets - roosts	954	4.1
Mist nets - fields	370	1.6
Territorial male traps	265	1.1
Totals	23,561	100.0

**Table 3. Recovery rate by age and sex of Red-winged Blackbirds banded in Brown County, South Dakota, 1961-1974.**

Age and sex	Number Banded	Number Recovered	Recovery Per Cent
<b>Male</b>			
Adult	10,898	62	0.57
Immature	7,070	43	0.61
Subtotal	17,968	105	0.58
<b>Female</b>			
Adult	1,575	6	0.38
Immature	1,343	2	0.15
Subtotal	2,918	8	0.28 <sup>1</sup>
Nestlings and fledglings	2,216	5	0.23 <sup>2</sup>
Unrecorded sex	449	1	0.22
Total	23,561	119	0.51

<sup>1</sup>Recovery rate significantly less ( $X^2 = 4.48$ ,  $P = > 0.05$ ) than male recovery rate.

<sup>2</sup>Recovery rate significantly less ( $X^2 = 4.68$ ,  $P = > 0.05$ ) than male recovery rate.

Breeding, wintering, and migratory periods were well represented by recoveries. Of the 115 Red-wing recoveries with the month noted, 35 (30.4%) were during May-July in breeding areas; 24 (20.5%) in August-November, the late summer-early fall southward migratory period; 23 (20.0%) during December-February in wintering areas; and 33 (28.2%) in March-April, the late winter-early spring northward migratory period.

Of the 119 recoveries, 100 (84.0%) were of Red-wings banded in August and September; 93 were males, 6 were females, and 1 was of unrecorded sex. These 93 male recoveries, representing 78.2% of all recoveries, were a sufficient number to enable us to approximate the breeding and wintering areas of males banded in late summer. Seven of the 93 recoveries, however, lacked information on the month of recovery (hunting season recoveries). The 87 recoveries of late summer banded males (including 1 banded on 2 October) with the month of recovery given were mapped (Fig. 1).

**Breeding Range of Late Summer Banded Males.** The 22 breeding season (May-July) recoveries of late summer banded male Red-wings were made in a 497-km strip from Mansfield, South Dakota (63 km south of the

banding site) to Gainesborough, Saskatchewan (436 km northwest of the banding site, Table 5, Fig 2). The median location of the 22 recoveries was near Gackle, Logan County, North Dakota, 116 km northwest (323°) of the banding site. Twenty-one (95.4%) of these 22 were made in the Drift Plains (12) and Missouri Coteau (9) physiographic regions, areas that have poorly developed or no drainage systems (Fenneman 1938). These two physiographic regions contained 70.5% of the Red-wings found breeding in North Dakota in a 1967 statewide census (Stewart and Kantrud 1972). This appears to be the area of origin for most Red-wing males found in late summer in Brown County, South Dakota, crop fields.

**Wintering Range of Late Summer Banded Males.** The 18 winter (December-February) recoveries of late summer banded male Red-wings were made in a 1617-km north-south strip from Lake Preston, Kingsbury County, South Dakota, to Beaumont, Texas (161 to 1778 km south of the banding site, Table 5). The median location of the 18 recoveries was near Ben Wheeler, Van Zandt County, Texas, 1533 km south of the banding site. Eleven (61.1%) of the 18 December-February recoveries were made in the West Gulf Coastal Plain of eastern Texas. This area, particularly the headwaters of the Neches River, appears to be the primary wintering area for Red-wing males banded in late summer in Brown County, South Dakota.

**Migration Routes of Late Summer Banded Males.** Information on the migratory routes of late summer banded male Red-wings was obtained from 44 migratory period recoveries. The March-April northward migratory period was represented by 28 recoveries and the August-November southward migratory period by 16 recoveries (Fig. 1). Spring recoveries included one male from Brooks, Alberta, 714 km west northwest of the northernmost breeding season recovery (Gainesborough, Saskatchewan) depicted in Figure 1. This recovery increases the total range of the late summer banded males in Brown County to 2759 km. Inasmuch as the recovery was made on 10 April, this male may not yet have reached its breeding area.

Both the principal southward and northward migratory routes lie in the Central Lowlands physiographic province just west of the Great Plains province, as depicted by Fenneman (1938). The routes appear to closely follow a corridor from the Alberta and Saskatchewan Plains, through the recently glaciated plains of the Dakotas to the junction of the Missouri and Big Sioux Rivers. They then follow the Missouri River into northeastern Missouri and northwestern Kansas and then across the Osage (Prairie) Plains of eastern Kansas and Oklahoma into eastern Texas. All but 1 of the 44 spring and fall recoveries are included in a 120-126 km corridor through this area (Figs. 1 and 2).

**Table 4. Effects of leg tags and immobilizing chemicals on band recovery rates of Red-winged Blackbirds banded in Brown County, South Dakota, 1961-1974.**

Banding status	Number Banded	Number Recovered	Recovery Per Cent
Not tagged	5,587	31	0.55 <sup>1</sup>
Tagged	17,974	88	0.49 <sup>1</sup>
Total	23,561	119	0.15
Tagged, not taken with an immobilizing chemical	15,234	74	0.49 <sup>2</sup>
Tagged, taken with an immobilizing chemical	2,740	14	0.51 <sup>2</sup>
Total	17,974	88	0.49

<sup>1</sup>P = > 0.5 (X<sup>2</sup> = 0.36).

<sup>2</sup>P = > 0.5 (X<sup>2</sup> = 0.07).

**Table 5. Recovery location by months of 86 male Red-winged Blackbirds banded in late summer in Brown County, South Dakota, 1961-1969.**

Recovery month(s)	No.	Distance (Km) and direction of recovery from banding site	
		Median	Range
May-June	17	164 north	61 south - 436 northwest
July	5	116 north	0 - 148 northwest
Aug-Sep	5	29 north	0-824 northwest
Oct	6	0	16 north - 1,561 southeast
Nov	7	525 south	0 - 1,479 south
Dec-Jan-Feb	18	1,492 south	161-1,778 south
March	12	658 south	1,561 south - 84 eastnortheast
April	16	0	1,147 southsoutheast - 1,142 northwest

Spring migration in March-April appeared to be much more rapid than the late summer-early fall migration. The latter suggests more of a drift than a speedy migration. Several sightings of color-marked males in late July indicated some southward movement of Red-wing males — presumably to molt — in perennially used large marshes such as those along the James River in Brown County. From late July through October, the median male drifted slowly southward into Brown County (Table 5). However, some males apparently began to move greater distances in late August and early September, and these males may have largely passed through Brown County by mid-September. Thirteen males banded between 29 August and 13 September were recovered a median distance of 195 km northwestward from May to July in subsequent years, whereas the breeding areas of 5 males banded from 5 to 24 August had median distances of 47 km from the banding site. The sedentary nature of specific Red-wing

populations in early and mid-August is confirmed by unpublished data in the files of this Center obtained from studies with radio-instrumented males during August 1977 and 1978 in Steele County, North Dakota, 175 km NNE of Brown County. Of 30 adult male Red-wings instrumented between 6 and 25 August, the greatest distance any had moved by 27 August was 19 km southward and 23 km northward.

The more rapid movement of specific populations of Red-wings through Brown County late in August and early in September is supported by the only "foreign" recovery we made during 10 seasons of banding. An adult male Red-wing banded by Ann Gammell at Kenmare, Ward County, North Dakota, on 1 September 1967 was trapped in Brown County 9 day later, a movement of 396 km or an average of 44 km per day. Surprisingly, 6 males banded between 15 September and 2 October bred in areas with a median distance of only 105 km

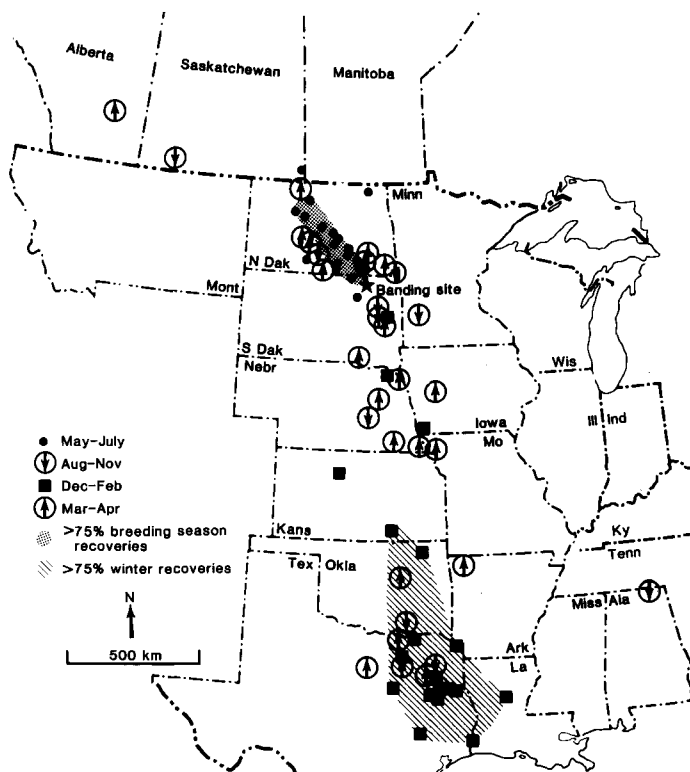


Figure 1. Recovery locations of 87 male Red-winged Blackbirds banded in late summer (August-September) in Brown County, South Dakota, 1961-1974.

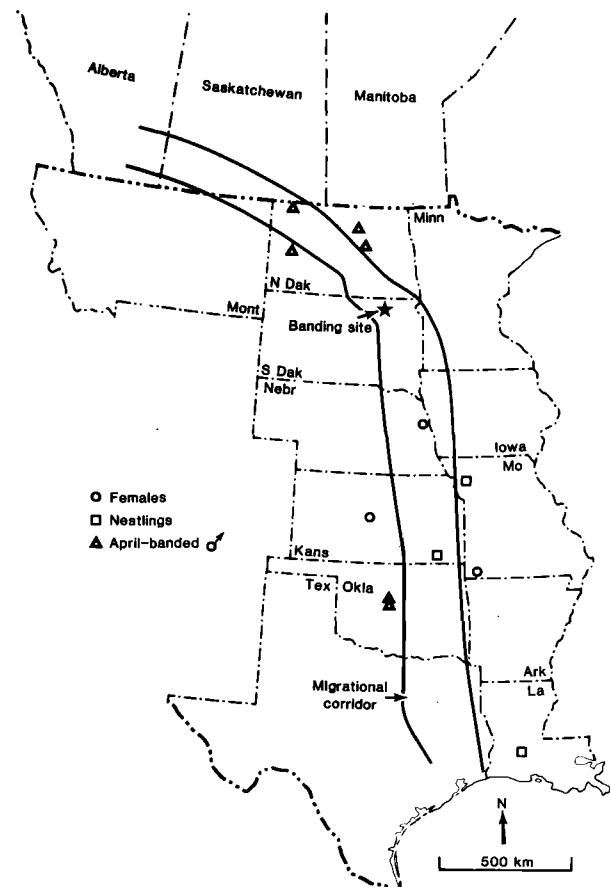


Figure 2. Recovery locations of 4 females, 3 nestlings, and 6 April-banded male Red-winged Blackbirds with respect to the migrational corridor of >90% of late summer-banded males.

from the banding site, indicating that some breeding males in northern South Dakota move only short distances until October or later.

**Recoveries of Females, Nestlings, and April-banded Male Red-wings.** Twenty-three Red-wings other than late summer banded males were recovered. These recoveries consisted of 8 females, 5 banded as nestlings, 1 of unrecorded sex, and 9 males banded in April. Each of these populations appeared to have a dispersal pattern somewhat different from the males banded in late summer; many birds were recovered outside the migratory corridor of >90% of the late summer banded males (Fig. 2).

Of the 8 females, only 4 were recovered outside Brown County. One was recovered in Nebraska in November, one in Missouri in January, and one in Kansas in April (Fig. 2). A fourth female was reported from Surrey, British Columbia, in June, but we were unable to contact the person making the recovery, so this recovery is of questionable validity, but we believe still remarkable enough to be noted.

Of the 5 nestling recoveries, 3 were made outside Brown County: one in Missouri in February, one in Kansas in April, and one in southern Louisiana in January (Fig. 2). The one recovery of a bird of unrecorded sex was made in southern South Dakota in February.

Of the 9 recoveries of males banded in April, 6 were recovered outside Brown County: 4 in North Dakota in May, July, and August (2), and 2 near Yukon, Canadian County, in central Oklahoma in late February and early March (Fig. 2). Both of the Oklahoma birds were taken in damage control operations at livestock feedlots and may have been migrating northward at the time they were recovered. Both are slightly west of the migratory corridor used by most late summer banded males.

## Summary

We and our co-workers banded 23,561 Red-winged Blackbirds in Brown County in northeastern South Dakota from 1961 to 1974. Of the resulting 119 recoveries, 100 (84.0%) were of birds banded in late summer during the period Red-wings damage ripening corn; 93 of these were males. Late summer banded males appeared to breed largely in the Drift Plains and Missouri Coteau physiographic regions of North Dakota; the median distance of 22 males recovered during following nesting seasons was 116 km northwest of the banding site. Most of these birds wintered in the West Gulf Coastal region of eastern Texas. The chief southward and northward migratory routes of late summer banded males appeared to follow the Alberta and Saskatchewan Plains, the recently glaciated plains of the Dakotas,

the Missouri River, and the Prairie Plains of eastern Kansas and Oklahoma. The routes of late summer banded males lie in a corridor only 120-260 km wide, stretching over a distance of 2759 km from Brooks, Alberta, to Beaumont, Texas. Females, nestlings, and April-banded males, although represented by few recoveries, appeared to have ranges somewhat outside the migratory corridor of late summer banded males.

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