

# THE FOOD HABITS OF THE RED-WINGED BLACKBIRD, *AGELAIUS PHOENICEUS*, IN MANITOBA\*

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THE RED-WINGED BLACKBIRD, *Agelaius phoeniceus* (L.), has been shown to feed on a variety of vegetable and animal material. Beal (1900), examined the stomachs (gizzards) of 1083 Redwings collected throughout the United States at various times of the year and found vegetable matter to be 73.4 per cent of the yearly average with a large proportion being weed seeds. In farmed areas the food of autumn concentrations of Red-wings has been found to be mostly grain; rice in Arkansas (Neff and Meanley, 1957); corn in Ohio (Giltz and Stockdale, 1960) and South Dakota (DeGrazio, 1961); and sunflowers, wheat, oats, and barley in Saskatchewan (Hurd, 1962).

Allen (1914) studied the ecology of Red-winged Blackbirds in a cat-tail marsh in New York and examined the stomachs of about 100 birds. He found the food to be nearly 100 per cent vegetable in the spring and autumn, and 100 per cent insects in the mating and nesting periods.

This paper reports on food consumed by the Red-winged Blackbird and the habitat occupied by the species during its period of residence in agricultural and marsh areas, in south-central Manitoba, in 1960.

## MATERIALS AND METHODS

Southern Manitoba, now intensively cultivated, is situated in the aspen parkland region of Western Canada (Bird, 1961). Red-winged Blackbirds nest in emergent vegetation around bodies of water in the farming area and in large marshes at a distance from cultivated land. Their use of nesting habitat in two different types of areas gave an opportunity to compare their food habits under disturbed conditions and under relatively natural conditions. Two representative agricultural areas and a marsh were selected for study.

### *Area I. Sunflower and cereal crop area near Altona, Manitoba*

Cereal crops, sunflowers, sugar beets, field peas, corn and alfalfa were grown in this area, which is situated 80 miles southwest of Winnipeg near the North Dakota boundary. A small breeding population of Red-winged Blackbirds occurred along Buffalo Creek. They nested in cattails, *Typha latifolia* L., and bullrushes, *Scirpus* spp. In August and September thousands of migrants formed night roosts in the rushes and ranged into the adjacent fields to feed.

### *Area II. Cereal crop area northeast of Portage la Prairie, Manitoba*

In this district, known locally as Flee Island, barley, wheat, and oats were the main crops. No sunflowers or corn were grown and there was only a small

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acreage of sugar beets and field peas. There was a small breeding population of Red-winged Blackbirds in ponds and roadside ditches. Large flocks of migrant Red-winged and Yellow-headed Blackbirds, *Xanthocephalus xanthocephalus* (Bonaparte), visited the fields to feed from roosts in the adjacent marshes at the south end of Lake Manitoba from July 20 to October 15.

*Area III. Marsh area along the shore of Lake Manitoba near St. Ambroise, Manitoba*

Large numbers of Red-winged and Yellow-headed Blackbirds nested in dense stands of reed grass, *Phragmites communis* Trin. var. *berlandieri* (Fourn.) Fern., rushes and cattails. They fed in adjacent hay meadows and left the area by August 20, as soon as the young were able to fly. No grain fields were found within 10 miles.

The three study areas were visited every second week from May through October in 1960. While the birds were nesting, typical study sites within these areas were used for observations and collections. Later, flocks feeding in fields and pastures, and returning to roosts within the areas were studied. The birds were observed with a pair of 8 x 30 binoculars and a 15x telescope, and collections were made for gizzard analysis of at least four adults of each sex, and of nestlings when present, from each study site, or from flocks. In 1960, 434 Red-winged Blackbirds were collected.

Gizzard and gullets were removed, shortly after the blackbirds were shot, and preserved in 70% alcohol. The contents were examined in a petri dish under a binocular microscope. A combined method of volumetric and numerical analysis as recommended by McAtee (1912) and Hartley (1948) was used. The volume of food, in alcohol, was measured in cubic centimeters and the percentage of each item estimated by measurement over a quarter inch grid. Individual seeds and insects were identified and counted when possible.

## RESULTS

### *Observations on the Ecology of the Red-winged Blackbird*

Adult male Red-winged Blackbirds commenced to return in early April but it was not until May 1 that they were abundant and had started to defend territories. Females and immature males arrived about two weeks later than the males. Nesting commenced shortly thereafter and the first eggs were found on June 7. Nests were built in cattails, reed grass, sedges and willows growing in shallow water. Some nests were found in patches of snowberry, *Symphoricarpos occidentalis* Hack., in pastures adjacent to creeks or ponds without suitable nesting sites but there was no nesting in fields of grain or alfalfa as reported by Giltz and Stockdale (1960) for Ohio and Neff and Meanley (1957) for Arkansas. Roadside ditches with water and sufficient vegetation to support nests were utilized. A breeding population of 509 males and females was counted in roadside ditches on a single trip on May 24 along thirty miles of highway between Winnipeg and Poplar Point. Our observations indicated that Red-winged Blackbirds nested readily close to cultivated fields where grain gleanings and weed seeds were abundant since few breeding birds were found in a community pasture between Areas II and III that appeared to



contain suitable nesting habitat. However, larger marshes such as Area III were used, but the birds left that area when the young were able to fly, presumably to join flocks feeding in fields. The first fledgling was seen at the end of June and the last in the first week of August. There was no indication that there was more than one brood of young per breeding pair per season.

Flocks began to form as soon as the young were strong fliers. These flocks ranged in size from four or five hundred to a thousand or more and were seen feeding in fields during August and September. Most of the birds were migrants, some leaving for the south as others moved in from the north. The population was reduced by October and by the middle of the month only stragglers were left.

The flocks were predominantly Red-winged Blackbirds but other species, Yellow-headed Blackbirds; Brewer's Blackbirds, *Euphagus cyanocephalus* (Wagler); Common Grackles; Brown-headed Cowbirds, *Molothrus ater* (Boddaert); and Starlings, *Sturnus vulgaris* L., were associated with them. Mature males usually formed in flocks separate from those composed of females and immature males.

During the flocking period the blackbirds spent the night in roosts. The roost was usually in cattails, rushes or *Phragmites* growing in shallow water and contained many thousands of birds. Suitable sites for night roosts were an essential habitat requirement. Three were located in Area I and several were known to occur in the marshes adjacent to Area II. The birds returned to the roost during the hour before sunset and left the roost during the half hour after sunrise. During the day they alternately fed in fields, drank at nearby water (often a farm pond) and rested in adjacent trees between periods of feeding. Water and trees close to food and suitable sites for night roosts were essential requirements for blackbirds after the young were on the wing.

#### *Analysis of the Food of the Red-winged Blackbird*

The total volume of food and mineral grit found in the gullet and gizzard increased with the season. The average, per bird, for May, June, July, August and September was 1.25, 1.30, 1.60, 1.75 and 2.95 cc, respectively. Only after the young were flying and flocks had begun to form was food retained in the gullet, the quantity sometimes exceeding that in the gizzard. The mineral grit was greatest when the vegetable food was greatest and was absent when the diet was solely insects.

The food of the blackbirds in the agricultural districts, Areas I and II was similar. When the birds returned in the spring the food averaged 90 per cent vegetable material. Animal food, chiefly insects, increased to 70 per cent in June and early July, when the young were being fed. Vegetable food again became dominant when flocks commenced to form and was 69 to 94 per cent of the total contents when the birds left on migration (Tables 1 and 2). Although the adults continued to eat some vegetable food in June the nestlings were fed entirely on insects.

The food of the blackbirds nesting in the large marsh, Area III, was almost exclusively animal (Table 3). Some vegetable material was found in the







TABLE 2. — Gullet and gizzard content of the Red-winged Blackbird from the cereal crop area north and east of Portage la Prairie, Man., in 1960  
(Percentages of total volume of food)

Date	May		June		July		Aug.		Sept.		Oct.	Total
	11	24	7	24	5	19	2	19	30	13	27	11
Number of Blackbirds	7	9	9	16	15	18	21	24	43	19	14	212
Total Volume of Food cc	—	9.4	14.3	22.4	30.1	26.6	40.6	34.0	81.9	49.7	63.1	425.8
												Average
Wheat	95	48	60	37	42	29	11	—	9	34	33	37
Oats	—	—	1	27	14	2	—	20	6	32	32	13
Barley	—	—	—	—	—	24	11	26	44	—	—	9
Wild oats	—	—	—	—	—	3	4	4	2	T*	T	2
Green foxtail	—	1	2	—	—	T	10	2	14	14	21	7
Wild buckwheat	—	—	T	T	—	T	T	1	T	T	T	1
Sedge	—	—	T	—	—	—	4	1	2	T	—	0.5
Polygonum and Undetermined	T	1.5	—	—	—	T	—	—	1	T	—	—
	95	51	63	64	56	58	40	54	79	80	88	68.5
Snails	—	1	T	1	T	—	T	1	T	T	T	0.5
Phalangida	—	2	—	—	3	—	1	1	2	—	—	—
Spiders	—	—	T	—	—	—	—	—	T	—	—	—
Insects	—	—	—	—	—	—	—	—	—	—	—	—
Odonata (Damselflies)	—	—	—	—	4	—	—	—	—	—	—	0.5
Orthoptera	—	—	—	T	7	19	32	5	0.5	3	—	5.5
Crickets	—	—	—	—	—	1	—	2	2.5	—	—	0.5
Lepidoptera	—	—	—	—	T	—	—	2	—	—	—	1.0
Coleoptera	1	15	8	31	5	2	2	T	T	T	T	6
Carabidae	T	17	2	—	—	—	—	—	—	—	—	2
Weevils	T	T	—	T	2	—	—	—	—	—	—	0.5
Hymenoptera	—	T	T	—	—	—	—	2	5	T	T	1.0
Diptera	—	—	2	—	T	T	11	1	T	T	T	3.0
Incidental & Undetermined	T	T	—	T	20	8	4	2	T	T	—	—
	1	36	26	32	41	30	52	16	10	3	1	20.5
	4	13	11	4	3	12	8	30	12	17	11	11

\*Less than 0.5 percent



gizzards of birds taken on May 24. This had probably been picked up when the birds were migrating. Some of the birds taken on July 19 contained the dehulled seeds of a grass.

The main items of vegetable food in Areas I and II were wheat, sunflowers, oats, green foxtail, *Setaria viridis* (L.) Beauv., and barley (Tables 1 and 2). Wheat averaged 37 per cent of the food in Area II but only 6 per cent in Area I. Observations indicated that it was taken mostly as gleanings from the fields since only mature kernels were found in the stomachs until mid-July when the current crop began to ripen. After mid-September harvesting operations had been completed in virtually all fields. But wheat was also removed from the ripening heads in the late milk and dough stages. Sunflowers were very attractive to the blackbirds and made up 23 per cent of the gizzard contents of birds collected in Area I. Flocks concentrated on them from the time the kernels formed until the seed coat became too hard for them to break. They also consumed gleanings from threshed fields. Oats were eaten in the milk and dough stage and as gleanings. The hull was always removed. Green foxtail, which was abundant in most of the fields, was consumed in large quantities. Nine hundred and eighty-four seeds were found in one bird. Barley was eaten in the milk and dough stage. No evidence was found of barley being eaten after it was ripe. Sweet corn was eaten in gardens but field corn was not eaten to any extent except as gleanings. Fields of soup peas were visited for insects but the peas were not eaten.

Animal food was mainly insects and consisted mostly of pest species; grasshoppers e.g. *Melanoplus bivittatus* (Say) and *Cammula pellucida* (Scudd.); lepidoptera e.g., the larvae of the beet webworm, *Loxostege sticticalis* (L.); coleoptera e.g., the sweetclover weevil, *Sitona cylindricollis* Fabr., and the strawberry root weevil, *Brachyrhinus ovatus* (L.). The corn leaf aphid, *Rhopalosiphum maidis* (Fitch), the pea aphid, *Macrosiphum pisi* (Harr.), and the sugar-beet root aphid, *Pemphigus betae* Doane, along with their predators, lacewing larvae and syrphid larvae, were eaten. Carabid beetles were often consumed, particularly in the spring and fall. Recently emerged damselflies and chironomids were taken in the early summer. Spiders and harvestmen (Phalangida) were eaten to a limited extent throughout the season.

The soft parts of insects were quickly digested, but the hard parts, particularly the jaws and the chitinous plate found on each side of the knee of the hind legs of grasshoppers were retained for grit. One gizzard contained 44 jaws and 77 chitinous plates.

#### SUMMARY

In southern Manitoba the food of the Red-winged Blackbird consisted of up to 90 per cent vegetable material in the spring and again in the autumn. It was composed of the seeds of cereal crops, sunflowers, and weeds. In June and July, animal food, mostly insects, was dominant and represented up to 70 per cent in agricultural areas and 100 per cent in a large marsh. Young were fed entirely on animal food. When insect food increased, mineral grit decreased, its function apparently being carried out by the hard parts of insects.



TABLE 3. — Gullet and gizzard content of the Red-winged Blackbird from the marsh area at St. Ambroise, Man., in 1960

Date	May	June		July		Aug.		Total
	24	7	24	5	19	2	17	
Number of Blackbirds	6	5	7	7	7	2	2	36
Total Volume of Food cc	7.1	6.3	8.0	9.5	14.2	4.6	2.3	52.0
								Average
Vegetable Food								
Sunflower	0.5	—	—	—	—	—	—	T
Incidental and Undetermined	4.0	—	—	—	19	T*	T	3
	5	0	0	0	19	T	T	3
Animal Food								
Snails	T	T	T	1	T	T		
Phalangida	—	—	—	7	—	—		1
Spiders	1	T	9	—	—	T	T	1
Insects								
Odonata (Damselflies)	—	—	—	7	4	—	—	2
Orthoptera	—	—	—	34	28	99	99	37
Lepidoptera	26	47	14	11	—	—	—	14
Coleoptera	22	24	14	25	16	T	T	14
Carabidae	18	20	57					14
Diptera	13	8	6	14	19	—	—	9
Incidental & Undetermined	13	T	—	1.0	14	—	—	4
	93	100	100	100	81	100	99	96
Mineral Grit								
	2	0	0	0	T	0	1	0.5

\*Less than 0.5%

Differences in the food items consumed by the birds in different areas were due to differences in local abundance of foodstuffs.

Food consumption per bird increased as the season progressed and in the autumn flocking period food was stored in the gullet.

Red-winged Blackbirds nested close to agricultural land when suitable sites were available. They also nested readily in large marshes remote from agriculture. In August and September they gathered in large flocks to feed in the fields. They required trees for resting and water for drinking close to a food supply. A suitable site for a night roost within a few miles of the feeding area was also essential.

The Red-winged Blackbird has adapted itself to changes brought about by agriculture and has benefited from an abundant food supply. It still utilizes nesting sites in remote marshes but appears to abandon them for cultivated areas as soon as the young are able to fly.

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## REFERENCES

- ALLEN, A. A. 1914. The Redwinged Blackbird: A study in the ecology of a cattail marsh. *Proceedings Linnean Society New York*, Nos. 24-25: 43-123.
- BEAL, F. B. L. 1900. Food of the bobolink, blackbirds and grackles. *United States Department of Agriculture, Division of Biological Survey, Bulletin 13*, 77 pp.
- BIRD, R. D. 1961. Ecology of the aspen parkland of Western Canada. Publication 1066, Canada Department of Agriculture.
- DEGRAZIO, JOHN W. 1961. Cooperative investigations on blackbird depredation control in the vicinity of Sand Lake Nat. Wildlife Refuge, South Dakota. Progress Report No. 1. Bureau of Sport Fisheries and Wildlife, Denver Wildlife Research Center, Denver, Colorado.
- GILTZ, M. L. and T. M. STOCKDALE. 1960. The Redwinged Blackbird Story. Special Circular 95, Ohio Agricultural Experiment Station.
- HARTLEY, P. H. T. 1948. The assessment of the food of birds. *Ibis* 90: 363-381.
- HURD, A. E. 1962. Prevention of crop damage caused by blackbirds. *The Blue Jay* 22: 110-111.
- MCATEE, W. L. 1912. Methods of estimating the contents of bird stomachs. *Auk* 29: 449-464.
- MEANLEY, BROOKE. 1961. The distribution, ecology and population dynamics of blackbirds. Report Patuxent Wildlife Research Center.
- NEFF, J. A. and B. MEANLEY. 1957. Blackbirds and the Arkansas rice crop. *Arkansas Agricultural Experimental Station (Fayetteville), Bulletin 584*.

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## ADDITIONAL RECORDS AND A CORRECTION OF THE TYPE LOCALITY FOR THE BOREAL CHORUS FROG IN NORTHWESTERN ONTARIO

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COLLECTIONS OF AMPHIBIANS from northwestern Ontario are few and the present range maps are often inadequate for even the commonest species. This is particularly true for the Boreal Chorus Frog, *Pseudacris triseriata maculata* (the choice of scientific name for this form is discussed at the end of this paper). Logier and Toner (1961, p. 38) list and map its Ontario occurrences as: "Cochrane Dist., Fort Albany (ROM). Patricia Dist., Akimiski Island (PC: F. R. Gelbach). Fort Severn (ROM). Rainy River Dist. Emo (ROM)." One additional locality listed with the above but received too late to include on their map was "Thunder Bay Dist., Connor Twp. (PC: A. E. Allin)." This should be corrected to O'Connor Township, which is 20-25 miles almost due west of Fort William (PC: A. E. Allin, August 15, 1963).

On the afternoon of May 20, 1963, the writer heard several Boreal Chorus Frogs calling from small roadside ponds 10 miles northeast on Hwy. 11 of Beardmore, Ontario. One specimen (NMC 7077) was collected at that time.





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