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Breeding Blackbird Populations in Iowa

Author File

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INTRODUCTION

Iowa had the 4th highest density of breeding Red-winged Blackbirds (*Agelaius phoeniceus*) of any state in the U.S. according to the annual roadside index of the North American Breeding Bird Survey (NABBS) conducted during the years 1966-80 (Johnson et al 1982). Indices of breeding Red-winged Blackbirds were somewhat higher (8.4%) in Iowa than in North Dakota during this 15-year period. The mean number of Red-winged Blackbirds recorded on 24.5-mi (39-km) routes for the period was 162.8 in Iowa and 150.2 in North Dakota. Because Red-winged Blackbirds prefer marshes over uplands for nesting (Robertson 1972) and Iowa has few marshes compared to North Dakota (Shaw and Fredine 1971), one might be skeptical that Iowa populations are as dense as NABBS data indicate. The usefulness and the shortcomings of data obtained in NABBS survey in Iowa have been pointed out by Dinsmore et al (1984). Censuses of randomly sampled areas, such as conducted by Stewart and Kantrud (1972) in North Dakota, should yield more accurate information on existing breeding populations in Iowa, than roadside indices. Thus, I censused random quarter sections (160 acres or 2.49 km²) in Iowa in 1983-1984. Breeding populations of two other species of blackbirds, the Common Grackle (*Quiscalus quiscula*) and the Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*), were also censused, as these species and the Red-winged Blackbird are responsible for most of the damage to ripening agricultural crops in Iowa (Besser and Brady 1982).

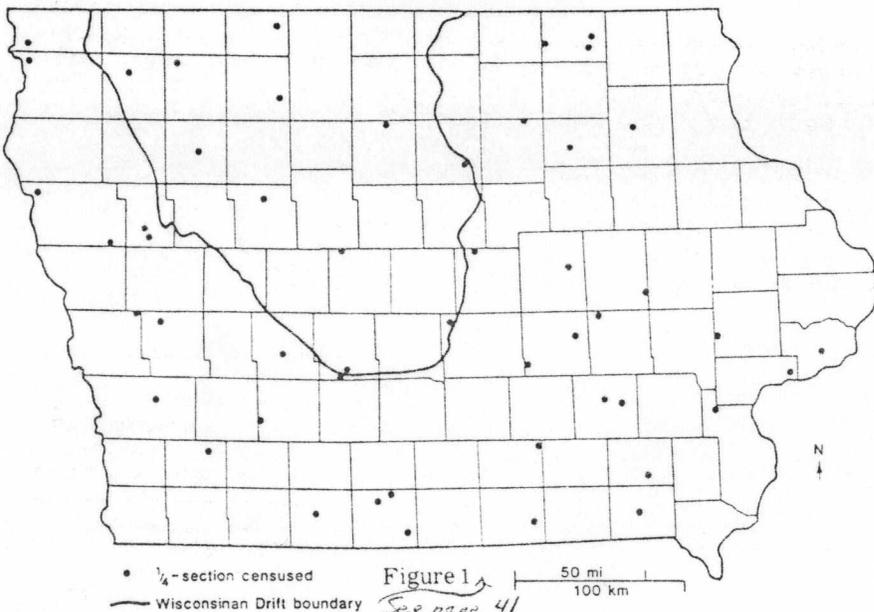
A secondary objective of the study was to determine the recruitment of young males into Red-winged Blackbird breeding populations. While censusing breeding blackbird populations in North Dakota (Besser 1985), I had been unable to find the number of immature Red-winged Blackbird males in censused areas indicated by the survival rates for this species reported by Fankhauser (1967) and Stewart (1978).

METHODS

Fifty randomly selected quarter sections were chosen for censusing in Iowa (Fig. 1). The 26 in southern Iowa (south of 41° latitude) were censused 18-26 May 1983, and the remaining 24 in northern Iowa were censused 19-25 May 1984. All breeding male Red-winged and Yellow-headed Blackbirds and pairs of Common Grackles holding breeding territories were counted in each 160-acre area censused. This census was similar to that described by Stewart and Kantrud (1972). Twin 440 x 880-yard (402 x 804m) strips were censused by walking the mid-point of the strip (220 yards from each edge of the strip). If any land area on the strip was not visible with binoculars because of rolling terrain or trees or shrubs, the transect was interrupted and this area visited to ensure a complete count. Marking the point of departure from the transect enabled the observer to return to that point. In Iowa, however, only a few of the 160-acre areas could be censused using the twin 440 x 880-yard census strips. Hills and wooded areas often necessitated running a 220 yard compass-line strip around 3 sides of the perimeter of the 160-acre area (100 acres censused) and then censusing the remaining 60 acres with additional twin 220 x 660 yard census strips. Each male seen was closely observed with binoculars to determine whether it was an immature (SY) or adult (ASY) bird. In addition, all breeding (and migrant) species and numbers sighted were recorded, but no departures from the center of the strip were made to obtain a complete census of these other species.

FIGURE 1. MAP OF IOWA SHOWING THE 50 QUARTER SECTIONS CENSUSED.





RESULTS AND DISCUSSION

Breeding Blackbird Populations

A total of 369 breeding male Red-winged Blackbirds were found on the 50 160-acre areas censused in Iowa, or 29.52 adult males (\pm SE 4.01) per mi^2 (Table 1). The statewide estimate was 1.7 million breeding males. Surprisingly, the density of breeding Red-winged Blackbirds in the recently glaciated Cary and Tazewell Drifts of the Wisconsin Ice Age (Prior 1976) were much lower than in the remainder of Iowa. Densities of only 9.5 (\pm SE 4.5) males/ mi^2 were found in the 11 quarter-sections sampled in the Wisconsin Drifts, compared to 25.2 (\pm SE 4.6) male/ mi^2 in the remainder of Iowa, or only 37% as many ($P = 0.0002$, t-test). A total of 110 breeding pairs of Common Grackles were found on the areas censused, or 8.80 (\pm SE 1.76) per mi^2 . The statewide estimate was 493,000 breeding pairs. Densities of breeding Common Grackles in the recently glaciated area and the remainder of Iowa were similar ($10.2 \pm$ SE 4.87 vs $8.4 \pm$ SE 1.83/ mi^2). Only 8 Yellow-headed Blackbird males were encountered, all on one area sampled in Calhoun County.

A mean density of 38.96 (\pm SE 7.22) breeding pairs/ mi^2 of the three species of blackbirds responsible for most crop damage was found in Iowa in 1983-84 (Table 1). The small number of breeding blackbirds found in feeding habitats (3 Red-

Table 1. Estimates of breeding blackbird numbers in Iowa, 1983-84.

Species	Density/ mi^2 (+ SE)	Estimated state total a/ (\pm) SE)
Red-winged Blackbird ^b	29.52 (\pm 4.01)	1,652,706 (\pm 224,664)
Common Grackle ^c	8.80 (\pm 1.76)	492,677 (\pm 98,710)
Yellow-headed Blackbird ^b	0.64 (\pm 0.64)	35,831 (\pm 35,831)
TOTAL	38.96 (\pm 7.22)	2,181,214 (\pm 3214,400)

a/ 55,986 mi^2 in Iowa (Prior 1976). b/ ASY males. c/ Pairs.

winged Blackbirds, 8 Common Grackles and 0 Yellow-headed Blackbirds) indicated that few breeders were missed and that the census of breeding blackbirds was nearly complete. The timing of the census period (18-26 May) appeared to be optimal, as no young of any of the 3 species were observed and most breeders were adhering closely to territories.

Blackbirds Densities in Various Habitats

In May of 1983 and 1984, wetlands made up 4.8% of the 50 160-acre sample areas (8,000 acres) but contained 41.7% of the 3 species of breeding Icterines censused (Table 2). Uplands made up 95.2% of the sampled areas and contained 46.2% of the 3 species of breeding blackbirds; cropland with breeding habitat made up 12.3% of the area and contained 15.2% of the blackbirds; and bare tilled and newly seeded cropland made up 55.1% of the area sampled and 2.9% of the breeding blackbirds were observed (while feeding) there. Iowa has less wetland habitat of much poorer quality (mostly stream courses) than North Dakota (4.8% vs 7.8%), but had much higher Red-winged Blackbird breeding densities in wetland areas (43.9 vs 25.8/100 acres) (Besser 1985). Surprisingly, Iowa and North Dakota had similar numbers of breeding Common Grackles in most habitats. The lack of suitable marshes for Yellow-headed Blackbird breeding in Iowa (0.1 vs 2.1/100 acres for North Dakota and 2.1 vs 25.3/100 acres of wetlands) was apparent. Breeding densities of the 3 species of crop-damaging blackbirds were 6.1/100 acres in all habitats in Iowa and 6.7/100 acres in North Dakota.

Population Recruitment of Red-winged Blackbirds

In the 50 160-acre areas censused in Iowa, only 71 immature (SY) males were observed (Table 3). Only 5 of the 71 were observed in a feeding habitat. SY male Red-winged Blackbirds were loosely holding territories most commonly in wetlands (21) and haylands (17). Only 1 of the 71 SY males holding territories was observed to have attracted a female. The statewide number of SY male Red-winged Blackbirds is estimated at 320,000 or 16.1% of the total male population. Only 1 SY male was observed for every 5.2 adult (ASY) males observed. This indicates that either the number of young males recruited into breeding Red-winged Blackbirds populations has been overestimated or that the reported survival rate of adult males has been underestimated by Fankhauser (1967) and Stewart (1978).

Relationship of Census and Breeding Bird Survey Index Data for Red-winged Blackbirds

The ratio of Red-winged Blackbirds numbers reported on 25-mi NABBS routes in Iowa (155.5) in 1980 (Johnson et al 1982) and the number of breeding males found per mi^2 in this census (29.5) was 5.27 (Table 4). This is almost precisely the ratio (5.25) found in 1982 for the Agassiz Lake Plain region of North Dakota (Besser 1985) the physiographic region of that state that is most similar to Iowa.

Other Species

A list of other breeding (and migrant) species and numbers observed while making the blackbird census is given in Table 5. Although no special effort was made to visit non-blackbird habitats, the list could serve as a baseline index if these areas are re-censused at a future time. The location of quarter sections censused is available from the author, upon request.

SUMMARY

Red-winged and Yellow-headed Blackbirds and Common Grackles were censused in 1983-84 in 50 quarter sections (160-acres) in Iowa. The density of breeding male Red-winged Blackbirds in Iowa was estimated at 29.5 (\pm SE 4.1)

Table 2. Densities of 3 species of blackbirds in 4 wetland and 13 upland habitats in Iowa, 1983-84.

Habitat	Red-winged Blackbird			
	Acres	(%)	No.	Per 100A
Wetlands				
Lake edges and lakes	80	(1.0)	3	3.8
Sloughs and marshes	47	(0.6)	41	87.2
Stream courses	222	(2.8)	91	41.0
Ponds	34	(0.4)	33	97.1
Total	383	(4.8)	168	43.9
Uplands				
Non-croplands				
Roadsides	165	(2.1)	37	22.4
Fence rows	47	(0.6)	7	14.9
Farmsteads and wind breaks	205	(2.6)	20	9.8
Railroad right-of-ways	27	(0.3)	10	37.0
Ungrazed pastures	266	(3.3)	26	9.8
Grazed pastures	919	(11.5)	27	2.9
Woodlands and brushlands	447	(5.6)	0	0.0
Urban areas	151	(1.9)	0	0.0
Croplands				
Breeding habitats				
>12" stubbles	412	(5.2)	5	1.2
Alfalfa and other hay lands	448	(5.6)	61	13.6
Flooded stubbles	120	(1.5)	5	4.2
Feeding habitats				
Bare tilled, <12" stubbles	1,173	(14.7)	2	0.2
Newly seeded	3,237	(40.5)	1	0.03
Total	7,617	(95.2)	201	2.6
Uplands				
Wetlands and Uplands - Grand Total	8,000	(100.0)	369	4.6
Upland Non-croplands				
Total	2,227	(27.8)	127	5.7
Croplands				
Total	5,390	(67.4)	74	1.4
Breeding habitats				
Sub-total	980	(12.3)	71	8.8
Feeding habitats				
Sub-total	4,410	(55.1)	3	0.1
Uplands				
Total	3,207	(40.1)	198	6.2
(excluding feeding habitats)				

per mi², or about 1.7 million for the state. Density of breeding Common Grackles was estimated at 8.8 (\pm SE 1.8) pairs per mi², or about 500,000 for the state. Density of breeding Yellow-headed Blackbirds was estimated at only 0.64 (\pm 0.64) per mi² or 36,000 for the state. Breeding density of the 3 species of blackbirds, responsible for most crop damage in the U. S., was estimated at 39.0 (\pm SE 3.8) per mi², or 2.2 million for the state.

The density of immature male Red-winged Blackbirds in Iowa was estimated at 5.7 (\pm SE 1.2) per mi² or 16.1% of all male Red-winged Blackbirds censused. These data indicate that either the recruitment of young male Red-winged Blackbirds into breeding populations is lower or adult male survival is higher than previously estimated, or both.

Table 2 (cont.)

Habitat	Yellow-headed Blackbird		Common Grackle		Total Blackbirds	
	No.	Per 100A	No.	Per 100A	No.	Per 100A
Wetlands						
Lake edges and lakes	0	0.0	1	1.3	4	5.0
Sloughs and marshes	8	17.0	1	2.1	50	106.4
Stream courses	0	0.0	16	7.2	107	48.2
Ponds	0	0.0	9	26.5	42	123.5
Total	8	2.1	27	7.0	203	53.0
Uplands						
Non-croplands						
Roadsides	0	0.0	13	7.8	50	30.3
Fence rows	0	0.0	2	4.3	9	19.1
Farmsteads and wind breaks	0	0.0	32	15.6	52	25.4
Railroad right-of-ways	0	0.0	0	0.0	10	37.0
Ungrazed pastures	0	0.0	3	1.1	29	10.9
Grazed pastures	0	0.0	11	1.2	38	4.1
Woodlands and brushlands	0	0.0	0	0.0	0	0.0
Urban areas	0	0.0	8	5.3	0	5.3
Croplands						
Breeding habitats						
>12" stubbles	0	0.0	0	0.0	5	1.2
Alfalfa and other hay lands	0	0.0	3	0.7	64	14.3
Flooded stubbles	0	0.0	0	0.0	5	6.0
Feeding habitats						
Bare tilled, <12" stubbles	0	0.0	3	0.3	5	0.4
Newly seeded	0	0.0	8	0.2	9	0.3
Total	0	0.0	83	1.1	284	3.7
Uplands						
Wetlands and Uplands - Grand Total	8	0.1	110	1.4	487	6.1
Upland Non-croplands						
Total	0	0.0	69	3.1	196	8.8
Croplands						
Total	0	0.0	14	0.3	88	1.6
Breeding habitats						
Sub-total	0	0.0	3	0.3	74	7.5
Feeding habitats						
Sub-total	0	0.0	11	0.2	14	0.3
Uplands						
Total	0	0.0	72	2.2	270	8.4

The ratio of Red-winged Blackbirds on 25-mile North American Breeding Bird Survey index routes and breeding males found/mi² in this census was 5.27, almost the same as for a similar area in North Dakota.

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Table 3. Numbers of immature (SY) and adult (ASY) male Red-winged Blackbirds by habitats in Iowa 1983-84.

Habitat	Number Males	
	SY	ASY
Wetlands		
Stream courses	14	91
Ponds	3	33
Sloughs	4	41
Lakes and lake edges	0	3
Sub-Total	21	168
Uplands		
Non-croplands		
Grazed pastures	6	27
Roadsides	8	37
Ungrazed pastures	5	26
Railroad right-of-ways	1	10
Farmsteads and windbreaks	0	20
Fence rows	4	7
Croplands		
Breeding habitats		
Alfalfa and other haylands	17	61
Tall weedy stubbles (>12")	3	5
Flooded stubbles	1	5
Feeding habitats		
Bare tilled, and short weedy stubbles (<12")	4	2
Newly seeded	1	1
Sub-Total	50	201
Total	71a/	369

a/Density of 0.89 (±SE0.19) SY males/100 acres or 5.68/mi²

Table 4. Relationship of data on Red-winged Blackbirds numbers for the American Breeding Bird Survey index and for this census, 1980-84.

State	Red-winged Blackbird Numbers		
	Index (Males/24.5 mi route) a/	Census ^b (Males/mi ²)	Index ^c Census Ratio
Iowa	155.5	29.5	5.27; 1
Agassiz Lake Plain, ND b/	109.7	20.9 c/	5.25; 1

a/ From Johnson et al (1982). b/ The physiographic region of North Dakota most similar to Iowa. c/ From Besser (1985)

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Table 5. Species and Numbers of breeding residents^a at observed 18-26 May 1983-84 while censusing blackbirds in 50 160-acre sample areas in Iowa.

Species ^b	No. ^c	Species	No.
Red-winged Blackbird	651	Ovenbird	7
Common Grackle	176	Chipping Sparrow	7
House Sparrow	132	Great Crested Flycatcher	6
European Starling	111	White-breasted Nuthatch	6
Brown-headed Cowbird	101	Veery	6
Barn Swallow	79	Upland Sandpiper	6
American Robin	69	Horned Lark	6
American Goldfinch	69	Red-bellied Woodpecker	5
Mourning Dove	45	Warbling Vireo	5
Brown Thrasher	44	Northern Bobwhite	4
Red-headed Woodpecker	39	Lark Sparrow	4
Blue Jay	37	Orchard Oriole	4
Eastern Kingbird	37	Canada Goose	1
House Wren	36	Downy Woodpecker	1
Bobolink	32	American Redstart	1
Gray Catbird	31	Black-capped Chickadee	1
Common Yellowthroat	30	Red-tailed Hawk	1
Eastern & Western Meadowlarks	30	Great Horned Owl	1
Dickcissel	28	Cedar Waxwing	3
Cliff Swallow	27	Willow Flycatcher	2
Grasshopper Sparrow	24	Loggerhead Shrike	2
Northern Oriole	23	Rufous-sided Towhee	2
Killdeer	22	Mallard	2
Indigo Bunting	19	Eastern Bluebird	2
Song Sparrow	19	Turkey Vulture	2
Rose-breasted Grosbeak	19	Great Blue Heron	1
Northern Cardinal	18	Belted Kingfisher	1
Field Sparrow	18	Green-backed Heron	1
Ring-necked Pheasant	18	Common Nighthawk	1
Eastern Wood Pewee	18	Barred Owl	1
Northern Rough-winged Swallow	18	Scarlet Tanager	1
Savannah Sparrow	17	Yellow-breasted Chat	1
American Crow	14	Least Flycatcher	1
Yellow Warbler	12	Chimney Swift	1
Northern Flicker	12	Hairy Woodpecker	1
Vesper Sparrow	11	Tree Swallow	1
Yellow-headed Blackbird	10	Swamp Sparrow	1
Rock Dove	8	Northern Harrier	1
Red-eyed Vireo	8	American Kestrel	1

a/ As classified by Dinsmore et al (1984) for Iowa.

b/Scientific names are available from Dinsmore et al (1984) or from American Ornithologists Union (1982).

c/ All ages and sexes.

Fig. 1. Location of 50 quarter sections censused in Iowa, 1983-84.

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Breeding Birds of the Sioux City Prairie

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The Sioux City Prairie, located within Sioux City, was purchased by The Nature Conservancy in 1983 as a remnant of the loess hill prairie ecosystem. The tract of 67.4 hectares (166.5 acres) encompasses some virgin prairie, dominated by big bluestem (*Andropogon gerardi*) or little bluestem (*A. scoparius*), depending on the position on a ridge or slope, and other prairie, successional or disturbed communities (Blankenship, Blankenship et al, unpubl. data, 1984). Floristic studies by the Blankenships are continuing.

METHODS

Several nature studies, including this breeding bird census, were undertaken to assay the richness of its flora and fauna. This study attempted to follow the procedure of George A. Hall (Hall, 1946). Although his criteria for habitat homogeneity and minimum size could not be met, his work remained the guideline.

The factors limiting census areas were the restriction of native prairies to 100 meter wide strips following loess hill ridges (size requirements) and the diversity of the various succession stages following prairie (habitat homogeneity requirements). A final decision was made to census the two largest prairie ridges, although disjunct, as one prairie, to be contrasted with a census of an equal area of "disturbed" prairie, including prairies invaded by smooth sumac (*Rhus glabra*), brome (*Bromus* spp.) and cottonwood (*Populus deltoides*) and those defaced by traffic and earth moving. The two prairie ridges totaled 7 ha (17.3 A); and the "disturbed" area, 6.5 ha (16.1 A). Surveys were conducted in the 1½ hours following dawn on 10, 13 and 21 June and 3 and 12 July, 1984.

The study was designed to detect and map the locations of all singing males. A singing male was assumed to represent a breeding pair. After subsequent visits, the mapped locations of singing males of each species were compiled onto one map to delineate the territories of those seen frequently. Exceptional species would be the non-territorial species, such as Cowbirds and Hummingbirds.

This study was conducted as a chapter project during May, June and July, 1984 by a number of members of the Loess Hills Chapter of the National Audubon Society at the request of The Nature Conservancy.

DATA

Singing males of 22 species (including Brown-headed Cowbird, (*Molothrus ater*) were observed on our census routes (Table I). Nesting was confirmed for eleven of these species (Table I).

Table I. Species of singing males on Sioux City Prairie census areas, summer, 1984.

Singing males species	Prairie	"Disturbed"
*Mourning Dove	2/1 (6/10,13)	1/1 (7/3)
Black-billed Cuckoo	—	2/1 (6/21;7/12)
Yellow-billed Cuckoo	—	3/3 (6/21)
Willow Flycatcher	—	3/1 (6/21;7/3,12)
Least Flycatcher	—	1/1 (6/10)
*Western Kingbird	3/2 (6/10,21)	2/1 (6/10,21)
*Eastern Kingbird	2/1 (7/3,12)	5/2 (6/10;7/3,12)
*American Robin	—	4/1 (6/10,13,21)
*Gray Catbird	2/1 (6/21;7/12)	5/2 (6/10,21;7/3)
Brown Thrasher	1/1 (7/12)	—
*Bell's Vireo	—	11/6 (6/21;7/3,12)
Warbling Vireo	—	1/1 (6/10)
Common Yellowthroat	4/1 (6/10,13,21;7/3)	—
*Yellow Warbler	—	21/5 (all)
Indigo Bunting	1/1 (7/12)	3/1 (6/10,13,21)
Dickcissel	16/7 (all)	4/3 (7/3,12)
*Field Sparrow	3/1 (6/13;7/3)	7/3 (6/21;7/3,12)
*Grasshopper Sparrow	20/7 (all)	—
*Eastern Meadowlark	14/4 (all)	—
*Brown-headed Cowbird	1/1 (6/21)	3/1 (6/13,21)
Northern Oriole	—	2/1 (6/13;7/3)
American Goldfinch	—	n/►12 (7/12)

(as yet non-territorial)

DISCUSSION

In addition to their presence, the observed number of certain species was notable. Six distinct Bell's Vireos (*Vireo bellii*) were heard one morning, implying six pairs. This is considered an uncommon resident in the state, locally common in SW Iowa (Dinsmore, Kent, Koenig, Petersen, Roosa, 1984). These data suggest that they may be locally common in NW Iowa, as well.

At least two pairs of Western Kingbirds (*Tyrannus verticalis*), including one nesting pair, were seen on several occasions, agreeing well with their published status (Dinsmore et al, 1984).

A minimum of three breeding pairs of Eastern Meadowlarks (*Sturnella magna*) were evident — with the notable absence of Western Meadowlarks (*S. neglecta*). Dinsmore et al (1984) indicates that Eastern Meadowlarks may represent less than 1% of the presumed breeding Meadowlarks in NW Iowa. This seems to be the case, the authors having seen none, other than the three breeding pairs on the S. C. Prairie. Also, this in a high and relatively dry (big bluestem — dominant) Loess Hill Prairie rather than the lower, moister areas favored by E. Meadowlarks (Dinsmore et al, 1984; Wilson, 1983). Perhaps a study of the relationship between E. Meadowlarks and specific vegetative habitats would show a big bluestem prairie to be a sufficiently moist environment (implying denser, taller grasses).