

A POPULATION INDEX OF BREEDING BIRDS IN ALLEGANY COUNTY

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The design of the Fish and Wildlife Service Breeding Bird Survey (Robbins and van Velzen 1967, 1969) has been adapted to obtain a population index of breeding birds in Allegany County, New York, for the 1970 season. The county, which is nearly rectangular, was divided into nine 10- to 12-minute blocks of latitude and longitude, bounded by Longitudes 7755 and 7805, by Latitudes 4210 and 4220, by the north, south, east, and west boundaries of the county. Two 12-mile routes were laid out along available roads within each of the blocks, the starting points and compass directions being selected by methods of random sampling. Twenty five stations, or "stops," spaced one-half mile apart, comprise the sampling unit referred to as a "route."

The 18 routes thus established provide a total of 450 sampling stations for Allegany County of total area 1047 square miles. This gives a sampling density of one station for every 2.3 square miles. For the F. and W.S. Survey eight routes per degree block provide 400 stations in approximately 3500 square miles, or one station per 8.7 square miles. The Allegany County survey thus provides about 4 times the sampling density.

As in the F. and W.S. Survey, observers were instructed to record all birds heard and those birds seen within one-fourth mile radius during a 3-minute period at each stop. The routes were run on any day during June with starting times set 30 minutes before sunrise and the routes completed within 2.0-2.5 hours. Weather conditions adversely effecting visibility, hearing and bird activity were avoided by selecting days when sky conditions, wind velocities and temperatures were favorable and within adopted standards.

Pertinent data for 17 of the 18 routes, which were completed during June 1970 with the help of 15 observers and assistants (to record and drive), are listed in Table I. Tables II and III contain compilations of the data for all routes. The average total count per 12-mile route was 531 individuals, the variation being from 195 to 949. The number of different species per route varied from 21 to 63, the average being 48. Interested readers may compare these figures with the corresponding values obtained for the F. and W.S. Surveys, as reported in several sum-

maries (Klabunde 1969, Robbins and van Velzen 1967, 1969, Yunich 1968), taking into account in making comparisons that the routes on the F. and W.S. Survey contain twice as many counting stations and extend for 24.5 miles rather than 12-miles. Thus, the total count per 12-mile route is likely to be one-half as large while the number of species has the probability of being less.

It is evident from Table II that two species, the Redwinged Blackbird and the Robin, head the list of the most abundant birds, and together account for one fourth of the cumulated total count. An additional three species, Common Grackle, Starling, and Song Sparrow, increases the cumulated total to nearly one half, while three more species, Common Crow, House Sparrow, and American Goldfinch raises it to nearly two thirds. The 32 species in Table II, listed in the decreasing order of abundance, account for 90% of the individuals recorded. The remaining 10% of the birds are represented among the 61 species listed in Table III; these are the least abundant species.

When one examines relative abundance on the basis of the birds recorded on the individual routes, a tally of the 5 most abundant species on each route includes 11 species which, with the exception of the Bank Swallow, are the first 10 species in Table II, but not in the same order. The Redwinged Blackbird heads the lists of the 5 most abundant species on 8 routes and the Robin on 6; these are the only two species that are on this list for each of the 17 routes. The Common Grackle is listed among the top 5 on 9 routes, the Starling on 9, the Song Sparrow on 13, the Common Crow on 10, the House Sparrow on 4, the American Goldfinch on 2, the Chipping Sparrow on 2, and the Barn Swallow and Bank Swallow each on one. The Bank Swallow, which is 19th in relative abundance for the county heads the list for Route 91, no doubt by virtue of its being a colonial breeder.

Among the least abundant species listed in Table III are 8 species for which only one individual was recorded. This list includes Bobwhite, American Woodcock, Upland Plover, Great Horned Owl, Rough-winged Swallow, Cliff Swallow, Magnolia Warbler, and Myrtle Warbler. Fourteen other species were listed with only 2 to 5 individuals. Six out of these 22 least abundant species are warblers.

Although one might wonder by how much of an accident a single individual of a species of low abundance becomes included on a sample count, it does happen that the Myrtle Warbler listed on this survey was

recorded on Route 21 in an area where their presence as a potential breeding bird was first observed about 3 years ago and observations suggest that their number during the breeding season have been on the increase since that time. Also 4 White-throated Sparrows were recorded by the author on Route 21 near Palmer's Pond in a State Reforestation area that was established over 30 years ago. All four birds responded by song, nearly simultaneously, with very little coaxing. It will be of interest to see whether White-throats will be recorded at the same station next year.

The distribution of the birds in the county may be assessed from the data in the two columns headed "relative frequency" in Table II. The first gives the percentage of the 425 stations at which the particular species was observed, the second gives the percentage of the 17 routes. The Robin and Song Sparrow head this list, followed by Redwinged Blackbird, Common Grackle, Starling, Field Sparrow, and Chipping Sparrow. It may also be seen that 13 species were recorded on all of the 17 routes.

No attempt has been made in this initial study to establish the statistical reliability of the results. There are likely to be comparisons and points of interest other than those mentioned above that can be culled from the data. The immediate value of the study seems to be that it provides some degree of quantitative measure to relative abundance and to distribution that did not exist previously. If the survey can be repeated annually it is possible that significant changes in the breeding bird population of this county can be measured and trends noted that possibly reflect ecological changes. It might also be desirable to add to this type of sampling some additional techniques that would more accurately measure the relative abundance of such species as the early and late breeders, species that are secretive or inconspicuous, or those that favor habitats that road systems avoid.

It is essential to point out that a project of this kind requires the generous cooperation of a number of competent bird observers. A sincere word of thanks is due the observers and assistants, all active members of the Allegany County Bird Club, whose names are listed in Table I. Grateful acknowledgment is also in order for the financial support and encouragement provided by the Board of Governors of the Alfred University Research Foundation.

Table I. Location of Routes and Summary of Total Counts.

Route Number Name* Lat.—Long.**	Date	Species Total	Total Count	Species with Five Highest Counts (Number of Individuals)
11 Andover N4209 W7754	6-23-70	36	315	Robin 60, C. Grackle 31, Crow 29, Redwing 27, Song Sparrow 24
12 Willing N4202 W7750	6-26-70	40	287	Redwing 44, C. Grackle 42, Robin 26, Song Sparrow 17, Crow 16
21 W. Almond N4216 W7750	6-21-70	55	426	Robin 71, Song Sparrow 44, Red- wing 28, Chipping Sparrow 22, Crow 21
22 Alfred N4215 W7746	6-19-70	52	544	Robin 99, Redwing 90, Starling 34, Song Sparrow 34, C. Grackle 27
31 Almond N4227 W7746	6-20-70	49	744	Redwing 123, Robin 112, House Sparrow 73, Song Sparrow 64, Crow 41
32 Grove N4226 W7753	6-19-70	52	722	Redwing 144, Robin 65, House Sparrow 55, C. Grackle 46, Song Sparrow 38
41 Scio N4209 W7802	6-11-70	50	458	Robin 58, Starling 54, Song Spar- row 34, Redwing 33, Crow 19
51 Amity N4210 W7757	6-22-70	50	572	Redwing 102, Robin 71, Starling 70, C. Grackle 46, Song Sparrow 36
52 Angelica N4218 W7759	6-18-70	52	469	Robin 90, Redwing 67, Song Spar- row 55, C. Grackle 21, Chipping Sparrow 21
61 Granger N4222 W7804	6-13-70	42	378	Crow 63, C. Grackle 62, Redwing 45, Song Sparrow 28, Robin 26
62 Allen I N4220 W7757	6-15-70	43	340	Redwing 72, Robin 35, Barn Swal- low 33, Song Sparrow 25, Crow 18
71 Genesee N4204 W7809	6-28-70	21	195	C. Grackle 79, Redwing 28, Crow 19, Robin 18, Song Sparrow 8
72 Wirt N4207 W7808	6-20-70	48	420	Robin 73, Redwing 69, Starling 46, Song Sparrow 27, Crow 21
81 Friendship N4214 W 7805	6-22-70	50	777	Redwing 112, Robin 107, Starling 103, C. Grackle 101, House Spar- row 66
82 New Hudson N4213 W7815	6-24-70	51	615	Redwing 120, Robin 92, Song Sparrow 57, C. Grackle 51, Crow 31
91 Rushford N4221 W7808	6-30-70	58	808	Bank Swallow 75, Goldfinch 68, Redwing 61, Starling 50, Robin 47
92 Caneadea N4224 W7809	6-14-70	61	949	Redwing 155, Starling 116, Robin 88, Goldfinch 77, House Sparrow 65
Total		93	9019	
Average		47.6	531	

* The name corresponds to the township in which a large part of the route lies.

** The Latitude and Longitude of the starting point, selected by methods of random sampling.

List of Observers (route number(s)) and Assistants: Sylvia Bosworth (71), David Bosworth; Elizabeth Brooks (22), Stephen Brooks; Lou Burton (72), Doris Burton; Christine Ferrand (11); Clarence Klingensmith (21, 31, 32, 52, 81, 82), Mark Klingensmith; Erma Larson (12), Jane Moore; Katherine Palmer (61, 62); Vivian Pitzrick (41, 51), Ruth Richardson; Larry Wilson (91, 92).

Table II. Relative Abundance and Relative Frequency of the More Abundant Species

	Total Count	Population Index ^a	Cumulated Total(%) ^b	Relative Stops(%) ^c	Frequency Routes(%) ^d
1. Red-w. Blackbird	1320	78	14.6	60.0	100
2. Robin	1138	67	27.2	74.8	100
3. Common Grackle	685	40	34.8	35.5	100
4. Starling	632	37	41.8	32.9	100
5. Song Sparrow	609	36	48.6	69.2	100
6. Common Crow	400	24	53.0	46.4	100
7. House Sparrow	387	23	57.3	17.2	94
8. Amer. Goldfinch	349	21	61.2	27.1	100
9. Chipping Sparrow	208	12	63.5	31.8	100
10. Barn Swallow	178	10	65.4	16.0	100
11. Field Sparrow	178	10	67.4	32.5	94
12. E. Meadowlark	177	10	69.4	22.4	100
13. Bobolink	163	10	71.2	15.8	100
14. Yellowthroat	158	9	72.9	28.2	94
15. Rufous-s. Towhee	139	8	74.5	25.2	94
16. House Wren	121	7	75.8	22.4	94
17. Catbird	113	7	77.1	22.8	100
18. Red-eyed Vireo	113	7	78.3	20.2	94
19. Bank Swallow	103	6	79.5	0.94	18
20. Eastern Phoebe	88	5	80.4	16.0	94
21. Savannah Sparrow	88	5	81.4	12.0	71
22. Rock Dove	85	5	82.4	2.82	41
23. Yellow Warbler	82	5	83.3	16.5	94
24. Blue Jay	81	5	84.2	14.4	100
25. Wood Thrush	78	5	85.0	14.6	88
26. Cedar Waxwing	77	5	85.9	8.71	83
27. Indigo Bunting	75	4	86.7	13.9	83
28. Eastern Kingbird	72	4	87.5	10.8	76
29. Yellow-sh. Flicker	69	4	88.3	14.1	83
30. Brown-h. Cowbird	64	4	89.0	10.4	76
31. Black-c. Chickadee	62	4	89.7	11.3	94
32. Killdeer	61	4	90.4	10.1	83

(a) The average number of individuals per route, i.e., the value in the first column divided by 17.

(b) The cumulated sums of the entries in the first column divided by 9019.

(c) The percentage of stops out of 425 at which the species was observed.

(d) The percentage of routes on which the species was recorded.

Table III. The Least Abundant Species

	Total Count	No. of Stops		Total Count	No. of Stops
Great Blue Heron	4	4	Purple Martin	30	2
Green Heron	13	10	White-br. Nuthatch	24	21
Mallard	5	3	Brown Creeper	2	2
Wood Duck	5	1	Brown Thrasher	39	34
Red-tailed Hawk	7	7	Hermit Thrush	6	3
Red-shouldered Hawk	2	2	Verry	28	20
Sparrow Hawk	6	5	Eastern Bluebird	16	12
Ruffed Grouse	2	2	Warbling Vireo	4	4
Bobwhite	1	1	Blue-winged Warbler	6	5
Ring-n. Pheasant	9	8	Nashville Warbler	2	2
American Woodcock	1	1	Magnolia Warbler	1	1
Upland Plover	1	1	Myrtle Warbler	1	1
Spotted Sandpiper	8	5	Black-thr. Green W.	12	10
Mourning Dove	58	48	Blackburnian Warbler	5	3
Great Horned Owl	1	1	Chestnut-s. Warbler	33	26
Black-billed Cuckoo	5	5	Ovenbird	18	18
Chimney Swift	32	15	Mourning Warbler	3	3
Ruby-thr. Hummingbird	3	3	Canada Warbler	2	2
Belted Kingfisher	17	15	American Redstart	9	8
Pileated Woodpecker	3	3	Baltimore Oriole	44	33
Yellow-b. Sapsucker	3	3	Scarlet Tanager	35	31
Hairy Woodpecker	9	7	Cardinal	51	37
Downy Woodpecker	21	21	Rose-br. Grosbeak	23	21
G. Crested Flycatcher	18	17	Purple Finch	9	9
Traill's Flycatcher	10	8	Grasshopper Sparrow	6	6
Least Flycatcher	47	40	Henslow's Sparrow	13	10
E. Wood Pewee	40	38	Vesper Sparrow	25	22
Horned Lark	20	7	Slate-colored Junco	4	3
Tree Swallow	45	11	White-thr. Sparrow	4	1
Rough-w. Swallow	1	1	Swamp Sparrow	13	11
Cliff Swallow	1	1			

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