

A COMPARISON OF WINTERING BIRD POPULATIONS IN THREE OPEN FIELD TYPES IN CENTRAL OHIO

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INTRODUCTION

The study of wintering bird populations is still a relatively unexplored field. Although a large number of censuses are available for some habitats, many important habitats and geographical areas remain unknown. Few studies have been made of winter bird populations in open field areas. Forbes and Gross (1921) surveyed bird populations in open fields in Illinois by means of a strip census method and summarized their results according to field type and the general section of the state. Since then, few extensive studies have been made. In recent years the Winter Bird-population Studies sponsored by the National Audubon Society have increased interest in this phase of ornithology.

A number of factors has limited the usefulness of many of these more recent studies in determining average populations for various field types. Many censuses have covered more than one field type without separating the data for the various types. Inadequate descriptions of single field types have also made comparisons difficult. Often no distinction has been made between edge species, the populations of which are not directly related to the field size, and true open field species.

In the present study the author has attempted to eliminate some of these difficulties and to determine average populations of certain field types. These data represent, however, only a preliminary step in this direction.

PROCEDURE

The following three types of fields were chosen for the study:

1. *Undisturbed corn stubble*.—Corn fields of this type had been harvested with a mechanical corn picker, which left the entire stalks rooted in the original rows, their upper parts bent over at a uniform height of one to one and one-half feet and lying parallel to the rows. Waste corn was abundant. These fields had not been otherwise disturbed.

2. *Disked corn stubble*.—Corn in this type had been harvested in a manner similar to that of the previous type; but following the harvesting, the field had been harrowed or disked and winter grain planted. This resulted in the uprooting and cutting up of the corn stalks, thereby eliminating much of the cover which had been present. The general appearance was that of a nearly bare field with scattered debris of corn stalks and short basal stubs sticking up at wide intervals. Much of the waste corn was still available. The winter grain had grown to a height of only 1 to 2 inches, in rows about eight inches apart.

3. *Soybean stubble*.—In this type the soybeans had been cut, leaving stubble 2 to 5 inches high, with occasional small mats of soybean stems. The general appearance was that of an almost bare field. In two of the fields, #11 and #12 (table 1), winter grain had been planted following the cutting of the soybeans. Although this had resulted in some disturbance of the ground, much of the stubble still remained, and this, along with soybean debris, still dominated the appearance of the fields.

These fields were located in Oxford, Troy, Radnor, and Marlboro Townships in north-central Delaware County, Ohio. The approximate sizes of the fields were obtained by pacing the sides and calculating the area from these measurements. Areas obtained in this manner ranged from 12 to 30 acres. Fields of undisturbed corn stubble were numbered from 1 to 5, and in size were respectively 25, 30, 20,

17, and 13 acres. Those of disked corn stubble, numbered 6 through 10, were respectively 29, 20, 12, 12, and 27 acres in size. Soybean stubble fields, numbered 11 through 15, were 24, 28, 14, 24, and 25 acres in size, respectively.

Bird populations of the fields were determined by a series of six census trips through each field. These trips varied from 10 to 30 minutes in length, depending upon the size of the field, its type, and the number of birds present. Censusing was carried out during two periods, December 25 to 28, 1956, and January 29 to February 2, 1957. Three trips were taken through each of the fields during each of these periods.

TABLE 1

Winter populations (birds per 100 acres) of open field birds in 15 fields of three types in Delaware County, Ohio, during the winter of 1956-57

Species	Field No.	Undisturbed corn stubble					Disked corn stubble					Soybean stubble				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Size in acres	25	30	20	17	13	29	20	12	12	27	24	28	14	24
Cooper's Hawk (<i>Accipiter cooperi</i>)				1												
Red-tailed Hawk (<i>Buteo jamaicensis</i>)		1		1						+	1				1	+
Marsh Hawk (<i>Circus cyaneus</i>)		+	+	1	1	2	+	1				+	1	1		
Sparrow Hawk (<i>Falco sparverius</i>)					1											
Bob-white (<i>Colinus virginianus</i>)			7		26											
Ring-necked Pheasant (<i>Phasianus colchicus</i>)			7													
Mourning Dove (<i>Zenaidura macroura</i>)		12	84	9	162	95	1	1								
Short-eared Owl (<i>Asio flammeus</i>)			1					+				+				
Horned Lark (<i>Eremophila alpestris</i>)		24	1	39	3	81	180	296	1	243	58	26	4	15	4	2
Starling (<i>Sturnus vulgaris</i>)								2								
Eastern Meadowlark (<i>Sturnella magna</i>)					1	1		48								
Lapland Longspur (<i>Calcarius lapponicus</i>)							19	95		35	12	35				
Snow Bunting (<i>Plectrophenax nivalis</i>)											4					
Total		37	101	50	194	180	200	443	1	278	75	61	5	16	5	2

Only permanent residents of open fields or species which utilized the fields apparently independently of the edge during daytime feeding were considered in the census. Birds of prey flying over the area were assumed to be foraging and were included. Other species merely flying over were excluded.

In many cases it was necessary to estimate large flocks of birds, resulting in the introduction of some error in the final population figures.

The average population per 100 acres for each of the 15 fields was calculated from the size of the field and the results of the six census trips (table 1). The average population per 100 acres for each type was calculated from the data for

the five fields of that type (table 2). Figures were rounded to the nearest whole number. Where the average population was less than 0.5 birds per 100 acres, or where the species was recorded at times other than census trips, a + was used to indicate presence only (tables 1 and 2). A frequency index was calculated for each species in each of the three types by dividing the number of occurrences of the species on individual census trips in all five fields of the same type by the number of possible occurrences (table 2).

TABLE 2

A comparison of the populations of open field birds (average numbers per 100 acres) in three types of open field areas in Delaware County, Ohio, during the winter of 1956-57

Species	Undisturbed corn stubble		Disked corn stubble		Soybean stubble	
	ave. pop.	freq. index	ave. pop.	freq. index	ave. pop.	freq. index
Cooper's Hawk (<i>Accipiter cooperi</i>)	+	.03				
Red-tailed Hawk (<i>Buteo jamaicensis</i>)	+	.10	+	.03	+	.03
Marsh Hawk (<i>Circus cyaneus</i>)	1	.13	+	.03	+	.07
Sparrow Hawk (<i>Falco sparverius</i>)	+	.03				
Bob-white (<i>Colinus virginianus</i>)	6	.07				
Ring-necked Pheasant (<i>Phasianus colchicus</i>)	2	.03				
Mourning Dove (<i>Zenaidura macroura</i>)	70	.53	1	.07		
Short-eared Owl (<i>Asio flammeus</i>)	+	.07	+	.00	+	.00
Horned Lark (<i>Eremophila alpestris</i>)	24	.43	156	.73	10	.30
Starling (<i>Sturnus vulgaris</i>)			+	.03		
Eastern Meadowlark (<i>Sturnella magna</i>)	+	.07	10	.17		
Lapland Longspur (<i>Calcarius lapponicus</i>)			32	.40	7	.03
Snow Bunting (<i>Plectrophenax nivalis</i>)			1	.07		
Total	103		200		17	

RESULTS AND DISCUSSION

The total population was found to be highest in the disked corn stubble type, where 200 birds per 100 acres were found, and second highest in the undisturbed corn stubble, where 103 birds per 100 acres were found. Only 17 birds per 100 acres were found in the soybean stubble (table 2).

The nature of the populations from which the samples were taken makes statistical interpretation of these differences difficult, but the high apparent differences in many cases suggest that they are real.

The difference between populations in the disked corn stubble and the soybean stubble is emphasized by the fact that in three cases fields of the two types were adjacent to each other. These three pairs of adjacent fields were #6 and #11, #7 and #13, and #10 and #15 (table 1). For these three disked corn stubble fields

the average population per 100 acres was 220 birds while for the three soybean stubble fields the population was only 28 birds per 100 acres. Since these adjacent fields were readily accessible to the same groups of birds, this difference seems to indicate a definite preference for the disked corn stubble.

Among the individual fields of the same type, there was a high degree of variation in total population and populations of individual species (table 1); *e.g.*, in the disked corn stubble total populations per 100 acres varied from 1 to 443 birds. The causes of these variations were not investigated. Some variation may have been due to minor differences between the fields themselves. In addition, since many of the species involved are wide ranging in their winter activities, differences may also have been due to characteristics of the surrounding areas which were not always apparent from examination of the fields themselves.

Populations of Horned Larks and Mourning Doves showed marked differences between the three field types. The former had populations, in birds per 100 acres, of 156 in disked corn stubble, 24 in undisturbed corn stubble, and 10 in soybean stubble (table 2). The high population in disked corn stubble seemed to be due to a combination of available waste corn and absence of much cover. The birds were observed feeding on the corn and, at times when light snow covered the ground, tracks of the birds formed radiating lines to corn ears from which much of the corn had been removed. The Mourning Dove showed the highest population in the undisturbed corn stubble, 70 birds per 100 acres (table 2). The high population of this species seemed to be related to the presence of waste corn and the cover provided by the basal parts of the corn stalks.

Two other typical open field birds, the Lapland Longspur and the Snow Bunting, the latter in small numbers in one field only, showed preferences similar to those of the Horned Lark. Bob-white and Ring-necked Pheasant, on the other hand, appeared only in fields of the undisturbed corn stubble (table 2).

The population figure of 10 birds per 100 acres for Horned Larks in the soybean stubble fields (table 2) may not represent true winter density. On trips during the period from January 29 to February 2, territorial males and pairs of this species were encountered in these fields where none were found during the first series of census trips. Future winter studies involving this species should probably be concluded at an earlier date, if the objective of such a study is to determine the relation of the bird to the winter food supply of the species.

Population figures calculated for the first three trips through each field, taken between December 25 and 28, and the last three, taken between January 29 and February 2, often gave considerably different results. This would seem to indicate that the winter population of the species under consideration was not a stable one. Horned Larks and Mourning Doves showed lower densities and Lapland Longspurs higher densities during the second series of census trips than during the first series.

SUMMARY

Because of the existing lack of information on wintering populations of open field birds, the author attempted to obtain accurate data in this regard by censusing five fields each of disked corn stubble, undisturbed corn stubble, and soybean stubble, ranging in size from 12 to 30 acres, and located in Delaware County, Ohio.

Open field species were censused on six occasions during the periods from December 25 to 28, 1956, and January 29 to February 2, 1957.

Total populations were found to be highest in the disked corn stubble, second highest in the undisturbed corn stubble, and lowest in the soybean stubble.

Considerable variation in both total population and populations of individual species occurred within the fields of the same type.

Horned Larks showed the highest populations in disked corn stubble, seemingly because of availability of waste corn and absence of cover. Lapland Longspurs and Snow Buntings showed similar preferences.

Mourning Doves were most abundant in undisturbed corn stubble, possibly related to the presence of waste corn and cover. Bob-white and Ring-necked Pheasant showed similar preferences.

Censuses involving Horned Larks should be concluded at an early date since these birds become territorial by late January.

Differences in population densities for individual species between the two census periods indicate that winter populations of some species are very unstable.

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LITERATURE CITED

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