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Fall-to-Winter and Winter Movements of Pheasants in Iowa

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Abstract. Ring-necked pheasant (*Phasianus colchicus*) movements were studied in south-central Hamilton County, Iowa, during the fall and winter of 1966-67. Fall-to-winter movements of 23 pheasants averaged 0.66 mile. The greatest movement recorded was 2.45 miles. There was no evidence of oriented movement either in direction or to specific wintering areas. The mean winter movement of 43 pheasants was 0.20 mile (based on 149 observations). There was no obvious difference in winter movement of flocks associated with distinct wintering areas. Few pheasants moved between wintering areas after winter flocks were formed.

Ring-necked pheasants (*Phasianus colchicus*) were captured and marked for field identification in south-central Hamilton County, Iowa, during the fall and winter of 1966-67. Objectives were to determine distances moved by pheasants from the summer and fall range to winter concentration areas and to supplement information on pheasant mobility during winter.

Field studies began in early August, 1966, and were terminated the following late April. Intensive investigations were conducted from December 1, 1966, through March 31, 1967. This report on movements covers part of a more inclusive study that covered pheasant production and populations in central Iowa (Egbert, 1968).

THE STUDY AREA

Most field work was confined to a six-square-mile area in south-central Hamilton County in Ellsworth and Clear Lake Townships (Figure 1). The topography is level to gently rolling, and much of the land would be unfit for row crops but for an extensive tiling system. Ninety-four percent of the area was intensively farmed during the growing season of 1966; corn (*Zea mays*), soybeans (*Glycine max*), oats (*Avena sativa*), alfalfa (*Medicago sativa*), red clover (*Trifolium pratense*), and pasture were most prevalent. Farmyards and roadside ditches constitute 5 percent of the land area and other non-agricultural land amounts to less than 1 percent.

Vegetation apart from agricultural crops is confined to fencerows, road ditches, wetland areas, and farm shelterbelts. Shelterbelts are usually composed of boxelder (*Acer negundo*), green ash (*Fraxinus pennsylvanica*), elm (*Ulmus americana*), and plum trees (*Prunus* spp.). Spruce (*Picea* spp)., honeysuckle (*Lonicera* spp.), and mul-

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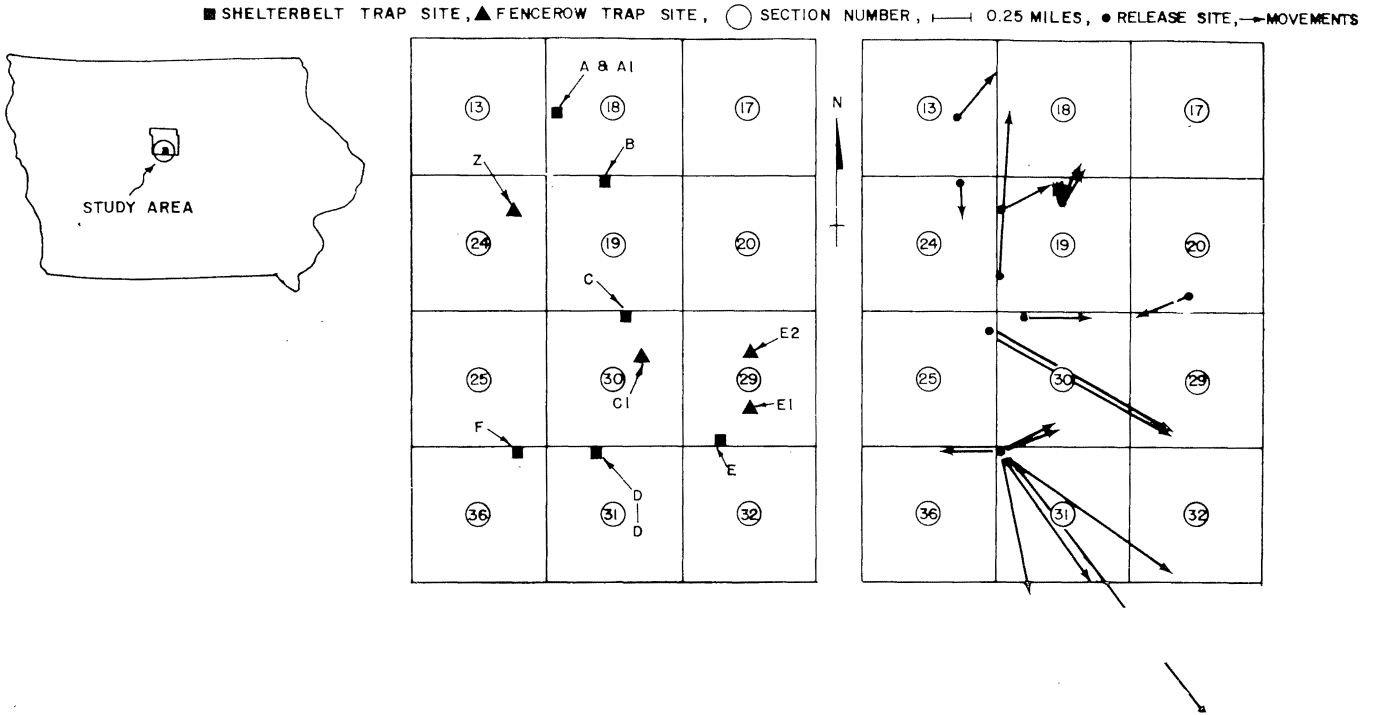

Figure 1 (Left). Location of the six-square mile study area in south-central Hamilton County, Iowa. Figure 2 (Center). Location of baited traps on the study area. Figure 3 (Right). Fall-to-winter movements of 23 pheasants in south-central Hamilton County, Iowa, 1966-67.

berry (*Morus ruba*) are of lesser importance. Fencerows and road ditches contain primarily bluegrass (*Poa pratensis*) and bromegrass (*Bromus* spp.), with occasional clumps of native prairie grasses. Wild plum and black locust (*Robina pseudoacacia*) grow in isolated thickets in fencerows, and giant ragwood (*Ambrosia trifida*) occasionally grows in low, moist areas.

The winter landscape is especially lacking of cover, even agricultural crop cover. Approximately 33 percent of the study area was fall-plowed in 1966. Harvested cornfields occupied about 31 percent of the area and oat stubble 13 percent. Most corn and some oatfields were grazed after crop removal.

The pheasant population before the 1966 nesting season was estimated as 73 birds per square mile. Winter counts, though incomplete, indicated a winter population of approximately 90 pheasants per square mile.

Methods

Pheasants were captured during August-November, 1966, by night-lighting as described by Labisky (1959). Hay and oat stubble were slowly traversed after dark searching for roosting pheasants with a United States Army weapons carrier. Mounted on the carrier's cab was a bank of five 150-watt, 120-volt projector splotlights powered by an Onan generator (AC, 120 volts, 1500 watts). When pheasants were seen before the vehicle, the bank lights were shut off, and a 12-volt, 100,000-candle spotlight was shone on the birds until they were captured with long-handled nets. Captured pheasants were placed in a holding crate and held until the crate was filled or searching of the field was completed. Pheasants were marked and released in a convenient field corner.

Baited wire traps were used to capture pheasants during December-February. Six "Ohio" traps (Leedy and Hicks, 1945) were placed in farm shelterbelts, and five modified Ohio traps were situated in fencerows (Figure 2). The traps were continuously baited with ear corn. Each trap site was checked once daily, and captured pheasants were marked and released at the site.

Pheasants were marked for identification with colored, numbered backtags (Labisky and Mann, 1962) and with leg bands supplied by the Iowa State Conservation Commission.

Movement records were secured by slowly cruising along county and secondary roads at about 20 miles per hour. A blind was used when pheasant concentrations could not be observed from the road. A 20× spotting scope was used to identify individual birds by their backtags. The location of each observed pheasant was recorded in relation to a landmark, and distances were measured on a map of the study area. A few records of movement were obtained through trapping.

All movements were recorded as straight-line distances. Fall-to-winter movements represent the distances between the sites of the fall

release and the locations of the initial winter observation. Winter movements are the distances between sites of successive observations or between the observation point and the site of release.

Weather

Mean temperatures for December, January and February were practically identical to the 1931-60 mean (Shaw and Waite, 1964, and U. S. Department of Commerce, 1966 and 1967). The mean temperatures were 25.4° (F.), 22.7° and 23.5° for the three months, respectively. Mean March temperature was 39.4°, about five degrees higher than the 30-year average of 34.2°. The only significant snowfall occurred on December 28 when approximately eight inches accumulated.

Fall-to-Winter Movements

The distance between the site of the fall release and the point of initial winter observation for 23 pheasants (17 hens and six cocks) averaged 0.66 mile (Table 1). Movements ranged from 0.00 (two records) to 2.45 miles, with 60 percent (14 records) of the movements less than 0.06 mile (Table 2). Seven pheasants (30 percent) traveled distances of at least one mile. The mean movement of birds initially observed in January was 0.72 mile (16 records), compared with a mean of 0.73 mile (five records) for pheasants first identified in February. Two pheasants initially identified in December moved 0.10 and 0.75 mile, respectively.

Table 1

Pheasant Fall-to-Winter Movement in South-Central Hamilton County, Iowa, 1966-67

(The figures in parenthesis denote the number of records)

	Miles Moved		
Movements	Entire Study Area	Northern One-Half	Southern One-Half
Maximum	2.45 (1)	1.25 (1)	2.45 (1)
Minimum	0.00 (2)	0.10 (3)	0.00 (2)
Mean	0.66 (23)	0.32 (13)	0.92 (10)

Table 2

Distribution of Fall-to-Winter Movement of 23 Pheasants in South-Central Hamilton County, Iowa, 1966-67

Range (miles)	Number	Percent	Cumulative Percent
0.00-0.20	7	30	30
0.21-0.40	3	13	43
0.41-0.60	4	17	60
0.61-0.80	2	9	69
0.81-1.00	0	0	69
1.01-1.20	1	4	73
1.21-1.40	2	9	82
1.41-1.60	2	9	91
1.61-2.60	2	9	100

There was little indication of oriented movement either in direction or toward specific wintering areas (Figure 3). The only recorded instance of pheasants moving an appreciable distance together was two juvenile hens (possibly of the same brood) captured in the northwest corner of section 25 and identified (on different dates) 1.50 miles southeast at trap-site E.

The magnitude of fall-to-winter movement was greatest in the southern half of the study area (Figure 3). The mean distance traveled by pheasants released south of section 19 was 0.93 mile (10 records), compared with a mean of 0.32 mile (13 records) on the northern half of the study area (Table 1). The difference in movement means between the northern and southern portions of the study area was significant ($t = 2.69$, $P < 0.05$). Also, 10 of 16 pheasants released on the northern half of the study area were ultimately observed, compared with 13 of 26 birds subsequently identified on the southern half. This also implies that the greatest movement occurred in the southern portion. The difference between areas in observed versus unobserved birds was not significant; however, chi-square (χ^2) $= 0.10$, $P > 0.05$.

To explain the seeming differences in movement is difficult. According to Leopold (1933), a deficiency of "welfare factors" may stimulate movement, but food is probably not a problem in this area at any time during the year, and what seemed excellent shelterbelts were located within 0.25 and 0.45 mile of one release site (the northwet corner of section 31). Excessive human activity in this area may have been an important factor in inducing greater fall-to-winter movement.

Winter Movements

The winter movements of 43 pheasant are summarized in Table 3. The mean straight-line distance of 149 movements was 0.20 mile, with 74 percent of the distances (110 records) being 0.20 mile or less. Fifteen percent (23 records) exceeded 0.30 mile, and 5 percent (8 records) was greater than 0.60 mile (Table 4). The greatest recorded winter movement was 1.55 miles.

Subsequent to winter flock formation, many marked pheasants could be associated with particular wintering sites, and movements of individual flocks were analyzed separately to determine if there were movement differences associated with area. The association of marked pheasants with particular wintering areas was based on repeated observations of individuals. Four concentrations, associated with Trap-Sites **A**, **B**, **E** and the northeast corner of 24 (designated Trap-Site **Z**), contained marked pheasants that were identified with some regularity throughout the winter (December through March).

Trap-Site **A** was in a shelterbelt composed of mature boxelder, green ash and honeysuckle. A stand of giant ragweed occurred in the southeast corner of the grove, and most pheasants were flushed from this

Table 3

Pheasant Winter Movements in South-Central Hamilton County, Iowa, 1966-67
(Figures in parentheses denote the number of records)

Location	Pheasant Winter Movements (miles)*		
	Maximum	Minimum	Mean
All records	1.55 (1)	0.00 (42)	0.20 (149)
Site A	0.75 (1)	0.00 (22)	0.16 (74)
Site B	0.75 (2)	0.00 (6)	0.15 (19)
Site Z	0.50 (1)	0.00 (1)	0.25 (13)
Site E	0.80 (1)	0.00 (4)	0.26 (8)
Separate flocks**	0.25 (2)	0.00 (8)	0.10 (16)
Other***	0.55 (1)	0.00 (1)	0.20 (12)

*Permanent winter shifts have been omitted in all but the first column.

**Flocks which contained only one marked pheasant which was observed at least four times.

***Flocks which contained only one marked pheasant which was observed no more than two times.

Table 4

Distribution of Winter Movement of 43 Pheasants in South-Central Hamilton County, Iowa, 1966-67

Range (miles)	Number	Percent	Cumulative Percent
0.00-0.10	60	40	40
0.11-0.20	47	32	72
0.21-0.30	20	13	85
0.31-0.40	4	3	88
0.41-0.50	5	3	91
0.51-0.60	6	4	95
0.61-0.70	0	0	95
0.71-0.80	4	3	98
0.81-	3	2	100

area. The greatest number of pheasants observed using the grove was 74 on December 31. Most observations of marked pheasants were gathered within the grove and along a lane extending 0.25 mile east (Figure 4). Early morning observations indicated that the flock sometimes roosted in a harvested cornfield 0.4 mile west of Site **A**, but no marked birds were identified there. The mean winter movement of 16 marked pheasants associated with **A** was 0.16 mile; 74 movement records ranged from 0.00 to 0.75 mile (Table 3). Eleven of the 16 marked birds were identified at least three times (in addition to 12 contacts through trapping), two were identified twice following capture and three were observed once. Three pheasants trapped at Site **A** were not observed again.

Trap-Site **B** was located in a shelterbelt composed of boxelder, green ash and mulberry. There was no appreciable herbacious cover, but trimmed branches were piled within the grove. The maximum count of pheasants at Site **B** was 50 on December 21. Nineteen movement

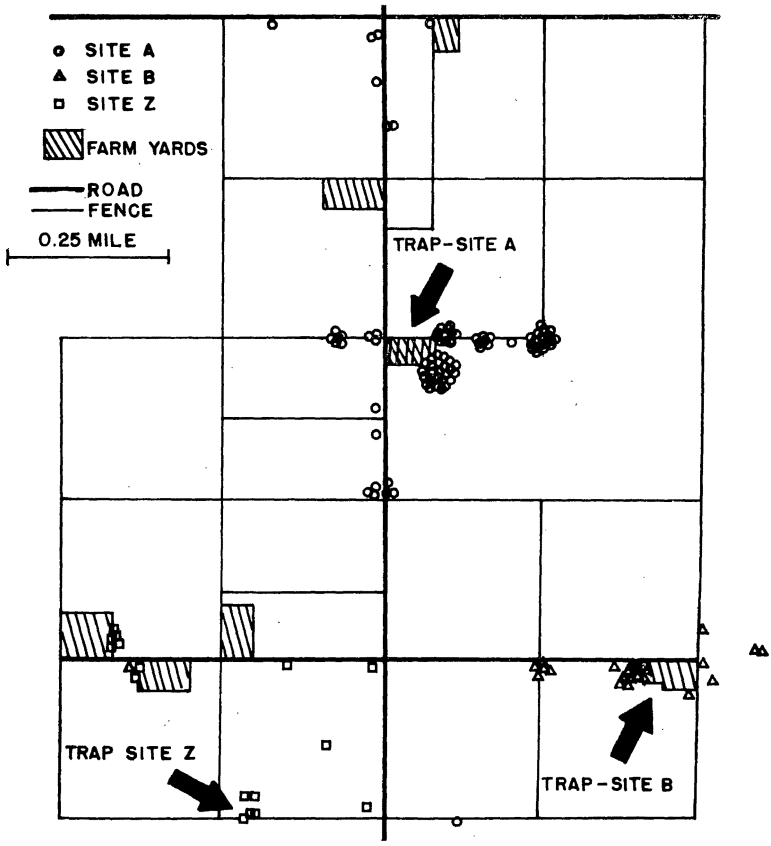

Figure 4. Observations of marked pheasants associated with Trap-Sites A, B and Z, winter 1966-67.

records of five hens averaged 0.15 mile, with records ranging from 0.00 to 0.75 mile (Table 3 and Figure 4). Three hens were identified three, six and 11 times, respectively; two observations were recorded for a cock, and a hen was identified once subsequent to capture.

The Site *Z* flock used at least two farm groves and was also observed in a 40-acre plowed field (Figure 4). The plowed field was bounded on the south and west side by a fencerow containing intermittent stands of giant ragweed. The greatest number of birds seen in the flock was 15 on January 21. The recorded movement of five marked hens averaged 0.25 mile, with distances ranging from 0.15 to 0.50 mile (Table 3). Three hens were identified at least three times each (11 movement records), and one hen was identified twice (one movement record). A hen captured at Site *Z* was subsequently observed twice.

Trap-site E was in a double row of honeysuckle on the west side of a farmstead (Figure 5). The maximum count of pheasants using the shelterbelt was 42 on December 29. Eight movement records of three marked hens averaged 0.26 mile (Table 3 and Figure 5). Two pheasants were identified two and five times, respectively, and one hen was found dead following its release at Site E.

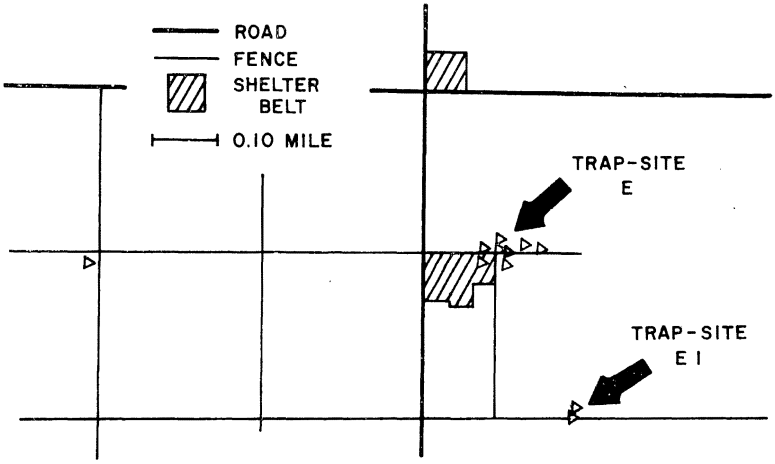

Figure 5. Observations of marked pheasants associated with Trap-Site E, winter, 1966-67.

Three additional winter flocks each contained one marked bird that was identified at least four times. A cock initially observed at Site **B** moved 0.35 mile southwest to a line of boxelders growing in a fencerow. Mean movement following the shift was less than 0.10 mile (nine observations), and individual movements never exceeded 0.20 mile. Another cock, also first identified at Site **B**, moved 0.85 mile to the east-central side of section 19; four subsequent records averaged less than 0.10 mile. A hen released in September was identified in the N.W.¼ N.W.¼ of section 30 on January 19; three movement records averaged 0.22 mile, with three of the four observations coming from opposite sides of a 40-acre field. The last winter observation of the hen in this area was on February 8, but it was re-observed 1.10 miles distant on April 25.

Other marked pheasants were observed less frequently. Twelve movements of nine pheasants averaged 0.20 (Table 3). The movement of these birds was possibly more extensive than indicated since, by virtue of greater mobility, there was less chance of observation.

Shifts in location by wintering pheasants seemed rare. Of 43 pheasants, only eight traveled between shelterbelts. The two cocks initially observed at Site **B** made permanent winter movements of 0.35 and 0.85 mile during January 6-17 and December 21-January 9, respectively.

Two hens captured together at Site **B** moved permanently 0.55 and 0.85 to Site **A** between December 29 and January 8-24. A hen trapped at site E1 moved 0.80 mile southwest between December 30 and January 6, but returned 0.5 mile north to Site **E** by January 10. A hen identified at Site **B** on January 6 and 9 was observed in a shelterbelt 0.75 mile west on January 11; by January 14, the hen had returned to **B**. A cock caputred at Site **A** on February 1 moved 0.55 mile to Site **B** by February 2, but had returned to **A** by February 6. A hen captured at Site **B** on December 29 was identified 1.55 miles south 21 days later; following another observation in this area, the hen was identified at **B** on March 17. Five of the eight movements between wintering areas may be attributed to the effects of capturing and handling, and three of the five pheasants subsequently returned to the area where they were captured. Of eight recorded shifts, only four were permanent.

Some winter shifts were undoubtedly not recorded. Seven of 31 pheasants captured during the winter were never identified again, implying that at least some of the birds moved out of the area. Ten pheasants were identified no more than once. The three marked hens associated with Site **E** were seen regularly from late December to mid-January, but only one observation was recorded after February 1.

Discussion

The winter movements reported in this study are, in general, less extensive than has been found in previous investigations. Lyon (1965) found in central Iowa (on the same study area as the present investigation) during 1961-62 a mean movement of 0.20 mile. However, he believed that movements that year were restricted because of below average temperatures and snow 10 to 18 inches deep. Weston (1954) recorded a mean winter movement of 0.50 mile in northwest Iowa during 1949 and 1950. Grondahl (1953) in north-central Iowa found winter movements averaged 0.39 mile during 1950-51.

Winter movement at distinct wintering areas seemed similar. The movements of pheasants associated with Site **E** seemed slightly greater than at Sites **A** and **B**, but were similar to those of Site ***Z***, and the techniques to determine movement used in this study were probably not precise enough to detect any differences that may have existed.

Once winter concentrations were formed, the flocks seemed to remain in a restricted area. Lyon (1965) observed no movement between wintering areas during the severe winter of 1961-62. Grondahl (1953) found considerable movement between shelterbelts and between shelterbelts and a slough in north-central Iowa during 1950 and 1951; he recorded 19 movements (through trapping) between wintering areas no less than 0.40 mile apart. Lyon (1965) speculates that the proximity of cover areas in north-central Iowa during that period may have

encouraged such movement. Flocks observed in this study were possibly isolated by the amount of fall-plowed land (about 33 percent of the land area) during this study, and movements between distinct shelterbelts may have been discouraged by a lack of travel lane cover.

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