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Variations in Two Spring Indices of Male Pheasant Populations, Story County, Iowa[1]

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The need for rapid indices to determine the spring population trends of ring-necked pheasants, *Phasianus colchicus,* on a statewide basis has resulted in the development of the crowing count (Kimball, 1949) and a male roadside count (Kozicky, 1952). Preliminary evidence (Kozicky, 1952) showed evidence that there was a higher degree of variation in areas of low population as compared to areas of high population (50 or more birds per section). Therefore, the intention of this study was to analyze the inherent variations in these two methods on secondary pheasant range in Iowa and compare them to findings in Winnebago County, our primary pheasant range.

The 14-mile route selected was circuitous and included the section line roads around the rectangle formed by sections 4, 5, 8, 9, 16, and 17, Lafayette Township, Story County, and sections 32 and 33 in Ellsworth Township, Hamilton County. In addition, the roadside count included roads on the north and west sides of section 9 and the west side of section 16.

The topography of the area is flat to gently rolling with the soil being about equally divided between Webster and Clarion types. An intermittent creek, Keigley's Branch, traverses the area diagonally from the northwest to the southeast. An estimate of farming practices indicated that the average 160-acre farm had about 65 acres of corn, 50 acres of oats, 15 acres of pasture, 15 acres of hay, 10 acres of soybeans, and 5 acres of miscellaneous cover types, such as farmsteads, hog lots, roads, etc. These land usage practices compare closely to those of the Winnebago Pheasant Research Area (Kozicky, 1952).

FIELD TECHNIQUES

The crowing counts were taken in accordance with the procedure outlined by Kimball (1949), except a circuitous route was followed to check the influence of the time of day on the crowing count.

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All-weather roads were selected, and the counts were started, after crowing intensity reached a plateau in mid-April, at 40 minutes before sunrise and completed by 25 minutes after sunrise. The stations were approximately one mile apart and were located at mid-section line points, depending on topography, human interference, and other influencing factors. The counts were timed so that a five-minute period of time elapsed between counts. No counts were made when the wind was in excess of eight miles per hour or during periods of precipitation. As a further check on the influence of the time of day on the crowing count, two-minute counts were taken from 1.5 hours before to 2.0 hours after sunrise at five-minute intervals on three mornings.

The male roadside count (Kozicky, 1952) was started 10 minutes after the completion of the crowing count or 35 minutes after sunrise. The car was driven at a speed of 15 miles per hour over a 15-mile route. As a check on the variation exhibited in the observed number of males and females, all pheasants were recorded by sex. If sex identification was doubtful, a 7 x 35 binocular was used as an aid; but it was not used to find pheasants. No effort was made to limit the width of observation or to try to locate a bird where one was seen the previous morning. Inasmuch as the presence of dew has been shown to influence the number of birds observed, roadside counts were made only on those mornings when dew was present. In general, about the same length of time was taken for the roadside and crowing counts, five minutes per mile.

Through winter surveys the State Conservation Commission determined the observed sex ratio for Story County in 1952 as one male to 2.9 females or 34.5 males per 100 females (Nomsen, 1952).

In 1950, the Winnebago County area was estimated to have a pheasant population of 50 birds per section, with an observed sex ratio of one male to 2.9 females; in 1951, 60 birds per section, with an observed sex ratio of one male to 2.5 females (Kozicky, 1952).

CROWING COUNT

The mean crowing count for 12 mornings from April 15 to May 28, 1952, was 14.6 with a standard deviation of 3.25 (Figure 1). The coefficient of variation was 22.2 percent, which is higher than the 19.3 percent found in Winnebago County in 1950 and the 7.6 percent, in 1951. As the sex ratios of pheasant and land usage practices were very similar between the Winnebago and Story County areas (Kozicky, 1952), these limited data indicate that popula-

tion levels may be important in increasing the variability of individual crowing count routes.

The circuitous route with stations number 1 and 2 being the same as numbers 14 and 15, invariably indicated a drop in the crowing count during the 65-minute interval between observations. The mean crowing counts at station number 1 for the 12 mornings dropped from 16.8 to 9.5 calls per two-minute period; station number 2, from 17.2 to 10.2. As a further check on the influence of time on the crowing count, three mornings were spent at one sta-
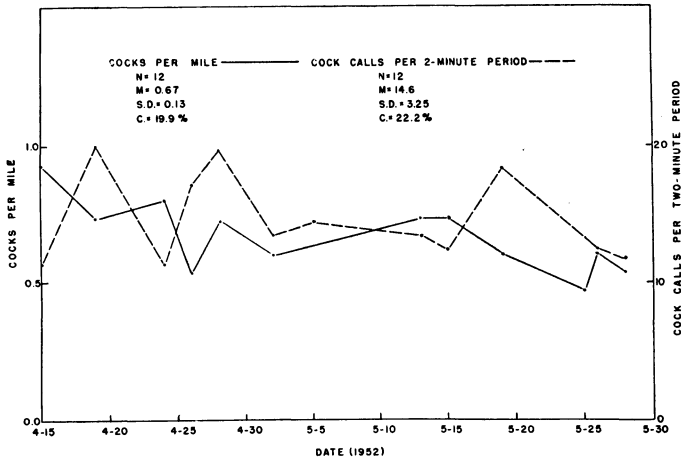

Figure 1. Variations in two indices of male ring-necked pheasant populations over a 15-mile route, Story County, Iowa.
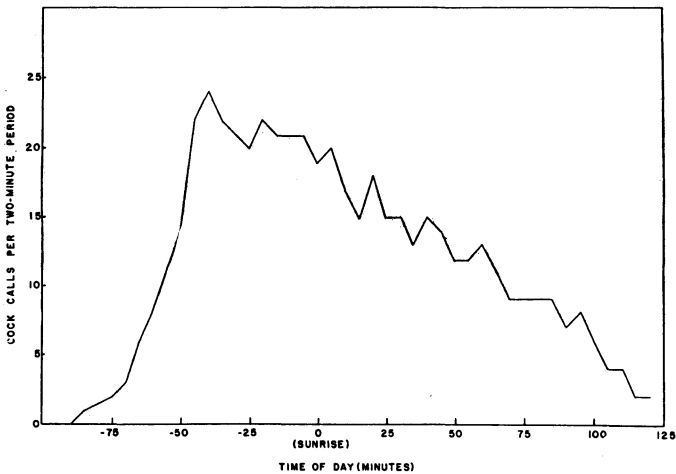

Figure 2. The mean influence of the time of day on the male ring-necked pheasant crowing count at one station on three mornings, Story County, Iowa, May, 1952.

tion from 90 minutes before to 150 minutes after sunrise (figure 2).
Crowing intensity reached a peak about 45 minutes before sunrise
as shown by Kimball (1949) and Taber (1949). No definite trend
of a decrease was noted until after sunrise, when crowing intensity
decreased in a linear fashion until observations were terminated at
about two hours after sunrise. These observations illustrate the im-
portance of proper timing in conducting the crowing count. If the
technique is to be used as an indicator of population trends, it is
essential to conduct the annual crowing count at the same time in
relation to sunrise as well as to the seasonal activities of the bird.

ROADSIDE COUNT

Analysis of the roadside count revealed that the number of ob-
served males for the 12 mornings fluctuated to a lesser degree
(C-19.9 percent) than the females (C-54.3 percent). The mean
number of observed males was 0.67 per mile; females, 0.72, with a
standard deviation of 0.13 for the males and 0.39 for the females.
This sexual difference in the variability of observed birds was also
demonstrated by the work in Winnebago County.

Similarly to the crowing count, the male roadside count showed
a higher degree of variation (19.9 percent) in Story County than in
Winnebago County, 13.1 percent in 1950 and 15.9 percent in 1951.
This again indicates a higher degree of variability for one route in
an area with a low population.

No attempt was made to determine the influence of time on the
roadside count, but general observations (Bennett and Hendrick-
son, 1938) indicate the need to conduct annual counts at the same
time of day.

DISCUSSION

Although we now have limited evidence showing a greater degree
of variation for both the crowing count and male roadside count
at low pheasant population levels (20 birds per section), more
work is still needed. The crowing count assumes that all or a con-
stant proportion of males crow. Taber (1949) in his investigations
on the behavior of the pheasants states, ". . . nonterritorial cocks
. . . were never seen to crow." Of the 29 birds he observed in 1948,
18 were territorial cocks; 8, nonterritorial; and 3, doubtful—a high
rate of non-crowing males. Also, one may speculate about the in-
fluence of changes in the sex ratio of a population, conceivably an
increase or decrease in male competition for females could affect
crowing intensity.

Likewise, the male roadside count needs to be studied with differ-

ent types of topography, population levels, and cover conditions. Observations are facilitated in northern Iowa during the spring by the dearth of available cover. Areas with low populations and dense cover conditions may require a large number of 15 to 20-mile routes to yield positive information.

SUMMARY

1. Analysis was made of the inherent variations of the ring-necked pheasant crowing count and the male roadside count on a 15-mile route in Story County, Iowa, which was estimated to support a spring population of about 20 birds per section with a sex ratio of one male to 2.9 females. This was compared to the route on the Winnebago County area, where the 1950 spring population was estimated to be 50 birds per section with an observed sex ratio of one male to 2.9 females and the 1951 spring population, 60 birds per section with an observed sex ratio of one male to 2.5 females.

2. Both the crowing count and the male roadside count indicated higher coefficients of variation, 22.2 and 19.9 percent, respectively, on the Story County route than they did on the Winnebago County route in 1950 and 1951.

3. If annual crowing counts are not going to be biased by the time of day, it is important to initiate the annual census at the same time of day in relationship to sunrise.

4. More basic studies are needed on the role of nonterritorial cocks and sex ratios on the intensity of pheasant crowing and the role of different cover conditions, topography, and low populations on the male roadside count.

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