AUTUMNAL CHANGES IN SEX-RATIOS IN THE RED-WINGED BLACKBIRD AND THE BROWN-HEADED COWBIRD

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In the autumn of 1968 a sudden increase in the sex-ratio (number of females divided by the total number of males plus females) was noted in the catch of Red-wings (Agelaius phoeniceus) at our decoy trap in Columbus, Ohio. Figure 1 shows the trend for 2193 Red-wings handled during October and November, 1968. The data are grouped by 5-day intervals (6 for the last interval in October). In each interval the total number of females is divided by the total of all Red-wings in that interval. These ratios are plotted on the ordinate (scale at left) against the 5-day intervals on the abscissa. The rise in early November is obvious. The trend is more apparent if the irregularities in the curve are smoothed out. A moving average is used to derive the smooth curve which is shown.

Actually the daily records indicate a sharp transition between November 3 and November 4. The sex-ratio for the period October 1 through November 3 is 6% while for November 4 through November 30 the ratio is 22%. The difference between these ratios is significant ($p < .01$).

To determine whether this phenomenon is unique for the 1968 population or is an annual occurrence we diagramed our data for 1965. Figure 2. presents data for 2015 Red-wings banded in October and November, 1965. The figure is similar in form to Figure 1. The same increase in sex ratio is apparent as in 1968 although not as marked.

In order to determine whether the phenomenon is limited to Red-wings, we considered our data on the Brown-headed Cowbird (Molothrus ater). Figure 3 involves 1562 Cowbirds banded in October and November, 1968 and is in the same form as the others. The abscissa begins with October 21-25 because no Cowbirds were banded in the fall prior to that date. A pronounced increase in the sex-ratio during the period is apparent, so the phenomenon occurs in at least two species.

A pertinent consideration is whether the increase in sex ratio is due to a decrease in male population or an increase in female population or both. The best available indicator of population is the number of birds banded. It is smaller than the actual population, of course, but may generally be regarded as proportional to the population in an area. These numbers banded are tabulated by the same 5-day intervals. The original curves (not shown) have ups and downs that tend to obscure any trend. Accordingly each curve is smoothed twice

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Figure 1. Sex Differences - Red-wings 1968

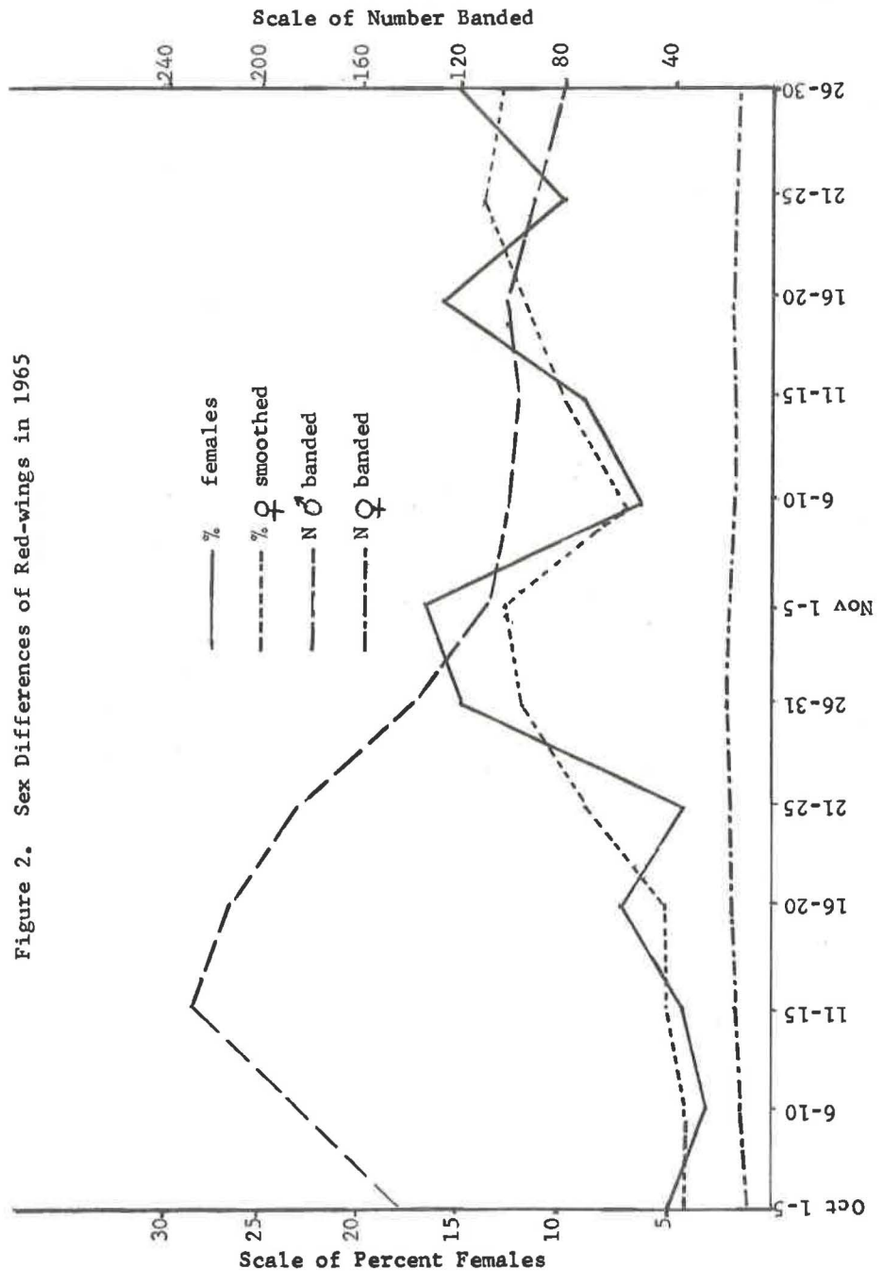
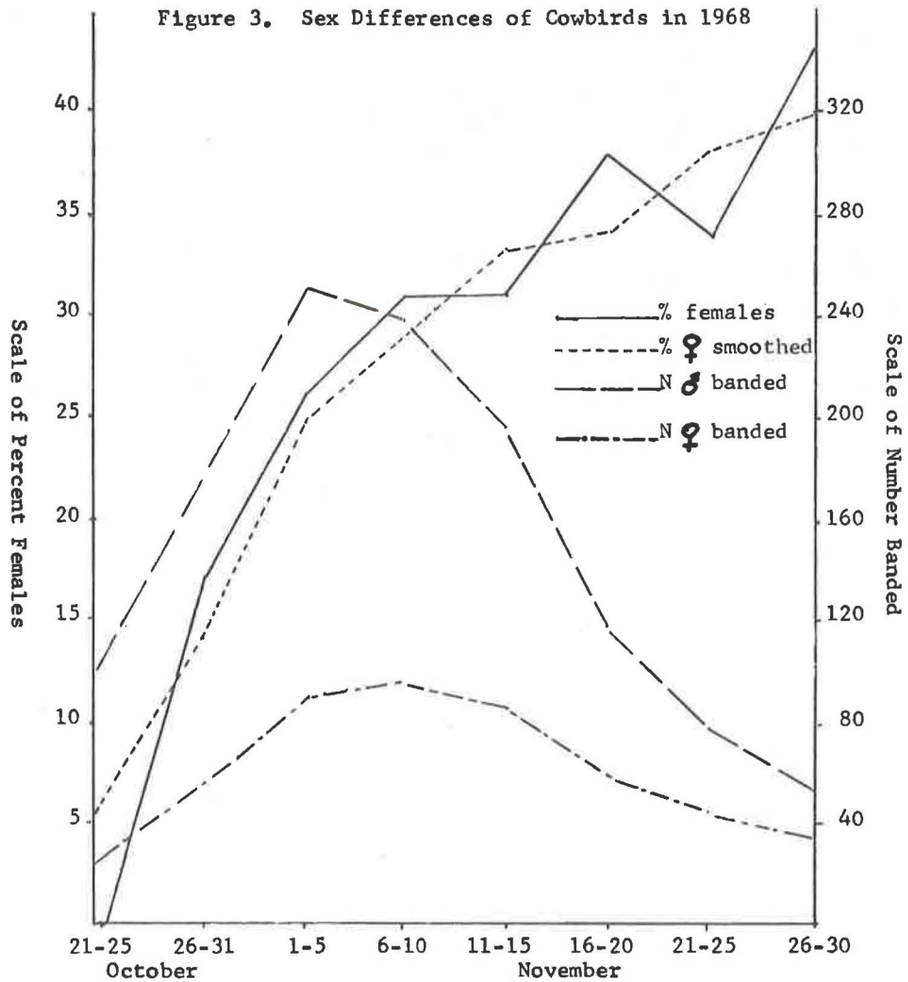


Figure 2. Sex Differences of Red-wings in 1965

using the moving average. These smoothed curves for each sex appear in all three figures (scale at right).

In Figure 1 there is a perceptible decrease in males and a slight increase in females during November. In Figure 2 the male population shows a pronounced decrease through the period while the female changes are comparatively slight. In the case of the Cowbirds (Figure 3) the male population decreases markedly during November.

Figure 3. Sex Differences of Cowbirds in 1968



In all three cases the increase in the sex ratio for both species is accompanied by a decrease in the male population. This concomitance may imply causality.

Incidentally the Lincoln Index (Nunneley) was explored as a basis for population estimate. It proved less satisfactory than the "number banded" as used above. For instance on a day when there are no repeaters the Index gives a population estimate of infinity.

It may be worthwhile to speculate as to the reason for the foregoing population changes although a final answer is not forthcoming at this time. One possibility is that the male population is stable in the early autumn, i.e. comprises mostly resident birds which migrate. It is well known that male Red-wings are seen at their northern breeding grounds before the females (Allen) presumably because the males start on their migration earlier than the females. However, the writers are unaware of any observation that would justify the assumption that male Red-wings depart for their southern wintering grounds before the females.

On the other hand if the local population is unstable and is augmented by migrants from the north to replace some who leave, the make-up of the migrant group may involve fewer males. However this characteristic of the migrant group remains unexplained.

Still another possibility is that the female replacements (migrants) tend to remain in the vicinity for a few days whereas the male replacements get trapped once and then move on. A bird that repeats in the trap obviously is remaining in the vicinity. Actually the number of female Red-wing "repeats" (i.e. re-entries) in November, 1968 divided by the number of females banded in that month is a ratio of .25 whereas the corresponding ratio for male Red-wings is .09. The difference between these ratios is significant ($p < .01$). The situation is similar with the Cowbirds in November, 1968 with the ratio for females .33 and for males .16 and with $p < .01$ for the difference.

The tendency for female Red-wings and Cowbirds to do relatively more repeating at our decoy traps than the males is not merely a November phenomenon. Data (unpublished) on 6606 Red-wings and 3609 Cowbirds banded from July to December 1965 yield a ratio of repeats to number banded of .21 for female Red-wings and .10 for males; for Cowbirds the corresponding ratios are .49 and .21. In both cases the sex difference is significant. ($p < .01$).

Thus the tendency for comparatively more repeating on the part of the female replacements in the autumn may be an essential factor in the change in sex ratio described at the outset. Hopefully someone will secure data on the fall sex ratio for other species and on sex differences in tendency to repeat on the part of those species.

Summary

The catch of Red-winged Blackbirds and Brown-headed Cowbirds in the autumns of 1965 and 1968 indicates an increase in the numbers of females in comparison to the males caught in our decoy traps. The change in sex ratio was accompanied in all cases with a decrease in the numbers of males caught in this season of the year. Our data also shows that there is a greater tendency on the part of the females to repeat than there is on the part of the males.

References

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Nunneley, Sarah A., Analysis of Banding Records of Local Populations of Blue Jays and of Redpolls at Granby, Mass. Bird Banding, 1964,35, 8-22