

## WEIGHT VARIATION OF GREATER REDPOLLS

BY B. M. SHAUB

### INTRODUCTION

During the first week of March 1949, a few redpolls were observed in the garden and lots adjoining 159 Elm Street, Northampton, Massachusetts. The first bird to enter a trap was on March 7 and on the next day several more were captured among which was a bird that was considerably smaller and much lighter in weight. As no report on the weight variations of either of the redpolls appears to have been published it was decided to make a special study of this feature providing a sufficient number of birds would become available and repeat frequently enough to provide a reasonably adequate number of weights. From a review of the literature available this appears to be the initial study of this kind and it should be a challenge to bird-banders everywhere to provide themselves with the few inexpensive pieces of equipment necessary and enter a phase of ornithology within their reach that has only been touched upon.

### METHOD OF RECORDING DATA

Each bird trapped was first banded and weighed and with one exception the following measurements recorded: length of wing, tail, tarsus, bill, also the depth of bill, the total length, and the size of the red patch on the head. The last measurement could only be determined approximately and does not appear to be of any diagnostic value. The color variation of individuals of the large and of the small redpolls appeared to be negligible as was also the variation between the two species. Only one of three rosy-breasted males that were seen was captured. The other birds trapped were females, immature males or males that had not assumed the characteristic male plumage. It appears that a plumage study made in connection with the weights and measurements outlined above would only be significant when made with individuals of known sex. This may not be feasible in connection with a study with live birds of this genus.

The birds were weighed on a laboratory type Toledo scales on which a weight could be repeatedly obtained to a tenth of a gram which is well within the accuracy of the other factors associated with weight determinations. The birds were placed in a cellophane cone; the small end was open but not large enough to allow a bird to pass through. The weight of the cone could be kept at a predetermined value by clipping away cellophane or adding transparent scotch tape. A bird could also be controlled during weighing by wrapping it in a piece of cheese cloth weighing about two or three grams.

### GENERAL BEHAVIOR AND REPEAT PATTERN

There did not appear to be any individuals that were trap-shy and avoided capture. We frequently observed groups of four to eight birds that appeared and after working around the traps, they entered one



It is rather improbable that any of the redpolls banded will ever return or be recovered. If one had avoided taking and weighing repeats, relatively few data of value would have been obtained. Bird-banders are in a most desirable position to record measurement, weights and other data of *live* birds and when sufficient material has been accumulated a statistical analysis should be recorded.

#### VARIATION OF WEIGHTS OF INDIVIDUALS

The range of variation of the weights of the individual birds from day to day, their loss of weight overnight and increase of weight, or the weight of food taken during the day, were not only surprising but greatly exceeded the range envisaged by any of the bird enthusiasts who watched the increasing range of the accumulating data as the birds repeated from time to time. The greatest range for an individual bird, 47-12584, Fig. 2, was from 14.2 to 20.8 grams or the change in weight amounted to 46.5 percent above the minimum. This change occurred over a brief period of 15 days during which the mean temperature was 46.4°F. The precipitation was 0.71 inches of rain one morning as recorded at the official weather observatory at Amherst a distance of about seven miles within the Connecticut Valley and at about the same elevation.

The graphical arrangement of weights of the 37 redpolls, Fig. 2, shows at once that the 344 weights recorded fall into two distinct categories. In the first 32 birds, Greater Redpolls, contribute 338 weights which average 17.8 grams while five birds, Common Redpolls, contribute six weights which average 12.9 grams.

One of the surprising features is the indicated *difference in repeat behavior* of the two species. The Greater Redpolls repeated on an average of 9.6 times per individual while the Common Redpolls repeated only 0.2 times per individual. Restating this behavior on an individual basis, 15.6 percent of the Greater Redpolls did not repeat while 80 percent of the Common Redpolls were not captured the second time. Owing to the small number of individuals involved, the conclusion indicated by the above figures may not be a good criterion to use at this time in classifying differences in behavior of the two species. It does not appear reasonable that these two species, which are so much alike in their other behaviors, should be so different in this respect. In the future some bander will no doubt be favored with having a large flock consisting of both Greater and Common Redpolls and he may find that the repeat behavior described in this instance is accidental and not a usual characteristic.

With few exceptions, the weights most frequently obtained for an individual as No. 47-12575 or 47-12579, Fig. 2, lie comparatively close to the average weight of the bird during its stay. However, the weights most frequently obtained for No. 47-12589 appear more or less as two groups located near the lower and upper limits of the weight range. The reason for this arrangement is clear upon examining the detailed record. The group of repeat weights at the lower part of the range were the first ones obtained soon after the bird's arrival. This bird was the

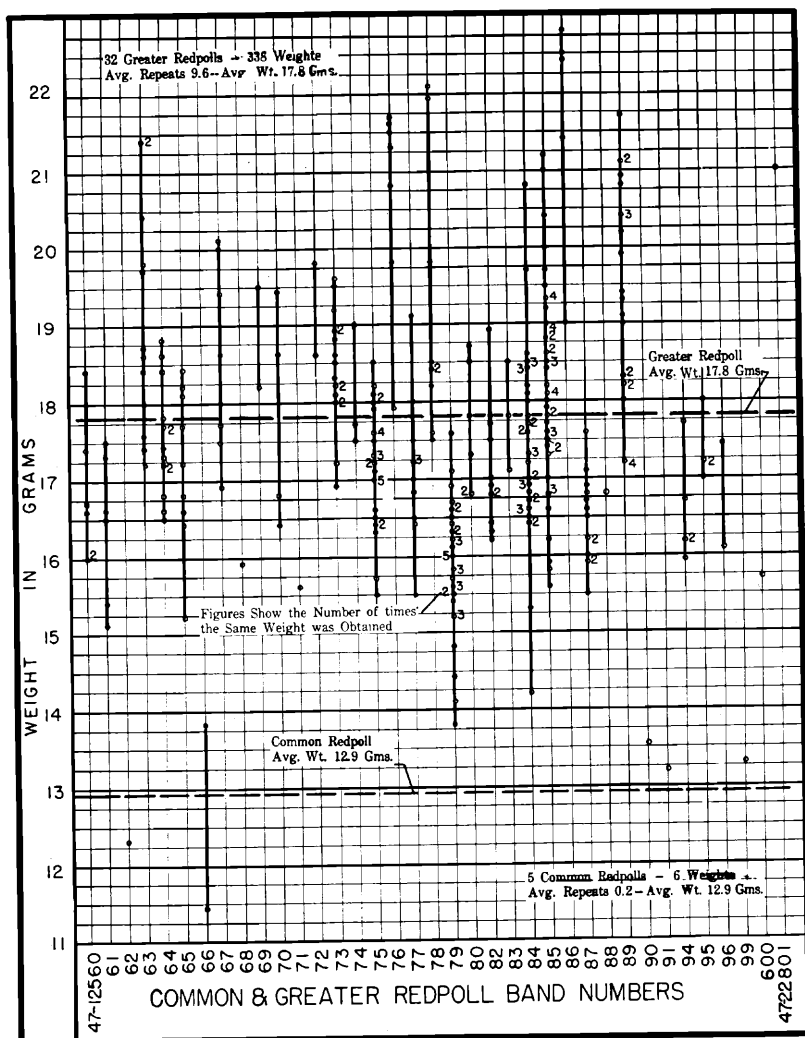


Fig. 2. Chart showing the weights obtained for the Greater and Common Redpolls. Each circle represents a weight and if the same weight were obtained more than once a near-by figure shows the number of times the same weight was recorded.

last of the flock to leave and the upper group of weights were the last to be obtained. Hence, it is quite obvious that the *average weight* of a redpoll during intervals will vary from time to time depending upon the time of the year and especially upon the available supply of food. It appears that the range of such averages may be surprisingly wide and that a single weight of a bird would not be a good classifying characteristic; on the other hand a range of weights would have considerable significance.

DIURNAL OR DAY-TO-DAY WEIGHT VARIATIONS

One may possibly gain some information regarding the hourly and daily weight variations of winter birds in general from the weight record of Greater Redpoll No. 47-12585, Fig. 3. The average weight for this bird for the period March 19 to April 2 inclusive was 18.2 grams. The diurnal variation in weight is indicated to be around 2½ to 3 grams, which is approximately 15 percent of its average weight. The low weights on March 24 to 26 inclusive may be due to the combination of rain and a slightly lower temperature, but a still lower temperature on March 31 did not duplicate in any way the lower weights. Since the weight of most of the birds dropped at this time, the rain on the 23rd seems to be the only factor of an adverse nature to the birds during the period they remained. The highest weight achieved was the last one on the last day of its visit. It is regretted that the bird did not remain long enough to establish an upper range of weights.

It must be obvious from such relatively great changes of weight from day to day during a period of mild winter weather that many birds could not endure long periods of even moderately severe weather if the

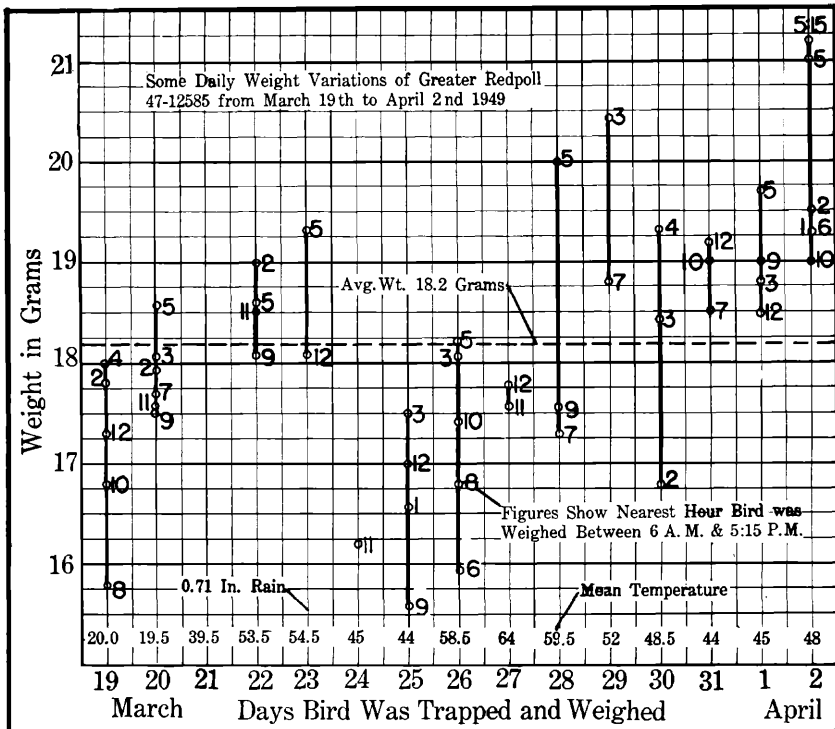


Fig. 3. Chart shows the weight variation of Greater Redpoll No. 47-12585 for a 15-day period.

food supply were very greatly reduced or rendered inaccessible. The crowding of many species of birds at feeding stations during periods when their normal food supply is covered with snow becomes somewhat more understandable.

The data obtained for those birds repeating more than 25 times follow a pattern similar to that given in Fig. 3.

COMPARISON WITH PREVIOUSLY REPORTED DATA

During the Redpoll invasion of 1935-1936 in the vicinity of Worcester, Massachusetts, Wetherbee (1937) caught, weighed, measured and identified 120 redpolls as: 6 Hoary, 32 Greater, 69 Common and 13 "Intermediate" Redpolls. The intermediates were described as possessing combinations of characteristics such as size, length, weight, shape of bill and general coloration, of the Common and Greater Redpolls. Of the 69 classed as Common Redpolls, 16 of these were placed in three groups and considered to be "intergrades" between the Hoary, Common and Intermediates.

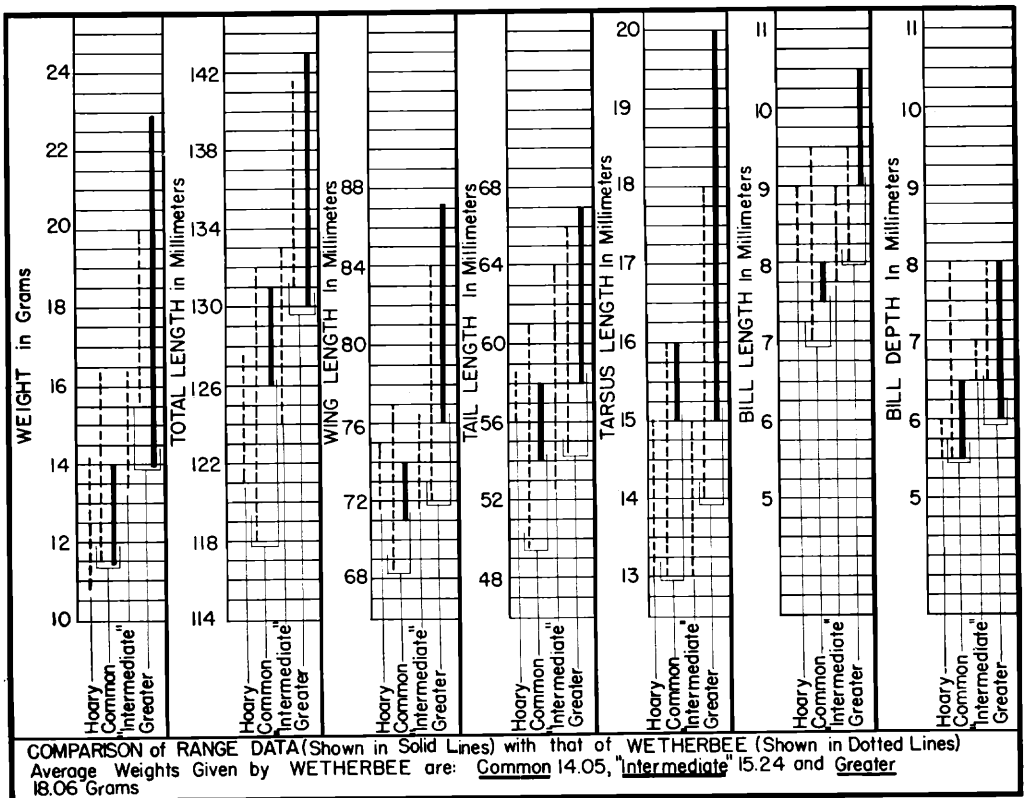


Fig. 4. Comparison chart of weight and measurement ranges of the Redpolls described in this study with those described by Wetherbee.

The comparison of our data with the tabulated data of Weatherbee is shown in Fig. 4. She states (p. 9) that the placing of "irregular intergrades—in the common class accounts for the wide variation of color and also measurements and weights." This situation is brought out clearly in the plot of her data on the comparison diagram.

The separation of the 37 individuals we trapped fell naturally into two categories—that of the Greater Redpoll and of the Common Redpoll. The coloring was so uniform among the four to eight individuals examined from time to time together in the gathering cage that no separation into intermediates or other groups could logically be made on the basis of coloration. There was never a question as to which species a bird belonged as soon as it was measured and weighed.

The writer wishes to express his appreciation to Edwin A. Mason and Samuel A. Eliot, Jr., for many helpful suggestions during the progress of banding and weighing. Mrs. Shaub also contributed many hours collecting data without which the full development of the study would have been impossible.

#### SUMMARY

This study on the variation of weights of redpolls is a natural sequence to banding a group of birds which normally would be banded, released, and left to the realm of chance for further scientific information. The birds appeared at the banding station for a brief period of 35 days. Small groups of individuals seemed to remain from a day to about two weeks, a few stayed longer.

The 37 individuals as shown by their weights and other measurements consisted of 32 Greater Redpolls and 5 Common Redpolls. The average weight of the former was 17.8 grams having a range from 13.8 to 22.8 grams while the latter averaged 12.9 grams and had a range from 11.4 to 13.8 grams. The greatest range of weight for an individual was from 14.2 to 20.8 grams. A single bird was weighed 50 times within a period of 15 days. From the weights obtained it appears that the daily variation of a Greater Redpoll during mild winter weather is of the order of  $2\frac{1}{2}$  to 3 grams. The graphical representation of the weights and other measurements shows clearly that only two species were represented and that there were no birds which had measurable characters of intermediate proportions.

*159 Elm Street, Northampton, Massachusetts.*

#### LITERATURE CITED

WETHERBEE, OLIVE PIKE

1937. A Study of Wintering Hoary, Common and Greater Redpolls, and various Intermediates and Hybrids. *Bird-Banding*, Vol. VIII, pp. 1-10.