

DATA GATHERED FROM THE REDPOLL FLIGHT OF 1966

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Introduction

In a recent issue of *The Kingbird* (1), regional editors described what was an outstanding 1966 winter influx of redpolls in New York State. Similarly *Audubon Field Notes* (2) described this flight on a continental basis. Large winter flights offer unique opportunities to study irregular, nomadic species from the North and it seems advisable to gather as much banding data as possible to augment published field notes, and possibly to establish differences in the flights from year to year. This paper deals mainly with the Common Redpoll (*Acanthis flammea flammea*) as observed at a banding station in Niskayuna, a suburb of Schenectady, New York, during February to April, 1966 with special attention devoted to the weekend of March 19-20, 1966.

Description of Banding Station

The banding station consisted of the confines of a backyard encompassing about 50 by 75 feet and bordered on three sides by similar yards in a well wooded, residential area which for the most part was developed 15-25 years ago. Hardwoods, shrubs and some conifers abound, as do numerous bird feeders on the typical 75 by 125-foot housing lot. However, of chief concern to the Common Redpolls, Pine Siskins (*Spinus pinus*) and American Goldfinches (*Spinus tristis*) found in this area in winter is the grey birch (*Betula populifolia*) on which these birds feed. In the yard and the ten or so in sight from it, there are about 50 or more grey birches. Several feeders in the yard were constantly stocked with suet, sunflower seed and cracked corn. During January and most of February, banding was strictly a weekend pursuit. By the fourth week of February, there was sufficient light and bird activity before 0730, when I left for work, to allow capturing birds. Up to the first week of March, almost all capturing was done with three traps. During the second and third weeks of March, three traps, three 12-meter and two six-meter Japanese mist nets were used. After that time, nets were used almost entirely. Over 95 percent of the redpolls banded were netted. After about the first week of April there was sufficient light after work (1645) to allow evening banding. Within these dates and times, birds were banded at every opportunity, weather permitting, until mid-May.

Scope of the Winter Finch Flight

For comparative purposes, Table I gives a summary, by ten-day periods, of the numbers of winter finches banded.

Briefly, these banding results quantitatively verified observations at the

Table I
Winter Finch Banding Totals, 1966

Date	AGF	PS	EG	CRP	HRP	PF
Jan. 1-10 (2).....	4		2			
11-20 (1).....	9		16			
21-31 (2).....	4		56			
Feb. 1-10 (1).....	22	10	106			
11-20 (2).....	2	4	47			
21-28 (1).....	1	2	58	1		
Mar. 1-10 (1).....	12	2	—	26		
11-20 (2).....	53	6	37	286	1	
21-31 (1).....	4	—	2	29		
Apr. 1-10 (2).....	3	1	3	4		
11-20 (1).....	10	3	38			3
21-30 (1.5).....	27	18	16			1
May 1-10 (1.5).....	25	10	33			22
11-20 (1).....	13	7	12			9
Total.....	189	63	426	346	1	35

The numbers in parentheses beside the dates represent the number of weekends in that period. Abbreviations used: AGF, American Goldfinch; PS, Pine Siskin; EG, Evening Grosbeak; CRP, Common Redpoll; HRP, Hoary Redpoll; PF, Purple Finch.

feeder. In early February there was a marked influx of goldfinches, siskins and grosbeaks. The grosbeaks were present in numbers up to 50-70 birds at one time and dominated the scene. A 17-18-inch snow storm on February 25 caused a very rapid decrease in their number and with this exodus the goldfinches returned to the feeders. Grosbeaks were not common again until mid-April and lingered well into May. After the initial influx of siskins, the number of new siskins banded was unimpressive; however, many of the banded birds were continually recaptured. They became common in late April and early May. There were no Purple Finches at the feeder during most of the season.

By comparison, in 1965 the banding totals for the same period were: AGF, 107; PS, 0; EG, 0; CRP, 0; HRP, 0; PF, 303; and in 1964: AGF, 177; PS, 134; EG, 176; CRP, 1; HRP, 0; PF, 2. These figures are not directly comparable to those in Table I, because improved traps and trapping methods resulted in greater capture in 1966 over 1964. However, the trends, i.e., Evening Grosbeaks were more common in 1966 than 1964, are valid. To say the grosbeaks were two to three times more common, however, would be grossly misleading.

Redpoll Occurrence

Common Redpolls were first heard in flight over the yard in early to mid-January. Apparently an abundance of food elsewhere satisfied the birds and none was seen feeding in the immediate area. On February 27, the first redpoll appeared at the feeder and was captured for banding. After that, their numbers increased gradually and by mid-March redpolls

were common, and getting more numerous in the birches, but were uncommon at the feeder. On the weekend of March 19-20, 1966 a heavy concentration of redpolls combined with proper snow conditions brought hordes of redpolls into the yard. Observation of the birds' feeding habits confirmed what was noted to a very limited extent in 1964 when the first redpolls were seen in the yard on March 19, maximum numbers were 25-30, and only one bird was banded. In both 1964 and 1966, the big attraction to the redpolls at this particular time of March was the winter's collection of seeds beneath the birch trees on the bare ground exposed by the newly melted snow. Very few redpolls fed in the birches when the ground first became bare. They also ate cracked corn on the ground and crushed sunflower seed at the feeders, but their primary concern was the concentration of birch seeds.

The Weekend of March 19-20, 1966

On the weekend of March 19-20, one Hoary Redpoll (*Acanthis hornemanni*) and 271 Common Redpolls were banded in an unforgettable fashion. The flocking of the redpolls to the ground to feed coupled with their attraction to the calls of redpolls already in a net led to the capture of large numbers.

It began at 0830 on March 19. The nets, but no traps, had been in place as of 0700. Perhaps four or five redpolls were in the yard feeding when one caught in a net. I watched disbelievingly as redpolls, answering the captive's calls, poured into the yard. Many hit the nets, some bounced off and gave another try. A great number scurried about the ground feeding. At 0845 redpolls continued to come, but I had to start emptying nets. Birds continued to hit the nets as I worked. In 20 minutes I had removed 56 redpolls and began banding, measuring, weighing and noting plumages. At 1010 I went out to remove another 30 newly netted redpolls and this took ten minutes. By 1045, the last of the 0845 group was released. At 1130 the last of the 1010 group was released. Shortly after, another group arrived and at 1200 I began removing 68 redpolls. These were processed by 1400. At 1440 another group came and I had 18 more to band. The day's total was 174 Common Redpolls.

On March 20 the nets were in place shortly after 0730. At 0830 there were two redpolls in the yard. Shortly before 0900, a redpoll caught in a net. The birds came more numerous than ever. There were redpolls everywhere—on the ground, trees, shrubs, fence, net and in the net. The feeling of excitement inspired by this huge influx of birds is beyond description. I telephoned for help and waited. Although the nets had lost much of their slack and did not capture many of the new comers, I wanted to let one of these "redpoll storms" take its course. On the previous day I had gone out during the height of some of these influxes and in so doing had scared off some of the birds. Since I was going to have help any minute, I could let one of the "storms" spend itself. This one did in

about 20 minutes. When the nets were emptied, 91 redpolls had been removed! By noon these birds were processed and released and only a few more redpolls were captured to give a total of 98. Of interest was the opportunity to examine such a large number of redpolls and see the variations in them.

The week following, redpolls were still numerous, but I dared not get too involved for fear I would not get to work. By the following weekend the birds were decidedly less numerous, apparently scattered far and wide to feed. The last redpoll was banded on April 9 and very shortly thereafter they became quite scarce.

Data Collected

Of the 347 redpolls banded, the wings of 334 were measured, and of these 334, 325 birds were weighed. Weight data were correlated with the time of capture. The 334 birds were inspected for fat and their plumage noted. All data were treated according to plumage, the birds being separated into three groups: 1) birds with no rose (NR) in their plumage, 2) birds with only a hint or slight wash of rose (HR) either on the cheek or upper breast, and 3) birds that were distinctly rosy (R) on the cheek and upper breast. Records of repeat captures of these banded birds were also kept.

Wing Chord Data

Table II and Figures Ia and Ib represent the wing chord measurements of 333 redpolls (hoary excluded). These were taken on the unflattened wing using a steel millimeter ruler read to the nearest millimeter.

TABLE II
Wing Chord Distribution

Plumage	Wing Chord, mm.																Ave.	SD	Mean
	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82				
NR	5	10	43	33	38	40	29	12	4	3	5	—	3	1		71.4	2.5	72	
HR		1	3	4	9	7	12	3	—	—	1					72.9	1.7	73	
R					7	6	12	20	12	3	3	1	2	—	1	75.1	2.0	75	
Total	5	11	46	37	54	53	53	35	16	6	9	1	5	1	1	72.9	2.3	73	

Roberts (3) claims that male redpolls acquire the pink of the underparts with the first postnuptial molt. Forbush (4) describes the first nuptial plumage as resembling that of the female, but with some trace of pink. Therefore those birds which are distinctly rosy (R) are adult males in their third calendar year and those with a hint of rose (HR) are subadult males. The remainder, those birds with no rose (NR), are

Figures Ia and Ib

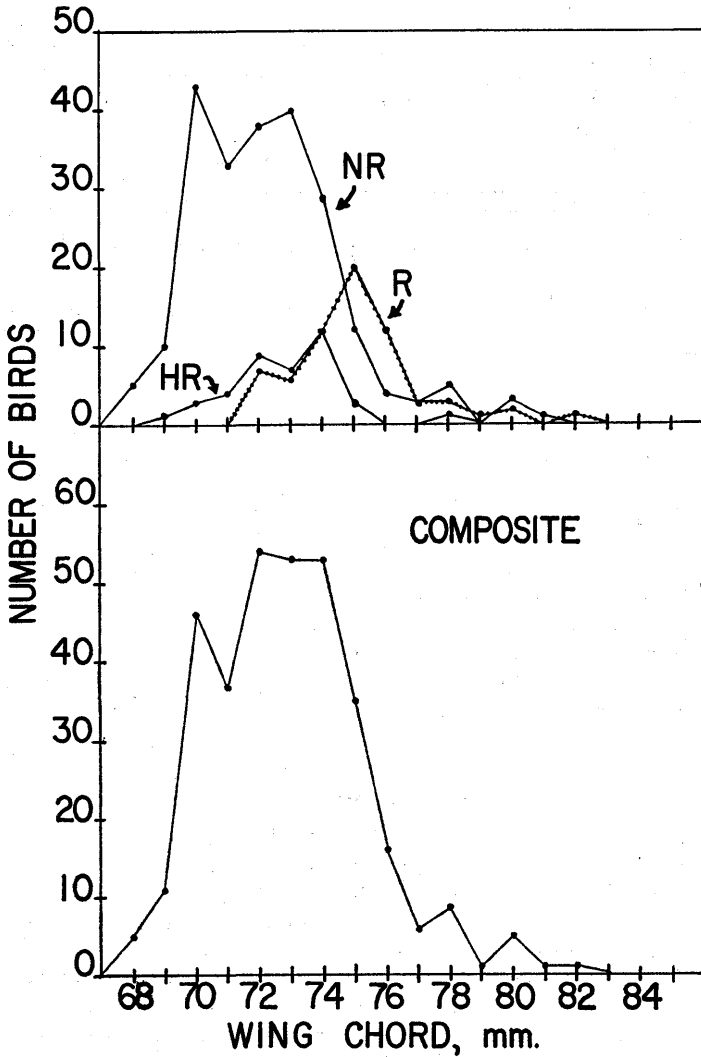


Figure Ia—Distribution of wing chord measurements according to the amount of rose in the plumage. Data for period of February 27 to April 9, 1966.

Figure Ib—Distribution of wing chord measurements for the entire Common Redpoll population banded from February 27 to April 9, 1966.

probably mostly females of all ages, but may also include some males, as indicated by Forbush.

The adult males averaged largest of the three groups and had a fairly uniform distribution. The subadult male group had a less uniform distribution favoring smaller birds. This might be expected for young birds, as the time of hatching and therefore the length of the growing period would vary and affect the hardiness and size of the young approaching their first winter. The widest spread and smallest average was found with the birds with no rose in their plumage. The irregular nature of the distribution curve suggests the existence of a group of subadult females peaking at 70 mm. and adult females peaking at 72-73 mm. The occurrence of several birds at the high end of the scale suggests the possibility of a race of larger size within the population. More data would be needed to confirm this.

Weight Data

Birds were weighed after banding on an Ohaus triple beam balance reading to 0.1 g. and estimated to 0.05 g. While being weighed, the birds were held quietly in a ventilated polyethylene bag. On the balance arm was a tare weight adjusted to the weight of the bag. Weights were recorded according to the time of capture when the birds stopped feeding. During their captivity, which in some cases lasted one to three hours, the birds were held in open ventilated cages where they had freedom of movement. The holding of these birds, therefore, gives slightly erroneous weights especially at times when large numbers were captured and held. Weights of the unbanded birds may be obtained by subtracting the average weight of a Fish and Wildlife Service band, size 0, i.e., 0.062 g., from the tallied weights.

As a whole, the weight data are difficult to treat. For this reason, the only serious treatment was given to data gathered on March 19 and 20. The averaging of weight data spanning considerable time requires extremely large data samples to be able to eliminate unwanted effects of weather, changes in sunrise, etc. Large samples are also needed to insure adequate sampling at all times of day. Even the data collected on March 19 and 20 suffer from inadequate sampling at certain times of day. Table III gives a brief treatment of the entire data and Table IV treats the data of March 19 and 20. The data from Table IV are plotted in Figures IIa and IIb.

The data in Table III are grouped over rather broad time intervals and therefore are not very specific. They do show, however, that rosy birds average heavier at all times indicated, and they gain weight more rapidly than the rest of the population. Table IV similarly shows this relationship. In plotting the data from Table IV in Figures IIa and b, two points involving only four individuals in the R and NR samples are very questionable, and all the HR data lack sufficient sampling. They are

Table III
Weight Data for All Dates, Feb. 27 to Apr. 9

Plumage	Weight, g., at Specified Time			Percent Change
	0700-0915	1000-1200	Beyond 1200	
NR	13.21/119	13.66/38	13.73/68	+3.41
HR	13.30/16	14.00/23	—	+5.26
R	13.58/39	14.65/31	—	+7.88

Subscript numbers under the slash in these Tables indicate the number of birds in the sample.

Table IV
Weight Data for Mar. 19-20

Plumage	Weight, g., at Specified Time					
	0845	0915	1010	1045	1200	1440
NR	12.95/42	13.50/58	13.27/19	14.39/4	13.72/50	13.65/14
HR	12.60/4	13.47/9	13.23/3	—	14.40/9	—
R	13.11/10	13.61/21	14.15/6	—	14.45/15	16.54/4
Total	12.95/56	13.52/88	13.46/28	14.39/4	13.93/74	14.27/18

included in order to be among the data making up the composite weight graph.

Table IV and Figure IIb shows an average weight change for the entire population of about ten percent from early mid-morning to mid-afternoon. A lack of sufficient early morning (0700) data when birds are beginning to feed, and late afternoon (1600) data just before roosting, prevents an accurate calculation of the full extent of the daily weight gain.

The weight of these redpolls over the entire banding period varied from 11.30 to 19.90 g. Within individual groups, the adult males (R) varied from 11.85 g. at 0845 on March 19 to 19.70 g. at 1440 on March 20; subadult males (HR) from 11.60 g. at 0845 on March 19 to 16.20 g. at 1200 on March 20; and the remainder (NR) from 11.30 at 1200 on March 19 to 19.90 g. at 1200 on March 19. As in the case with the wing chord measurements, the birds with no rose had the greatest range of values.

A plot of weight distribution was made by segregating weights within one-gram ranges. These are given in Table V and Figure III. Under the headings "11-12", etc. are the numbers of birds weighing 11.01 to 12.00 g., etc.

Figures IIa and IIb

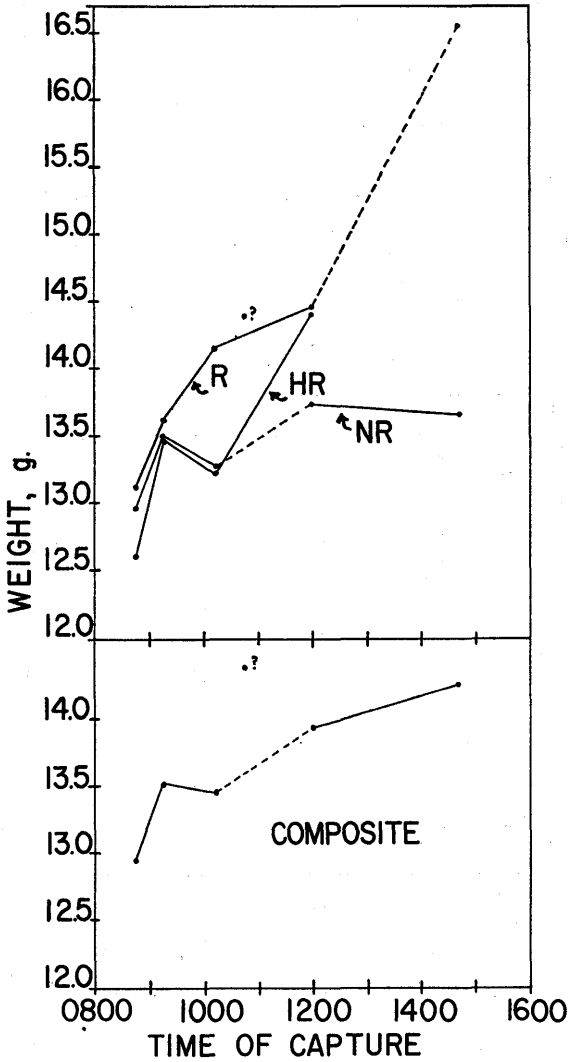


Figure IIa—Weight versus time of capture for the Common Redpolls captured on March 19-20, 1966. Weights separated according to the amount of rose in the plumage.

Figure IIb—Weight versus time of capture for the Common Redpolls captured on March 19-20, 1966. Data for all plumages collected into one graph.

Table V
Weight Data Distribution

Plumage	Number of Birds in Given Weight Range, g.								
	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20
NR	26	69	47	22	7	7	4	4	1
HR	1	8	9	4	2	1			
R	1	11	25	10	4	2	2	-	1
Total	28	88	81	36	13	10	6	4	2

Fat Deposition

Visible fat deposits were looked for in the area of the furculum, lower abdomen and axilla, and assessed in terms of "0, 1, 2, 3" as recommended by the Bird Banding Office (5) with one exception. One additional fat class (FC), called $\frac{1}{2}$, was used and fat class "1" modified. While fat class 0 indicates "fat not readily visible anywhere" and fat class 1 means "fat visible in furculum but does not fill it; small amounts present in other areas," fat class $\frac{1}{2}$ and 1 as used here are defined as follows. Fat class $\frac{1}{2}$ indicates small amounts of fat in furculum and abdomen, and small amount or none in the axilla; while fat class 1 means furculum half to nearly full and at least some fat in both the two other areas.

Among the group of 333 Common Redpolls that were fat classed, six birds were FC $\frac{1}{2}$, six were FC1 and two were FC2. The remainder were FC0. One bird in each fat class, other than 0, was a rosy plumaged individual and the remainder had no rose. The birds with the most visible fat were not the heaviest. The heaviest birds were those with the longer ($>$ or $=$ 78 mm.) wing measurements as shown in Table VI.

Table VI
Birds Fatter Than FC0

Plumage	FC $\frac{1}{2}$		FC1		FC2	
	W., mm.	Wt., g.	W., mm.	Wt., g.	W., mm.	Wt., g.
NR	75	14.15	79	19.70	74	17.65
NR	71	13.20	80	19.90	72	17.35
NR	72	14.10	76	17.20		
NR	68	13.50	74	14.10		
NR	78	18.45	73	14.00		
NR			70	12.85		
Average	72.8	14.73	75.7	16.29	73	17.50

Figures IIIa and IIIb

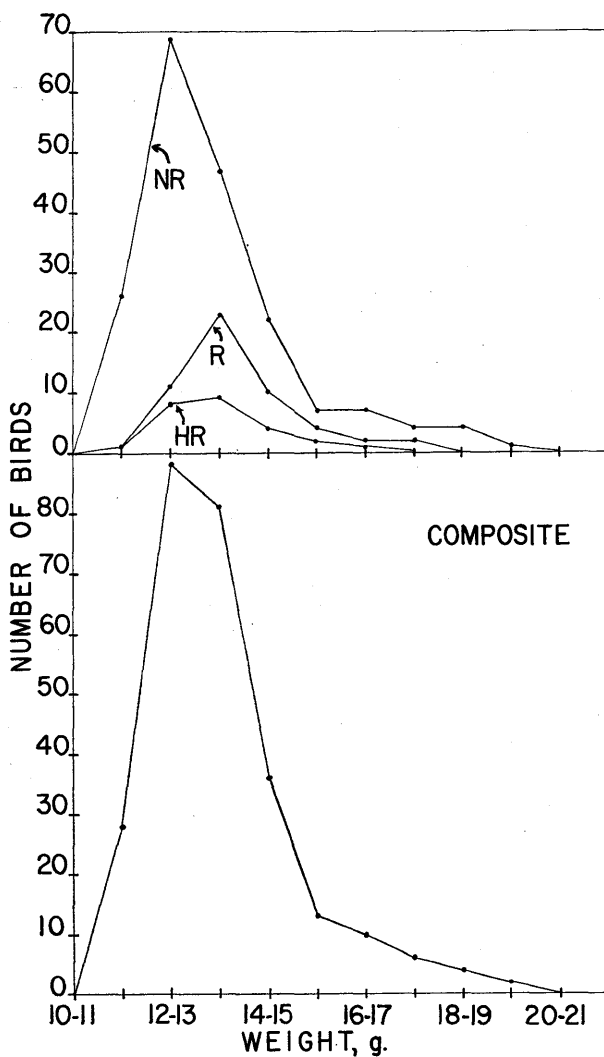


Figure IIIa—Distribution of weights by one-g. intervals according to the amount of rose in the plumage for those birds captured on March 19-20, 1966.

Figure IIIb—Distribution of weights by one-g. intervals for the entire population banded on March 19-20, 1966.

Population Composition

As already mentioned, data were segregated into three classes according to the amount of rose in the plumage. Table VII indicates the number of birds in each class for the entire banding season, as well as for the weekend of March 19-20. At least one-third of the population was male and at least one-fifth was adult male. No attempt was made to distinguish the plumage differences among the class of birds having no rose. Forbush indicates that some apparently male redpolls fall into this class lacking any rose. It is reasonable to expect that a considerable number of subadult males may also lack rose, thus giving rise to the greater population of adult males versus subadult males. The exact significance of this ratio of two-thirds of the birds with no rose and one-third with some rose is not known.

Table VII
Population Composition

	NR	HR	R	Total
1) Number (2/27 to 4/9).....	226	40	67	333
Percent.....	67.9	12.0	20.1	100.0
2) Number (3/19 and 3/20).....	188	25	56	269
Percent.....	69.9	9.3	20.8	100.0

Repeat Captures

Only five of the banded redpolls were recaptured during the banding period. No changes in fat class were observed. The results are in Table VIII. The paucity of repeat captures, compared to their occurrence with siskins and goldfinches, testifies to the wandering nature of these flocks of redpolls. The recapture three weeks later of the first redpoll banded, and another bird five days after banding indicates that at least some of the birds remained in the area for some time.

Table VIII
Repeat Captures

Date of Banding	Time	Wt., g.	Plumage	Date of recapture	Time	Wt., g.	Percent Change*
Feb. 27	0900	14.53	R	Mar. 19	1300	15.00	+3.23
Mar. 5	1315	14.05	NR	Mar. 10	0700	12.20	+23.4
Mar. 19	0845	12.10	NR	Mar. 20	0945	11.45	-5.37
Mar. 19	0845	12.00	HR	Mar. 19	1200	12.10	+1.54
Mar. 19	1010	13.00	NR	Mar. 19	1130	12.80	-0.83

* Percent change was based on the time of day, i.e., the percent change from early weight to later weight regardless of date.

Holboell's—Greater—Hoary Redpoll

The A.O.U. *Check-list* (6) states, "The validity of this race (*Holboell's* Redpoll, *Acanthis flammea holboellii*) is uncertain from present information; possibly it is not separable from *A.f.flammea*." Bull (7) claims *holboellii* to be "merely an individual variant of nominate *flammea*." Regardless of the status of recognition of this form, it is interesting to note that on March 19 two redpolls, and on March 20 one redpoll with bills matching Forbush's description of *holboellii* were examined and banded. The first bird, caught at 1010, was large and bulky to handle, quite brownish, with head and cheeks buffy, an iridescent orange, rather than crimson crown, and no rose on the breast. The bill was large measuring 10 mm., but more significant was the taper of the sides of the bill as viewed from above. Forbush describes *holboellii* as having straight sides to the bill. This bird had straight tapers to the sides of the bill, whereas the typical *flammea* has a pronounced concave taper. This bird weighed 18.00 g. at FC0 and had a wing measuring 78 mm. The second similar bird was caught at 1200, weighed 17.05 g., FC0, and its wing measured 80 mm. It was a big bird with a rosy breast, the more usual crimson crown patch, and a very straight taper to the bill. The third bird was caught at 0915 on March 20 and had no rose, a crimson crown patch, was bulky and weighed 18.70 g. at FC0. Its wing measured 81 mm. and bill 10 mm. Again the straight taper of the bill was prominent. In general all three of these birds, beside having straight bill tapers and being large-sized, were grossly and diffusely marked especially in the streaking of the flank, side and upper breast. Others among the large, heavy segment of the population had markedly concave tapers to the sides of the bill.

According to Forbush, the Greater Redpoll (*Acanthis flammea rostrata*) is characterized by "large size and relatively thicker, shorter more obtuse bill; also rather darker and browner with dusky stripes on sides and flanks usually heavier and broader." Similarly the Hoary Redpoll (*Acanthis hornemanni*) is described as having a "small, short conic" bill. The hoary caught at 0915 on March 20 indeed had a stubby bill measuring 7.8 mm. It weighed 13.30 g. at FC0 and the wing measured 73 mm. The bird had no rose, the upper breast streaking was delicate and faint, the rump was white and *unstreaked* and the bird generally pale, but not as pale as expected from various bird plates. This Hoary Redpoll was the only stubby-billed redpoll in the group, indicating the absence of any Greater Redpolls.

Several days later in Pittsburgh I examined the Carnegie Museum's series of redpoll skins. No specimens were labeled *holboellii*. Some, but not all, of the specimens labeled *rostrata* had stubby bills similar to *hornemanni* and confirmed the impression that none of the large birds banded resembled the obtuse-billed form known as *rostrata*. Seeing the series of *hornemanni* confirmed the identity of the banded Hoary Red-

poll. It was interesting to see that some of the *hornemanni* had pinkish rumps rather than white rumps, which nonetheless were *unstreaked*.

Careful study of redpolls caught by banders fortunate to have them in numbers could help resolve the redpoll problem. Beside plumage notes and wing measurements, bill measurements and shape should be recorded.

Acknowledgements

I want to thank David Stoner for his help on March 20, 1966 in processing the day's catch. This was of great help to one who was weary from sitting at the balance and note pad from the previous day. In addition, his mere presence offered peace of mind every time I thought about what I would do if my gathering cages filled and another redpoll "cloud" appeared.

Thanks are also due Dr. M. Graham Netting for permission to use the Carnegie Museum collection and to Dr. Mary A. Heimerdinger for assistance in using the collection.

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JANUARY 1967 WATERFOWL CENSUS DATE

The Federation's annual waterfowl census will be taken January 14-22, 1967. It is hoped that Member Clubs will schedule this as a club event. If the weather is good, as many areas as possible should be covered on Sunday, January 15. In case of bad weather, January 22 is the preferred alternate. If neither is possible for your club, the census may be taken at any time within the period. Please send the report, giving date census was taken, area covered, and numbers of each species of waterfowl seen, to John L. Mitchell, 345 Conrad Drive, Rochester, N.Y. 14616, who will compile the summary and the comparison with the Conservation Department's aerial census for publication in the *Kingbird*.