NESTING HABITS OF THE COMMON REDPOLL [1]

BY LAWRENCE I. GRINNELL

IN June and July, 1940, I visited Churchill, Manitoba, with Ralph S. Palmer, to study and photograph nesting birds. "Churchill stands at the junction of two life zones. It is precisely at the limit of tree growth, where the spruce forest dies out on the arctic tundra and both types of biological association are in contact. The country south of the townsite is bare, mossy tundra. . . . Fronds of juniper, crowberry, and lowly willow . . . compose the principal shrubby elements of the flora. Dwarf spruces . . . stand widely scattered or grouped. . . . Inland, the trees increase in number and in size, especially on warm, well drained declivities and along the river, where the bush is more or less continuous" (Taverner and Sutton 1934:8). Between June 2 and July 22, I made a detailed study of the nesting habits of the Common

Figure 1. Observation and photographic blind on platform placed near Redpoll nest. Churchill, Manitoba.

Redpoll (*Acanthis l. linaria*). The study was concentrated mainly within a mile radius of camp (two small cabins situated two miles southeast of Churchill), but several trips in search of Redpolls were made further afield, the whole study area extending from a point near

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the grain elevator in Churchill five miles eastward to the Gravel Pit, the highest elevation (about 100 feet) in the neighborhood. We made detailed observations, mostly from blinds, on three female Redpolls with eggs or nestlings, on 17 days, for a total of 46 hours, including all hours of the day from 3 A.M. to midnight: one nest between June 10 and 17, a second between July 10 and 20, and a third between July 17 and 21.

Pre-nesting Redpolls

From June 2, when we first recorded Redpolls, to June 10, we saw Redpolls daily but not abundantly: several solitary birds, a few pairs, an occasional flock of seven or less. In town they were usually perched on the top branches of the still bare dwarf willows (3 to 6 feet in height), or feeding on the ground near houses. Out near camp, during this period, Redpolls were more numerous among the thin lines or small clumps of dwarf Black Spruces than among the willows fringing the ponds of the open tundra. When perching they generally occupied a conspicuous position, 6 to 10 feet up, on a spruce top or on the tip of a prominent branch. A favorite feeding place was on the ground, just below the ridge of Churchill's water pipe-line, on its lee (south) side, where they fed on dry grass seeds. They were often in more or less close association with Tree, White-crowned, Gambel's and Savannah Sparrows, and Horned Larks. We recorded fewer Hoary Redpolls (*Acanthis hornemanni exilipes*) than Common Redpolls (about one Hoary to every 25 Common). In 1931, Taverner and Sutton (1934:73) found the two forms about equally abundant at Churchill; in 1930 the Hoary occurred in "somewhat smaller numbers" than the Common.

Nests

We made intensive efforts to find Redpoll nests, and it was surprising in view of the relative abundance of Redpolls that we found only nine of the season's nests. (We found 13 Redpoll nests from previous seasons.) Taverner and Sutton (1934:74) reported "roving bands" of Common Redpolls, which were probably "non-breeding individuals and birds on incubation relief." The nine nests contained a total of 33 eggs. Three nests were deserted before the eggs hatched or before the young were fledged. The nests with parent birds still present were all Common Redpoll nests. Of the total 33 eggs discovered, 24 (72 per cent) hatched; 13 of these 24 nestlings (39 per cent of the total number of eggs) survived up to nest-leaving time. This survival percentage corresponds to the 40 per cent obtained by Kendeigh (1942) near Cleveland, Ohio, for large numbers of nests of two other small Fringillids, the Song and Chipping Sparrows.

The 22 nests (both new and old) were placed 3 to 7 feet above the ground, in either dwarf trees or shrubbery on the open tundra. Five of the nine 1940 nests were in trees or shrubbery at the edges of lakes or ponds. The kind of nest tree was noted for 21 nests: 12 were built in dwarf spruces, 5 in dwarf willows, 3 in dwarf birches, one in a dwarf larch. The exact positions of 14 nests were noted: 9 saddled on more or less horizontal branches, 5 built in crotches. Using four categories, excellent, good, fair, and poor, the concealment of five (out of 19 nests for which degree of concealment was noted) was excellent. These were

Figure 2. Redpoll nest, saddled on bough, showing willow down used in the bulk of the nest structure.

all placed in dwarf spruces, most of them saddling a horizontal bough, shaded and concealed by another horizontal bough directly above. The concealment of one was good, of eight, fair, of five, poor. The poorly concealed nests were almost all built during June in deciduous bushes, such as dwarf willows or birches, before the leaves had matured. We found no nests in the dense bush, and none on the ground, though Jourdain reported (Witherby *et al.*, 1938:66) that exceptionally Redpolls nest in grass tussocks.

The shortest distance between any two active nests was about a hundred yards, though one active nest was placed in a dwarf spruce within a foot and a half of an old nest. Taverner and Sutton (1934:73)

found Hoary and Common Redpolls nesting within a stone's throw of each other.

In all nine of the 1940 nests, the bulk material was chiefly dried grasses, though in one nest, small twigs had also been used. Brown or white Willow Ptarmigan (*Lagopus lagopus albus*) feathers were used in the lining of eight nests, plant-down in five, hair in one, and lemming fur in one. The measurements of seven of the 1940 Redpoll nests are given in the accompanying table.

MEASUREMENTS OF SEVEN REDPOLL NESTS

	Range	Average
Diameter		
Top interior	4½ – 6 cm.	5.1 cm.
Top exterior	8 – 10 cm.	8.7 cm.
Depth		
Inside	3 – 4 cm.	3.2 cm.
Outside	5 – 8 cm.	6.1 cm.
Weight	10.8 – 26.7 gm.	17.8 gm.

EGG-LAYING, INCUBATION, AND BROODING PERIODS

In Alaska, Dice (1918:130) found the egg-laying interval to be one day; I found it to vary from one to two days, though one day was more usual. I was able to obtain accurate data on the incubation periods of only two sets: one, a set of five, hatched in 10 days (July 2 to 12); the other, a set of three, hatched in 10 or 11 days (July 10 to July 20 or 21). Jourdain (Witherby *et al.*, 1938:66) also found the incubation period to be 10 or 11 days. I determined the length of the brooding period at one nest: 11 or 12 days, July 11 to 22. Incubation and brooding were performed by the female; Dice (1918:130) states that "apparently the male has no function in the home life of the Redpoll other than to fertilize the eggs" (though I found, as reported below, that the male sometimes fed the nestlings).

NESTLINGS

The activity of the adult female sometimes extended from about 3 A.M. to 10:30 P.M. Tables 1 and 2 give the average attentive periods (time at the nest) and inattentive periods (time away from the nest) and average feeding intervals for the three nests and for different times of day. The attentive periods of the female at the nest ranged from a minimum of less than a minute to a maximum of one hour, 24 minutes (an average of 22.8 minutes); periods away from the nest ranged from a minimum of less than a minute to a maximum of one hour, 16 minutes (an average of 20.9 minutes).

TABLE 1

ATTENTIVENESS OF FEMALE COMMON REDPOLLS, CHURCHILL, MANITOBA, 1940

	No. of Periods at Nest*	Total Time at Nest	Av. Length of Period at Nest	No. of Periods off Nest*	Total Time off Nest	Av. Length of Period off Nest
Nest 1 (June 10–17)	25½	5 *hrs.* 50 *min.*	13.7 *min.*	26	4 *hrs.* 25 *min.*	10.2 *min.*
Nest 2 (July 10–20)	15½	11 37	44.9	18	7 33	25.2
Nest 3 (July 17–21)	16½	4 29	16.3	15½	8 43	33.7
All Nests	57½	21 *hrs.* 56 *min.*	22.8 *min.*	59½	20 *hrs.* 41 *min.*	20.9 *min.*

* Including fractional periods at beginning and end of observation time, which are counted as half-intervals.

TABLE 2

AVERAGE FEEDING INTERVALS FOR COMMON REDPOLL NESTLINGS, CHURCHILL, MANITOBA, 1940

Intervals by Nest	
Nest 1 June 10–17, nestlings aged 0 to 8 days	17 *min.*
Nest 2, July 10–20, nestlings aged 0 to 10 days	36
Nest 3, July 17–21, nestlings aged 6? to 11? days	20
Average for all nests	24 *min.*

Intervals by Three-hour Periods			
3–6 A.M.	8 *min.*	12–3 P.M.	19 *min.*
6–9	28	3–6	20
9–12	29		
Morning average	21⅔ *min.*	Afternoon average	19½ *min.*

Between 3 and 6 A.M., the female was busily engaged in search of food for the young, and was usually at the nest only momentarily, for feeding and nest cleaning. The feeding intervals (8 minutes) from 3 to 6 A.M. were very short as compared with other times of day. The female stayed very close at the nest between 6 A.M. and noon, feeding the young on the average every 28 minutes. Between noon and 3 P.M., the average period away from the nest was appreciably longer than the average period at the nest: 29 minutes as compared with 17. The average feeding interval during these hours was 19 minutes. The average attentive period at the nest from 3 to 9 P.M. was 18 minutes, close to the total average attentive period (21 minutes); but from 9 P.M. to midnight, the maximum average attentive period was reached: 80 minutes. It is to be assumed that the female remained continuously at the nest from midnight to 3 A.M., though the nests were not under observation during those hours.

Nest 1 was observed from June 10, when it contained one egg and 3 young from less than a day- to a day-old, to June 17. The female spent 57 per cent of the total hours she was observed (10 hours, 15 minutes) at the nest. Nest 2 was observed from July 10, when it contained 5 eggs (two of which hatched on the two following days) to July 20. The female spent 60 per cent of the total hours she was observed (19 hours, 10 minutes) at the nest, though she was seen to do no actual brooding on either July 18 (observed 1:30 to 3:30 P.M.) or July 19 (observed 1:55 to 3:55 P.M.).

Figure 3. Female Redpoll preening.

On July 20, she was absent from the nest during the entire 70 minutes of observation (1:20 to 2:30 P.M.). Nest 3 was observed from July 17, when it contained 5 young about 6 days old, to July 21, when the young were fledged. The female at this nest spent only 34 per cent of the hours she was observed (13 hours, 12 minutes) at the nest. The average feeding interval at this nest was 20 minutes, as compared with 36 minutes for Nest 2 and 17 minutes for Nest 1.

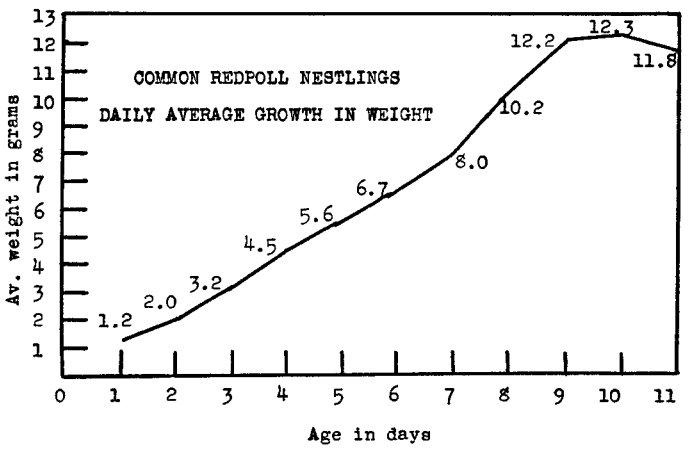
Dividing nestling period into three stages: early (age one to four days) middle (5 to 7 days), and late (8 to 10 days), the average interval between feedings was found to be 38, 23, and 19 minutes, respectively. Nestlings were fed sometimes by regurgitation, as in the closely related Pine Siskin (Dales and Bennett, 1929:76),

Figure 4. Female Redpoll cleaning nest.

Figure 5. Redpoll nestling, aged 11 days, just before first flight.

sometimes directly. Feeding was usually performed by the female, but occasionally, and contrary to the findings of Dice (1918:130) in Alaska, the nestlings were fed by the male. Frequently the male fed the female at the nest. The female, before accepting the food from the male, opened and shut her bill rapidly several times, and while taking the food, she vibrated her wings continuously; Gross (1938:255) mentions this behavior as characteristic of the Eastern Goldfinch also. After accepting the food, the female regurgitated and fed the young. In the case of a rosy-breasted male and its mate, one parent would come alone to the nest, feed the brood of five, then fly off; the other parent would come almost immediately afterward and also feed the brood.

Nests were frequently cleaned by parent birds, usually immediately after feeding the young; the parent sometimes swallowed the excreta, sometimes carried them away.



The chart shows the daily average growth in weight of the nestlings. The figures given for ages one to seven days are the average weights of four to six nestlings; weights for ages 8 to 11 days are weights of single individuals. By far the greatest percentage gain in weight occurred on the second, third, and fourth days (increases of 66, 60, and 40 per cent respectively); no gain in weight was recorded on the tenth and eleventh days.

Most female Redpolls found on nests were not very shy. They generally allowed an approach to within three or four feet (sometimes to within two feet) before flushing. When flushed, they usually flew away at once to a considerable distance. Sometimes, however, if an intruder was standing near the nest when a female returned with food, she would perch in a conspicuous spruce top and utter the nasal, questioning *tu-wee* note.

SUMMARY

The nesting habits of the Common Redpoll (*Acanthis l. linaria*) were studied at Churchill, Manitoba, from June 2 to July 22, 1940.

Common Redpolls were relatively abundant. Nine of the season's nests were found, containing a total of 33 eggs. Seventy-two per cent of the eggs hatched; 39 per cent of the eggs resulted in fledglings.

Placement and structure of the nests are described.

The egg-laying interval varied from one to two days, though one day was the more usual. The incubation period was 10 to 11 days; the nestling period, 11 to 12 days. Incubation and brooding were performed by the female.

The active day sometimes extended from 3 A.M. to 10:30 P.M. The attentive and inattentive periods ranged from less than a minute to over one hour, averaging respectively 22.8 minutes and 20.9 minutes.

The maximum activity (feeding and nest cleaning) occurred between 3 and 6 A.M.; the maximum brooding (except from midnight to 3 A.M., when the nests were not observed) between 6 A.M. and noon, and between 9 P.M. and midnight.

Nestlings were fed usually by the female, sometimes by regurgitation, sometimes directly. They were fed occasionally by the male.

According to the stage of nestling development, average intervals between feedings were: 38 minutes (age one to four days); 23 minutes (age 5 to 7 days); and 19 minutes (age 8 to 10 days).

The nests were frequently cleaned, usually immediately after the young were fed.

Daily increase in weight of nestlings is recorded.

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