

A NESTING STUDY OF RED CROSSBILLS

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DURING the winter of 1951-52, Red Crossbills (*Loxia curvirostra*) were seen at Eastern Point, Cape Ann, Essex County, Massachusetts, on numerous occasions. On March 2, Ludlow Griscom saw a female carrying nesting material at an estate called Shoal Waters; on March 4, I found the partially built nest.

Nests and eggs of this species have been previously seen and taken in New England; in Maine the most recent reports are those of Allan D. Cruickshank from the Muscongus Bay region, where a nest was found on August 22, 1949, and a nest with young on August 14, 1952 (letter). There is an old Massachusetts record of Maynard's (1882:520): "Nest and eggs collected in Tyngsboro a few years ago" (in August about 1875). An incubating female was flushed from a nest in Marblehead, Essex County, on April 22, 1917; the empty nest was brought a month later to William Brewster (1918). Red Crossbills were seen building a nest at Andrews Point, Cape Ann, in March, 1949 (Snyder, 1951). The female was incubating when the nest was blown down in a gale on April 6; the nest and egg fragments were recovered.

With the exception of Lawrence's observations (1949), I have found no complete record of the nesting of the species in North America; in most cases nests were deserted or broken up shortly after discovery. Therefore I decided to watch the Eastern Point nest from a distance unlikely to interfere with its success. Observations were usually made with a telescope from a car parked across the road. While this procedure prevented the gathering of precise data concerning egg laying, incubation, and number of days young were in the nest (facts previously determined for this species by Lawrence, 1949, and the Rosses, 1950), it did result in a series of observations during the entire period of a successful nesting. Except on week ends, observations were made before and after school classes in Gloucester; 25 visits to the nest were made on 20 days. The periods of observations totalled 41 hours and 15 minutes.

HABITAT

Wilderness is apparently not a nesting requirement of the Red Crossbill. The Andrews Point nest was located in a pitch pine (*Pinus rigida*) within a few feet of a summer cottage. At Shoal Waters the nest was only 8 feet from a stone wall enclosing the property, and not more than 15 feet from the road. It was at the edge of a grove of 93 Japanese black pines (*Pinus thunbergii*) which were fruiting abundantly and formed a convenient food supply for the nesting pair. Across the road were sumac (*Rhus typhina*), privet (*Ligustrum vulgare*), and a small cherry (*Prunus* sp.) often used as a singing perch.

WEATHER CONDITIONS

A complete weather chart for March 1 to April 18, furnished by the U.S. Coast Guard station at Eastern Point, shows a low temperature of 17 degrees, a high of 51, below freezing temperatures on 9 nights and an average temperature of 38 degrees. The wind velocity averaged about 15 mph; the highest recorded was force 8 (48 mph) on April 5. During the nesting period there was sun or broken clouds on 11 days in March and fog, rain, and snow on 15. In April there were only 3 days with sunshine or light clouds in contrast with 11 days of fog and /or rain.

COURTSHIP

Since the nest was partly built when located, little courtship behavior was observed. On my first visit the male was singing brilliantly. This was probably a courtship song as it was never heard again. On March 14, while the female was building, the male sang from a tall elm in the adjoining property. Here the female joined him and both birds flew high around the grove in large circles, calling continuously, with the male in the lead. This (courtship?) flight ended with the pair dropping to the top of the elm, where the female still called loudly.

NEST BUILDING

On my arrival at Shoal Waters on March 4, a male Red Crossbill (M) was singing from a cherry limb overhanging the road; 20 minutes later a female (F) flew into a small pine across the road. Carrying a twig in her bill, she went directly to a half-built nest, thus revealing its location. F then made five trips to the nest in three-quarters of an hour; on one trip she brought a six-inch privet twig on which she had been tugging vigorously. During this time M, a bird with mottled green and red plumage either accompanied F or sang near the nest tree. Once F fluttered her wings like a hungry juvenile and was fed by M.

Two days later, March 6, during a northeast drizzle, there were no signs of crossbills in the vicinity and the nest was no nearer completion.

Between 10 and 10:30 a.m. on March 9, F came to the nest tree three times with material, once staying on the nest and molding the interior by turning around vigorously. At noon on March 13 there was much crossbill activity in the grove; the nesting pair seemed to be courting and were feeding on the pine cones. M was singing often and both birds were calling. F made 5 trips to the nest, once bringing a white feather two inches long. During this hour F spent a total of 7 minutes at the nest.

By the next visit, on March 18, the nest was completed. Measurements taken later showed it to be 16 feet 2 inches from the ground and 24 inches

from the top of a small pine. It was saddled on a branch $\frac{1}{2}$ inch in diameter and (contrary to descriptions of most other nests) only $2\frac{1}{2}$ inches from the trunk, in a thick tuft of needles and cones. The outside was of loosely woven spruce twigs (*Picea* sp.), many of them from 90 to 160 mm. long. Inside were grass and weed stems, together with a few feathers and some felted material of vegetable origin. Measurements were: outside diameter, 120×140 mm.; inside diameter, 70×85 mm.; shape somewhat oval; inside depth, 35 mm.; outside depth, 60 mm.

INCUBATION

At noon on March 18 F was first seen on the nest, where her olive-green feathers blended perfectly with the surrounding pine needles. She was fed there three times by M, who signalled his arrival by calling. F kept up a soft *cheeping* much of the time. Returning at 3 p.m., I did not see F until 3:13 when she returned to the nest. The first egg was probably laid on this date. During the noon hour on March 20 the actions of both birds were similar and I judged that the third egg was laid. On this date, the female again left the nest after being on it more than an hour although the weather was inclement. On the 23rd and 25th I noted little activity—in the poor light F could not be detected on the nest until she moved. M was not seen at all between the 20th and 27th. On the latter date, when incubation must have been well advanced, it seemed safe to approach the nest tree. From a step-ladder placed under the tree, I raised a hand mirror wired to a 12-foot pole and saw three pale-bluish eggs, lightly spotted with reddish-brown. As reported by other authors, the female was a very close sitter. On my few inspections of the nest it was necessary to poke her off gently with some object. Squawking loudly, she would jump to the nearest twig, to return to the nest as soon as the mirror was removed. On April 1 F was still sitting closely. I saw her scratch and dress her feathers vigorously and, with opened bill, thrust her tongue in and out a number of times. During the entire incubation period F was only seen off the nest once; for the most part she sat quietly and moved little although her black and beady eyes seemed always alert.

CARE OF YOUNG

The young probably hatched on April 2 (no visit) or April 3, when feedings were observed. For the next four days F brooded constantly during my visits. She was fed on the nest by M, and fed the young herself several minutes later. During this period the food regurgitated appeared thin and watery. On the 4th, after poking F gently off the nest, the naked appearing young were seen huddled in the bottom of the nest. By April 5 they showed a covering of gray down and were able to hold up their heads. On the 8th both parents

were bringing food. M always fed first but F regurgitated for longer periods, and sometimes brooded after feeding. Excreta was swallowed by both parents but more often by F. During the last week of occupancy, however, the rim and outside of the nest was whitened with excreta of the young. On April 12 inspection of the nest from an extension ladder showed three young, covered with dark bluish-gray down and with pin feathers now visible.

On this date and later, photographs were taken from a ladder 8 feet from the nest. This disturbance resulted in only a slight delay in feedings. On April 17, the nestlings' heads showed high above the rim of the well-filled nest. The young were never observed exercising their wings nor climbing about the nest. They were last seen at 5:30 that night. At noon on the following day nothing could be seen in the nest. M and F were calling and flying about in back of the nest tree but never came to it. At 3:30 p.m. I climbed the tree and found the nest empty. The young could not be located until 5 p.m. when one was seen in the driveway. M and F came within two or three feet as I picked it up, M being bolder and calling continuously. As this fledgling could barely fly it seemed doubtful that it would survive a night with numerous cats and dogs in the neighborhood. Consequently, it was taken for the Peabody Museum collection.

I left for a trip on April 18. On this date Jeffrey Thomas searched the grove thoroughly and found a pair of adult crossbills in a large, thickly needled pine, where he suspected they might be feeding young. On the two succeeding days no crossbills could be found anywhere in the vicinity.

A description of the fledgling follows: length 103 mm., tail 21, wing 51, culmen 12, depth of bill at base 8, tarsus 26, middle toe 16. Mandibles just starting to cross. Head and body striped with dark Grayish Olive to Olivaceous Black on pale Olive-Buff; tail and wings solid Chaetura Drab to Chaetura Black; some Old Gold on back, most noticeable on rump; bill dark Mouse Gray with a Cinnamon-Drab base; tarsus and toes Light Drab (Capitalized color terms from Ridgway's *Color Standards and Nomenclature*).

SONGS AND CALLS

A rich warble suggesting the song of a Brown Thrasher (*Toxostoma rufum*) was heard for twenty minutes on the first visit; this musical song agreed with Pough's (1946:235) description of "an ascending series of double notes," though it lacked the final trill. This song was never heard again. During the first weeks, M's usual song was *z-z-zt, z-z-zt, z-z-zt*, all on the same note, in twos, threes, or fours. On March 17 he sang *whit-whit, zzzzt, zzzzt, zzzzt*; the last notes low and rasping. On the same date, when a courting flight (?) was seen, he also sang *pit-pit, tor-r-ree, tor-r-ree*. On April 16 M sang a new song: *whit-wheet* and *wheet, wheet, wheet*, changing pitch frequently and us-

ing doublets and triplets, with single notes interspersed. On the following day, when the young left the nest, the male sang many of the songs noted above, and called in a new and more rasping manner. The arrival of either bird in the vicinity was always signalled by *pip-pip*; there was much formless twittering or cheeping by both sexes. Calls were sometimes recorded as *pit-pit*, *whit-whit-whit*, *wheet-wheet*, or *whit-wheet*. F's lower and deeper tones could be distinguished from M's somewhat higher and softer calls.

TERRITORY

No actions relating to territorial defense were noted. Cats crossed the yard below, dogs were always in the vicinity, a gray squirrel (*Sciurus carolinensis*) ran along the wall near the nest. A small flock of Black-capped Chickadees, (*Parus atricapillus*), Red-breasted Nuthatches (*Sitta canadensis*), and Golden-crowned Kinglets (*Regulus satrapa*) fed in neighboring trees. The crossbills ignored all this activity. Flickers (*Colaptes auratus*), a Phoebe (*Sayornis phoebe*), and Robins (*Turdus migratorius*) were nesting nearby, while Brown Creepers (*Certhia familiaris*), Ruby-crowned Kinglets (*Regulus calendula*), Cowbirds (*Molothrus ater*), Slate-colored Juncos (*Junco hyemalis*), and Song Sparrows (*Melospiza melodia*) fed in the grove or on the ground below. Other species were seen flying over the grove. At least two other pairs of Red Crossbills fed in the grove, both of the males with mottled plumage. These other crossbills were observed on March 23 and 25 and on April 3 and 8. Except for one occasion late in the nesting period when she came off the nest, F incubated or brooded quietly with no response to their calls and movements.

SUMMARY

The activities of a pair of Red Crossbills were watched from the time a half-built nest was found until the young left the nest 45 days later. Observation periods totalled 41 hours. The female built the nest with the male in close attendance.

The nest was 16 feet 2 inches high in a small black pine on an estate bordering Gloucester Harbor, Massachusetts; there was abundant food in this grove of trees.

During the nesting period temperature averaged 38°F., wind velocity averaged 15 mph; the weather was cloudy or stormy 67 per cent of the time.

The female alone incubated the eggs; she was fed on the nest by the male.

For the first 4 to 5 days after hatching, the young were fed by the female after the male had fed her. Subsequently the pair returned to the nest together, the male always feeding the young first, and more briefly. Food regurgitated, whether to female or young, was a whitish "pap." In early stages this was thin and watery; when the young were half-grown it changed to a

thicker substance transferred in soft balls. Usually it was the female who removed the excreta and swallowed it but the nest became fouled by excreta in the later stages of nestling life.

Young left the nest at the age of 15 or 16 days.

Various types of songs and calls are described.

The young were not seen after the day they left the nest. One fledgling was collected and its plumage is herein described.

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