BOREAL CHICKADEE INVASIONS

Bruce A. Sorrie, Quincy

Boreal Chickadees have arrived, and if the present trend continues, this fall's flight promises to be a fine one. Field observers in northern New England had reported some movement away from breeding areas by late September, and in Massachusetts the first few trickled in during the first week of October, but it was not until mid-month that the first wave arrived at our latitude. On October 13th one Boreal Chickadee was banded at Monomet Bird Observatory (MBO); on the 15th two turned up in the Glades in Scituate; another was found in Lincoln; and others were found in the Quabbin and Connecticut Valley areas. In addition, Boreal Chickadees were seen in southern New York state and Northern New Jersey--a further indication that a flight year was at hand. Numbers then increased slowly, particularly in western Massachusetts where several flocks were reported, until around October 29, when a second wave of birds moved in.

Keen birders have also noted a coincident and marked influx of Black-capped Chickadees. At MBO, for example, over 800 were banded from September 15 to November 15, compared with 193 for the same period a year ago, when no Borealss were reported. Are the movements of the two species related? When Black-caps stage an invasion, do Borealss necessarily follow? In the following table, yearly flights of both species since 1961 are compared, using data from various published sources (in parentheses are the number of birds banded at MBO, beginning in 1966).

A pattern of marked Black-cap flights during alternate years is evident, the exceptions being in 1967-68 after which the previous pattern resumed. Boreal invasions are less predictable (one might argue in favor of a four-year cycle), but <u>in every case</u> are in conjunction with flights of Black-caps.

This last observation is important, for it suggests a possible connection between the two species movements. Studies of invasions of other northern species have pointed to food shortage and/or over-population as the cause for irruptions. Apparently, lack of food is applicable in the case of Black-caps. In a synthesis of data from the northeastern U.S. and Canada, A. M. Bagg (Audubon Field Notes 23 (1): 8-12, 1969) concluded that when cones and certain hardwood seeds are plentiful, no movement of Black-caps occurs, but when the supply fails, the birds move southward. Most interesting is the data on natural tree-seed crops, for there appears to be an alternation of good and poor crops, usually in a two-year cycle. Thus, good seed production occurred in 1956, 58, 60, 62, 64, 66, 67; while poor production occurred in 1957, 59, 61, 63, 65, 68. Compare these data with the table and note the perfect fit, especially the crop-cycle alteration in 1967-68 and the coincident Black-cap shift. According to Bagg's findings, wintering Black-caps rely heavily on tree seeds.

But why don't Borealss maintain a similar cycle? Obviously, when Borealss move, Black-caps also do so, but if such mutual incursions are triggered by cone scarcity, then why don't Borealss, which have a very similar diet, appear every other year? What is it about their biology that ennables them to stay north?

Wait a minute! We are getting ahead of ourselves. There is a more fundamental question to be answered. <u>Do</u> chickadees eat cone and tree seeds? According to every reference I have consulted, both species primarily eat insects (eggs, larvae, etc.), even during the winter; only a low percentage of the diet is comprised of tree seeds. Is Bagg's feeding data erroneous? Is he overlooking certain biological facts to make an association between cone crops and irruptions? I don't think so. His data on diet comes from a reliable observer in <u>northern</u> Maine, whereas most of the data presented in standard reference works seem to be taken from our latitude, not in the conifer belt. What winter residents eat in Quebec may be quite different from that eaten by our birds. Clearly, this conflict concerning winter food preferences must be resolved by gathering accurate data on northern birds over a wide area. Until this is done, we can only guess at the riddle of Boreal Chickadee invasions.

Comparison of Black-capped and Boreal Chickadee Flights

	1961	1962	1963	1964	1965
Black-capped	Heavy	No	Good	No-Light	Good
Boreal	Heavy	No+	No+	No+	Good
	1966	1967	1968	1969	1970
Black-capped	No (146)	No (76)	V. Good (1300)	Good (920)	No-Light (279)
Boreal	No (0)	No (0)	No (0)	Heavy (25)	No+ (0)
	1971	1972	1973	1974	1975
Black-capped	V. Heavy (4472)	No (111)	Good (921)	No (193)	Good (800+)
Boreal	Moderate (12)	No (0)	No+ (0)	No (0)	Good (6)

+: Few scattered birds reported south of breeding areas

(): Numbers of birds banded at MBO from 15 September to 15 November, 1975

New Light on Arctic Loons?

One would think that the plumages of endemic American birds are so thoroughly known that all markings useful for field identification have been noted. Yet, in the April, 1974, issue of The Auk, Anthony and Judith McIntyre describe a relatively conspicuous field mark that will aid experienced birders in resolving the thorny problem of distinguishing winter-plumaged Arctic and Common Loons.

Let's first look qualitatively at wintertime field marks attributed to both species.

	Arctic	Common
Bill size	short	long
Bill shape	thin, straight	stout, straight
Top of head) Back of neck)	lighter than back	) dark gray
Back	gray	)
Size	small	large

Unfortunately, all of these features are either essentially subjective or grade continuously from one species to the other. If you were to see simultaneously two loons: A having a straight bill half the size of B, an overall size two-thirds of B, and a topside lighter gray than B, you could conclude that A was an Arctic Loon and B a Common. In New England waters, however, such a fortuitous situation may never occur, and any suspect Arctic Loon will have to be judged in isolation. Is there a discrimination that does not depend upon direct comparison?

The McIntyres conclude that over 90 percent of the Common Loons in winter plumage appear to have a complete eye-ring, whereas the Arctics never do. The crucial areas are above the eye and between the eye and the bill. This difference is very well illustrated in Robbins' et al. Birds of North America and Pough's Audubon Water Bird Guide.

Therefore, if our hypothetical subject A had all of the markings attributed to it and no whitening above or in front of its eye, the case for Arctic Loon would be stronger. However, since no specimen has yet been collected in Massachusetts, a diagnostic photograph would be needed to remove this species from the state's hypothetical list. New field mark or not, the winter-plumaged Arctic Loon remains an extremely difficult species to identify in areas outside its normal range.

Leif J. Robinson