SOME OBSERVATIONS ON THE BREEDING STATUS OF THE PINE SISKIN

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INTRODUCTION

The breeding status of the Pine Siskin *(Carduelis pinus)* in New York is not well documented. The species is an irruptive bird of variable occurrence, not nesting commonly in the state, and most authors describe its breeding status as erratic, irregular or unpredictable. Bull (1974) cites only two proven nest records, at Ossining and Cornwall in 1883 and 1887, respectively; and eleven other records outside of the higher elevations of the Catskill and Adirondack Mountains.

With the advent of the NYS Breeding Atlas, new information on this species' status may come to light. However, based on my personal experience with this species at two banding stations, this new information will require considerable care in interpretation, because of the species' unconventional breeding habits. This paper reports on eighteen years of personal banding experience, and some presumed breeding activity of this species. It is intended to stimulate further breeding documentation under the aegis of the Atlas program.

METHODS AND RESULTS

Since the winter of 1963-64, I have operated a banding station in my yard in Schenectady, Schenectady Co.; and since 1970 a second station at Jenny Lake near Corinth, Saratoga Co., in the Adirondack Mountains at 380 m elevation. During this time I have banded 3820 Pine Siskins at Schenectady and 86 at Jenny Lake. The Schenectady bandings are summarized by month and year in Table 1.

This summary illustrates a nearly biennial rhythm to the occurrence of this boreal finch. Generally, invasions have occurred in winters of odd-even designation, though upsets in this pattern occurred in 1967, 1969, 1979 and 1980. A similar biennial pattern has been described by Kennard (1976, 1977) for the Common Redpoll *(Carduelis flammea)* and Purple Finch *(Carpodacus purpureus)*. Typically, the Pine Siskin irrupts from the boreal forests in response to seed crop failures and/or very successful breeding seasons, and in those years appears along the coast as early as September and October. In October and November, as they pour south in numbers, they

seem not to be attracted by feeders, and do not generally frequent them. In my experience, they do not normally begin to appear at feeders in numbers in the Schenectady area until cold weather in December or January, even though they may have been passing south through the area for several months.

Depending on the flight year, their winter numbers stabilize or decrease in February and March; they rarely increase. Then in April and May comes a heavy return flight of birds that have wintered farther south. In non-flight years, the birds are usually scarce, and at my feeder they have been either totally absent, or a very few have appeared usually as spring transients. It is during these spring return flights, typically in invasion years, that I have encountered siskins in breeding condition.

Table 1 — Pine Siskins Banded at Schenectady

Year	Number Banded by Month								Date of Last Appearance
	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Total	
1963-64				8	76	30		114	19 Apr.
1964-65									
1965-66				16	8	22	17	63	15 May
1966-67									
1967-68									
1968-69						2	2	4	
1969-70							2	2	
1970-71									
1971-72		1	185	68	96	497	421	1268	29 May
1972-73						3		3	
1973-74		135	74	73	16	34	236	568	20 May
1974-75									
1975-76	385	158	236	60	18	158	249	1264	17 May
1976-77									
1977-78		2		2	13	77	301	395	1 June
1978-79						1		1	
1979-80									
1980-81	2				5	52	79	138	20 May
Total	387	296	495	227	232	876	1307	3820	

My assessment of these invasions is as follows:

1963-64 and 1965-66 – The numbers banded as shown in Table 1 are not truly reflective of the magnitude of these flights. At this time I was developing the techniques and experience at this station which led to later, more successful trapping methods. Nevertheless, the birds arrived in mid-winter in moderate number, and there was a heavy repeated recapture of these first arrivals through the winter, followed by a lull in late winter and early spring. In late April and May, transients returned on their way north.

1971-72 – There was a heavy January inflex with numerous short-term recaptures of these birds. Winter numbers remained high followed by the heaviest spring return flight experienced so far, starting in the middle third of April. In addition to the record 1268 bandings, there were 14 recaptures of birds previously banded in Md., N.J., Pa. and N.Y. Five of these recaptures occurred on 28 April.

1973-74 – There was an early invasion, with the first capture on 8 December. Many siskins were present through February, but they became scarcer in March. Then a moderate return flight developed in mid-April and was heaviest in early May.

1975-76 – This was another intense invasion similar to that of 1971-72, but differing from it in that it: 1) began with the earliest recorded capture to date on 8 November; 2) involved large numbers of birds in the period November through January; 3) featured many repeat captures of the birds banded in late December, followed by a scattering of these birds to other local feeders (based on eight band recoveries during the winter, within 40 km); and 4) involved the reappearance of many of the previously banded birds in April. The spring flight of transients was heaviest in the first half of May, but the total spring flight was far below that of 1972.

1977-78 – It was a late invasion of only modest proportions, dominated by returning spring migrants in late April and May with the birds staying later than in any other year to date. The last capture occurred on 25 May and last sighting on 1 June.

1980-81 – What appeared in the fall to be the beginning of a major invasion proved otherwise. The first capture on 15 November was the second earliest arrival at my feeder. However, the birds were absent thereafter, and there was only a small, brief return flight beginning in mid-April and occurring mostly in May.

The results point to a high degree of variability in the timing of their appearance and the numbers encountered. During these en-

counters of birds in the hand, I routinely measured wing chords, recorded weights and examined birds for fat deposits. While blowing on the abdominal feathers to search for fat deposits, it was my practice to search for, and make note of, certain external, sex-determining characteristics such as a brood patch on females and cloacal protuberance on males. Some of the capture data on these recognized males and females are given in Table 2.

In summary, 104 males and 97 females were recognized on the earliest dates of 16 April 1979 and 16 April 1976, respectively. The maximum lapse between captures of a recognizable male was 33 days; and for a female, 18 days. Results varied from year to year, but there was an approximately 60/40 split among both males and females between birds whose sex was recognized on first capture vs. birds whose sex was apparent on recapture. In the latter category were mostly birds which spent the winter in the area and were captured originally as birds of unknown sex; and the former were mostly transients passing north.

Table 2 — Occurrence of Pine Siskins of Known Sex

Year	No./Sex *	Range of Capture Dates	Number Recaptured	Average Lapse Between Captures, Days **	Range, Days
1965-66	26M	27 Apr.-15 May	15	10.2	1-33
	5F	28 Apr.-14 May	3	3.7	2-13
1971-72	5M	7-21 May	0		
	14F	25 Apr.-21 May	1	7.0	7
1973-74	2M	5-14 May	0		
	7F	1-14 May	1	3.0	3
1975-76	48M	23 Apr.-14 May	18	5.7	1-18
	49F	16 Apr.-14 May	11	5.7	1-18
1977-78	8M	16 Apr.-25 May	3	5.0	1-13
	16F	27 Apr.-25 May	3	4.3	1-10
1980-81	15M	17 Apr.-14 May	1	26.0	26
	6F	3-13 May	1	2.0	2

* M = Male, F = Female

** This represents the average lapse of time between the date of first capture as a recognized male or female, and the last capture as a recognized male or female.

In addition to these captures of birds in apparent breeding condition, I captured four young of the year as single captures on 13 May 1976, 15 and 20 May 1978, and 19 May 1981. All had typically buffy, unworn, juvenal plumage and unpneumatized skulls. All appeared to feed independently; they showed no particular attachment to any of the older birds; and none was recaptured. They appeared to be as transient as any of the other siskins encountered in mid-May, but obviously had recently fledged.

At the Jenny Lake station, Pine Siskins have been heard or seen in low numbers and very irregularly in almost any month. Except for two encounters with it at the feeders in 1972 and 1973, it has been a scarce, nomadic visitor. In 1972, following the heaviest incursion noted at Schenectady, the birds appeared at feeders at Jenny Lake in May. On 28-29 May I captured 15 males and three females. In July, young appeared and 10 were banded between 6 and 15 July. There were five recaptures of these birds lasting until 16 July when they disappeared.

In spring 1973 there was no invasion at Schenectady and I banded only three siskins on 7 April. However, at Jenny Lake I banded 49 adults (28 males, 20 females, 1 unknown) during 6-27 May, and nine young during 13-27 May. Nine of these 58 birds were recaptured, but none beyond 27 May after which they disappeared.

DISCUSSION

Superficial examination of the banding results at Schenectady suggests possible local breeding. Such factors as the mid-April appearance of birds in breeding condition; recapture of some of the same birds still in breeding condition for periods of up to 33 days; and the capture of young of the year at or just after mid-May, support this conclusion. In my judgment, however, these observations are inadequate confirmatory proof, because certain other breeding characteristics are lacking, such as courtship behavior (pair association, courtship display, territorial defense, mate feeding, etc.), parental attachment to young, feeding of young, flocking of young to feeders, and repeated appearance of young at feeders.

Rather, it is my opinion that the few young that have appeared at Schenectady are birds hatched somewhere to the south. All but one occurred following major irruptions that penetrated south into mountainous areas of Pa., N.J., Md. and perhaps Va. and W. Va., as well as the Catskill Mountains. They were independent of their parents when captured as they followed the returning tide of migrants going north.

What is more interesting is the timing and number of birds that appeared and remained in apparent breeding condition at Schenectady. Among many other sparrows, warblers etc. that I have handled at Schenectady, Jenny Lake and Vischer Ferry, N.Y. as returning breeders or spring migrants, it is extraordinarily unusual to find migrating individuals with brood patches or cloacal protuberances. These characteristics develop typically only after the species has arrived on territory and some brief time has lapsed. The occurrence of siskins in breeding condition during migration at Schenectady from mid-April to late May prompts consideration of three possible explanations: 1) the birds had already bred prior to arrival; 2) they were breeding locally; or 3) they were preparing to breed when and where they found suitable habitat.

In examining these options, certain of them can be ruled out with some assurance based on current evidence. Had all these birds in apparent breeding condition already bred, there should have been a far greater showing of young birds. The banding of four juvenals hardly balances with the capture of 201 birds in breeding condition, thereby ruling out this possibility as a likely explanation. Some few of them had obviously bred, to judge from the young that were recorded, but certainly the vast majority of them appear not to have bred as evidenced by a lack of young. The lack of any hint of courtship or breeding behavior at my feeder, cited earlier, rules out the second option as a likely explanation. This leaves the third option, namely that they are prepared to breed. It suggests that Pine Siskins are unpredictable, opportunistic breeders with no fixed attachment to any particular territory and therefore likely to appear and breed wherever suitable conditions exist. This explanation is consistent with past recorded observations on their breeding behavior as reported by Eaton (1912), Bent (1968), Bull (1964, 1974), Beardslee and Mitchell (1965) and Forbush (1929). However, the observation reported here that some Pine Siskins migrate in breeding condition is previously unreported and appears unique to this species.

Certain aspects of their appearances at Jenny Lake are consistent also with the conclusion that they are unpredictable, opportunistic breeders. Their 1972 appearance was on the heels of one of the greatest invasions measured locally. It was rather strange that the male/female ratio was 5/1. However, it is possible that the May captures of adults represented several breeding pairs and a temporary surplus of transient males. The capture of 10 young (3.3 per female)

supports this conclusion. Quite differently, the 1973 encounter at Jenny Lake occurred earlier in May in a year when there was no appreciable invasion. The male/female ratio was high (1.4/1), and the capture of nine young appears out of balance with the capture of 49 adults. Again, the possibility exists that among the few pairs that bred there were surplus transients, this time both male and female.

Thus, while I feel the evidence does not support the belief that breeding occurred at Schenectady, I feel more assured that limited breeding did take place at Jenny Lake in 1972 and 1973, in the former case in an invasion year and in the latter case in a non-invasion year. The feeding of young by adults at Jenny Lake in 1973 lent further support to this conclusion.

In light of the apparent opportunistic breeding habit of this species and its lack of attachment to a definite breeding territory, the mere sighting of Pine Siskins in the period May through August should not be taken as an indication of breeding. Even the spot appearance of unattached juvenals is not a definite indication of breeding. Atlas observers should establish more positive criteria than mere sightings, to confirm breeding of this species and thereby better define its exact status.

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