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The Balance at the Feeder

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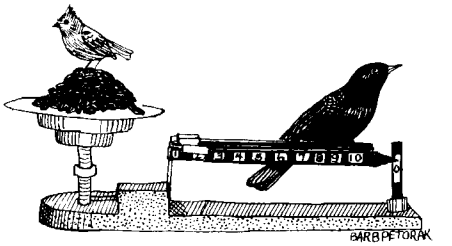


Introduction

Banders frequently express bird abundance by use of the term birds per net-hour, wherein the number of captures are related to a particular unit of capture effort, most typically one hour's use of a 12-m. long mist net. This effort is at times influenced by extraneous factors such as wind, weather, placing of nets, frequency of use, etc., which may alter interpretation of the abundance data.

At a year-round, nearly isolated feeding station, a study was initiated to compare the abundance of the birds netted with the quantity of sunflower seed consumed. The objective was to determine the extent to which the two methods correlated to one another, and the extent to which data on food consumption would augment capture data in determining seasonal and annual changes in the populations of the principal wintering and summering species.

Methods

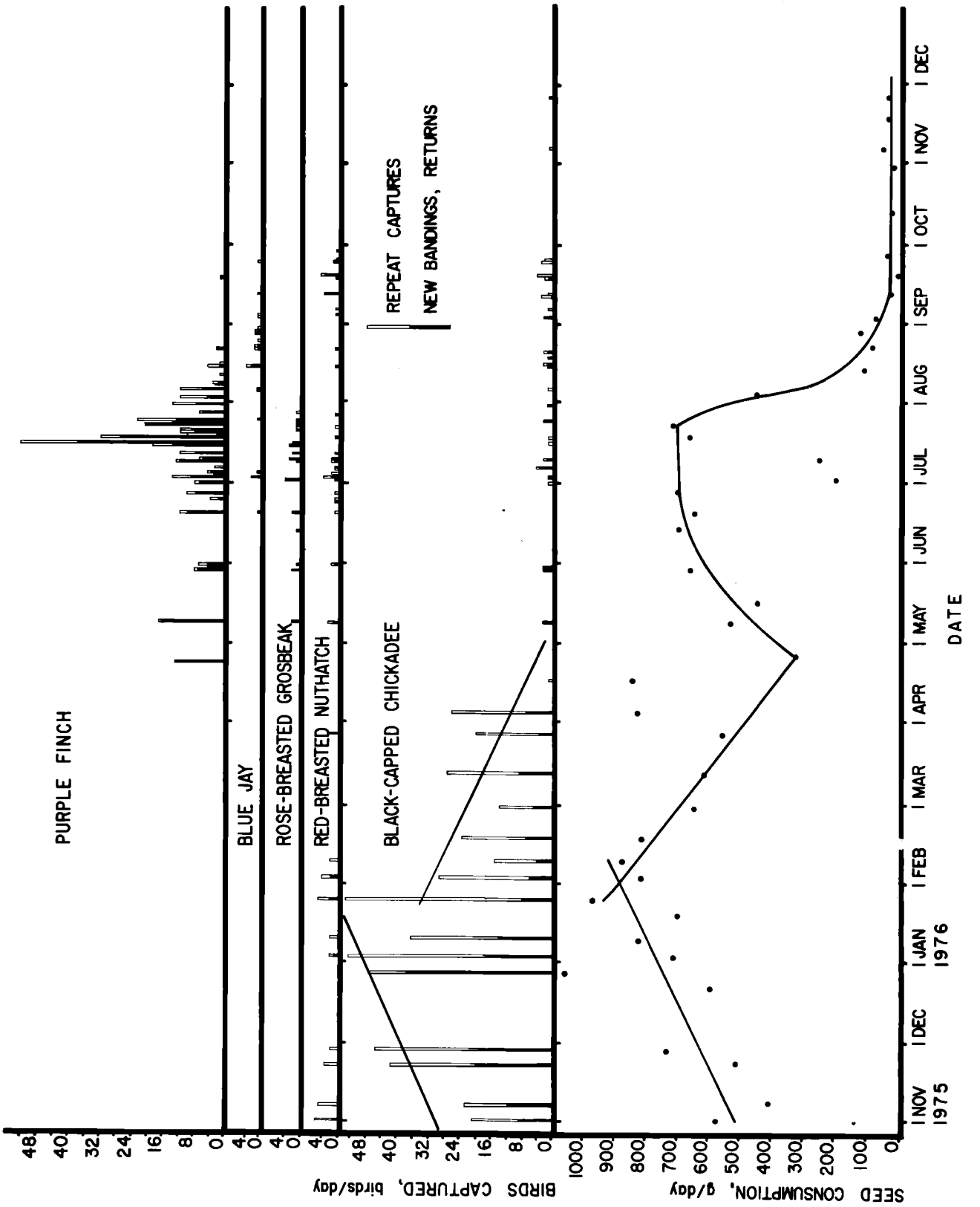
The feeding station was located at a summer home on a small lake in the Adirondack Mountains of northern New York (Jenny Lake near Corinth, Saratoga Co.). The lake, which is a glacial bowl atop a mountain, is situated at an elevation of 365 m. (1200 ft.) and is surrounded by regrowth forest of approximately 40-50 years of age consisting of mostly white pine and hemlock with lesser amounts of spruce, maple, oak, beech, and birch. In summer, seasonal residents operate approximately a dozen feeding stations within one km. of this feeding station; while in winter only one other feeding station located 50 m. away is operated within the surrounding five km.

In the winter feeding season (October to May or June), the feeders were visited every one to four weeks for restocking. At such times, one 12-m. and one 6-m. mist net were operated near the feeders. The winter feeders were of a design that allowed access to the sunflower seed by only those species that could fit through a 25 x 38-mm. (1 x 1-1/2-in.) wire mesh. The feeder was mounted on a pipe in the ground with an aluminum flashing mammal guard below, and an enclosed seed reservoir above, which dispensed seed to the enclosure surrounded by the limiting wire mesh. This feeder design allowed access by the Black-capped Chickadee *(Parus atricapillus)*, Red-breasted Nuthatch *(Sitta canadensis)*, White-breasted Nuthatch *(Sitta carolinensis)*, Purple Finch *(Carpodacus purpureus)* and Rose-breasted Grosbeak *(Pheucticus ludovicianus)*, but not by the Evening Grosbeak *(Hesperiphona vespertina)*, Blue Jay *(Cyanocitta cristata)*, Common Grackle *(Quisculus quiscula)* and Brown-headed Cowbird *(Molothrus ater)*. The principal winter species were Black-capped Chickadee and Red-breasted Nuthatch, while in summer the Purple Finch dominated the station.

In the summer season, a non-restrictive tray feeder was operated which allowed all species to feed. These feeders were stocked on approximately a weekly basis, and banding was done on nearly a daily basis, weather permitting, while I was in residence. By weighing the seed required to fill the feeders, it was possible to calculate the usage during the preceding use period.

The seed consumption and captures of the most frequently caught species are represented in Figure 1 for the 13-month period of November 1975 to December 1976.

Figure 1. A comparison of seed consumption and captures for the period 1 November 1975 to 1 December 1976. The rising winter seed consumption rate fits the equation: Consumption = 490.3 + 4.00(Days beyond 30 October.); and the declining seed consumption rate fits the equation: Consumption = 1544.8 − 6.75(Days beyond 30 Oct.). Beyond 1 May, the curve was fitted by eye. The increasing chickadee captures fit the equation: Birds Captured = 23.5 + 0.316(Days beyond 30 Oct.); and the declining captures fit the equation: Birds Captured = 62.7 − 0.319(Days beyond 30 Oct.).


PURPLE FINCH
BLUE JAY
ROSE-BREASTED GROSBEAK
RED-BREASTED NUTHATCH
BLACK-CAPPED CHICKADEE
REPEAT CAPTURES
NEW BANDINGS, RETURNS
BIRDS CAPTURED, birds/day
SEED CONSUMPTION, g/day
DATE
NOV 1975
DEC
JAN 1976
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC

Discussion

Winter season—In August 1975 when the local breeding species began to disperse from their breeding or natal territories, it became apparent from the number of chickadees that were being captured that a major fall chickadee flight was mounting. In November when the monitoring of seed consumption and the winter netting began, the flight was well in progress. At approximately one- to two-week intervals I would spend one-half day on a weekend netting the birds at the feeders until either birds discontinued coming to them or until the only captures were previously banded birds.

Figure 1 shows that chickadee captures increased until late January. The slope of the increase was equivalent to the slope of the increase in seed consumption. During this time of invasion and establishment of a winter territory, the increase in capture rate of this species correlated very well with the increase in seed usage.

After the peak of the winter season in late January, both the seed consumption and the capture rate of chickadees declined at similar, though not equivalent, rates until April when wintering chickadees abandoned the area. Previous years' banding results and observations agree with the data illustrated here that chickadees become very scarce in April as they leave the winter territory to establish breeding territories. During the breeding season the species is relatively inconspicuous at the feeding station, and not until young emerge in late June or July do they reappear at the station in any significant number.

The capture data and the seed consumption data complement one another in illustrating how divergent the abundance of this species can be from one year to the next. In the fall of 1976 the few birds that were present were well acquainted with the nets and avoided them during their food-gathering forays.

The April data deserve futher comment to explain the two points that do not fit the regression line. At the latitude and elevation of this feeding station, winter normally persists with all its vigor through the month of March. In April, the accumulated snows begin to melt and it is a time of transition at the feeder. Winter residents are departing, transients are in passage and summer residents are slowly establishing themselves. Normally, except for late in fall, it is the low point of the feeding and banding cycle. In April 1975, there was a sudden change to very unseasonably warm weather which produced a rush of transients into this winter-bound area. Purple Finches and Dark-eyed Juncos *(Junco hyemalis)* were early and abundant in arriving. Lacking other food, they relied on the feeders and fed heavily until they passed through the area. Due to my absence from the station at that time, I was not able to ascertain this influx through conventional capture of the transients. However, the two high April seed consumption points illustrate their presence. In this regard, these consumption data serve in a surrogate capacity in a way that netting or trapping cannot.

Summer season—The newly arrived breeding Purple Finches showed increased usage of the feeders in May and early June. During this time the banding effort was intermittent. However, after mid-June, when residence was established and an intense banding program was begun, the impact of the netting on feeder usage was apparent. Seed consumption became asymptotic. By early July, a large portion of the regular users of the feeders were captured and rather than continue using the feeder, they relied on neighboring feeders for food. Thus, there was a sharp decline in consumption during early July as the limited population of breeding birds was trapped repeatedly, and as a result developed a wariness to return to use the feeders.

Immediately following this decline in usage by the heavily trapped adults was the increased usage by the newly fledged young. This produced a high yield of captures and raised the food consumption level to that of June. Typically, the young of the year remain abundant at the feeder until late August or early September. In recent years, 150 to 330 juveniles have been banded each summer. In 1976, however, the yield of young was rather poor and only 63 were banded. In addition, the young departed especially early from their natal area and became very scarce by mid-August. At this time the capture rate and seed consumption dropped drastically.

In September when the banding activity reverted to weekend netting, there was correlation between the low banding yield and the low seed consumption. Customarily the Purple Finch which abounds as a summer resident totally abandons the area in October and is absent through the winter. Only during the heavy invasion winters of 1974-75 and 1976-77 were a few Purple Finches present at this feeding station; and to date, after seven winters, no summer-banded Purple Finches have been found in winter.

Conclusions

The data presented here illustrate that under controlled conditions, quantitative information on food consumption can prove to be useful in augmenting banding data to determine seasonal population changes of some species. Where applicable, banders should consider the use of the scale or the balance at the feeder to gather these kind of data to take greater advantage of the many potential opportunities for study that exist at feeding stations. ◆

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An unusual nest site of the Mountain Chickadee

Charles T. Collins

The Mountain Chickadee, *Parus gambeli*, is a widespread and familiar bird of the western coniferous forests. It typically nests in natural crevices or cavities created in rotting stubs, or where limbs have broken off living trees. Nest sites are typically within 6 to 15 feet of ground level although some have been found within a few inches of the ground and others as high as 80 feet up (Bent, A.C. 1946. Life histories of North American jays, crows and titmice. Bull. U.S. Nat. Mus., 191:1-495). Bent (1946:361) also records a nest found by J.S. Rowley which was below ground level in a "squirrel hole underneath a dead pine stub." Mountain Chickadees have also utilized abandoned woodpecker holes, man-made structures and nest boxes. A further indication of their diverse choice of nest sites is a nest I found in a vertical drill hole in a lava boulder.

This unusual nest was found in June 1971 in the course of a visit to Sunriver Lodge in the cascade country south of Bend, Oregon. This visit was in preparation for our WBBA annual meeting held at Sunriver in 1972. While there, my attention was attracted to a lava rock boulder (fig. 1) on the edge of the parking lot at the Sunriver ecology center by the sequential visits of a pair of Mountain Chickadees. Further investigation revealed that the birds were actively feeding a brood in a nest located at the bottom of a vertical hole drilled in the rock.

The nest hole was at least 15-18 inches deep which must have placed the actual nest near ground level. The contents were not observable from the top. However, each arrival of the parents with a bill-full of food resulted in a noisy chorus from the depths of the hole. So busy were the adults that they allowed me to approach the rock and photograph their rapid comings and goings (fig. 2) My limited stay did not allow further observations or a determination of the final outcome of this nesting attempt.

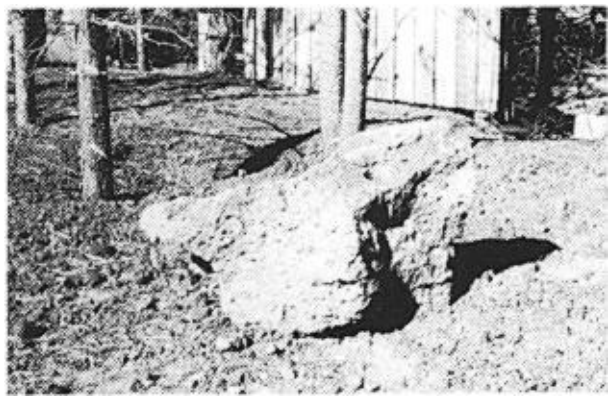

Figure 1. The rock containing the nest hole

Figure 2. Adult bird bringing food to the nest

The unusual location serves only to reinforce earlier conclusions as to the opportunisticness of the Mountain Chickadee in finding nesting sites in both natural and man-altered environments.

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