

ARE ACCIPITER POPULATIONS IN WINTER AFFECTED BY BIRD FEEDERS?

by William E. Davis, Jr.

It has been convincingly argued that the continued presence of abundant and concentrated food (energy) that bird feeders provide in winter may have contributed to the increase in Black-capped Chickadee and Tufted Titmouse populations in Massachusetts (Kricher 1981), as well as to the increase in Blue Jay populations nationally (Bock and Lepthien 1976). Forster (1990) and Davis (1991) have suggested that the Carolina Wren range expansion into Massachusetts is related to bird feeding stations. Since 1950 the number of feeders in Massachusetts has increased markedly. Concurrent increases in food available to wintering birds cannot be quantified due to the lack of quantitative data from distributors of bird food. One distributor, however, reported to John Kricher (1981) that the amount of bird seed sold had increased dramatically from 1965 to 1980. This matches nicely with the increase of thirty percent in the Blue Jay population between 1962 and 1971 reported by Bock and Lepthien (1976), which they suggest was most likely the result of winter feeding stations. By 1972, twenty-four percent of metropolitan Boston households were feeding birds in winter (DeGraaf and Thomas 1974).

Bird feeding stations concentrate birds that would otherwise be foraging over broad areas. Do these concentrations of small birds act as "bird feeders" for wintering raptors? And if so, have they affected the numbers of accipiters that winter in Massachusetts?

Certainly substantial numbers of accipiters visit winter bird feeders. In recent years as many as seventeen percent of the participants from the northeastern region of Project FeederWatch (Cornell Laboratory of Ornithology) reported Sharp-shinned Hawks, and ten percent reported Cooper's Hawks (Erica Dunn, personal communication).

During the past few winters both Cooper's and Sharp-shinned hawks have apparently overwintered near my home and frequented my bird feeders, exploiting the concentrations of small passerines and doves that congregated there. Unless a hawk is banded or has some individually distinguishing feather pattern, it is impossible to be sure that the hawk you see on different occasions is the same bird, but multiple sightings of what appears to be the same bird certainly suggest that a hawk has settled into your neighborhood. For example, I observed an immature Sharp-shinned Hawk in my winter study area in the Foxboro conservation land about two hundred yards from my back yard bird feeders on December 29 and 30, 1985, and again on January 18, 1986. On February 15 and on two other occasions I saw what appeared to be the same bird attacking small birds at my feeders. It is probable that these sightings were of a

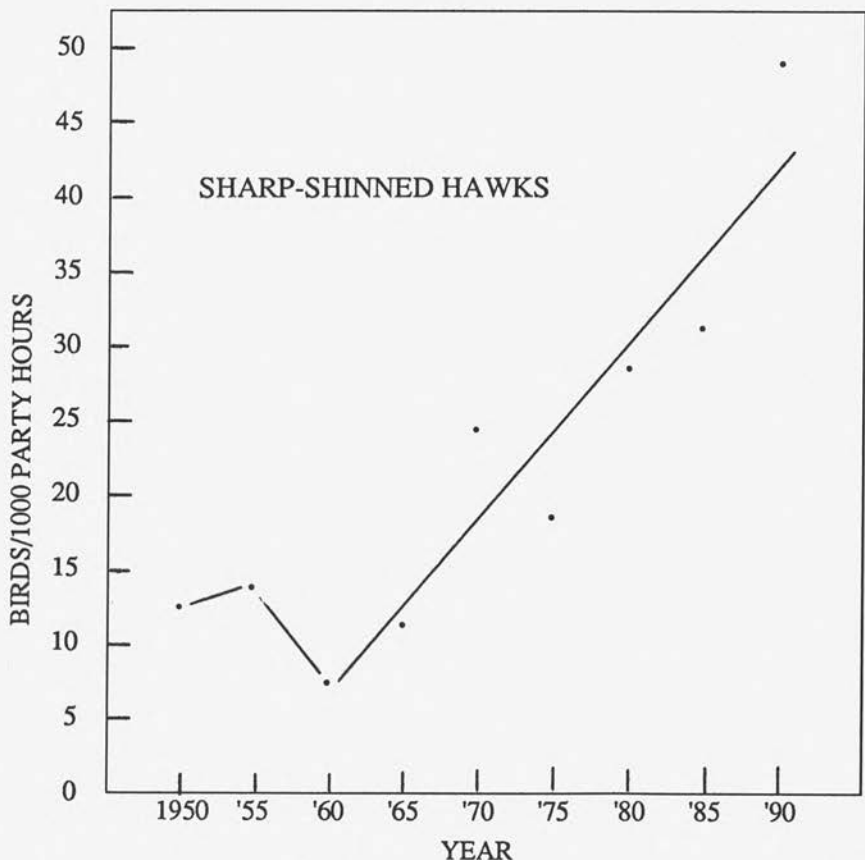
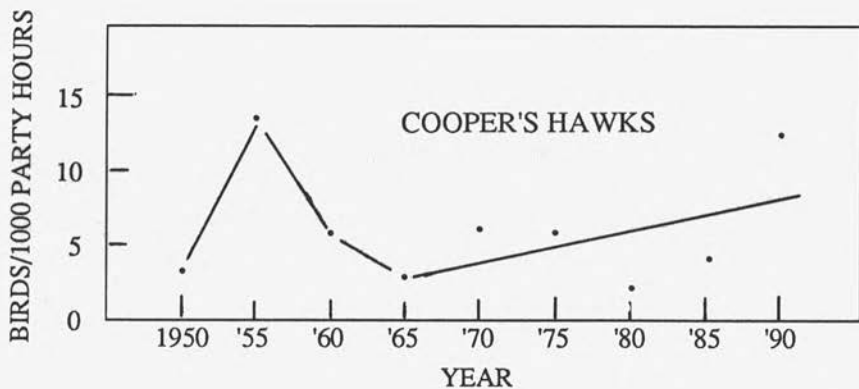


FIGURE 1. The upper diagram shows numbers of Cooper's Hawks reported on selected Christmas Bird Counts; the lower diagram, numbers of Sharp-shinned Hawks. Numbers are birds per 1000 party hours. Data points are three-year cluster averages. The straight lines from years 1965 to 1990 are calculated "best fit" lines.

single bird that was resident for several months that winter.

On February 11, 1989, and on at least two other occasions that winter, a small (presumably male) immature Cooper's Hawk attacked birds at my feeders. I recorded a large (presumably female) immature Cooper's Hawk at my feeders on more than a dozen occasions from January 10 to March 25, 1989. This latter bird captured a House Sparrow in a forsythia bush among my feeders on January 10 and a sick Mourning Dove capable of only short flights on January 29. On March 4 I found Rock Dove wing and body feathers under one of the feeders. Later that same day I saw the hawk attack and miss another Rock Dove. Eventually the hawk perched in trees and shrubs adjacent to the bird feeders for more than two hours. Clearly this hawk was successfully utilizing the concentrated food resources (birds) that my bird feeders attracted.

The question of whether the presence of winter feeders has had an effect on accipiter populations in our area is more difficult to answer. Do accipiter winter population trends correlate with an increase in bird feeding in Massachusetts? My subjective impression is that Sharp-shinned Hawk numbers have increased considerably since the 1950s, and that Cooper's Hawks had been more common in the early 1950s, then decreased sharply, but are now on the increase, particularly in recent years. One source of quantitative data available for winter populations of these birds is the National Audubon Society's Christmas Bird Counts (CBC), published annually in *American Birds*. I compiled data on accipiter counts from six Massachusetts CBCs, all of which had been censused annually since 1950: Cape Ann, Cape Cod, Newburyport, Northampton, Quincy, and Springfield (Holyoke).

There were a number of problems with these data. First, the number of observers changed with time, so the question arises whether changes in numbers of birds reported reflect actual changes in bird numbers or merely better coverage. Kricher (1981) demonstrated that total party hours is the most reliable parameter for standardizing counts available for CBC data, so the numbers reported are per 1000 party hours (Figure 1). Second, there is often substantial year-to-year variation in winter accipiter numbers, so to compensate for "good" years and "bad" years, the data were averaged over three-year clusters. The first data point for each species is, for example, the average of the counts reported in 1949, 1950, and 1951. Third, in 1974 some counts began to add "feeder hours." When feeder hours were reported separately, I added them to party hours. Otherwise, I assumed that feeder hours were already included in party hour totals. Since some previous censuses may not have included feeder hours, it is possible that some counts per party hour may be lower than they otherwise would have been. There is always a problem with accipiter identification, and, for example, some of the reported Cooper's Hawks may have been large female Sharp-shinned Hawks.

Because of the problems with the data, I attempted no statistical analysis.

Nevertheless, the trends are suggestive. There has been a substantial increase in the numbers of Sharp-shinned Hawks reported, and my impression that Cooper's Hawks decreased from the 1950s but are now increasing seems justified. Although the increases are not nearly as steady as with Sharp-shinned Hawks, the number of Cooper's Hawks reported in the 1990 cluster is nearly four times that of the 1965 cluster. The low numbers from the late 1970s and early 1980s correlate with large increases in Cooper's Hawks migrating through Pennsylvania (Bednarz 1990; Rosenfield 1988) and may indicate that much of the population wintered farther south, leaving Massachusetts with fewer birds. The substantial increase from 1965 to 1970 for both species matches rather closely with the dramatic increase since 1965 in bird food sales and with the documented increase in Blue Jays, which has been attributed to winter bird feeding (Bock and Lepthien 1976).

Accipiter population trends have been analyzed by several authors using migration counts. After thoroughly pointing out the difficulties of using count data to examine population trends, Heintzelman (1986) nevertheless concludes that both Sharp-shinned and Cooper's hawk populations seem to have increased starting about 1975. This increase presumably is related to the banning of DDT in 1972 and the subsequently reduced pesticide burdens that these hawks carried. If Heintzelman's analysis is correct, then the population increases of both species, indicated by the CBC analyses, began about a decade too early—in fact at a period when the pesticide burdens were close to the maximum. Bednarz et al. (1990), using data from Hawk Mountain, Pennsylvania, concluded that both Sharp-shinned and Cooper's hawk populations began their recovery in the mid-1960s, nearly a decade before the effects of DDT and its derivatives substantially declined in the United States. Further, a U. S. Department of Interior study concluded that there was an increase in Cooper's Hawks in the eastern United States from 1967-1974 (Rosenfield 1988). If these analyses are correct, then the population trends match nicely with the increase in numbers of wintering accipiters in our area as reported on the CBCs. But why did the population increase begin a decade before the DDT impact significantly lessened? Perhaps the answer lies in reduced DDT usage in Canada (where many accipiters breed) before the ban in the United States. The general warming trend for New England winters may have affected the latitude at which accipiters can survive winter in substantial numbers. Warmer winters may also have increased the number of wintering songbirds, and thus increased the available food supply for the predators.

My favorite hypothesis suggests that the increase in winter bird feeding, enhanced perhaps by ever larger numbers of songbirds, led to higher winter survival rates, particularly among immature accipiters (which are the most frequently reported in New England winters), and thus provided an expanded wintering range. This in turn may have helped to produce a general population

increase.

Although the data strongly suggest that feeding songbirds in winter helps accipiters overwinter, any definitive answer to the question of the effect bird feeders have on winter accipiter populations will have to await much better data than are currently available. But it is interesting to speculate about the degree to which your feeding seeds to those little passerines may be inadvertently supporting a growing winter population of raptors. Your suet, peanut butter, and mixed bird seed may be providing the "ultimate bird feeder" for sharpies and Cooper's Hawks during those hard winter months when a concentrated food supply may make the difference between life and death.

References

- Bednarz, J.C., D. Klem, Jr., L.J. Goodrich, and S.E. Senner. 1990. Migration of Raptors at Hawk Mountain, Pennsylvania, as Indicators of Population Trends, 1934-1986. *Auk* 107:96-109.
- Bock, C.E., and L.W. Lephien. 1976. Changing Winter Distribution and Abundance of the Blue Jay, 1962-1971. *American Midland Naturalist* 96:232-236.
- Davis, W.E., Jr. 1991. How Do Carolina Wrens Survive New England Winters? *Bird Observer* 19:248-251.
- DeGraaf, R.M., and J.W. Thomas. 1974. A Banquet for the Birds. *Natural History* 83(1):40-45.
- Forster, R.A. 1989. About the Cover: Carolina Wren. *Bird Observer* 18:369-371.
- Kricher, J.C. 1981. Range Expansion of the Tufted Titmouse (*Parus bicolor*) in Massachusetts. *American Birds* 35:750-753.
- Heintzelman, D.S. 1986. *The Migration of Hawks*, Bloomington: Indiana University Press.
- Rosenfield, R.N. 1988. Cooper's Hawk. In *Handbook of North American Birds*, Volume 4, ed. R.S. Palmer. New Haven: Yale University Press.

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