

POPULATION TRENDS OF BIRDS AT FEEDERS IN SULLIVAN COUNTY N.Y. 1981-1994

Valerie M. Freer and Joan Visconti
Division of Science and Mathematics
Sullivan County Community College
Loch Sheldrake NY 12759

ABSTRACT — In Sullivan County NY during 1981-1994, results of a feeder survey showed that populations of Mourning Dove (*Zenaida macroura*), Red-bellied Woodpecker (*Melanerpes carolinus*), Tufted Titmouse (*Parus bicolor*), Northern Cardinal (*Cardinalis cardinalis*), and House Finch (*Carpodacus mexicanus*) increased, while American Tree Sparrow (*Spizella arborea*) and Evening Grosbeak (*Coccothraustes vespertinus*) decreased. No changes were observed for Downy Woodpecker (*Picoides pubescens*), Hairy Woodpecker (*Picoides villosus*), Blue Jay (*Cyanocitta cristata*), Black-capped Chickadee (*Parus atricapillus*), Red-breasted Nuthatch (*Sitta canadensis*), White-breasted Nuthatch (*Sitta carolinensis*), European Starling (*Sternus vulgaris*), Dark-eyed Junco (*Junco hyemalis*), and American Goldfinch (*Carduelis tristis*). Two major irruptions of Common Redpoll (*Carduelis flammea*) were noted.

In November 1981 the Sullivan County Audubon Society initiated a feeder survey in order to document winter bird populations in the county. The survey design as originated by Burt in the Syracuse, New York area in November 1959 (Burt and Burt 1980) required that volunteers count birds at their feeders or in their yards during the first week of each winter month. In order to avoid counting individuals more than once, participants were instructed to record the maximum number of individuals of each species seen at any one time. A much larger survey of similar methodology in Ontario was shown to provide valid information about bird population trends for most species (Dunn 1986).

We consider the information resulting from careful analysis of this countywide survey to be of value for several reasons. It is more likely to represent actual population levels than are anecdotal impressions of bird abundance sporadically reported by a few people. In addition, it

documents in detail the winter bird life in a restricted area, providing evidence about changes on a scale that would be missed in a national or regional survey (such as the Cornell Laboratory of Ornithology Feederwatch), and it encompasses a much longer period of time each winter than the single day of the annual Christmas Count.

Sullivan County, in the southern Catskills, is rural, sparsely inhabited (fewer than 70,000 people) with no cities and almost no industry. According to the Department of Environmental Conservation publication "Forest Statistics for New York" (Considine and Frieswyk 1982), 74% of the county is covered by commercial grade forest, more than any other county of southeastern New York State. Agriculture is confined to small portions of the central and northwest areas, and the county has many small ponds and lakes in addition to two large New York City reservoirs. A few of our feeder reports came from people who live in villages and have back yards abutting those of their neighbors, but most participants live on rural roads and have woodlands adjacent to their property.

METHODS

Participants were recruited through the Sullivan County Audubon Society newsletter *Warblings*. The first count was done in December 1981 when reports were received from 19 people. The number of participants quickly grew, finally averaging 34 per month, for a total of 1764 reports accepted over 13 winters. We were fortunate to have a remarkably enthusiastic and dependable core of ten people who provided reports every month, and 20 others who participated in more than half of the 78 months since the project started. Most of the participants (and feeder sites) are known to Freer, who collected, edited, and stored the data.

We analyzed the percentage of reports on which each species appeared as a broad indicator of population size, and we combined the reports from four months to produce a single data point for each winter (Fig. 1b-h). (Although we collected counts from November to April, data from the months of December through March only was used in this study in order to exclude the possible influence of fall migration in November or dispersal and spring migration in April.) We do not here analyze the numbers of individual birds counted for most species. Data

from the Sullivan County Christmas Count (officially named Monticello) done annually since 1950, was used to corroborate findings on some of the more common species. Uncommon and rarely reported species were not analyzed.

Weather conditions were examined as probably the single most important factor in affecting local bird population levels (Fig. 1a). The 1981-82 and 1983-84 seasons of our study period were harsh, and the 1992-93 and 1993-94 winters were particularly severe. The winters of 1982-83 and 1990-91 were the warmest, and those years from 1985-86 through 1988-89 were mild with moderate precipitation. Weather data for the Eastern Plateau of New York State was supplied by the Northeast Regional Climate Center at Cornell.

The statistical method used for the determination of significance was Spearman's rank correlation coefficient ($-1 \leq r_s \leq 1$) (Fowler and Cohen 1986).

RESULTS

The Black-capped Chickadee and Dark-eyed Junco were the most consistently reported winter residents of Sullivan County. Over the 13 years of this project, chickadees appeared at 92% to 99% of feeders, and juncos were reported at 82% to 95% of feeders. There were no significant changes found in those species or in the percentage of reports showing Blue Jay, White-breasted Nuthatch, Red-breasted Nuthatch, European Starling, American Goldfinch, Downy Woodpecker, and Hairy Woodpecker, although each fluctuated more than the chickadee or junco.

We found statistically significant increases in several species. Mourning Dove populations in the Sullivan County area increased steadily during the course of this feeder survey (Figure 1b). At the beginning of the study period, doves were sighted at only 44% of feeders. The frequency of reports of Mourning Dove almost doubled in the 13 years of this project, increasing to a high of 87% in 1992-93. Because this is an easily counted species, we also looked at the average number of doves counted per feeder, and found an increase from a low of 2.8 doves per feeder in 1981-1982 to a high of 8.5 in 1993-94. The trends in both frequency of reports and average numbers were highly significant ($r_s = .967$, $r_s = .934$). Eaton suggests that increases in

Mourning Dove are related to supplemental feeding and the bird's adaptability to a wide variety of land uses including agriculture (Andrle and Carroll 1988).

In *The Atlas of Breeding Birds of New York State* (Andrle and Carroll 1988), Meade discusses the routes of northward expansion into New York State by several southern species. For the N. Cardinal, Tufted Titmouse, and Red-bellied Woodpecker he describes expansion from northern New Jersey into southeastern New York and Long Island, with subsequent spread north through the Hudson Valley. Because of its geographic location, these species did not arrive in Sullivan County as early as they did in those southeastern counties bordering New Jersey or the Hudson River, and their population growth as reported here is considerably more recent. Our data suggests that their entry from New Jersey may have been via the Delaware River and its tributaries, especially the lower Neversink and Bashakill, leading to the lowest elevations of the county.

We documented the continuing northward range expansion of the Northern Cardinal and a somewhat later arrival, the Tufted Titmouse (Figure 1c). For both species, the pattern of feeder reports is consistent with Root's finding that river valleys provided the corridors for dispersal (1988). Both species show a highly significant increase in appearances at feeders over the course of our survey ($r_s = .707$, $r_s = .735$). This has been attributed to strong population pressure in the south leading to expansion northward, and to increases in winter bird feeding (Beddall 1963, Davis 1972). In the case of the titmouse, maturation of forest on abandoned farmlands has also been a factor in supporting range expansion (Eaton 1959, Grubb and Pravosudov 1994). The first cardinal appeared on Sullivan County's Christmas Count in 1954 and the first titmouse was sighted in 1959, and after a year or two both species were found on every subsequent count. (Sullivan County's Christmas Count is in the southern half of the county; both species are still less common at the higher elevations of the northern portions of the county.)

We believe that the parallel drop in reports of cardinals and titmice in the winter of 1986-87 reflects a population decrease due to a poor nesting season the previous spring, perhaps related to cool weather during critical parts of the nesting cycle. We found a similar (though smaller) decline that winter in other resident species that feed insect

larvae to their young, such as White-breasted Nuthatch and Black-capped Chickadee, but no decline was found in the House Finch, which feeds ground seeds to the young.

The Red-bellied Woodpecker, first seen on our 1981 Christmas Count, has shown a highly significant increase of appearances at feeders ($r_s = .940$). At only 1 or 2% of feeders at the beginning of our study period, by 1993-94 the frequency of sightings of this woodpecker had increased dramatically to 16% of the feeder reports (Figure 1d). A species that readily visits feeders and prefers habitats of mixed deciduous forests, the Red-bellied Woodpecker's northward spread up into New York from northern New Jersey is most likely attributable both to supplemental feeding and to maturation of forests (Andrle and Carroll 1988). In an analysis of winter range based on Christmas Count data, Root (1988) noted concentrations of this woodpecker in river valleys. Our reports are all from the southern regions of Sullivan County (and the Neversink River Valley).

The House Finch also increased rapidly after the first six individuals were sighted on the Sullivan County Christmas Count in 1969. Their rapid range expansion throughout New York State to New England and the Mid-Atlantic states since the release of a small number of birds on Long Island in 1940 has been closely followed and well-documented (Andrle and Carroll 1988, Hill 1993). Burt and Burt (1984) documented the early stages of the increase in the Syracuse NY region using their 1971-1983 feeder survey data. By 1981, the first season of the Sullivan County feeder survey, the House Finch appeared on 41% of feeder reports. The frequency of sightings at feeders showed a highly significant increase ($r_s = .929$) to a high in 1992-93 of 90% (Figure 1e). The continuing increase in their population documented by Burt and Burt (1984) followed by this study was without setback from 1971 until the most recent year of this survey, 1993-94, when we found a decrease of 15% in House Finch appearances at feeders. This was an extremely severe winter, so some might have moved to a more mild environment as suggested by Hilton (1994). Alternatively, an eye disease first documented in 1994 may have started to reduce their populations (Anon. 1994).

Perhaps our most unexpected finding was a significant decline in local populations of the American Tree Sparrow ($r_s = .791$). The Am. Tree Sparrow appeared at between 43% to 60% of feeders during the

first six years of the survey period, but was reported at only 28% to 39% of feeders during the last six years (Figure 1f). It is possible that the decrease we found might be indicative of a northward shift in range related to long term gradual warming in eastern North America, as suggested for Pennsylvania populations by Paul Hess (1989).

In addition to these trends in populations of several locally wintering species, we were able to document two major irruptions by the Common Redpoll in Sullivan County during the course of the survey (Figure 1g). The first irruption was a massive influx in 1986-87 when redpolls were found at 55% of feeders (with reports of up to 150 at some locations). We documented a somewhat smaller irruption in 1993- 94 when they were reported at 39% of feeders. The Common Redpoll was virtually absent from the Sullivan County area in non-irruption years except for 1981-82 when it was listed on about 17% of the participants' reports.

The Evening Grosbeak is another northern species whose irruptions, like that of the redpoll, are generally believed to be strongly affected by food supply in the north (Bock & Lepthien 1976). A more consistent winter visitant to Sullivan County than the Common Redpoll, the Evening Grosbeak appeared each year on our feeder reports, with the irruptions in years 1981-82 and 1983-84 documented at more than 80% of feeders (Figure 1h). However, there has been a significant gradual decline in the frequency of reports over the course of the study period ($r_s = -.66$). This irregular decrease in grosbeak numbers from peaks in the early 1980s has also been reflected in the local Christmas Count. It has been suggested that a population boom in the late 1970s and early 1980s resulted from a major spruce budworm outbreak in eastern Canada, and now that the infestation is on the wane, grosbeaks are returning to their more usual numbers (DeVore 1993, Peterson 1993). An alternate explanation is that grosbeaks and other winter finches may no longer need to move far to find food when it is in short supply in the north, because of the incredible numbers of feeders in southern Canada and the northern U.S. (Kaufman 1992).

SUMMARY/CONCLUSION

Closely monitored small area feeder surveys can provide meaningful information on local winter bird populations. Using the Sullivan

County Audubon Society's feeder survey as a source of data on winter population levels in the local area we found significant increases in five species (Mourning Dove, Northern Cardinal, Tufted Titmouse, Red-bellied Woodpecker and House Finch) during the 1981 to 1994 period. We found a significant decline in sightings of American Tree Sparrow, and we documented two major irruptions of Common Redpoll as well as a decline in Evening Grosbeak.

ACKNOWLEDGEMENTS

We acknowledge the work of Fatima Ahmad, Richard Bard, Alex Cherviok, Kris Conklin, and Susan Koenig, all of whom shared in both the data analysis for this work as well as in preliminary write-ups. We also thank Phyllis Gerhard and Kathy Scullion who produced graphs, Kelly Erlwein for secretarial assistance, and all those who participated in the feeder survey.

LITERATURE CITED

- Andrle, R.F. and J.R. Carroll, Editors. 1988. *The Atlas of Breeding Birds in New York State*. Cornell University Press, Ithaca. 551 pp.
- Anon. 1994. House Finch eye infections. *Nat Aud Soc Field Notes* 48: 262.
- Beddall, B.G. 1963. Range expansion of the Cardinal and other birds in the Northeastern States. *Wilson Bull* 75:140-156.
- Bock, C.E. and L.W. Lepthien. 1976. Synchronous eruptions of boreal seed-eating birds. *American Naturalist* 110:559-571.
- Burt, H.E. and B.P. Burt. 1980. The feeder survey and trends in central New York Cardinal populations. *Kingbird* 30:138-142.
- Burt, H.E. and B.P. Burt. 1984. Changes in the House Finch population in central New York. *Kingbird* 34:8-10.
- Considine, T. J. Jr and T.S. Frieswyk. 1982. *Forest Statistics for New York*, 1980. USDA For. Serv. Resour. Bull. NE-71. 118 p.
- Davis, T.H. 1972. The increase of the Tufted Titmouse, Mockingbird and Cardinal in the New York City-Long Island area over the past 22 years. *Linnaean News-Letter* 25(8):1-4.

- DeVore, S. 1993. Wild Cards. *American Birds* 47:363-369.
- Dunn, E.H. 1986. Feeder counts and winter bird population trends. *American Birds* 40:61-66.
- Eaton, S.W. 1959. The Tufted Titmouse invades New York. *Kingbird* 9:59-62.
- Fowler, J. and L. Cohen. 1986. *Statistics for Ornithologists*. British Trust for Ornithology. Tring. 176 pp.
- Grubb, T.C., Jr. and V.V. Pravosudov. 1994. Tufted Titmouse (*Parus bicolor*). In *The Birds of North America*, No. 86 (A. Poole and F. Gill, eds.). Philadelphia: The Academy of Natural Sciences; Washington, D.C.: The American Ornithologists Union.
- Hess, P. 1989. American Tree Sparrows (*Spizella arborea*) in Pennsylvania: speculations on a 15-year decline, 1973-1987. *Pennsylvania Birds* 3:90-93.
- Hill, G.E. 1993. House Finch (*Carpodacus mexicanus*). In: *The Birds of North America*, No. 46 (A. Poole and F. Gill, eds.). Philadelphia: The Academy of Natural Sciences; Washington, D.C.: The American Ornithologists Union.
- Hilton, B. Jr. 1994. *Carpodacus* finches in South Carolina's piedmont: migration, sex ratios, site fidelity, and longevity. *North American Bird Bander* 19:1-11.
- Kaufman, K. 1992. The Changing Seasons: Winter 1991-1992. *American Birds* 46:224-227.
- Peterson, M. 1993. Region 7 highlights. *Kingbird* 43:147.
- Root, T. 1988. *Atlas of Wintering North American Birds*. Univ of Chicago Press, Chicago. 312 p.

POPULATION TRENDS OF BIRDS AT FEEDERS IN SULLIVAN COUNTY N.Y. 1981-1994

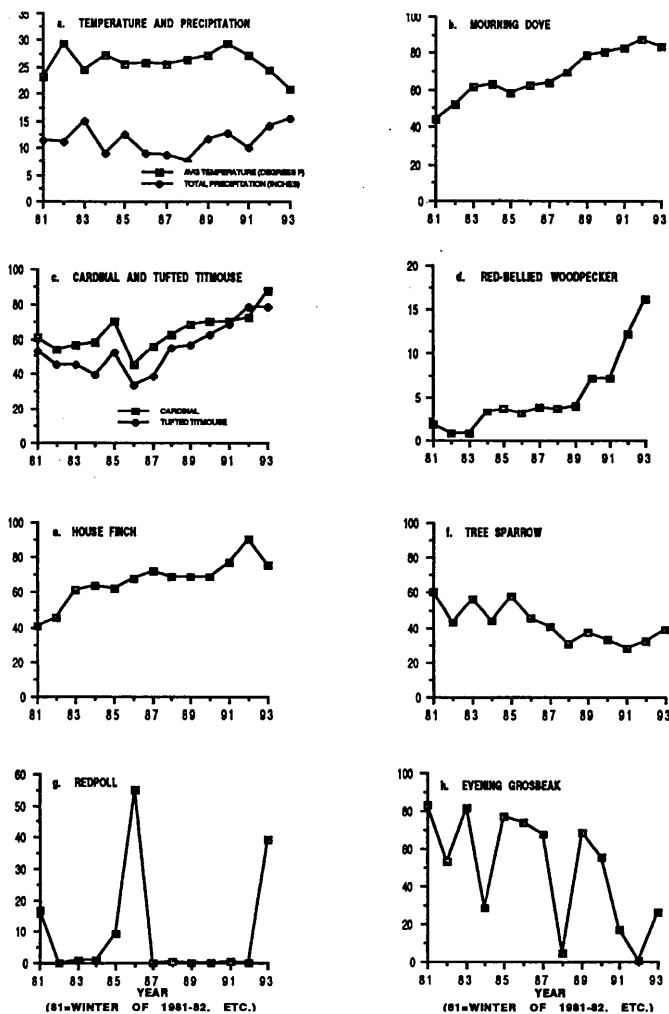


Fig. 1

Fig 1. The percentage of reports on which each species occurred. 1a: Average temperature (degrees F) and total precipitation (inches) for the eastern plateau of New York State. 1b through 1h: the percent of feeder reports on which this species occurred. Each data point is for 4 months combined (December through March).