

BIRD FEEDERS AND CHRISTMAS BIRD COUNTS: A CAUTIONARY TALE

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An estimated 30% of North Americans annually purchase bird food, an increase over the 20% estimated only a few years ago (Filion *et al.* 1985 and unpubl., Shaw and Mangun 1984). Birds at feeders are conspicuous, so Christmas Bird Count (CBC) field observers are likely to count more individuals of species that come to feeders if there are feeding stations along the CBC routes than if there are not. Thus, the numbers of feeder species in CBC's may have been artificially inflated over the past 25 years as more and more people offered bird food. This potential bias could be compounded by the practice of adding to the CBC totals the bird numbers seen by participants who remain at home to count birds at their feeders. Partly in recognition of the latter bias, *American Birds* (now *National Audubon Society Field Notes*) began in 1974 to record the number of "home based" observers taking part in each CBC and their hours of observation. The birds they observe are still incorporated in the reported totals, but starting in 1975, their hours of effort were not included in "party-hours".

This paper presents results of the 1990-91 CBC in Ithaca, New York, in which a separate accounting was made of birds seen at feeders both by field parties and home based observers. These data allow us to assess the importance of feeders to each species, and to evaluate the potential for bias in CBCs for those species that are regular visitors.

METHODS

Field parties in the Ithaca, New York, CBC on 1 January 1991 separated their records into birds seen near feeders and those sighted elsewhere. Also recorded were the numbers of feeders checked. About one-third of field parties only estimated the number of feeders observed. "Birds near feeders" was defined as all birds observed within sight of a feeder and whose presence could reasonably be attributed to attraction by that feeding station. Flybys and species not known to frequent feeders were excluded. The amount of time spent by field observers at each feeder was short, typically lasting 1-5 minutes. Home based observers, who reported watching their feeders from a few minutes to all day, also recorded their sightings separately.

Table 1. Comparisons of common feeder species recorded on the Ithaca, NY, CBC by field parties and by home based observers.

Species	Total N in CBC	% at feeders	N/feeder seen by:		Ratio
			Field parties	Home based observers	
American Goldfinch	270	66	0.30	2.29	7.5
Tufted Titmouse	166	71	0.31	1.62	5.2
Mourning Dove	712	42	0.86	3.84	4.5
Dark-eyed Junco	381	69	0.81	3.20	4.0
Northern Cardinal	382	56	0.72	2.40	3.3
White-breasted Nuthatch	226	58	0.46	1.40	3.0
Blue Jay	430	53	0.82	2.42	3.0
Downy Woodpecker	230	61	0.54	1.38	2.6
Evening Grosbeak	718	59	1.74	3.78	2.2
House Finch	1323	63	3.62	7.00	1.9
Black-capped Chickadee	1557	48	3.36	5.67	1.7
American Tree Sparrow	352	32	0.54	0.78	1.4
House Sparrow	1018	52	2.87	2.62	0.9

Field parties surveyed 145 feeders; home based observers surveyed 45 feeders. Ratio = N/feeder seen by home-based observers, divided by N/feeder seen by field parties.

RESULTS

Eighty-nine field observers took part in 41 parties, spent 186 hours in the field (118 on foot), and encountered about 145 feeders. An additional 45 feeders were watched by home based observers. Of the 74 species seen on the count, 31 (42%) were seen at least once at feeders, either by field parties or home based observers. Species were considered "common" if >100 were recorded by the CBC, and "feeder species" if >20% of all individuals were tallied at feeders. Twenty-four

species were defined as "feeder species" because at least 20%, average 54%, of individuals tallied on the CBC were seen at feeders (Tables 1 and 2). Of the remaining seven species seen at feeders, four were abundant (100+ recorded by field parties) but <1% of the individuals tallied were at feeders (Rock Dove, American Crow, Cedar Waxwing, and European Starling). Three uncommon species were also seen occasionally at feeders: Pileated Woodpecker, Brown Creeper, and Northern Mockingbird.

Home based observers found the same species to be common at feeders as did field parties, but the numbers they saw were quite different. The discrepancy between the two comes about because home based observers recorded more individuals per feeder than did field parties for every species except House Sparrow (Table 1). The ratios of birds/feeder from the two types of feeder count showed that, on average, home-based observers saw 2.4 times more birds per feeder than did field observers. The effect is not uniform across all species, however. For most, 1.4 to 4.5 times more individuals were seen by home-based observers, but 5.2 and 7.6 times as many were recorded for Tufted Titmouse and American Goldfinch, respectively (Table 1). These calculations were done only for species that were both abundant (>100 seen by field parties) and frequent visitors to feeders (at least 20% of individuals tallied at feeders), to avoid very high or low ratios resulting from small samples. In some uncommon species, all individuals recorded were at feeders (Table 2).

DISCUSSION

Nearly 200 feeders were observed in the 1991 Ithaca CBC, three-quarters of them by field parties. If birds are more visible and thus more readily counted when at feeders, then the CBC tallies for feeder species were probably considerably higher than if feeders had not been present. The magnitude of this potential bias cannot readily be tested in the field. The best possible comparison would be of CBC counts from areas with many feeders to counts in areas with few feeders. However, we could never be certain that true winter populations in the two sets of areas were equal at the outset. Indeed, there is good evidence that winter bird density is higher in areas with more feeders (Brittingham and Temple 1988, Graber and Graber 1979, O'Connor 1980). More studies similar to ours would at least help determine whether the Ithaca CBC has a particularly high number of feeders, although we suspect the problem is general.

Another benefit of similar studies would be to document which birds are "feeder species". Data from Project FeederWatch, a volunteer survey of feeders run by the Cornell Laboratory of Ornithology and the Long Point Bird Observatory, show which species visit frequently, but can give no perspective on the proportion of the population that visits feeders. European Starling, for example, is a frequent visitor according to Project FeederWatch, but our data indicate that only a tiny fraction of the starling population visits feeders on a given day. This proportion

**Table 2. Uncommon feeder species recorded at feeders
by field parties and by home based observers.**

Species	Total reported	Percent at feeders	% seen at feeders by	
			field parties	home based observers
Hairy Woodpecker	67	73	37	36
Red-breasted Nuthatch	38	53	21	32
Red-bellied Woodpecker	37	73	32	41
White-throated Sparrow	33	69	45	24
Northern Flicker	25	24	12	12
Song Sparrow	21	24	5	19
Carolina Wren	20	45	10	35
Ruffed Grouse	19	21	5	16
Purple Finch	8	100	0	100
Sharp-shinned Hawk	7	43	0	43
Brown-headed Cowbird	2	100	100	0

might vary among locations, dates, times of day, weather conditions or natural food supplies. Further data like ours would elucidate the amount of variation in proportions of each species visiting feeders in different years and different locations.

The remainder of this discussion sets aside the concern that field party counts of feeder species may be biased, and focuses on home based observers. The inclusion in CBC totals of home based counts poses some special, additional problems for interpreting trends in winter populations of feeder birds. First, home based observers in our study recorded substantially more birds per feeder than did field parties. House Sparrow was the only species that both groups reported present at feeders at about the same level of abundance. We suspect that sparrows resident near feeders spend a large part of the day at or near those feeders. Thus, the chances of field parties seeing House Sparrow at feeders passed once during the day are about as high as for home-based observers watching one feeder all day long. American Goldfinch, by contrast, spend much of the day away from feeders. Home based observers would have a high chance of seeing a flock at some point in the day, but field parties could miss most of the visits to feeders.

CBC data are usually standardized in order to compare data from counts with very different levels of coverage. Most commonly, this is done by expressing the number of birds seen as birds per party-hour (Bock and Root 1980, Butcher and McCulloch 1990). A problem arises,

however, in deciding how to treat the hours spent observing bird feeders by home based counters. Should the hours of home based observation be taken into account when calculating birds per party-hour for feeder species (assuming we know which these are for a given count)? A further difficulty arises because hours spent by home based observers are poorly quantified. Most people don't watch continuously, and it is hard to tally the time spent in frequent brief checks on feeder activity. These problems can be clearly illustrated with a simple hypothetical example. Suppose a CBC with one participant tallies 100 individuals of a single species in a count circle with no feeders, during 10 hours. The result is 10 birds/party-hr. Now do a rerun of the count, adding a stop at a feeder. This time, on the assumption that the birds concentrate at feeders and chances of seeing them are increased, 110 individuals are recorded. Result: 11 birds per party hour, with 1 bird per party-hr seen at feeders. Rerun a third time, still stopping at a feeder and repeating the count of 110 in 10 party-hrs; but this time, add a second feeder with a home-based observer who puts in 5 hours and sees 20 birds (2 times more per birds/feeder than were seen by the field counter). Should the final tally be 130 birds in 10 party hours, resulting in 13 birds/party-hr if feeder hours are excluded from the calculation, as is the current practice for CBC analyses? Or is it 130 birds in 15 party hours (giving 8.7 birds/party-hr when feeder hours are included)? In this example, either inclusion or exclusion of hours spent by home based observers still leads to about 20% alteration in the 11 birds party-hr seen by field parties alone.

A relatively simple solution to the problems posed by home based observers is for CBC compilers to record separately the numbers of birds tallied by participants at home. These numbers could be printed in CBC summaries in parentheses following the grand total for each feeder species. The procedure should not add a great burden either to counters or CBC compilers because relatively few species are involved, and should not importantly add to cost of printing or data base management.

Separate record keeping for birds seen by home based observers would confer several benefits. In combination with field party totals, it would give some indication of which species are "feeder species." Users of the data could calculate birds/party-hr for each species as deemed appropriate for their purposes. Long stints at feeders bring to light a high proportion of the sightings of certain uncommon species, sometimes the only sightings (Table 2). Separate accounting of these birds would tell us something about the importance of feeders in

extralimital winter records. Lastly, with data on birds seen separately by field parties and home based observers, long term trends could be calculated for CBC counts based on field party observations alone. A comparison of CBC trends for feeder and non-feeder species to trends in Breeding Bird Survey data might tell us whether CBC field totals have been biased upwards by wide-spread increases in the hobby of winter bird feeding.

We would like to repeat the analyses reported in this paper for other geographic locations. Any CBC count compilers who are willing to collect data are asked to contact the second author.

SUMMARY

Participants in the 1990-91 Ithaca, New York, Christmas Bird Count recorded the number of each species seen at bird feeders, whether by home-based observers or by field parties. In 27 species over half of all individuals recorded were at feeders. Because birds visiting feeders are probably more conspicuous than otherwise, increases in the hobby of bird feeding over the past several decades likely has inflated CBC counts of feeder species. Moreover, home based observers in this study counted as many as 7.6 times more birds/feeder than did field parties. Inclusion of home-based feeder observations in CBC totals can have large effects on birds/party-hr, whether or not observation hours at feeders are used in the calculations. We recommend that numbers of birds seen by home based observers always be reported separately in published accounts and in CBC data bases. More studies like ours could elucidate the range of variation in proportions of each species likely to be found at feeders, and how this proportion changes with location, weather and natural food conditions.

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