

## Three Decades of Backyard Birds in New Hampshire (1967-1997)

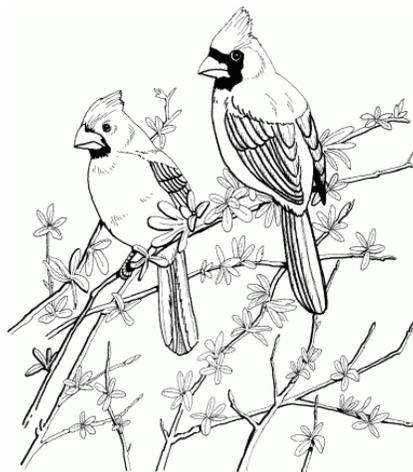
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Way back in 1967, the Audubon Society of New Hampshire initiated a statewide survey of three southern birds that had recently invaded the state in large numbers: the Northern Cardinal, Tufted Titmouse, and Northern Mockingbird. Mourning Doves were added to the survey in 1979, and in 1987, the project expanded to include all birds and became the Backyard Winter Bird Survey (BWBS). The most recent year of data, 1997, thus represents the 11th year of the BWBS, and the 31st of the Cardinal-Titmouse-Mockingbird survey. It thus seems fitting to put your efforts, as well as those of the observers who came before you, into something of a bigger perspective.

But before I begin speculating on winter bird populations a note on the data is in order. In most cases, the numbers presented here are the total numbers for the state (or portion thereof). As attractive as the resulting graphs are, they hide a very important variable: the number of people participating in the survey! The 1500+ people who sent in forms in 1997 was a new record and stands in stark contrast to the 800 participants only a year earlier, to say nothing about the 200 or so in the mid-1970s. Obviously, the more eyes there are watching feeders throughout New Hampshire, the more birds are going to be reported. It thus becomes difficult to separate increases in bird populations from the increase in observers, as you shall see. Another confounding factor is the weather. Since the survey only takes place on a single weekend, the data are subject to all sorts of outside influences that are beyond our control, namely the weather. Participants in the 1996 survey probably still remember the miserable weather that drove both birds and birders away in droves. In light of this, how real are any perceived population declines? That is why it's good to have such a large data set: the odd years get smoothed over when you step back and look at the big picture.

And what a big picture it is. In the 31 years since the survey was initiated, the number of Northern Cardinals reported has increased from 53 to 1423, or over 2500%!

Remember, however, that observers have also increased 750% since 1975, while cardinals only increased 350% in the same period. In fact, if you calculate the number of cardinals per feeder, the cardinal population has actually declined since 1975. Does this make sense? Not really, since lots of other data sets indicate that cardinals are still increasing. It might thus reflect an increase in observers in areas with fewer cardinals (the northern part of the state, for instance), although the data are not in a form that makes this latter possibility easy to investigate. What we can do is compare populations in the north (Coös, Grafton, and Carroll counties) with those in the south (the rest of the state).



This analysis shows, for starters, that cardinals are roughly ten times more common in the south. Also note that the increases since 1981 (when county data became available) are relatively low compared to those in the first 15 years of the survey.

A final comment on cardinals before moving on. If you go a step further and look at the data county by county, you find that the increases have been strongest in the central part of the state: in particular, Grafton, Sullivan, and Strafford counties. Merrimack and Hillsborough counties both show moderate increases, while Cheshire, Rockingham, Coös, Carroll, and Belknap show only slight increases. This confusing hodgepodge of trends suggests to me that the cardinal "invasion" has already passed through the southern part of the state and has not yet hit full strength in the north. I could continue to break the cardinal data down and look for neat little stories among the numbers, but you get the point: northern cardinals have been increasing since the survey began in 1967, and, although their numbers have been leveling off somewhat, they show no sign of stopping their spread through the state.

The same could be said for the Tufted Titmouse, whose overall trend is remarkably similar to that of the cardinal. The obvious difference, however, is that the titmouse started off less common than the cardinal and is now more common. This may indicate that titmice are still in a growth phase, whereas cardinals are leveling off; it is generally true that titmice arrived slightly later than cardinals. Bearing this out are the "per feeder" data for titmice, which do show a slight increase (in contrast to the cardinal).

A final comment on the cardinal and titmouse data is in order. You may notice that the shapes of the two species' graphs show a lot of similarities. In particular, note the sharp increase and decrease between 1981 and 1984, and a similar increase-decrease in 1990-1996. What was behind these extreme fluctuations? One possibility is changes in the numbers of observers. The earlier peak corresponds nicely with an increase and decrease in the number of survey participants; lacking any summary of weather data for that period, there's not much more to say. As mentioned previously, 1996 was generally a miserable year for observers, which in turn could partially explain the sharp declines in cardinals and titmice. But in this case, there is another explanation, one that is borne out by other data sets: the winter of 1995-96 was unusually cold. Even if the weather had been pleasant on the survey weekend in 1996, I'm guessing there still would have been fewer birds to count. Both cardinals and titmice are essentially southern species and thus still susceptible to cold temperatures. By mid-February, the winter may have taken its toll on less hardy individuals.

Another southern species that invaded in the 1960s was the Northern Mockingbird. Mockingbirds first showed up on the survey in 1971 and rapidly increased through the mid-1980s. But then, unlike the preceding species, mockingbirds began a consistent decline that continues to the present. It is not at all clear what this decline means, or, for that matter, if it really exists. While it is generally true that mockingbird populations have stabilized somewhat in the last decade throughout New England, I know of no other data showing a decrease. Perhaps it's just that mockingbirds are changing their behavior and visiting feeders less.

A more recent southern invader is the Carolina Wren, which did not occur regularly in the state until the mid-1980s. Soon thereafter, this species showed up on the feeder survey and increased rapidly through 1993. The following year, however, the population dropped slightly and then crashed between 1994 and 1996. Most of this crash can be attributed to the weather, as Carolina Wrens are regularly set back by cold winters even in relatively balmy regions such as southern New England. The 1997 data, however, already suggests something of a rebound, so it will be interesting to see what 1998 has in store for this species.

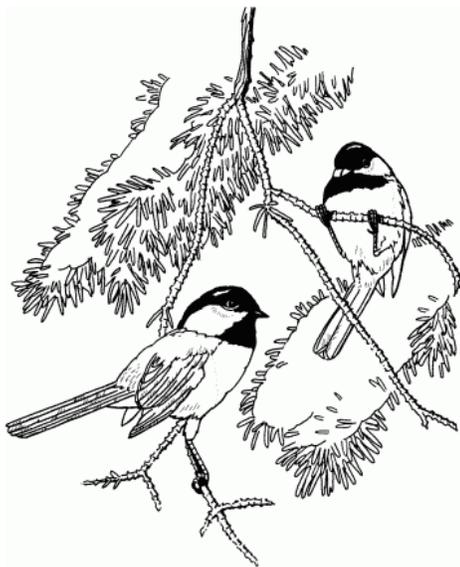
The last and most recent newcomer from the south is the Red-bellied Woodpecker. Between 1987 and 1995, this species was reported every other year or so, and then

there was usually only one bird for the entire survey. In the fall of 1995, however, red-bellieds invaded the state in record numbers, and 16 were tallied on the 1996 survey. This number increased to 21 in 1997, and it seems that the Red-bellied Woodpecker is here to stay. Also note that it does not seem to be affected by the cold winter of 1995-96. At the moment, this species' strongholds are the seacoast and the Merrimack River valley, but keep an eye out for it farther to the north and west as well as it continues to expand its range.

Although they breed more or less throughout the state, Mourning Doves did not always winter here in large numbers. Their increase as winterers began in the 1970s and is at least partly due (as are all these species' increases) to an increase in bird feeders. Between 1980 and 1997, dove abundance on the survey approximately doubled, despite, as in all the other species, a sharp decline in 1996.

So that covers the original cohort of species included in the survey, and the general pattern for all has been one of consistent increase (except the mockingbird) with declines during harsh winters. But not all species are from the south, and it can be enlightening to see what's been happening with those species that have been a part of our avifauna longer than there's been an Audubon Society of New Hampshire. For lack of a better plan, I'll do them roughly in taxonomic order.

Both Downy and Hairy Woodpeckers have shown gradual increases since 1987 with no obvious sharp peaks or deep valleys. My guess is that these species, which are among the only birds in New Hampshire that don't migrate, simply take each winter as it comes and go about their activities no matter what the weather. Cold winter or warm winter, the woodpeckers will simply keep tapping away at that stump or suet feeder. Another species that rarely migrates is the White-breasted Nuthatch; it, like the woodpeckers, doesn't show all that much of a trend.



Two other species are often thought of as permanent residents when in reality many of them migrate to warmer climes in winter. These are the Blue Jay and Black-capped Chickadee, and both show a pattern of ups and downs that ultimately leads to no overall population trend. Some of these fluctuations are due to cold, some to changes in observer numbers, and some to changes in the food supply. Some may remember that the winter of 1995-96 (yes, there it is again!) was notable for its relative scarcity of Blue Jays. Yes, it was cold, and yes, there were fewer observers in the survey, but again, the lack of jays was widespread and not limited to a single weekend. In this case, it was due to a lack of food. The fall of 1995 was marked by very low production of the acorns and beech nuts that are the staples of a jay's winter diet, and as a

result, large numbers of jays left New England to seek food elsewhere. They were all back in the spring, unlike species whose declines in 1996 were due to increased mortality.

Now we come to a suite of species for whom New Hampshire is south of where they breed and thus could probably care less about how cold it is. These guys are in New

Hampshire partly because for them, it's warmer than where they came from. The stars of this group are the winter finches, but there are a few others that are worth discussing as well. We'll start off with the American Tree Sparrow, by far the most common native sparrow at New Hampshire winter feeders. This one is easy: there has been no change in American Tree Sparrow numbers since 1987, with the population hovering between 1000 and 1500 for almost the whole period. Another sparrow, the Dark-eyed Junco, shows a very different pattern. Junco numbers vary dramatically from year to year, with a peak every two or three years. What causes these peaks is unclear, but it likely has something to do with food supplies.

And finally, the true irruptives, species that vary so much in abundance that they may be completely absent one year and super-abundant the next. Most of these are finches, but the group also includes waxwings (for which we have only limited data) and the Red-breasted Nuthatch. The data for the latter don't show much of a pattern, with the exception of a threefold increase in the winter of 1993-94. Red-breasted Nuthatches move south in larger numbers when Canadian cone crops are poor and our cone crops are good, and when they're down here they're not averse to visiting a feeder or two. There was another large influx of these little nuthatches in the fall of 1997, and by the time you read this we'll have found out if this was the vanguard of the latest invasion.

But it is the finches that come to mind when someone mentions irruptive seed-eaters, and six species show up in the BWBS database. By far the most common is the American Goldfinch, which is also a common breeding species throughout the state. Nonetheless, its abundance varies greatly with seed crops on what appears to be a two- to three-year cycle. Also on a two-year cycle are the Pine Siskin and Common Redpoll, which follow birch crops across the northern U.S. and southern Canada. Note, however, that the peaks for the siskin do not coincide with those for the redpoll. This is probably because the two species come from different breeding habitats (redpolls are closer to the tundra), and are thus responding to different food sources.

Perhaps the most famous winter finch of all is the Evening Grosbeak, known far and wide for its penchant for cleaning out a feeding station in a matter of minutes. Evening Grosbeaks were rare birds in New England until the mid-1900s but since then have become a reliable part of our avifauna. In recent years, however, winter numbers have been unusually low, leading many to wonder whether populations are declining or whether migration strategies have changed. The last big peak for Evening Grosbeaks for the BWBS was in 1992, and the current scarcity is paralleled in other sources of data. Unlike the other finches, the Pine Grosbeak is more of a fruit-eater than a seed-eater, and is more likely to be found in a crab-apple or mountain-ash than a bird feeder. As a result, the numbers in the BWBS are relatively low, and have been multiplied by 100 so that the trend can be discerned. Note the synchronicity of Pine Grosbeaks and Common Redpolls, but I'm afraid I can't provide an explanation for it.

The final irruptive finch is our state bird, the Purple Finch. This species seems to have cycles that average four years apart, and as a result it often doesn't co-occur with the two- to three-year irruptives discussed above. Often confused with the Purple Finch is the final species of this summary, the House Finch. House Finches are not native to the eastern United States, having been introduced in New York City in the 1940s. From this starting point, they spread north, south, and west, reaching New Hampshire in the 1960s. Thus we have come full circle, since House Finches were moving into the state at the same time as cardinals, titmice, and mockingbirds. Unfortunately, we don't have data for House Finches before 1987, and they appear to have stabilized by that time. Interestingly, this species was also negatively affected by the cold winter of 1995-96.

So that's the run-down on the common birds on the BWBS, and what their populations have been doing over the last decade or three. Several underlying processes are at work here, and it seems fitting to close with a quick review of the big picture. For starters, several southern species have been gradually increasing in the state since the 1960s, these being the Northern Cardinal, Tufted Titmouse, Northern Mockingbird, Carolina Wren, and, since it fits better here than anywhere else, the House Finch. The Mourning Dove can also be included in this category. Because these species are not perfectly adapted to cold northern winters, their populations often decline when temperatures get particularly low, as seems to have happened for several species in 1995-96. At the same time, other species, such as Blue Jays and irruptive finches, declined in 1996 because food supplies in the region were naturally low. As we watch the approach of the 1997-98 winter season, it appears that the winter irruptives are here again, and with a mild winter predicted, who knows what's going to show up at feeders!

Thus the composition of visitors to your feeder in any given year is a complex mix of colonizers from the south, survivors of the cold, and invaders from the north, and the chances are that no two years will ever have the same exact mix. That, of course, is one of the reasons we enjoy watching birds: we never know what's going to happen next. So keep on watching, and see what the next decade brings.