

# **Six Decades of Migration Counts in North Carolina**

---

**Marilyn Westphal**

*230 Park Lane , Hendersonville, NC 28791*

## **Introduction**

“Might the day come when Turkeys are easier to come by than Northern Bobwhites?” This was a question posed by John Fussell (1993) in his analysis of the 1992 spring bird count. His prediction may soon come true. This report analyzes population changes of these two species, as well as several others, based on data from spring bird counts in North Carolina from the 1950s through the current year. With the exception of the 1980s, spring count data were published in *The Chat* almost every year from the early 1950s through the current year. Thanks to Peggy Ferebee, even the data from the missing years have been located and are included in this report. Because of the extensive amount of time it takes to enter all of the data into a file for easy analysis, only three years of each decade were selected for comparison. In most cases these are the fourth, fifth, and sixth years, but in two cases where data were missing, another year close to that period (1952 instead of 1954, and 1983 instead of 1984) was selected.

Not all counts that were completed each year have been included. Only those with consistent coverage throughout the six decades were selected. Only consistent count areas were selected because including different count areas each year can introduce additional regional bias. In the case of the piedmont, the count areas include Raleigh, Durham, Chapel Hill, Greensboro, Winston-Salem (Forsyth), and, on the edge of the piedmont/coastal plain, Southern Pines. None of these count areas except Greensboro includes data from every year, but they all have counts from most years. No coastal count areas were consistently covered throughout this entire period, but Wilmington was the most consistent until recently, and Onslow County has been in recent years. No mountain counts were conducted in the 1950s and 1960s, but the Brevard and Buncombe counts from the 1970s to present were included. Although all of these small inconsistencies affect some results to a certain extent, all species analyzed for statewide trends are those that occur regularly, and in most cases somewhat uniformly, statewide.

Of course many factors, including variations in coverage from year to year, weather, variations in birding skills, and improved equipment in later years, complicate analysis over time. To reduce some of the variables the same counts were used every decade and comparisons were made on birds per party-hour (a.k.a. per field-hour) rather than total birds. Birds per party-hour are calculated by dividing the total number of each species by the total time in hours in the field of all groups or “parties” of birders in the count. This reduces variations that occur because of greater participation in any

given year. Three years each decade, rather than just one, were used to reduce variations that occur because of inclement weather during any particular count. Nonetheless, there are always factors for which it is difficult to compensate. It is assumed that variation in birding skills has always existed and balances out over time. Also, variations in specific count areas can occur because of birders' knowledge of a count area, but often this information is passed on to successive birders. It is also assumed that birders have always had the tendency to seek out certain species to increase total species count. Thus, for some species that may be declining in recent years, birders probably seek out areas where they know these species still exist. So the extent of population change is difficult to assess from spring counts.

A few common birds have been included for comparison in this analysis to provide "control" species for which little change over time was expected. Population changes over time for some species are quite dramatic and probably indicate real gains or losses. Other changes are less significant. All changes can be tested using other survey methods, and in some cases these will be noted. However, this article focuses specifically on results from spring counts. In most cases, speculations on reasons for population changes are left for other studies.

## Results and Discussion

The first pair of species analyzed are the two that John Fussell remarked about in 1992, the Northern Bobwhite and Wild Turkey (Fig. 1). The Northern Bobwhite population has been greatly affected by loss of habitat.

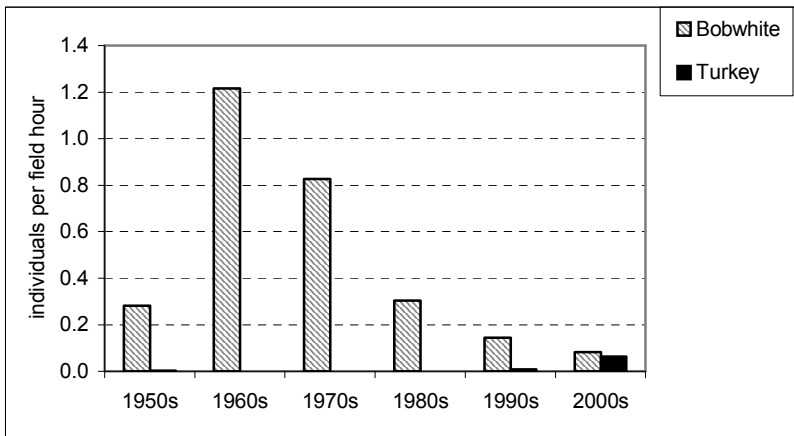


Figure 1: Northern Bobwhite and Wild Turkey—Statewide

Northern Bobwhites were very common on the counts in the 1960s but have steadily declined in each decade since that time. Current count totals on spring counts are a tenth of what they were in the 1960s. Although there may still be Bobwhites in areas that are less accessible to birders, it is probably

also true that birders are now deliberately going to places where Bobwhites are known to exist. It apparently took a great deal less effort to find this species before 1980.

Hunting was a key factor in the early decline of the Wild Turkey, but reintroduction of this species has been a great success and Turkeys now appear regularly on spring counts. This is also the case on Christmas Bird Counts in North Carolina. Wild Turkeys rarely appeared on CBCs before 1990, but since then they have been found every year, and often found in good numbers. If the current trend continues, count totals of Turkeys could exceed those of Bobwhites by the next decade, although the Bobwhite population could at least be partially restored if additional suitable habitat were maintained and properly managed.

The next pair includes the Bald Eagle and the American Kestrel. The Bald Eagle population declined dramatically in the 1960s and 1970s primarily from the effects of DDT on eggshell thickness, but numbers bounced back in the 1980s and have remained fairly steady on counts since then (Fig. 2). American Kestrel numbers are thought by some to be declining, but numbers on North Carolina spring counts have been fairly consistent throughout the past 50 years, although the current decade does show a slight decline. Results from Christmas Bird Counts in North Carolina over the same period are also inconclusive.

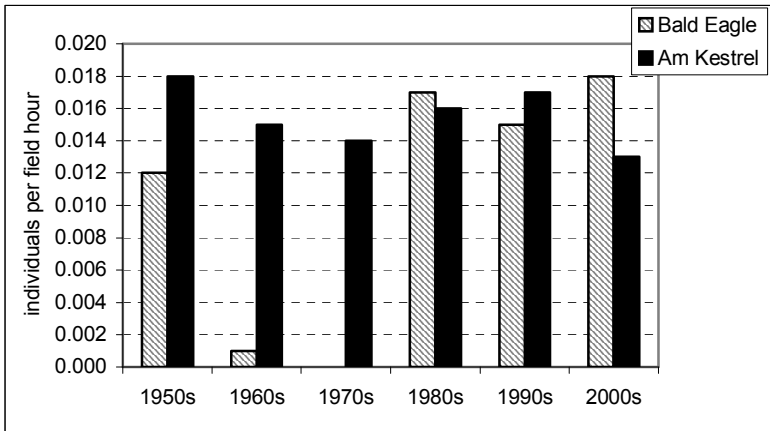


Figure 2: Bald Eagle and American Kestrel—Statewide

Another species thought by some to be declining throughout much of its breeding range is the Whip-poor-will, and indeed that appears to be the case in North Carolina (Fig. 3). Since the amount of time spent in the field at dawn and dusk and the phase of the moon are critical to locating this species, the comparison species chosen was a close relative, the Chuck-will's-widow. No dramatic overall population changes have been noted in the Chuck-will's-widow, although there does appear to be some local variation.

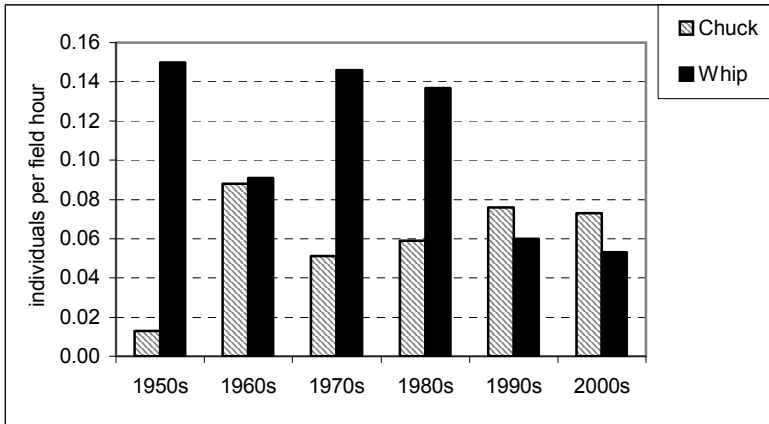


Figure 3: Chuck-will's-widow and Whip-poor-will—Statewide

The Wood Thrush is also thought by some to be declining in many parts of its range. While numbers were much greater in North Carolina in the 1950s and 1960s, and declined in the 1970s, they have remained fairly stable on counts since then (Fig. 4). The Black-throated Blue Warbler was chosen as a comparison species because it is also a neotropical migrant that occurs in ample numbers throughout the state in spring migration. The chart reveals an increase in Black-throated Blue numbers in the past two decades, but this is probably the result of wider coverage on the two mountain counts where the species is more common. Although using field-hours does help reduce increased coverage as a complicating factor, more birders usually mean larger areas are included, and in some areas like the mountains expanded coverage may mean that more forested areas with suitable habitat were included in the later counts.

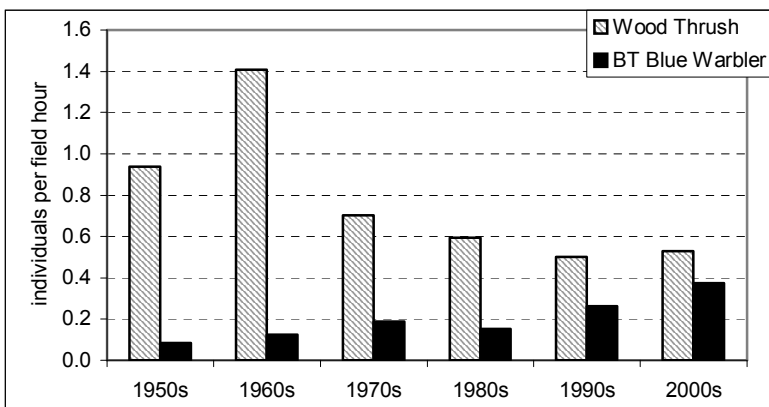


Figure 4: Wood Thrush and Black-throated Blue Warbler—Statewide

The next two charts focus on three grassland species that are declining largely as a result of habitat loss. Figure 5 shows the change in the population of Field Sparrows and Grasshopper Sparrows. As the chart demonstrates, Field Sparrows were once quite common on spring counts but their numbers are now less than one-third of what they were in the 1950s, 1960s, and 1970s. In contrast, Grasshopper Sparrows were never very common in these selected count areas, but numbers have recently dwindled to the point where they are now unusual finds. Grasshopper Sparrows can be more difficult to locate, especially for birders with some hearing loss, but it is assumed that this difficulty was as true in 1955 as in 2005, and when species become rare, birders have a tendency to “stake them out” before a count to be sure that they do make the list. Thus, Grasshopper Sparrows may actually be even more uncommon than the numbers indicate.

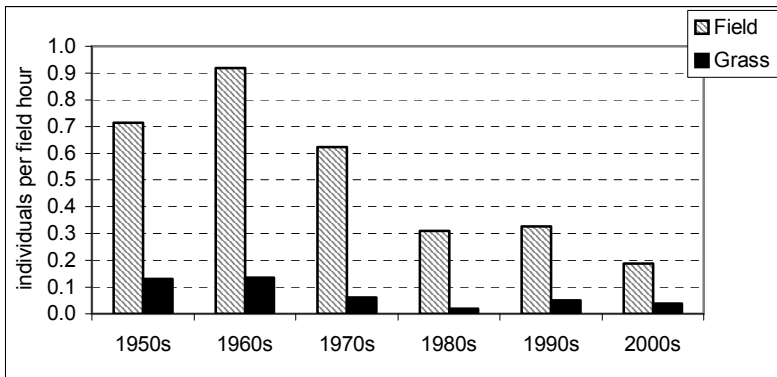


Figure 5: Field Sparrow and Grasshopper Sparrow—Statewide

The third grassland species that shows significant decline is the Eastern Meadowlark (Fig. 6). As with the other grassland species analyzed, Meadowlark numbers per party-hour have been declining steadily since the 1960s. This same decline is evident from the North Carolina Christmas Bird Counts. The Carolina Chickadee is included in this chart, not because it uses the same habitat, but because chickadee numbers were not expected to vary greatly over time. Finding another grassland species not affected by habitat loss is difficult.

Finally, in the statewide analysis of population changes two introduced species, the House Sparrow and House Finch, are included (Fig. 7). House Sparrow numbers skyrocketed in the 1960s, and even comments on many counts in that decade remark on the high numbers. Since then numbers have declined every decade. The decline probably stems at least in part from the growth of suburbia into former farmland areas. House Finches first reached North Carolina in the 1960s but do not appear on spring counts in any numbers until the 1980s. In the past two decades their numbers have surpassed those of the House Sparrow. In more recent years disease may be keeping House Finch numbers in check.

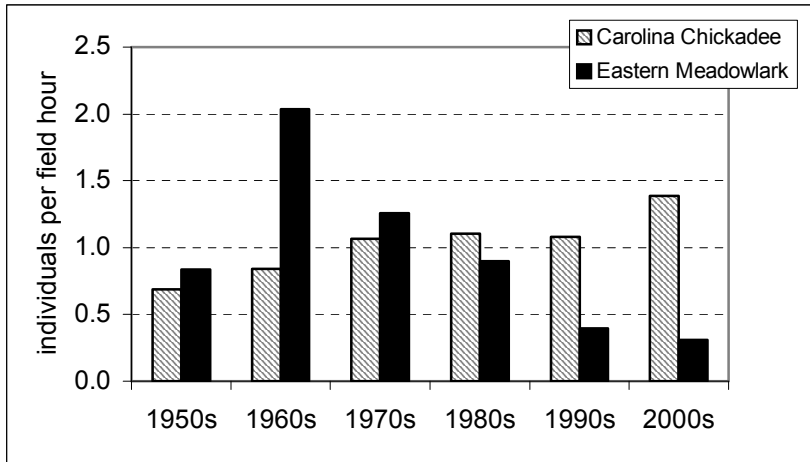


Figure 6: Carolina Chickadee and Eastern Meadowlark—Statewide

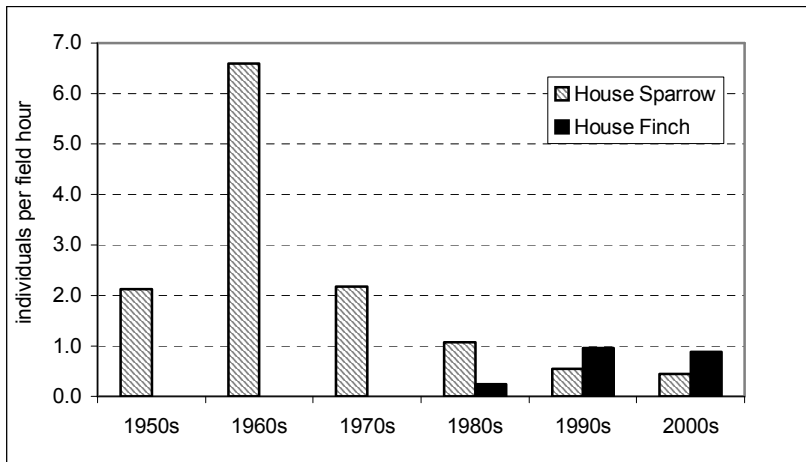


Figure 7: House Sparrow and House Finch—Statewide

Some species are of more regional interest. Since there is such consistent documentation from the piedmont, it is easier to make comparisons over time in that area. Figure 8 shows piedmont counts for Great Blue Heron and Canada Goose. The sudden increase in Great Blue Heron numbers in this decade may be a result of the recent increase in numbers of beaver ponds and the subsequent discovery of nesting colonies of these birds at these ponds. Habitat protected from human disturbance is critical for heron nesting, and its provision may be significant in the apparent increase in numbers. Resident Canada Goose populations have been burgeoning in the past two decades as the species has begun breeding in the southern states. It is now one of the most common species found in many North Carolina count areas.

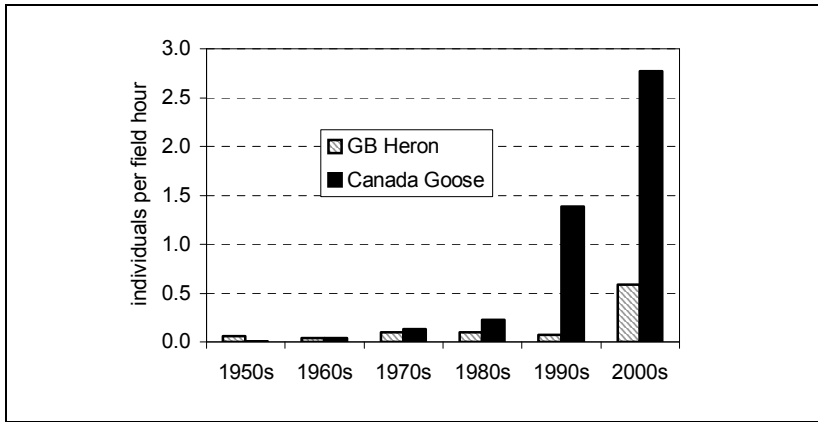


Figure 8: Great Blue Heron and Canada Goose—Piedmont

Some birders in the piedmont have indicated that the number of Song Sparrows appears to be increasing over time. The chart does not show a significant change over time from the piedmont counts included in this analysis (Fig. 9), but the number of this species is greatly affected by the weight of the counts from the inner and outer portions of the piedmont. Song Sparrows are much more common in the western piedmont. An analysis of Song Sparrow range expansion is probably better accomplished on a county-by-county basis. For example, the number of Song Sparrows on the Chapel Hill count has increased tenfold in this decade. In fact, on that count they now outnumber Field Sparrows, which have shown a decline. Here the Song Sparrow has been paired with the Chipping Sparrow, which has shown some variation on counts over the past 50 years.

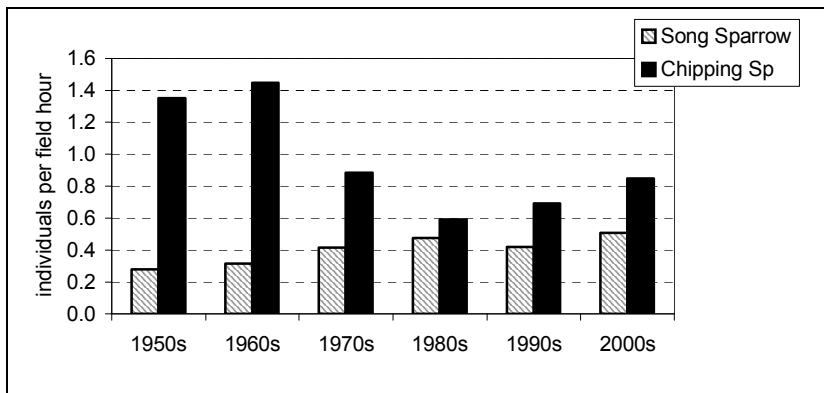


Figure 9: Song Sparrow and Chipping Sparrow—Piedmont

Finally, this analysis includes an overview of hawk populations in the piedmont. For whatever reason, the numbers of Red-shouldered, Red-tailed, and Cooper’s Hawks sighted have increased considerably in the past two to three decades, while the numbers of Broad-winged and Sharp-shinned

Hawks have remained stable (Figs. 10 and 11). With only a few exceptions, the proportion of each species found in each count area over the years has remained about the same. Cooper's Hawks may be taking advantage of increased numbers of bird feeders where these hawks find relatively easy and concentrated targets.

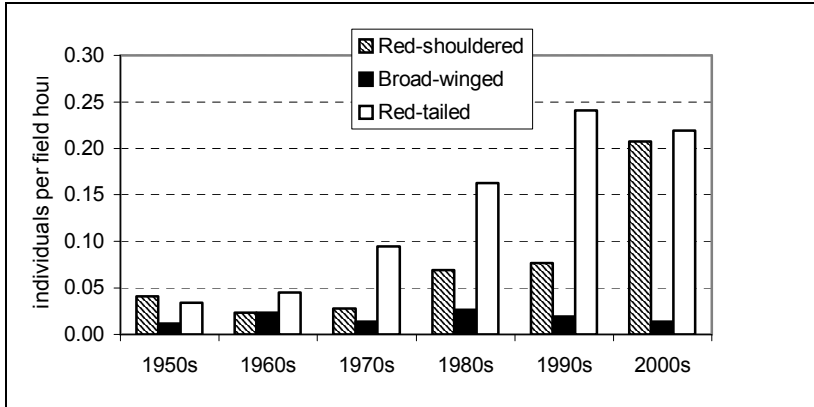


Figure 10: Red-shouldered, Broad-winged, and Red-tailed Hawks—Piedmont

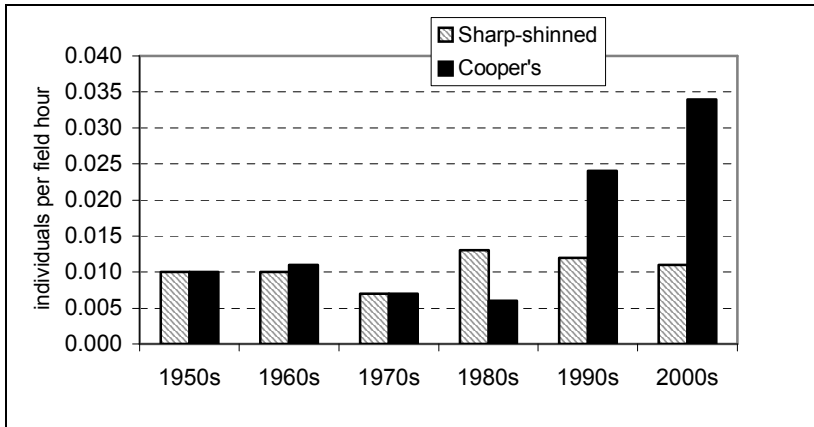


Figure 11: Sharp-shinned and Cooper's Hawks—Piedmont

As mentioned, compiling the data from all of the spring counts through the years and putting them into a format easy to analyze is a huge undertaking. Once compiled, however, it can be made available to anyone interested in studying changing bird populations and analyzing range data.

### Literature Cited

Fussell, J.O. III. 1993. Spring Bird Count—1992. *Chat* 57:32–45