Winter Birds

by David Malakoff,
George Constantz, and Steve Fretwell

Introduction
The Christmas bird count was started in 1900 by Frank Chapman of the American Museum of Natural History as a substitute for the annual "side hunt", during which teams went into the field and shot game to achieve a larger bag of species than other teams. Today side hunts are a thing of the past, replaced by over 2,000 counts across the United States and Canada; 13 or 14 are held in West Virginia. The results of every count are published in American Birds, a journal of the National Audubon Society.

Since 1969, the Hampshire County Christmas bird count has used Cold Stream Lodge, just downstream of Capon Bridge, as its headquarters. With 21 years of data (no count in 1988) to its credit, the Hampshire County count provides the most comprehensive data set available on the abundance of winter birds in the Cacapon River basin. The Lab is fortunate that David, the senior author and current organizer of the count, has assembled the data in his computer's memory and made them available to the Lab.

Materials and Methods
Christmas counters typically walk through fields and along forest edges and drive country roads within an 8-mile radius of headquarters. Over the 21 years, the level of effort has varied:
- number of observers..................14-49
- total party hours.....................39-168
- foot party hours......................14-147
- car party hours......................12-39
- total party miles...............57-487
- foot party miles..................16-305
- car party miles.................134-435
- date..........................27 Dec - 3 Jan.

For comparisons among species and years, we divided the raw observed counts by total party hours, yielding number of birds per party hour.

Results
A total of 93 species have been recorded on the Hampshire County Christmas bird count (Table 1). The ten most common winter birds in the Cacapon River basin were the European starling, slate-colored junco, chickadee species (black-capped and Carolina combined), common crow, American robin, house sparrow, blue jay, northern cardinal, tufted titmouse, and tree sparrow.

The ten least frequently sighted species were the Oregon junco, savannah sparrow, northern oriole, common yellowthroat, palm warbler, peregrine falcon, osprey, wood duck, bufflehead, and gray catbird. Of the 10 rare species all were seen only once during the two plus decades, except the catbird which was recorded twice. (As this piece was being written — early December — George saw a goshawk at the Lab. This explains why the chickens, somewhat fewer in number, were holed up in the brush pile! The goshawk has been recorded only three times during the count.)

The results of a count depend on the number of counters. For example, the number of species grew as the number of party hours (a function of number of observers) increased (Figure 1). This graph emphasizes the importance of enlisting as many bird counters as possible.

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Three of the winter bird species are exotic year-round residents. The starling, house sparrow, and pigeon were imported from other shores and have spread throughout the country. The black vulture, in contrast, is a recent natural invader from the south.

Some ecologists believe those species exhibiting consistent numbers among years are useful for tracking environmental trends. How stable are population sizes of our winter birds? Table 1 lists the bird species in descending order of stability (measured by coefficients of variation, i.e., the variance in birds per party hour divided by mean birds per party hour). The following ten species were relatively stable from winter to winter, and therefore may be useful for tracking environmental changes:

- northern mockingbird
- belted kingfisher
- house sparrow
- brown creeper
- red-tailed hawk
- white-breasted nuthatch
- red-bellied woodpecker
- American kestrel
- pileated woodpecker
- common flicker

The plot of the northern mockingbird counts illustrates a stable pattern (Figure 2); in contrast, the tufted titmouse exhibited intermediate stability, while the American robin fluctuated wildly.

The contrast between stable and fluctuating populations can be seen in closely related species as well. The song sparrow is stable, compared to the tree sparrow (Figure 3).

### Abundance & Stability

Now let us combine measures of abundance and stability. The following 5 species were both abundant and stable: slate-colored junco, house sparrow, northern cardinal, white-breasted nuthatch, and downy woodpecker. The following six species were abundant and unstable: American robin, house finch, evening grosbeak, common bobwhite, tree sparrow, and cedar waxwing. The brown creeper and belt kingfisher were both rare and stable. The category of rare and unstable is not meaningful because it would be an artifact of single sightings.

### Discussion

What causes some species to be relatively stable and others to fluctuate wildly? At least two phenomena, one a statistical artifact and the other an interesting biological cause, seem to be involved.

First, fluctuation seems to be associated with abundance, and stability with rarity. That is, high numbers allow for large deviations, while small numbers do not. And second, flocking birds seem to fluctuate wildly. A big flock passing through the count area can overwhelm a given year’s results. Thus, it makes sense that all of the six abundant and unstable species overwinter in large flocks.

### An Invitation

Participation in the Hampshire County Christmas bird count is open to everyone. Each team has at least one experienced birder so beginners can learn the ropes. Call the Lab at (304) 856-3911 for details. (This year’s count was held on December 28th — but call us if you want to receive an announcement for next year’s count.)