

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 observers14-49
- total party hours39-168
- foot party hours14-147
- car party hours12-39

- total party miles57-487
- foot party miles16-305
- car party miles134-435
- date27 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.

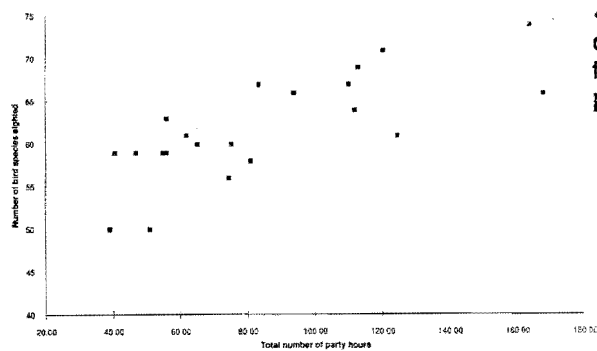
Results

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 sited 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.)

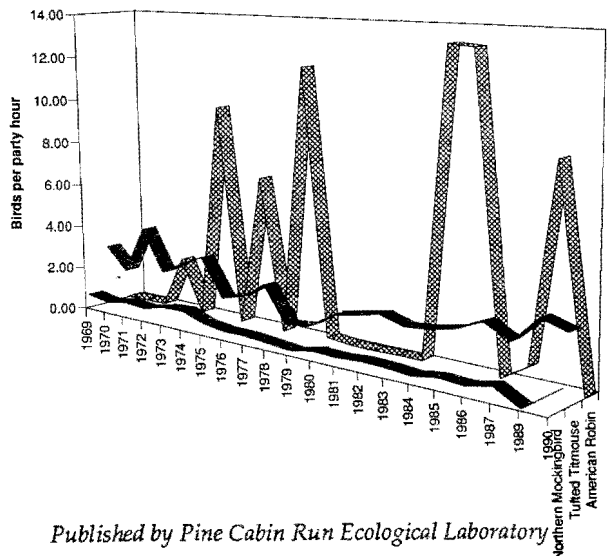
The results of a count depend on the number of counters. For example, the number of species grew as the number of party hours (a function of number of observers) increased (Figure 1). This graph emphasizes the importance of enlisting as many bird counters as possible.

"A total of 93 species have been recorded on the Hampshire County Christmas bird count."



← Figure 1. Number of bird species as a function of number of party hours

→ Figure 2. Inter-year stability of birds per party hour: northern mockingbird, tufted titmouse, and American robin



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).

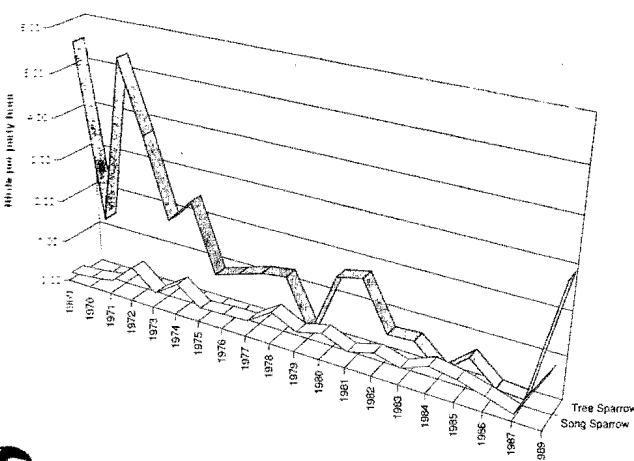


Figure 3. Inter-year stability of birds per party hour: song and tree sparrows

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 belted 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.)

TABLE 1. Rankings of bird species according to relative abundance and relative stability. Christmas bird count, Hampshire County, WV, 1969-1990. Abundance is the total number observed, and stability is the coefficient of variation of birds per party hour for all years. Both columns are listed in descending order.

ABUNDANCE	STABILITY
European starling	northern mockingbird
slate-colored junco	belted kingfisher
chickadee species	house sparrow
common crow	brown creeper
American robin	red-tailed hawk
house sparrow	white-breasted nuthatch
blue jay	red-bellied woodpecker
northern cardinal	American kestrel
tufted titmouse	pileated woodpecker
tree sparrow	common flicker
white-breasted nuthatch	downy woodpecker
cedar waxwing	slate-colored junco
downy woodpecker	ruffed grouse
American goldfinch	eastern bluebird
eastern bluebird	hairy woodpecker
mourning dove	common raven
golden-crowned kinglet	field sparrow
evening grosbeak	northern cardinal
white-throated sparrow	song sparrow
pigeon	white-throated sparrow
field sparrow	eastern meadowlark
pileated woodpecker	tufted titmouse
red-bellied woodpecker	yellow-bellied sapsucker
purple finch	mourning dove
song sparrow	Cooper's hawk
common bobwhite	golden-crowned kinglet
northern mockingbird	European starling
house finch	blue jay
common flicker	chickadee species
Carolina wren	common crow
eastern meadowlark	rufous-sided towhee
turkey vulture	American goldfinch
brown-headed cowbird	Carolina wren
horned lark	red-headed woodpecker
red-winged blackbird	ruby-crowned kinglet
black vulture	great horned owl
hairy woodpecker	loggerhead shrike
red-tailed hawk	sharp-shinned hawk
common raven	tree sparrow
ruffed grouse	eastern phoebe
brown creeper	northern harrier
pine siskin	purple finch
yellow-rumped warbler	evening grosbeak
common grackle	turkey vulture
red-breasted nuthatch	hermit thrush
wild turkey	cedar waxwing
belted kingfisher	black vulture
ruby-crowned kinglet	white-crowned sparrow
black duck	brown-headed cowbird
hermit thrush	mallard
American kestrel	yellow-rumped warbler
red-headed woodpecker	red-breasted nuthatch
yellow-bellied sapsucker	American robin
loggerhead shrike	rough-legged hawk
killdeer	swamp sparrow
screech owl	pine siskin
winter wren	winter wren
mallard	common bobwhite
eastern phoebe	fox sparrow
rufous-sided towhee	common grackle
great horned owl	red-winged blackbird
barred owl	great blue heron
Canada goose	horned lark
northern harrier	goshawk
red-shouldered hawk	killdeer
swamp sparrow	lesser scaup
white-crowned sparrow	house finch
sharp-shinned hawk	ring-necked pheasant
rusty blackbird	green-winged teal
red crossbill	gray catbird
Cooper's hawk	golden eagle
fox sparrow	house wren
great blue heron	bufflehead
rough-legged hawk	barn owl
American woodcock	red crossbill
golden eagle	common yellowthroat
goshawk	osprey
ring-necked pheasant	pine warbler
pine warbler	wood duck
green-winged teal	peregrine falcon
lesser scaup	Canada goose
barn owl	northern oriole
house wren	savannah sparrow
gray catbird	Oregon junco
bufflehead	palm warbler
wood duck	pigeon
osprey	screech owl
peregrine falcon	red-shouldered hawk
palm warbler	wild turkey
common yellowthroat	barred owl
northern oriole	black duck
savannah sparrow	rusty blackbird
Oregon junco	American woodcock