

## HOW DO CAROLINA WRENS SURVIVE NEW ENGLAND WINTERS?

by William E. Davis, Jr.

The Carolina Wren (*Thryothorus ludovicianus*) has expanded its range into Massachusetts during this century and in recent years has become common in the southeastern part of the state. These wrens are largely nonmigratory. They have followed a pattern where they expanded their range for several years and then experienced widespread extermination during severe winters (Bent 1948). Griscom and Snyder documented this periodicity (1955), and stated that the Carolina Wren was at its maximum abundance in Massachusetts in 1954.

More recently Root (1988) suggested that temperature is the parameter most strongly associated with both distribution and abundance of this species. She stated that Carolina Wrens are absent when January's average minimum temperatures drop below 10 degrees F, and their occurrence is irregular below 20 degrees F. Robbins et al. (1986) documented declines in eastern populations during the severe winters of 1976-1977 and 1977-1978, but suggested that Carolina Wrens can survive periods of cold weather if they can find food. In Indiana, even under severe conditions, some wrens survived at feeding stations (Tamar 1978).

Forster (1990) linked the increase of Carolina Wrens in Massachusetts to feeding stations where peanut hearts seem to be a preferred food item. The range expansion of the Tufted Titmouse into Massachusetts has been linked to the increase in feeders for winter birds and hence an increased availability of both animal (suet) and plant (seeds) food (Kricher 1981). Winter feeding by man most likely caused the increase in Blue Jays in North America between 1962 and 1971 (Bock and Lepthien 1976). Clearly, inclement weather conditions, such as ice storms or protracted cold, limit the survival of Carolina Wrens in northern climes, but feeding stations are linked to their ability to survive these harsh conditions.

In recent years the Carolina Wren population in southeastern Massachusetts increased substantially. For example, at least one Carolina Wren has been seen on the Taunton-Middleboro Christmas Bird Count over the past fifteen years, with double figures reported for the past seven years, including an enormous 112 and forty-six reported for the past two counts. The number of party hours was similar in these fifteen years of Christmas counts. Because the most reliable parameter for standardizing count data is party hours (Kricher 1981), the increase in the Carolina Wren population appears to be real. During this period, southeastern Massachusetts experienced some episodes of prolonged extreme cold and heavy snow accumulations. The record-breaking cold of December 1989 appeared not to have a major impact on the Carolina Wren population of

Massachusetts (Forster 1990).

Why are these birds surviving? People have been providing large quantities of bird food for at least three decades. Why do we see a sudden increase in the Carolina Wren population? One possible answer is that the birds have developed the inclination to shift from a largely insectivorous diet in the summer to a more plant-dependent (bird seed) diet in the winter. A shift of this kind could be learned behavior. It would more likely be a genetically controlled predisposition toward a dietary shift in which the birds that possessed this trait would survive and pass it on to their offspring, while those without this trait would not survive the harsh winter conditions.

The Carolina Wren is a largely insectivorous bird. The contents of 291 stomachs of wrens from the southeastern United States, taken in every month of the year, showed about ninety-four percent animal materials, mostly insects. The six percent plant materials were mostly tree and shrub seeds including bayberry, poison ivy, and sumac (Beal et al. 1916). The proportion of plant food rises to eleven percent in winter and falls to one percent in summer (Martin et al. 1951).

Many of our local resident birds substantially change the proportion of plant food eaten during the winter months. For example, the Black-capped Chickadee eats fifty-three percent plant food in winter but only nine percent in summer, the Tufted Titmouse seventy-eight percent in winter and eighteen percent in summer, and the White-breasted Nuthatch sixty-eight percent in winter and zero percent in summer (Martin et al. 1951). Perhaps the successful range expansion of the Tufted Titmouse resulted from its ability to change diets in the winter and take advantage of the bird seed at feeding stations.

We may be witnessing a shift in dietary flexibility in the local Carolina Wren population, a shift that permits their exploitation of feeding station food. If some birds can survive even the most severe winters because they can utilize feeding stations, they would constitute a nuclear breeding population for replacing winter losses.

I first noticed a Carolina Wren at my feeders in Foxboro, Massachusetts, in October 1980. In December I trapped and banded presumably the same bird, using birdseed as bait. I saw the banded bird again at my feeders a week later. I recorded Carolina Wrens at my feeders during most winters since then, and in an attempt to document their use of feeder food, I made notes on their foraging behavior during the winters of 1987-1991. Some typical notes suggest that my Carolina Wrens forage on natural substrate (presumably for spider and insect food), eat suet, and eat birdseed, including sunflower seeds and cracked corn.

12/27/87 Carolina Wren foraging in leaves, lifting and probing beneath them, almost leaf-tossing

1/7/88 Twice in five minutes disappeared into feeder, foraged

heavily under the suet feeder (scraps?), and "nuthatched" around lilac limbs, picking at bark and bill wiping

1/17/88 Wren foraging at base of forsythias and on snow with freshly spread birdseed

2/14/88 Carolina Wren picking at seeds on snow at base of forsythias; Carolina Wren actively eating suet fragments directly under lilac suet sock, as Downy Woodpecker feeds on suet

1/3/89 Carolina Wren on ground ate seven or eight seeds (?); I could see it swallow them in about ten second intervals, foraging like the House Sparrows it was with

1/6/89 Same as above but twenty to thirty pecks in roughly thirty seconds

1/12/89 Carolina Wren pecking through dusting of snow to seeds on ground; flew to sunflower seed feeder and pecked several times and flew off with sunflower seed (?); pecked on ground repeatedly and swallowed; flew to feeder and swallowed two identifiable fragments of cracked corn (among other swallowings of items too small to see)

1/30/89 Foraging with juncos, two Carolina Wrens eating seeds (multiple swallows) on ground under lilacs

2/9/90 Two Carolina Wrens under feeders, rapidly eating seeds of variable size (could see them swallow); one flew off with a sunflower seed

2/11/90 Carolina Wren in one of the Potter trap feeders; made multiple probes, swallowing frequently; must be seeds. Although it was very difficult to identify many tiny objects which the Carolina Wrens ate, they were likely eating small seeds such as millet.

The evidence supporting this suggested linkage between feeder food and Carolina Wren survival is of course only anecdotal, and the hypothesis of increased dietary plasticity is sheer speculation. But some Carolina Wrens utilize bird feeder food in winter, and the hypothesis warrants investigation. It would be interesting, for example, to know what percentage of the Carolina Wrens in southeastern Massachusetts include bird feeders in their territories or shift territories in the winter to include them. Are they as sedentary at the northern limits of their range as they typically are farther south? It would also be interesting to compare survival rates between birds that have access to bird

feeders and those that do not.

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