Recent Breeding Range Expansion of Cedar Waxwings in North Carolina

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Historically the breeding distribution Cedar Waxwing (*Bombycilla cedrorum*) was poorly understood in North Carolina. Direct evidence of nesting in the state through the first part of this century is limited. A nest was found in Raleigh 13 June 1890. A newly-built nest was found at Blowing Rock 12 August 1929. Burleigh (1941) observed a bird gathering nesting material on Mount Mitchell on 10 August 1931. Cedar Waxwings were said to summer in small numbers at Rocky Mount (Pearson *et al.* 1942). Stupka (1963) added information on their breeding status in the Great Smoky Mountains National Park in the early 1960s, but all specific records were from the Tennessee side of the park.

A major problem in documentation of breeding is the protracted spring departure of wintering flocks and the frequent late nesting of the species (Bent 1950). It is now generally accepted that historically this species was largely confined to high elevation areas of our mountains as a breeding bird and that even there Cedar Waxwings nested sporadically. In 1970 Simpson *et al.* (1970) provided a summary of our knowledge on the breeding distribution of the species in North Carolina. They noted that while most of the published information on nesting in the state is from the piedmont and low mountain valleys, the bulk of the breeding population is found above 3,000 feet. Potter *et al.* (1980) were aware of no additional information and noted that waxwings breed throughout the higher elevations of our mountains. They also noted that on rare occasions waxwings nest across the northern half of the piedmont, nesting eastward to Wake County and Rocky Mount. Neither Simpson *et al.* (1970) nor Potter *et al.* (1980) gave any indication of a range expansion for this species within the historical period.

The distribution of this bird as a breeding species, or at least our knowledge of it, changed very little in the first 80 years this century. In this study we summarize the reported nesting evidence and nesting phenology for Cedar Waxwings in North Carolina, and we document a recent range expansion of breeding individuals through the piedmont and onto the coastal plain.

Table 1 summarizes the known breeding distribution of Cedar Waxwings in North Carolina. Records and reports are arranged geographically and by county. We have included reports which document nesting and all sightings of birds from July which imply nesting. Reports from other months cannot be separated from those of migrants without nesting evidence (see below). Reports from the North Carolina Breeding Bird Atlas (BBA) project and nest record card program (NC State Museum) that indicated probable or confirmed nesting are also included. Simpson (1992) reported on 35 sites along the North Carolina Blue Ridge where Cedar Waxwings occur during the breeding season. These are included in Table 1 in the few cases where these reports represent additional county breeding season occurrence records. Since the 1970s and 1980s (Simpson *et al.* 1970; Potter *et al.* 1980), nesting evidence in the following counties south and east of previously established geographical limits has been reported: Piedmont— Chatham, Cleveland, Franklin, McDowell, Polk, Yadkin; Sandhills and Coastal Plain — Bladen, Chowan, Craven, Cumberland, Currituck, Gates, Harnett, Hoke, Moore, Richmond, and Scotland. There are also now confirmed breeding records for six mountain counties (Allegheny, Ashe, Cherokee, Graham, Swain and Transylvania) where the species had not previously been recorded (Table 1). These records show the species to have generally increased in overall abundance and to have spread eastward and southward.

Waxwings began expanding onto the coastal plain and outer coastal plain of North Carolina in the 1980s, and the process is ongoing (Figures 1 and 2). We are confident that this is an actual range expansion and not simply the recent documentation of an already established distribution. Carter (1971) in his review of the birds of North Carolina's Sandhills did not consider the species as a summer resident in the 1960's. Lee (1986, 1987) did not find these birds breeding in the state's pocosins or Carolina Bays in the 1980's. In fact, one of our recent records is from White Lake, Bladen County, where the birds were found on one of Lee's primary study sites. Figure 2 illustrates the general timing of reports of breeding Cedar Waxwings on the piedmont and coastal plain of North Carolina.

During this same period Cedar Waxwings have expanded their breeding distribution into South Carolina. Sprunt and Chamberlain (1949) did not

include them as breeding species in their *South Carolina Bird Life*, although they recognized the possibility of the species being found as a breeder in the highlands of the far west. Subsequently waxwings have been reported as breeding at several sites in South Carolina (McNair and Gauthreaux 1984; Rodgers and Post 1989). The latter of these reports is from the lower coastal plain of that state, suggesting that this species may be more widespread in South Carolina than current documentation indicates (see also comments about breeding in Post & Gauthreaux 1989; McNair & Post 1993).

The species has a protracted nesting period, and nest construction has been observed between 28 May (Yadkin County BBA records) and 26 August (eggs, Blowing Rock, Pearson *et al.* 1942). Adults have been seen feeding young as late as 3 September (Chat 57:107). The earlier nesting dates presented in Table 1 overlap with periods when winter residents and migrants are still present in the state, so it is likely that many early nesting pairs are overlooked. Likewise, late nesting dates are well within the period of fall migration for many local songbirds.

Little information is available on the breeding phenology of this bird at the southern limits of its breeding range, but what is compiled here shows little synchronization in breeding. We do not know if the latest breeding records are of second nestings. There seems to be little seasonal variation in nesting that can be attributed to geography or habitat. Nesting peaks, if they exist, tend to be late in the season.

Spring migration extends well into May. A flock of 100 was reported on May 23 and 24 in Raleigh (Chat 21:17), and a flock of 20 was reported there on 26 May (Chat 25:75). A group of 60 migrants was reported on the coastal plain (Bladen County) as late as 24 May (Chat 45:108). Individuals and small groups of late migrant or vagrant waxwings have been reported at various sites in the state well into June. Fall migrants have been seen as early as 25 August at Pea Island (Chat 27:25). This leaves July as the only month for which local migratory movements have not been suggested. While we have included all published occurrence reports of Cedar Waxwings from July in Table 1 and Figure 1, this only implies, and is not proof of, breeding.

Nesting sites are in a number of different community types, with some indication of nesting pairs forming loose colonies. Nesting is mostly in pines, but it has also been reported in other situations including: heath balds, hawthorn thickets, woodland margins (Simpson 1992), edges of spruce fir forest, riparian sycamores, river margins, suburban settings, Carolina Bays, bay lakes, and Bald Cypress stands.

We cannot attribute specific land changes, resulting from human activities, to be associated with the recent range expansion of Cedar Waxwings in the southeast. Because of the large number of reports from urban piedmont settings, it seems logical that human induced landscape changes have benefitted this species. The recent timing of this range expansion, compared to the actual periods when the landscape was modified, however, does not match. Reports from early in the century indicate the existence of isolated populations in the piedmont, with no indication of local expansions through the 1980s. For Cedar Waxwings, and other breeding birds, we tend to think of the preceding fifty to one hundred years as our benchmarks of distributional and abundance norms. This is far from the case. Glaciated climate conditions have predominated in North America for more than 80% of the past 900,000 years (Ruddiman and Raymo 1988). Much of unglaciated southeastern North America was occupied by spruce/fir forests throughout this period, and the current warmer and drier period which the region is now experiencing is one of maximum deglaciation that has persisted for only about the last 500 years. It is reasonable to assume that Cedar Waxwings were ubiquitous breeding residents throughout most of the southeast until very recently, and that their current expansion is a reoccupation of a former range. Why this is occurring, why it is occurring now, and why this particular change in distribution is occurring in Cedar Waxwings, and not all avian species with distribution centers to our north, is simply unknown.

Acknowledgments

We thank the many volunteers of the Breeding Bird Atlas and Nest Record Card programs for their participation. Susan Campbell provided electronic copies of the NC State Museum of Natural Sciences data base.

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Figure 1. Occurrence of Cedar Waxwings during the breeding season

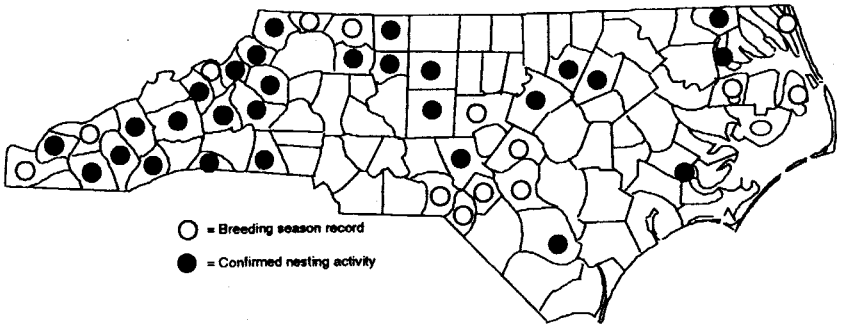

Figure 2. Dates of first breeding season reports of Cedar Waxwings in North Carolina

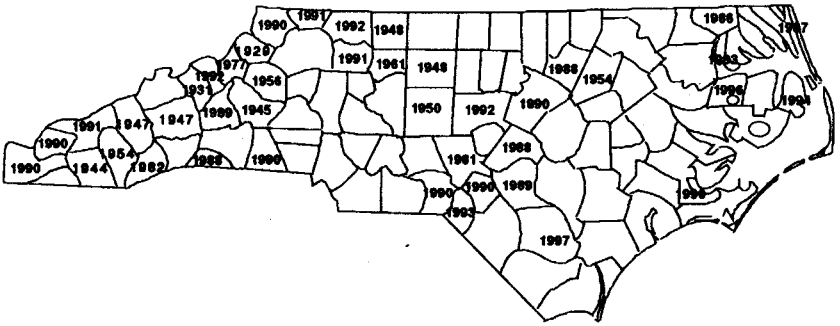

Table 1 Nesting Season Records of Cedar Waxwings in North Carolina

County	Locality	Observation	Citation
Mountains			
Allegheny	Doughton Pk		Simpson 1992
Ashe	nr Chestnut Hill		Simpson 1992
Ashe	nr jct SR 1594/1601	nest building 7 June 1990	Nest Record Card
Avery		yg left nest 22 Aug. 1977	Potter 1978
Avery	Avery Co. Airport	pr. building nest 10 June, 1992	BB Atlas, NCSM
Buncombe	Biltmore	4 yg fledged 10 July, 1947	Chambers 1947
Graham	Lake Santeetla	newly fledged young, 17–19 June, 1990	BB Atlas, NCSM
Haywood	Lake Junaluska	2 nests, 8 yg fledged 4-5 July, 1947	Lesley 1947
Haywood	Black Balsom Knob	nest with 2 eggs, 25 Aug, 1984	Duyck & McNair 1991
Haywood	Great Balsam Mtns.	nest building, 25 Aug. 1987	Duyck & McNair 1991
Jackson	Balsam Gap	pr 12 June, 1954	Murphy 1954
Jackson	nr Cullowhee	2 ad feeding 3 yg Summer, 1982	Chat 27:82
Jackson	Plott Balsam Mt.	various sites	Simpson 1992.
Macon Co	Highlands	3 pr seen 5 July–22 Aug. 1944	Howell et al 1947
Mitchell		singing male, 9 June, 1992	BB Atlas, NCSM
Swain	Great Smoky Mtns NP	various	Stupka 1963
Swain	Wolf Laurel Gap		Simpson 1992
Transylvania	Brevard	nesting and yg 1982	Chat 47: 55
Transylvania			Siebenheller 1995
Watauga	Blowing Rock	new nest 12 Aug., eggs 26 August 1929	Pearson, et al 1942
Watauga		carrying food, 19 June, 1991	BB Atlas NCSM
Yancey	Mt. Mitchell	gathering nesting material 10 Aug. 1931	Pearson, et al 1942
Yancey	Mt. Mitchell	observed, 2–5 Aug., 1962	Davis 1962
Piedmont			
Burke	Spense Field	2–31 Aug. 1945	Chat 10:18
Burke	Valdese	2–25 Aug. 1954	Chat 10:18
Caldwell	Lenoir	8 July 1956	Chat 20:83
Chatham	near Jordan Lake	summer, 1992	BB Atlas, NCSM
Cleveland	near Lattimore	pr building nest early June 1990	Chat 55: 64
Cleveland		pr on nest on 12 June 1990	Chat 55: 64
Forsyth	Winston-Salem	pr 5 June 1961	Chat 25:75
Forsyth	Winston-Salem	8 sightings from mid June-mid July 1967	Chat 40:20
Forsyth	Salem Lake	2 ad feeding 4 yg 14 July 1971	Chat 36:37
Forsyth	Salem Lake	nesting evidence 1977	Potter 1978
Forsyth		fledgling 3 July 1981	Chat 46: 24
Forsyth	Tanglewood Park	12 nests, 30 May to 10 July 1986	Chat 51: 81
Forsyth	Hillcrest Golf Course	fledgling with parent 25 July 1989	Chat 54: 69
Forsyth	Tanglewood Park	2 pr with fledged young	Chat 54: 69
Franklin		1 block confirmed, 1988	BB Atlas NCSM
Guilford	Greensboro	3 nests	Craft 1949
Guilford	Greensboro	ad feeding fledged yg June 18-19 1948	Shaftsbury 1949
Guilford	Greensboro	fledged yg 5-6 July 1948	Shaftsbury 1949
Guilford	McLeansville	nest building, 13 June, 1990	pers. obser.
McDowell		3 confimed nests, May-June 1989	BB Atlas, NCSM
McDowell	Crabtree Meadows,		Simpson 1992
McDowell	Linville Falls		Simpson 1992

County	Locality	Observation	Citation
Nash	Rocky Mount	summer	Pearson et al 1942
Nash	Rocky Mount	incubation, 10 June 1954	Joyner 1954
Nash	Rocky Mount		Joyner 1954
Nash	northern	2 ad carrying food 10 June 1990	Chat 55: 64
Nash	Rocky Mount	2 ad feeding yg 28 June 1990	Chat 55: 64
Polk	Green Creek	nest building 11 June 1988	Chat 53: 76
Polk	Tryon	pr on nest 14 July, 1990	Chat 55: 64
Polk		2 fledged yg early July 1990	Chat 55: 64
Polk	Tryon	pr building nest July 18 1992	Chat 57: 84
Polk	Tryon	pr feeding yg 3 Sept. 1992	Chat 57: 107
Randolph	High Point	4 nest June 1950, 2 nest incubation 11 June	
Mattocks 1950			
Stokes	Hanging Rock, SP	3 nests, June 1948	Craft 1949.
Surry		1 block, possible 2 June 1992	BB Atlas, NCSM
Wake	Raleigh	nest 13 June 1890	Brimley 1891;
Wake	Raleigh	pr on 15 June and 4 July 1984	Chat 49: 26
Wake	Falls Lake	8 seen on 15 July 1984	Chat 49: 26
Wake	Raleigh	nest with 3 yg 14 July 1985	Chat 50: 26
Wake	Falls Lake	2 ad with imm. 18 July 1988	Chat 53: 76
Wake	Zebulon	2 ad feeding yg; 4-7 June 1990	Chat 55: 64
Wake	n. of Raleigh	nest building 11 June, 1990	Nest Record Card
Wake		2 blocks confirmed	BB Atlas NCSM
Yadkin	Donnaha Park	nest building 28 May, 1991	Nest Record Card
Sandhills			
Cumberland	nr Fayetteville	one bird 8 July 1989	Chat 54: 69
Cumberland		1 block probable	BB Atlas NCSM
Harnett		1 block probable, 1988	BB Atlas NCSM
Hoke		1 block probable,10 May 1990	BB Atlas NCSM
Moore		1 block probable	BB Atlas NCSM
Moore	Southern Pines	2 on 17 July 1981	Chat 46: 24
Moore	Whispering Pines	flightless yg 15 July 1984	Chat 49: 25
Moore	Pinehurst	5 seen mid July 1984	Chat 49: 26
Moore	Southern Pines	pair nested 1984	Chat 49: 26
Richmond		1 block probable, 1990	BB Atlas NCSM
Scotland		1 block probable, 1993	BB Atlas NCSM
Coastal Plain			
Bladen	White Lake	nest building, 30 May 1997	pers obser
Chowan	Rockyhock	pr "unusually agitated" 10 June 1983	Chat 48: 101
Craven	Great Neck Point	fledged 6 June 1990	Nest Record Card
Craven	se, on Neuse River	nesting 1990	Chat 57: 84
Currituck	Currituck Banks	one seen 22 July 1987	Chat 52: 68
Currituck		1 block probable	BB Atlas NCSM
Dare	Stumpy Pt	2-7 wandering imms, 15-31 July 1994	Chat 59: 80
Dare	Stumpy Pt	four all summer 1996	Chat 61: 126
Franklin	Bunn	several nesting summer 1984	Chat 49: 25
Gates	Merchants Millpond SP	2 ad with 2 juv 19 July 1986	Chat 51: 81
Gates	Merchants Millpond SP	June and July 1987	Chat 52: 68
Washington	Lake Phelps	one seen 13 July 1996	Chat 61:126