J. Field Ornithol., 65(3):381–387

MIGRATION PATTERNS OF CEDAR WAXWINGS IN THE EASTERN UNITED STATES

KRISTIN E. BRUGGER[1], LORI N. ARKIN[2], AND JEAN M. GRAMLICH[3]

U. S. Department of Agriculture
Denver Wildlife Research Center
Florida Field Station
Gainesville, Florida 32601 USA

Abstract.—Records for 327 Cedar Waxwings (*Bombycilla cedrorum*) banded or recovered in eastern North America (<105°W) from 1921–1990 were analyzed to determine migration patterns. Southward migration occurred November–January; northward migration in March–May. Eastern waxwings wintered in the coastal plain from South Carolina to Texas and were at their greatest distance from breeding sites in February ($\bar{x}$ = 2082 ± 1787 [SD] km, n = 27). Recoveries of waxwings banded during summer suggested that birds of divergent breeding populations mix at wintering sites. There was little interchange of birds across the Rocky Mountains. As few encounters occurred in Florida, it was not possible to establish the existence of a geographic source of Cedar Waxwings that may damage early ripening fruits such as blueberries in Florida.

PATRONES DE MIGRACIÓN EN *BOMBYCILLA CEDRORUM* EN EL ESTE DE LOS ESTADOS UNIDOS DE AMÉRICA

Sinopsis.—Se analizaron los registros de 327 *Bombycilla cedrorum* anillados o recuperados entre 1921 y 1990 en el este de Norte América (<105°O) para determinar el patrón migratorio. La migración hacia el sur ocurrió entre noviembre y january; la migración hacia el norte entre marzo y mayo. Individuos orientales de *Bombycilla cedrorum* invernaron en planicies costaneras desde Carolina del Sur hasta Texas y se alejaron más de sus lugares de reproducción en febrero ($\bar{x}$ = 2028 ± 1787 [SD] km, n = 27). La recuperación de individuos anillados durante el verano sugiere que aves pertenecientes a diferentes poblaciones reproductivas se mezclan en las zonas donde invernan. Se detectó poco intercambio de *Bombycilla cedrorum* a través de las Montañas Rocosas. No pudimos establecer la existencia de una fuente geográfica de *Bombycilla cedrorum* que pueda causar daño a frutos que maduran temprano en el año en la Florida porque se detectaron pocos encuentros en ese estado.

Cedar Waxwings (*Bombycilla cedrorum*) breed in North America from 35° to 50°N in the east and 40° to 55°N in the west. Overall, continental population sizes remained stable in recent decades; however, eastern populations exhibited slight increases from 1965 to 1979 (Robbins et al. 1986). Some waxwings overwinter in their breeding range (Putnam 1949), but most are migratory and overwinter in southern North America and Central America (Bent 1965, Root 1988). In recent years, waxwing populations wintering in peninsular Florida came into conflict with blueberry production when new, early-ripening varieties created overlap in blueberry fruiting and waxwing residency (Nelms et al. 1990). The objective of this study was to assess migration patterns and origins of Cedar

[1] *Current address: DuPont Agricultural Products, Experiment Station, Wilmington, Delaware 19880-0402 USA.*
[2] *Current address: National Fishery Research Lab, 7920 NW 71 Street, Gainesville, Florida 32606 USA.*
[3] *Current address: Florida Game and Freshwater Fish Commission, Big Bend Office, Perry, Florida 32347 USA.*

Waxwings wintering in the eastern United States to evaluate their relation to fruit damage in Florida.

METHODS

Band recovery records for Cedar Waxwings from 1921 to 1990 were obtained from the U. S. Fish and Wildlife Service, Laurel, Maryland. Waxwings captured at longitudes <105° were selected for analyses of eastern birds. Records were excluded if they did not identify the month (1–12) or location of recovery. No encounters were excluded from analyses based on how they were obtained. In all analyses, we assumed that the probability of recovery was equal for all locations.

Age at recovery was estimated assuming a mean hatching date of 1 June. Thus, the "known" age of birds banded as local, fledgling or hatching year could be determined by subtracting mean hatching date from recovery date. In our analyses, waxwings reached a chronological age of 1 yr by the following June. A minimum age for birds banded as adults was determined by adding 1 yr to the banding date. When possible, we used *t*-tests to compare age groups (≤1 yr or >1 yr) for differences in distances traveled between banding and recovery sites.

RESULTS

Sample sizes and data constraints.—Of the 1213 recovery records available from North America through 1990, only 386 (32%) were from birds encountered east of 105°W. One third (34%) of the eastern Cedar Waxwings were hatching-year birds (Table 1), and one third (32%) were banded in summer (June–August, Table 1). Most recoveries were made of waxwings found dead (44%), but 17% were shot, 15% were hit by vehicles or struck stationary objects, and 25% were obtained from a variety of sources. Only 4% of these birds, however, were banded previously and recaptured, suggesting little geographic bias in methods of recovery. The temporal distribution of recoveries was uneven, however. Nearly 20% of eastern waxwings were recovered prior to 1960; approximately 39% were recovered in the 1960s. Of the 386 eastern waxwings, 327 (85%) had sufficient recovery data (month and recovery location) for analysis.

Recovery distance from natal or breeding site.—For waxwings banded in summer or early autumn (1 Jun.–31 Oct.), southward migration began in December for hatching-year birds and by November for adults (Fig. 1). Both first-year and adult Cedar Waxwings were at their greatest mean distance from nesting areas in February (Fig. 1). Birds banded in summer revealed no age-related difference in migration distance upon winter capture (December–February), traveling an average of 1417 ± 1486 km (n = 60). Spring migrations occurred mainly in March for waxwings of all ages and continued into May (Fig. 1). Known-age birds (i.e., banded as nestlings or fledglings) that were recovered in a subsequent summer demonstrated no age-related difference in recovery location. Mean distance from natal banding site to recovery site for these birds was 222 ± 117 km, (n = 10).

TABLE 1. Age class and month of banding for the 386 Cedar Waxwings recovered east of 105°W from 1921 to 1990.

Month of banding	Age at banding			Total recovered
	Hatching year[a]	Unknown	Adult	
January	0	1	9	10
February	0	3	12	15
March	0	3	26	29
April	0	7	32	39
May	0	2	31	33
June	0	0	20	20
July	17	2	19	38
August	33	4	29	66
September	22	7	5	34
October	51	17	7	75
November	7	13	6	26
December	0	0	1	1
Total	130	59	197	386

[1] Banded on or before 31 December of year hatched.

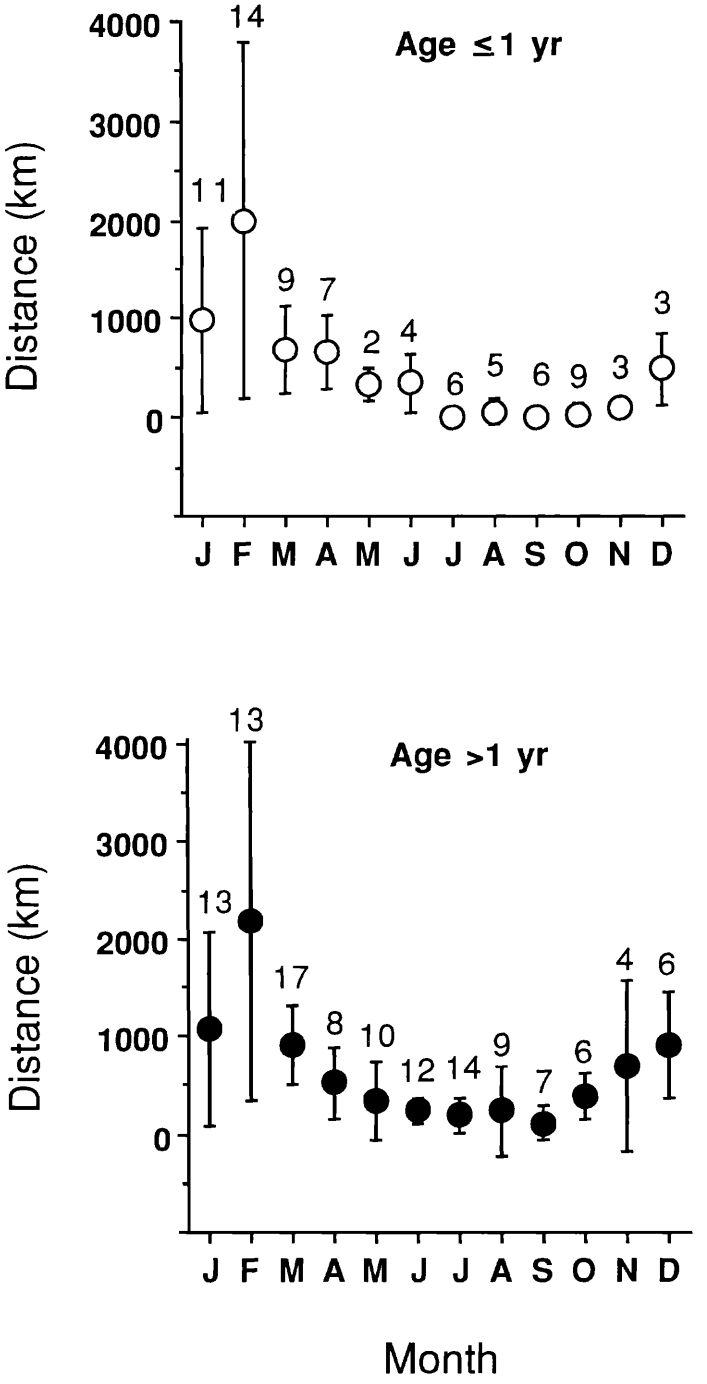
Distribution of wintering Cedar Waxwings.—Of 29 waxwings banded in summer and recovered in winter, most were found near coastal Gulf of Mexico (Fig. 2). Five Cedar Waxwings recovered in Mexico in winter were banded in Michigan, Pennsylvania (n = 2), Ontario or Vermont. One waxwing recovered in Honduras was banded in Michigan. Cedar Waxwings showed no geographic trends in selection of wintering sites. For example, six birds banded in Michigan were recovered from Georgia to Mexico (Fig. 2).

Only 15 encounters of Cedar Waxwings were from Florida. Five were banded in Florida during spring (March–May) and recovered in Georgia, Louisiana, New York or Quebec from March to July. Two of these waxwings apparently wintered in Florida one year, then Georgia or Louisiana in subsequent years. Ten were recovered in Florida, February–April; these birds had been banded in all seasons of the year in South Carolina, Maryland, New York, Massachusetts, Rhode Island, Ohio or Michigan.

Eight Cedar Waxwings crossed the Rocky Mountains between banding and recapture. Three waxwings that were banded in California in winter or spring were recovered in Saskatchewan or Alabama 1–3 yr later. Five waxwings banded in autumn in Iowa, Wisconsin or Ontario, were recovered in spring or summer in British Columbia, California, or Oregon 1–2 yr later.

DISCUSSION

Most waxwings banded in eastern North America wintered in the southeastern coastal plain from South Carolina to Texas, corroborating analyses from Christmas Bird Count data (Root 1988). There appeared to be no geographic patterns in selection of wintering sites, suggesting that


Age ≤1 yr
Distance (km)
4000
3000
2000
1000
0
11
14
9
7
2
4
6
5
6
9
3
3
J F M A M J J A S O N D
Age >1 yr
Distance (km)
4000
3000
2000
1000
0
13
13
17
8
10
12
14
9
7
6
4
6
J F M A M J J A S O N D
Month

waxwings of divergent breeding populations mix at wintering locations, as has been identified for other migratory species (Dolbeer 1978, 1982, 1991). The doubling of mean distances flown from summer banding to winter recovery sites between January and February and the high variance around these mean distances suggest that some Cedar Waxwings migrate steadily through the winter. We found no evidence for differences in migration distances to wintering areas between immature (≤1 yr old) and mature (>1 yr old) Cedar Waxwings as has been found for other species (Dolbeer 1982). There was little interchange between populations east and west of the Rocky Mountains, supporting earlier observations (Stoner 1976).

Although spring migration occurs mainly in March, the northward spread of Cedar Waxwings may continue throughout the season. Cedar Waxwings are notoriously late nesters in North America (Lea 1942), with the peak of breeding occurring from mid-June to July and running as late as September (Leck and Cantor 1979). Thus, it is possible that waxwings could begin northward migration in late May or early June, yet return to breeding sites with sufficient time to nest.

There were few encounters of Cedar Waxwings in Florida making it difficult to draw inferences about the relation of spring fruit damage and migration patterns. Banded Cedar Waxwings were only encountered in Florida from February through May. To elucidate source areas, demography and patterns of migration by Cedar Waxwings that winter in Florida, an intensive multi-year banding study would be valuable. Waxwings can be decoyed to traps or mist nets with the help of a few captive birds (Feltes 1936), thus large numbers of waxwings could be banded rapidly.

Early blueberries, harvested in mid-April and May, are particularly vulnerable to bird damage and because of high market value, bird damage to early ripening berries has greater economic impact than does damage to later-ripening berries (Nelms et al. 1990). Winter population sizes of Cedar Waxwings in Florida typically are low, but local populations of migratory waxwings may increase in size rapidly or unpredictably during spring. These variable population densities in combination with flexible timing of spring migration indicate fruit growers and wildlife managers should plan for the presence of fruit-eating waxwings during early blueberry harvest. As blueberry bushes are perennial, they require long-term planning and care prior to production. A long-term fruit protection device, such as bird netting, may be the only appropriate method for reducing fruit loss during the critical period when early fruiting overlaps with spring migration of Cedar Waxwings.

←

FIGURE 1. Mean distance (±SD) from summer banding site to recovery site by month for Cedar Waxwings recovered east of 105°W. Sample sizes are given for each month. Cedar Waxwings were recovered at ≤1 yr or >1 yr of age.

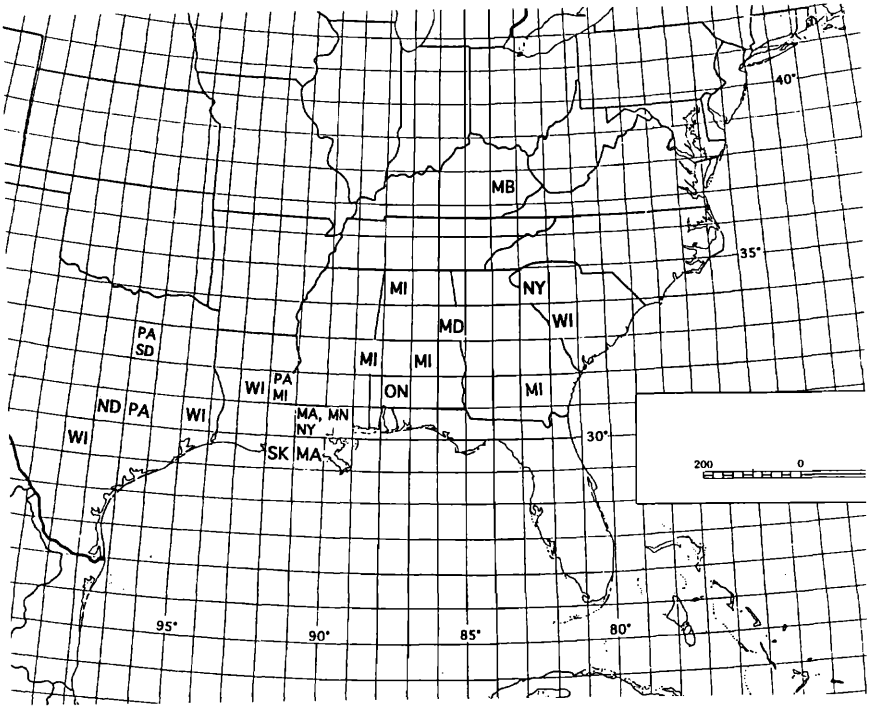


FIGURE 2. Recovery sites by single-degree blocks of latitude and longitude for Cedar Waxwings banded in summer (June–August) and recovered in winter (December–February) in the USA east of longitude 105°W. Abbreviations indicate state or province where banded.

ACKNOWLEDGMENTS

We thank the many bird banders whose efforts made these analyses possible and the U. S. Fish and Wildlife Service Bird Banding laboratory for providing data from the recovery-retrieval file. We also thank R. A. Dolbeer, G. Linz, and the journal editor for reviewing an earlier manuscript.

LITERATURE CITED

BENT, A. C. 1965. Life histories of North American wagtails, shrikes, vireos, and their allies. Dover Publications, Inc. New York, New York. 411 pp.

DOLBEER, R. A. 1978. Movement and migration patterns for Red-winged Blackbirds: a continental overview. Bird-Banding 49:17–34.

———. 1982. Migration patterns for age and sex classes of blackbirds and starlings. J. Field Ornithol. 53:28–46.

———. 1991. Migration patterns of Double-crested Cormorants east of the Rocky Mountains. J. Field Ornithol. 62:83–93.

FELTES, C. H. 1936. Trapping Cedar Waxwings in the San Joaquin Valley, California. Condor 38:18–23.

LEA, R. B. 1942. A study of the nesting habits of the Cedar Waxwing. Wilson Bull. 54:225–237.

LECK, C. F., AND F. L. CANTOR. 1979. Seasonality, clutch size, and hatching success in the Cedar Waxwing. Auk 96:196–197.

NELMS, C. O., M. L. AVERY, AND D. G. DECKER. 1990. Assessment of bird damage to early-ripening blueberries in Florida. Proc. Vertebr. Pest Conf. 14:302–306.

PUTNAM, L. S. 1949. The life history of the Cedar Waxwing. Wilson Bull. 61:141–182.

ROBBINS, C. S., D. BYSTRAK, AND P. H. GEISSLER. 1986. The breeding bird survey: its first fifteen years, 1965–1979. U.S. Fish and Wildlife Serv. Resource Publ. 157. Washington, D.C. 196 pp.

ROOT, T. 1988. Atlas of wintering North American birds: an analysis of Christmas bird count data. Univ. Chicago Press, Chicago, Illinois. 312 pp.

STONER, E. A. 1976. Cedar Waxwing recoveries. N. Am. Bird Bander 1:171.

Received 26 Feb. 1993; accepted 6 Sep. 1993.

V NEOTROPICAL ORNITHOLOGICAL CONGRESS

The Fifth Neotropical Ornithological Congress will be held on 5–11 Aug. 1994 in Asuncion, Paraguay. To be placed on the mailing list to receive a copy of the first announcement, write to Nancy Lopez de Kochalka, % Comité Organizador Local del V CON, Museo Nacional de Historia Natural del Paraguay, Sucursal 19, Campus, Central XI, Paraguay.