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# Bohemian Waxwing Banding Results in North America, 1923 - 2003

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## ABSTRACT

Bohemian Waxwings (*Bombycilla garrulus*) have been banded in 44 states and provinces by more than 169 banders. From 14,968 banded birds, there were 92 recoveries, including 11 encounters of birds released alive. The recovery rate dropped from 3.5% in the 1930s to 0.5% in the 1980s. Long-distance movements of up to 1890 km were predominantly in a west-east direction.

## INTRODUCTION

"[T]he natural history of the Bohemian Waxwing has not been extensively studied, and important information is still lacking ..." (Witmer 2002:15).

Bohemian Waxwings (*Bombycilla garrulus*) have been banded in North America in every calendar year since at least 1931, excepting 1945. Over one thousand were banded in each of four different years: 1942, 1962, 1964 and 1967. We studied this data set to learn what it might reveal about causes of death, migration directions, distance and speed of travel, and longevity. Waxwings are a nomadic and "notoriously irruptive" species (Witmer 2002), moving east and south-east in an unpredictable fashion from their breeding grounds in Alaska and northwestern Canada to visit, sometimes for up to three months, winter banding stations.

## METHODS

### *Recoveries/encounters:*

The banding office provided us with a printout of 12,197 Bohemian Waxwings banded in North America since 1955. A breakdown by yearly numbers is not available for the years 1923 - 1932 inclusive. For 1933 to 1954, before banding data were retroactively computerized back to 1955, we

extracted the total of 2785 birds banded and located annual numbers banded each year from 1933 to 1964 (Anonymous 1933 - 1964). We deleted 14 waxwings, 13 banded in Panama and one banded in Jamaica, that evidently had been given species code 6180 (for Bohemian Waxwing) in error. This correction left us a total of 12,183 Bohemian Waxwing bandings since 1955 and recovery information (only) from among the 2785 waxwings banded before 1955.

We also received a printout of 84 Bohemian Waxwing recoveries. Contact with band finders allowed us to obtain information on eight additional recoveries or encounters of waxwings banded in Saskatoon, SK. We also obtained a more precise date of recovery in two instances. We changed three "how found" codes from "00, found dead" to "13, hit a picture window"; one from "04, caught in a mammal trap" to "89, caught in a bander's trap"; and one from "28, caught by hand" to "12, caught by cat."

## RESULTS: BANDING

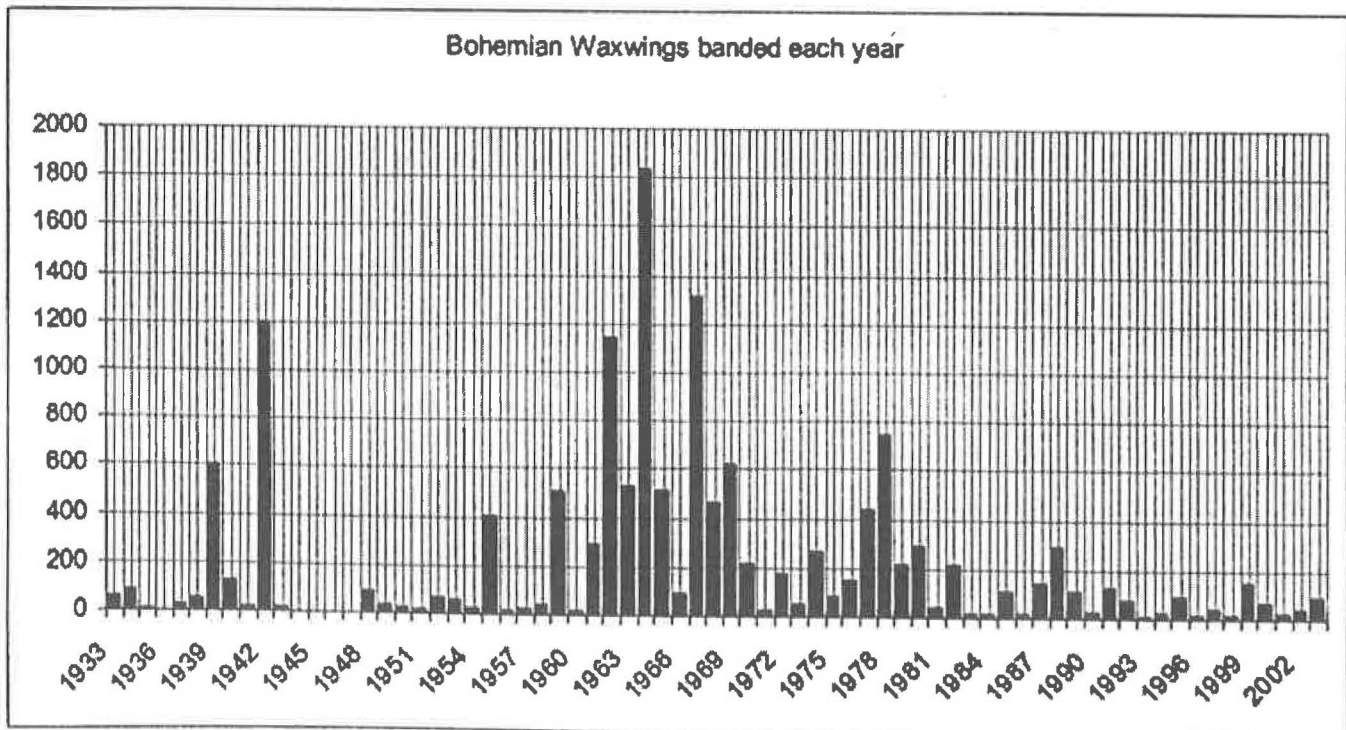
### *Locations and years of banding:*

Prior to the computerization of banding records, retroactive to 1955, nine banders in five states and two provinces are known only from the 26 waxwings that were recovered (Table 1). Since then, Bohemian Waxwings have been banded in 34 states and provinces, but particularly in Saskatchewan, Colorado, Idaho and North Dakota (Table 2, Figure 1).

**Table 1. Banders who had recoveries of Bohemian Waxwings in North America, 1932 - 1954. In all, 2785 waxwings had been banded during this period.**

Permit #	Name	State/- Prov.	Years	Recoveries
121	Tait, E.M.	BC	1933	1
301	Ridley, C.T.	MB	1937	1
2020	Lyon, W.I.	IL	1932	2
3703	Berner, G.L.	ND	1931	1
4308	Feltes, C.H.	CO	1932	1
5676	Mickey, A.B.	WY	1939, 1942	12
5735	Berrey, C.R.	WY	1942	4
5782	Baldwin, D.D.	ND	1939	3
520	Street, M.G.	SK	1953	1
<b>TOTAL</b>				<b>26</b>

**Fig. 1. Number of Bohemian Waxwings banded each year, 1932-2003, in North America.**



**Table 2. Post-1955 banding and recovery totals by state and province.**

<b>State of Banding</b>	<b>Number of Banders</b>	<b>Years Banded</b>	<b>Numbers' Banded</b>	<b>Recoveries from Banding in State</b>
Alberta	13	1961-2002	175	0
Alaska	17	1957-2002	105	0
Alabama	1	1965	4	0
British Columbia	6	1962-1999	19	0
California	2	1969	10	0
Colorado	17	1957-2001	2584	11
Idaho	6	1959-1985	1234	3
Illinois	1	1977	2	0
Iowa	3	1959-1984	4	0
Kansas	2	1962, 1973	23	0
Maine	1	1977	1	0
Manitoba	2	1964-1992	68	0
Maryland	2	1963, 1975	17	0
Michigan	6	1963-1994	69	0
Minnesota	19	1958-1987	379	2
Montana	4	1955-1983	142	0
New Brunswick	1	1989	2	0
Nebraska	2	1959, 1962	14	0
New Hampshire	1	1976	12	0
New Mexico	1	1962	70	1
New York	2	1971, 1995	7	0
North Dakota	6	1957-1969	1077	3
Ontario	8	1959-2002	97	0
Oregon	1	1972	16	0
Pennsylvania	1	1964	3	0
Quebec	5	1968-2001	417	1
Saskatchewan	5	1958-2003	4952	44
South Dakota	8	1958-1994	118	0
Utah	6	1955-1990	89	1
Vermont	2	1972, 1993	11	0
Washington	6	1962-1987	37	0
Wisconsin	7	1958-1987	61	0
Wyoming	3	1955-1986	328	0
Yukon Territory	2	1967-2002	36	0
<b>TOTAL</b>	<b>169</b>		<b>12,183</b>	<b>66</b>

Although waxwings can occur in flocks of up to 5,000 individuals, and although Saskatoon scored an all-time high of numbers counted anywhere in North America on a one-day Christmas Bird Count (12,442 in 1975; Houston and Houston 1989), they are difficult to entice into Potter traps (Houston 1968). Banding was concentrated (>400 waxwings banded) in particular winters when waxwing abundance was associated with a poor crop of berries such as those of the domestic mountain ash. These factors, combined with availability and effort by banders, placed Saskatchewan first in terms of numbers banded in five different years (1955, 1965, 1967, 1968, 1978), Colorado in three years (1959, 1962, 1964), North Dakota in two years (1963, 1969) and Idaho in one year (1977).

Well over half the birds banded were in the 1960s, in nine of the 49 years of post-1955 study. Although banders' efforts no doubt were somewhat inconsistent, these figures indicate years when major irruptions occurred in varying localities.

The four top banders, all of them women, each banded over 900 waxwings: Mary Houston at Saskatoon, SK; Ann Gammell at Kenmare, ND; Allegra Collister at Longmont, CO; and Eleanor Hough at Boulder, CO (Table 3). All of the bandings in New Mexico and most of the bandings in Colorado took place during exceptional winter invasions—in 1962 in New Mexico and 1962 and 1964 in Colorado.

**Table 3. Principal banders of Bohemian Waxwings since 1955.**

Permit #	Name		Years	# Banded	Recoveries	
00460	Houston, Mary	SK	1953-2003	4928	44	0.9%
07604	Gammell, Ann	ND	1958-1969	991	3	0.3%
06549	Collister, Allegra	CO	1957-1977	951	3	0.3%
06092	Hough, Eleanor	CO	1962-1964	904	5	0.6%
06680	Ryder, Ron	CO	1962-1986	387	2	0.5%
08086	Hanson, H.R.	MN	1959-1964	222	1	0.5%
05856	Fosberg, M.A.	ID	1963	154	3	1.9%
07251	Johnson, C.M.	MN	1959-1962	83	1	
08681	Strauch, J.G., Jr.	CO	1985	82	1	
06671	Killpack, M.L.	UT	1957-1990	73	1	
07603	Travis, J.R.	NM	1962	70	1	
10494	Smith, Alan R.	SK	1995	30	1	
10314	Ouellet, Reginald	QC	1981-1999	23	1	
<b>Subtotal</b>	<b>14 banders with recoveries</b>			<b>8875</b>	<b>66</b>	<b>0.7%</b>
20849	Jeppson, J.H.	ID	1978-1995	756	0	
10478	Giroux, J.M.	QC	1985-1994	386	0	
08404	Trost, C.H.	ID	1975-1977	317	0	
05735	Berrey, C.R.	WY	1955-1962	289	0	
07175	Rogers, T.H.	MT	1955, 1957	118	0	
06445	Thorne, Oakleigh	CO	1962-2001	117	0	
<b>Subtotal</b>	<b>6 banders with no recoveries</b>			<b>1983</b>	<b>0</b>	
<b>Subtotal</b>	<b>148 banders with &lt;70 banded</b>			<b>1325</b>	<b>0</b>	
	<b>TOTAL since 1955</b>			<b>12,183</b>	<b>66</b>	<b>0.5%</b>
	<b>TOTAL, 1923-1954</b>			<b>2785</b>	<b>26</b>	<b>0.9%</b>
	<b>TOTALS</b>			<b>14,968</b>	<b>92</b>	<b>0.6%</b>



## RESULTS

### How found:

Of the 92 recoveries and encounters, 46 were found dead, 14 were killed by flying into windows or other objects, five were hit by a car, five were trapped and released alive in a different 10-min block of latitude and longitude (four had moved from Laramie to Casper, WY, see below), four were shot, four killed by a cat, three caught by hand, two were injured, two killed by a dog, and two died of

disease. One each was reported as "band only," trapped and released in same 10-min block where banded, scientific specimen, found as skeleton only within three months of banding, and froze to death when a metal nail immobilized its foot. At least two of the window-collision deaths, occurring on the University of Saskatchewan campus, were among simultaneous mortality of 10 or more unbanded waxwings, presumably inebriated from eating fermented berries (Stephen and Walley 2000).

**Table 4. Distant recoveries (>50 km) of Bohemian Waxwings in descending order of distance traveled.**

RECOVERY DATA					BANDING DATA							
Band #	Date	How Found	St	Lat-Long	Bander	Permit	A	S	St	Lat-Long	Date	Dist (km)
571-21291	05/43/59	00	AB	511-1152	Johnson CM	07251	1	0	MN	440-0922	02/15/58	1890
31-53871	04/41/32	28	SK	510-1054	Lyon WI	02020	0	0	IL	422-0875	03/25/32	1660
41-19645	03/20/34	01	SD	440-1033	Tait EM	00121	0	0	BC	493-1193	02/15/33	1360
521-83313	04/--/73	13	BC	501-1191	Houston M	00460	1	0	SK	520-1063	02/19/68	905
611-31653	03/22/64	00	WY	411-1053	Gammell A	07604	1	0	ND	484-1020	03/02/63	880
731-01983	02/24/70	13	MT	454-1095	Gammell A	07604	1	0	ND	484-1020	04/05/69	680
861-21432	03/42/79	00	AB	533-1133	Houston M	00460	1	0	SK	520-1063	04/03/78	500
591-35113	spring '66	00	AB	533-1133	Houston M	00460	1	0	SK	520-1063	03/02/65	500
521-91513	04/66/62	01	AB	533-1132	Houston M	00460	0	0	SK	520-1063	04/05/62	490
521-91526	03/22/63	89	ND	484-1020	Houston M	00460	0	0	SK	520-1063	04/09/62	490
601-17840	02/05/64	00	CO	400-1050	Travis JR	07603	1	0	NM	354-1055	03/11/62	485
521-76814	04/58/69	00	AB	525-1132	Houston M	00460	1	0	SK	520-1063	04/09/67	470
391-43118	03/27/42	89	WY	425-1061	Mickey AB	05676	1	0	WY	411-1053	01/17/42	195
391-43222	03/26/42	89	WY	425-1061	Mickey AB	05676	1	0	WY	411-1053	01/18/42	195
391-43226	03/10/42	89	WY	425-1061	Mickey AB	05676	1	0	WY	411-1053	01/18/42	195
391-43298	03/24/42	89	WY	425-1061	Mickey AB	05676	1	0	WY	411-1053	01/25/42	195
461-00468	03/58/65	00	WA	481-1170	Fosberg MA	05856	0	0	ID	464-1165	12/27/63	165
321-38236	03/20/64	03	CO	385-1044	Hough E	06092	1	0	CO	400-1051	03/07/64	135
611-99926	04/58/62	00	MN	463-0953	Hanson HR	08086	1	0	MN	470-0943	03/04/62	95
461-00483	04/60/64	00	WA	473-1171	Fosberg MA	05856	0	0	ID	464-1165	12/27/63	95
31-53849	04/11/32	20	WI	430-0875	Lyon WI	02020	0	0	IL	422-0875	03/23/32	75
501-42162	12/41/53	01	SK	525-1043	Street MG	00520	1	0	SK	532-1040	02/18/53	65
631-68378	03/16/85	00	CO	393-1050	Strauch JR	08681	1	0	CO	400-1051	02/23/85	55
631-59788	04/16/64	00	CO	393-1045	Collister A	06549	1	0	CO	400-1050	04/01/64	55

\*How Found Codes: 00, found dead; 01, shot; 03, injured; 13, struck window; 20, diseased; 28, caught by hand; 89, trapped by bander in different 10-min block

\*See Banding Manual for inexact date codes

\*St: State/Province

\*Lat-Long (e.g., 511=51°10' to 19' N), Long - Longitude (e.g., 1152 = 115°, 20' to 29' W)

\*A - Age; S - Sex; Dist - Distance

Recoveries came mainly (71 of 92) from the same 10-min block of latitude and longitude within which the bird was banded, an immediately adjacent 10-

min block, or up to two 10-min blocks distant. Twenty-four birds traveled 50 km or more (Table 4, Fig. 2). The greatest distance, from Minnesota to Alberta, was 1890 km.

Fig. 2. Map showing movements >50km of 24 Bohemian Waxwings. Arrows point to recovery site, label is year of recovery.



Remarkable were the four waxwings banded in Laramie, WY, by Arthur B. Mickey on 17, 18, 25 and 25 Jan 1942, and recaptured and released in Casper, WY, evidently by another bander, C.R. Berrey, on 27, 26, 10 and 24 Mar 1942, respectively. Berrey's usual postal address was Midwest, WY, in the mountains to the north of Casper, but between 2 Feb and 4 Apr that winter, he had three local recoveries and one encounter from waxwings he had banded in Casper. The distance from Laramie to Casper, north along the Laramie Mountains, is 195 km.

#### **When found:**

Seventy-eight recoveries were concentrated in the city in which they had been banded during the same winter, over half of them within 20 days of banding—21 recovered within 10 days of banding and 22 recovered 11 - 20 days. There were 10 recoveries one year after banding, and three in the second winter after banding. The oldest waxwing in the banding records, banded in Saskatoon on 19 Feb 1968, was killed when it hit a picture window in Vernon, BC, 905 km to the west, some time in Apr 1973; it was at least 5 yr and 10 mo old (Klimkiewicz et al., 1983, Klimkiewicz 2006).

In Saskatoon, records of return encounters to traps in subsequent years with large trap totals, 1965 - 1972, included seven in the first winter after banding, and one each at two and three years after banding.

#### **Decline in recovery rates:**

The recovery rates declined gradually over six decades, from 3.5% in the 1930s, to 3.4% in the 1940s, 2.6% in the 1950s, 2.3% in the 1960s, 1.3% in the 1970s, and finally 0.5% in the 1980s.

#### **DISCUSSION**

From 1923 to 2003, there was a gradual decline in the percentage of bands reported, a phenomenon noted with other species such as the Ring-billed Gull (Houston 2006). One suspects that one factor may have been a decline in the "novelty" and "curiosity" factors among those finding the bands.

One might assume from the map (Fig. 2) that birds moving west from Minnesota, Illinois, North Dakota

and Alberta, were moving back towards their breeding grounds. Such a hypothesis would tend to be supported by the two "direct" recoveries, which at the same time provide some evidence of the speed of travel. One waxwing traveled from Saskatoon, SK, to Edmonton, AB, a distance of 490 km in 11 days or less, or at least 45 km/d. Another, banded at Waukegan, IL, on 25 Mar 1932 was caught by hand at Craik, SK, in the first ten days of April that year, a distance of 1,660 km in a maximum of 15 days, or at least 110 km/d. However, 10 of the 12 waxwings that traveled more than 400 km from the banding site were among the minority of recoveries found in winter or early spring of a *subsequent* calendar year.

The concentration of recoveries soon after the day of banding, with many fewer late recoveries, is somewhat unique, and differs from spring and summer species that follow regular migration paths. Perhaps such a concentration should not be unexpected in a nomadic species, whose breeding grounds are too remote in coniferous forests for bands to be found there, and where both banding and recoveries are largely restricted to urban areas in winter. The farther north one goes, the longer the winter, and the more time is spent by waxwings in cities, where recoveries are more likely to occur.

Banders are encouraged to expend more effort in banding this interesting but little known species.

#### **ACKNOWLEDGMENTS**

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