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FIRST HUMMINGBIRD REPORTS IN EASTERN AND CENTRAL MASSACHUSETTS, 1933-2006: A TREND TOWARD EARLIER ARRIVALS?

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In a previous report on the arrival of Ruby-throated Hummingbirds in New England 2003-2005 (Stichter, 2006a), New England Hummers observed that the frequency of very early sightings had increased over that time period. This suggested the need to look at both “first sightings” and “average arrivals” in a longer time perspective. This report does the former; it analyses historical “first bird” reports for eastern and central Massachusetts over the last 74 years, from 1933-2006. It supersedes an earlier report (Stichter, 2006b), which included only data for the years 1933-2005. The areas covered in the analysis were chosen because of the existence of careful published sightings records over a long period of time. The review demonstrates a trend toward earlier sighting reports, and discusses whether this reflects a trend toward actual earlier arrivals, or perhaps simply an increase in human interest in these beguiling “jewels of the air.”

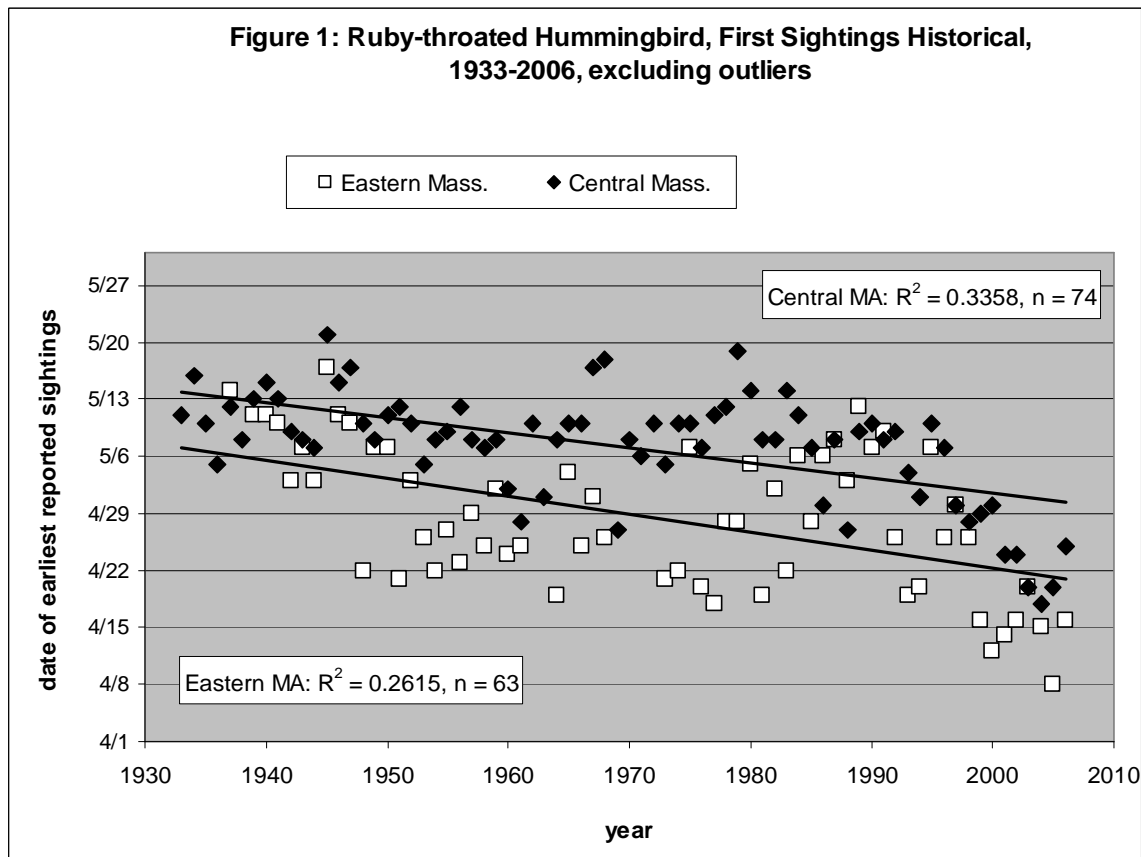
Are Ruby-throats arriving here earlier than they have in the past? One recent site-specific study in Massachusetts suggests that they are. Wayne Petersen, Kathleen Anderson, and Dr. Richard Primack of Boston University analyzed mean arrival dates as recorded at Anderson’s farm in Middleboro, Massachusetts, and found that of 16 bird species for which there were data, five demonstrated a statistically significant tendency to arrive earlier during the 33 years between 1970 and 2002 (Petersen and Anderson, 2005). One of the five was the Ruby-throated Hummingbird. Could a warming climate be responsible for such earlier arrivals? That is certainly a strong possibility. Researchers are now finding that average annual temperatures over the northeast have increased by about 1.8° F. since 1900, that average winter temperatures over New England have increased in the last 100 years, that the bloom dates of plant species such as lilacs, crabapples and grapes have been occurring earlier, and that the growing season—the time between the first and last frosts—has lengthened (Clean Air-Cool Planet, 2005; Boston Globe, 2007). Presumably, the time of first insect emergence is also becoming earlier. If the nectar and insect supply are the key factors which influence hummingbird arrival, then there is good reason to expect that our first sightings would be occurring earlier.

Table 1 (see below) presents a compilation of the first reported Ruby-throat sightings in eastern and central Massachusetts for the years 1933-2006. For eastern Massachusetts, the data are from listings in *Bird Observer* and its predecessors. [These are *Bulletin of New England Bird Life*, which was published 1937-1944; and *Records of New England*

Birds, which was published from 1945-1968, except for 1962-1963, when only the first four months of 1961 had issues. In the few years 1969-1972 there were no published records for eastern Massachusetts, until *Bird Observer* began in 1973.] For central Massachusetts, the data are from *The Chickadee*, which fortunately has been published continuously by the Forbush Bird Club, Worcester, Massachusetts, from 1933 to the present. For recent years, the data from these printed sources is supplemented by reports submitted to www.hummingbirds.net, the nation-wide website created and managed by Lanny Chambers, and to the New England Hummers website.

Only the very first reported hummingbird sighting for each year is recorded in the table, and its source is given. Nearly all the sightings in recent years seem to be yard reports where feeders are present, rather than field sightings. This is probably the case for earlier years as well, but it is impossible to be certain on this point.

Figure 1 presents the data from Table 1 graphically. A downward (earlier) trend is visually apparent for both regions. The calculated trend line shows a strong relationship between year and earlier first bird sightings for both areas of the state. The trend line moves downward (earlier) in both regions over this time period, and the R² coefficient indicates that year explains 26 – 33% of the variation in first reported sighting dates. Examination of the residuals indicates that the relation is linear.



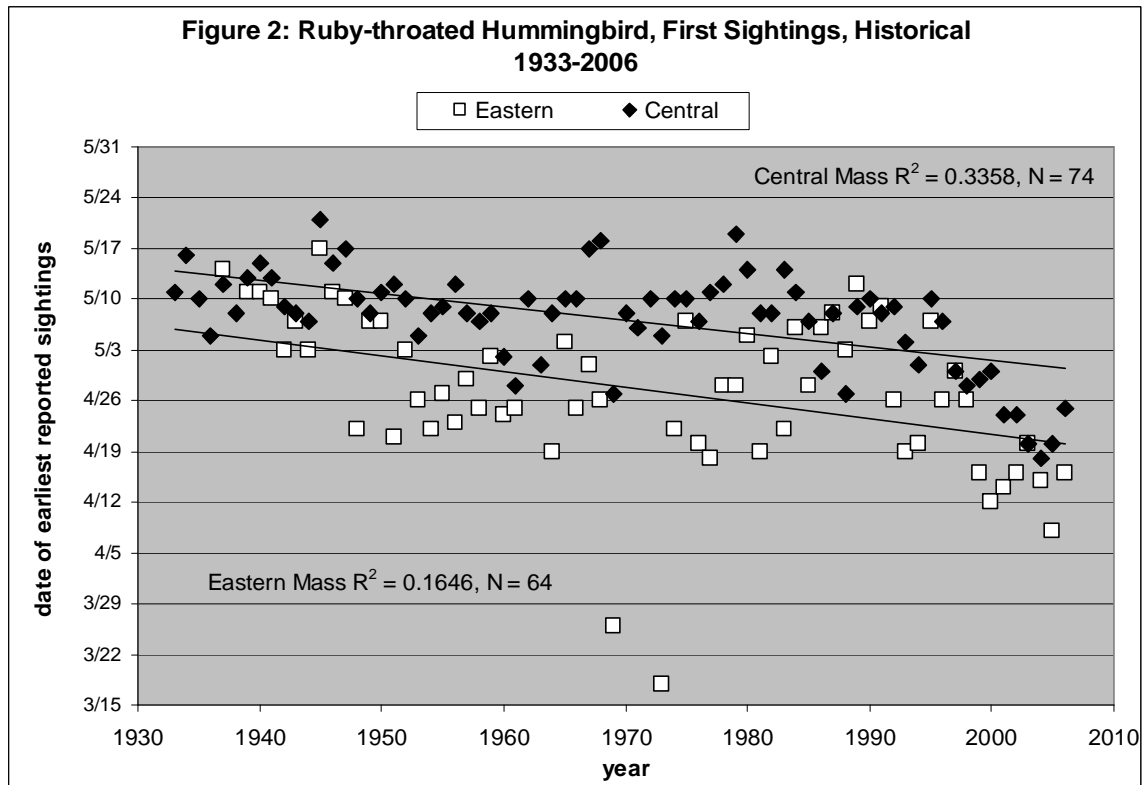


Figure 1 excludes two problematic “first sightings” which appear in the records for eastern Massachusetts but which are so much earlier than the rest of the dates that they need to be examined for unusual circumstances. The first, 3/26 for 1969, does not appear in *Records of New England Birds*, which was not published that year, but instead is reported in Veit and Petersen (1993), p. 279. The second, 3/18 for 1973, does appear in *Bird Observer of Eastern Massachusetts*, but it involved a bird which arrived alive but soon died. Since we are interested in successful migrations, the next earliest date, 4/21/73, was substituted in Figure 1. Figure 2 shows what happens if we decide to include these two “outlier” cases. The eastern Massachusetts correlation coefficient R^2 is reduced to .16, or 16% of the variation in first reported sighting dates explained by year. There is still some relationship between the two variables for this region, but its strength is reduced. The correlation for central Massachusetts remains the same. In both regions, whether or not outliers were included, the strength of the correlation increased when the 2006 data were added to the 1933-2005 sequence.

Explaining and further confirming this finding would require more extensive research. Time-series correlations with trends in various environmental factors would have to be demonstrated. Increased observer effort must also be part of the explanation. It is possible that the earlier reports trend does not reflect an actual earlier arrivals trend, but rather more human vigilance over the years in watching for and attracting hummingbirds.

The widespread adoption of hummingbird feeders since the 1970's, and the growth of recreational birding, have increased the number of people who keep an eye out for these tiny creatures, and work to attract them to their yards, where they can be easily observed. The first commercial hummingbird feeder was invented in Boston and came on the market in 1950, spreading gradually. At first, a few enthusiasts used home-made feeders, but the start-up of Droll Yankees in 1969 and Perky-Pet in 1981 brought standard-design hummingbird feeders to the mass market. In addition, the advent of well-made optics has increased the accuracy of sightings of all birds, and the numbers of people who watch birds. Finally, the advent of the internet has not only made possible but in fact stimulated the reporting and sharing of sightings over wider areas. For example, the majority of the earliest hummingbird sightings in our region in the past few years have come from Lanny Chambers' www.hummingbirds.net website. When this site began in 1997 it seems to have stimulated people who previously did not report hummingbird sightings to birding journals or hotlines, or were not birders, to jump into the reporting game. As enthusiasm increased, more and earlier sightings resulted, showing up not only on that website, but also on the New England Hummers website beginning in 2003, and in other more traditional reporting venues.

As these comments suggest, the expansion of human interest in hummingbirds is real, but it seems unlikely to be the sole reason for the trend toward earlier sightings. . Short-term correlations of bird migration timing with climate variables are well established, and hummingbirds, like other birds, can be expected to respond quickly to changes in temperature, prevailing winds, and precipitation, all of which directly affect food availability.

Despite the anticipated effects of climate change, I believe that our human concern for hummingbirds probably bodes well for their future survival. Ruby-throats, in particular, co-exist fairly well in our humanized landscapes, such as rural and suburban, though not urban, areas. They have quickly adopted artificial feeders. (In fact, one might ask, a bit whimsically: are we domesticating them, or are they training us?) Ruby-throats will also feed in a wide range of habitats, including parks, yards and gardens. Their diet includes tiny insects as well as nectar from a range of sources, so they are not dependent on a single food source, as are some bird species which are seed or insect specialists. One limiting factor for Ruby-throats is that they prefer second-growth and old-growth forested areas near water for nesting, and declines in forest acreage may therefore put pressure on their breeding habitat. In general, however, the Ruby-throat's resiliency and adaptability should help it survive as a species despite the perils of human-induced habitat loss, climate change and urbanization.

Table 1
Earliest Sightings of Ruby-throated Hummingbirds in Massachusetts 1933-2006

Year	Date-East	Location-East	Source-East	Vol.	No.	Date-Central	Location-Central	Source-Central	Vol.	No.
1933						5/11	Worcester	CD	3	2
1934						5/16	Worcester	CD	4	2
1935						5/10	Worcester	CD	5	1
1936						5/5	nr Worcester	CD	6	1
1937	5/14	Cambridge	BNEBL	1	7,8	5/12	Athol	CD	7	
1938			n/a			5/8	nr Worcester	CD	8	1
1939	5/11	Belmont	BNEBL	3	5	5/13	Worc area	CD	9	1
1940	5/11	Sharon	BNEBL	4	5	5/15	Worc area	CD	10	1
1941	5/10	Edgartown	BNEBL	5	5	5/13	Worc area	CD	11	1
1942	5/3	Cotuit	BNEBL	6	5	5/9	Westford	BNEBL	6	5
1943	5/7	Cambridge	BNEBL	7	5	5/8	Spencer	CD	13	1
1944	5/3	Concord	BNEBL	8	5	5/7	Worcester	CD	14	1
1945	5/17	Marshfield	RNEB	1	5	5/21	Leicester	CD	15	1
1946	5/11	Cambridge	RNEB	2	5	5/15	Athol	CD	16	1
1947	5/10	Fall River	RNEB	3	5	5/17	Worcester	CD	17	1
1948	4/22	Edgartown	RNEB	4	4	5/10	Harvard	CD	18	
1949	5/7	Braintree	RNEB	5	5	5/8	Harvard	CD	19	
1950	5/7	Middleboro	RNEB	6	5	5/11	Mendon	CD	20	
1951	4/21	Edgartown	RNEB	7	4	5/12	Barre	CD	21	
1952	5/3	Plymouth	RNEB	8	5	5/10	Lunenburg	CD	22	
1953	4/26	Edgartown	RNEB	9	4	5/5	Webster	CD	23	
1954	4/22	Ipswich	RNEB	10	4	5/8	Gardner	CD	24	
1955	4/27	Orleans	RNEB	11	4	5/9	Worcester	CD	25	
		Martha's				5/12	Paxton	CD	26	
1956	4/23	Vineyard	RNEB	12	4					
1957	4/29	Woods Hole	RNEB	13	4	5/8	Athol	CD	27	
1958	4/25	Lexington	RNEB	14	4	5/7	Fitchburg	CD	28	
1959	5/2	Belmont	RNEB	15	5	5/8	Westboro	CD	29	
1960	4/24	Tisbury	RNEB	16	4	5/2	Northboro	CD	30	
1961	4/25	Nantucket	RNEB	17	4	4/28	Worcester	CD	31	
1962			n/a			5/10	Southbridge	CD	32	
1963			n/a			5/1	W Boylston	CD	33	
1964	4/19	Somerset	RNEB	20	4	5/8	Mendon	CD	34	
1965	5/4	So Wellfleet	RNEB	21	5	5/10	Oxford	CD	35	
1966	4/25	Topsfield	RNEB	22	4	5/10	Worcester	CD	36	
1967	5/1	Marblehead	RNEB	23	5	5/17	Worcester	CD	37	
1968	4/26	Chatham	RNEB	24	4	5/18	Leominster	CD	38	
1969	3/26	Chatham	Viet&P			4/27	W Boylston	CD	39	
1970			n/a			5/8	Athol	CD	40	
1971			n/a			5/6	W Boylston	CD	41	
1972			n/a			5/10	Uxbridge	CD	42	
1973	4/21*	Plum Island	BOEM	1	3	5/5	Worcester	CD	43	
1974	4/22	Squantum	BOEM	2	3	5/10	Athol	CD	44	
1975	5/7	Middleboro	BOEM	3	4	5/10	Hardwick	CD	45	

1976	4/20	Nantucket	BOEM	4	3	5/7	Lancaster	CD	46
1977	4/18	Rockport	BOEM	5	3	5/11	No Brookfield	CD	47
1978	4/28	Cambridge	BOEM	6	4	5/12	Berlin	CD	48
1979	4/28	Plum Island	BOEM	7	4	5/19	New Braintree	CD	49
1980	5/5	Sharon	BOEM	8	4	5/14	Charlton	CD	50
1981	4/19	Cambridge	BOEM	9	3	5/8	Shrewsbury	CD	51
1982	5/2	Wellfleet	BOEM	10	4	5/8	No Brookfield	CD	52
1983	4/22	Marblehead	BOEM	11	3	5/14	Charlton	CD	53
1984	5/6	Westport	BOEM	12	4	5/11	No Brookfield	CD	54
		Martha's				5/7	Princeton	CD	55
1985	4/28	Vineyard	BOEM	13	4				
1986	5/6	Middleboro	BO	14	4	4/30	Brookfield	CD	56
1987	5/8	Cambridge	BO	15	5	5/8	Shrewsbury	CD	57
1988	5/3	Nahant	BO	16	5	4/27	Sterling	CD	58
1989	5/12	Cambridge	BO	17	5	5/9	New Braintree	CD	59
1990	5/7	Brookline	BO	18	4	5/10	Princeton	CD	60
1991	5/9	Manomet	BO	19	4,5	5/8	Spencer	CD	61
1992	4/26	Cambridge	BO	20	4	5/9	W Brookfield	CD	62
1993	4/19	Truro	BO	21	4	5/4	Athol	CD	63
1994	4/20	Mattapoisett	BO	22	4	5/1	Athol	CD	64
1995	5/7	E Middleboro	BO	23	5	5/10	Bolton	CD	65
1996	4/26	Cambridge	BO	24	4	5/7	Athol	CD	66
1997	4/30	EBridgewater	MR			4/30	Harvard	LC	
1998	4/26	Pepperell	BO	26	4	4/28	Sutton	LC	
1999	4/16	Dracut	LC			4/29	Sutton	LC	
2000	4/10	Dighton	LC	28	4	4/30	Sutton	LC	
		Martha's				4/24	Webster	LC	
2001	4/14	Vineyard	MR						
2002	4/16	Brewster	LC			4/24	Oxford	LC	
2003	4/20	Plum Island	NEH			4/20	Townsend	LC	
2004	4/15	Chilmark	BO	32	4	4/18	Rochdale	LC	
2005	4/8	Newburyport	NEH			4/20	Princeton;Upton	LC	
2006	4/16	Concord**	LC			4/25	Uxbridge	LC	

Sources: BNEBL=Bulletin of New England Bird Life, 1937-1944 (courtesy of Jim Berry)
RNEB=Records of New England Birds, 1945-1968 (courtesy of Jim Berry)
BOEM=Bird Observer of Eastern Massachusetts, 1973-1985 (courtesy of Jim Berry)
BO = Bird Observer, 1986-2005
MR= records kept by Marj Rines, 1994-2001 (courtesy of Marj Rines)
CD= The Chickadee, a Journal of Worcester County Ornithology, 1931-2003, Forbush Bird Club (courtesy of Francis X. Mc Menemy, Barbara Walker)
LC= Lanny Chambers; maps at www.hummingbirds.net, data at www.learner.org/jnorth
NEH= New England Hummers, www.nehummers.com
Veit&P = Veit, Richard, and Wayne R. Petersen 1993, p. 279

Notes: n/a = no record available
*In this year, a hummingbird was picked up in Sudbury on 3/18, but it soon died. (BOEM 1, 3, 1973). Since we are interested in "successful " migrations, the next earliest date, 4/21 on Plum Is., has been used instead.
**there were also sightings in Rehoboth and Rochester on that day, same source
Eastern MA= Essex, Middlesex, Norfolk, Plymouth, Suffolk, Bristol, Barnstable, Dukes, and Nantucket counties
Central MA= Worcester County

Sources

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