

**STATUS OF THE RUFIOUS HUMMINGBIRD (*Selasphorus rufus*)
IN OKLAHOMA**

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Abstract—The Rufous Hummingbird (*Selasphorus rufus*) has become an increasingly common migrant east of the Rocky Mountains during fall, with an elliptical migration that takes it back to the breeding grounds through the western U.S. It is a regular low-density fall migrant in most of Oklahoma, becoming less common in the southeast, and it is a rare winter resident and spring migrant, primarily in central and northeastern Oklahoma.

INTRODUCTION

Rufous Hummingbirds (*Selasphorus rufus*) breed in the western U.S. and Canada, as well as north into southeast Alaska, claiming the farthest northern breeding latitude of any hummingbird (Healy and Calder 2006). They have an elliptical migration pattern bringing them south through Oklahoma during the fall (Sutton 1967, Baumgartner and Baumgartner 1992, Healy and Calder 2006), and northward through the western U.S. (Healy and Calder 2006).

Overall, the population has shown declines, at least from 1980-2004 (Healy and Calder 2006). However, the number of records has increased in Oklahoma (Baumgartner and Baumgartner 1992), in neighboring Kansas (Thompson *et al.* 2011), and in the eastern U.S. (Hill *et al.* 1998, Healy and Calder 2006) in recent years. Whether this is a result of a new trend in migration patterns, better detection at feeding stations, or an increase in birder awareness and sophistication remains uncertain (Hill *et al.* 1998, Healy and Calder 2006).

Since these apparent changes in migration are recent, relatively few data exists on the migration of the Rufous Hummingbird during

fall through the central and southern Great Plains. The first records in Oklahoma were in the 1950s, with only two recorded (Baumgartner and Baumgartner 1992). The first specimen from Oklahoma was taken on 3 November 1959, Cleveland County (Sam Noble, Oklahoma Museum of Natural History OMNH 3724) with a second not taken until 23 August 1972, Washington County (OMNH 7374, Mery 1974). One additional specimen was obtained prior to Baumgartner and Baumgartner (1992, OMNH 20416), a bird found dead on 27 November 1985, Cleveland County, although it had been observed from 7-26 November by M. Howery (pers. comm.). Baumgartner and Baumgartner (1992) listed only 22 records from 1950-1985 with over half of these coming from northeast Oklahoma. Reinking (2017) stated that the Rufous Hummingbird was a rare visitor, mostly from July through late November, seldom present during December through February. They were recorded in one survey block (Tulsa County) in December 2004 as part of the Oklahoma Winter Bird Atlas project (Reinking 2017). The Oklahoma Bird Records Committee (OBRC 2005) reported one from Oklahoma County, 5-21 December 2004. OBRC (2004, 2009) also reported *Selasphorus* sp. in Tulsa and Comanche Counties throughout the winter of 2003-2004 (in Reinking 2017) and from Pittsburg County during January 2008 (Table 2).

Herewith, we try to elucidate the known movement of the Rufous Hummingbird in Oklahoma based on historical data, banding and specimen records, and recent observations.

METHODS

Womack (EW) banded hummingbirds in her yard in Grove, Delaware County, and in other counties in northeastern Oklahoma, from 1991-2013, under banding permit #22056. EW maintained one hummingbird feeder in Grove year-round. During this period, she banded a total of 11 Rufous Hummingbirds. We provide data on two additional observations from her residence.

Additionally, we reviewed the historical literature, personal records, and records from the Oklahoma Bird Records Committees (OBRC), including "validated" e-Bird records by OBRC (Joe Grzybowski pers. comm., Sullivan *et al.* 2009), to ascertain migration patterns in Oklahoma. We also searched for voucher specimens from Oklahoma using the VertNet database (<http://portal.vertnet.org/search>). For purposes of

this paper, we define fall as being from July through November, winter from December through February, and spring from March through June. We assume all *Selasphorus* sp. records to be Rufous Hummingbirds based on the scarcity of verified Allen's Hummingbird (*Selasphorus sasin*) in the Great Plains and eastward (Hill *et al.* 1998, Clark and Mitchell 2013, Thompson *et al.* 2011).

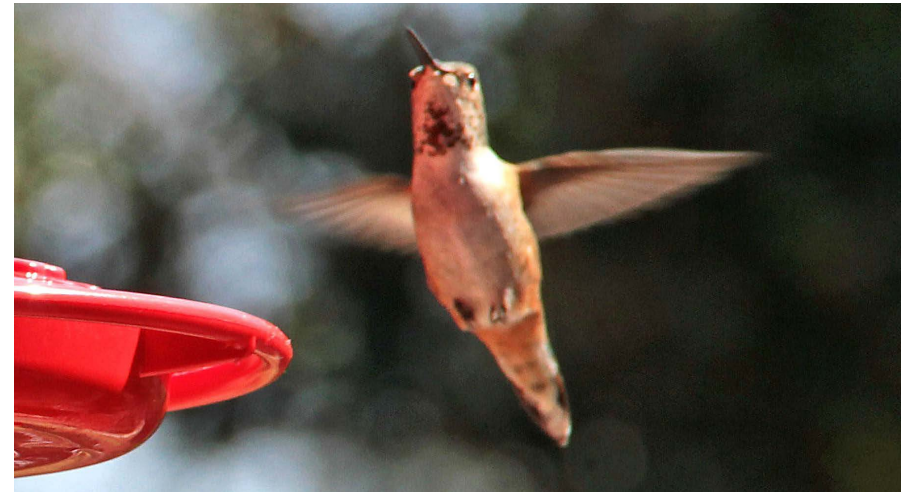


Figure 1. Rufous Hummingbird (*Selasphorus rufus*), 26 March 2016, which remained at the EW residence, Grove, Delaware County, Oklahoma, from 21 November 2015 through 30 March 2016. Photograph by E. Womack.

RESULTS

Between 1992 and 2002, EW banded 11 Rufous Hummingbirds with extreme dates from 12 July to 6 January (see below, Table 1). Six individuals were hatch year (HY) birds, and five after hatch year (AHY, Table 1). We include within the HYs a second-year female (SY-F) banded (#Y99478) on 6 January 2001, which was a HY-F on 18 December 2000 (HY is age before 1 January, and SY is age on or after 1 January), when she was hand-captured in a garage in Ketchum, Craig County (ca. 40.2 km from Grove), during a snowstorm. This female was brought to EW; the bird appeared uninjured, and could perch and fly normally within a cage. EW fed her Nektar-Plus (NEKTON, Pforzheim, Germany), banded her on 6 January 2001, and released her on 9 January. Six of the banded individuals were females (four HY, two AHY), and five were males (three AHY, two HY). An AHY-M banded (#Y27831) on 15 December 1999 remained until 16 February 2000 (64 days).



Figure 2. Wintering Rufous Hummingbird (*Selasphorus rufus*), 24 January 2017, at EW residence, Grove, Delaware County, Oklahoma. It was seen from 20 November 2016 through 7 April 2017. Photograph by E. Womack.

Observational data includes two additional records from EW's feeders, both of AHY females. One was observed at EW's feeders from 21 November 2015 through 30 March 2016 (131 days, Figure 1, Table 2). A second was observed from 20 November 2016 through 7 April 2017 (139 days, Figure 2, Table 2). These birds represent the first consecutive-year records for Rufous Hummingbirds at EW's feeders. Additionally, based on detailed notes of behavior and plumage, they possibly represent the first time a Rufous Hummingbird (EW unpublished data) returned to its previous overwintering site in northeast Oklahoma.

OBRC has 46 records covering a span from 2000 through 2008 compared to only 18 from 1986 through 1999, and they validated another 89 records from eBird, mostly from 2009 through present. Specimen records are few, with only five from Oklahoma (Table 2, or in text above).

Of the 64 OBRC records evaluated between 1986 and 2008, the majority were for fall migration with extreme dates of 1 July through 27 November. Twelve records for winter indicated extreme dates from 1 December through 29 February, with an additional four spring records with extremes of 1 March through 29 April. One *Selasphorus* sp. overwintered and remained until 21 March (Table 2). Of the 89 OBRC eBird validated records, 18 were from winter with extreme dates of 8 December through 10 January, with an additional five spring records ranging from 18-20 April (Table 2). The remaining records were for fall.

Table 1. Rufous Hummingbird (*Selasphorus rufus*) banding in northeastern Oklahoma from 1991-2013 by E. Womack, with banding permit #22056.

DATE	BAND NUMBER	AGE-SEX*	LOCATION		COMMENTS
			COUNTY	TOWN	
11 Aug 1992	T31054	AHY-M	Delaware	Grove	
5 Nov 1993	T75883	HY-F	Delaware	Grove	Re-trapped following day
12 Nov 1993	T75884	AHY-F	Tulsa	Bixby	Present from 6 Nov through 10 Dec
26 Sept 1995	Y05411	HY-M	Tulsa	Tulsa	
5 Oct 1996	Y05612	HY-M	Delaware	Grove	
21 Aug 1997	Y05696	AHY-M	Delaware	8 km west of Jay	
12 July 1998	Y27621	AHY-F	Delaware	Cleora	
15 Dec 1999	Y27831	AHY-M	Delaware	Grove	Remained until 16 Feb 2000
6 Jan 2001	Y99478	SY-F	Delaware	Grove	HY-F when hand captured in Ketchum, Craig County, on 18 Dec 2000 (see text)
17 Aug 2002	R54912	HY-F	Delaware	Grove	
20 Aug 2002	N04279	HY-F	Craig	Vinita	

* HY = hatching year; SY = second year (young beginning January after hatch); AHY = after hatching year; F = female; M = male.

Table 2. Observational records of wintering and spring Rufous Hummingbird (*Selasphorus rufus*) in Oklahoma.

DATE	OBSERVER(S)	LOCATION		SOURCE*
		COUNTY	TOWN	
Late Aug 1971 – 12 Jan 1972		Northeast		Baumgartner and Baumgartner 1992 (Tomer 1972)
Mid-Oct 1974 – 26 Jan 1975		Northeast		Baumgartner and Baumgartner 1992 (Goard 1975)
10 Oct – 3 Dec 1981	McMahon	Muskogee ¹	Fort Gibson	Baumgartner and Baumgartner 1992
1 Nov – 3 Dec 1981		Muskogee		Baumgartner and Baumgartner 1992
Nov – 30 Dec 1992 (<i>Selasphorus</i> sp.)	P. Seibert	McIntosh ¹	Checotah	EW
Nov 1992 – 1 Jan 1993 (<i>Selasphorus</i> sp.)	P. Seibert	Oklmulgee ¹	Henryetta	EW
10 Dec 1992 – 17 Jan 1993	M. Lindsey et al.	Tulsa ¹	Tulsa	OBRC/EW
Late Oct – Dec 1993 (<i>Selasphorus</i> sp.)	J. Beasley, J. Norman	Muskogee	Muskogee	EW
1 Oct 1993 – 7 Jan 1994 (<i>Selasphorus</i> sp.)	C. Sowers, EW	Craig ¹	Vinita	EW
Mid-Oct – winter 1994	M. Fisherlew	Dewey ²	Taloga	EW
9 Dec 1994	P. Seibert	Tulsa	Catoosa	EW
12-14 April 1996	B. Whitten, B. Heck	McCurtain ³	Hochatown	OBRC
9 March 1997	T. Horn	Tulsa	Broken Arrow	OBRC
28 Nov 1998 – 3 Jan 1999	D. Wiedenfeld	Rogers ¹	Catoosa	EW
11-30 Dec 1998	W. Williams et al.	Tulsa	Sand Springs	OBRC/EW
21 Dec 1998	D. Wiedenfeld	Washington ¹	Bartlesville	EW (OMNH 21573)
26 Dec 1998 (<i>Selasphorus</i> sp.)	J. Loyd et al.	Wagoner ¹	Godley Reservoir	OBRC
11 Dec 2000 – 5 Jan 2001	S. Going, EW	Delaware ¹	Grove	OBRC
9 Dec 2003	specimen	Cleveland ⁴	near Norman	OMNH 22020
22-24 Feb 2003	K. Meisenzahl	Comanche ⁵	E of Indianoma	OBRC
4 Dec 2002 – 28 Feb 2003	D. Lambert et al.	Creek ⁴	Lake Keystone	OBRC
28-29 April 2003	K. Meisenzahl	Comanche	Lawton	OBRC
1 Dec 2003 – 29 Feb 2004 (<i>Selasphorus</i> sp.)	B. Mercer et al.	Comanche	Indianoma	OBRC
1 Dec 2003 – 29 Feb 2004	M. Kamp et al.	Tulsa	Jenks	OBRC
1 Dec 2003 – 29 Jan 2004 (<i>Selasphorus</i> sp.)	J. and J. Bacon	Tulsa	Tulsa	OBRC
1 Dec 2003 – 28 Jan 2004 (<i>Selasphorus</i> sp.)	J. Arterburn	Tulsa	Tulsa	OBRC
1-25 March 2004	P. and J. Eads	Tulsa	Jenks	OBRC
5-21 Dec 2004	B. Horn	Oklahoma ⁴	Choctaw	OBRC
4 Dec 2004	P. and J. Eads	Tulsa	Jenks	OBRC
1 Jan – 21 March 2008 (<i>Selasphorus</i> sp.)	David Beall	Pittsburg ³	McAlester	OBRC
Through 21 Mar 2008 (<i>Selasphorus</i> sp.)	David Beall	Pittsburg	McAlester	OBRC
8 Nov – 3 Jan 2010	Brian Davis	Oklahoma	Edmond	OBRC
31 Dec 2009	Angie Holt	Oklahoma	Edmond	eBird (OBRC)
2 Jan 2010	B. Davis and A. Holt	Oklahoma	Edmond	eBird (OBRC)
21 Dec 2010	Jana Singletary	Tulsa	Collinsville	eBird (OBRC)
5 Nov 2012 – 10 Jan 2013	Christie Stoops	Logan ⁴	Cottonwood Creek	eBird (OBRC)
8 Jan 2013	Joe Grzybowski	Logan	Guthrie	eBird (OBRC)
17 April 2013 (<i>Selasphorus</i> sp.)	Joshua Jones	Payne ⁴		eBird (OBRC)
18-19 April 2014 (<i>Selasphorus</i> sp.)	Brandy and John Polo	Payne		eBird (OBRC)
20 April 2014 (<i>Selasphorus</i> sp.)	Torre Hovick	Payne	Stillwater	eBird (OBRC)
21 Nov 2015 – 30 March 2016	EW	Delaware ¹	Grove	EW (AHY-F)
20 Nov 2016 – 7 April 2017	EW	Delaware	Grove	EW (AHY-F)

*EW = Ellie Womack personal records; OBRC = Oklahoma Bird Record Committee records; eBird (OBRC) are records reviewed by OBRC; both data sets provided by J. Grzybowski; OMNH = Oklahoma Museum of Natural History.

County superscript represents the geographic region in Oklahoma: 1 = northeast; 2 = west central; 3 = southeast; 4 = central; and 5 = southwest.

For all data combined, over 100 records exist for fall, 19 for winter only, 25 from fall through winter, and one record from winter through spring (Table 2, Figure 3). Seven spring records exist, with an additional two records of individuals that remained from fall through their departure in spring (EW's, see above, Table 2).

DISCUSSION

Baumgartner and Baumgartner (1992) indicated the Rufous Hummingbird was a rare fall transient in Oklahoma, though they were not reported from southeastern and south-central regions. Interestingly, few records exist for southeastern Kansas as well (Thompson *et al.* 2011). Therefore, the frequency of occurrences in northeastern Oklahoma (Figure 3) at first glance appears to indicate that Rufous Hummingbirds might not pass through eastern Kansas, but have a southeasterly movement from the western Rocky Mountain region. However, based on Thompson *et al.* (2011), eBird observational data, Kansas Bird Records Committee (KBRC) records (http://www.ksbirds.org/kos/kos_kbrc.htm), and Thompson (pers. comm.) this is probably not the case, but likely a reflection of the scant number of birdwatchers in southeastern Kansas, since migration records in northeastern Kansas appear similar to northeastern Oklahoma. The paucity of records from both southeastern Kansas and Oklahoma may reflect a lack of feeding stations, and less interest in bird watching.

The main migration season in Oklahoma occurs from August through October with extreme dates of 1 July through 30 November (this study, Sutton 1967, Baumgartner and Baumgartner 1992, Reinking 2017). Furthermore, some Rufous Hummingbirds remain and winter primarily in central and northeastern Oklahoma from 1 December through 29 February (normally 28 February, Figure 3). The fall migration is similar to that reported in Kansas, namely late-July and August through September, with extreme dates from 13 July through 6 December (Thompson *et al.* 2011).

Published spring records for Oklahoma are few, but this study suggests most individuals are wintering birds that remained until departure for their breeding grounds (Table 1, 2, Figure 3). Spring *Selasphorus sp.* (presumed to be *S. rufus*) records from eBird that have been validated by OBRC include: individuals on 17 April 2013 (Joshua Jones) and from 18-24 April 2014 (Torre Hovick, John Polo, and Brandy

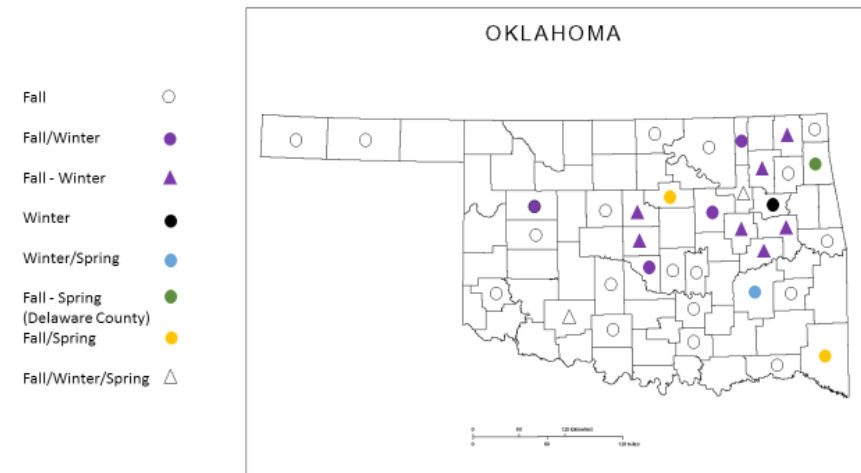


Figure 3. Distribution of Rufous Hummingbird (*Selasphorus rufus*) in Oklahoma.

Polo), all from Payne County. Another intriguing record accepted by OBRC is from Pittsburg County; a *Selasphorus sp.* that over-wintered into spring from 1 January through 21 March 2008, 81 days (reported by D. Beall), one of only a few southeastern Oklahoma records (Table 2, Figure 3). Thompson *et al.* (2011) reported only one spring record from Kansas, 26 April in Finney County (southwestern Kansas). There are two additional records, one from 17 May 1997 in Meade County (southwestern Kansas), and a second from Marion County (central Kansas) on 13 April 2013 (Thompson pers. comm.). The latter record was reported as having a rufous back and green wings, presumably this species. Additionally, a few records show up on eBird for Kansas during spring, though most have not been confirmed.

Breeding is unknown in Oklahoma (Sutton 1967, Baumgartner and Baumgartner 1992, Reinking 2004) or Kansas (Busby and Zimmerman 2001, Thompson *et al.* 2011).

The Rufous Hummingbird is an uncommon, low-density fall migrant throughout Oklahoma with the exception of southeastern and south-central regions where it appears rare (Figure 3). It is a rare winter resident in central and northeastern Oklahoma with some remaining until they commence their spring migration, and a vagrant elsewhere during fall and spring (Figure 3). It may be a winter resident in the southwest on occasion.

We anticipate additional spring records if fall migration and winter numbers continue to increase eastward (Hill *et al.* 1998). We hypothesize that an increase in the number of winter-feeding stations is responsible for birds ceasing their migration and remaining during winter. Based on banding data, Healy and Calder (2006) suggested the termination of migration could occur with winter site fidelity. Increased wintering may also be a reflection of warming winter temperatures related to global climate change.

Bird-feeding activities have increased in the U.S. in recent decades and often the effects are viewed as positive: such as a reduced risk of starvation or an increased over-winter survival rate (Newton 1998, Robb *et al.* 2008). However, the possible negative impacts such as the potential to spread disease, feeding stations acting as ecological traps, or an increased exposure to predators, are not well understood (Robb *et al.* 2008). Furthermore, supplemental feeding may increase large-scale changes in population dynamics and migratory strategies, including overwintering (Jokimäki *et al.* 1996, Robb *et al.* 2008).

Given the scarcity of insects and flowering plants in winter, a prime reason for Rufous Hummingbirds to remain in Oklahoma in that season is the availability of feeding stations. The efficacy of these winter-feeding stations has not been determined. When ambient temperatures of food resources are low, the energetic cost of warming the nectar that is consumed may be substantial enough to affect thermoregulation in Rufous Hummingbirds (Lotz *et al.* 2003). Therefore, we recommend studies on Rufous Hummingbirds to ascertain the impacts the winter-feeding stations may have on individuals, and to determine if numerous or widespread winter feeding stations could negatively affect the species at the population level.

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