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# Ruby-throated Hummingbird Populations in Northeastern Oklahoma ---- 1977 - 1988

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## Introduction

The following discussion is based on a 12-year banding program of Ruby-throated Hummingbirds (*Archilochus colubris*) south of Jay, Oklahoma. The birds were trapped and netted in our yard, which straddles a wooded ridge two miles north of Lake Eucha. Fence rows laden with coral honey-suckle have attracted great numbers of these birds. Two wire drop-door traps were operated 10-12 hours a week. These were baited with nectar tubes of sugar water. From two to five nets of varying lengths were spread several mornings a week and also captured a few hummingbirds.

Male Rubythroats usually arrive several days earlier than the females between mid to late April. Many are transients, with only one or two repeat visits, if at all. The bulk of the female migration occurs during May. All individuals that are captured or recaptured between mid May and late August are considered potentially resident birds.

A total of 2733 Ruby-throated Hummingbirds have been banded from 1977 through 1988. Tabulation of each sex-age category indicates about equal numbers of males and females, adult and first-year birds, with only a 5% preponderance of young males.

Many birds return from previous years, arriving in numbers from late April through May, with another influx at the end of the nesting season in mid to late July and August. The symbol R1 (Return 1) denotes birds which were captured one year after banding; R2 denotes those recaptured two years after banding, etc.

## Comparison of 1987-1988 Populations

Table 1 summarizes the proportions of males and females, adults and first-year birds, and returns. The data selected for this table represent the years 1987 and 1988, when the largest numbers of birds were handled, both new and returns.

Figure 1 graphs comparable population peaks during those two years, occurring during the migration period in early May (augmented by return birds), and in mid August, with arrival of young of the year. Return birds are tabulated by a bar graph superimposed on the seasonal graph.

Deleting the 361 birds banded in 1988, there have been a potential of 2372 individuals banded long enough to have

returned in a subsequent year. This figure is used to compute the survival ratio from year to year.

Table 2 presents the year-by-year populations, including totals of newly banded birds plus the survivors that have returned from previous years. During the 12 years of the study, 360 hummingbirds have returned during one or more subsequent years.

Table 3 traces the longevity of those birds that have returned for one or more succeeding years. Thus, of the 110 banded in 1977, a total of 35 returned one or more years. The last survivor, a female, appeared as a return bird (R6) at least seven years old. Of a total of 2733 birds banded, 15.17% survived at least one year after banding, and one female banded as an adult was recovered as an R7, at least nine years old.

Variations in the intensity of my banding activities have affected the data as follows:

Table 2 reflects the increasing amount of time devoted to capturing an increasing number of birds. During the last three years, over 1000 new hummingbirds plus the returns have passed through the yard. In the peak year, 1987, the tally stands at 387 new plus 65 returns, a total of 452 individuals in one small yard in one season.

Table 3, listing the number of returns in a subsequent year, inevitably reflects the bander's extraneous activities and may or may not represent total hummingbird populations. Thus:

In 1977, I did not start banding until June, thereby missing the major spring migration, but captured a greater-than-average population of resident birds which could be more likely to return in a subsequent year.

Of the 1980 catch, only 12% were recaptured the following year, a misleadingly small percentage attributed to unavoidable breaks in the banding program.

In 1986 and thereafter we were no longer absent from home during May, resulting in an abrupt increase in annual banding totals. Brief absences in midsummer, another factor that affects banding totals, are indicated on the line graph.

## Analysis of Data

During the first period (1978-1982), the normal percent of returns was consistently 21-22% of totals banded (Table 2).

During the second period (1983-1987), involving considerably more time devoted to capturing larger numbers of birds, the percent of returns ranged from 13 to 15% of totals banded. I believe this return rate most accurately reflects life expectancy for Ruby-throated Hummingbirds.

Survival, as expressed by returns from year to year (Table 3), follows a fairly regular pattern. Of the 15% that survive the first year after banding (R1), approximately half have survived to R2, halved again by R3. Of these, a hardy few linger to age 5, 6, and 7, though some may skip a year occasionally. The oldest record is a female age 9 when last encountered.

The formula  $\frac{360R}{2373} = 15.17\%$  expresses Rubythroat survival for one or more years.

There is a noteworthy similarity in the percent of returns for a single year (e.g., 1982) and for the accumulated totals of the 12-year study (1977-1988). In each successive year, returns are approximately half that of the preceding year. Thus:

In 1982	Total	R1	R2	R3	R4	R5	R6	R7
21%R	40	20	14	11	5	3	--	
	190							
1977-1987	360	159	80	35	13	6	1	
	2373							

The effect of the 1988 drought was a major concern. The 1987 season had produced record numbers, with more males than females, and about the same number of new adults and first-year (immature) birds. There was an impressive total of 65 returns from previous years.

During midsummer of 1988, in spite of a determined effort and many hours at both traps and nets, there simply were not as many birds in the yard. There were a few more adults banded in 1988 than in 1987, probably because of the increased time devoted to both trapping and netting. The numbers of returns were practically identical.

The accompanying seasonal graph depicts comparable population peaks during the two years, both in early May and again in August. But the 1988 numbers of both adult and immature birds are well below those of 1987. There were 51 fewer immature birds in 1988 than in 1987. The fall "inundation" did not materialize in 1988, in spite of the 14 nectar feeders religiously tended until November.

Hopefully analysis of the 1989 season will show a population more normal.

**Table 1.** The Age-Sex Composition of Hummingbird Populations at Jay, Oklahoma (1987-1988)

1987	Birds		Banded		Returns					
	As Adult	As Immature	R1	R2	R3	R4	R5	R6		
Males	112	129	21	4	1					
Females	82	64	28	11	11	5	4			
Totals	194	193	49	15	12	5	4	0		

Population - Total New 387 + 65R = 452 Individuals

1988										
	Birds		Banded		Returns					
	As Adult	As Immature	R1	R2	R3	R4	R5	R6		
Males	106	94	13	4	-	1				
Females	113	48	18	14	8	4	1	3		
Totals	219	142	31	18	8	5	1	3		

Population - Total New 361 + 66R = 427 (51 fewer than 1987)

**Table 2.** Annual Populations of Ruby-throated Hummingbirds Banded at Jay, Oklahoma.

Year	Total New	Total Returns
1977	110	---
1978	158	+34
1979	125	+41
1980	195	+54
1981	84	+27
1982	190	+45
1983	224	+53
1984	289	+46
1985	266	+56
1986	344	+62
1987	387	+65
1988	361	+66

12-year Totals = 2,733 New; 360 Returns

**Table 3.** Survival Ratio of Ruby-throated Hummingbirds Based on Banding Returns at Jay, Oklahoma.  
(Maximum ages attained by birds returned from previous years.)

Year	Total *Survivors		Numbers of Survivors Recaptured							
	Returned A Subsequent Year	% of Total	R1	R2	R3	R4	R5	R6	R7	R8
1977	35	32%	20	5	6	2	1	1		
1978	37	22%	16	13	2	11	2	1	1 (and R8**)	
1979	27	21%	19	3	4	1				
1980	24	12.8%	5	12	5	1	1			
1981	18	21%	12	3	2	1				
1982	40	21%	20	6	3	6	2	3		
1983	27	13%	11	5	8	4	1			
1984	37	13%	19	6	7	14				
1985	31	12%	14	9	8					
1986	51	14.8%	34	17						
1987	31	8%	31							
1988	--		--							

12-year Totals 15.17% 360 159 80 35 13 6 1 (and R8\*\*)  
2733 Banded; 360 Returns 4M All F All F Ad.F  
31F

\* Survivors include returns to their last appearance whether recaptured in intervening years or not (some are skippers).

\*\*Same bird for R7 and R8; lived to age 9.

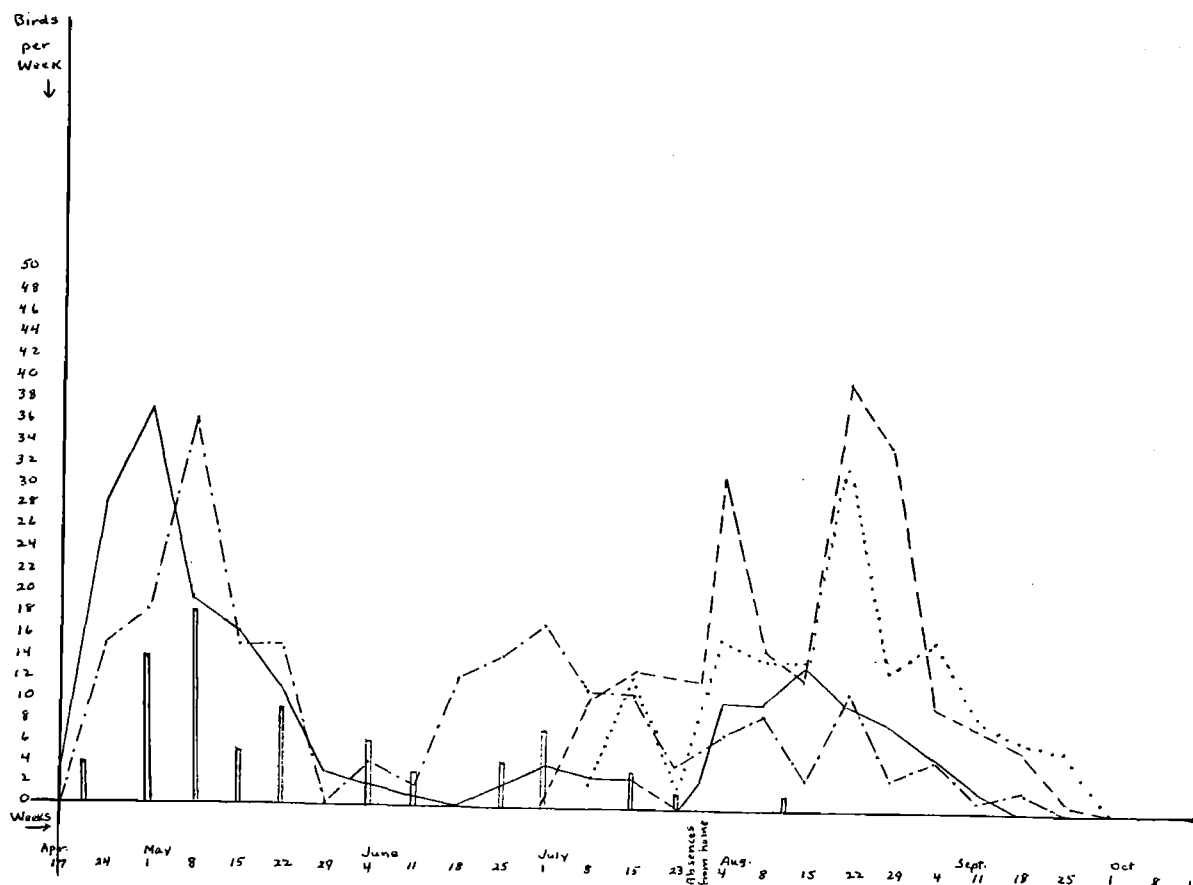


Figure 1. Ruby-throated Hummingbird Populations at Jay, Oklahoma, 1987-1988. Adults = — and — — — ; Immatures = ..... and ..... for 1987 and 1988 respectively. Histogram bars indicate weekly totals of returns during 1988.