The Migratory Pattern of House Finches in Eastern North America

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INTRODUCTION

The release and subsequent expansion of House Finches *(Carpodacus mexicanus)* in eastern North America has been well documented (Elliott and Arbib 1953; Hamilton 1991). Several studies of U.S. Fish and Wildlife Service banding records have shown that as the eastern population expanded it developed some migratory behavior with large numbers of birds moving to a more southerly location for the winter months (Hamilton 1991; Belthoff and Gauthreaux 1991; Stewart 1989). In this research, we attempted to determine if there has been a general change in the distances House Finches migrate with seasonal change by analyzing banding data for three time periods: 1980-1984, 1985-1989, and 1990-1992; and we explore the possibility that the distance House Finches migrate is influenced by the severity of winter conditions.

METHODS

We obtained banding data from the U.S. Fish and Wildlife Service on 1,297 House Finches banded and recaptured in the years 1980 through 1992 in all states and provinces of the Eastern Flyway. These data were tabulated into three time periods: two five-year periods (1980-1984, 1985-1989) and one three-year period (1990-1992). Each period was divided into the following four categories: (1) banded in summer, recaptured in winter (141 birds); (2) banded in winter, recaptured in summer (146 birds); (3) banded in summer, recaptured in summer (94 birds); (4) banded in winter, recaptured in winter (155 birds). Summer was defined as May through September, and winter was defined as November through March. October and April were considered transition periods; therefore, birds banded or recaptured in either of these months were excluded from the data analysis. This method of analyzing banding data is similar to the one used by Hamilton (1991) in a study of the seasonal movement of House Finches in the Midwest.

Maps were constructed by plotting points at the banding and recapture sites and drawing an arrow from the banding site to the recapture site. Birds recaptured within a radius of 100 km of their original banding site were considered to be nonmigrants. The maps for the 1985 to 1989 analysis are illustrated in Figures 1, 2, 3 and 4. Only these maps are included in this article because they are, in general, similar to the maps for the other two time periods. After the maps were constructed, we then asked the following questions: (1) Has the distance traveled by House Finches during seasonal changes increased or decreased since 1980? (2) Did House Finches travel greater distances during the exceptionally cold winter of 1989-90?

In order to answer the first question, we estimated the mean distances traveled during each of the three time periods (1980-1984, 1985-1987, 1990-1992) by determining the distances between summer banding sites and winter recapture sites (Table 1), winter banding sites and summer recapture sites (Table 2), summer banding sites and summer recapture sites (Table 3), and winter banding sites and winter recapture sites (Table 4). We then performed an analysis of variance of the means of distances traveled for each time period to determine if there had been significant change over the 13 years we considered.

Figure 1. Location of 53 House Finches banded in summer (May - Sept.) and recaptured in winter (Nov. - Mar.), 1985-1989.

Key

o = No migration for 1 bird

▫ = No migration for 2 to 5 birds

↗ = Direction of migration for 1 bird

↗ = Direction of migration for 2 to 3 birds

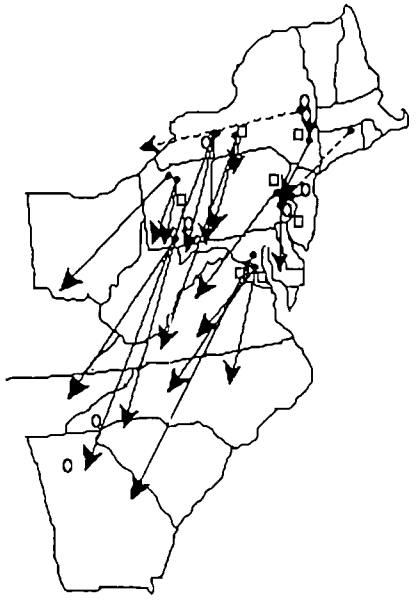


Figure 2. Location of 62 House Finches banded in winter (Nov. - Mar.) and recaptured in summer (May - Sept.), 1985-1989.

Key

o = No migration for 1 bird

▫ = No migration for 2 to 21 birds

↗ = Direction of migration for 1 bird

↗ = Direction of migration for 3 birds

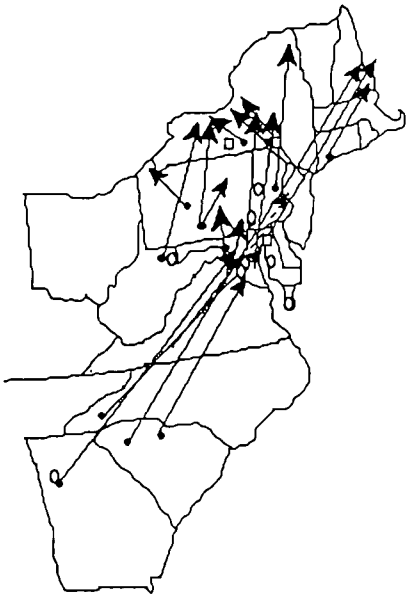


Figure 3. Location of 41 House Finches banded in summer (May - Sept.) and recaptured in summer (May - Sept.), 1985-1989.

Key

o = No migration for 1 bird

▫ = No migration for 2 to 6 birds

↗ = Direction of migration for 1 bird

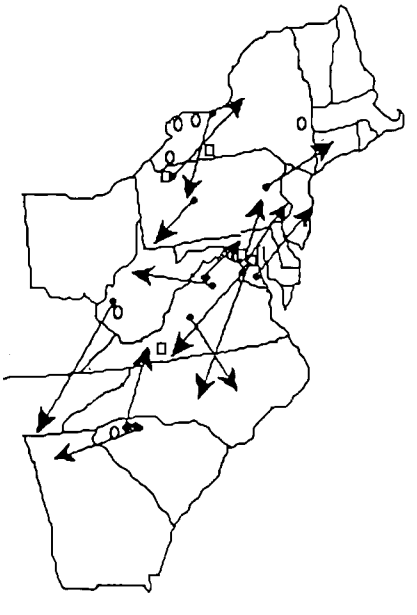
Figure 4. Location of 48 House Finches banded in winter (Nov.- Mar.) and recaptured in winter (Nov.- Mar.), 1985-1989.

Key

o = No migration for 1 bird

▫ = No migration for 2 to 19 birds

↗ = Direction of migration for 1 bird



To investigate the effect of weather on the extent of migration of House Finches, we compared the mean distances migrated by birds banded in summer and recaptured during the winter of 1981-1982 with those banded in the summer and recaptured during the winter of 1989-1990. We selected those years because the winter of 1981-1982 was relatively mild compared with the early winter of 1989-1990. Data from The Weather Almanac (Bair 1992) from 22 cities ranging from Washington, DC, to Burlington, VT, for November and December show that there was no significant difference in the amount of snowfall during those two months but there was a dramatic difference in the mean temperatures, 2.7°C (n = 44, SD = 3.7°C) in 1981 versus -0.7°C (n = 44, SD = 6.6°C) in 1989.

RESULTS AND DISCUSSION

The data suggest that in general House Finches have not increased nor decreased the average distance they travel from season to season (summer to winter, F = .136, P > .10; winter to summer, F = .58, P > .10). Although the finches that were banded in summer and recaptured in winter for the 13 years included in this study had traveled an average of 176.7 km (n = 141, SD = 238.4 km), those that were banded in the winter and recaptured in the summer, on average, traveled almost as far (192.1 km, n = 146, SD = 247.5 km), and the difference was not found to be significant (t = .628, P > .10). In a similar study of House Finches in the Midwest, Hamilton (1991) found that the average distance between summer banding and winter recapture sites was 344.9 km, and between winter banding and summer recapture sites was 416.4 km. These numbers clearly suggest that many House Finches in the Midwest travel much further than those in the East. An analysis of variance of the distances traveled by birds banded in the East in winter and recaptured in a subsequent winter shows that there was significant variability from year to year (F = 3.48, P < .05). A similar comparison of those banded in summer and recaptured in summer shows no significant difference between the three time periods (F = .750, P > .10).

Table 1. Summary statistics of distances traveled by House Finches banded in summer,recaptured in winter.

Years	Mean Km	Standard Deviation	n	F
1980-1984	207.0	225.6	71	.136
1985-1989	200.6	238.9	53	
1990-1992	235.5	294.6	17	
1980-1992	208.0	238.4	141	

Table 2. Summary statistics of distances traveled by House Finches banded in winter, recaptured in summer.

Years	Mean Km	Standard Deviation	n	F
1980-1984	199.6	218.3	68	.058
1985-1989	186.5	274.5	62	
1990-1992	181.9	299.7	16	
1980-1992	192.1	247.5	146	

Table 3. Summary statistics of distances traveled by House Finches banded in summer, recaptured in summer.

Years	Mean Km	Standard Deviation	n	F
1980-1984	50.3	105.7	45	.75
1985-1989	37.9	68.8	41	
1990-1992	11.4	9.9	8	
1980-1992	41.6	86.0	94	

Table 4. Summary statistics of distances traveled by House Finches banded in summer, recaptured in summer.

Years	Mean Km	Standard Deviation	n	F
1980-1984	111.9	180.5	98	3.48
1985-1989	103.2	121.8	48	
1990-1992	268.0	312.5	9	
1980-1992	118.3	148.7	155	

The mean distance between winter banding sites and winter recapture sites for all House Finches banded between 1980 and 1992 was 118.3 km (n = 155, SD = 148.7 km), while the mean distance between summer banding sites and summer recapture sites was 41.6 km (n = 94, SD = 86.0 km). These data suggest that House Finches have a stronger fidelity to their nesting areas than to the areas in which they overwinter ($t = 4.12$, $P < .005$). This also appears to be the case for House Finches in the Midwest (Hamilton 1991).

We found that House Finches retrapped during the mild winter of 1981-1982 were an average distance of 259.8 km (n = 11, SD = 70.9 km) from their summer banding sites, while those retrapped in the colder winter of 1989-1990 averaged 492.8 km (n = 5, SD = 185.9 km) from their summer banding sites. This difference is clearly significant ($t = 3.74$, $P < .005$) and is most likely the result of the early severe cold weather that affected much of eastern North America in November and December of 1989.

CONCLUSIONS

In general, since 1980 House Finches in eastern North America have not increased nor decreased the distance they travel with changes in the seasons; however, the data analysis does suggest that eastern House Finches will extend their southerly migration during exceptionally cold winters. Compared with their conspecifics in the Midwest, House Finches in the East travel significantly shorter distances between seasons.

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