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INTRODUCTION

Band removal by birds can adversely affect the analysis and interpretation of data collected about banded populations of avian species. Consequently, information about the degree to which birds of a particular species may remove bands is desirable. I conducted a study of the House Finch *(Carpodacus mexicanus)*to determine whether or not they remove standard, aluminum, butt-end U.S. Fish and Wildlife Service (USFWS) #1 bands and to determine, if they did remove these bands, the degree to which this behavior manifested itself in a population of the species. It is well known that fringillids work to remove newly attached bands (McClure 1984). The present study revealed this behavior to be common, since about one-third of all House Finches that repeated during the study wore bands that had been slightly to considerably opened (i.e., up to 2 mm). However, it has not been previously shown that House Finches remove bands, as, in fact, this study revealed to be the case.

The study site was situated 6.4 km (4 mi.) southeast of Cookeville, Putnam County, Tennessee (36°08' N, 85°27' W), at an elevation of 293 m (960 ft.). Banding of House Finches occurred in a suburban yard with frontage on East Lake, an impoundment of the Falling Water River. The surrounding area consisted primarily of rural subdivisions with some small farms and moderate size (10+ ha) tracts of deciduous woodland interspersed.

The study was conducted during two periods: 18 February-18 June 1989 and 1 October 1989-3 June 1990.

The House Finches banded during this period are part of a population of birds wintering in or migrating through Tennessee and breeding mainly north and northeast of the state, as evidenced by recoveries of birds banded during the first study period: a bird banded 16 March 1989 was recovered almost due north in Houston, Ohio (40°10' N, 84°10' W) on 18 April 1989; a bird banded 14 March 1989 was recovered northeast in Carnegie, Pennsylvania (40°20' N, 80°00'W) on 7 April 1989; and a bird banded 18 March 1989 was recovered northeast in Dunkirk, New York (42°20' N, 79°10' W) on 27 June 1989. As of October 1989, all other out-of-state recoveries of House Finches banded in Tennessee east of Nashville (87° W) have been from states to the north and northeast of Tennessee, including three other recoveries from Pennsylvania, two others from Ohio, one from New York, and two from West Virginia (Bird Banding Laboratory data).

Another indication that the birds involved in the study were mainly wintering or migrating individuals was supplied by daily counts of House Finches foraging on feeders at the study site. During 1989 and 1990, numbers of House Finches dropped sharply from 25-300 per day in March when many birds were banded (period one: 772 birds banded in 10 banding days; period two: 436 birds banded in 9 banding days) to 1-10 per day in April when few birds were banded (period one: 10 birds banded in 5 banding days; period two: 2 birds banded in 1 banding day), suggesting that winter resident or migratory birds represented about 95% of the population being banded.

METHODS

House Finches were banded with standard USFWS #1 bands (prefixes 950, 2020, 2040, 2011, and 2081). Each bird was also secondarily marked by having about 1 cm clipped off the right outermost rectrix with a small pair of household scissors. Some birds were missing this rectrix and did not receive secondary marking; a few were inadvertently not clipped. Large numbers of birds were rectrix-clipped during each of the periods noted above (Table 1).

House Finches do not undergo a prenuptial molt (Pyle, et al. 1987). Therefore, birds with rectrices clipped on or after 1 October normally retain the clipped feather until the following June or later. Thus, if a banded bird removed its band during the study period and was recaptured, it would still have the clipped rectrix to identify it as a previously

banded bird. The clean cut made in clipping the rectrix was also desirable as it gave the rectrix a very different appearance from that of naturally broken rectrices (Figure 1); thus, little or no confusion with birds whose rectrices were broken in natural conditions was possible. A final advantage of this method of secondary marking is that it is self checking. As birds are processed for banding and clipping, any which have been previously clipped will draw the attention of the bander clipping the rectrices, since he or she will not be able to clip an already clipped rectrix.

Figure 1. Photograph of hand-held House Finch showing clipped outermost right rectrix and naturally broken central rectrix.

RESULTS

In order for this method of demonstrating whether or not House Finches remove their bands to work, moderately large number of banded/clipped birds have to be recaptured at the banding site before the prenuptial molt. During this study, these conditions were satisfactorily met since repeat birds (those recaptured within 90 days of being banded or by June) totalled 230. Of these, one bird repeated without a band but with a clipped rectrix, clearly demonstrating that House Finches can remove #1 bands. The remaining 229 birds repeated with bands still on their tarsi, as well as with clipped rectrices. Of importance to the study was the fact that many repeat birds' bands had been opened in the interval between banding/clipping and recapture. During the first period of the study, nearly half of repeat birds (Table1) had opened their bands to some degree during this interval. (In addition, 14 birds banded during the first period returned during the second period with four (29%) having bands that were opened.) During the second period, about one-fourth of repeat birds had opened their bands (Table 1).

Table 1. Data for House Finches banded in Putnam County, Tennessee.

	1988-1989	1989-1990	2-Yr.Total
Total Banded	948	1472	2420
Total Clipped	866	1449	2315
Repeats	51	179	230
Birds with Opened Bands	25	47*	72
(% of Repeats)	(49)	(26)	(31)

*Does not include one bird that repeated without a band but with a clipped rectrix.

House Finches commonly (72 of 230 repeats, or 31%) open bands placed on their tarsi and, thus, might be suspected of removing their bands entirely. However, only infrequently (1 of 230 or 0.4%) do House Finches remove their bands. Consequently, the effect of band removal by House Finches in skewing data anlyses dependent on banding information is probably small. Should the result of this study be confirmed by other studies, a correction factor for this small amount could be introduced into data analyses involving House Finches.

DISCUSSION

The history of several House Finches that repeated during the study periods indicates the usual behavior of newly banded individuals of this species. During the two study periods, five birds that repeated within three hours of being banded wore bands that were noticeably opened, indicating that many House Finches try to remove their bands immediately following banding and are often successful in opening the bands somewhat in a very short period of time.

House Finches appeared to stop trying to remove bands within a few days to a few weeks of being banded, as

indicated by the following multiple repeat cases. A bird banded on 10 March 1989, repeated on 18 March 1989 with an opened band; the band was closed and the bird released. The bird repeated on 27 March 1989 and its band had not been reopened. This same sequence was reenacted by a bird banded on 15 January 1990, which repeated on 28 January and 3 March 1990, and by a bird banded 15 January 1990, which repeated on 27 January and 3 March 1990. Finally, there is the case of a bird banded 3 February 1990. It repeated three hours later on the same date with an opened band; its band was closed and the bird released. It repeated on 17 February 1990 with an opened band, on 3 March 1990 with a slightly opened band, and on 13 March 1990 with a closed band.

The possibility that partly opened bands might have an injurious effect on the tarsi of banded birds was suggested to me by Edward H. Burtt, Jr. (pers. comm.). However, during the second period of the study, I handled nearly 50 House Finches that repeated with partly opened bands, as well as four birds banded during the first period that returned during the second period wearing partly opened bands. In no case could I detect any injury to the tarsus of a bird as a result of its having worn the partly opened band. However, my inspection of the birds' tarsi was invariably performed quickly. Minor injuries or chronic irritation caused by opened bands might easily have been present but not noted during these inspections. The effect of opened bands on the health of House Finches might reward further study, especially if this effect could be distinguished from the effect of closed bands.

Researchers who conduct similar studies in the future might benefit from two suggestions: first, if other banders are working in the vicinity of a project where finches are rectrix clipped, alert them to this marking technique and request that they check birds for it; second, do not band birds missing the rectrix that is chosen for clipping, since it is easy to neglect to check for clipping on rectrices other than the one chosen.

Even though the percentage of House Finches that remove bands is small, it would be preferable if none could remove bands. One way to reduce or eliminate this problem would be to produce bands with somewhat less malleability than those I worked with. I recommend that the Bird Banding Lab attempt to have #1 bands manufactured in the future with a less malleable alloy of aluminum than was present in the bands I used.

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