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Age Determination of Male House Finches

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Male House Finches (*Carpodacus mexicanus*) show variations in the brightness of their reddish basic plumage. From casual observation I found that males could be separated generally into two plumage classes. Brightly colored birds appeared to have large, brightly colored rump patches, while less intensely colored birds appeared to have small, dull rump patches. Believing that these variations might be age related, and therefore might provide an age-determining method for birds in the hand, I began measuring these rump patches in an attempt to correlate their size with plumage brightness and subsequently with age.

Methods

I examined the head, throat, breast, and belly areas of captured male House Finches at Schenectady, New York. Birds with intense and extensive reddish plumage about the head and breast (which was usually accompanied by a reddish wash on the belly) were classified as "bright." Those with less intense color or limited area of reddishness, or both (which usually, but not always, lacked red on the belly) were classified as "dull."

Having so classified a bird, I then examined and measured the rump patch. I recorded maximum width measurements to the nearest millimeter, holding the bird as illustrated in Figure 1. I gathered width (W), length (L), and width \times length (W \times L) data according to plumage class and examined them for differences between classes.

As appropriate, I determined the age of birds using incompleteness of skull pneumatization, presence of juvenal plumage, presence of flight feather molt, or recapture history. The skulling procedure was used for identifying only hatching-year (HY) birds. Those that had been banded in juvenal plumage of unknown sex and were recaptured as males following their first prebasic (postjuvenal) molt were known HY birds to the end of the year, and second-year (SY) birds in the following January-September period prior to the next prebasic molt.

Flight feather molt was used for age determination after body molt had produced a new rump patch, and then it served to identify only after-hatching-year (AHY) birds. Because some HY birds undergo molt of some outer primaries (beginning at P4 to P7), and some rectrices, but no secondaries, individuals displaying this pattern of

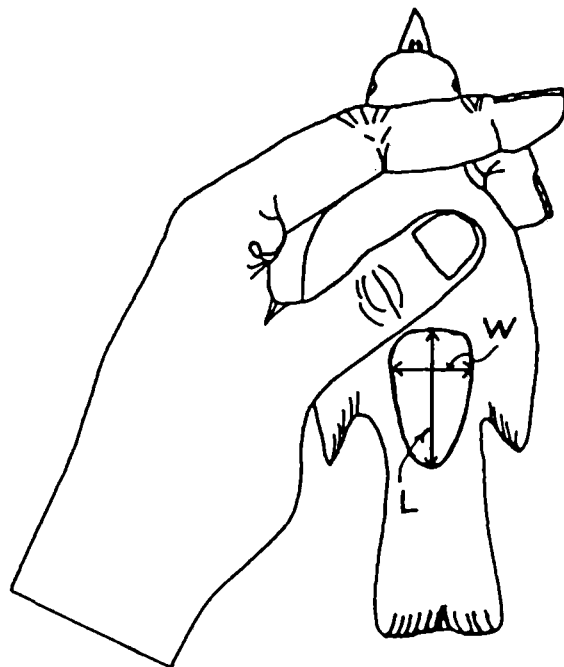
prebasic molt were excluded from the group of known-age AHY birds (P. W. Stangel. 1985. Incomplete first prebasic molt of Massachusetts House Finches. *J. Field Ornithol.* 56:1-8). Birds recaptured more than one year after banding were identified as known AHY or after-second-year (ASY), depending on their month of recapture.

Width, length, and width \times length data on these birds of known age were similarly analyzed by plumage class. The results were compared with those obtained for the two general plumage classes.

Results and Discussion

Between 16 May 1983 and 13 January 1985 I gathered data on 637 newly captured male House Finches and on 143 recaptures of birds banded prior to 16 May 1983. Among new bandings, dull birds (N = 266) had an average rump patch width of 17.7 mm (range, 10-24), length of 23.2 mm (range, 12-24), and W \times L of 411.3 (range, 144-760). Bright birds (N = 371) had an average width of 20.5 mm (range, 14-27), length of 30.6 mm (range, 19-40), and W \times L of 629.0 (range, 378-936).

Figure 1. Method for holding male House Finches for the taking of width (W) and length (L) measurements of the rump patch.



The average widths differed by only 2.8 mm and were sufficiently overlapping that they were not considered useful in separating the two plumage classes. $W \times L$ values were similarly overlapping and not useful. The average lengths differed by 7.4 mm and were examined further to assess their usefulness. Their distribution is shown in Figure 2. I found 97.1 percent of the 137 birds with rump patches up to 23 mm long were dull, while 96.4 percent of the 307 birds with rump patches 29 mm and longer were bright. In the overlap zone of 24 to 28 mm (31.1 percent of the total sample), 64.1 percent were dull.

The percentage distribution of the dull plumage class is compared to rump patch length in Figure 3. Up to 22 mm, all but one of the data points consist of samples that were 100 percent dull birds. From 22 mm through 31 mm, the data points were fitted by linear regression to the equation ($r = 0.9607$): Percentage of Dull Birds = $374.198 - 12.1818$ (Rump Patch Length). The 100-percent and 0-percent intercepts were 22.5 and 30.7 mm, respectively. Beyond 31 mm, all of the data points except one were 0 to 4.5 percent dull birds. The percentages of bright birds may be obtained by subtracting the percentages of dull birds from 100 over the range of 19 to 40 mm.

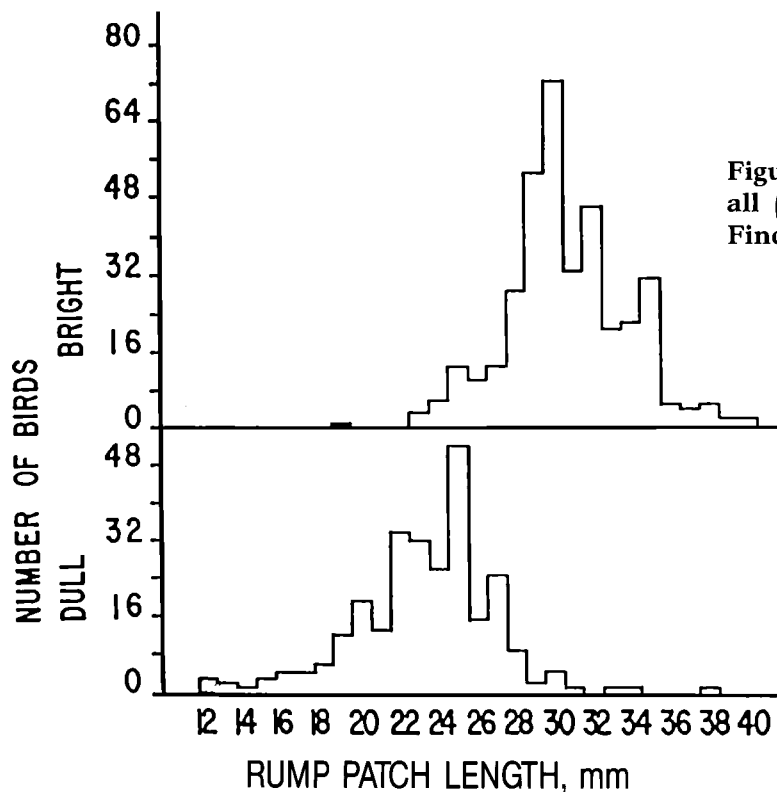


Figure 2. Distribution of the rump patch lengths of all ($N = 266$) and bright ($N = 371$) male House Finches.

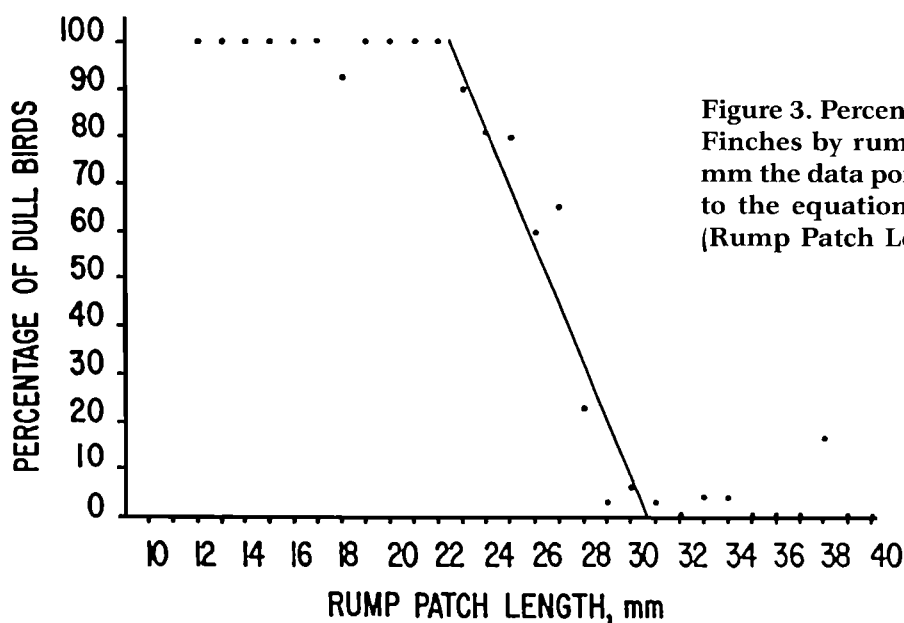


Figure 3. Percentage distribution of dull male House Finches by rump patch length. Between 22 and 31 mm the data points were fitted by regression analysis to the equation: Percentage = $374.198 - 12.1818$ (Rump Patch Length).

The data on length distribution shown in Figures 2 and 3 supported the earlier observation that birds in dull plumage had relatively small rump patches whereas birds in bright plumage had relatively large rump patches. Based on the presumption that duller plumage might be a characteristic of HY/SY birds and that bright plumage might indicate AHY/ASY birds, these results supported the hypothesis that rump patch length might be a useful indicator of age. To test this hypothesis, plumage classification and rump patch lengths on birds of confirmed age were examined and compared. The presumption proved only partly correct owing to an unusual aspect of the molt of this species.

Out of a sample of 117 known AHY/ASY birds, 116 (99.1 percent) were in bright plumage. However, in a sample of 84 known HY/SY birds captured following the completion of their first prebasic molt (but before their second such molt), 52 birds (61.9 percent) were in dull plumage and 32 (38.1 percent) were in a bright plumage essentially indistinguishable from that of bright birds known to be AHY/ASY. The measurements of these known-age birds compared to all of the dull and bright birds are given in Table 1.

Brightness of plumage, however, is not a reliable indicator of the AHY/ASY age group. Uniquely, immature males of the species, at the first prebasic molt, assume either a recognizable dull-red plumage, with attendant smaller rump patch measurements; or the bright-red plumage, and nearly equivalent measurements, of the fully adult male. In the sample studied here, the split of young molting into dull-red or bright-red plumage was 62:38. Therefore, neither the brightness of the red nor the rump patch length of 29 mm or more may be used to recognize adult birds.

Values of W and L for bright, known AHY/ASY birds were slightly greater (1.7 mm for W and 1.2 mm for L) than for bright, known HY/SY birds, while the values for the total bright sample fell in between, reflecting a mixture of the two. This observation, in combination with an examination of the recapture history of certain individuals, suggests that while some HY males achieve the bright plumage and nearly the rump patch dimensions of the fully adult males at their first prebasic molt, there is a further intensification and enlargement at a subsequent molt. The brightest, most intensely colored males of known age were return birds of more than 2 years of age.

Table 1. Rump Patch Measurements of Male House Finches by Plumage and Age Class.

Group	N	Width, mm (range)	Length, mm (range)	W × L (range)
Dull, all	266	17.7 (10-24)	23.2 (12-34)	413.1 (144-760)
Dull, known HY/SY	52	17.5 (14-20)	23.2 (13-30)	407.5 (221-600)
Dull, known AHY/ASY	1	20	21	420
Bright, all	371	20.5 (14-27)	30.6 (19-40)	629.0 (378-936)
Bright, known HY/SY	32	19.7 (17-23)	30.1 (24-38)	591.6 (450-770)
Bright, known AHY/ASY	116	21.3 (17-28)	31.3 (25-40)	667.6 (432-1120)

The measurements of the sample of dull birds very closely match those of known-age HY/SY birds, and at the same time differ substantially from those of bright birds of any age, suggesting that dull males are mostly HY/SY birds. This presumption is supported by the observation that out of a sample of 43 dull bandings and returns of known age, 42 (97.7 percent) were HY/SY, and one (2.3 percent) was AHY/ASY. Based on these data, it appears that dullness of plumage is a reliable indicator that a dull male House Finch is an HY/SY bird. This criterion applied to 41.8 percent (N = 266) of all bandings.

Among 18 individuals banded as bright birds and then recaptured as bright birds following an intervening molt, 9 individuals showed rump patch length increases of 1 to 10 mm (average, 4.3 mm); 2 showed no change; and 7 showed decreases of 1 to 3 mm (average, 1.7 mm). The average increase of L for the entire group was 1.2 mm. Similar examination of a sample of 19 birds first measured in dull plumage, then in bright plumage following an intervening prebasic molt showed changes in rump patch size similar in magnitude to those between the dull and bright samples in general. Every one of these 19 birds increased W and L measurements, with L increased by 1 to 17 mm (average, 7.0 mm).

Summary

Plumage brightness and size of rump patch in male House Finches were examined to determine whether these criteria could be used to determine age of this species in the hand. At rump patch lengths of 23 mm or less, 97.1 percent of the males were in dull plumage, while at 29 mm or more, 96.4 percent were bright. Dullness, regardless of patch length, appeared to be a reliable characteristic for identifying HY/SY birds (97.7 percent of the known-age dull birds were HY/SY) and applied to 41.8 percent of the sample. Rump patch lengths of 24 mm or less were also reliable for identifying HY/SY birds (96.8 percent of known - age sample was HY/SY at these lengths).

Neither brightness nor a rump patch length of 29 mm or more was reliable in identifying AHY/ASY birds, because at the time of the first prebasic molt approximately 38 percent of the HY males in an 84-bird sample of known age molted into bright plumage with rump patch measurements closely matching those of fully adult males. The other 62 percent of HY males molted into dull plumage from which they molted into a brighter plumage at a subsequent molt.

(Eastern)

Additional Recoveries of Banded North American Birds in Europe

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In a previous article in *North American Bird Bander*, "A Summary of Banded North American Birds Encountered In Europe," Vol. 6, No. 3, July-Sept. 1981, pp. 88-96, I reported on 50 recoveries of banded North American birds in Europe. Excluded from this summary were birds banded in Greenland (except for a listing of species banded and numbers recovered) and Brant banded in Canada and recovered in Europe. Members of the light-bellied race of Brant migrate to northern Europe and have furnished numerous sightings of marked birds and recoveries. This is another study altogether; therefore, this species was omitted from treatment in the previous paper.

Here I am reporting eleven recoveries received from the Bird Banding Laboratory since the publication of the first paper. I am again excluding Greenland banded birds and Brant in this paper.

Once again I am indebted to personnel at the Bird Banding Laboratory, Laurel, Maryland, for assistance. Among those who have assisted were M. Kathleen Klimkiewicz, Nancy Mullis, Danny Bystrak, and Nina Haramis. Also, I am indebted to the banders for granting permission to publish their recovery reports, as well as, in some cases, supplying additional information. In the listings below, the term bander does not necessarily indicate the person who applied the band; but in all cases it is the person who held the banding permit. All the birds listed were banded either as nestlings (L) or immature birds of the year (HY).

Northern Gannet (*Morus bassanus*). 638-73693

Banded: Funk Island, Newfoundland, Canada, 19 August 1984.

Recovered: Found dead. Cabo Raso, Portugal, 15 November 1984.

Bander: Memorial Univ. of NFLD, Dr. W. Threlfall.

Blue-winged Teal (*Anas discors*). 845-17304

Banded: Codroy River, Newfoundland, Canada, 11 September 1983.

Recovered: Shot. County Offaly, Ireland, 15 January 1984.

Bander: Atlantic Reg. Sackville, Miss M. Bateman.

Blue-winged Teal (*Anas discors*). 825-86035

Banded: Aroostock Co., Maine, USA, 25 August 1981.

Recovered: Shot. Island of Terceira, Azores, 23 September 1981.

Bander: Me. Dept. Inland Fisheries and Wildlife, G. Matula.

American Wigeon (*Anas americana*). 776-88774

Banded: St. John River, New Brunswick, Canada, 9 August 1982.

Recovered: Shot. Treguennec, Finistere, France, 9 December 1982.

Bander: Atlantic Reg. Sackville, Miss M. Bateman.