

NOTES ON BANDING RECORDS AND PLUMAGES OF THE BLACK-HEADED GROSBEAK

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The purpose of this paper is to present information obtained from the banding of Black-headed Grosbeaks (*Pheucticus melanocephalus*) during a twenty-five year period (1921-1945) at our banding station in Pasadena, California. Grosbeaks breed in this area but migrate southward for the winter so that none is trapped in the winter months. Of 707 individuals banded, 31 returned 41 times. During the first 14 years of this period, 682 were banded of which 29 returned 39 times. After the fourteenth year, we were unable to band with any regularity and in the last seven years, only 25 grosbeaks were banded.

Returns.—The term "return" will here be considered as meaning the first capture in any one summer-resident season of a previously banded bird. To determine what information the records may provide, only those of the first fourteen years of almost constant trapping and banding will be considered. In these records there are 682 birds banded and 39 returns, making a total of 721 captures. Counting each bird once only in each summer-resident season, there is an average of 51.5 such captures per year.

The 682 birds banded can be divided into the following categories: males, 208; females, 206; immatures, 261; no age or sex recorded because of oversight at time of banding, 7. By including the 39 returns, the number of males of probable breeding age is raised to 237 and the number of adult females to 216. This proportion of 237 adult males, 216 adult females, and 261 immatures in the trapped populations for the entire 14-year period does not hold for each of the component years. Beginning with 1925 the proportions for each year are as follows:

Year	Males	Females	Immatures	Year	Males	Females	Immatures
1925	6	11	8	1932	23	31	18
1926	13	15	42	1933	37	24	11
1927	21	12	33	1934	5	10	5
1928	23	14	35	1935	15	16	10
1929	33	19	7	1936	9	15	13
1930	13	14	26	1937	21	16	34
1931	5	8	5	1938	13	11	14

Looking at the year 1926 it is easy to say there were about 14 pairs which raised 3 young each; but in 1929 there were 33 males, 19 females and 7 immatures trapped. It can be concluded that records of almost continuous trapping will not give a good index of the local population of our grosbeaks. We feel such records do give a rough measure of the abundance or scarcity of the species for a given year, but they should not be relied on to show the relative number of males, females and immatures that make up the summer-resident population of a locality. Careful observation of nesting pairs and of the juveniles, as they are reared, should give much more reliable results. Such a project, on a considerable area, was that carried out recently in Strawberry Canyon, Berkeley, California, by Weston (*Condor*, 49, 1947:54-73).

It is of interest to look at the returns by themselves. Including ten returns of birds that had already returned at least once, there were 39 returns from 692 previously trapped birds, or 5.6 per cent. Of these 39 returns, 29 or 74.4 per cent were males, and 10 or 25.6 per cent were females. Of the 237 adult males trapped, 12.2 per cent returned, and of the 216 adult females trapped, 4.6 per cent returned. In these figures for females, there is one banded as an immature that returned the following year as an adult female. This evidence may suggest that there is a greater tendency among males than among

females to return to the precise breeding area of the previous year, or that in the general breeding area the males move about more than the females and thus more previously banded males return to the banding station in subsequent years.

Some banders in the East have used the designations "return-1," "return-2," etc., to indicate the number of times a bird has returned. More recently some of them have used the same designations to indicate the ages of the birds when they return. In the present study, as a trial, three numbers following the word "return," are being used. The first number indicates the number of times the bird has returned; the second number indicates the number of years since the bird was banded; and the third number indicates the minimum possible age of the bird at the time of its return. Thus, "return-1-1-1" means the first return, the first year after banding, and the known age of approximately one year; that is, the bird was banded during its first summer-autumn season. "Return-3-5-6" means the third return for the bird, the fifth year after banding, and that the bird was in at least its sixth year of life. This age figure takes into account the known age of the bird when banded whenever that age was recognized and recorded by the bander, or the minimum possible age for a bird that was an adult or indistinguishable from an adult when banded.

The application of this system of designation to the 29 grosbeaks that returned to our station gives the following concise statement. There were, during the 14-year period, one return-1-1-1 (1 female); fifteen returns-1-1-2 (6 females); one return-1-4-5; four returns-1-2-3 (1 female); three returns-2-2-3; two returns-2-3-4 (1 female); one return-2-4-5; one return-3-3-4; and one return-3-5-6.

The 39 returns of 29 birds can be grouped by months as follows:

18 in April, from the 3rd to the 30th.	1 in June, on the 26th.
16 in May, from the 1st to the 29th.	4 in July, from the 11th to the 31st.

The lower figures in June and July are due to the fact that most returning birds entered the traps earlier and were not thereafter classified as returns for the remainder of that year. In some years more adults entered in June and July than in April and May; but in other years the opposite was true. A single adult could pile up many trap entries in one season.

The length of the grosbeak season, as indicated by our trapping records, is from March 28 to September 30, and both of these extremes were recorded in 1938 only. Over the fourteen years the date of first arrival varied from March 28 to April 25 with an average date of arrival of April 12. These, it should be remembered, are trapping records and the birds should be allowed a little time to look around and find the traps. However, it is true with grosbeaks as with other migrants, that one commonly finds the first individual for a given season in a trap.

Plumages.—Most Black-headed Grosbeaks are easily placed as adult males, adult females, or juveniles. In addition, according to various field books, a juvenal male plumage may be recognized. We found none that described a juvenal female plumage, and we made a good many notes in an effort to find some consistent difference between the juvenal plumages of male and female Black-headed Grosbeaks.

When the young grosbeak leaves the nest, the juvenal plumage has replaced the natal down but is not completely grown. The postjuvenal molt takes place while the birds are in our area, but it is not always completed when they leave. The wing and tail feathers are not all lost at this molt and frequently none is lost.

Most of the young grosbeaks that entered our traps were in the first winter plumage or in the last stages of molt into that plumage. In the first winter plumage, the depth of the cinnamon color, its extent, the brown shade of the flight feathers, the spotting of

rectrices, and the yellow under the wings all showed some variation. There was no evident correlation between the variations. We did tentatively mark the darker birds as males and hoped returns the following spring would help us, but very few returned.

Occasionally we were able to determine the sex of a first winter bird. Usually this was because of presumably accidental loss of certain juvenal feathers which were replaced by feathers of the adult type more or less diagnostic for sex; at other times a partial molt of these feathers made recognition of sex possible. Number 38-235746, a juvenile caught on September 9, 1938, was called a male. It had patterned feathers on one side of the tail. Two outer tail feathers were much darker than the other rectrices and showed a close approach to the distinct pattern of the corresponding feathers of an adult male. The dark area was not as black as in adults, but it was much darker than in juvenal feathers and the white spots had the size and sharp edges resembling those of males and not the occasional spots of females or juveniles. It seemed apparent that these two feathers had been lost by accident and replaced and that they showed the bird to be a male.

We have found young grosbeaks with one primary missing and a new quill in its place. We think some of them do undergo a molt that involves more primaries. Our reason for this belief is based on the plumage characters of some of the Black-headed Grosbeaks returning in the spring. These conditions seem due to partial molt. Others obviously have not molted flight feathers and do not do so until their second autumn. This fact makes it possible to age some of the spring migrants. The possibility of assigning a bird with some certainty to the one-year old group has helped to explain some puzzling plumages.

Black-headed Grosbeaks in the spring for the most part are easily identified as male or female. Yet 38-235761, banded on April 13, 1939, as a female, returned in 1940 definitely in male plumage. This bird, in 1939, lacked the typical head of the male and its flight feathers were like those of the female. It could not have been a juvenile on April 13 and no doubt was in its first prenuptial plumage. For some reason this plumage was not completely adult in type. It merited a note as aberrant.

Another individual, B111955, was banded and called a male on June 14, 1931. This bird we recorded as a "one-year old male." The cinnamon color was very pale; the head was black in part but not typical; two outer tail feathers were very dark, with white spots, but the other rectrices were brown. Although in June it could have been a juvenile, its head color prohibited that classification and the category "one-year old" was almost certainly correct. The pale feathers of the tail were those of the juvenal plumage. The two outer tail feathers that had been replaced were of the adult male type.

Number C-103085, banded on May 12, 1932, was called a male with a note that its head was more like that of a female than a male. On June 27, when it repeated, it was doubtfully described as a male once more. "Probably one year old" is again used. This bird did not return in a subsequent year. These three instances show that problematical plumages occur in the spring, and we are inclined to think that such birds are usually males not yet one year old.

Some males we assign to this age group with no doubt as to sex. We banded a male Black-headed Grosbeak on May 28, 1938, as 37-230051. In this bird secondaries 7, 8, 9 were very dark; the greater coverts were very dark; but the primary coverts and all primaries and secondaries 1-6 were the pale brown color of juvenal or female feathers. The tail was particularly interesting. Beginning at the middle, right rectrices, 1, 3, 4, 5, 6 were pale like the primaries and left rectrix 5 was of the same pale color. Right rectrix 2 and left rectrices 1, 2, 3, 4 were dark, of normal size, and were much less worn than

the pale feathers. They were also strongly marked with "diurnal" bars; they were not, however, quite black. Our studies of feather growth rate (Michener and Michener, Condor, 40, 1938:149-160) would indicate they were several weeks old. Left rectrix 6 was about half grown. It showed the black of the adult male and the typical pure white spot of that feather. Our conclusions were that this bird had not molted any primaries or secondaries 1-6, nor had it molted any retracts. But it had lost retracts by chance at two different times. The first loss was now replaced by the fully grown dark feathers. Later, rectrix 6 on the left had been lost, and the replacement feather at this time was half grown out and of the adult male type. We felt no hesitancy in aging the bird as one year old.

An individual banded on June 17, 1938, was another in partial male plumage with a head much like that of a female. The easily lost tail feathers were again the evidence of its sex. Left retracts 2-6 were pale as were all primaries and secondaries 1-6. But left rectrix 1 and right retracts 1-6 were dark, strongly barred and patterned. These feathers were not quite black, the pattern was not perfect and they were considerably worn. We believed they were lost and replaced while the bird was too young to produce the typical adult feather but that it was correctly called a male and that its age was one year.

Our latest date for trapping a Black-headed Grosbeak, as previously mentioned, is September 30. This bird was a male and was our only example of a molting adult of this species. There were several interesting things about this bird, 38-235754. Its right wing had been broken. It had mended, but a large bony growth or displacement projected at the angle of the wing. This injury may well have been the reason for lateness of the record. The bird was at this date undergoing the postnuptial molt, which was not far advanced. The head showed little evidence of it and, although apparently once black, the feathers now were gray because they were worn to the quills. The body tracts were full of pin feathers. The wing coverts were not alike on the two sides: There were two full-length black primary coverts on the right wing and the greater coverts were mixed in age (2 old, 1 new, 3 old, 2 new and 1 old). Old coverts were very worn and pale in color. On each side, below the two full-length, new primary coverts were two new primaries, 9 and 10. These were black patterned with white, as in adult males. All old primaries were brown. Secondaries 7, 8, 9 were new and black with 8 full-length and 7 and 8 still short. Secondaries 1-6 of the left wing were brown and extremely worn; the same was true of secondaries 1-3 of the right wing. But secondaries 4-6 of the right were blacker and were not worn at all to the same extent. The tail as well as the wings showed feathers of three different ages. Beginning at the middle, rectrix 1 was a new feather, black and not yet fully grown. Right rectrix 1 was old and worn but quite dark. All other tail feathers were present and all were alike; they were so worn that only the quill remained of the distal half of each feather. The width was much reduced by wear. All of these worn feathers were brown. No pattern could remain, if indeed pattern was present originally to the extent it sometimes prevails in juvenal feathers which these were. This bird must have been about fifteen months old.

In the Black-headed Grosbeak, then, the bander can use a designation of age for pre-adult birds more precise than "immature." If juveniles and birds in first-winter plumage are all recorded as immatures, some potentially useful information is buried forever. A scrutiny of returning migrants which have been aged satisfactorily when banded may help to explain plumage sequence and abnormal or unusual plumages.

Pasadena, California, September 6, 1950.