
White Pattern in the White-winged Form of the Dark-eyed Junco

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ABSTRACT

Examination of 1,183 living birds for gray-white patterns of tail feathers and wing-bars in the white-winged subspecies of the Dark-eyed Junco (*Junco hyemalis aikenii*) provides a somewhat more precise description than that derived from earlier judgments based on nonliving specimens. Additionally, comparisons from recaptured banded juncos after one or more annual molts suggest somewhat greater variability in the gray-white patterns, especially for tail feathers.

INTRODUCTION

The white-winged form of the Dark-eyed Junco (*Junco hyemalis aikenii*) formerly held species status and was known as the White-winged Junco. Typical descriptions of the plumage patterns of this form expressed generalizations regarding the amount of white in the outer tail-feathers and the appearance of wing-bars. For example, A. H. Miller (1941) noted "tail with three outer tail feathers largely white, and white usually present in the third retriix." For the wing-bars, Miller remarked that "the amount of white present on the wings is exceedingly variable," with "middle and greater wing coverts usually with some white." R. T. Peterson (1941) claimed the White-winged Junco's "four outer tail feathers on each side are white." N. R. Whitney, Jr. (1968) cited Ridgway's (1901) description, for males "middle and greater wing coverts usually tipped with white, forming two distinct bands; three outermost tail-feathers wholly white, the third sometimes a little dusky, the fourth with more or less white."

Miller's treatise on the genus *Junco* provides extensive commentary on the White-winged Junco. Nevertheless, he evidently gathered his

descriptive data on gray-white patterns in White-winged Juncos from examining museum and university collections. For details about wing-bars, he used 220 specimens. As to the gray-white tail patterns, which are detailed, he does not indicate the number of examined specimens; presumably he used the same 220 specimens.

This report focuses on the patterns revealed by a large sample of living White-winged Juncos.

METHODS

Through the resource of banding, I gathered information about the tail patterns and wing-bars for 1,183 living White-winged Juncos. Even though this junco has a history of some southward winter migration on the east side of the Rocky Mountains, many individuals make only an altitudinal migration from the higher forest to lower elevations of the Black Hills. All banding captures for this study were made at my residence in western Rapid City, SD, in the foothills of the Black Hills (10-min banding block 440-1031). All captures were by a government sparrow trap or a 2-cell trip trap. This banding spanned the years 1964-1988; banding began in October or November and continued until March or April, primarily on weekends and holidays. The first season spanned only 9 Feb - 29 Mar 1964; the second season encompassed 26 Nov 1964 - 21 Mar 1965, and subsequent years followed a similar schedule. No juncos were banded during winters 1967 - 1968, 1974 - 1975, and 1987 - 1988. The last banding for this study occurred on 6 Nov 1988.

At the initial capture, I accumulated details about variations in white patterns of White-winged

Juncos and, through recapture of some birds after one or more annual molts, noted differences from initial patterns.

Despite some evidence in the literature for male/female differences in wing and weight measurements, sex determinations for living birds during winter were not practical. All birds in the sample were recorded as age unknown in the fall months and as after-hatching-year after 1 Jan. Each fall these juncos manifested adult plumage so that any actual hatching-year juncos were not separated readily from other adult individuals. Age determinations by degree of skull ossification was not an option for this study.

Tail score. All measurements represent visual estimates of amount of white. Tail score represents number, or amount, of white on one side's tail feathers (right or left). In all instances the outermost tail feathers, rectrices 6 and 5 on both right and left sides, were white. For tail feathers appearing less than fully white, the proportions of white were ranked by fourths ($\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$). In rare instances for comparisons after an annual molt, a large trace of white, but less than $\frac{1}{4}$, earned a designation of $\frac{1}{8}$; similarly, if the amount of white appeared more than $\frac{1}{4}$ but less than $\frac{1}{2}$, it ranked as $\frac{1}{4}$.

Wing-bars. Visually determined categories for wing-bars ranged from none to bold. Faint wing-bars involved very small, dim white tipping spots. Faint spots usually were not numerous but were sufficient to give the impression of faint lines. Distinct wing-bars manifested somewhat larger and more numerous white spots to make a clear impression of bars. Bold wing-bars always contained numerous, large white tipping spots.

RESULTS

White Outer Tail-Feathers - Table 1 presents the quantities of white outer tail-feathers on the tail's right and left sides in descending order from rectrix 6 for individuals in 10 categories. The majority of birds on their initial capture had 3 - $3\frac{3}{4}$ white tail-feathers on each side. The percentages are rounded at the first digit after the decimal.

Table 1. Distribution of white outer tail feathers for 1,183 White-winged Juncos. Indicated tail score range includes lower limit but does not include upper limit.

Tail Score Range	Number of Individuals	Percent of Sample
2 - 3	102	8.6
3 - $3\frac{1}{4}$	233	19.7
$3\frac{1}{4}$ - $3\frac{1}{2}$	356	30.0
$3\frac{1}{2}$ - $3\frac{3}{4}$	255	21.6
$3\frac{3}{4}$ - 4	126	10.7
4 - $4\frac{1}{4}$	94	7.9
$4\frac{1}{4}$ - $4\frac{1}{2}$	14	1.0
$4\frac{3}{4}$	2	0.2
5	1	0.1

Wing-bars - Table 2 indicates the various impressions of wing-bars on the 1,183 banded White-winged Juncos. While the range of variation is notable, the majority of the sample had distinct or bold wing-bars.

Table 2. Distribution of appearance of wing-bars for 1,183 White-winged Juncos.

Number of wing-bars	Number of Individuals	Percent of Sample
no wing bars	80	6.8
1 faint wing-bar, upper	12	1.0
1 faint wing-bar, lower	5	0.4
2 faint wing-bars	236	19.8
2 wing-bars, 1 faint, 1 distinct	32	2.7
2 distinct wing-bars	415	35.1
2 bold wing-bars	403	34.1

White Outer Tail-Feathers: Recaptured Individuals - The natural practice of altitudinal migration by White-winged Juncos enhanced possible recapture of birds after they had undergone at least one annual molt. Table 3 reveals a fair range of change in the gray-white tail-feather pattern for some individuals after one or more molts. A few birds manifested no change in their white tail-feathers. Others showed only slight or modest increases, and a few of the juncos had rather impressive increases of the amount of white in the innermost gray-white tail-feather.

Some birds returned more than one time after successive molts. In most cases only the last

Table 3. Changes in tail score for White-winged Juncos recaptured after one or more annual molts. Asymmetrical tail scores indicated by L (left) or R (right).

Band Number	Tail Score		Intervening Molts	Change
	Initial Value	Recapture Value		
58-68541	3¾	3¾	1	unchanged
66-72555	R 3½; L 3¼	R 3½; L 3¼	1	unchanged
830-71520	3½	3½	1	unchanged
830-71552	3	3	1	unchanged
830-92495	2¾	2¾	1	unchanged
830-09554	3½	3½	1	unchanged
58-68547	2½	R 3¾; L 3½	1	increase
58-68552	3½	R 3½; L 3¾	1	increase
58-69554	4	4¼	1	increase
31-50105	3¼	R 3¼; L 3½	1	increase
66-72561	3¼	R 3½; L 3¼	1	increase
66-72570	3¾	4¼	1	increase
73-70986	3¼	3½	1	increase
74-64141	R 3⅓; L 3½	4	1	increase
75-20502	R 3⅓; L 3¼	R 3½; L 3¾	1	increase
75-20563	3½	4¼	1	increase
830-71512	3⅓	3¾	1	increase
830-92449	3¼	4	1	increase
870-74747	3¼	3¾	1	increase
860-51855	3¼	3½	1	increase
830-31407	3	3½	1	increase
870-74709	3½	3½	2	unchanged
75-20520	R 3⅓; L 3¾	R 3¾; L 4	2	increase
75-20529	3⅓	3½	2	increase
75-20530	R 3¼; L 3⅓	R 3¾; L 3½	2	increase
75-20532	R 3½; L 4	4	2	increase
830-92472	2½	3	2	increase
66-72547	R 3½; L 3¼	4¼	3	increase
860-51831	3	3¾	3	increase
73-76976	3⅓	3¾	4	increase
73-76957	3¼	3¾	6	increase
940-05606	3	R 3¾; L 3½	7	increase

recapture figured in the comparison. Nonetheless, a few individuals merit additional commentary.

Junco 75-20502, banded 21 Dec 1969, had 3⅓ white tail-feathers on the right side and 3¼ on the left; when recaptured on 20 Dec 1970, the pattern increased to 3½ on right and 3¾ on left; no further change was evident on subsequent recaptures on 7 Dec 1971, 10 Feb 1973 and 13 Jan 1974.

Junco 75-20532, banded 26 Dec 1970, had 3½ white feathers on the right side and 4 on the left. Only a slight increase was evident on 18 Feb 1973 with four white outer feathers on both right and left. This latter pattern was unchanged on 13 Jan 1974.

Junco 940-05606, banded 8 Dec 1981, was recaptured only once, on 9 Dec 1988, after seven annual molts. In 1981, the pattern was three white

outer tail-feathers on each side; in 1988, it had increased to 3¾ on the right and 3½ on the left.

Miller (1941) judged that the White-winged Junco's gray-white tail pattern appeared relatively stable and that the feather germ seemed stable once developed. The patterns for my recaptured White-winged Juncos suggest a range of some variability.

As a matter of curiosity, an additional comment may be appropriate. Two of the banded individuals in this study had an extra rectrix, on one side of the tail. In each instance it was a fully gray innermost tail feather.

Wing-Bars: Recaptured Individuals -Table 4 tallies the changes in wing-bars for some birds recaptured after one or more annual molts. As 66% of them were unchanged, the degree of variation involving wing-bars may be quite modest.

Table 4. Changes in wing-bars of White-winged Juncos recaptured after one or more annual molts.

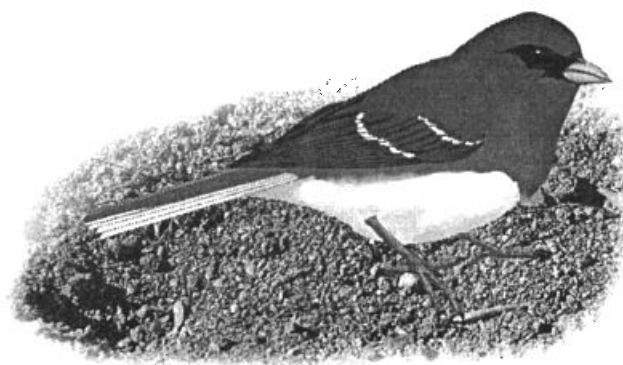
	No. Individuals
Wing-bars unchanged	
faint	4
distinct	5
bold	9
Wing-bars increased	
from none to faint	2
from faint to distinct	4
from distinct to bold	3

DISCUSSION

In comparison with earlier descriptions, results in this report provide a somewhat more precise description of white tail feathers and wing-bars in White-winged Juncos. Evidence from individuals recaptured after one or more annual molts indicates a fairly significant ageing factor. The amount of white never decreased. For wing-bars, the increased degree of white is relatively modest but worthy of note. The increase of white in tail feathers appears more distinctive. The necessary time to establish an adult White-winged Junco's stable pattern of white apparently is at least one annual molt.

LITERATURE CITED

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White-winged Junco
by George West