Ageing Green-tailed Towhees by Eye Color

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ABSTRACT

I determined iris color in 48 Green-tailed Towhees *(Pipilo chlorurus)* to ascertain any age-related differences. I classed eye colors as brown (from gray to brown) or cinnamon (any of variously described warm, orangey-brown colors) and compared those colors to the known ages of the birds that were obtained by skulling. In fall, immature towhees usually had brown irides and adult towhees invariably had cinnamon irides; thus, I suggest here an ageing criterion for Green-tailed Towhees.

INTRODUCTION

Most bird species that have brightly colored irides as adults (e.g., Brown Thrasher *[Toxostoma rufus]* and White-eyed Vireo *[Vireo griseus]* have duller and/or browner irides as immatures [Pyle 1997, pers. obs.]). Eye colors change in some towhees but not in others. Adult Eastern *(Pipilo erythrophthalmus)* and Spotted towhees *(P. maculatus)* acquire bright red eyes as adults. However, the dark brown iris color apparently does not change in Abert's Towhee (R. Tweit pers. com.). Thus, there is no apparent pattern by genus in determining whether eye color changes. It is also of interest to note that results of research by Zink and Dittman (1991) suggest that the Green-tailed Towhee may not belong in *Pipilo.*

Pyle (1997) does not mention an age difference in eye color for Green-tailed Towhee; nor does Rising (1996), despite his description of the adult eye color as "cinnamon." None of the standard illustrated field guides for identification of North American birds (Dickinson 1999, Dobbs et al. 1998, Peterson 1990) mentions anything about eye color, and all depict all age classes of Green-tailed Towhees with dark eyes. Oberholser (1974) reported seasonal variation in eye color of adults but does not mention any age-related variation in eye color. Since the species is difficult to age once skull pneumatization is complete (Pyle 1997, pers. obs.) and since it is important to be able to separate age classes in demographic work, a reliable method of ageing Green-tailed Towhees is of interest. Field work performed by the Colorado Bird Observatory (CBO) from 1988 to 1998 has resulted in data indicating that Green-tailed Towhees experience a change of iris color from a grayish-brown as immatures to a rich cinnamon as adults.

METHODS

I searched the data of the CBO for relevant records obtained prior to 1994 and asked banders at various banding stations operated by the CBO from fall 1994 to fall 1998 to note iris color of Green-tailed Towhees captured, specifically whether irides were warm (with reddish tones) or cold (with no reddish tones). Iris colors reported prior to fall 1994 are potentially suspect, though I used them at face value. Iris colors reported as "brown" from fall 1994 on were intended to indicate a cold color. Towhees were aged by accepted criteria (Pyle 1997), including skull ossification, and eye color was noted on the data form. I did not have any of the color guides in the field, such as that of Smithe (1975 & 1981), so made no effort to standardize color names in the field (see Discussion). I pooled all eye color data from all stations that reported it and compared the reported eye color to the ossification data.

RESULTS

Of all post-fledging Green-tailed Towhees banded by the CBO, 1988-1998 (n=325), eye color was noted on 48 individuals, all but eight banded on fall migration (Table 1). Of these, 17 individuals had eye colors variously described as rust, cinnamon,

burnt orange, or a similar color. The eye color of the remaining 31 individuals, all immatures, was described as various shades of brown or gray with no hint of warm shades.

DISCUSSION

Green-tailed Towhees are readily aged (HY vs AHY) in the fall on the basis of eye color alone. In fact, the eye colors of Green-tailed Towhee approximate those of corresponding age classes of White-throated Sparrow *(Zonotrichia albicollis)*. Upon consultation with Smithe (1975), I believe that the iris color of most immatures in fall is between Fuscous (#21), Olive-Brown (#28), and Hair Brown (#119A), though with more of a gray tone; that of adults between Amber (#36) and Cinnamon-Rufous (#40). In my sample of fall birds, only two of 42 (August-October; 4.8%) would have been misaged by eye color (Table 1). Both were birds with incomplete ossification, but with warm-colored irides, thus all birds with brown irides were correctly aged by eye color, though 14.3% of warm-eyed birds were misaged by eye color.

Table 1. Eye color and other banding data of selected Green-tailed Towhees captured by Colorado Bird Observatory personnel, 1988-1998. Skull codes: 1 = 1-5% ossification; 2 = 6-33% ossification; 3 = 34-50% ossification; 4 = 51-67% ossification; 6 = fully ossified; 8 = skull not checked.

Band Number	Skull Code	Location[1]	Date	Eye Color
AHY birds in spring and summer:				
1501-26910	8	Barr Lake S.P.	7 May 88	red-brown
1501-26938	8	Barr Lake S.P.	16 May 88	red-brown
1531-35621	8	Near Parshall	10 Jul 96	brown
1481-33161	8	Rocky Mountain N.P.	11 Jul 97	burnt orange
AHY birds in fall:				
901-34579	6	Near Boulder	13 Sep 94	burnt ochre
8051-05757	6	Barr Lake S.P.	18 Sep 94	burnt ochre
1511-28212	6	Barr Lake S.P.	23 Sep 95	cinnamon
1531-35453	6	Barr Lake S.P.	22 Sep 95	cinnamon
8061-70585	6	Barr Lake S.P.	24 Sep 98	burnt ochre
8081-65288	6	Barr Lake S.P.	25 Sep 97	reddish-brown
8081-65482	6	Barr Lake S.P.	27 Sep 96	cinnamon
8081-65289	6	Barr Lake S.P.	28 Sep 97	reddish-brown
8081-65290	6	Barr Lake S.P.	28 Sep 97	reddish-brown
8061-70592	6	Barr Lake S.P.	30 Sep 98	orange-brown
8051-05777	6	Barr Lake S.P.	6 Oct 94	burnt ochre
8051-05779	6	Barr Lake S.P.	11 Oct 94	cinnamon

Table 1. cont'd

HY birds:				
8051-01257	1	Near Silverthorne	27 Jul 92	olive-brown
8051-01258	1	Near Silverthorne	31 Jul 92	olive-brown
8071-10376	4	Wildcat Ranch	24 Aug 96	gray-brown
8071-10377	3	Wildcat Ranch	24 Aug 96	gray-brown
8051-05731	2	Barr Lake S.P.	28 Aug 94	brown
1531-35382	2	Barr Lake S.P.	1 Sep 96	brown
8051-05743	2	Barr Lake S.P.	4 Sep 94	brown
1481-33197	2	Barr Lake S.P.	5 Sep 97	brown
8051-05747	2	Barr Lake S.P.	6 Sep 94	brown
1531-35387	2	Barr Lake S.P.	7 Sep 96	brown
1531-35391	1	Barr Lake S.P.	8 Sep 96	brown
8081-65276	2	Barr Lake S.P.	8 Sep 97	brown
1531-35394	2	Barr Lake S.P.	9 Sep 96	brown
8081-65278	2	Barr Lake S.P.	11 Sep 97	brown
8081-65817	2	Barr Lake S.P.	12 Sep 95	brown
8051-05750	2	Barr Lake S.P.	13 Sep 94	brown
901-34580	2	Near Boulder	13 Sep 94	brown
8081-65279	3	Barr Lake S.P.	13 Sep 97	brown
4501-02907	2	Barr Lake S.P.	15 Sep 97	brown
4501-02908	3	Barr Lake S.P.	15 Sep 97	gray-brown
8081-65280	3	Barr Lake S.P.	16 Sep 97	dull brown
1531-35627	2	Barr Lake S.P.	17 Sep 96	brown
1481-33691	2	Barr Lake S.P.	19 Sep 96	brown
1511-28213	1	Barr Lake S.P.	23 Sep 95	brown
1481-33695	2	Barr Lake S.P.	23 Sep 96	brown
8081-65285	2	Barr Lake S.P.	24 Sep 97	brownish gray
8081-65286	2	Barr Lake S.P.	25 Sep 97	brownish gray
8081-65824	1	Barr Lake s.P.	29 Sep 95	cinnamon
8061-70591	2	Barr Lake S.P.	29 Sep 98	brownish
8081-65484	1	Barr Lake S.P.	30 Sep 96	brown
8081-65292	2	Barr Lake S.P.	2 Oct 97	rusty orange
8061-70599	3	Barr Lake S.P.	10 Oct 98	brown

[1]Locations: Barr Lake S.P., Adams Co. (39°55'N, 104°45'W, elevation-5000'; Near Parshall, Grand Co. (40°05'N, 106°10'W), elevation-8100'; Rocky Mountain N.P., Larimer Co. (40°21'N, 105°37'W) elevation-8400'; Near Silverthorne, Summit Co. (39°40'N, 106°55'W), elevation-7500'; Near Boulder, Boulder Co. (39°55'N, 105°15'W), elevation-5700'

The explanation of why a small percentage of immatures in my sample had irides of adult coloration eludes me. The most obvious possibility would be that the birds were aged incorrectly due to skull pneumatization being misjudged. However, both of these birds were banded by highly experienced banders with proven abilities at accurately skulling birds. It has also been suggested that introgression due to hybridization

between Green-tailed and Spotted towhees might account for the anomalous reddish iris color in the two warm-eyed immatures. Despite this hybrid combination being relatively frequent (R. Bunn and S. Craig pers. comm.; Leukering 1999, 2000), it should not explain these individuals, as Spotted Towhees, like Green-tails, have brown, not reddish, irides in their first fall (Pyle 1997, pers. obs.).

As I have no data on the species between mid-October and mid-May, I have no way of determining when the color change is usually completed in Green-tailed Towhees. From experience with Eastern and Spotted towhees though, I would suggest that the change is gradual and variable, with some individuals retaining some vestige of the juvenile eye color well into their second calendar year, as in Eastern and Spotted towhees (Pyle 1997). This is borne out by one breeding adult captured on 10 July having eyes described as brown and one bird with retained juvenile coverts with eyes of the adult color in mid-May (Table 1; #1501-26938).

My data suggest the following key:

1a. Eye color completely cinnamon (Jan - 25 Sep).....AHY

1b. Eye color completely cinnamon (26 Sep - Dec).....U

1c. Eye color at least partially brown. HY/SY

Oberholser (1974) described eye color of adults in Definitive Basic having irides of "raw sienna or rather purplish rufous irises" and those in Definitive Alternate plumage having "cinnamon or dark reddish brown irises." I interpret these iris colors as warm, thus agreeing with my data. However, I have very few data on iris colors on breeding adults, so cannot comment on the subject of change in adult iris color among seasons.

I urge those banders who capture Green-tailed Towhees in late fall and winter to determine iris color in this species and attempt to correlate it with age. Those with the opportunity to recapture individuals within a single winter should be particularly vigilant at determining iris color at each capture so as to obtain data on rate of iris color change and the amount of time needed to complete the change.

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