

Age Determination of Swainson's Thrush using the Distal Marginal Coverts

Blaine H. Carnes

917 Tupelo

Coppell, TX 75019

blainehcarnes@gmail.com

ABSTRACT

The Swainson's Thrush (Catharus ustulatus) undergoes a partial preformative molt resulting in molt limits within the median and greater coverts and alula. As in other Catharus, distinct buff, shaft streaks to the juvenile median and greater coverts may be lacking and can wear off in many birds, sometimes making precise age determination difficult. However, most juveniles have buff streaking to the distal marginal coverts located under the alula, which often can be retained in the preformative molt, making this another useful feather tract to examine when aging this species.

INTRODUCTION

Swainson's Thrush (*Catharus ustulatus*) is a widespread and familiar North American passerine with two distinct subspecies groups. The russet-backed subspecies group has a breeding range along the west coast from Alaska to southern California and winters in Mexico, while the olive-backed subspecies group is found throughout the Boreal Forest and in western mountain ranges and the Appalachians and winters in montane regions of Central and South America (Mack and Yong 2000).

Age determination is important to studies of avian ecology, including behavioral ecology (Greenberg and Gradwohl 1997) and population dynamics (Rushing et al. 2015). As in most passerines, Swainson's Thrushes undergo a partial preformative molt in which they replace the body feathers, some to all median coverts, and usually a number of inner greater coverts, but no remiges or rectrices (Pyle 1997). The juvenile plumage in *Catharus* thrushes is distinct from later plumages in that the feathers of the upperparts have buff-colored tips and shaft streaks, and juvenile median and greater

coverts retained during the preformative molt will often show shaft streaks through the subsequent spring and summer. This tipping and streaking can be lacking or wear off in many birds.

Although experience with the species allows for reliable separation of birds in formative plumage in which there is no buff streaking on the greater coverts from birds in basic plumage, by molt limits in the wing coverts and rectrix shape and condition, these criteria can be subtle or intermediate and many banders have difficulty with accurately micro-ageing formative-plumaged *Catharus* that lack streaking in the coverts. As a result of wear reducing the streaking, the confidence interval for separating formative-plumaged and basic-plumaged individuals drops from 25-95% in the months of October through June to 5-25% in July and August (Pyle 1997). However, the distal marginal coverts, which are located beneath the alula and thus less exposed to elements that cause feather wear, also have buff-streaking in many juvenile Swainson's Thrushes.

Here I describe the proportion of Swainson's Thrushes in the olive-backed subspecies group with buff-streaked distal marginal coverts, at different ages and from a wide geographic area, in order to help refine our ability to age this species. Age terminology follows the plumage categories in Humphrey and Parkes (1959) as modified by Howell et al (2003, 2004) and Howell and Pyle (2015) in order to account for plumage stages crossing over from one calendar year to the next.

METHODS

While working on a variety of banding projects in Peru, Costa Rica, Alberta, Texas, and Maryland

between 2013 and 2017, I took digital photographs of Swainson's Thrush wings whenever bird condition and capture rates allowed for extra handling time. I positioned the alula to expose the distal marginal coverts, took the photo, and, if time allowed would also photograph the tail and the body. Additional photos of the russet-backed subspecies were provided by Vancouver Island University's Buttertubs West banding station.

Each individual bird was carefully examined for active molt, state of feather wear indicating timing and extent of previous molts, and plumage and feather-shape criteria that could relate to age. All photos were cross-referenced with the banding data and sorted by age.

RESULTS

I photographed the wings of 133 Swainson's Thrushes: 38 in juvenile plumage, 63 in formative plumage, and 32 in basic plumage (Table 1).

Among juvenile-plumaged individuals, 25 had buff-streaked distal marginal coverts and five did not (Fig. 1A,B). The five without buff-streaked distal marginal coverts had faint pale tipping to the greater coverts, but no streaking in that tract. Seven with buff-streaked distal marginal coverts had no buff streaking in the greater coverts. Four individuals undergoing their prejuvenile molt had not yet molted their distal marginal coverts while an additional four individuals undergoing this molt

were actively replacing some to all feathers in this tract. Individuals which partially replaced the tract during the preformative molt did so proximal-distally and replaced formative feathers did not have buff streaking.

Although some individuals appear to replace this tract in the preformative molt, in many cases, formative-plumaged individuals without buff streaking to the distal marginal coverts – or in which the buff streaking had worn off – still appeared to have retained their distal marginal coverts, as they were often more worn and loosely textured than those of basic-plumaged birds (Carnes, unpublished data).

Among formative-plumaged individuals, 32 had buff-streaked distal marginal coverts and 31 did not (Fig. 1 C,D). Seventeen of the 32 with buff-streaked distal marginal coverts had no buff streaks remaining in their greater coverts. Among the 31 without streaking in the distal marginal coverts, 17 also had no streaking in the greater coverts.

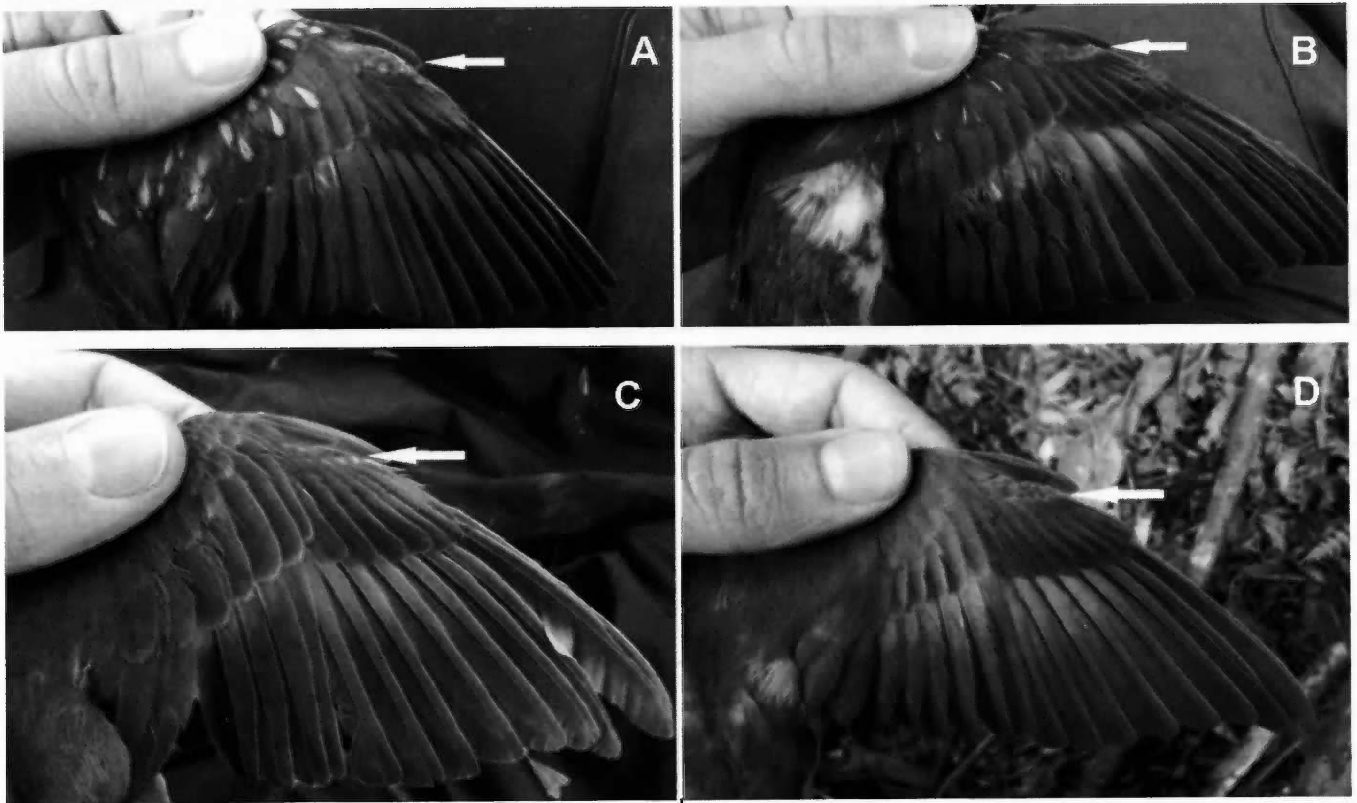
Among basic-plumaged individuals, none of 32 individuals had buff streaking in either the distal marginal coverts or the greater coverts.

Additional photos from Vancouver Island of the russet-backed subspecies group show three basic-plumaged individuals without any buff streaking, five formative-plumaged individuals without buff-streaked distal marginal coverts, and one formative-plumaged individual with buff-streaked distal marginal coverts.

Table 1. Number of individuals with and without buff-streaked distal marginal coverts in juvenile, formative, and basic plumages. DMC = distal marginal coverts; GC = greater coverts.

Plumage Class	With buff-streaked DMC		Without buff-streaked	
	With buff-streaked GC	Without buff-streaked GC	With buff-streaked GC	With no buff streaking in GC
Juvenile	18	7	0	5
Formative	15	17	14	17
Basic	0	0	0	32

Figure 1. Wings of juvenile-plumaged Swainson's Thrushes with (A) and without (B) and of formative-plumaged Swainson's Thrushes with (C) and without (D) buff streaking to the distal marginal coverts. Distal marginal coverts indicated with white arrow.



DISCUSSION

The juvenile distal marginal coverts appear to be retained during the preformative molt in about 50% of Swainson's Thrushes of the olive-backed subspecies group, and examination of this tract in conjunction with other plumage criteria results in a more reliable determination of age. Approximately 50% of formative-plumaged individuals that lacked buff streaks in the greater coverts showed streaks in the distal marginal coverts. It remains to be seen if this variation in molt extent results from variation in hatching age, resource availability, or migration length, as in other taxa (Schondube et al. 2003, Pyle 1998).

Among individuals with a partial replacement of this tract in the preformative molt, the proximal-distal pattern appears to follow the proximal mode, which seems associated with a reduction in molt extent (Guallar et al. 2014). Further study may show if there is connectivity between extent of replacement in the greater and median coverts and if there is any replacement within the distal marginal coverts.

The sample of individuals from the russet-backed subspecies group, while admittedly small in size, may indicate a much different proportion of retained buff-streaked distal marginal coverts than in the olive-backed subspecies group. Other authors have found that distant populations of the same species may differ in extent of molt, especially when they differ greatly in latitude (Mulvihill and Winstead 1997, Grosselet et al. 2014), and the two subspecies groups have markedly different migration patterns.

Other *Catharus* retain buff-streaked distal marginal coverts as well, with evidence of this in Veery (*C. fuscescens*), Gray-cheeked Thrush (*C. minimus*), and Hermit Thrush (*C. guttatus*) (Carnes, unpublished data). Further study is needed to determine the rates of retention in this tract in these species, as well as in the russet-backed subspecies group of Swainson's Thrush, Bicknell's Thrush (*C. bicknelli*), and the non-migratory Neotropical species of the genus.

There appears to be very little in the literature about this somewhat hidden feather tract in any species outside of the swallows (Pyle 1997), and it may be possible that other genera and families similarly can retain their juvenile distal marginal coverts during the preformative molt, which may allow for more precise age determination.

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by George West