Ageing and Sexing Lapland Longspurs

David J. T. Hussell
Wildlife Research and Development Section
Ontario Ministry of Natural Resources
P.O. Box 7000
Peterborough, Ontario K9J 8M5
david.hussell@mnr.gov.on.ca

ABSTRACT

To determine ageing and sexing criteria for Lapland Longspurs *(Calcarius lapponicus),* I studied known-age longspurs during fall migration at Thunder Cape, Ontario, examined museum specimens, and reviewed the literature. In fall and winter, Lapland Longspurs can be aged reliably by the shape of the rectrices, particularly the central pair, which have pointed tips in first winter (Hatch Year/Second Year) birds and rounded tips in older birds. Feather wear may render this criterion increasingly unreliable in late winter, spring, and summer. Primary covert shape and wear were not reliable for ageing. Because the pre-alternate molt is extremely limited, much of the sexually distinctive summer plumage is present throughout the winter, though obscured by feather tips and edgings that subsequently disappear. Therefore, fall and winter Lapland Longspurs can be sexed by the same criteria as in summer, specifically by sexual dimorphism of the plumage of the upper breast, nape, and crown. At Thunder Cape, up to 61% of Lapland Longspurs could be sexed by wing chord measurements, but no overlap between the sexes was apparent in plumage criteria.

INTRODUCTION

The first prebasic molt of Lapland Longspurs involves the body plumage, the lesser- and median-coverts, rarely one or two inner greater coverts, but not the remiges, rectrices, primary coverts or alula (Hussell 1972, Francis et al. 1991, Pyle 1997). Consequently, molt limits in the greater coverts can rarely, if ever, be used to determine age.

According to Svensson (1992), Lapland Longspurs can be aged in autumn by the shape of the tail feathers (Fig. 1a), which are rather narrow and pointed in the young (HY/SY = hatch year/second year) but broad and rounded in older birds (AHY/ASY = after hatch year/after second year). Pyle et al. (1987) showed similar pointed and relatively rounded tips to the tail feathers for those ages (Fig. 1b). However, the newer version of Pyle's guide illustrates only generalized passerine tail shapes for each age (Pyle 1997: Fig. 139B) that are said to apply to Lapland Longspurs (Pyle 1997: 599), but are very different from those illustrated in the earlier guide (Fig. 1c). Comparison of Figure 1c with Figures 1a and 1b shows that Pyle's (1997) HY/SY feather is as rounded as the AHY feathers of Svensson (1992) and Pyle et al. (1987).

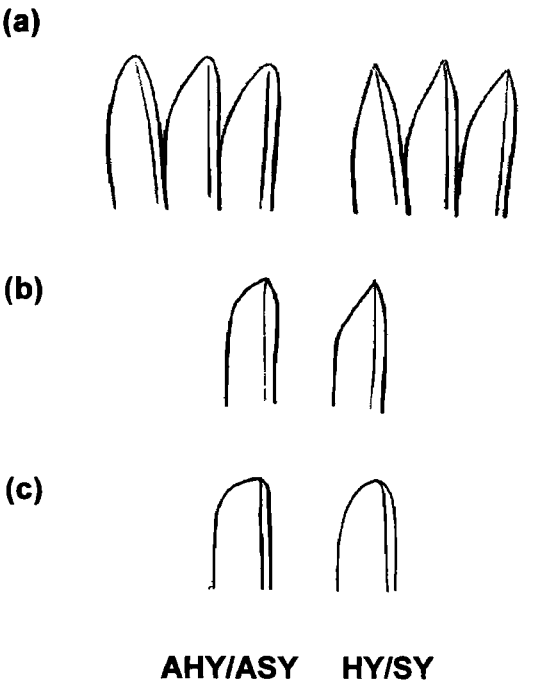

Fig. 1. Shapes of tail feathers of longspurs as depicted in three publications. Left: AHY/ASY; right: HY/SY. (a) 4th-6th tail feathers of Lapland Longspurs copied from Svensson (1992: p.314, flipped to show left side instead of right side). (b) Tail feathers of longspurs, from Pyle et al. (1987: Fig. 182). (c) Generalized shapes of tail feathers of passerines, including Lapland Longspurs, from Pyle (1997: Fig. 139B, reduced and positions reversed for comparison).

Pyle (1997) also says that the outer primary coverts of HY/SY Lapland Longspurs are "narrow, tapered, relatively abraded, and brownish dusky with indistinct, narrow or no buffy-whitish edging," in contrast to those of AHY/ASY birds that are "broad, truncate, relatively fresh, and dusky with relatively distinct and broad, grayish-white edging."

In spring and summer, Lapland Longspurs can be sexed easily by obvious differences in plumage, particularly on the crown, nape, and upper breast. In autumn and winter, the two sexes wear plumages that are superficially similar to each other. In those seasons, sex can be determined by wing measurements (some individuals) or by the pattern of feathers of the crown, which are mainly black, but have longer buff margins in females than in males (Svensson 1992, Pyle et al. 1987, Pyle 1997). Pyle (1997) adds descriptions of nape, upper breast, and primary coverts for each age/sex class. These form an array of apparently rather fine distinctions of plumage characters among the age and sex classes of this species.

While researching and writing the molt and plumage descriptions for the "Lapland Longspur" in *The Birds of North America* (Hussell and Montgomerie 2002), certain relevant facts became apparent. First, the prealternate molts are extremely limited, primarily involving feathers of the ear coverts, chin and lores; and second, the distinctive spring and summer plumages are acquired mainly by wear of the basic plumage (Hussell and Montgomerie 2002). It follows that much of the summer plumage is present in the autumn and winter, albeit obscured by feather edgings that subsequently disappear. Therefore, it should be easy to determine the sex of fall and winter Lapland Longspurs by looking for the distinctive features of the summer plumage beneath the obscuring tips of the feathers that form the outer coat of winter birds.

The purpose of this paper is to provide recommendations for ageing and sexing Lapland Longspurs in fall and winter, based on a review of the literature and on a study of known-age birds at Thunder Cape, Ontario, in Oct 2002 and 2003.

METHODS

I used the information in Hussell and Montgomerie (2002), Pyle et al. (1987), Pyle (1997), and Svennson (1992) as the basis for this study. The plumage descriptions in Hussell and Montgomerie (2002) were compiled by R. Montgomerie from examination of museum specimens, supplemented by data in other publications cited therein

I examined 43 Lapland Longspurs captured in baited traps at Thunder Cape, Ontario (48°18'N, 88°56'W), from 17 to 24 Oct 2002. Skull condition was determined by examination through the skin under strong light using a 5x magnifying glass Birds that had incompletely or completely pneumatized skulls were aged as HY (hatch year, less than one year old) or AHY (after hatch year, more than one year old), respectively. Wing chord was measured to the nearest 1 mm. For nearly all of these birds, the feathers of the crown, nape, and upper breast were described and the shapes of the tips of the tail feathers were recorded as pointed or rounded. For a sample of 34 birds, the shapes of primary coverts 6 and 7 were described in five categories as Pointed, Semi-pointed, Intermediate, Semi-rounded, or Rounded. My "Pointed" and "Rounded" were intended to be equivalent to the "tapered" and "truncate" categories, respectively, described by Pyle (1997), including the differences in color and abrasion (see above). Because I had difficulty assigning all primary coverts to those two categories, I established three intermediate categories (Semi-pointed, Intermediate, and Semi-rounded) to accommodate birds that did not clearly correspond to the first two categories.

An additional 41 Lapland Longspurs were examined at Thunder Cape by personnel of the Thunder Cape Bird Observatory from 22 to 31 Oct 2002 and 12 more by me from 26 to 30 Oct 2003. They were also aged according to skull condition, sexed by the criteria described below, and their wing chords measured.

Photographs of tails were taken by Christian Friis in Oct 2002 and of breast and nape feathers by William Petrie in Oct 2003.

On 13 Mar 2003 in the National Museum of Canada, I examined specimens of Lapland

Longspurs taken on the breeding grounds in summer. I took detailed notes on tail shape of 11 males and 9 females from the Adelaide Peninsula, the McConnell River, Baffin Island, and North Twin Island (in James Bay), all in Nunavut.

RESULTS

Tail feather shape - At Thunder Cape, I examined the tails of 41 Lapland Longspurs that I aged by skull as 16 AHY and 25 HY. I used the plumage criteria described by Hussell and Montgomerie (2002), and elaborated below, to sex these birds as 8 AHY-M, 8 AHY-F, 13 HY-M, and 12 HY-F. AHYs had rounded and HYs had pointed tips to the tail feathers regardless of sex (Figures 2, 3). The distinction between AHYs and HYs was clearest in the central tail feathers and was found to be almost completely consistent. Thirteen HY males and 12 HY females had pointed central tail feathers, while 8 AHY males and 7 AHY females had rounded tips to those feathers. One AHY female had central tail feathers that were judged to be intermediate in shape.

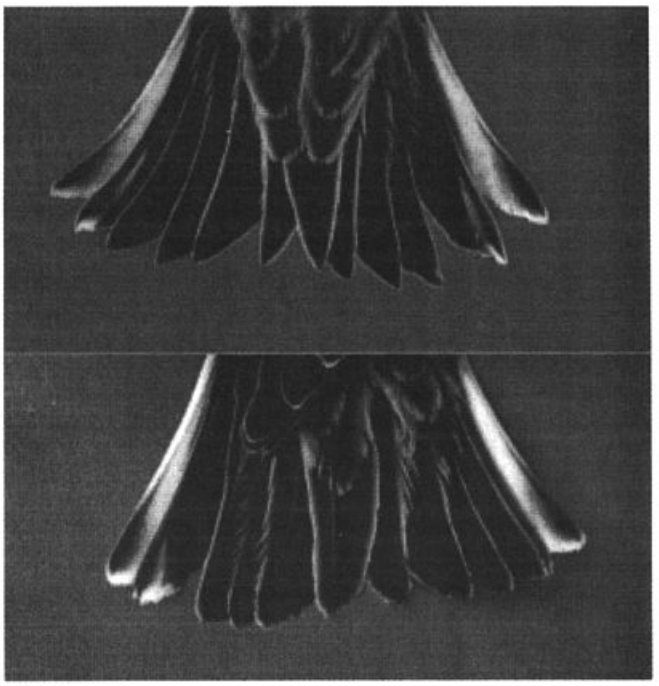

Fig. 2. Tails of HY female (upper) and AHY female (lower) Lapland Longspurs at Thunder Cape, Ontario, 23 Oct 2002. Note the pointed tips of the feathers of the HY and relatively rounded tips of the AHY. (Photos by Christian Friis)

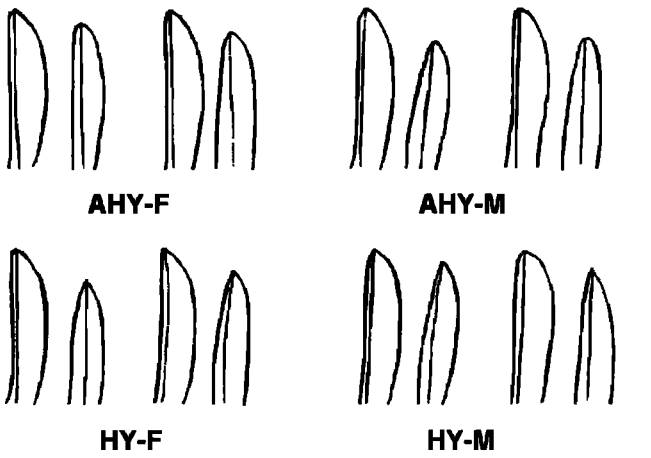

Fig. 3. Shapes of 4th and 1st tail feathers (upper right side) of 4 AHY and 4 HY Lapland Longspurs, traced from birds captured at Thunder Cape, Ontario, October 2002. Tips of these feathers are rounded in AHYs and pointed in HYs, regardless of sex.

Examination of summer (late May and June) specimens of Lapland Longspurs in the National Museum of Canada indicated that wear on the tail feathers makes it much more difficult to age birds accurately as SY or ASY during the breeding season. By summer, wear appears to make the tail feathers of presumed ASYs more pointed and more similar to those of SYs than earlier. Therefore, the two age categories were not as distinct as in the fall. The outer rectrices (4 - 6) appeared to have been less affected by wear and possibly retained their shape better. The tips of the central tail feathers of presumed SYs formed a narrow V, usually 2.5 - 4.5 mm wide at 5 mm from the tip and less than 6 mm wide at 10 mm from the tip. The central tail feathers of presumed ASYs were often sharply pointed at the extreme tip (in contrast to fall) but were otherwise more U-shaped than those of presumed SYs: > 4mm and > 6mm at 5 and 10 mm from the tip, respectively.

Primary covert shape - I recorded the shapes of primary coverts (PCs) 6 and 7 of 34 longspurs that I aged by skull at Thunder Cape. Although there was a tendency for HY birds to have pointed and AHYs to have rounded PCs, there was much overlap (Table 1). Moreover, the differences in shape were not always clear-cut and many birds were difficult to classify and were placed in the three intermediate categories. Because tail feather shape was clearly a superior ageing technique, I did not persist in attempting to classify PC shape of all individuals.

Table 1. Shapes of primary coverts of 34 Lapland Longspurs at Thunder Cape, Ontario, in Oct 2002. (Age and sex determined as described in the text).

	Shape of Primary Coverts 6 and 7				
Age/Sex	Pointed	Semi-pointed	Interme-diate	Semi-rounded	Rounded
AHY/M			1	1	4
AHY/F	1	1		2	3
HY/M	6	3		1	1
HY/F	8	1		1	

Upper breast - The sexual differences noted by Hussell and Montgomerie (2002) were seen at Thunder Cape. Regardless of age, the feathers of the throat and upper breast of birds judged to be males were jet black, obscured with 2-6 mm (usually about 3 mm in October) whitish-buff tips. The edge of the black was sharply defined and ran more or less horizontally across each feather or formed a shallow V with the feather shaft at the apex (Fig. 4), The corresponding feathers of females were grayer (not jet black) at the base and were tipped broadly and edged (usually > 5 mm) with buffy. The gray area formed a deeper V than the black of the males or was confined to a central streak, and the transition to the buffy tips was more diffuse than in males (Fig. 4).

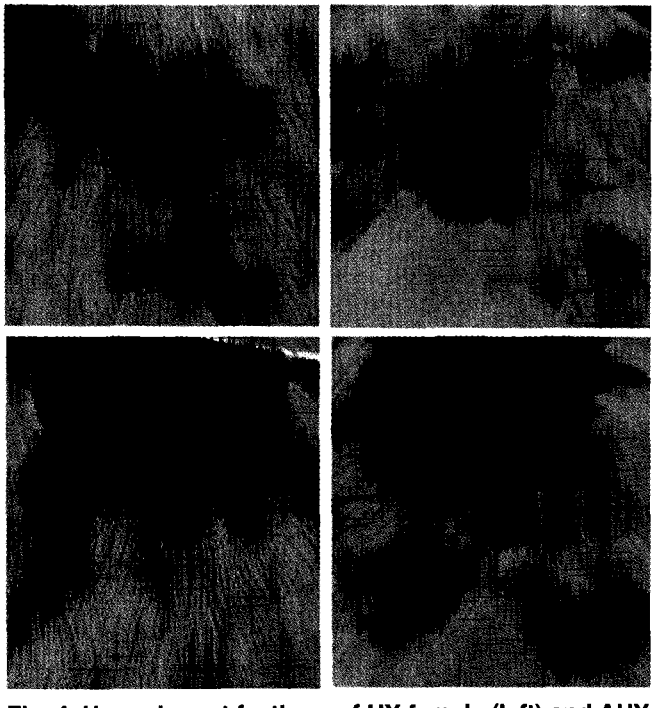

Fig. 4. Upper breast feathers of HY female (left) and AHY male (right) Lapland Longspurs at Thunder Cape, Ontario, October 2003. The upper pictures show the feathers in a natural position; lower pictures with bases of feathers exposed. The patterns of these feathers indicate sex, regardless of age. Photos by William F. Petrie.

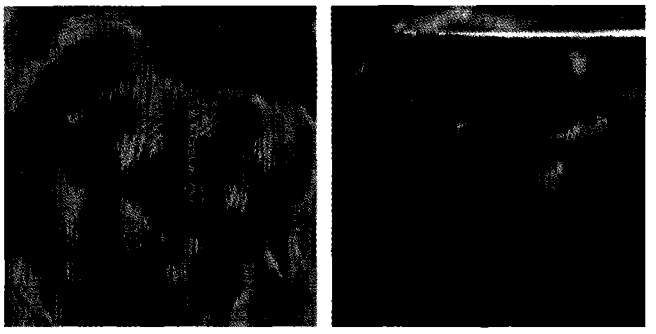

Fig. 5. Nape feathers of AHY female (left) and AHY male (right) Lapland Longspurs at Thunder Cape, Ontario, October 2003. Males have bright rufous nape feathers with short buff tips and few or no small dark central spots. Females have paler rufous feathers with long buff tips and edges, usually with dark streaks along the shafts. Photos by William F. Petrie.

Nape - Observations at Thunder Cape confirmed the descriptions in Hussell and Montgomerie (2002) and Pyle (1997), and added more details as follows (Fig. 5). Males tended to have deeper rufous feathers on the nape with fewer dark central spots than females. AHY males often had quite bright cinnamon-rufous napes with no dark spots on the central feather tips (at least in the center of the nape). The napes of HY males were similar to those of older males in general color, but usually had many indistinct spots or smudges at the tips of the shafts. Females had noticeably paler orange-rufous nape feathers, often tending to a fleshy color. They usually had somewhat buffy tips to those feathers and distinct brownish spots or streaks at the tips and along the shafts of the feathers, the spots and streaks tending to be larger and more distinct in HYs than AHYs. The napes of some HY females were so pale and obscured by spots that, on casual inspection, it was not apparent that they have any rufous tinges at all.

Crown - As illustrated by Pyle (1997, fig. 305) and Svensson (1992, p. 314), the central crown feathers of males are black with smaller buffy tips and edgings than those of females. Those tips wear off to form the black crown of males in summer plumage but are at least partially retained in females. At Thunder Cape, I found that those feathers generally conformed to the foregoing descriptions. Nevertheless, those feathers are small and somewhat variable, and it was often difficult to see the distinctive pattern of individual feathers among the many small feathers on the crown.

Table 2. Wing chords of 96 Lapland Longspurs at Thunder Cape in Oct 2002 and 2003. (Age and sex determined as described in the text.)

	Wing Chord (mm)															
Age/Sex	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**
AHY/M							3			2	3	3	6	1		1
HY/M								1	4	6	6	4	4		1	
AHY/F	1	1	1	3	3	6	5		1	2						
HY/F			3	6	3	2	6	3	2	2			1			

Wing chord - At Thunder Cape in October, Lapland Longspurs with wing chords of 88 mm or less were females and those with wing chords of 93 mm or longer were usually males (Table 2). About 61% of the 96 Lapland Longspurs examined at Thunder Cape could be sexed by wing chord alone with an accuracy of 98% (58 of 59 correct; Table 2).

DISCUSSION

There is little geographic variation in North American populations of Lapland Longspurs. The Alaskan race, *C. l. alascensis,* has slightly paler plumage than eastern and Greenland breeders, *C. l. subcalcaratus,* and there appears to be a weak west-to-east trend to longer wing chords with the largest birds breeding in Greenland (Hussell and Montgomerie 2002). Lapland Longspurs banded in west and southeast Greenland have been found in Manitoba, Iowa, and Minnesota during autumn and spring migrations (Brewer et al. 2000, Lyngs 2003), so it seems likely that birds captured at Thunder Cape in October include Greenland breeders. In any case, Thunder Cape migrants are probably all from the eastern portions of the range of *C. l. subcalcaratus.*

I recommend that fall and winter Lapland Longspurs be aged by comparing the shape of the tail feathers with Figures 2 and 3. HY/SY birds have pointed tips particularly to the central tail feathers; AHY/ASYs have rounded tips to those feathers. If there is any doubt, check the skull, which is probably reliable prior to 15 Nov (Pyle 1997), or call the age Unknown. The shapes of the 4th - 6th tail feathers are correctly shown by Svensson (1992: p. 314), but my experience indicates that the central tail feathers (T1) are even more distinctive. The shapes of longspur tail feathers by age in Pyle et al. (1987: fig. 182) also correspond well with those of fall Lapland Longspurs. However, the generalized shapes of outer rectrices of passerines shown by Pyle (1997: Fig. 139B) are not applicable to Lapland Longspurs, indicating that caution should be exercised in interpreting that figure for other species as well.

It may be possible to age many Lapland Longspurs in spring and summer using the same tail shape criteria as for fall and winter birds, but the shapes of the worn tail feathers differ from those shown in Figures 2 and 3. Worn central tail feathers apparently have pointed tips in both SYs and ASYs, but ASYs may remain more U-shaped, in contrast to a more V-shaped appearance in SYs. Consideration should be given to the shapes of all of the tail feathers and caution is recommended. More information is needed on plumages of known-age (banded) individuals in summer.

Primary covert shape was not reliable for ageing. If Semi-rounded and Rounded coverts are aged AHY and Pointed and Semi-pointed as HY, then the error rate was 5/33 or 15% (Table 1). If age is based only on the Rounded and Pointed categories, the error rate becomes 9% (2/23), with 32% (11/34) of the birds unaged. In my view, these are unacceptable error rates. Primary covert shape should not be used as the sole ageing technique in Lapland Longspurs. In some cases, primary covert shape may be useful to confirm ageing based on tail shape in fall or winter but, based on experience at Thunder Cape, it should rarely be necessary to examine or use this difficult criterion. Again, more information is needed on primary covert shape of known-age individuals in spring and summer before its usefulness for ageing birds in those seasons can be assessed.

Because the summer plumage is acquired mainly by wear of the basic plumage, sex can be determined easily in fall and winter by looking for the distinctive summer plumage beneath the obscuring

tips of the feathers. Sex is determined most easily by examining the pattern of the feathers of the throat and upper breast: jet black, narrowly tipped with buffy white in males, grayer with broader tips and edging in females. These criteria are not emphasized or adequately described in current guides (Svensson 1992, Pyle et al.1987, Pyle 1997). Confirm sex by looking at the nape and crown. The nape is bright rufous in males with no or few dark spots; paler in females and obscured by few to many central dark brownish spots and streaks. Feathers of the crown are black with broader buff edgings in females than in males, as illustrated in all current guides.

At Thunder Cape, about 61% of Lapland Longspurs could be sexed by wing chord alone: females < 89 mm, males > 92 mm. Based on measurements of 100 individuals of each sex, Pyle (1997) indicated a somewhat wider range of overlap between the sexes: females < 88 mm, males > 94 mm. Pyle's measurements are more conservative and are recommended for other populations. At Thunder Cape, those measurements would have sexed 36% of the birds with an accuracy of 97%. Nevertheless, it should rarely be necessary to resort to using wing measurements to determine sex.

ACKNOWLEDGMENTS

Thanks to the staff and volunteers of Thunder Cape Bird Observatory for their assistance with my work at Thunder Cape. Jody Allair and John Woodcock (station managers in 2002 and 2003, respectively) and Christian Friis (volunteer) were particularly helpful. Christian Friis and William Petrie assisted by taking photographs of plumages. Thunder Cape Bird Observatory is a joint project of the Thunder Bay Field Naturalists, Bird Studies Canada, and the Wildlife Assessment Program of the Ontario Ministry of Natural Resources, with core funding provided by the latter organization. Thanks also to Michel Gosselin for access to specimens in the National Museum of Canada and to Martha Caskey for help in examining them. Erica Dunn and William Petrie helped prepare Figures 2, 4 and 5, and Erica Dunn and Nicholas Escott commented on a draft of the manuscript. This paper is a contribution of the Thunder Cape Bird Observatory and is Contribution No. 2003-05 of the Wildlife Research and Development Section, Ontario Ministry of Natural Resources.

LITERATURE CITED

Brewer, D., A. Diamond, E.J. Woodsworth, B.T. Collins, and E.H. Dunn. 2000. Canadian atlas of bird banding. Vol. 1: doves, cuckoos, and hummingbirds through passerines, 1921-1995. Special Publ. Can. Wildl. Serv.

Francis, I.S., A.D. Fox, J.P. McCarthy, and C.R. McKay. 1991. Measurements and moult of the Lapland Bunting *Calcarius lapponicus* in West Greenland. *Ringing & Migr.* 12:28-37

Hussell, D.J.T. 1972. Factors affecting clutch size in arctic passerines. *Ecol. Monogr.* 42:317-364.

Hussell, D.J.T. and R. Montgomerie. 2002. Lapland Longspur *(Calcarius lapponicus). In* The Birds of North America, No. 656 (A.Poole and F. Gill, eds.). The Birds of North America, Philadelphia, PA.

Lyngs, P. 2003. Migration and winter ranges of birds in Greenland. An analysis of ringing recoveries. *Dan. Ornithol. Foren. Tikdsskr* 97:1-167.

Pyle, P. 1997. Identification guide to North American birds. Part 1. Columbidae to Ploceidae. Slate Creek Press, Bolinas, CA.

Pyle, P., S.N.G. Howell, R.P. Yunick, and D.F. DeSante. 1987. Identification guide to North American passerines. Slate Creek Press, Bolinas, CA.

Svensson, L. 1992. Identification guide to European passerines. Fourth revised and enlarged edition. Stockholm, Sweden, and BTO, Tring, England.