



A new insight into the ageing of Common Snipe *Gallinago gallinago* – the value of contrast within the wing coverts of adults

KRZYSZTOF KACZMAREK¹, PIOTR MINIAS^{2*}, RADOSŁAW WŁODARCZYK³,
TOMASZ JANISZEWSKI³ and ANNA KLESZCZ²

¹Medical University of Łódź, Kosciuszki 4, Łódź, Poland ²Students' Ornithological Section, University of Łódź, Banacha 1/3, 90-237 Łódź, Poland ³Department of Teacher Training and Biodiversity Studies, University of Łódź, Banacha 1/3, 90-237 Łódź, Poland

The ageing criteria for Common Snipe *Gallinago gallinago* are complex, and a significant proportion of birds in autumn which have completed moult cannot be aged. Jeziorsko Reservoir is an important stopover site for Common Snipe during autumn migration through central Poland. Detailed studies of wing coverts show that in a proportion of adult birds a contrast or moult limit between old, faded feathers and new ones grown during the moult can be used as an additional criterion to distinguish adults from first-year birds that have completed their post-juvenile moult. In particular, the presence of one or more old humeral coverts allowed a high proportion of birds, otherwise of indeterminate age, to be identified as adults. Since these feathers are normally hidden under the scapulars, careful plumage examination is needed to age birds correctly.

The Common Snipe *Gallinago gallinago* is widely distributed as a breeding wader in Eurasia (Cramp & Simmons 1983) and North America, and as a wintering bird in North Africa (Hayman *et al* 1986). This species is also well recognized as a game bird (Devort 1997, Clausager 2000). Despite intensive research on its biology, the Common Snipe is a species which requires special attention in age identification. Ageing criteria are based on specific colour patterns of lesser and median coverts, scapulars and tertials, shape of outer rectrices and on the presence of ongoing or suspended moult of primary or secondary feathers (Prater *et al* 1977, Chylarecki 1985, CICB & OMPO 2002). The colour patterns on Common Snipe feathers are complex and vary between individuals, leading to difficulties in ageing birds correctly. Moreover, the Common Snipe has a unique moult sequence among Palearctic waders. Post-juvenile and post-breeding moults start in the breeding areas and continue during the autumn migration. Some individuals do not complete moult until they reach their wintering grounds (Cramp & Simmons 1983).

Post-juvenile moult is partial and includes body feathers, lesser and median coverts, tertials and tail feathers, whereas the post-breeding moult is complete and includes all parts of the plumage (Ginn & Melville 1983). After the post-juvenile moult, newly grown feathers have the same patterning and shape as adult ones. Thus, the plumage of the first calendar-year birds after the post-juvenile moult

is indistinguishable from that of adults, unless the bird retains some juvenile wing coverts. In autumn, birds can often be aged correctly only if the post-breeding and post-juvenile moults have not been completed. Therefore, there is great interest in finding new features which would reduce the number of birds of undetermined age. In this paper, we describe the use of moult limits within the humeral coverts of adults as a new way to identify adult birds in the autumn.

METHODS

Study site

The study was conducted at Jeziorsko Reservoir, central Poland (51°40'N 18°40'E). This is one of the most important stopover sites for migrating Common Snipes in central Poland (Janiszewski *et al* 1998). A ringing camp has been organized annually there since 1989 and the number of shorebirds, especially Common Snipes, ringed at Jeziorsko is relatively high in comparison with other ringing stations focusing on wader studies (Mitrus *et al* 1998, Sciborski *et al* 2005, Pinczuk *et al* 2005). Common Snipe were caught in mist nets and walk-in traps, which were moved in relation to changes of water level (Bargiel *et al* 1998, Włodarczyk *et al* 2005). Data were collected from the beginning of July till the end of September, covering the main autumn migration period of Common Snipe in central Poland (Tomiałojc & Stawarczyk 2003).

* Correspondence author
Email: pminias@op.pl

Plumage characteristics

In addition to collecting typical biometric data (structural measurements, weight, fat-load assessment), details of plumage were recorded. These plumage details were focused on features diagnostic for age determination. Three age categories were distinguished: juvenile (first-calendar-year birds), adult (\geq second-calendar-year birds) and undetermined. Within these groups two types of plumage could be observed: juvenile-type plumage and adult-type plumage. Depending on moult stage, first-calendar-year birds can have juvenile-type feathers (before and during post-juvenile moult) and adult-type feathers (after post-juvenile moult is completed). Adults have adult-type feathers before and after post-breeding moult. Birds of undetermined age are either first-calendar-year birds with no retained juvenile wing coverts or adults after completion of moult, both showing adult-type feathers. All the Common Snipes caught were aged using both the 'classical' or standard diagnostic features and plumage characteristics described in this paper. The most basic feature used in identifying birds as adults was the presence of active moult of primaries or secondaries. The other standard criteria (Prater *et al* 1977, Chylarecki 1985) used in ageing are presented in Table 1.

For all birds examined between 1989 and 1997 inclusive, special attention was paid to the moult stage. Each flight-feather (primaries, secondaries, tertials) and rectrix was scored on the five-point BTO scale (Busse 2000). If possible, moult stages of primary, greater and tertial coverts, alula feathers and carpal covert were also scored in the same way. Lesser and median coverts were divided into three categories: old, growing and new, and the percentage in each category was noted. In 1998, moult limits or feather contrasts within the wing coverts were observed in some birds. For the next three years, the description of moult in all ringed birds ($n = 1,404$) was extended to identify contrasts or moult limits representing different generations of feathers, particularly within the lesser, median and

humeral tracts. Feather abrasion creates fading or reduced pigmentation of old generation wing coverts by comparison with new ones: old coverts are a faded brown or even light brown in colour. In contrast, new feathers are a fresh, dark grey. In the case of lesser and median coverts, the proportion of contrasting feathers was recorded as the approximate ratio of the number of old feathers to the total of growing and fully grown new ones. In case of humeral coverts (Figs 1 & 2) the exact number of faded, old feathers was recorded. To reveal all the humeral coverts, the scapulars must be moved inwards and the humeral coverts shifted slightly up and outwards.

RESULTS

Data for moult limits within the wing coverts of Common Snipes ($n = 1,404$) ringed between 1999 and 2001 inclusive revealed that there was no case of contrast between old faded feathers and new ones in first-calendar-year birds. Conversely, a considerable fraction of adults, identified on the basis of the standard criteria (Table 1) and the presence of flight-feather moult, showed this type of contrast (Fig 2). The contrast was also observed in some birds with adult-type plumage which could not otherwise be aged on the basis of standard criteria. Since the extent of depigmentation in the faded feathers at these moult limits would be unlikely in juvenile feathers of first-calendar-year birds, contrast within the wing coverts was adopted from 2002 as an additional criterion for identifying adults. Between 1989 and 2001, inclusive, Common Snipes were aged using the standard diagnostic criteria in combination with the presence of flight-feather moult ($n = 3,651$); these criteria allowed approximately 55% of birds with adult-type plumage to be aged as adults. The application of wing-covert contrast as an additional criterion in 2002 led to a significant increase ($\chi^2 = 20.52$, $P < 0.0001$) in the percentage of birds with adult-type plumage classified as adults (71.4%; $n = 1,578$). In view of the efficiency of wing-

Table 1. Standard features used in ageing of Common Snipe.

Feature	Juvenile-type plumage	Adult-type plumage
Patterning of tertials	Generally pale-tipped with dark subterminal band parallel to the edge of the feather	Generally pale-tipped with subterminal band not parallel to the edge of the feather
Patterning of lesser and median coverts	Subterminal band parallel to the edge of the feather	Subterminal band not parallel to the edge of the feather. Broad, black shaft-streak on the pale tip of the feathers
Patterning of scapulars	Narrowly fringed, less yellowish	More broadly fringed and more yellowish
Shape and size of the outermost rectrices	Short and narrow, without any incision	Longer and wider, with a characteristic incision made by wide inner web narrowing distinctively before the tip

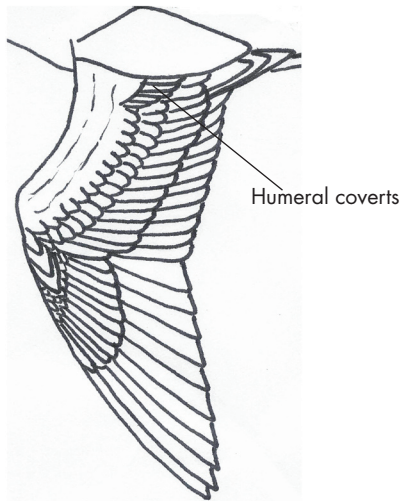


Figure 1. Position of humeral coverts.

covert contrast as an apparent diagnostic characteristic of adults, detailed studies were carried out in 2005.

In 2005, plumage details of 418 individuals were recorded and the progress of moult was noted in 43 of these which were subsequently retrapped during the fieldwork. Of these birds, 307 were aged as juveniles and the remainder ($n = 111$) included 84 adults and 27 of undetermined age. The 111 birds with adult-type plumage fell into two groups: the first (group I) consisted of birds undergoing active moult of primaries and/or secondaries ($n = 27$) or with suspended moult in these flight-feather tracts ($n = 5$). These criteria automatically allowed birds in group I to be classified as adults and this could be confirmed using the standard diagnostic characteristics. Contrast within the humeral coverts was seen in 10 individuals from this group: five birds were at an advanced stage of moult and the other five had suspended moult of remiges.

The second group (group II, $n = 79$) included birds with no signs of flight-feather moult and with complete adult-type plumage. With the application of standard ageing criteria, most would be of undetermined age. However, using wing-covert contrast as an additional criterion, it was possible to age 52 individuals as adults. Contrast in

Table 2. Number of adult Common Snipes (group II: adult-type plumage with no flight-feather moult) with contrast or moult limits within different wing-covert tracts.

Contrast	$n = 52$
Humeral coverts	27
Humeral and lesser coverts	13
Humeral and median coverts	1
Humeral, lesser and median coverts	7
Lesser coverts	3
Lesser and median coverts	1



Figure 2. Contrast in humeral coverts. The three large feathers are conspicuously paler and browner than the adjacent, fresh feathers.

the humeral coverts (Fig 2) was present in 48 birds (61% of this group) and over one third ($n = 27$) of birds from group II were identified as adults based only on this feature. The remainder of the 48 birds with humeral-covert contrast had additional contrasts in lesser coverts ($n = 13$), median coverts ($n = 1$) or in both tracts of feathers ($n = 7$). There were only four birds showing contrast in lesser or median coverts but not in humeral coverts (Table 2). Within group II, 27 birds remained unaged and all criteria (both standard and wing-covert contrast) were useless due to the completion of moult.

Overall, 58 individuals with contrast in the humeral coverts were recorded. The number of faded feathers per wing ranged from one to five (Fig 3); however, four or five faded feathers were observed only in four birds with suspended primary-feather moult. The number of old, faded feathers in the lesser and median coverts was highly variable. In group II (birds with no sign of flight-feather

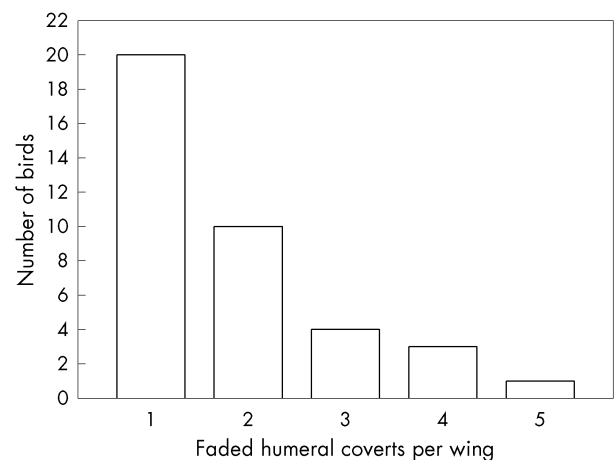


Figure 3. Number of birds (ordinate) with 1, 2, 3, 4, or 5 faded humeral coverts per wing (abscissa).

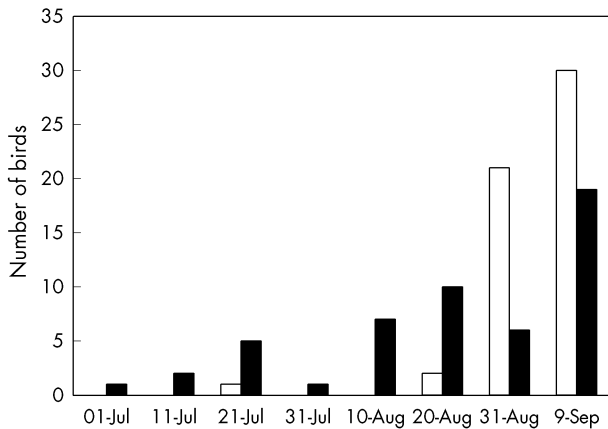


Figure 4. Number of adult snipes with (white) and without (black) humeral-covert contrast in successive ten-day periods of 2005 at Jeziorsko Reservoir.

moult) it ranged from only single feathers to about the half of all coverts.

In 2005, the number of birds caught with completed moult increased considerably in the end of August and this trend was consistent with previous years of fieldwork at the study site. The number of birds with contrasts or moult limits in the humeral coverts increased rapidly during the transition from August to September (Fig 4). Only a single case of such contrast was recorded earlier during the season and that was in a Common Snipe moulting primaries at the end of July.

DISCUSSION

The ageing criteria for Common Snipe are complex and individually variable (Prater *et al* 1977, Strandgaard 1986). Despite good identification skills and the wide experience of ringers, many Common Snipes caught during autumn migration are still impossible to age. This is because individuals which have completed post-juvenile and post-breeding moult are often indistinguishable (Chylarecki 1985). Thus, a considerable proportion of the Common Snipes ringed at this time of year are classified as birds of ‘undetermined age’. The presence of contrast in wing coverts was included as a diagnostic criterion for adults in the OMPO key for ageing (CICB & OMPO 2002). However, in spite of the fact that contrasts and suspended moult in wing coverts have been reported in the literature (OAG Münster 1975, Chylarecki 1985, Devort 1997), their value as ageing feature has not been adequately evaluated. Furthermore, previous authors have not described contrast or moult limits in the humeral coverts, which appears to be the most useful criterion for ageing.

The contrast in humeral coverts appears to be particularly prevalent late in autumn migration, in September. This feature was often present in adults which were not actively moulting and many of these individuals had such contrast only in the humeral coverts with the rest of their plumage being fresh. On the other hand, birds in the initial stage of moult had all humeral coverts of an old generation.

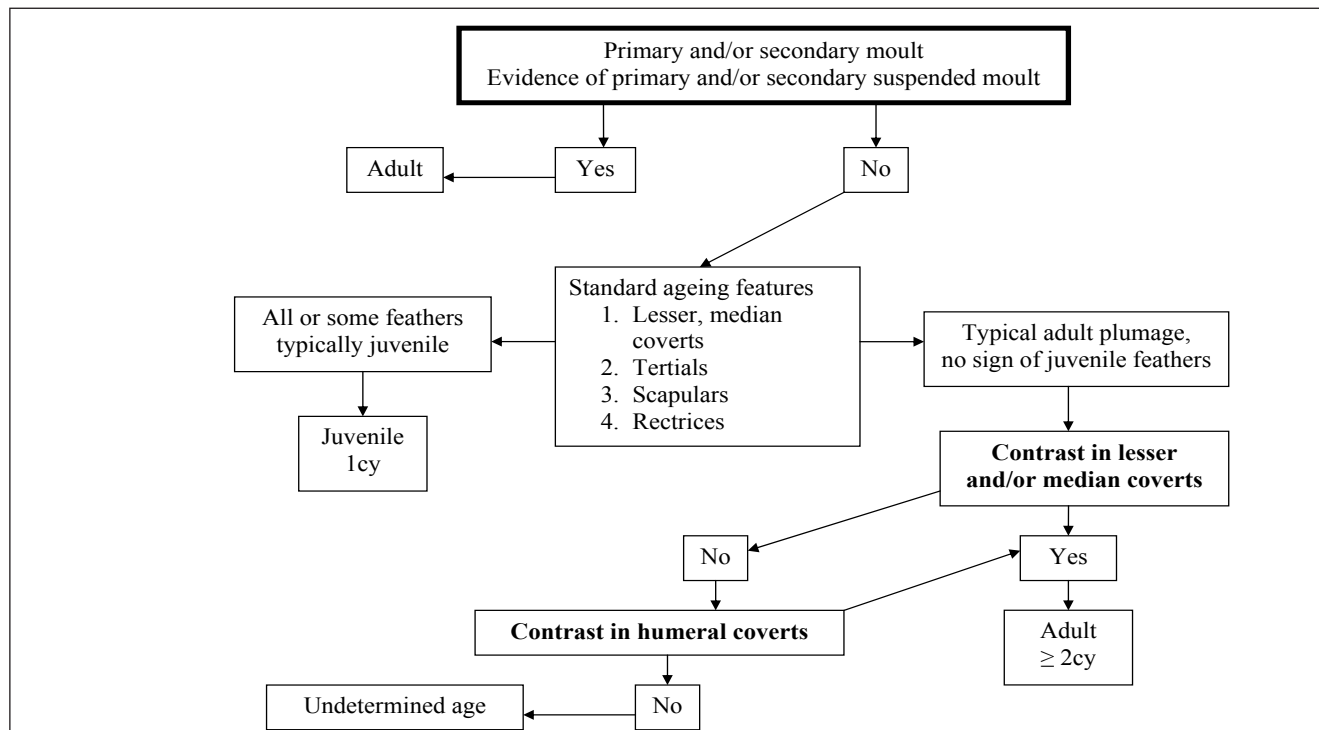


Figure 5. Algorithm for ageing Common Snipe. 1cy, first calendar year; 2cy, second calendar year.

These observations suggest that humeral coverts are moulted relatively late, usually at the end of the primary and secondary moult. It is also possible that humeral covert moult proceeds slowly, or is suspended or arrested. Many adults showed only one old inner humeral covert contrasting with new ones, and it is possible that this feather can be retained and shed during the next moult. If so, potentially this would be a useful criterion for ageing adult Common Snipes more precisely (*ie* separating birds in their second and third calendar years).

Information on wing-covert contrast in the literature (Prater *et al* 1977, Strandgaard 1986) needs to be interpreted with care. Prater *et al* (1977) state that all wing coverts in adults are uniform in winter, in contrast to our data for autumn birds and reports from others (Devort 1997, Rouxel 2000). Thus it is important to be aware that adult plumage condition will vary in relation to moult processes at different times in the post-breeding period. Furthermore, Prater *et al* (1977) indicate that there can be wing-covert contrast in first-calendar-year birds as a result of the retention of juvenile feathers contrasting with new ones of adult type. It is important to distinguish this type of contrast which results mainly from differences in patterning, from the faded or bleached appearance of old-generation adult feathers contrasting with fresh new ones.

Strandgaard (1986) described contrast in underwing coverts in about 20% of adults and suggested that this could be used as an ageing criterion. Careful plumage examination in our study revealed that contrast in underwing coverts of Common Snipes was present only sporadically. The majority of individuals had white underwing coverts with a little patterning, and this makes it difficult to see any areas of faded, depigmented feathers. Moreover, these coverts are often moulted simultaneously (OAG Münster 1975 and own unpublished data). Therefore, we feel that underwing coverts are not an important criterion for ageing.

In summary, to age Common Snipe successfully, the plumage should be carefully examined for colour contrast in the wing coverts, particularly the humeral coverts. To reveal these, the scapulars must be moved inwards and the humeral coverts shifted slightly up and outwards. It is important to identify all the humeral coverts because often only the innermost old feather is retained (52.5% of birds in our study). An algorithm for ageing Common Snipe in the post-breeding period is presented in Fig 5.

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