

## Ageing and Sexing Series

This series summarising current knowledge on ageing and sexing waders is co-ordinated by Włodzimierz Meissner (Avian Ecophysiology Unit, Department of Vertebrate Ecology & Zoology, University of Gdańsk, ul. Wita Stwosza 59, 80-308 Gdańsk, Poland, w.meissner@ug.edu.pl). See *Wader Study Group Bulletin* vol. 113 p. 28 for the Introduction to the series.

### Part 9: Ageing and sexing the Northern Lapwing *Vanellus vanellus*

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The Northern Lapwing *Vanellus vanellus* is a common wader of inland habitats across Eurasia. Birds from eastern and central parts of the breeding range are migratory, but migration distance differs between geographical populations being the longest in north-eastern ones (Imboden 1974). Northern Lapwings from the western and southern parts of the breeding range are sedentary or make only short movements (Glutz von Blotzheim *et al.* 1975). Dispersal from breeding areas begins early, even in late May, with most moving away in June. These summer movements merge progressively into autumn migration, which lasts until November (Glutz von Blotzheim *et al.* 1975). Cold weather winter movements occur frequently, displacing birds towards wintering grounds that are more to the west and south (Cramp & Simmons 1986, Leitão & Peris 2004). No subspecies are recognized (del Hoyo *et al.* 1996), but it is unknown whether there are differences in moult schedule among birds from different parts of the vast breeding range. Thus the ageing and sexing criteria described in this paper, which are based mainly on observations in Poland and Belarus, should be applied to other populations (especially those in the Far East) with caution.

Descriptions in our paper are based on the literature (Cramp & Simmons 1986, Fletcher 1976, Glutz von Blotzheim *et al.* 1975, Prater *et al.* 1977) and the authors' own experience (about 250 birds examined in the hand) and were validated using about 300 photographs available on the Internet.

#### MOULT SCHEDULE

Post-juvenile moult starts as early as mid-July, and involves body feathers, wing coverts, inner secondaries and some tail feathers. Some birds are still in active moult as late as December (Fig. 1). In their first autumn, young birds may replace the majority of their juvenile coverts and those retained usually become indistinguishable due to quick wear. Pre-breeding moult in adult and second-year birds starts in February and is usually finished in March. During this moult, breeding plumage is attained due to the replacement of feathers in the head,

neck and upper breast. Sometimes wing coverts and some inner secondaries are also moulted. In adults, post-breeding moult involves all feathers and lasts from May to October (Fig. 1). After this moult second-year birds are indistinguishable from adults.

#### AGEING

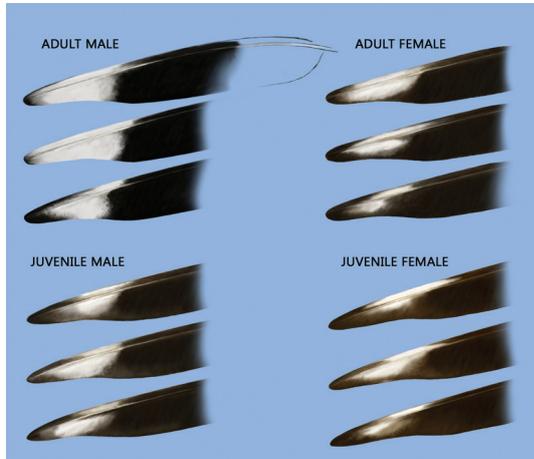
It is widely accepted that it is important to use a combination of different criteria for sexing and ageing Northern Lapwings. In the breeding season, crest-length and general colour seem to be very useful, but the colour pattern and shape of the outermost primaries is also helpful. In the non-breeding period, the shape of the pale patch near the tips of the outer primaries and the shape of the outermost primary seem to be most useful for ageing. However some publications that depict the appearance of the outermost primaries are inconsistent with others in connecting the patterns with a particular sex (see Glutz von Blotzheim *et al.* 1975 and Prater *et al.* 1977 versus Cramp & Simmons 1986, in which some aspects of the illustrations are incorrect).

In adult Northern Lapwings, the tip of the outermost (tenth) primary is broad and has a blunt tip, while in juveniles the first generation of this feather is narrower towards the tip and rounded (Fig. 2). However in some individuals this difference may be difficult to see. According to Klomp (1947), the outermost primary of about 20% of adults had a rounded tip, and the outermost primary of 4% of juvenile males and no juvenile females had a square shaped tip. Therefore the shape of the outermost primary is a useful criterion for ageing but not wholly reliable. Nevertheless the vast majority of individuals with a square-tipped tenth primary will be adults.

In comparison the shape of the pale patch on the outermost primary and the colour of this feather are better characters. Only in adult males is the basal part of this feather black. In adult females and in juvenile males this part of the feather is blackish-brown and in juvenile females it is dark brown (Fig. 2). The dark tip of the outermost primary is smaller in adults than in juveniles. In adult males the border between



**Fig. 1.** Moults schedule of the Northern Lapwing. P = primaries, B&C = body feathers and upper wing coverts. Black = juvenile feathers, grey = winter plumage, white = breeding plumage.



**Fig. 2.** Variability in the pattern on 10th (outermost) primary in Northern Lapwings (drawings by Cezary Wójcik).

black base of this feather and the whitish spot on the inner vane is more or less perpendicular to the shaft, but in females and juveniles it is more like 45° (Fig. 2).

In adult males the white spot on the outermost primary is almost uniformly whitish (white with a greyish-brown tinge), reaching both edges of the feather. Moreover, as the base of the primaries of adult males is darker than in females and juveniles, the overall impression is of a stronger contrast between the white spots and rest of the feathers. The whitish spot on the outermost primary of adult females has a brown (not greyish) tinge and there is a dark edge to the inner vane (which is sometimes lighter towards the middle; Fig. 2). Therefore, in contrast to adult males, in adult females the whitish spot does not usually reach both edges of the feather. In juveniles, the whitish spot is not uniformly coloured, but has a dark band along the inner vane. This band is much wider in juvenile females than in juvenile males and adult females (Fig. 2). Moreover in juvenile females the white patch on the outer vane is longer, extending toward feather base. Thus, distinguishing between adult females and juvenile males may be problematic especially when the primaries are worn and bleached.

The first juvenile primaries are replaced during the first post-breeding moult (Fig. 1). Thus these feathers are retained throughout the first spring and this should help in ageing



**Fig. 3.** Fresh median wing coverts (left) and lesser scapulars (right) of juvenile and adult Northern Lapwings (drawings by Cezary Wójcik).

during the second calendar year. However, due to progressive wear and fading, ageing may not be possible in all cases.

Juveniles have buffish edges to their wing coverts, scapulars and tertials which may be disrupted by darker spots (which common in the case of the scapulars). In adults these feathers only have buff tips (Fig. 3). However, in both juveniles and adults these fringes become abraded quickly, which means that ageing on the basis of this character is only possible for a limited time. Note that wing coverts, scapulars and tertials are only fresh in juveniles during Jun–Aug, whereas they are only fresh in adults in late autumn or early winter.

It is possible to distinguish adults and juveniles by examination of the tail. The adult tail is tipped light buff or white, whereas in juveniles the tail is tipped rusty brown with no white. This difference is especially conspicuous on the inner rectrices. The tips of the tail feathers are narrow and quickly become abraded. Hence this characteristic cannot be safely used after October. There is a record of one bird with a juvenile outer tail feather on one side of the tail only (Fletcher 1976). Therefore both sides of the tail should be checked.

There are several other features of the body and tail feathers of Northern Lapwings that might be of additional help in ageing and sexing (Table 1).

### Juvenile plumage

The mantle, scapulars, tertials and inner wing coverts are dull green tinged brown with buffish edges, which soon wear off. The median coverts are shiny green with broad buff edges.

**Table 1.** Additional criteria for ageing and sexing Northern Lapwings during the breeding season.

Feathers	Adult males	Adult females	Juveniles
Mantle and scapulars	Mantle glossy green, scapulars brownish with green or greenish-purple gloss. Fresh feathers with clear buff tips.	Bright green, strongly tinged olive. Fresh feathers with clear buff tips.	Dull green tinged brown with buffish edges (not just tips).
Lesser wing coverts	Green with deep violet-purple gloss.	Dark green only slightly tinged violet.	Dull brownish-green with very narrow buff edges.
Tail feathers	Black tail band glossed green and white to light buff tips.	Black tail band usually tinged brown without or with only tiny green gloss. Tips white to light buff.	Similar to adult female, but tips rusty brown (quickly bleaching to buff) with no white.

The lesser coverts are dull brown-green narrowly tipped buff. Only in this plumage do the wing coverts, scapulars and tertials have buff edges, not just tips. Moreover these edges are usually disrupted by darker spots, which is especially apparent in the scapulars. The dark pattern on the sides of the head is less extensive and much browner and the streak across the ear coverts and breast shield is narrower than in adults. The crest is very short.

### First non-breeding plumage

Buff edges on the greater wing coverts are lacking or they are very narrow due to abrasion. In fresh plumage, the scapulars and median coverts have broad buff edges. The black breast-shield is narrower than in adults.

### First breeding plumage

Resembles adults of respective sex, but wing coverts may be duller. At this stage juvenile primaries are retained and may be significantly more worn than the primaries of adults. On average, the crest of second-year males is shorter than in adults.

### Adult male in non-breeding plumage

The sides of the head are buffish-white and the forehead and crown is brown-black with a slight green gloss. The mantle feathers are glossy green, tinged brown towards the tips. The scapulars are brown with a green or purple gloss. In fresh plumage, the mantle feathers and wing coverts have buff tips. The breast shield and patches in front of and below the eye and are black. The black sub-terminal band of the tail feathers often has a green gloss. The wing coverts have a green, violet and purple gloss.

### Adult female in non-breeding plumage

In this plumage the female differs from the male as follows: The forehead and crown is browner and less green glossed.

The mantle, scapulars and tertials are less deep green, more strongly tinged olive. The black patch in front of and below the eye and breast shield is browner with feathers more often edged white. The black tail-band is tinged brown and less glossed green. The median wing coverts are only slightly glossed bluish. The lesser wing coverts are dark green and much less tinged violet.

### Adult breeding plumage

The black pattern on the head in males has a deep green gloss, while in females it is intermixed with worn winter feathers. The buffish parts of the face become white. The feathers of the upperparts are abraded and buff edges, if still present, are confined to just a few wing coverts and scapulars. However it should be noted that there is great individual variation in the size and position of the white markings on the head and breast and this makes it possible to recognize individual birds (Byrkjedal *et al.* 1997, Liker & Székely 1999).

### SEXING

Males in breeding plumage usually have a completely black breast and throat and black and white contrasting head pattern with deep black forehead (Fig. 4). However some worn, faded feathers from winter plumage might be retained. Moreover some males might have a white area in the front of the eye, on the throat or on the black area of the breast. In extreme, but rare cases such individuals may resemble females.

In females, the dark feathers on the breast, throat and head are not deep black, but rather black-brown with a variable mixture of whitish feathers (Fig. 4). However some females can be much darker than usual and might be confused with males; but invariably they have a conspicuous mixture of brown feathers on the forehead and crown and whitish feathers at the front of the eye (Fig. 4). Some females might be almost totally whitish in the throat and upper breast, but such individuals are completely different from males and easy to sex. When in doubt, other features should be checked, espe-

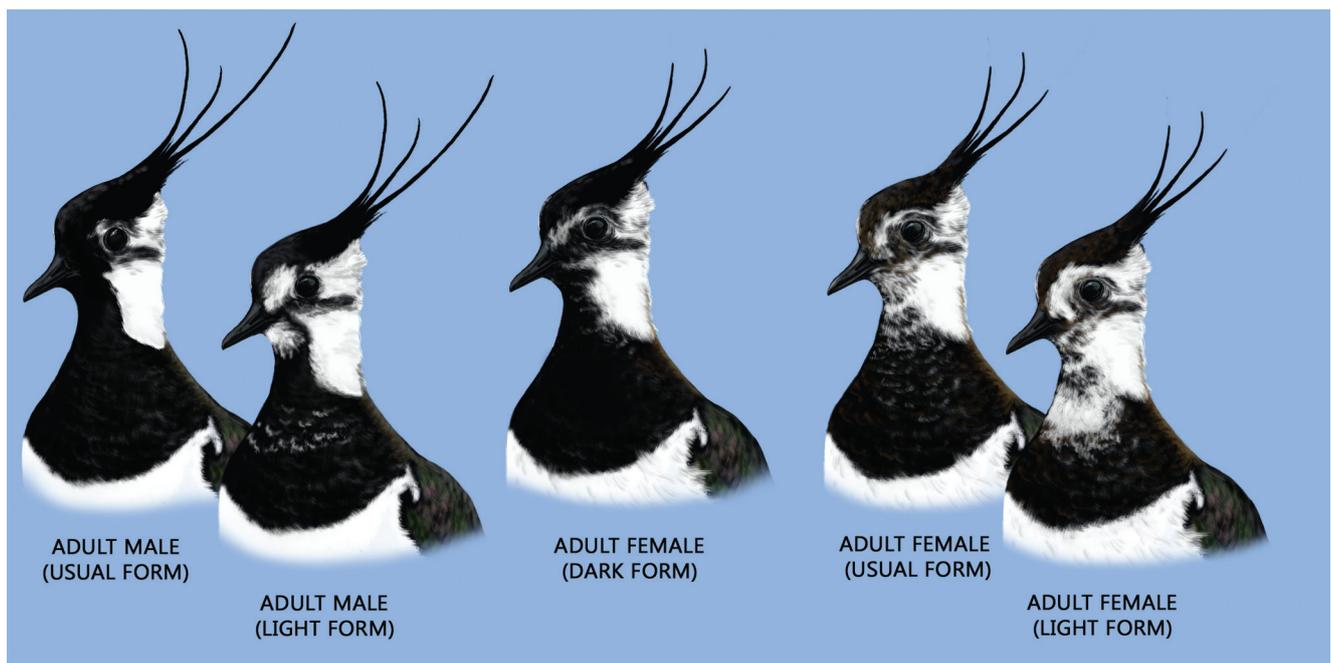


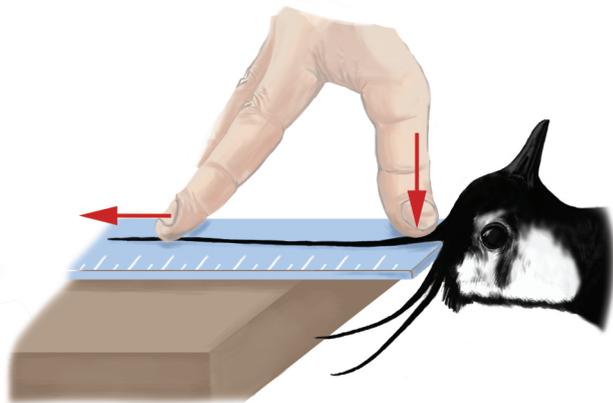
Fig. 4. Variation in the head and breast pattern of adult male and adult female Northern Lapwings (drawing by Cezary Wójcik).



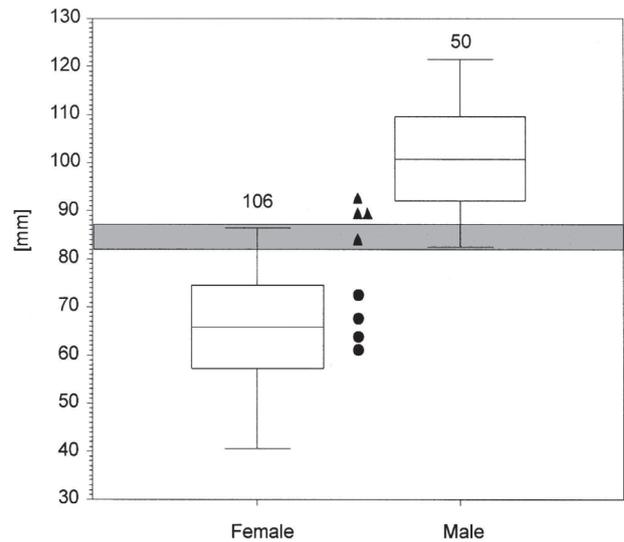
**Fig. 5.** Differences in the wing-shape in Northern Lapwings according to age and sex: that of juvenile males and adult females is similar (drawings by Cezary Wójcik).

cially the length of the crest, and the general colour and shine on the upperparts. The shape of the pale patch on the outermost primary (Fig. 2; see description in ageing section above) and the wing formula (see below) are also helpful in sexing.

Other differences in plumage colouration clearly separate adult males in breeding plumage, but are more problematic when comparing adult females and juveniles (Table 1). Adult males and females also differ in wing shape. In adult males the wing is much more rounded and broader than in females and juveniles with primaries seven and eight (P7 and P8) forming the wing tip (Fig. 5). In females and juveniles the wing tip is usually P9 (occasionally P8) and the wing shape



**Fig. 7.** Recommended method of measuring crest-length in Northern Lapwings (drawing by Cezary Wójcik).



**Fig. 6.** Variation in the crest-length of Northern Lapwings from breeding populations in S Belarus according to sex (data on second-year and older birds are combined; central horizontal line = mean; rectangle = standard deviation; vertical line = range; numbers above = sample size; grey bar shows zone of overlap; values for second year males and females are shown as triangles and circles respectively).

is more pointed than in adult males. In adult males, P6 is usually longer than P10, but in females and juveniles P6 is shorter than P10. With a bird in the hand, adult males and juvenile females can be distinguished by examining the relative position of P10 to the other primaries in the folded wing, but this is not possible in the case of adult females and juvenile males (Table 2). Note that these positions relate to the folded wing and when the wing is spread out (as in Fig. 5) they are different.

Adult males have also a longer crest than females. Data on crest length collected in S Belarus reveal that the overlap in this measurement between breeding males and females is very small (Fig. 6). Birds with a crest length  $>87$  mm may be treated as males and those with a crest  $<82$  mm as females. When using this method, it is crucial to use the same measuring method. In our study we took the maximum length of the longest feather straightened on a ruler inserted at the feather base perpendicularly to the crown (Fig. 7). Other sources (Bub & Kolar-Plicka 1969, Cramp & Simmons 1986, Prater *et al.* 1977) indicate that Northern Lapwings can be sexed on crest length in a similar way, but do not describe the measurement method. In general, crest-length is shorter in second-year birds (Cramp & Simmons 1986, Prater *et al.* 1977), but due to great variability this measurement cannot be used for ageing (see Fig. 6). There is evidence that crest-length increases with age in males, but not in females (Bub

**Table 2.** Position of the 10th primary in relation to the other primaries in the folded wing of Northern Lapwings according to age and sex. Note that when wing is spread the position of primaries will be slightly different (see Fig. 5).

Age/sex class	Most common position	Occasional position
Adult males	10 = 4/5	10 = 3/4 or 10 = 5
Adult females	10 = 6/7	10 = 7
Juvenile males	10 = 6/7	10 = 7
Juvenile females	10 = 8/9	10 = 7/8 or 10 = 7

& Kolar-Plicka 1969), and we have found a similar tendency in birds from S Belarus (Fig. 6). It should be remembered that Northern Lapwings may start breeding in their second calendar year (Thompson et al. 1994); therefore birds caught on the nest may be second year or adult.

Juveniles and immatures can often be sexed according to the shape of the pale patch on the outermost primary, which is retained during their first winter and replaced in the first post-breeding moult (Fig. 1).

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