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Voor taxonomie, volgorde en naamgeving van vogels in Dutch Birding worden de volgende overzichten aangehouden: *Dutch Birding-vogelnamen* door A B van den Berg (2008, Amsterdam; online update 2021, www.dutchavifauna.nl/wpvogelnamen) (taxonomie en wetenschappelijke, Nederlandse en Engelse namen van West-Palearctische vogels); en *IOC world bird list 11.1* door F Gill, D Donsker & P Rasmussen (2021, www.worldbirdnames.org) (taxonomie en wetenschappelijke, Engelse en Nederlandse namen van overige vogels in de wereld; Nederlandse namen door P Vercruijsse en A J van Loon).

Voor (de voorbereiding van) bijzondere publicaties op het gebied van determinatie en/of taxonomie kan het Dutch Birding-fonds aan auteurs een financiële bijdrage leveren (zie Dutch Birding 24: 125, 2001, en www.dutchbirding.nl onder 'Tijdschrift').

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JAARGANG 43 NUMMER 2 2021 *VOLUME 43 NUMBER 2 2021*

Artikelen / papers

85 Ageing and plumage variation in Audouin's Gull *Sylvain Reyt & Jérôme G Prunier*
113 Measurement of relative bill length of Black-tailed Godwits from photographs *Jan Bisschop*
120 Migrating chiffchaff taxa in the Netherlands: a 10-year genetic study *Vincent van der Spek & Peter de Knijff*
132 Stejnegers Roodborsttapuiten op Texel in oktober 2012 en op Vlieland in oktober 2016 en oktober 2017 [STEJNEGER'S STONECHATS ON TEXEL IN OCTOBER 2012 AND ON VLIELAND IN OCTOBER 2016 AND OCTOBER 2017] *Enno B Ebels, Henri Bouwmeester, Lars Buckx, Nils van Duivendijk, Arjan Dwarshuis, Peter de Knijff & Diederik Kok*

141 Pallid Harrier breeding near Dobřichov, Czechia, in 2020 *Jan Studecký*
144 Tufted Puffin on Bjørnøya, Svalbard, in July 2019 and May 2020 *Geir Mobakken*
147 Blue-naped Mousebird and Black Scrub Robin at Tamanrasset, Algeria, in 2018-19 *Karim Haddad & Soufyane Bekkouche*

WP reports

150 February to late March 2021 *Łukasz Ławicki & Arnoud B van den Berg*

Recente meldingen / recent reports

159 Januari-februari 2021 *Hans Groot, Tim Schipper & Koen Stork*

Voorplaat / front cover

Zwarte Arend / Verreaux's Eagle *Aquila verreauxii*, Wadi Al Mughsayl, Dhofar, Oman, 28 februari 2017 *(René Pop/The Sound Approach)*

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Ageing and plumage variation in Audouin's Gull

Sylvain Reyt & Jérôme G Prunier

As a breeder, Audouin's Gull *Larus audouinii* only occurs in the Mediterranean Sea (except for a few pairs in Algarve, Portugal). After breeding, it disperses to its main wintering sites in the south-west of the Mediterranean Sea and along the Atlantic coast from Portugal to Gambia (Olsen & Larsson 2004, Olsen 2018, Burger et al 2020). It has been recorded as a vagrant as far as the Azores, South America, Britain, Scandinavia and the Middle East. The global population is estimated at 33 000-46 000 individuals, including 15 900-21 800 breeding pairs. The species is currently classified as 'Vulnerable' by the IUCN (BirdLife International 2020).

Although knowledge about identification and ageing of large European gulls has considerably improved over the last years, Audouin's Gull surprisingly remains an exception. Identification has been treated in the literature (eg, Grant 1986, King & Shirihai 1996, Olsen & Larsson 2004, Olsen 2018) and does not present any special difficulties, except for some immature individuals, so we will not address this topic here. However, the subject of ageing has been explored in some detail by only few papers (eg, Mackrill 1989, King & Shirihai 1996, Barthel 1997). In standard field guides, such as Svensson et al (2015), some ageing criteria are provided but they may not always be the most useful. Despite the use of specialised guides (Grant 1986, and chiefly Olsen & Larsson 2004 and Olsen 2018), containing more thorough information, we still experienced problems when trying to age some individuals, especially a few subadults, adults and perched immatures. For instance, our experience suggests that third-cycle birds may be remarkably difficult to separate from adults. In addition, several photographs in these publications contain some obvious mistakes regarding ageing, as shown below.

This paper aims to present efficient and simple criteria for the ageing of Audouin's Gull (see table 2). Because ageing mistakes and uncertainties seem to be quite abundant in bird databases, our text and simplified tables provide a practical tool for observers and validators. By defining ageing criteria for adults and immatures, this work could also assist in monitoring breeding colonies and estimating age ratio. We furthermore highlight challenging plumages and describe plumage changes and variations in a detailed way for each age class. Finally, we deal with age-related vocal changes, a poorly studied feature so far; we describe how adult and immature long-calls can be differentiated by acoustic criteria.

Material and methods

Samples

Our study is based on the analysis of photographs of 497 individuals: 475 living birds and 22 museum specimens. Photographs of living birds were from both wintering and summering areas (France, Italy, Spain, Portugal, Morocco and Mauritania). Photographs of specimens were kindly provided by National Museum of Natural History of Paris, France (16); Natural History Museum of Genève, Switzerland (three); Natural History Museum of Berlin, Germany (two); and Natural History Museum of Toulouse, France (one). Because photographs cover all seasons, we were able to assign each individual to an age class as follows: ***1*** first-cycle: 64 birds photographed in July-August of the first calendar-year, 53 from first calendar-year September to second calendar-year March and 33 from second calendar-year April to second calendar-year August; ***2*** second-cycle: 45 from second calendar-year September to third calendar-year March and 45 from third calendar-year April-August; ***3*** third-cycle: 28 from third calendar-year September to fourth calendar-year March and 37 from fourth calendar-year April-August; and ***4*** 192 adults.

Each cycle follows a complete moult (eg, first-cycle follows the pre-juvenile moult, second-cycle follows first complete moult, etc). To also take into account the seasonal variations due to wear, hormonal activity (affecting bill colour and feather colouration), and partial moults, we also distinguished juvenile (first calendar-year July-August), 'winter' (September-March) and 'summer' (April-August) birds.

Our sample contained 48 ringed birds of known age (seven first-cycle, 18 second-cycle, six third-cycle and 17 adult birds). The assignment of un-

TABLE 1 Investigated features for each age class in Audouin's Gull *Larus audouinii*. When feature is season dependent, it is compared between 'summer' and 'winter' (eg, bill colour). When not season dependent, it is compared between cycles (eg, black on tail). GC=greater coverts, P=primary, PC=primary coverts.

	First-cycle Juvenile (1CJ)	First-cycle Winter (1CW)	First-cycle Summer (1CS)	Second-cycle Winter (2CW)	Second-cycle Summer (2CS)	Third-cycle Winter (3CW)	Third-cycle Summer (3CS)	Adult Winter (AW)	Adult Summer (AS)
Pale-tipped bill	X	X	X	X	X	X	X	X	X
Width of bill-band	X	X	X	X	X	X	X	X	X
Bill colour	X	X	X	X	X	X	X	X	X
Dark on head and / or nape	X	X	X	X	X	X	X	X	X
Dark on GC				X		X			
Dark on P1				X		X			
Dark on P2				X		X			
Dark on P3				X		X			
Mirror on P10						X		X	
Grey base on P9						X		X	
Grey base on P8						X		X	
Grey tongue on P8						X		X	
Black on P4						X		X	
Dark on secondaries						X		X	
Black on tail						X		X	
Black on lesser and/or median PC						X		X	
Black on P5: 0, 1 or 2 vanes						X		X	
Width of black marks on greater PC						X		X	
Number of dark-marked greater PC						X		X	
Size of primary tips						X	X	X	X

ringed individuals to each age class was based on literature (Grant 1986, King & Shirihai 1996, Olsen & Larsson 2004, Olsen 2018), our own field experience and discussions with experienced ornithologists familiar with the species (see Acknowledgements). First-cycle birds were separated from older birds by primary pattern, shape of primary tips and presence of unmoulted brownish juvenile feathers. Second-cycle birds were separated from older birds by colour and pattern of the lesser and greater coverts and tertials, colour and shape of primary tips and bill colour. Third-cycle birds were separated from adults by the number of marked greater primary coverts, extent and width of dark marks on the primary coverts, pattern of remiges and rectrices, head pattern and bill colour. A total of 13 individuals (adults or subadults) could not be confidently assigned to an age class because of the characteristics of photographs (eg, inadequate camera angle) or because of the characteristics of birds (eg, unusual combination of features). These individuals were thus excluded from further analysis to avoid any bias in the identification of relevant ageing criteria. The ageing of a few of them is treated in the discussion section.

Data collection

We used the photographs to collect data of features (see table 1). For each image, only features that could be confidently observed were considered. For easier age classes (eg, young immatures such as first-cycle and second-cycle birds), we collected data of fewer features than for trickier age classes (eg, subadults versus adults). We described all features as categorical, and most were binary (presence/absence) except for: ***1*** number of mark-

FIGURE 1 Three classes for dark marks on greater primary coverts (**a-b**, **c-d**, **e-f**) in Audouin's Gull *Larus audouinii (***a-b** *Bob Burgess*; **c** *Claudio Bracho*; **d** *Ole Friis Larsen*; **e** *Xavier Bayer*; **f** *Christopher Gibbins)*. Here, we considered type of marks of most patterned feathers rather than number of marked feathers. Outermost feather was not taken into account because of its great variability and small size, making it difficult to score its pattern. Feathers were not considered marked when pattern was dark grey or shaded, without real black mark. For each class, left and right images represent least and most marked variations, respectively. First two images (**a-b**) are 'unmarked' birds: black marks are missing or grey and extremely narrow and inconspicuous. Next two (**c-d**) are birds in which dark marks have same width as shaft, or slightly larger (in this group, first outermost primary covert tends to be more widely marked). Last two (**e-f**) are birds in which feathers are strongly marked (in this group, some birds have more black, without grey base and inner web but, for lack of photographs of sufficient resolution, they are not illustrated here).

ed greater primary coverts, for which we distinguished five classes (0, 1-2, 3-4, 5-6 and 7-8); ***2*** width of black marks on greater primary coverts, for which we distinguished three classes: absent (or extremely thin and inconspicuous), thin (same width as shaft or slightly broader) or broad (clearly broader than shaft) (see figure 1); ***3*** bill colour which was measured at three different points of illuminated parts of the bill, using Gimp software (version 2.10.14) and classified into three easy-to-identify classes: red, orange and yellow. Colour was considered as red (including dark red) when the colour hexadecimal value was between FF2 and FF0022, orange for values ranging from FFA50 to FF2 and yellow (including yellow-green and greenish) for values ranging from 00F to FFA50; ***4*** width of the black bill-band in two classes: broad or thin (see figure 2); and ***5*** size of white tip on the five outer primaries, for which we distinguished three classes: reduced or absent, medium and large (see figure 3).

FIGURE 2 Width of black bill-band in Audouin's Gull *Larus audouinii* divided into two classes: 'broad' and 'thin' *(Eric Didner)*. This measurement was obtained as follows: ***1*** placing point at end of feathering; ***2*** from this point, drawing line parallel to proximal half of culmen; and ***3*** measuring bill-band where it is crossed by this line. It has been recorded as 'broad' if length of bill-band (b) is larger than one quarter of length from feathering to bill tip (a), and regarded as 'thin' if it is shorter than one quarter or if bill-band is broken.

TABLE 2 Summary of age features of Audouin's Gull *Larus audouinii*. Refer to Methods section and figure 2 for assessment of width of bill-band.

	First-cycle	**Second-cycle**	**Third-cycle**	**Adult**
Primaries	• fully dark and brown-tinged • pointed	• more dark (blackish) primaries than grey primaries • rounded, without white tips (or extremely thin and dull pale tips)	• approximately as many black primaries as grey ones (see text for details) • rounded • white tips on average more reduced than in adults • p10 mirror generally lacking	• approximately as many black primaries as grey ones (see text for details) • rounded • white tips on average larger • p10 mirror (rarely lacking)
Secondaries	• fully dark (edged pale in fresh plumage)	• fully black and clearly edged white	• grey or slightly dark-spotted or with shorter and interrupted wing-bar	• grey
Upperwing-coverts	• grey inner wing contrasting with dark outer wing, greater coverts, secondaries and leading edge	• as in first-cycle but with cleaner and larger grey area • black-centred greater coverts (at least outer ones)	• grey	• grey
Primary coverts	• fully dark (pale-tipped in fresh plumage)	• greater: almost all dark (pale-tipped in fresh plumage)	• greater: broadly black-centred, with as many black feathers as grey ones • lesser and median: spotted	• greater: all grey, or clearly fewer black-marked feathers than grey ones; marks generally fainter • lesser and median: grey (exceptionally dark marked)
Tail	• almost all-dark	• black tail-bar narrower than half the length of tail; outer rectrices sometimes unmarked	• all-white or with shorter and narrower (or even interrupted) tail-bar than previous plumage	• white
Underwing	• typical pattern: whitish inner wing contrasting with dark hand and leading and trailing edge	• uniform and globally white, except for dark trailing edge and some dark spots on lesser coverts, primary coverts and sometimes greater coverts	• unmarked	• unmarked
Bill	• yellow, more or less greenish • large dark tip	• yellowish in winter, yellowish or orange in summer • generally dark tip in winter, and faint pale tip in summer • broad bill-band	• yellowish, orange or red in winter, red in summer • pale tipped • bill-band more often broad than thin	• red and pale tipped • bill-band more often thin (or interrupted) than broad
Head and body	• dirty white and dark marked	• slightly whiter than previous plumage, with sparser dark marks; even sometimes unmarked in summer • body slightly grey-tinged	• often faint and sparse streaks on head in winter; generally unmarked in summer • body grey-tinged	• white head • body unmarked and grey-tinged

FIGURE 3 Three classes for size of primary tips in Audouin's Gull *Larus audouinii*: large (**1**), intermediate (**2-3**) and absent or very reduced spots (**4**). Although size of white spots is extremely dependent on wear, we included this character because it can provide information about age. Subadults may indeed have more reduced and more worn white spots than adults *(***1** *Nick Smith*; **2-4** *Bob Burgess)*.

Alula colour seems to be a useful feature to distinguish adults from subadults (pers obs) but, as the alula is often hidden under flank feathers, we did not include this feature in our analyses.

Methods

Relevant criteria for proper ageing of individuals were inferred from a systematic analysis of collected features. In first- and second-cycle individuals, all birds were considered for analyses. In third-cycle and adult individuals, two classes that are more difficult to distinguish, we only considered features from unringed individuals and used features from ringed individuals for cross-validation (see below). To support our visual investigation of important features allowing a proper differentiation between adults and third-cycle individuals, categorical data generated using this scoring protocol were also processed with a robust supervised machine-learning algorithm (random forest classification procedure; Breiman 2001). The objective was here to help identify informative combinations of features that might have otherwise gone unnoticed from the sole visual inspection of photographs. We designed three random forest classification models in which the response variable was the age class of non-ringed individuals and the predictor variables were a set of preselected features. For each case, we only considered relevant features, ie, features occurring in both age classes and displaying enough variability. Random forest algorithms combine multiple decision trees to obtain averaged predictions based on all the generated trees (the 'forest'). Each decision tree in the forest is built using a bootstrapped sample of original data (ie, a randomly sampled subset with replacement) and a number 'p' of randomly chosen predictor variables for each split of the tree. Here, we considered 5000 classification trees, and a number 'p' of predictors ranging from 1 to 4 for each tree. The value of 'p' was chosen so as to minimise the out-of-bag (OOB) error rate, that is, the number of incorrectly predicted age classes for individuals that were not considered in the bootstrap sample. The OOB error rate can be viewed as an 'internal' cross-validation procedure, and is used to assess the validity of the model: the higher the OOB error rate, the lower the validity of the model. We used the mean decrease in Gini index as a measure of the relative importance of predictors to accurately estimate the response variable across all of the trees from the forest. Each random forest classification model was finally cross-validated by comparing model predictions with actual age classes from ringed individuals. All analyses were performed in R using the package 'Random Forest' (Liaw & Wiener 2002).

Voice

In addition to auditory perception, visual representations of bird voice (sonagrams) can provide critical information for the identification of taxa and sometimes for ageing (Constantine et al 2008, Wroza 2019). We used Raven Lite 2.0.0 to produce sonagrams and compare long-calls of adult and immature birds. Sonagrams were obtained with the software's default visual settings, namely 50.0 brightness, 50.0 contrast, 7.5 floor (dB) and 82.5 ceiling (dB).

Results and description

Audouin's Gulls can be aged precisely until late third-cycle. For each age class, in order to avoid repetitions, description of perched birds is mostly included in the 'summer' sections (April-August),

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127 Audouin's Gull / Audouins Meeuw *Larus audouinii*, juvenile, Pamplona, Navarra, Spain, 9 August 2015 *(Ricardo Rodriguez)*. Like other juvenile large gulls, juvenile Audouin's show dark and scaly overall appearance. This bird has rather fresh coverts, whereas scapulars and mantle have started to wear. Feathers moulted early, such as one inner lesser covert and some mantle-feathers and scapulars, are more greyish and show more reduced or less contrasting pale edge.

128 Audouin's Gull / Audouins Meeuw *Larus audouinii*, first-cycle, Tarifa, Cádiz, Spain, 10 September 2012 *(Dick Forsman)*. Pale edges of juvenile feathers form scaly aspect, with two thin wing-bars on median and greater coverts. Head, neck and maybe rump have started to moult. Greyer and dark-centred feathers on scapulars and mantle are second-generation feathers.

129 Audouin's Gull / Audouins Meeuw *Larus audouinii*, first-cycle, Râs Nouâdhibou, Dakhlet Nouâdhibou, Mauritania, 3 February 2018 *(Eric Didner)*. Whitish area in centre of underwing produces striking effect.

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130 Audouin's Gull / Audouins Meeuw *Larus audouinii*, juvenile, Ebro delta, Catalunya, Spain, July 2007 *(Christopher Gibbins)*. Example of bird in full juvenile plumage. Note pointed primary tips (typical for first-generation feathers) and bill still very dark, barely paler at base. **131** Audouin's Gull / Audouins Meeuw *Larus audouinii*, first-cycle, Spain, 11 October 2012 *(Pepe Greno)*. Well-advanced bird. Note effects of post-juvenile moult: streaked head, grey-white underparts and grey scapulars, inner and median coverts. These strongly patterned scapulars are often seen in 'early moulting' first-cycle birds. Large part of these feathers will be replaced by plain grey ones during moult to second-cycle. Bill is paler, flesh-coloured, and starting to become yellowish. **132** Audouin's Gulls / Audouins Meeuwen *Larus audouinii*, first-cycle, Râs Nouâdhibou, Dakhlet Nouâdhibou, Mauritania, 3 February 2018 *(Eric Didner)*. Birds with different moult stages, the central and right ones being the most advanced. Note grey-spotted tertials of right and left birds, typical of second-generation tertials.

and wing pattern in the 'winter' sections (September-March). Sections dealing with plumage of 'young immatures' (ie, first two cycles) are less extensive than those dealing with the more complex case of subadults versus adults.

Moult

Information on moult can be found in King & Shirihai (1996), Olsen & Larsson (2004) and Olsen (2018). To help understanding plumage changes, we have illustrated the progression of moult in figure 4.

First-cycle

Juveniles: first calendar-year June-July to first calendar-year August (n=64)

As in other large juvenile gulls, Audouin's Gull shows a dark general appearance with fresh and scaly upperparts (plate 130). The head and underparts are slightly paler than the rest and washed brown. The flank is often the darkest part while the rest of the underparts becomes creamy or whitish from belly to undertail-coverts. In flight, juveniles appear dark and uniform, with the exception of

FIGURE 4 Successive moults in Audouin's Gull *Larus audouinii* from birth to adulthood. As in other southern large gulls, partial post-juvenile moult is early and extensive. In addition to some of coverts, scapulars as well as mantle, head and body-feathers, few tertials (and, more rarely, one secondary) can also be replaced before winter. Note that no moult to 'first-summer plumage' is illustrated here, although it sometimes is in standard literature. Our personal observations do not provide evidence of partial moult of head and body-feathers in winter and early spring, as bleaching of head and body could simply be explained by wear (Howell & King 1999, Howell 2001). Note also that a few second-cycle birds (15% of our sample) can replace one or two central rectrices from January-February, before complete moult to third cycle. In third-cycle and adults, it is unclear if earlier replacement of rectrices can also occur. However, it never seems to be the case in first-cycle birds, because rectrices are moulted from May, at same time as (or slightly later than) primaries.

the white (but spotted) uppertail-coverts and pale head. The primaries are pointed and all blackish-brown, thus differing from second-cycle birds (cf plate 127, 130). The underwing reveals a typical pattern, formed by a whitish central area (including the greater and median coverts and base of the axillaries) bordered by the dark flight feathers, lesser coverts and flank. The tail is almost all black (except for the terminal pale edges and the white tongue on the bases of the inner webs) and always shows more extensively dark than in the following cycles. The bill is dark, with a grey-fleshy base and a black distal third (gonys included). The bill-tip is normally dark but may be yellowish from a few days or weeks after fledging. The legs are dark grey, more or less olive-tinged, and do not show significant variation in hue during the following immature plumages.

First calendar-year September to second calendar-year March (n=53)

In late summer and autumn, new feathers appear on coverts, mantle and scapulars, replacing the juvenile ones. They are easily recognisable by the dark grey tinge and, generally, solid black centre (see plate 131). The feathers that are moulted later

133 Audouin's Gull / Audouins Meeuw *Larus audouinii*, first-cycle, Tarragona, Catalunya, Spain, 15 April 2006 *(Ricardo Rodriguez)*. Late moulting bird, with no moulted coverts and with some greater coverts missing. Yellowish bill with all dark tip, brownish wing coverts and pointed primary tips easily rule out an older bird.

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134 Audouin's Gull / Audouins Meeuw *Larus audouinii*, first-cycle, Râs Nouâdhibou, Dakhlet Nouâdhibou, Mauritania, 2 February 2018 *(Eric Didner)*. Back and mid-wing are grey and slighty dark-spotted, whereas old feathers are plain brown. Note also that rump feathers and uppertail-coverts have been replaced. **135** Audouin's Gull / Audouins Meeuw *Larus audouinii*, moulting to second-cycle, Espoo, Uusimaa, Finland, 24 June 2007 *(Matti Koivula)*. Due to their brown tinge, remaining juvenile feathers (secondaries, outer primaries, outer primary coverts, one outer greater covert, some lesser coverts and probably one tertial) are readily located on this well-advanced vagrant bird. **136** Audouin's Gull / Audouins Meeuw *Larus audouinii*, moulting to second-cycle, Espoo, Uusimaa, Finland, 24 June 2007 *(Matti Koivula)*. Same bird as in plate 135. Almost complete replacement of coverts gives appearance closer to second-cycle than first-cycle. Bicoloured (grey and black) tertials diagnostic of second-generation feathers. This bird differs from third calendar-year by its fresh plumage, yellow-green bill and strongly patterned head. Juvenile primary can also be noted on right wing. **137** Audouin's Gull / Audouins Meeuw *Larus audouinii*, second-cycle, Almeria, Andalucía, Spain, 2 January 2014 *(Nick Ransdale)*. Typical pattern of second-generation tail. Some third-cycle individuals can present clear tail-band but, in this case, band is narrower and discontinuous.

(from winter) are clearly paler (and close to the grey tinge of adults) and often plain. The new 'saddle' and upperwing-coverts form a pale area, strongly contrasting with the worn remiges and rectrices (plate 132). This contrast is reinforced by the more faded and plainer aspect of any remaining juvenile feathers on the upperparts (the pale edges of which may become strongly reduced as early as August). The rump and uppertail-coverts become pale grey and white, respectively, during early winter (plate 134). Effects of moult and wear considerably brighten the body and head: there are usually dark streaks only around the eye (mask effect), on the crown, nape (forming a shawl reminiscent of immature Caspian Gull *L cachinnans*) and breast. From autumn, the bill colour progressively changes from flesh to dull yellow or yellow-green but never orange or red.

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138 Audouin's Gull / Audouins Meeuw *Larus audouinii*, second-cycle, Tarifa, Andalucía, Spain, 10 October 2006 *(Jukka J Nurmi)*. Bird with poorly patterned inner primaries that can recall older bird if other criteria are not checked. In third-cycle, black is less extensive, rare on p3 and normally boot-shaped on central primaries. **139** Audouin's Gull / Audouins Meeuw *Larus audouinii*, second-cycle, Malaga, Andalucía, Spain, 7 October 2013 *(Nick Ransdale)*. Some fresh second-cycle birds show distinct white tips on primaries, thus being reminiscent of third-cycle. However, ageing remains straightforward, if based on other criteria (bill colour, head, coverts and tail pattern). **140** Audouin's Gull / Audouins Meeuw *Larus audouinii*, second-cycle, Tamri, Haha, Morocco, 30 March 2017 *(Bart Moons)*. Underwing pattern is significantly different from first-cycle and third-cycle birds. Dark bars on secondaries and lesser coverts are vaguely reminiscent of previous age classes but general appearance is primarily white. **141** Audouin's Gull / Audouins Meeuw *Larus audouinii*, second-cycle, Colónia de Sant Jordi, Mallorca, Balearic Islands, Spain, 8 April 2015 *(Morten Scheller Jensen)*. Example of pattern of underparts in second-cycle bird. This one is whiter than bird in plate 140: inner coverts almost unmarked and dark carpal crescent is lacking.

Second calendar-year April to second calendar-year August (n=33)

In spring, the head and body become whiter through wear (plate 133). Some dark streaks of varying extent remain around the eye, chest, flank and nape (forming a shawl). The back is pale grey with black spots mostly visible on the proximal mantle feathers and scapulars, and with black streaks on the coverts, the lesser coverts being the most marked. In flight, the pale area in the centre of the upperwing is increased due to the presence of newly moulted coverts (mostly lesser and median), and contrasts with the brown juvenile flight feathers. The bill base has turned yellow, with a more or less greenish tinge (rarely still flesh). It is useful to note that the bill was never red or orange in birds of this age class in our sample (n=32), unlike older birds. When observing a perched bird, it is best to focus on the black-stained upperparts, remaining juvenile primaries (brownish and point-

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142 Audouin's Gull / Audouins Meeuw *Larus audouinii*, second-cycle, Tarragona, Catalunya, Spain, 31 May 2013 *(Fran Trabalon)*. Moult to third-cycle has started: p1-2 missing and inner lesser coverts have been replaced. Brownish tinge of primaries is reminiscent of first-generation feathers but rounded tips and grey colour of inner ones definitely indicate second-generation feathers. Spotted lesser coverts, red bill and solid black band on secondaries confirm age as second-cycle. **143** Audouin's Gull / Audouins Meeuw *Larus audouinii*, second-cycle, Canet-en-Roussillon, Pyrénées-Orientales, France, 21 April 2018 *(Jessica Joachim)*. Bill changes from winter colour (yellow) to summer colour (orange or red, with a pale tip). As illustrated here, some birds can show one white central rectrix. **144** Audouin's Gull / Audouins Meeuw *Larus audouinii*, second-cycle, Canet-en-Roussillon, Pyrénées-Orientales, France, 21 April 2018 *(Jessica Joachim)*. Strongly patterned bird (same individual as in plate 143), with dark spots on lesser and median coverts, dark centre of greater coverts reaching onto inner feathers and black of primaries extending inwards to p1. One central rectrix has probably been replaced. **145** Audouin's Gull / Audouins Meeuw *Larus audouinii*, second-cycle, Ebro delta, Catalunya, Spain, April, unknown year *(Christopher Gibbins)*. Typical second-cycle individual with worn greater coverts revealing black secondaries, second-generation primaries (rounded tips and no white), spotted lesser coverts and red bill with broad bill-band (almost reaching bill tip).

ed), bill colour and the presence of heavily worn and faded juvenile wing-coverts.

Second-cycle

Second calendar-year September to third calendar-year March (n=45)

In the second cycle (in fact, as soon as July-August of the second calendar-year), the mantle feathers, scapulars and coverts are fresh and all second generation. As in first-cycle, the upperparts are marked dark but the spots are far less numerous and only distributed on the upper mantle (rarely on the scapulars), lesser coverts, alula and outer median coverts. The outer greater coverts always show a dark centre (see figure 5). This feature,

usually well apparent on a flying bird, is very useful to rule out older birds (third-cycle birds never show black marks on greater coverts).

The general pattern of the primaries forms a large dark area, with very few grey inner primaries (unlike in first-cycle birds). The 'remiges/lesser coverts/primary coverts' group contrasts sharply with the inner and central grey part of the wing.

The primaries are now completely renewed (last primaries moulted in September-October). The pattern of primaries shows significant variation but it is important to note that it always differs from other age classes (figure 5). P1 is either all grey (63% of cases) or marked dark (37%). The same goes for p2, which is more often marked (87%). The dark marks extend onto the outer web, covering the base, entire web or subterminal part of the feather. P3 is always marked dark with, on average, a more extensive dark mark than on p1-2. The primary pattern hence offers a good way to distinguish second-cycle from third-cycle birds: the latter never show black on p1-2 (and very rarely on p3). The variation of the pattern on p4 ranges from a subterminal black area extending over both webs (forming the shape of a boot) on a grey background to a predominantly dark look with a pale tongue on the inner web. P5 is globally dark with a variable amount of grey on the inner web (the grey occasionally reaching the base of the outer web). P1-5 have a small terminal white tip, gradually decreasing in size towards the outer primaries. The latter are dark, blackish rather than pure black. The white tips of secondaries and inner primaries form a fine white trailing edge. The secondaries always show a dark centre (thus differing from third-cycle plumages, in which the black can sometimes be lacking), creating a dark subterminal bar on the inner wing. Only the longer tertials (ie, lower tertials on closed wing) typically show a black centre but variation exists: some birds show black on each tertial whereas others have no black at all.

The black tail-bar is reduced and covers less than half of the tail length. T5-6 may have very small or no black marks. In our sample, a small number of birds (15%) had replaced one or two central rectrices from as early as January or February, these being entirely white. The head and body, while becoming whiter, retain some dark marks and hence differ from many winter third-cycle birds. Unlike first-winter plumage, the underwing is now more uniformly white, except for the dark secondaries and few black marks on the lesser, primary and sometimes greater coverts. The bill is generally dull yellow (and more or less greenish), like younger birds, sometimes orange (22%) but never red (figure 5). Typically, the distal part of the bill is entirely dark, lacking a pale tip in 91% of cases (this pale tip can begin to appear in

146 Audouin's Gull / Audouins Meeuw *Larus audouinii*, second-cycle, Ebro delta, Catalunya, Spain, 19 March 2016 *(Nick Ransdale)*. Ageing is based on totally dark primaries, dark spot on lower tertial, black on secondaries (small black area underneath greater coverts), brown streaks on head, nape, chest, mantle and lesser coverts, and dull bill.

FIGURE 5 Stacked proportions of feature components in Audouin's Gull *Larus audouinii* across age classes for each feature and each combination of second-cycle versus third-cycle birds (**A**) and second-cycle versus third-cycle birds across seasons (**B**). Number (n) of observations for each feature and each age class is indicated above each bar plot. 2C and 3C = second-cycle and third-cycle birds; 2CW and 2CS = second-cycle birds in winter and summer; 3CW and 3CS = third-cycle birds in winter and summer.

some birds but is generally still yellowish and very thin), while it is never lacking in third-cycle and older birds. The black bill-band is always broad, covering more than a quarter of bill length.

Third calendar-year April to third calendar-year August (n=45)

Because of wear, the white tips on primary coverts and flight feathers start disappearing. From May on, the newly moulted inner primaries are plain grey (see third-cycle section), contrasting with the old brown primaries. The breast and head become whiter and dark marks become indistinct, in such a way that only 43% of individuals (figure 5) continue to show dark marks on the head. In third calendar-year birds, such dark marks are rare (2.7%) in summer. The bill is orange (34%) or red (66%), never yellowish. It can be kept in mind that third-cycle birds always seem to be red-billed in summer. The black bill-band remains broad (96%) but is now commonly (80%) followed by a small, brightly coloured tip (generally yellowish, or even orange or red), on average much smaller and duller than in older birds. In summer third-cycle individuals, the bill-band is thinner on average and the bill-tip paler. We sum up the main age criteria as follows: ***1*** Black primaries, with rounded tips devoid of white (or with extremely thin and dull white tips) on outer ones, this criterion often being sufficient to rule out a first- or third-cycle bird; ***2*** Dark marks on outer lesser coverts in some birds, keeping in mind that third-cycle birds never display this feature; ***3*** Often distinctly worn outer greater coverts with dark centre, hence forming a more or less brownish dull band that contrasts with (fresh) inner coverts. Due to heavy wear or moult, the secondaries can become visible and form a black band. This feature cannot be used from late summer, because then greater coverts are being replaced; ***4*** Often black centre on lower ter-

tials; ***5*** Orange or red bill (never orange in summer third-cycle birds) with large bill-band and reduced or no pale tip (never lacking in older birds); ***6*** Always black marks on rectrices (sometimes all white in third-cycle); and ***7*** Thin dark markings on breast, nape and/or head in up to 50% of summer birds, which seem to be very unusual in summer third-cycle birds (less than 3% show dark marks on head).

In summary, the ageing of second-cycle birds is generally not a problem. When doubt remains, a view of the stretched wing will suffice to confirm the age.

Third-cycle

Third calendar-year September to fourth calendar-year March (n=28)

The proportion of grey primaries is larger than in the previous cycle, creating a different general impression of the 'hand': the number of grey feathers appears to be about the same as the number of black feathers. The primaries are white-tipped but, compared with adults in winter, the white tips are on average smaller. Indeed, in winter, 36% (see figure 7) of third-cycle birds show reduced or absent white tips, against only 15% of adults. P1-3 are plain grey but p3 can rarely show a small black spot (in 4%, against 0% in adults). P4 is grey with a small black spot (sometimes reaching slightly up onto outer web) that can be absent (in 11%, against 92% of adults). Black on p5 forms a boot-shaped or L-shaped bar always covering both webs (54% in adults), and reaches up onto the outer web to some extent. P6 is black with a grey tongue on inner web and with a white tip. P7 displays a similar but smaller tongue. P8-9 are normally all black (respectively in 96% of cases and in 98% of cases) or show a small greyish base. The p8 tongue is normally lacking (only one third-cycle bird in our sample displayed a tongue on p8 but very small). The mirror on p10 is often absent (in 95% of cases) and, when present, is always smaller and more rounded than in adults. Sometimes, it can be present on only one of the wings. Also note that the colour of patterned primaries is now completely black, normally without any brown shade.

The outer primary coverts are normally strongly black-centred while the inner ones are grey. In our sample, 9% had seven or eight black-centred primary coverts, 91% had five or six and none less than five. Although it occurred extremely rarely in our dataset, it is not totally excluded that odd birds might display only four black-centred feathers. The bird in plate 158, not included in our analysis,

147 Audouin's Gull / Audouins Meeuw *Larus audouinii*, third-cycle, Belvédère-Campomoro, Corsica, France, 6 September 2017 *(Claude Gaillemain)*. Note that timing of moult is similar to bird in plate 149. Here, ring provides confirmation of bird's age but it is not indispensable to rule out adult. Note dark streaks on head, orange bill and remaining 'immature' primaries.

148 Audouin's Gull / Audouins Meeuw *Larus audouinii*, third-cycle, Tamri, Haha, Morocco, 19 October 2017 *(Mike Barth)*. Typical third-cycle in every way: black marks on tail, secondaries, lesser and median primary coverts and p4, extensive black centre on greater primary coverts, dark streaks on head, orange bill with broad bill-band. **149** Audouin's Gull / Audouins Meeuw *Larus audouinii*, third-cycle, Villasimius, Sardinia, Italy, 6 September 2017 *(Victor Claes)*. Active moult of primaries, with p8 growing, p9 missing and p10 remaining. Quite typical third-cycle bird with orange bill, black marks on (unmoulted) secondaries, extensive marks on primary coverts and black on p4 (possible in adults but normally never on both webs).

could perhaps confirm this hypothesis (provided that it is really a subadult and not an adult; see comments in caption). The broad dark centres on the greater primary coverts (on which black pattern extends sharply beyond the shaft) provide the most robust feature to rule out an adult (figure 6-7). The lesser and median primary coverts are also a key feature: all of our third-cycle birds showed dark marks on these feathers, whereas it seems exceptional in adults (0.7%). The pattern ranges from neat and solid spots to fine, sometimes almost inconspicuous, streaks, so that good photographs can be necessary to notice them. The alula is also sometimes black-centred, which we have never noticed in adults.

The pattern of the secondaries is variable: most show a solid black centre (forming a more or less continuous and long wing-bar, sometimes recalling second-cycle birds), whereas in others, only the central secondaries show fine black-centres (which can be difficult to discern) or, rarely, no black at all (5.7%). Furthermore, compared with second-cycle birds, the secondaries show a broader pale trailing edge. The tertials are never black centred and show a thin, adult-like white crescent at the end. The lesser and greater coverts are not black-centred either, and constitute one of the best ways to distinguish second-cycle from third-cycle birds in a flight shot.

It is particularly advisable to pay attention to the frequent dark streaks or spots on head and nape (see figure 6-7), since these are particularly rare and less conspicuous in winter adults (present in only 1.6%). The body colour is now adult-like (ie, pale grey) but with a less deep hue and occasionally with some dark marks on the upperbreast. As in adults, the grey colour on nape and rump is fainter. The tail shows a variable extent of black marks. It can be all white (55%) like in adults or spotted black (45%), producing a shorter, narrower and more irregular caudal bar than in the previous plumage. It is often discontinuous and only covers central feathers (so that t6, t5 and sometimes t4 are white). In winter, as in second calendar-year, some third-cycle individuals continue to show a yellow-green bill but more rarely so (26%). The bill is now usually orange (22%) or red (52%). In winter adults, the bill is red in 97% of cases and orange in 3% (but note that yellow-billed adults exist: see plate 167). The black bill-band is generally broad (86%, as against 44% in adults) and the pale (yellow, orange or red) tip seems to be always present (100%).

Our Random Forest model accordingly indicated that the best combination of criteria to distinguish adults from subadults is: ***1*** the presence of black on lesser and/or median primary coverts; ***2*** a total of more than five dark greater primary coverts; and ***3*** the presence of black on secondaries. They can be completed by some indicative features (listed in figure 6A) and, in winter (figure 7B), by the presence of dark on nape, the bill colour (yellowish or orange) and, to a lesser extent, the extent of the primary tips (small or absent).

FIGURE 6 Ranking of predictors for Audouin's Gull *Larus audouinii* according to their contribution to classification performance of Random Forest models, as measured by mean decrease in Gini (the larger the decrease, the most informative the predictor) in: adults versus third-cycle birds (**A**); adults versus third-cycle in winter (**B**); and adults versus third-cycle in summer (**C**). Right panels provide stacked proportions of individuals (adults and subadults) for each feature component, out-of-bag (OBB) model error rate (in %) and cross-validation (CV) success (expressed in number of correctly classified ringed birds over total number of ringed birds with complete data). 3C and A = third-cycle and adult birds; 3CW and AW = third-cycle and adult birds in winter; 3CS and AS = third-cycle and adult birds in summer. In A, model shows very small error rate (3.4%) and allows us to accurately predict age of 13 (100%) ringed individuals in our cross-validation procedure. In B, it shows error rate of 13%, and despite reduced cross-validation dataset (n=4), allowed us to accurately predict age of all ringed individuals. In C, model allowed distinguishing adults from subadults in summer with error rate of c 25% (only 11 out of 16 ringed individuals were accurately aged in our cross-validation procedure).

FIGURE 7 Stacked proportions of feature components in Audouin's Gull *Larus audouinii* across age classes for each feature and each combination of: adults versus third-cycle birds (**A**); adults versus subadults in winter (**B**); and adults versus subadults in summer (**C**). Number (n) of observations for each feature and each age class is indicated above each bar plot. 3C and A = third-cycle and adult birds; 3CW and AW = third-cycle and adult birds in winter; 3CS and AS = third-cycle and adult birds in summer.

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150 Audouin's Gull / Audouins Meeuw *Larus audouinii*, third-cycle, Ilha da Bareta, Algarve, Portugal, 16 May 2018 *(Renato Bagarrao)*. Black of primaries reaching p4, five strongly patterned greater primary coverts (with fifth being slightly washed dark), slightly shaded base of secondaries, faint dark mark on both outermost median coverts, dark shaft on alula and broad bill-band: all these features point to third-cycle bird. Note that, as in adults, some third-cycle individuals can have mirror (only visible on left wing but maybe present on both wings). **151** Audouin's Gull / Audouins Meeuw *Larus audouinii*, third-cycle, Port de Pollença, Mallorca, Balearic Islands, Spain, 8 June 2014 *(Bob Burgess)*. Black-marked secondaries and lesser primary coverts are enough to rule out older bird. Supporting features are broad dark marks on greater primary coverts, black base on p8-9 and black spot on p4. Broad bill-band also rather indicative of subadult. **152** Audouin's Gull / Audouins Meeuw *Larus audouinii*, third-cycle, unknown location, Italy, 5 May 2013 *(Danila Mastronardi)*. Other prime example of subadult. Compared with bird in plate 148, note changes in bill colour and pattern, as well as head colour.

Fourth calendar-year April to fourth calendar-year August (n=37)

Because of wear, the white tips of flight-feathers and primary coverts gradually disappear. On the outer primaries, the tips are generally smaller than in summer adults: in this time of year, third-cycle birds actually present no or reduced white tips in 89% of cases, against 53% in adults. The set of third-generation primaries (see previous age class for a detailed presentation of their pattern) is progressively replaced until September-October, in such a way that it is no longer possible to attribute an exact age after this period. The body is very similar to adults: a pale grey hue becomes evident in fresh plumage, and the head is clean white (only one out of 36 individuals showed dark marks on the head, whereas summer adults were all white-headed). Like adults and unlike some winter second-cycle birds, the bill is red. It differs by the pale tip which is on average slightly smaller (but apparently always present) and a clearly less frequent, thin or interrupted black band (in 37%, as against 81% of summer adults). The distinction between summer adults and summer third-cycle birds can be really challenging, especially without a view of the open wings. On the ground, these two age classes share a lot of similarities: black-patterned primaries, red bill, completely grey upperparts, greyish underparts, and the white tips on primaries can be reduced or absent in both.

In summary, our Random Forest model indicated that the key features (pattern of primary coverts and of secondaries) must be used first (see figure 6A). In summer, the width of bill-band and the size

of primary tips can be used as a complement. If a bird does not show any reliable criteria, it is better to regard it as an adult/subadult.

Adult (n=192)

'Winter' (September-March) and 'summer' (April-August) adults are not treated separately because plumage differences are very small between these two periods. When differences occur, they are presented in the text. As already shown, confusion can occur with subadults (third-cycle birds). In adults, the plumage no longer shows dark markings (black is always lacking on tail and secondaries), except for the primary coverts and outer primaries. The wing now shows a broader white trailing edge (formed by the white tips to the remiges) in fresh plumage. It is progressively reduced by wear, sometimes almost completely disappearing after the breeding period.

The black parts of the primaries are now pure black. Typically, p10 is totally black with a subterminal white mirror on the inner web (for examples of variation in p10, see plate 155-156, 159-161). The larger size and more oval shape is indicative (but not diagnostic) of an adult. In flying birds, it is important to keep in mind that the mirror can be hard to see when the hand is held back. In this case, the remiges overlap, which can cause p10 to be hidden by p9. The proportion of truly mirrorless birds is small (11%, against 95% in third-cycle). P9 is black, with a diffuse grey base, which we noticed in 42% of birds (against 2% in third-cycle). P8 exhibits in some cases (37%) a grey tongue on the inner web (as against 2% in third-cycle) and, most of the time, a bit of grey on the feather base (in 95%, against 4% in third-cycle). P7 shows a pattern that is close to that of p8 but with larger grey areas. P6 shows a subterminal black bar that goes up on the outer web more than on the inner web. P5 is quite variable: black is either lacking (in only 1.4% of cases), or it forms a small patch on the outer web (45%) or a wide band extending on both webs (54%), while in subadults the black always covers both webs. P4 is normally all grey but can present a small black spot on the outer web in some cases (in 8%, against 89% of third-cycle birds). The other primaries are always plain grey. Although the primary pattern generally differs between adults and subadults, it is not diagnostic. As shown in figure 6-7, details of primary coverts and secondaries are more important.

Although adults show on average thinner black marks on primary coverts than subadults, there is important variation in the pattern of the primary coverts. We found fewer individuals without black (36%) than with black (64%, against 100% in third-cycle). 53% of birds presented one or two black-marked feathers, 11% three to four black-marked feathers and only one individual (against 91% in third-cycle) five to six black-marked feathers. It is also noteworthy that adults never displayed more than six black primary coverts (against 9% in third-cycle) whereas third-cycle birds never showed black on less than five to six primary coverts (see figure 7A). Another notable difference is the width of black marks: while birds of previous age classes always show a broad centre (namely, sharply extending beyond the shaft) on primary coverts, the pattern is different in adults. Only a minority (20%, against 100% in third-cycle) presented broad marks, while the majority showed marks as thin as the shaft (43%) or no marks at all (37%).

Never absent in subadults, the lack of black marks on the lesser and median primary coverts constitutes one of the most valuable indications of adult age (figure 7A). Only one adult (0.7%) showed (very reduced) black marks. Our Random Forest model accordingly indicated that the best combination of criteria to distinguish adults from subadults was: ***1*** the absence of black on lesser and/or median primary coverts; ***2*** a total of less than five dark greater primary coverts; ***3*** the absence of black on secondaries; and, to a lesser extent, ***4*** the absence of mirror on p10 or lack of grey base on p8 (figure 6A).

In winter, the head pattern is a key feature (figure 6B): only three adults (1.6%) showed dark marks there. Furthermore, the marks were inconspicuous in all three birds. In third-cycle birds, the proportion of birds with head streaking is much higher (71%) and the marks average thicker. The nape, breast and upper belly are washed pale grey, with a slightly more pronounced tinge on the flanks. Adults differ from younger birds by a slightly deeper hue and an always uniform aspect.

Our results clearly indicate a change of the bill-band across seasons, which, to our knowledge, has never been mentioned in literature. As is evident in figure 8, the bill-band becomes narrower in summer (particularly from February to August), with only 49% of winter adults displaying a thin or interrupted bill-band, against 81% of summer adults. The bill is always red during spring and summer and tends to be brighter and glossier than in autumn and winter, during which it stays generally red (in 98% of birds; orange in 2%) but duller. Very rarely, some birds can present a yellow bill (see discussion and plate 167). The bill colour does not help to rule out a summer third-cycle bird, but

FIGURE 8 Seasonal evolution (winter versus summer) of width of bill-band in adult Audouin's Gull *Larus audouinii*. Interrupted bill-bands were considered 'thin'. In addition to individual variation, width of bill-band depends on season, widening during reproduction period. AW = adult in winter; AS = adult in summer.

can be useful in winter third-cycle birds, which more often show an orange (22%) or yellow colour (26%). The same also goes for the colour of the bill tip (varying from faded yellow to dark red), which is generally more extensive in adults.

On the ground, and without a view of the open wings, ageing is not always possible. When a bird combines the lack of 'immature' features with a large and oval p10 mirror and largely white-tipped primaries, it should be an adult. However, if the primary tips are reduced or lacking (commonly seen in spring and summer), it could be wiser to classify the bird as 'subadult/adult'. When faced with a presumed subadult presenting only 'indicative' criteria, trying to obtain a photograph of the open wings remains the best option. When this is not possible, the focus needs to be on the features highlighted by our Random Forest models: in winter, presence of dark on head, bill colour and, to a lesser extent, size of the white primary tips (figure 6B); and, in summer, bill width and size of primary tips (figure 6C).

Voice

The length of long-calls in adult Audouin's Gull does not differ significantly from other large European gulls. The total number of notes is nevertheless lower (often between six and 10, sometimes up to 20) and quite variable. Their sonority can be reminiscent of Caspian Tern *Hydroprogne caspia*, or even of grey geese *Anser*. Following the terminology used for large gulls by Constantine & The Sound Approach (2008), typical long-calls (figure 9) are composed of 'introductory notes', characterised by a short length and a stable or accelerating rhythm, long and stretched 'high notes' (middle phase), and short 'final notes'. These final notes are initially fast, short and tight and gradually decrease in speed and intensity. They are also often particularly less numerous than in other large gulls.

It seems that the third part is the most 'stable' part across individual long-calls and the easiest one to identify thanks to the fast notes. Part 1 and 2 may be harder to distinguish (Magnus Robb pers comm) and in that case part 1 can be very short or nonexistent and/or merged with part 2 (figure 10-11).

As in other large gull species, sexual maturity causes voice changes. This 'voice change' allows separating (by ear and sonagram) immature birds from adults, the latter having a hoarser voice. In a sonagram, horizontal 'frequency bands' (formed by harmonics and subharmonics) of immature

FIGURE 9 Audouin's Gull / Audouins Meeuw *Larus audouinii*, adult, Mallorca, Balearic Islands, Spain, 28 July 2006 *(Magnus S Robb/The Sound Approach)*. Typical adult long-call with well-defined phases. Note short and accelerating introductory notes, stretched median notes and tight final notes, first tightened then progressively spaced.

FIGURE 10 Audouin's Gull / Audouins Meeuw *Larus audouinii*, adult, Mallorca, Balearic Islands, Spain, 28 July 2006 *(Magnus S Robb/The Sound Approach)*. Another variant of adult long-call, in which notes of phases 1 and 2 are interspaced.

FIGURE 11 Audouin's Gull / Audouins Meeuw *Larus audouinii*, adult, Ebro delta, Catalunya, Spain, 7 June 2002 *(Arnoud B van den Berg/The Sound Approach)*. Variant of adult long-call, here shorter and less complex. Phases 1 and 2 tend to be merged, as indicated by slightly stretched shape of first and second notes.

long-calls are generally much less numerous than in adults (Magnus Robb pers comm).

The widely spaced aspect of frequency bands is consequently a good indicator of immaturity (referring here to all non-adult age classes), as is the rising form of final notes (figure 12-13). By ear, resemblance to the nasal tonality of Common Gull *L canus* is also typical of immatures (but note that Audouin's Gull differs from Common by its fewer notes and shorter calls).

Discussion

In our opinion, this work illustrates our actual knowledge of ageing Audouin's Gull. In short, we can assert that almost all birds can be confidently aged, except for a limited number of adults and subadults. While some second-cycle birds can occasionally be problematic, we demonstrate that appropriate use of different age features should always reveal their age. The large amount of adult birds in our dataset seems sufficient to understand the extent of plumage variation. For subadults, a

FIGURE 12 Audouin's Gull / Audouins Meeuw *Larus audouinii*, third-cycle, Ebro delta, Catalunya, Spain, 25 September 2014 *(Magnus S Robb/The Sound Approach)*. Quite well-structured third-cycle long-call, where no phase is missing (but with only one note in first phase). Compared with adult, band frequencies clearly spread out.

FIGURE 13 Audouin's Gull / Audouins Meeuw *Larus audouinii*, third-cycle, Ebro delta, Catalunya, Spain, 25 September 2014 *(Magnus S Robb/The Sound Approach)*. Variant of third-cycle long-calls. Note obviously spread band frequencies, making voice less hoarse and shriller than in adults.

larger dataset could probably improve our knowledge of features changing during the year (especially bill colour, bill pattern and head pattern). We believe, however, that our results provide a reliable base to ascertain the value and relevance of all features that remain 'stable' all year round (especially patterns of primaries, secondaries and rectrices).

With our accumulated knowledge, we found some obvious ageing errors in some literature (Barthel 1997, Olsen et al 2004, Olsen 2018). We use the remainder of this discussion to point out several of such errors. Firstly, reading Barthel (1997) we encountered a mistake in plate 12. Labeled as 'moulting from third-summer to adult winter plumage', this bird is actually a second-cycle, moulting to third-cycle plumage. Wing pattern is typical of a third-cycle bird: the five outer greater primary coverts are strongly dark centred (the ninth and 10th primary coverts are lacking and about to be renewed but the presence of black on the previous (and freshly renewed) three coverts necessarily implies black on the following two), black extends to lesser and median primary coverts, black reaches p4 and bill-band is broad (possible in adults, but uncommon).

In Olsen et al (2004), some captions could be criticised, too. For example, left bird taking flight

153 Audouin's Gull / Audouins Meeuw *Larus audouinii*, adult, Arta, Mallorca, Balearic Islands, Spain, 12 March 2016 *(Nick Smith)*. Adult with large white primary-tips and quite small mirror on p10. In March, breeding season is nearing; bill becoming glossy, black band thin and pale tip large. **154** Audouin's Gull / Audouins Meeuw *Larus audouinii*, adult, Port de Pollença, Mallorca, Balearic Islands, Spain, 8 May 2017 *(Bob Burgess)*. Textbook adult: large and oval mirror, rather large white primary-tips (beginning to wear) and red bill with thin band

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155 Audouin's Gull / Audouins Meeuw *Larus audouinii*, adult, Santa Pola, Alicante, Spain, 24 April 2018 *(James Wilson)*. Typical adult with unmarked primary coverts, p10 mirror and (faint) grey base on p8. Dark spots on head and neck result from soiling. **156** Audouin's Gull / Audouins Meeuw *Larus audouinii*, adult, Ebro delta, Catalunya, Spain, 17 March 2018 *(Claudio Bracho)*. Small mirror does not necessarily point to young bird. In this 13th calendar-year (ringed) bird, large amount of black on primaries results also in rather reduced white tips and lack of tongue on p8. **157** Audouin's Gull / Audouins Meeuw *Larus audouinii*, adult, Ischia, Campania, Italy, 28 June 2008 *(Vincenzo Cavaliere)*. This adult (fifth calendar-year) aptly illustrates ageing issues in perched birds. Without ring, it would have remained in indeterminate age category 'adult/subadult'. **158** Audouin's Gull / Audouins Meeuw *Larus audouinii*, adult, Aspretto, Corse-du-Sud, Corsica, France, 16 July 2017 *(Arnaud Le Dru)*. Although greater primary coverts show rather large black spots, all other age criteria (large p10 mirror, p4 without black, tongue on p8) point towards adult.

in plate 90 is identified as an adult. This bird is rather problematic because of the presence of 'immature' characters (or, more precisely, most often found in immatures): black on p4, rather broad marks on greater primary coverts, and more surprisingly, a black streak on the lesser primary coverts. This character is found only rarely in adults (less than 1% in our dataset) but it could be tricky to consider this feature here, since the size of the photograph does not allow us to rule out a spot resulting from soiling. The tongue that seems to be present on p8 would be unusual for a subadult, as is the reduced number of patterned greater primary coverts. We therefore think that this bird should not be given a precise age class but be regarded as a 'subadult/adult'. In another plate (89), the date (May) looks odd. Labeled as second-summer, this perched bird contains all traits of a winter second-cycle: fresh plumage, distinctly streaked head and greenish-yellow bill. The confusion could here result from an error in date. In plate 92, a perched bird with the white primary tips worn off is annotated as an adult but it is important to remember that a third-cycle bird cannot be excluded from this single image in which no open wing is visible. The same remark can be made for plate 93. In Olsen (2018), plate 7 (p 53) clearly shows a second-cycle bird, whereas it is captioned as first-

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159 Audouin's Gull / Audouins Meeuw *Larus audouinii*, adult, Tarragona, Catalunya, Spain, 16 March 2013 *(Xavier Bayer)*. Individual showing lot of black on primaries. Note also wide marks on outer greater primary coverts but confined to three single feathers. **160** Audouin's Gull / Audouins Meeuw *Larus audouinii*, adult, Sant Carles de la Ràpita, Catalunya, Spain, 7 May 2018 *(Jessica Joachim)*. At first sight, dull bill, broad bill-band and streaked head suggest immaturity but large p10 mirror and black on only six primaries indicate adult. In May, it is particularly uncommon to find birds with such 'immature' or 'winter' facial pattern. **161** Audouin's Gull / Audouins Meeuw *Larus audouinii*, adult, Tarragona, Catalunya, Spain, 31 May 2013 *(Fran Trabalon)*. Some adults have red bill tip. Primary pattern typical, with black covering six primaries, with oval mirror, greyish base on p8-9 (less obvious on latter), grey tongue on p8, and p5 with a 'boot' pattern. **162** Audouin's Gull / Audouins Meeuw *Larus audouinii*, adult/subadult, Tarragona, Catalunya, Spain, 31 May 2013 *(Fran Trabalon)*. Very difficult bird, with many ambiguous features. Many criteria indicate third-cycle: dark-washed secondaries, broadly marked primary coverts, faint (but real) marks on median primary coverts and black spot on p4. Unfortunately, p10 is hardly visible so presence of mirror cannot be assessed. However, small number of dark-marked primary coverts (four) tips balance in favour of adult. Furthermore, dark secondaries and black on only four primary coverts are features never found in subadults, and dark marks on lesser and median primary coverts are normally wider. Does this point to slightly atypical subadult or very atypical adult?

summer moulting to second-winter. Wing feathers are all second generation: rectrices are white-based (almost all black in previous generation), secondaries clearly white-tipped and forming an evident trailing edge, and inner primaries are partially grey (always dark in first generation). White head (with faint dark streaks), bicoloured greater coverts and orange bill confirm the age as third calendar-year. Plate 9, labeled as putative second-summer (moulting into third-winter), actually displays a first-cycle (moulting to second-cycle) as evidenced by remaining juvenile outer primaries, fresh dark-spotted tertials, strongly patterned head and dull bill. As mentioned in the caption, the

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163 Audouin's Gull / Audouins Meeuw *Larus audouinii*, putative adult, Alcúdia, Mallorca, Balearic Islands, Spain, 20 October 2008 *(Dirk Huitzing)*. Five greater primary coverts dark-marked (but only four with broad mark), head (including nape) slightly streaked and bill broadly banded, with colour intermediate between orange and red; these elements would support ageing as third-cycle. Nevertheless, resemblance to adult seems stronger here: p4 is unpatterned, black of p5 is only present on outer web and p8 shows tongue (partially hidden by p7) and subtle greyish base. **164** Audouin's Gull / Audouins Meeuw *Larus audouinii*, adult/subadult, Cubelles, Catalunya, Spain, 28 April 2011 *(Xavier Bayer)*. Without better view of underside of p10 or open wings, it is preferable to refrain from assigning age to this individual. Here, very thin bill-band would suggest adult. **165** Audouin's Gull / Audouins Meeuw *Larus audouinii*, putative adult, Valencia, Communidad Valenciana, Spain, 5 June 2011 *(Xavier Bayer)*. Ear-coverts and neck soiled. Feeling of adult predominates here but combination of immature features dictates caution. Except for number of black-marked greater primary coverts, all features compatible with adult, and unmarked lesser and median primary coverts even point towards this age. However, pattern of greater primary coverts intermediate between third-cycle and adult, p4 shows black spot, p10 mirror seems lacking and all black p8-9 would indicate third-cycle. **166** Audouin's Gull / Audouins Meeuw *Larus audouinii*, adult/subadult, Ebro delta, Catalunya, Spain, 4 June 2014 *(Dani Valverde)*. P10 mirror seems missing, which prevents us from ruling out third-cycle bird. Reduced and worn white primary tips do not necessarily indicate third-cycle, as these are regularly absent in adults during and after breeding season.

white tips of new primaries are part of what led the author to classify this bird as a second-summer, while we have found such white tips also on second-generation inner primaries, though reduced in size. The bird in plate 13 is labeled as third-summer based on its lack of white tips on primaries. An adult cannot be ruled out, however (like subadults, some adults can lack white tips in spring and summer), especially since a mirror seems present on p10 (possible in subadults, but more suggestive of an adult). Finally, the bird labeled 'third-summer moulting to adult-winter' in plate 14 is actually an

167 Audouin's Gull / Audouins Meeuw *Larus audouinii*, putative adult, Sesimbra, Setúbal, Portugal, 17 February 2018 *(António Gonçalves)*. Although p10 mirror strongly points to adult, yellowish bill and reduced primary tips, unusual at this time of year in adults, call for caution.

adult, according to the p10 mirror and the lack of black on outer greater primary coverts.

Our study contributes to a better knowledge of the distinguishing features of subadult birds. Firstly, we emphasise that the presence of black on greater primary coverts is by no means diagnostic of subadults, contrary to what is suggested by King & Shirihai (1996) or Olsen (2018). Adults present black on these feathers in 64% of cases in our dataset. It is actually the combination of the large number (at least half of feathers, although exceptions can occur) of strongly black-centred primary coverts and dark marks on lesser and median primary coverts that is important. Furthermore, when typical immature features such as black on tail or on secondaries are missing, observers should focus their attention on additional features, especially the amount of black on wing-tip (p10 mirror missing, black on p4 and sometimes on p3, p8-9 with grey base and p8 tongue missing) and duller bill colour in winter. While our results demonstrate that the width of the bill band decreases with age, significant overlap renders it an unreliable criterion. Another interesting result is the variation in bill pattern in adult plumages. To our knowledge, widening of the bill-band in winter has never been mentioned in literature and could be comparable with the seasonal variation that occurs in many other gulls. This is described in, eg, Pallas's *L ichthyaetus*, Caspian, Common, American Herring *L smithsonianus*, European Herring *L argentatus* and Yellow-legged Gull *L michahellis* in Garner (1997), Adriaens & Mactavish (2004), Olsen & Larsson (2004), Gibbins et al (2010), Adriaens & Gibbins (2016) and Olsen (2018). There is no evidence to suggest that it may be sex related.

One of the main questions to address now is how to age unringed birds presenting a set of strongly ambiguous features that prevent confident assignment to any age class. If we exclude perched birds (in which not all criteria are visible), unringed birds of uncertain age only represented 2% of our dataset (n=152; cf plate 162-167 for annotated examples). It is well-known that in several large European gulls, some individuals continue to exhibit traces of immaturity during all or part of their life (Monaghan & Duncan 1979, Grant 1980, Olsen 2018), which led to classification of fourth-cycle birds as 'fourth-cycle type' or 'subadult type'. In Audouin's Gull, an identical phenomenon beyond the second complete moult (leading to third-cycle plumage) is conceivable. Some adults can actually exhibit a few immature characters beyond their third cycle (see plate 156 for a known-age adult and plate 163, 165 and 167 for putative adults). However, our data suggests that only few birds are truly problematic, and we propose to restrict the 'third-cycle type' (or 'subadult type' or 'subadult/adult') terminology to the real conundrums only.

We argue that only a large series of photographs of ringed birds will allow answering issues related to the extent of the variation (especially in adults and subadults) and persistence of immature features in adults. Increased ringing efforts, already implemented in France (Corsica), Italy and Spain, could help build a reference collection of photographs in the near future. Finally, we argue that the vocalisation of Audouin's Gull is poorly documented and that age-related variation in the long-calls is not fully understood. Is there a relatively sudden change, as in humans, or a progressive maturation towards adult vocalisations? Good knowledge of vocalisations could be complementary to visual age criteria and could help in monitoring and conservation, eg, in establishing age ratio in a nesting colony.

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Samenvatting

Leeftijdsbepaling en kleedvariatie bij Audouins Meeuw Dit artikel behandelt leeftijdsbepaling en kleedvariatie bij Audouins Meeuw *Larus audouinii*. Het is gebaseerd op de analyse van foto's van bijna 500 vogels gemaakt in Zuid-Europa en Noord- en West-Afrika, waaronder enkele geringde vogels waarvan de leeftijd bekend is. Vogels werden ingedeeld in een leeftijdsklasse (eerste-, tweede- en derde-cyclus en adult kleed). Van iedere leeftijdsklasse werden kenmerken van verenkleed en naakte delen verzameld. Voor de bepaling van informatieve kenmerken of combinaties van kenmerken bij lastige leeftijdsklassen werd een computer getraind in het herkennen en interpreteren van kenmerken ('supervised machine-learning algorithms'). Van iedere leeftijdsklasse werden verenkleed en seizoensgebonden variaties daarvan nauwkeurig beschreven en de belangrijkste criteria worden gepresenteerd. We richtten ons vooral op de uitdaging om derde-cyclus en adulte vogels te kunnen onderscheiden. We bespreken de daarvoor belangrijke kenmerken, mede aan de hand van enkele vogels met een problematisch verenkleed. Tevens behandelen we leeftijdsgebonden veranderingen in geluiden, waarbij we tonen dat bepaalde kenmerken van 'long-calls' van adulte en onvolwassen Audouins Meeuwen van elkaar zijn te onderscheiden.

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Measurement of relative bill length of Black-tailed Godwits from photographs

Jan Bisschop

Measurements of wing or bill length are helpful in the identification of certain (rare) bird species or subspecies with inconclusive plumage features. Trapping (rare) birds for identification purposes, to obtain absolute size measurements or a DNA sample, is often not possible, so many rare bird records are documented by field photographs only. Sharply demarcated bare parts, feathers or plumage features of birds provide the opportunity to define relative size measures from field photographs that may help identification. A well-known relative size measure that can be determined from field photographs is the primary projection, the distance between the tips of the longest tertial and primary feather divided by the length of the visible part of the longest tertial. Dufour & Crochet (2020) made relative bill structure measurements from field photographs in order to distinguish West African Crested Tern *Sterna albididorsalis* and American Royal Tern *S maxima*. Measurement of the angle between lines through specific bird parts can also be made from field photographs and help bird identification. For example, Lee & Birch (2006) measured the so-called loral angle of Short-billed Dowitcher *Limnodromus griseus* and Long-billed Dowitcher *L scolopaceus* and showed how this parameter varies statistically between these species.

In this paper, I present how relative bill length, ie, bill length divided by head length, can be measured from field photographs of Black-tailed Godwit *Limosa limosa*. The objectives of the study were ***1*** to obtain statistical distribution diagrams that show the ranges of bill length overlap between sexes and subspecies of Black-tailed and ***2*** to compare these data with data from hand measurements found in the literature. Relative and absolute measurements of bill length differ by definition and possibly in accuracy and it is interesting to see how both parameters relate.

This study was motivated by the presence of two winter-plumage Black-tailed Godwits wintering in 2019 at the southern end of Bodensee (lake Constance) near Arbon, Thurgau, Switzerland, from 18 January to 3 March 2019 and then at nearby Fussach, Vorarlberg, Austria, until 15 April 2019. These godwits were notably short billed and were suspected to be Icelandic Godwits *L l islandica*. The relative bill length of both birds was measured from field photographs published on the internet. In this paper, it is investigated if these godwits can be identified to subspecies level on basis of their relative bill length using the abovementioned reference bill length distribution diagram.

Subspecies

Until recently, three subspecies of Black-tailed Godwit were known. The bill length varies strongly between these three subspecies (*L l limosa*, *L l islandica* and *L l melanuroides*) and between sexes, as shown in studies using measurements of hand-held birds or museum specimens (Roselaar & Gerritsen 1991, Gunnarsson et al 2006, Schroeder et al 2008, Zhu et al 2020). *L l melanuroides* breeds in Mongolia and in the (sub-)Arctic regions of eastern Russia, and has the smallest average bill length (Zhu et al 2020). Recently, a fourth subspecies (*L l bohaii*) was described from the Far East, at Bohai bay, northern China, based on measurements and genetic analysis; it probably also breeds locally in the Russian Far East (Zhu et al 2021). Both *L l melanuroides* and *L l bohaii* are not further considered in this study.

Of the two European breeding subspecies, Icelandic Godwit *L l islandica* (hereafter *islandica*) has on average a shorter bill than nominate Black-tailed Godwit *L l limosa* (hereafter *limosa*), and males of both have on average a shorter bill than females. In western Europe, the range of bill lengths is c 7-12 cm for, respectively, the shortest male *islandica* to the longest female *limosa* (Roselaar & Gerritsen 1991, Gunnarsson et al 2006, Schroeder et al 2008; table 1). There is extensive overlap in bill length between sexes and subspecies but outside the overlap ranges the bill length is indicative for sex or subspecies.

Methods

Definition of relative bill length

The relative bill length was measured from field photographs found on the internet with sufficient quality and resolution such that the bill edges were clearly visible. Moreover, the photographs depict-

TABLE 1 Mean bill lengths (in mm) and standard deviations (in % for easier comparison), and number of measurements (n) for nominate Black-tailed Godwit *Limosa limosa limosa* and Icelandic Godwit *L l islandica* from hand measurements (different sources) and results of current study (relative bill length). In last two columns, results are also expressed as normalised values (in bold between brackets).

subspecies & sex	Lourenço unpublished	Schroeder et al 2008	Gunnarson et al 2006	Roselaar & Gerritsen 1991	combined literature mean	this paper (relative bill length)
limosa ♀	105.7 ±5.5% n=401	105.0 ±5.8% n=70	–	107.7 – n=39	106.2 (**1**) – –	2.12 (**1**) ±6.5% n=50
limosa ♂	89.9 ±5.9% n=377	89.8 ±6.1% n=64	–	90.7 – n=57	90.1 (**0.85**) – –	1.88 (**0.89**) ±5.5% n=50
islandica ♀	–	–	94.7 ±6.6% n=32	94.2 – n=6	94.5 (**0.89**) – –	1.97 (**0.93**) ±5.7% n=44
islandica ♂	–	–	79.3 ±4.5% n=47	78.5 – n=19	78.9 (**0.74**) – –	1.69 (**0.80**) ±6.1% n=50

ed more or less a side view of the bill and head (see the section on the effect of bill rotation angle below). The relative bill length (l_r) is defined in this paper as the bill length (l_b) divided by the head length (l_h) along the same line, ie, the line that is following the underside of the upper bill part (cf figure 1). This parameter can be easily measured in image software applications with the capability of measuring distances between points. In applications without a measuring tool (eg, Photoshop), the first step is to rotate the bill center plane to a horizontal position. In case of an open bill, the underside of the upper bill part is rotated to a horizontal position. The second step is to select the bill or head with the select tool and crop the image to the selection in order to determine the length in terms of number of pixels.

The measure defined in this paper differs in two ways from standard hand measurements. Firstly, the bill length l_b in figure 1 corresponds to the 'chord of exposed culmen' commonly used for measuring bill length of waders in the hand (Gunnarsson et al 2006, Schroeder et al 2008). However, instead of measuring from the bill-tip to the feathering edge at the culmen top (as by hand), the measurement is made from the bill-tip to the perpendicular line that runs through the feathering edge on the line between the nostril and eye center points (as shown in figure 1). The feathering edge at the culmen top is not always clearly visible on side view images of the head (see, eg, figure 1b). Secondly, in this study, the back side of the head is defined by the feathering outline, whereas in the hand, the head is measured towards the back of the skull.

Effect of bill rotation angle

The measurement of relative bill length may be less accurate if the bill does not lie in the plane of the photograph. If the bill is turned towards the photographer, the bill will appear as proportionally slightly larger than the head on the photograph, because it is closer to the photographer. As a result, the relative bill length will slightly increase with increasing rotation angle towards the photographer. The opposite is true when the bill is turned away from the photographer. In order to get a sense of the inaccuracy caused by rotated bills, the following experiment was carried out: a 30 cm ruler attached to a tripod was photographed with rotation angles of -45°, -22.5°, 0, +22.5° and +45° to a reference ruler using a 400 mm lens (figure 2). This was done at photographing distances of 12, 18, 24 and 30 m. The effect of bill rotation angle on relative bill length was then measured in Photoshop (by pixel measurements) for a head length of 5 cm and a bill length of either 10 or 25 cm, meaning a relative bill length of 2 or 5, respectively. The results are shown in figure 2. No influence of photographing distance on bill rotation effect was noted, and therefore the results at different distances were averaged.

The results show that in the case of a bird with a head length of 5 cm and a bill length of 10 cm, the theoretical error is ± 0.7% for a bill rotation angle of ± 45°. Thus, a bird with a relative bill length of 2.00 (ie, two times longer bill than head) would appear to have a relative bill length of 2.01 on photographs with the bill rotated towards the photographer at a 45° angle. Note that this result is based on the assumption that the back side of the

FIGURE 1 Relative bill length (l_r) is defined as bill length (l_b) divided by head length (l_h) in this paper. **A** Icelandic Godwit / IJslandse Grutto *Limosa limosa islandica*, male, Iceland, 17 June 2006 *(Markus Varesvuo/www.agami.nl)*; **B** Black-tailed Godwit / Grutto *Limosa limosa limosa*, female, Tscheljabinsk, Russia, 1 June 2016 *(Ralph Martin/www.agami.nl)*.

FIGURE 2 Theoretical error in measurement of relative bill length as function of rotation angle of bill. In Black-tailed Godwits *Limosa limosa* (with bill length ≈ 10 cm; head length ≈ 5 cm), theoretical error is c -0.4% and -0.7%, respectively, when bill is 22.5° and 45° turned away from photographer and +0.4% and +0.7%, respectively, when bill is turned towards photographer at 22.5° or 45° angle.

head remains visible on photographs at larger rotation angles. For a spherical head and large bill rotation angle, this will not be true in reality and the actual effect of bill rotation angle on relative bill length will be larger. For this study, only internet photographs that appear to have small bill rotation angles and with the back side of the head visible, were selected. Inaccuracies in the measurement of the relative bill length may result in larger overlap ranges between subspecies and sexes in the bill length distribution diagram.

Sampling of internet photographs

The internet provides a huge collection of bird photographs that can potentially be used to obtain biometrics or other types of data of bird species. However, scientific sampling of internet photographs has to be done with care: photographers may need to be contacted for confirming the origin of photographs and for asking permission to analyse the photographs. Moreover, obtaining statistical data requires an unbiased (random) sampling method of internet photographs. For *limosa*, the sampling and sexing problem was overcome by only working with photographs of copulating adults in summer plumage from the breeding grounds in Denmark, Germany and predominantly the Netherlands. A total of c 60 copulating godwit photographs, with unique godwit pairs and small bill rotation angles, were found on a variety of websites. On these photographs, 50 males and 50 females were depicted with sufficient quality for bill and head length measurements. If *limosa* shows a geographical variation in bill length, the results presented in this article may be geographically biased.

For *islandica*, photographs of birds in adult breeding plumage from predominantly Iceland were selected. A few analysed photographs were taken in Scotland. The majority of *islandica* photographs with confirmed Icelandic origin were found on www.flickr.com. These included only a few photographs of copulating or displaying birds with confirmed sex. Most photographs were selected on the basis of described structure and plumage sexing criteria (eg, Gunnarsson et al 2006). A total of 44 females and 50 males *islandica* with convincing sex designation and small bill rotation angle on photographs with sufficient quality were found. The internet links of all analysed photographs are available upon request or can be found on https://dutchbirding.nl/godwit_bills.

Comparison of photographic and hand measurements

It is interesting to make a comparison of the results obtained by photographic and hand measurements. Such a comparison could give some insight into the accuracy of the bill length measurements from field photographs. The hand measurements for *limosa* (from the Netherlands) were provided by Pedro Lourenço and the data for *islandica* are from Gunnarsson et al (2006). Note that the geographical origin of the photographic and hand measurements are comparable: Iceland for *islandica* and predominantly the Netherlands for *limosa*.

Plotting relative and absolute bill length data along an equally-valued axis such that they can be directly compared, requires a normalisation of the

FIGURE 3 Bill length distributions in nominate Black-tailed Godwits *Limosa limosa limosa* and Icelandic Godwits Godwits *L l islandica*, comparison between photographic measurements (upper) and hand measurements (lower). Vertical dotted lines show mean value for each combination of subspecies and sex. Upper figure also shows photographic measurement results of two Black-tailed Godwits wintering near Arbon, Switzerland, and Fussach, Austria, in 2019 (horizontal error bars show standard deviations of different photographs).

data. This was done by dividing the mean of each dataset by the mean for female *limosa*. The normalised mean for female *limosa* will then get a value 1 and the normalised means for *islandica* and the mean for male *limosa* will have values smaller than 1 (the values are given in bold in table 1). In figure 3, the secondary (upper) horizontal axis, expressing the normalised results, is equally valued and aligned in both diagrams.

Results and discussion

The measurements of relative and absolute bill length are plotted as frequency distribution diagrams in figure 3. The purpose of using this diagram type here is to clearly show the overlap ranges in bill length between the subspecies and sexes, and to be able to directly compare relative and absolute bill length distributions. The dotted vertical lines show the mean bill length of the subspecies and sexes of the plotted datasets. These mean values are also given in table 1. The relative bill measurements of the wintering godwits at Arbon and Fussach are plotted as vertical black and brown lines.

The main outcome of the comparison between the relative and absolute bill length measurements is that the differences between subspecies and sexes are smaller in the case of the relative bill length. For example, the mean relative bill length of males *islandica* is 80% of the mean length of females *limosa* (table 1), whereas the mean absolute bill length of males *islandica* is 74% of the mean length of females *limosa*. The standard deviations for all data sets are comparable and range between 4.5% and 6.5% of the mean bill length (table 1). Thus, relative bill length measurements from field photographs are not obviously less accurate than abso-

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168 Icelandic Godwit / IJslandse Grutto *Limosa limosa islandica*, Arbon, Thurgau, Switzerland, 26 January 2019 *(Eric Sauser)*. Bird nr 1. **169** Icelandic Godwit / IJslandse Grutto *Limosa limosa islandica*, Fussach, Vorarlberg, Austria, 3 April 2019 *(Jan Bisschop)*. Bird nr 1. **170** Icelandic Godwit / IJslandse Grutto *Limosa limosa islandica*, Arbon, Thurgau, Switzerland, 26 January 2019 *(Eric Sauser)*. Bird nr 2. **171** Icelandic Godwit / IJslandse Grutto *Limosa limosa islandica*, Fussach, Vorarlberg, Austria, 3 April 2019 *(Jan Bisschop)*. Bird nr 2.

lute bill length measurements from handheld birds. A recent study showed that photographic bill length measurements and manual bill length measurements are highly correlating, and that the photographic measurements have a significantly lower coefficient of variation (Williams et al 2020).

The probable reason why the mutual differences between subspecies and sexes in case of relative bill length are smaller (ie, show more overlap), is that the head size (length) is probably not constant for sexes and subspecies. Godwits with longer bills probably also have somewhat longer heads, and therefore the relative bill size (bill length/head length) differs less between sexes and subspecies.

Black-tailed Godwits at Arbon and Fussach

The winter-plumage godwits wintering at Arbon in January-March 2019 (referred to as nr 1 and nr 2; plate 168, 170) had notably short bills and were therefore suggested to be islandica. The question was raised whether the bill length could be measured from field photographs for subspecies identification. All suitable photographs of both birds on www.ornitho.ch were analysed with the method described in this paper. Later in March, the birds moved to the Rheindelta near Fussach, 15 km east of Arbon. Here, they stayed until 15 April 2019 and moulted into partial summer plumage (plate 169, 171). The advanced moult of the upperparts and strong rufous colouration of

head and breast (in combination with the short bill and legs) elucidated the subspecific identify of the godwits as *islandica*. Various plumage details (eg, damaged wing feathers) and bill shape confirmed that the godwits at both locations were the same individuals. On 3 April 2019, both birds were extensively photographed by the author to obtain the images for a relative bill length analysis. These birds were accepted by the Swiss and Austrian rarity committees as the first and second record of *islandica* for Switzerland and Austria, respectively.

Analysis of the photographs shows that the godwits at Arbon (in winter plumage) have mean relative bill lengths of 1.64 (±2.3%; n=10; nr 1) and 1.58 (±2.4%; n=5; nr 2). At Fussach, the birds in (partial) summer plumage were measured to have relative bill lengths of 1.70 (±1.4%; n=8; nr 1) and 1.61 (±1.4%; n=8; nr 2). The maximum measured relative bill lengths of the Arbon/Fussach godwits are 1.73 for nr 1 and 1.64 for nr 2. The minimum relative bill length from the studied reference population is 1.69 for male *limosa*. So, nr 2 can be identified as *islandica* based on relative bill size only. Note, that the far-eastern subspecies *melanuroides* was not considered in this study since this subspecies has never been recorded in the WP.

Interestingly, the relative bill length of the godwits at Fussach in summer plumage is larger than the one for the godwits at Arbon in winter plumage (see figure 3). It is not clear what exactly causes this increase. At Arbon, the birds were photographed by different photographers over a time span of c five weeks. At Fussach, the analysed photographs were obtained by the author on a single day while the birds were actively feeding in water and temperatures were higher. The standard deviation of bill length of the birds at Fussach is smaller than at Arbon. The selection of photographs of the Arbon birds may include some resting birds in cold weather with expanded head feathering (ie, with larger head), causing the relative bill size to be smaller. Also, perhaps the moult from winter to summer plumage may have affected the feathering edge on the upper culmen and slightly increased the relative bill length of the birds at Fussach.

Conclusion

In this study, statistical data on the relative bill length of Black-tailed Godwit was obtained from field photographs published on the internet. The differences in bill length between sexes and subspecies measured from photographs correlated well with those obtained from traditional hand measurements. One of the two Black-tailed Godwits wintering in Switzerland and Austria in 2019 had a relative bill length outside the overlap ranges for sexes and subspecies, and could be identified as male *islandica* on basis of relative bill length only. The identification approach described in this paper using relative size measures is time-consuming but could be rewarding for other (rare) bird species with inconclusive plumage features for which good field photographs are available.

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A list of all analysed photographs and measurement data can be requested from the author or can be found on https://dutchbirding.nl/godwit_bills.

Samenvatting

Meting van relatieve snavellengte van Grutto's van foto's Van 18 januari tot 3 maart 2019 overwinterden twee Grutto's *Limosa limosa* in winterkleed aan de zuidkant van het Bodenmeer nabij Arbon, Thurgau, Zwitserland, en vervolgens tot 15 april 2019 bij het nabijgelegen Fussach, Vorarlberg, Oostenrijk. Beide vogels waren opvallend kortsnavelig en dat deed vermoeden dat het IJslandse Grutto's *L l islandica* betrof; deze ondersoort was nog niet eerder in Zwitserland vastgesteld. Dit geval gaf aanleiding tot een uitgebreide studie waarin van veldfoto's van Grutto's de relatieve snavellengte (snavellengte gedeeld door koplengte) werd gemeten. In totaal werden c 200 foto's van internet geanalyseerd van bevestigde mannetjes en vrouwtjes van nominaat *L l limosa* en *L l islandica*. De data werden geplot in verdelings-

diagrammen die de overlap tussen geslachten en ondersoorten goed laten zien. Ook werden ter vergelijking handmetingen van absolute snavellengtes uit de literatuur geplot in een zelfde diagramtype. De relatieve en absolute metingen van snavellengtes correleerden goed en de metingen van relatieve snavellengtes bleken niet opvallend onnauwkeuriger te zijn dan de handmetingen. Wel waren de onderlinge verschillen tussen de geslachten en ondersoorten bij de relatieve metingen van veldfoto's iets geringer. De reden daarvoor is dat de koplengte van Grutto's waarschijnlijk niet constant is: een Grutto met een langere snavel heeft waarschijnlijk ook een iets langere kop. De relatieve snavellengte van de beide Grutto's van Arbon werd ook van gepubliceerde internetfoto's gemeten en geplot in het verdelingsdiagram. Eén van beide vogels bleek buiten de overlapbereiken van geslachten en ondersoorten te vallen en kon op basis van alleen de snavellengte worden gedetermineerd als mannetje IJslandse. In Fussach ruiden de Grutto's naar zomerkleed. De determinatie als IJslandse kon toen voor beide exemplaren worden bevestigd. Ze zijn aanvaard als het eerste geval voor Zwitsersland en tweede voor Oostenrijk.

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Migrating chiffchaff taxa in the Netherlands: a 10-year genetic study

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Currently, four taxa of the chiffchaff complex are on the Dutch list: nominate Common *Phylloscopus collybita collybita* (hereafter *collybita*), Scandinavian *P c abietinus* (hereafter *abietinus*), Siberian *P tristis* (hereafter *tristis*) and Iberian Chiffchaff *P ibericus*. A pilot study on chiffchaff genetics, using samples collected in 2009-11, provided new insights in taxa migrating through the Netherlands, especially with respect to *tristis* (de Knijff et al 2012). However, several questions remained. For instance, we gained no insights in the – alleged – occurrence of *abietinus*. Here we present a second genetic study, using samples collected in 2012-18. This study confirms previous results and answers several questions – but also poses new ones.

Tristis breeds in eastern Russia (Siberia east of the Urals) and northern Kazakhstan to southern Siberia and northern Mongolia (Gill et al 2021). Along the southern Urals and into Arkhangelsk, Russia, a long but narrow introgression zone between *tristis* and *abietinus* exists (eg, Marova & Leonovitch 1993, Marova et al 2013, Shipilina et al 2018).

Our pilot study showed that, based on mitochondrial DNA (mtDNA) analyses, *tristis* occurs much more frequently in the Netherlands than previously thought: it is a scarce migrant and winterer rather than a rarity. However, the majority of the birds in that study (21 out of 30) had been misidentified by the bird ringers as *abietinus* (de Knijff et al 2012). This error was mainly based on a misinterpretation of identification literature but also because some individuals showed features thought to be outside of the range for *tristis* by, eg, Dean & Svensson (2005).

While 30 birds of the pilot study had *tristis* mtDNA, not a single bird with *abietinus* mtDNA was sampled. So what about *abietinus*? With a range from northern Fennoscandia to north-western Russia (west of the Urals) and south to the Black Sea and northern Iran (Gill et al 2021) and apparently the Balkans (Raković et al 2019), they occur much closer to the Low Countries than *tristis*. Nevertheless, there are no ringing data to support the widely accepted assumption that they migrate through the Netherlands. So far, there are only four ringing recoveries of birds from the *abietinus* breeding range. However, all four were both ringed *and* controlled outside the breeding season (Ringersvereniging & Vogeltrekstation 2021), and therefore there is no certainty about their breeding grounds. Recovery data from surrounding countries are also sparse: both Belgium (Royal Belgian Institute of Natural Sciences 2021) and Britain (Collinson et al 2018) have only two recoveries of chiffchaffs that were trapped within the range of *abietinus* during the breeding season. This raised multiple questions that we try to address in this study. Does *abietinus* occur in the Netherlands in the first place, and if so, how regular, and when? Are ringers able to separate them from *collybita*? Furthermore, we were keen to learn more about the occurrence and temporal distribution of *tristis*. Since the sex ratio of *tristis* in Britain was unbalanced with more males than females trapped (Collinson et al 2018), we also determined the sex of birds trapped.

Methods

All five ringing sites involved in the pilot study also volunteered to participate in this study (figure 1, table 1). In addition, ringers from a few other sites also sent feather material to examine presumed *tristis* individuals. Two to five breast feathers per bird were collected with plastic gloves (in order to avoid contamination with human tissue), stored in small glassine envelopes with the presumed taxon name, ring number, site, date, time, age and measurements written on it.

Our pilot study strongly suggested that ringers had difficulties recognizing *abietinus* as something 'unusual': ringers were apparently unable to tell them apart from *collybita*. In order to increase the chances of sampling *abietinus*, a subset of samples was collected randomly among trapped chiffchaffs (hence: unbiased) by sampling any number of chiffchaffs throughout the autumns of 2012-18 (mainly in 2012-14). Moreover, during these years birds suspected not to be *collybita* were always sampled (usually *tristis*-type birds; biased sampling). We focused on collecting samples during autumn migration – when by far most chiffchaffs

[*Dutch Birding 43: 120-131, 2021*]

172 Scandinavian Chiffchaff / Scandinavische Tjiftjaf *Phylloscopus collybita abietinus,* Meijendel, Zuid-Holland, Netherlands, 3 November 2018 *(Vincent van der Spek/Vrs Meijendel)*

173 Common Chiffchaff / Tjiftjaf *Phylloscopus collybita collybita*, Meijendel, Zuid-Holland, Netherlands, 1 December 2017 *(Vincent van der Spek/Vrs Meijendel).* Grey bird, indistinguishable from Scandinavian Chiffchaff *P c abietinus.*

FIGURE 1 Sites in the Netherlands where chiffchaff *Phylloscopus* feather samples were collected for genetic analysis in 2009-18. Red dots indicate where collection was systematic, blue dots indicate incidental sampling sites. See table 1 for names of sampling sites / Nederlandse locaties waar in 2009-18 veermateriaal van tjiftjaffen *Phylloscopus* is verzameld voor genetische analyse, met in rood vaste onderzoekslocaties en in blauw incidentele monsterlocaties. Zie tabel 1 voor namen van monsterlocaties.

are trapped in the Netherlands – but we also collected a few samples in spring to serve as reference material (eg, from returning Dutch breeders ringed in previous years). At four out of the five main sampling sites (all except Schiermonnikoog, Friesland), tape luring of both *collybita/abietinus* (songs and calls indistinguishable) and *tristis* (songs and calls diagnostic) was used. If time permitted, sampled birds were photographed (complete bird, underparts including legs, head, both sides of wing).

Until 2016, collecting feathers of live birds fell under the Dutch animal testing legislation. The Dutch ringing scheme therefore filed a request to the Animal Experiments Committee (Dier Experimenten Commissie – DEC) responsible for the ethical considerations for animal experiments. The study, which also included other species, was formally approved by the DEC. All ringers participated in a required training course in order to receive a permit to collect feather samples. Due to a change in the law, collecting feather material became possible under regular ringing permits from 2017 onwards.

DNA was isolated from the sampled feathers using Qiagen DNA-isolation columns. For all 474 individuals from 2012-18, a fragment of 309 basepairs (bp) of the mitochondrial cytochrome B-gene (cytB) was sequenced. For 145 (28%) individuals, a cytB fragment of 945 bp (which includes the 309 bp fragment) was also sequenced, predominantly to study the genetic variation among a subset of these individuals with a higher genetic resolution. Chiffchaff taxa are sufficiently discernable in both the 309 bp and the 945 bp mtDNA cytB gene frag-

TABLE 1 Number of samples collected per chiffchaff *Phylloscopus* taxon and site in the Netherlands in 2009-18. *Systematic sampling sites. **Note that Siberian Chiffchaff *P tristis* sampling was biased, whereas other taxa were sampled unbiased. Site numbers refer to locations in figure 1. / Aantal monsters per tjiftjaf *Phylloscopus*-taxon per locatie in 2009-18. *Vaste onderzoeklocaties. **Merk op dat bij Siberische Tjiftjaf *P tristis* bemonstering selectief was terwijl dit bij andere taxa aselect was. Locatienummers verwijzen naar locaties in figuur 1.

Sampling site	***abietinus***	***brevirostris/ caucasicus***	***collybita***	***tristis*** **	**Total**
1 Eemshaven, Groningen				1	1
2 Markelo, Overijssel			1		1
3 Ooijse Graaf, Gelderland			3		3
4 Overdinkel, Overijssel	1		1		2
5 Vlieland, Friesland			1	2	3
6 Vrg Almere, Flevoland*	2		67	7	76
7 Vrs Castricum, Noord-Holland*	6	1	100	58	165
8 Vrs Meijendel, Wassenaar, Zuid-Holland*	6		100	20	126
9 Vrs Schiermonnikoog, Friesland*	4	1	64	6	75
10 Vrs van Lennep, Bloemendaal, Noord-Holland*	3		55	5	63
Total	**22**	**2**	**392**	**99**	**515**

FIGURE 2 MtDNA cytB genetic variation network of 515 trapped Dutch chiffchaffs *Phylloscopus*. Every filled circle represents unique cytB sequence, of which fragment of 309 base pairs was sequenced. Numbers inside circles represent number of times that sequence was observed among 515 individuals, circles without number represent sequences found in one individual only. Short connecting lines mark differences on one position (of maximum of 309) only, longer lines differ in two or more (indicated by numbers along lines) positions. Black dot: not (yet) observed sequence but necessary to construct network. In this short mtDNA fragment, *collybita*, *abietinus*, *tristis* and *brevirostris/caucasicus* can reliably be differentiated. / Netwerk van mtDNA-cytB genetische variatie van 515 in Nederland gevangen tjiftjaffen *Phylloscopus*. Ieder bolletje is unieke cytB-sequentie. Van cytB werd fragment van 309 baseparen gesequenced. Nummer in bolletje: aantal malen dat sequentie is waargenomen bij 515 exemplaren. Ongenummerde bolletjes: sequenties die bij slechts één exemplaar zijn waargenomen. Korte lijntjes tussen bolletjes vertegenwoordigen verschil van één positie (op 309 posities), langere genummerde lijntjes vertegenwoordigen twee of meer (aangegeven door nummer) verschillen. Zwart bolletje: gereconstrueerde sequentie die (nog) niet is waargenomen maar die nodig is om netwerk te tekenen (en berekenen). In dit korte mtDNA-fragment zijn *collybita*, *abietinus*, *tristis* en *brevirostris/caucasicus* betrouwbaar te onderscheiden.

ments. For this reason, we used the shorter 309 bp fragment as a rapid screening tool for all sampled birds. The sequences were compared with those from the 41 individuals of the pilot study (2009-11), rendering a total dataset of 515 individuals (see de Knijff et al 2012). All 515 cytB sequences of 309 bp (accession number MW268029-MW268543) and all 145 cytB sequences of 945 bp (accession number MW268544-MW268688) were deposited in GenBank.

For the temporal distribution of *collybita*, *abietinus* and *tristis*, only birds sampled in autumn were used. In order to calculate the relative abundance of *collybita* and *abietinus*, we only used the data from the random sampling during autumns 2012-14. Since sampling was biased for *tristis*, and since *tristis* can (now) be readily identified in the hand, we calculated the relative abundance for this taxon differently by measuring a ratio between all DNA-confirmed *tristis* among all chiffchaffs trapped (including chiffchaffs not sampled) during the *tristis* migration period in October-November in 2012-14 at the five main ringing sites.

We also tried to identify the sex of each bird using a DNA-based method that targets the avian sex chromosomes (Z and W), using the same PCR primers 2550F/2718R (Fridolfsson & Ellegren 1999) as in Collinson et al (2018).

Results

Genetic variation and sampled taxa

In 2012-18, 474 chiffchaff feather samples were collected. With the 41 samples from 2009-11 added, a grand total of 515 chiffchaffs was analysed (table 1). The vast majority of birds (n=506) was

FIGURE 3 MtDNA cytB genetic variation network of 145 trapped Dutch chiffchaffs *Phylloscopus*. Every filled circle represents unique cytB sequence, of which fragment of 945 base pairs was sequenced. Numbers inside circles represent number of times that sequence was observed among 145 individuals, circles without number represent sequences found in one individual only. Short connecting lines mark differences on one position (of maximum of 945) only, longer lines differ in two or more (indicated by numbers along lines) positions. Black dot: not (yet) observed sequence but necessary to construct network. Compared with shorter 309 bp fragment (figure 2), this longer mtDNA fragment clearly shows that *collybita*, *abietinus*, *tristis* and *brevirostris/caucasicus* have more genetic variation within each taxon and among taxa. / Netwerk van mtDNA-cytB genetische variatie van 145 in Nederland gevangen tjiftjaffen *Phylloscopus*. Ieder bolletje is unieke cytB-sequentie. Van cytB werd fragment van 945 baseparen gesequenced. Nummer in bolletje: aantal malen dat sequentie is waargenomen bij 145 exemplaren. Ongenummerde bolletjes: sequenties die bij slechts één exemplaar zijn waargenomen. Korte lijntjes tussen bolletjes vertegenwoordigen verschil van één positie (op 945 posities), langere genummerde lijntjes vertegenwoordigen twee of meer (aangegeven door nummer) verschillen. Zwart bolletje: gereconstrueerde sequentie die (nog) niet is waargenomen maar die nodig is om netwerk te tekenen (en berekenen). Dit langere mtDNA-fragment laat, in vergelijking met het 309 bp fragment (figuur 2), een duidelijke toename in mate van genetische variatie binnen en tussen *collybita*, *abietinus*, *tristis* en *brevirostris/caucasicus* zien.

sampled in autumn. The remaining birds (n=9) were sampled in January (n=2), March (n=2), April (n=4) and May (n=1). As the genetic networks in figure 2-3 show, *collybita*, *abietinus* and *tristis* were all sampled, as was at least one additional, highly unexpected subspecies: either Turkish Chiffchaff *P c brevirostris* (hereafter *brevirostris*) or Caucasian Chiffchaff *P c caucasicus* (hereafter *caucasicus*). The latter two taxa cannot be differentiated in their mtDNA yet. Either taxon would be new to north-western Europe (see discussion). Birds showing *brevirostris/caucasicus* mtDNA were sampled on Schiermonnikoog on 25 November 2015 and at Castricum, Noord-Holland, on 14 December 2015. With 22 *abietinus* sampled, this taxon is now confirmed to (regularly) occur in the Netherlands.

Temporal distribution in autumn

As expected, *collybita* was sampled throughout August-December, with a peak between mid-September and mid-October (figure 4). The relatively few *abietinus* (n=22) were spread out over the autumn, with a possible peak in October (figure 4). An additional bird was from 1 May. *Tristis* (n=99) was found to arrive late (earliest date: 7 October) with numbers peaking from late October to mid-November (figure 2).

Relative abundance

Since *collybita* and *abietinus* were sampled randomly at five locations in the autumns of 2012-14, we could calculate an approximate ratio of occurrence for the two (table 2). About one in every 18 autumn chiffchaffs (5.6%) appeared to be *abieti-*

FIGURE 4 Trapping numbers per autumn week of four chiffchaff taxa in the Netherlands in 2009-18: Common Chiffchaff *Phylloscopus collybita collybita* (n=351), Scandinavian Chiffchaff *P c abietinus* (n=22), Siberian Chiffchaff *P tristis* (n=99) and Turkish/Caucasian Chiffchaff *P c brevirostris/caucasicus* (n=2) / vangstaantallen per najaarsweek van vier tjiftjaftaxa in 2009-18: Tjiftjaf *Phylloscopus collybita collybita* (n=351), Scandinavische Tjiftjaf *P c abietinus* (n=22), Siberische Tjiftjaf *P tristis* (n=99) en Turkse/Caucasische Tjiftjaf *P c brevirostris/caucasicus* (n=2)

nus (302 *collybita* and 18 *abietinus;* these calculations exclude *tristis*). The *tristis* data as shown in table 1 is biased, since birds showing *tristis* features ('suspicious birds') were disproportionately sampled. However, we made a rough estimate of its relative abundance during autumn for the same five sites (table 2) during the autumns of 2012-14. In these three years, an autumn total of 4145 chiffchaffs sensu lato were ringed at the five participating sites. Of these, 40 individuals (0.96%) were identified as *tristis* by means of mtDNA. If we focus on the peak migration of *tristis* (October-November), a total of 1916 chiffchaffs sensu lato were ringed, of which, again, 40 individuals (2.1%) were identified as *tristis* by means of mtDNA.

Sex ratios

DNA-sexing of birds is not always straightforward. We were able to reliably sex 454 (88.1%) of the 515 birds (table 3). Failure (n=61) was either due to inconclusive results, or test failure. Of the successfully sexed birds, 66% were males. These male frequencies were 66% for *collybita*, 85% for *abietinus*, 56% for *tristis* and 50% for *brevirostris/caucasicus*.

Discussion

Siberian Chiffchaffs and Scandinavian Chiffchaffs

The results of this study confirm the status of *tristis* as a perhaps scarce but nevertheless regular migrant, occurring in a frequency of 1-2% of all chiffchafs in autumn. Although this was long assumed to be the case, our study offers the first actual evidence (genetic or otherwise) that *abietinus* occurs in the Netherlands. This matches recent findings in Britain and Ireland (Collinson et al 2018). Although the number of sampled birds in our study is fairly low, *abietinus* does not seem to be rare, nor does it seem to be restricted to certain periods during autumn migration. It occurs in a frequency of c 5% of all autumn chiffchafs. The relatively low number of *abietinus* sampled might be due to differences in migration patterns. In Sweden, where both *collybita* and *abietinus* occur, ringing recoveries suggest that *abietinus* has an eastern component in their migration, whereas *collybita* seems to take a more western route (Lindström et al 2007).

This study again confirms that even the keenest of ringers are not capable of identifying *abietinus* in the hand: they appear to be indistinguishable from *collybita*. Both with respect to plumage and biometrics, there seem to be no diagnostic fea-

TABLE 2 Number of chiffchaffs *Phylloscopus* ringed and sampled per month at five major ringing sites in the Netherlands in autumns of 2012-14. Site numbers correspond with those in figure 1 and table 1. / Aantal tjiftjaffen *Phylloscopus* geringd en bemonsterd per maand op vijf belangrijke ringlocaties in Nederland in najaren van 2012-14. Locatienummers komen overeen met die in figuur 1 en tabel 1.

Site	Ringed/DNA/Taxon	Aug	Sep	Oct	Nov	Dec	Oct+Nov	Total
6 Almere	Ringed: all	36	133	49	5	3	54	226
	DNA: *abietinus*	0	1	1	0	0	1	2
	DNA: *collybita*	3	42	12	0	2	12	59
	DNA: *tristis*	0	0	0	0	1	0	1
	DNA: all	3	43	13	0	3	13	62
7 Castricum	Ringed: all	92	463	681	162	1	843	1399
	DNA: *abietinus*	0	0	3	2	0	5	5
	DNA: *collybita*	1	25	36	12	0	48	74
	DNA: *tristis*	0	0	8	13	0	21	21
	DNA: all	1	25	47	27	0	74	100
8 Meijendel	Ringed: all	74	221	251	132	0	383	678
	DNA: *abietinus*	0	0	5	0	0	5	5
	DNA: *collybita*	0	49	26	6	0	32	81
	DNA: *tristis*	0	0	9	2	0	11	11
	DNA: all	0	49	40	8	0	48	97
9 Schiermonnikoog	Ringed: all	553	437	229	47	1	276	1267
	DNA: *abietinus*	0	0	4	0	0	4	4
	DNA: *collybita*	6	14	30	4	0	34	54
	DNA: *tristis*	0	0	4	0	0	4	4
	DNA: all	6	14	38	4	0	42	62
10 van Lennep	Ringed: all	27	188	271	89	0	360	575
	DNA: *abietinus*	0	1	0	0	1	0	2
	DNA: *collybita*	0	16	16	2	0	18	34
	DNA: *tristis*	0	0	2	1	0	3	3
	DNA: all	0	17	18	3	1	21	39
All five	Ringed: all	782	1442	1481	435	5	1916	4145
	DNA: *abietinus*	0	2	13	2	1	15	18
	DNA: *collybita*	10	146	120	24	2	144	302
	DNA: *tristis*	0	0	23	16	1	39	40
	DNA: all	10	148	156	42	4	198	360

TABLE 3 Sex ratio of chiffchaffs *Phylloscopus* trapped in the Netherlands in 2009-18 (n=454). Binomial test, p-values for null hypothesis of equal sex ratio; p<0.05 reject null hypothesis (in bold in table). / Sekseverhouding van gevangen tjiftjaffen *Phylloscopus* in Nederland in 2009-18 (n=454). Binomiale toets, p-waarden voor nulhypothese van gelijke sekseverhouding; p<0.05 verwerpt nulhypothese (vet in tabel).

Taxon	Male	Female	Total	% male	p
abietinus	18	3	21	86%	**0.001**
brevirostris/caucasicus	1	1	2	50%	–
collybita	241	121	362	67%	**$2*10^{-10}$**
tristis	39	30	69	57%	0.3
Total	299	155	454	66%	**$8*10^{-12}$**

174 Siberian Chiffchaff / Siberische Tjiftjaf *Phylloscopus tristis,* Meijendel, Zuid-Holland, Netherlands, 19 October 2014 *(Vincent van der Spek/Vrs Meijendel)*. Identification in field confirmed by mtDNA-analyses. Diagnostic call heard when removed from net but not recorded. Note how warm morning sunlight influences its colours.

175 Siberian Chiffchaff / Siberische Tjiftjaf *Phylloscopus tristis,* Meijendel, Zuid-Holland, Netherlands, 17 November 2017 *(Vincent van der Spek/Vrs Meijendel)*. Classic bird on plumage, and diagnostic calls also recorded.

176 Chiffchaff / tjiftjaf *Phylloscopus*, Meijendel, Zuid-Holland, Netherlands, 25 November 2017 *(Vincent van der Spek/Vrs Meijendel)*. Based on mtDNA, this is Siberian Chiffchaff *P tristis* but it consistently uttered Common/Scandinavian Chiffchaff *P collybita collybita/abietinus*-like calls. Future full genome study will investigate whether this bird has mixed genes. **177** Turkish/Caucasian Chiffchaff / Turkse/Caucasische Tjiftjaf *Phylloscopus collybita brevirostris/caucasicus*, Castricum, Noord-Holland, Netherlands, 14 December 2015 *(Jan van Leeuwen)*. See main text for additional information.

tures. Previously, it was shown that very long-winged birds having measurements (formerly) thought to be (nearly) outside the range for nominate *collybita* and within those for *abietinus* (eg, Svensson 1992, Demongin 2016) nonetheless showed cytB sequences of *collybita* (de Knijff et al 2012, Collinson et al 2018). This strongly suggests that wing measurements on their own are not a decisive feature to identify *abietinus*. A sigh was nearly palpable when Collinson et al (2018) suggested that had it not been for genetic differences (Helbig et al 1996), a proposal to treat these two taxa as conspecific would not be far fetched. We wholeheartedly support this contemplation.

Since the pilot study, the participating ringers certainly learnt a lot about *tristis* identification: they hardly made any mistakes during the follow-up. All but one of the birds with *tristis* mtDNA were correctly identified in the field. The one intriguing exception was sampled at Meijendel, Zuid-Holland, on 25 November 2017 (ring Arnhem AJP645). It mostly looked like a *tristis*, although something was a bit off. Perhaps there was a trifle too much yellow on the underwing, or was it the legs that were dark brown rather than ink-black? While the ringer was in doubt about the identification, the bird started calling. The (recorded) calls sounded like a typical *collybita/abietinus* and nothing like the diagnostic calls of *tristis*. Confused, the bird was left unidentified by the ringer. Surprisingly, the DNA results showed a *tristis* cytB sequence (van der Spek 2018). A similar case has been reported in Britain (Collinson et al 2018).

Vice versa, only four birds identified as *tristis* in the field appeared to be misidentified based on mtDNA. Perhaps surprisingly for some, three had the mtDNA of *collybita* and only one of *abietinus*. As also described by Collinson et al (2018), the occurrence of unusually grey *collybita* without traces of yellow and with restricted olive tones and somewhat warm-coloured cheeks are an unexpected identification pitfall (see also van der Spek 2017). However, do not let these exceptions – because that is what they are, exceptions – put anyone off: for the keen ringer and birder alike, *tristis* usually is a readily identifiable bird on plumage alone.

Mixed genes?

In our pilot study, some birds with *tristis* mtDNA did not completely match the 'classic image' of this taxon (cf Dean & Svensson 2005). Some experts have suggested that these 'odd' birds could in fact have mixed genes (Shipilina et al 2017; Alan Dean in litt). MtDNA only reveals genetic information from the maternal line, and therefore does not necessarily reflect an individuals' complete ancestral story. Shipilina et al (2017) reported gene flow between *abietinus* and *tristis* in the long but narrow contact zone in the southern Urals and they indicated that *tristis* mtDNA dominates among the hybrids within the contact zone. Like Marova et al (2017), they presented descriptions of hybrids. However, as there are no photographs or sound recordings available, and since these birds were studied in late spring and early summer (while ours are from autumn), we were unable to make plumage comparisons. So for now, we simply do not know if mixed genes are involved in some or all of these cases (but see Remaining questions).

Brevirostris or caucasicus: chiffchaffs from the south-east

Then there is the curious case of the sampled *brevirostris/caucasicus*. Reliable means to separate *caucasicus* (breeding in Georgia, Armenia and north-western Iran) from *brevirostris* (breeding in Turkey) (Gill et al 2021) on DNA are not yet available but a new whole mtDNA-genome DNA-based assay to separate the two is in development and will probably allow us to identify which taxon was involved in the near future. Another chiffchaff with *brevirostris/caucasicus* mtDNA was sampled on Helgoland, Schleswig-Holstein, Germany, on 8-11 December 2015 (unpublished own data). On the latter site, a 'sad' call type that in theory matches either of these south-eastern subspecies was heard but unfortunately not recorded (Jochen Dierschke in litt). So quite remarkably, during the late autumn of 2015, no less than three individuals of a highly unexpected subspecies were trapped in north-western Europe, where neither taxon had previously been recorded. These birds may shed light on a field sighting of a cryptic chiffchaff at Lauwersmeer, Groningen, the Netherlands, on 21-28 February 2015. Intriguingly, at the time one observer (Rik Winters) mentioned that its calls best matched *brevirostris*. We do know now that it is not far-fetched to have chiffchaff subspecies from the south-east of the Western Palearctic on the radar as potential vagrants to north-western Europe.

Sex ratios

In Britain and Ireland, the sex ratio among sampled *collybita* was close to equal, whereas it was male biased in *tristis* (Collinson et al 2018). For our study, four out of five sites used calls and/or song to lure chiffchaffs. It is known that in some species males react more strongly to tape luring than fe-

males, and this effect has even been specifically shown in chiffchaffs (Lecoq & Catry 2003). Tape luring could therefore be a good explanation for the over-representation of males in our study. However, on Schiermonnikoog no tape luring was used. The numbers of sampled *abietinus* (n=4) and *tristis* (n=6) at this site are too low for analysis but in 60 *collybita*, 37 birds were males (62%), which is not significantly different from an equal sex ratio (binomial test, p=0.09), as well as not significantly different from the percentage of males (68%) among all sexed *collybita* (n=302) at the remaining sites (two-proportions z-test, p=0.40). So, while tape luring was previously shown to have a significant impact, it does not give a satisfactory explanation for the biased sex ratio in this study. For now, we can only guess what other reasons lie beneath the measured ratios.

Remaining questions

Currently, we are working on the analyses of the entire nuclear genome of the existing *abietinus* and *tristis* samples. This could shed light on the hypothesis that at least some of the sampled *tristis* in the Netherlands are admixed with *abietinus*. Of special interest in this context will be the aforementioned cases of the bird with *tristis* mtDNA but with *collybita/abietinus* calls, and the birds that show plumage features generally not considered 'acceptable' for *tristis*. Photographs of more sampled *tristis* and *abietinus* at Meijendel can be found at www.turnstones.org/tristis-proof.

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Samenvatting

Doortrekkende tjiftjaf-taxa in Nederland: een 10-jarige genetische studie In de periode 2009-11 werd op vijf ringlocaties in Nederland een verkennende studie gedaan naar de genetica van tjiftjaffen: Tjiftjaf *Phylloscopus collybita collybita*, Scandinavische Tjiftjaf *P c abietinus* en Siberische Tjiftjaf *P tristis*. Van verdachte vogels (dus vogels waarvan vermoed werd dat het niet de nominaat *collybita* betrof) werden borstveertjes verzameld voor een mtDNA-analyse. Siberische bleek daarbij algemener dan gedacht: een schaarse soort en geen dwaalgast. Veel Siberische waren door de ringers in het veld echter als Scandinavische gedetermineerd. Dat het onderzoek geen enkele genetische Scandinavische opleverde gaf te denken: blijkbaar zagen ringers niets bijzonders aan deze vogels en konden ze deze dus niet van de nominaat onderscheiden. Dit was aanleiding voor een vervolgstudie. Daarbij werden op dezelfde vijf locaties opnieuw veertjes verzameld maar dit keer gebeurde dat willekeurig (data zonder bias). Daarnaast werden wederom zo veel mogelijk 'verdachte' vogels bemonsterd (data met bias). In 2012-18 werden van 474 tjiftjaffen veertjes verzameld, voornamelijk in het najaar. Met 41 monsters uit 2009-11 daarbij opgeteld zijn daarmee in 10 jaar 515 tjiftjaffen genetisch geanalyseerd.

In de vervolgstudie in 2012-18 werd het eerste bewijs geleverd dat Scandinavische Tjiftjaf inderdaad in Nederland voorkomt (n=22). Ze komen verspreid over het najaar voor; de verhouding Scandinavische versus nominaat *collybita* is c 1:18. Ook na 2012 bleken ringers niet in staat om Scandinavische van de nominaat te onderscheiden. Met identieke geluiden, een niet-onderscheidend kleed en zonder diagnostische maten lijkt het logisch deze taxa als 'consubspecifiek' te beschouwen – ware het niet dat ze als groep genetisch van elkaar zijn te onderscheiden. Het eerder ontstane beeld van Siberische Tjiftjaf (n=99) werd in de vervolgstudie bevestigd. Deze arriveert als laatste van de drie, met de vroegste genetisch bewezen vogel op 7 oktober. Ruim 2% van alle geringde (dus inclusief niet bemonsterde) tjiftjaffen bleek in oktober-november 2012-14 een Siberische te zijn. Ringers hadden geleerd van de verkennende studie, want ze waren nu wél in staat om dit taxon te herkennen: alle op kleed geïdentificeerde Siberische bleken dat op één uitzondering na ook op basis van mtDNA te zijn. Uitzondering was een vogel met (goeddeels) het uiterlijk van een Siberische maar met de (opgenomen) roep van een nominaat of Scandinavische. De vogel kreeg van de ringer geen taxon toegewezen maar had het mtDNA van een Siberische. Een dergelijk geval werd eerder ook in Engeland vastgesteld. Van alle locaties tezamen waren er daarnaast vier foutief als Siberische gedetermineerde vogels, die op basis van hun genetische informatie een ander taxon betroffen. Eén vogel bleek een Scandinavische, de andere drie betroffen een nominaat. Blijkbaar – en ook dit was in Brittannië al vastgesteld – komen er soms grijze nominaat Tjiftjaffen voor, die weinig of zelfs geen geel- en groentinten hebben, een nog onbekende determinatie-uitdaging. Dit zijn echt uitzonderingen en de foutmarge is klein: nagenoeg altijd is voor waarnemers met enige ervaring (zoals de ringers in dit project)

Siberische uitstekend op uiterlijk te herkennen. Het horen van de roep is daar niet voor nodig.

Bijzonder verrassend waren twee vangsten van de ondersoort *P c brevirostris* (Turkse Tjiftjaf) of *P c caucasicus* (Kaukasische Tjiftjaf) in het late najaar van 2015 (met een derde op Helgoland, Schleswig-Holstein, Duitsland). Een toetsmethode om deze twee nauw verwante taxa genetisch van elkaar te onderscheiden is nog in ontwikkeling. Hoewel onverwacht is het goed om zuidoostelijke ondersoorten op de radar te hebben als mogelijke dwaalgast in Noordwest-Europa.

Van alle taxa tezamen bleek op basis van een genetische analyse twee derde een mannetje. Deze disbalans kan samenhangen met het afspelen van geluid (van zowel de nominaat als Siberische Tjiftjaf) op vier van de vijf studielocaties. Bij tjiftjaffen is eerder aangetoond dat mannetjes daar sterker op reageren dan vrouwtjes. Op de vijfde locatie (Schiermonnikoog, Friesland) is echter geen geluid gebruikt, van geen enkele zangvogel. Het aandeel mannetjes was daar maar iets lager en wijkt niet heel sterk af zodat er geen volledige verklaring is gevonden voor de afwijkende sekseverhouding.

MtDNA vertelt alleen het genetische verhaal van de moederlijn en geeft daarmee dus geen compleet beeld. In een vervolgstudie met gebruik van het huidige materiaal zal daarom het volledige genoom bekeken worden (nDNA) van alle Scandinavische Tjiftjaffen en Siberische Tjiftjaffen, alsmede van de zuidoostelijke vogels, zodat ook genetische informatie van de vaderlijke lijn wordt verkregen. Dan wordt duidelijk of in Nederland ook vogels komen uit de smalle hybridisatiezone tussen Scandinavische en Siberische. Zeker de vogels die vanwege enkele opvallende uiterlijke kenmerken of een 'verkeerde' roep discussie opriepen over hun zuiverheid zijn dan interessant.

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Stejnegers Roodborsttapuiten op Texel in oktober 2012 en op Vlieland in oktober 2016 en oktober 2017

Enno B Ebels, Henri Bouwmeester, Lars Buckx, Nils van Duivendijk, Arjan Dwarshuis, Peter de Knijff & Diederik Kok

In oktober 2012 verbleef gedurende meer dan twee weken een Stejnegers Roodborsttapuit *Saxicola stejnegeri* op de noordpunt van Texel, Noord-Holland. De identiteit van deze vogel werd (pas) bevestigd op basis van DNA-analyse nadat aantoonbaar dezelfde vogel in Engeland was geringd. Het betrof het eerste geval voor Nederland. In oktober 2016 en oktober 2017 volgden het tweede en derde geval, beide op Vlieland, Friesland. In dit artikel worden de drie gevallen gedocumenteerd en wordt ingegaan op de determinatie van dit tot voor enkele jaren weinig bekende taxon.

Texel, 8-23 oktober 2012

In de ochtend van maandag 8 oktober 2012 was Diederik Kok aan het vogelen op de noordpunt van Texel. Bij het 'Renvogelveld' aangekomen ontdekte hij aan de overzijde van het veld een lichte zangvogel. DK herkende de vogel als 'Aziatische Roodborsttapuit' *S maurus* en waarschuwde andere vogelaars in de buurt. De determinatie in vergelijking met Roodborsttapuit *S rubicola* (hierna *rubicola*) was eenvoudig maar het was geen typische *maurus*, want de bovendelen waren vrij donker, de stuit was opvallend diep oranje-zeemkleurig, contrasterend met een zwartachtige staart, en er was nauwelijks een wenkbrauwstreep aanwezig. Hij werd voor het laatst waargenomen en gefotografeerd op 23 oktober (de melding van een *maurus* op 25 oktober in de 500 m verderop gelegen 'Tuintjes' betrof op basis van kleedkenmerken een ander exemplaar). Vooral tijdens het Dutch Birding-vogelweekend op 13 en 14 oktober trok hij veel bekijks en tijdens zijn verblijf werd hij door meer dan 300 vogelaars gezien. De opvallende witachtige randen aan de handdekveren met een iets bredere witte top duidden op een eerstekalenderjaar en het doorschijnende zwart op de teugel en wang en de zwartachtige oksel en ondervleugeldekveren duidden op een mannetje.

In die periode las DK een bijdrage op Birding Frontiers (www.birdingfrontiers.com) over een *maurus* op Shetland, Schotland, waarbij werd aangekaart hoe Stejnegers Roodborsttapuit (hierna *stejnegeri*) in Europa van *maurus* kon worden onderscheiden. De vogel van Texel leek donker ge-

178 Stejnegers Roodborsttapuit / Stejneger's Stonechat *Saxicola stejnegeri*, eerste-winter mannetje, Renvogelveld, De Cocksdorp, Texel, Noord-Holland, 8 oktober 2012 *(Diederik Kok)*

179 Stejnegers Roodborsttapuit / Stejneger's Stonechat *Saxicola stejnegeri*, eerste-winter mannetje, Renvogelveld, De Cocksdorp, Texel, Noord-Holland, 10 oktober 2012 *(Ipe Weeber)*

180-181 Stejnegers Roodborsttapuit / Stejneger's Stonechat *Saxicola stejnegeri*, eerste-winter mannetje, Renvogelveld, De Cocksdorp, Texel, Noord-Holland, 10 oktober 2012 *(Jos van den Berg/birdingtexel.com)* **182** Stejnegers Roodborsttapuit / Stejneger's Stonechat *Saxicola stejnegeri*, eerste-winter mannetje, Portland Bill, Dorset, Engeland, 25 oktober 2012 *(Martin Cade)*. Zelfde vogel als in plaat 178-181 / same bird as in plate 178-181.

noeg voor *stejnegeri* maar er waren onvoldoende handvatten bekend om dit taxon in het veld te determineren. Opvallend was hoe de vogel onder verschillende waarnemingsomstandigheden een verschillende indruk kon maken, wat vooral de algemene indruk wat betreft kleur beïnvloedde (vaak vrij donker en intens gekleurd overkomend, soms weer lichter en bleker). Dit is ook terug te zien op de foto's.

Een aanvankelijk als *maurus* gedetermineerde roodborsttapuit te Portland Bill, Dorset, Engeland, op 24-26 oktober (geringd op 25 oktober) werd door Paul Leader uit Hongkong, China, op basis van foto's gedetermineerd als potentiële *stejnegeri*, met name vanwege de relatief donkere bovendelen en scherp afgetekende lichte keelvlek. Eenmaal gevangen bleken de maten geen uitsluitsel te geven maar DNA-analyse van een veer door Martin Collinson bevestigde enige tijd later de determinatie als *stejnegeri* (https://tinyurl.com/y9lhz8m4). De gelijkenis tussen de vogel van Portland Bill en die van Texel was opvallend. Martin Garner was de eerste die opperde dat het hetzelfde exemplaar kon zijn. Een gedetailleerde fotoanalyse door Nils van Duivendijk toonde op basis van kleine beschadigingen op individuele veren aan dat het inderdaad hetzelfde exemplaar betrof. Dit betekende dat de vogel tussen 23 oktober om 18:30 (laatste waarneming Texel) en 24 oktober om 16:00 (eerste waarneming Portland Bill; lokale tijd) minimaal 584 km had afgelegd (Kok 2012).

De vogel van Texel en Portland Bill werd aanvaard als eerste geval voor zowel Nederland als Brittannië (Cade & Collinson 2015, Haas et al 2015). Het is de eerste dwaalgast in Nederland die op basis van in het buitenland verkregen DNA gedetermineerd kon worden.

Beschrijving

De beschrijving is gebaseerd op notities van DK en foto's van onder meer DK, Eric Menkveld en Ipe Weeber (cf Dutch Birding 34: 427, plaat 604, 2012; www.dutchbirding.nl, www.waarneming.nl) en op de gepubliceerde gegevens in Cade & Collinson (2015).

GROOTTE & BOUW Niet duidelijk verschillend van *rubicola*. Snavel relatief dik en stomp, met vooral basis hoog en breed; op sommige foto's opvallend. Handpenprojectie vrij lang, c 80% van zichtbaar deel van tertials. Staartpennen puntig.

KOP Net als bovendelen donkere indruk makend. Kruin bruin met donkere veercentra en lichte oranje zweem in bruin (maar minder opvallend dan op bovendelen). Zijkop egaal en met onopvallende wenkbrauwstreep. Onder sommige waarnemingshoeken zwakke aanzet van lichte wenkbrauwstreep zichtbaar. Zwart doorschijnend op gezicht (teugel en wang).

BOVENDELEN Duidelijk bruinig, donkerder en verzadigd zwakke oranje tint, zonder typische koude zandkleurige of bleek geeloranje tinten van *maurus*. Kleur van veerranden variërend van oranjebruin tot bleekoranje. Indruk van bovendelen sterk variërend met lichtomstandigheden, maar nooit zo licht en bleekoranje als bij typische *maurus*. Relatief weinig contrast tussen lichte veerranden en zwarte veercentra. Bovendelen 'overall' donker, enigszins 'smokey' overkomend en daarin herinnerend aan Roodborsttapuit van de ondersoortgroep *S r hibernans/rubicola*. Stuit van afstand reeds opvallend als groot opvallend oranje veld. Stuit en bovenstaartdekveren ongetekend, effen oranje. Bovenzijde van stuit iets lichter van kleur. Geen donkere schachtstrepen of andere duidelijke tekening op deze veren (op sommige foto's diffuus donkerder centrum zichtbaar op enkele bovenstaartdekveren; mogelijk staartpennen door bovenstaartdekveren heen schemerend). Stuitvlek relatief hoog oplopend en daarmee groot veld vormend (als bij *maurus*), in grootte duidelijk verschillend van *hibernans/rubicola*. Stuit opvallend contrasterend met zwartachtige staart en duidelijk kleurcontrast vormend met bleke flank.

ONDERDELEN Lichte indruk makend met bleekoranje tot zalmkleurig zweem, aansterkend tot duidelijke oranje zweem op borst en contrasterend met geheel witachtige keel. Oranje tekening op borst brede en hoge borstband vormend. Onderdelen 'schoon', zonder diffuse grijzige streping op achterflank.

VLEUGEL Zwartachtig met opvallend licht bleekoranje paneel gevormd door lichte randen aan armpennen en tertials. Lichte randen aan zwartachtige grote dekveren bleekoranje tot zalmkleurig. In vlucht witte velden zichtbaar op binnenste dekveren op bovenvleugel. Ondervleugeldekveren en oksel in vlucht zwartachtig ogend.

STAART Staartpennen donker, met witte rand aan top.

NAAKTE DELEN Snavel, poot en oog zwart.

GELUID Niet gehoord.

GEDRAG Als *rubicola*: actief jagend vanaf lage struikjes op vliegende insecten; soms lange perioden uit beeld.

Vlieland, 9 oktober 2016

Op 9 oktober 2016 om 09:15 werd door Marc van der Aa, Henri Bouwmeester en Holmer Vonk een donker ogende roodborsttapuit geringd op de ringbaan in de Kroonspolders op Vlieland; MvdA en HB zagen gelijk dat het geen gewone Roodborsttapuit was. De vogel werd geringd, gemeten, gewogen en gefotografeerd en er werden enkele lichaamsveertjes verzameld voor DNA-analyse door Peter de Knijff. Jeroen Breidenbach en Merel Zweemer waren te gast op de ringbaan en konden hem ook bekijken en fotograferen. Hij werd gedetermineerd als eerste-winter mannetje *stejnegeri* op basis van de contrasterende lichte keel, oranjekleurige onderdelen, oranjekleurige stuit doorspekt met wit, langste bovenstaartdekveren met

183-185 Stejnegers Roodborsttapuit / Stejneger's Stonechat *Saxicola stejnegeri*, eerste-winter mannetje, Kroonspolders, Vlieland, Friesland, 9 oktober 2016 *(Merel Zweemer)* **186** Stejnegers Roodborsttapuit / Stejneger's Stonechat *Saxicola stejnegeri*, eerste-winter mannetje, Kroonspolders, Vlieland, Friesland, 9 oktober 2016 *(Henri Bouwmeester)*

donkere schacht, zwarte oksels en relatief brede snavel. Om c 10:00 werd hij losgelaten en hij landde verderop in het gebied (https://ringersdagboek-henri.blogspot.com/2016_10_09_archive.html). Ondanks zoekpogingen dezelfde middag en de volgende dag werd hij niet meer teruggevonden.

Beschrijving

De beschrijving is gebaseerd op notities van MvdA, HB en HV en op foto's van HB en MZ (cf Dutch Birding 38: 477, plaat 726, 2016).

GROOTTE & BOUW Niet duidelijk verschillend van *rubicola*. Staartpennen puntig.

KOP Kruin bruin, met fijne donkere streepjes. Wenkbrauwstreep niet of nauwelijks aanwezig. Teugel en oorstreek bruin. Keel licht. Achterhoofd lichtbruin en zwart gevlekt.

BOVENDELEN Mantel met bruine grondkleur en zwarte schachtstrepen. Bovenste schouderveren zwart met lichtbruine tot crèmekleurige randen; onderste schouderveren als mantel. Rug als mantel, lichtbruin tot crèmekleurig. Stuit dieporanje, naar bovenstaartdekveren toe lichter wordend.

ONDERDELEN Borst en buik oranje, meest intensief op bovenborst. Onderstaartdekveren lichter bleekoranje. Flank uniform oranje met ter hoogte van poot enkele kleine donkere vlekjes.

VLEUGEL Buitenste dekveren en duimvleugel zwart met witte randen. Binnenste dekveren wit, veld vormend,

vooral in vlucht zichtbaar. Handdekveren zwart met smalle lichte rand. Tertials zwart met bleekoranje rand, bovenste tertial met witte rand. Slagpennen zwartachtig. Ondervleugel met grote donkergrijze okselvlek waarvan centrum volledig zwart. Onderzijde van slagpennen met vrijwel witte basis.
STAART Bovenstaartdekveren lichtbruin met crèmekleurige zweem, lichter dan rug. Meerdere bovenstaartveren met zwart centrum. Staartpennen donker, met witte rand aan top.
NAAKTE DELEN Oog zwart. Snavel zwart. Poot gitzwart.
GELUID Niet gehoord.
BIOMETRIE Vleugellengte 68 mm; staartlengte 46 mm; tarsus 21.8 mm. Snavelbreedte ter hoogte van neusgat 4.6 mm. Vetgraad 3. Vliegspierontwikkeling 5. Gewicht 12.9 g.

Vlieland, 16-17 oktober 2017

Op maandag 16 oktober 2017 rond 12:30 ontdekten Lars Buckx en Arjan Dwarshuis op de noordoostpunt van Vlieland een spannende roodborsttapuit. In het gebied bevonden zich verschillende Roodborsttapuiten maar dit exemplaar viel op door de effen, lichtoranje en ongestreepte onderdelen, witte keel zonder enige donkere tekening (duidelijk afgescheiden van de lichtoranje bovenborst), lichtere kop en meer opvallende wenkbrauwstreep. In vlucht trokken de warmoranje, ongetekende bovenstaartdekveren en lichte ongetekende stuit de aandacht. Ook viel op dat de vogel een relatief dikke snavel had. Door deze set aan kenmerken determineerden ze hem als waarschijnlijke *stejnegeri*. Ze verstuurden enkele back-of-camera-shots naar NvD, die snel instemde met de determinatie als vermoedelijk eerste-winter vrouwtje *stejnegeri*. Geslacht en leeftijd werden gebaseerd op de lichte ondervleugeldekveren en de opvallende lichte handpen- en tertialtoppen en tertialranden. Ze slaagden erin een vers poepje te verzamelen onder de struik waar hij zich geruime tijd in bevond; het monster werd opgestuurd naar PdK. Enkele vogelaars die het eiland net hadden verlaten keerden terug met de middagboot en Lonnie Bregman en Enno Ebels staken later in de middag over met de reguliere watertaxi. De vogel liet zich tot donker zien en fotograferen door ruim 15 vogelaars. De volgende dag was hij nog aanwezig en maakten nog eens c 25 vogelaars de oversteek (Buckx et al 2017).

Beschrijving

De beschrijving is gebaseerd op foto's van Roelof de Beer, Julian Bosch, LB, Jurriën van Deijk en Sven Valkenburg.

GROOTTE & BOUW Postuur vergelijkbaar met *rubicola* maar snavel en met name snavelbasis verhoudingsgewijs dikker en handpenprojectie fractie langer dan bij *rubicola*.
ALGEHELE INDRUK Opvallend bleker ogend dan aanwezige eerstejaars *rubicola* maar met name kop en bovendelen donkerder ogend dan bekende beeld van eerstejaars *maurus*.
KOP Tekening als eerstejaars vrouwtje *rubicola* maar fractie lichter en met opvallendere lichte wenkbrauwstreep, vooral recht en schuin van voren opvallend (goed zichtbaar op foto's). Wenkbrauwstreep redelijk ver achter oog doorlopend, sterk contrasterend met rest van kop. Kruin met fijne donkerbruine streepjes op lichtoranje grondkleur; teugel, oogstreep en oorstreek zelfde kleur bruin als kruin. Keel ongetekend wit en scherp contrasterend met lichtoranje bovenborst en rest van onderdelen.
BOVENDELEN Mantel en nek zelfde kleur en tekening als kruin (fijne donkere bruine streping op lichtoranje grondkleur) en daarin overgaand. Stuit ongestreept, zeer licht oranje en sterk contrasterend met onderrug.
ONDERDELEN Lichtoranje. Geen enkele donkere tekening (streping) op onderdelen.
VLEUGEL Opvallend licht veld in vleugel, veroorzaakt door sterk contrasterende lichte randen van tertials en armpennen. Handpennen egaal donker en met vage lichte randjes en opvallende lichte kleine top. Duimvleugel opvallend donker met sterk contrasterende smalle lichte rand.
STAART Bovenstaartdekveren duidelijk donkerder oranje dan stuit, ongestreept en contrasterend met lichtere stuit. Rest van staart bruinzwart met fijne lichte omranding van staartpennen en contrasterende lichte top, vooral in vlucht opvallend. Donkere staart sterk contrasterend met bovenstaartdekveren en stuit.
NAAKTE DELEN Poot en snavel donker bruin tot zwart. Oog donker.
GELUID Niet vastgesteld.
GEDRAG Redelijk schuw en vliegerig, zich soms over afstand van c 200 m verplaatsend. Soms minder schuw en dan tot c 8 m te benaderen. Daarnaast regelmatig lange tijd op één plek open en bloot zittend.

Determinatie

De determinatie van Stejnegers Roodborsttapuit staat nog voor een belangrijk deel in de kinderschoenen en heeft pas in recente jaren meer aandacht gekregen, getriggerd door de verkregen soortstatus en de recente door DNA-analyse bewezen gevallen in Europa. De belangrijkste publicaties zijn Garner & Scally (2014) en Hellström & Norevik (2014); zie ook Corso (2001), Urquhart & Bowley (2002) en Hellström & Wærn (2005), en Moores (2012) voor foto's van *stejnegeri* uit Korea. Doordat inmiddels een klein aantal vogels in Europa mede aan de hand van DNA-analyse is gedetermineerd, ontstaat er steeds meer beeld van de uiterlijke kenmerken van *stejnegeri*. Met de huidige stand van kennis zijn deze morfologische en biometrische kenmerken nog onvoldoende betrouwbaar om roodborsttapuiten zonder onder-

187 Stejnegers Roodborsttapuit / Stejneger's Stonechat *Saxicola stejnegeri*, eerste-winter vrouwtje, Oostpunt, Vlieland, Friesland, 16 oktober 2017 *(Julian Bosch)* **188** Stejnegers Roodborsttapuit / Stejneger's Stonechat *Saxicola stejnegeri*, eerste-winter vrouwtje, Oostpunt, Vlieland, Friesland, 16 oktober 2017 *(Lars Buckx)* **189** Stejnegers Roodborsttapuit / Stejneger's Stonechat *Saxicola stejnegeri*, eerste-winter vrouwtje, Oostpunt, Vlieland, Friesland, 17 oktober 2017 *(Rob Halff)* **190-192** Stejnegers Roodborsttapuit / Stejneger's Stonechat *Saxicola stejnegeri*, eerste-winter vrouwtje, Oostpunt, Vlieland, Friesland, 17 oktober 2017 *(Jurriën van Deijk)*

TABEL 1 Gevallen van Stejnegers Roodborsttapuit *Saxicola stejnegeri* in Europa; alle gevallen bevestigd door DNA-analyse (* nog niet aanvaard) / records of Stejneger's Stonechat *Saxicola stejnegeri* in Europe; all records confirmed by DNA analysis (* not yet accepted) (Hellström & Norevik 2014, Cade & Collinson 2015, Herrig Liebermann et al 2018, Stoddart & Collinson 2019, Stoddart & Hudson 2021; Arnoud van den Berg in litt, Łukasz Ławicki in litt)

Brittannië (8+)
24-26 oktober 2012, Portland Bill, Dorset, Engeland, eerstejaars mannetje (vervolgwaarneming van vogel in Nederland)
6-7 oktober 2016, Landguard, Suffolk, Engeland, eerstejaars mannetje
22-26 oktober 2016, Spurn, Yorkshire, Engeland, eerstejaars vrouwtje
19 oktober tot 8 november 2018, Salthouse, Norfolk, Engeland, eerstejaars mannetje
8-14 oktober 2019, Westing, Unst, Shetland, Schotland, eerstejaars mannetje
17-28 oktober 2019, Sandwick en Leebitten, Mainland, Shetland, Schotland, eerstejaars
22-24 oktober 2019, Whitburn, Durham, Engeland, vrouwtje
9-13 november 2019, Easington, East Yorkshire, Engeland, eerstejaars
* 5-7 oktober 2020, Happisburgh, Norfolk, Engeland, eerstejaars
* 17-30 oktober 2020, South Gare, Cleveland, Engeland, eerstejaars

Denemarken (1)
31 oktober 2017, Gedser, Sjælland, eerstejaars

Finland (2)
31 oktober tot 26 november 2013, Orivesi, Pappilanniemi, eerstejaars mannetje
13 oktober 2018, Espoo, Matinkylä, eerstejaars mannetje

Nederland (3)
8-23 oktober 2012, Texel, Noord-Holland, eerste-winter mannetje (zelfde vogel daarna in Brittannië)
9 oktober 2016, Kroonspolders, Vlieland, Friesland, eerste-winter mannetje
16-17 oktober 2017, Oostpunt, Vlieland, Friesland, eerste-winter vrouwtje

Zweden (3)
2 oktober 2008, Landsort, Sörmland, eerstejaars mannetje (dood gevonden)
9-11 oktober 2015, Ottenby, Öland, eerstejaars mannetje
20 september 2016, Falsterbo, Skåne, eerstejaars vrouwtje

steunende DNA-analyse als *stejnegeri* te aanvaarden. De verwachting is echter dat naarmate er meer bewezen vogels zijn en meer studiemateriaal gepubliceerd wordt uit de reguliere gebieden in Azië, aanvaarding van vogels zonder DNA-analyse en zonder biometrische gegevens tot de mogelijkheden gaat behoren.

Op basis van wat nu bekend is pleiten de volgende kenmerken voor *stejnegeri*: ***1*** totale indruk meer verzadigd, warmer en donkerder gekleurd dan *maurus* en meer in de buurt komend van *rubicola*; ***2*** flank ongestreept (als bij *maurus*, diffuus gestreept bij *rubicola*); ***3*** lichte keel duidelijk contrasterend met oranje borst en buik (minder contrast tussen keel en bovenborst bij *maurus*; *rubicola* toont minimaal iets van donkere tekening op de keel); ***4*** lichte wenkbrauwstreep duidelijker dan bij *rubicola* maar niet opvallend (meest opvallend in vooraanzicht; lichter en meer contrasterend bij *maurus*); ***5*** bruin-oranje toppen aan dekveren, duidelijke oranje vleugelstreep vormend (lichter bij *maurus*); ***6*** dieporanje tot kastanjerode bovenstaartdekveren, contrasterend met lichtere stuit en ook contrasterend met de lichtere onderstaartdekveren, met bij sommige exemplaren wat donkere schachtstreping op de onderste/langste onderstaartdekveren (lichter oranje tot wit-oranje zonder streping bij *maurus* met vrijwel geen contrast tussen bovenstaartdekveren en stuit; meestal zwaarder gestreept bij *rubicola*; Stoddart & Collinson (2019) gaven aan dat op basis van een via DNA-analyse bewezen exemplaar, *maurus* soms ook enige donkere tekening kan hebben); ***7*** iets langere handpenprojectie bij *stejnegeri* (en *maurus*), c twee derde van langste tertial (c helft bij *rubicola*); en ***8*** snavel iets steviger en met bredere basis dan bij *maurus* en *rubicola*.

Een illustratie hoe lastig de velddeterminatie kan zijn vormt een exemplaar dat in oktober 2016 op Fair Isle, Shetland, werd gezien; op basis van het op bepaalde foto's schijnbare verzadigde verenkleed en de dieporanje bovenstaartdekveren werd deze vogel in het veld gedetermineerd als kansrijke *stejnegeri* maar DNA-analyse toonde aan dat het een *maurus* betrof. Interessant is dat deze vogel de contrasterende witte keel miste (keel en borst licht oranje), een kenmerk dat bij de bewezen exemplaren van *stejnegeri* in Europa steeds duidelijk aanwezig was.

De drie vogels van 2012, 2016 en 2017 lieten alle bovengenoemde kenmerken zien; in combinatie met de DNA-analyse kon de determinatie daarmee voldoende zeker worden gesteld. De vogel van Texel werd eind 2012 aanvaard door de Commissie Dwaalgasten Nederlandse Avifauna (CDNA); de beide vogels van Vlieland werden be-

gin 2020 aanvaard, nadat de DNA-analyses waren afgerond (www.dutchavifauna.nl).

Genetische analyse

Verzameld materiaal (veertjes of feces) van de drie vogels in Nederland is gebruikt voor DNA-analyse. Gepoogd is om de sequentievolgorde van het mitochondriale ND2-gen vast te stellen volgens Zink et al (2009). Van het eerste geval (Texel 2012) werd de sequentie van het volledige ND2-gen (1041 baseparen) vastgesteld door Martin Collinson aan de hand van veren die tijdens de vangst van dezelfde vogel op Portland Bill werden verzameld (Cade & Collinson 2015). Van het tweede geval (Vlieland 2016) kon de sequentie van het volledige ND2-gen worden vastgesteld door Peter de Knijff. In het fecesmonster van het derde geval (Vlieland 2017) kon een kort maar voldoende informatief fragment (147 baseparen) van het ND2-gen worden vastgesteld door PdK. De drie sequenties zijn opgenomen in de vrij toegankelijke DNA-database GenBank (www.ncbi.nlm.nih.gov/nuccore/LN864489, www.ncbi.nlm.nih.gov/nuccore/MK868049 en www.ncbi.nlm.nih.gov/nuccore/MK868030).

De drie ND2-sequenties werden vergeleken met referentiesequenties uit de studie van Zink et al (2009), die een fors DNA-verschil tussen *maurus* en *stejnegeri* liet zien. De drie sequenties vielen zonder twijfel binnen de genetische variatie van 63 ND2-sequenties afkomstig van *stejnegeri* en duidelijk buiten het patroon van genetische variatie binnen *maurus*. Net zoals bij het uiterlijk is ook de interpretatie van de DNA-variatie bij deze twee taxa niet zonder problemen, vanwege de taxonomische onduidelijkheid van vogels afkomstig uit een mengzone die vanaf het Baikalmeer, Siberië, Rusland, naar het zuiden loopt, dwars door Centraal-Mongolië. In Zink et al (2009) werden 22 vogels afkomstig van zes locaties binnen deze zone omschreven als '*S. maura* spec.' (dus zonder ondersoortaanduiding); 14 van deze vogels hadden een 'klassieke' *maurus* ND2-sequentie en acht een 'klassieke' *stejnegeri* ND2-sequentie. Waarom Zink et al (2009) besloten om deze vogels niet op (onder)soort te identificeren is onduidelijk. Omdat vrijwel alle vogels van deze studie werden verzameld, zijn ze beschikbaar voor een nadere studie die eventueel meer duidelijkheid aangaande deze mogelijke 'mengzone-vogels' kan verschaffen. Op basis van de huidige kennis kan echter gesteld worden dat de DNA-resultaten de vermoedelijke identificatie van de drie behandelde vogels in Nederland in het veld ondersteunen en zeker niet tegenspreken.

Voorkomen en verspreiding

Stejnegeri broedt in Oost-Siberië, Rusland (vermoedelijk niet ten westen van het Baikalmeer), Mongolië, noordelijk China, Korea en Japan, ten oosten van nominaat *maurus* en overwintert van noord-oostelijk India oostelijk tot Taiwan en zuidelijk tot in het zuiden van Maleisië, soms zuidelijker (cf Dutch Birding 34: 382, figuur 1, 2012; Opaev et al 2018). Op basis van broedgebied en trekgedrag is het een te verwachten dwaalgast in Europa. DNA-onderzoek heeft uitgewezen dat *stejnegeri* en *maurus* niet elkaars nauwste verwanten zijn en als aparte soorten kunnen (of moeten) worden beschouwd. Er bestaan echter nog veel onduidelijkheden over hun verwantschap met andere taxa (ondersoorten) in het roodborsttapuitencomplex (cf Wittmann et al 1995, Wink et al 2002, Illera et al 2008, Zink et al 2009, Opaev et al 2018, Stoddart & Collinson 2019).

In Europa zijn er behalve de Nederlands-Engelse vogel van 2012 en de beide vogels van Vlieland nog 13 exemplaren vastgesteld waarbij de determinatie door genetische analyse is bevestigd: in Brittannië (zeven, exclusief de vogel van Texel; daarnaast zijn twee vogels uit 2020 nog niet aanvaard); Denemarken (één); Finland (twee) en Zweden (drie). Een overzicht van alle Europese gevallen staat in tabel 1. Elders in het West-Palearctische gebied ('grote WP') is er een recent geval (bevestigd door DNA-analyse) van 20 november tot 17 december 2020 in Sila, Abu Dhabi, Verenigde Arabische Emiraten (Oscar Campbell in litt).

Een vogel op 28 oktober 2014 in de Lauwersmeer, Groningen, werd aanvaard als *maurus/stejnegeri* omdat er geen DNA-materiaal kon worden verzameld en omdat de foto's net niet voldoende details lieten zien. Deze vogel toonde wat uiterlijk betreft een aantal overeenkomsten met de drie als *stejnegeri* aanvaarde vogels in Nederland (Haas et al 2016; Dutch Birding 36: 429, plaat 577, 2014; https://waarneming.nl/soort/view/788603).

Summary

Stejneger's Stonechats on Texel in October 2012 and on Vlieland in October 2016 and October 2017 On 8-23 October 2012, an interesting looking 'eastern' stonechat *Saxicola* stayed on Texel, Noord-Holland, the Netherlands. It was identified as a rather warmly coloured Siberian Stonechat *S maurus* and, due to its long stay during popular birding weeks, was seen by c 300 birders. Remarkably, on 24 October, the same individual (recognized by feather details visible when comparing close-up photographs) was discovered at Portland Bill, Dorset, England, where it was ringed (first-winter male) on 25 October and last seen on 26 October. DNA analysis

proved that the bird was the first (acceptable) Stejneger's Stonechat *S stejnegeri* for both Britain and the Netherlands. On 9 October 2016, a first-winter male was ringed on Vlieland, Friesland, the Netherlands; it was not relocated after its release. On 16-17 October 2017, a first-winter female stayed on Vlieland and was seen by c 40 birders. DNA-analyses of feathers of the first two birds and of feces of the third bird supported their identity as *stejnegeri*. All three birds showed morphological characters which appear to distinguish *stejnegeri* from *maurus* and European Stonechat *S rubicola*, raising suspicions in the field or after the bird was trapped. These characters include an overall more saturated plumage compared with *maurus*, with deep orange uppertail-coverts (sometimes with some dark markings on the longest feathers), deep buff wing-bar, white throat contrasting with unstreaked buff-orange underparts, pale supercilium less contrasting than in *maurus* but more prominent than in *rubicola*, and relatively broad bill. Safe identification without confirmation by DNA analysis is not yet considered possible but increasing knowledge from field studies and analysis of museum skins may help to make field identification without DNA possible in the future. In addition to the three records in the Netherlands, there are at least 13 records in the WP ('sensu BWP'): in Britain (seven; excluding the same bird as the first in the Netherlands; two birds from 2020 have not yet been accepted), Denmark (one), Finland (two) and Sweden (three), all confirmed by DNA (see table 1).

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Pallid Harrier breeding near Dobřichov, Czechia, in 2020

It is fascinating that Pallid Harrier *Circus macrourus* is currently increasing its range westward throughout Europe (Henry 2018). At the same time, it is considered to be a species decreasing in numbers and categorised as 'near threatened' (BirdLife International 2020). In this paper, I describe the first successful breeding of this species in Czechia and central Europe since 1952.

Breeding in Czechia

The agricultural landscape near Dobřichov in Central Bohemia forms a rather uninteresting habitat with highly limited biodiversity due to large-size fields with intensive use of pesticides. However, in early spring 2020, a peak of Common Vole *Microtus arvalis* abundance resulted in unprecedented numbers of breeding Short-eared Owls *Asio flammeus*. While looking for new owl territories in the evening of 19 April, I found a second calendar-year male Pallid Harrier that flew to a Hen Harrier *C cyaneus* roosting site. At that time, already as many as 14 Short-eared Owl territories were known in an area of 3 km^2, along with one displaying male Hen and three pairs of Montagu's Harrier *C pygargus*. The Pallid soon started to display too. Its display alternated with nest building in a rapeseed *Brassica napus* field from 23 April, although no female was seen yet. High numbers of voles and the bird's frequent vocalisations probably attracted a third calendar-year male Pallid, that arrived on 26 April and started to display almost immediately. A second calendar-year female Pallid was seen at the youngest male's side on 30 April. It stayed at the locality and interacted with both males. The younger male tried to prevent the female from mating with the older male, which had already started to build a nest in the nearby wheat field, and after several days the older male left the spot, probably in the morning of 15 May. The female remained around one of two nests built by the younger male, starting to behave inconspicuously. I saw the first prey transfer on 21 May.

As it was already at the time of building that I found the nest, I left the birds alone, not disturbing them during the incubating period. On 8 June, I went back and both birds were still present. They started to transfer food more frequently (every 65 min on average) and the female started to hunt from 17 June. I visited the nest for the first time on 18 June and found three chicks and two unhatched eggs. The estimated age of the oldest chick was 7 days (based on wing measurement and appearance). With an incubating period of 30 days (Terraube et al 2009), the laying date of the first egg was c 12 May. The nest was located exactly 100 m from the edge of the field in 1-1.5 m high rapeseed with only a narrow landing window above it. Soon, the nest was protected with a fence, and a trail camera was installed for monitoring. All three chicks successfully left the nest between 4 and 11 July. The young and the female were tagged with GPS-GSM transmitters. The first juvenile started its dispersal on 31 July and by early September all juveniles had left Czechia.

193 Nest of Pallid Harrier / Steppekiekendief *Circus macrourus* with three chicks and two unhatched eggs in rapeseed *Brassica napus*, Dobřichov, Central Bohemia, Czechia, 18 June 2020 *(Jan Studecký)*

194 Pallid Harrier / Steppekiekendief *Circus macrourus*, second calendar-year male, Dobřichov, Central Bohemia, Czechia, 7 July 2020 *(Jan Studecký)*

195 Pallid Harrier / Steppekiekendief *Circus macrourus*, second calendar-year male, Dobřichov, Central Bohemia, Czechia, 30 June 2020 *(Jan Studecký)* **196** Pallid Harrier / Steppekiekendief *Circus macrourus*, second calendar-year male bringing food (vole) to female, Dobřichov, Central Bohemia, Czechia, 22 June 2020 *(Jan Studecký)* **197** Pallid Harriers / Steppekiekendieven *Circus macrourus*, second calendar-year female with chicks, Dobřichov, Central Bohemia, Czechia, 27 June 2020 *(Jan Studecký)* **198** Pallid Harrier / Steppekiekendief *Circus macrourus*, newly fledged juvenile female, Dobřichov, Central Bohemia, Czechia, 6 July 2020 *(Jan Studecký)*

Second calendar-year pair breeding

Breeding in the second calendar-year is known for all European harrier species. It occurs often in Western Marsh Harrier *C aeruginosus* (Altenburg et al 1987, Arroyo 1996) and Hen Harrier, in which most first-year females breed, but males do so less often (Hardey et al 2009). Montagu's Harrier, on the other hand, is a much rarer first-year breeder, with the female percentage varying between zero in a year with low vole abundance, to 19-30% in a peak vole year (Salamolard et al 2000), while first-year male breeding is extremely rare (Arroyo 1996). In 2006, 35% of aged breeding Pallid Harrier females in Kazakhstan were yearlings (Terraube et al 2009) but no data for males are available. First-year breeders tend to be less successful in raising young than adults (Hardey et al 2009).

Distribution and range extension

Pallid Harrier breeds mainly in the steppes of central Asia from Mongolia and north-western China through southern Russia and Kazakhstan to Europe (BirdLife International 2020), where the western part of the breeding range reaches Ukraine, Moldova and Romania. An isolated population breeds in Finland since 2003, with more than 10 pairs in a good vole year now (Henry 2018). It is a migratory species, wintering primarily in sub-Saharan Africa and south-eastern

Asia (BirdLife International 2020). In recent years, the status of this species in Europe changed rapidly, and it is thought that an increasing number from the western part of the species' range started to use a migration route through western Europe (Henry 2018).

Breeding in central and western Europe

During a Pallid Harrier influx in 1952, five or six pairs nested on Gotland and Öland, Sweden, and three pairs in Germany: one on Norderney, Niedersachsen, and two in Mecklenburg-Vorpommern (Henry 2018). Earlier, two juveniles collected at Werkhoven, Utrecht, the Netherlands, in August 1935 indicates that breeding took place somewhere in western Europe before but there is no locality proof (van den Berg & Bosman 2001).

65 years later, the species bred again in western Europe, with a pair raising four young in a barley field in eastern Groningen, the Netherlands, in 2017 (Koks & Vellinga 2017; cf Dutch Birding 39: 268, 272, 279, 2017). In 2018, an unsuccessful breeding attempt took place at the same site involving the same female Pallid and a male Montagu's Harrier. In 2019, a pair of Pallid successfully raised six young at another site in Groningen (Ławicki & van den Berg 2019; https://tinyurl.com/y3988jxp). In spring 2019, a female young that fledged in eastern Groningen in 2017, wearing a black ring with C3 inscription, was nesting with a male Pallid in Tierra de Campos, Castillia y Léon, constituting the first documented breeding in Spain (Mougeot & Tazo 2019). In 2020, Pallid became a new breeder not only for Czechia but also for France, where a pair raised four young in southern Pas-de-Calais in July (BirdGuides 2020, Ławicki & van den Berg 2020).

Moreover, on 15 July 2017, a juvenile with a wing not yet fully grown photographed near Krugi, Magiliou, probably constituted the first breeding for Belarus since 1916 (Ławicki & van den Berg 2017).

Status in Czechia

Once a mega rarity, Pallid Harrier has become a rather regular migrant in Czechia with 65 records until 2020, of which 55 since 2010 (http://fkcso.cz/fk/posuzovane.html). Most records concerned single birds on migration, with just three of two together, all in autumn. The three birds displaying near Dobřichov constituted the first Czech spring record of more than one bird at one locality. In 2017, an unsuccessful breeding attempt was reported in Vysočina region (Kunstmüller 2017), but only the displaying male was accepted by the Czech rarities committee (Vavřík & FK ČSO 2018).

199 Pallid Harrier / Steppekiekendief *Circus macrourus*, juvenile male encountering European Hares / Hazen *Lepus europaeus*, Dobřichov, Central Bohemia, Czechia, 24 July 2020 *(Jan Studecký)*

In 2019, a third calendar-year male displayed for a brief period in Southern Bohemia region (Vojtěch Kubelka in litt).

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Tufted Puffin on Bjørnøya, Svalbard, in July 2019 and May 2020

During the summer of 2019, Fannar Gudmundsson and Guus Wellesen conducted fieldwork on behalf of Norsk polarinstitutt (Norwegian Polar Institute) on Bjørnøya (Bear Island), Svalbard. The work is done every year with the aim to monitor seabirds and also to trap and ring birds. On this particular trip, the focal species were Great Skua *Stercorarius skua* as well as Northern Fulmar *Fulmarus glacialis* and Atlantic Puffin *Fratercula arctica*. This year's main study plot was on the north-western corner of Bjørnøya but also several seabird colonies near the meteorological station situated in the north-central part.

200 Tufted Puffin / Kuifpapegaaiduiker *Fratercula cirrhata*, adult, Bjørnøya, Svalbard, 13 July 2019 *(Guus Wellesen/Norsk polarinstitutt)*

On 13 July 2019, they were studying Atlantic Puffins at the Nordhamna bay (74°30'N, 18°55'E), due west of the station. At 16:00, while trapping puffins, FG noticed an unusual bird flying along the bird cliff. Impressed yet confused as to what he just had seen, he ran over to his colleague and by the description given to him, GW realized it could only be a Tufted Puffin *F cirrhata*. Back on the spot they looked for it on the cliff face with no immediate success, after which they scanned the ocean, eventually refinding the bird sitting on the water. It was obviously an all-dark alcid, except for a whitish face and, having the signature bill of a puffin, it was indeed a Tufted Puffin. Luckily,

201 Nordhamna bay, Bjørnøya, Svalbard, 24 June 2014 *(Bjørnøya meteorologiske stasjon)* **202** Tufted Puffin / Kuifpapegaaiduiker *Fratercula cirrhata*, adult, with Northern Fulmar / Noordse Stormvogel *Fulmarus glacialis*, Bjørnøya, Svalbard, 28 May 2020 *(Venke Ivarrud)* **203** Tufted Puffin / Kuifpapegaaiduiker *Fratercula cirrhata*, adult, Bjørnøya, Svalbard, 28 May 2020 *(Venke Ivarrud)*

GW was equipped with a camera and a heavy lens, enabling him to get a few but important shots to document this incredible encounter. After a short while, it flew off in a westerly direction, passing the headland of Kapp Kjellström, and out of sight. The bird was not seen again in 2019.

Reappearance in 2020

Venke Ivarrud arrived on Bjørnøya in November 2019 in order to work at the meteorological station on the island until June 2020. Having a basic interest in birds she is keen to follow the local birdlife when time permits. In the prevailing harsh Arctic conditions, this birdlife is normally species restricted and predictable. This time, however, there was a big surprise waiting for her at the end of her stay.

On her way to the station on 28 May 2020, VI noted something completely different among the ever-present auks. At first, she had no clue to the bird's identity as it was initially seen only in flight. She fired off several shots with her camera. Only later, when the bird had settled on the bird cliff, she took time to study her photographs and started to realize that it could be a Tufted Puffin. Later still, when the bird flew past at close range, she was happy with the identification. All this happened close to the meteorological station, not far from where the bird was sighted in 2019. As in 2019, the bird was not seen again during the rest of the season.

Since Bjørnøya is extremely isolated and not included in any companies' regular sailings, the bird proved untwitchable for prospective Norwegian (and international) listers. While the Tufted Puffin now is the top vagrant on Bjørnøya's list, the island has been host to several other rare species. Since the turn of the century, these have included Pacific Golden Plover *Pluvialis fulva*, White-rumped Sandpiper *Calidris fuscicollis*, Buff-breasted Sandpiper *C subruficollis*, Terek Sandpiper *Xenus cinereus*, Laughing Gull *Larus atricilla* and Pallas's Grasshopper Warbler *Locustella certhiola*. Most of these rarities have been found by polar researchers.

Description and identification

Essentially the bird had the size and shape of a puffin with: ***1*** relatively small and compact body; ***2*** all-black body including wings; ***3*** white face in the form of a triangular area around the eye; ***4*** pale yellow elongated eyebrow running down the nape; ***5*** greenish-grey iris; ***6*** bill like Atlantic Puffin but larger, high at base, slender and relatively short, bi-coloured with greenish at base and orange at tip; and ***7*** washed-out orange feet. Of the three puffin species, Tufted Puffin is the only black-bodied one (cf Sibley 2014).

Distribution and movements

Tufted Puffin is widespread in the North Pacific, from the mid-Transition Zone (c 35°N) to the Beaufort Sea. Its breeding range extends from California, USA, to the Chukchi Sea (c 80% of world population breed in North America). Non-breeders are observed in spring and summer in oceanic waters of the central North Pacific. It winters offshore, throughout the North Pacific, south to 35°N (Piatt & Kitaysky 2020).

Vagrancy and status in WP

Prior to the Bjørnøya sightings, there were only two records of Tufted Puffin in the Western Palearctic (WP), both from quite unlikely sites for such an extreme pelagic vagrant where even a report of an Atlantic Puffin would be notable. The first occurred in Sweden in the bay of Laholm at the outlet of river Lagan, Halland, on 1 and 8 June 1994. It was an adult in breeding plumage seen in flight (not photographed) by two birders (Cederroth 1995, Haraldsson 1995). The second was first seen in flight at Swale Estuary, Kent, England, and photographed while swimming at the outlet of Faversham Creek on 16 September 2009; it was seen by a handful of birders but was not twitchable (Wright 2009, 2011, Hudson & Rarities Committee 2010; cf Dutch Birding 31: 318, plate 413-414, 2009). The fourth for the WP was shot by a resident hunter in the strait of Vestmannasund, off Slættanes, Vágar, Faeroes, on 17 January 2020; the skin was donated to the islands' national museum Tjóðsavnið (BirdGuides 2020, Ławicki & van den Berg 2020; Janus Hansen in litt).

In addition, outside the WP, there are two records from Greenland (Kalaallit Nunaat). One bird was videoed by a birder (also seen by the crew) from a seismic vessel in the Davis Strait, west of Disko Island (western south-west Greenland), on 19 August 2009 (Kristensen et al 2010; see photograph at https://tinyurl.com/y4s2xq8c). Another was photographed by a group of polar researchers on Dalrymple Rock, west of Dundas (western north-west Greenland), between 15 July and 6 August 2019 (Burnham et al 2020; Kurt Burnham in litt).

With so few people having had the chance and luck to see a Tufted Puffin in the WP, it stands out here, even after the Bjørnøya sightings, as one of the most sought-after species. The Bjørnøya bird of 2019 has been accepted by the Norwegian rare birds committee (Norsk sjeldenhetskomité for fugl

– NSKF) (Olsen 2021), while the one in 2020 is yet to be considered by NSKF. By all probability, the two sightings will be regarded as one and the same returning individual.

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Blue-naped Mousebird and Black Scrub Robin at Tamanrasset, Algeria, in 2018-19

This paper documents records of two Afrotropical species at Tamanrasset in extreme southern Algeria, Blue-naped Mousebird *Urocolius macrourus* in July 2018 and Black Scrub Robin *Cercotrichas podobe* in May 2019. The Blue-naped Mousebird was the country's first and the Black Scrub Robin the second.

Blue-naped Mousebird, July 2018
On 29 July 2018, I (Soufyane Bekkouche) photographed and videoed a Blue-naped Mousebird at Tin-Zaouten, Tamanrasset (a species I had seen before in the area but never photographed). The images clearly show the pale brownish grey plumage with bluish tinge on the rump, prominent crest, extremely long and pointed tail, pale blue nape patch, dark 'bandit mask' around the dark eye and stubby darkish bill. This combination of characters excludes the other five mousebird species, which all occur in sub-Saharan Africa (cf del Hoyo et al 2001, Sinclair & Ryan 2010).

Blue-naped Mousebird breeds in the Sahel region and in East Africa, up to an altitude of 2100 m, from the south-west coast of Mauritania and eastern Senegal to eastern Africa (southern Sudan to central Tanzania) (del Hoyo et al 2001). It is a sociable bird, often occurring in groups of 20-30 individuals. Birds nest, take dust baths, forage for food and clean plumage together. It feeds mainly on green leaves, which are digested very slowly; its diet is supplemented with fruits, seeds and insects (Harrison & Greensmith 1993).

In the Western Palearctic (WP, 'sensu BWP'), the species is a rare visitor to northern Mauritania, where it has been observed in the Adrar region, eg, at Akhmakou (up to 10 birds in January 2005) and at Toujounine oasis, south of Choum (up to 13; eg, in December 2007, April 2017, March-April 2018 and March-April 2019) (Crochet & Haas 2013, Ławicki & van den Berg 2017, 2018, 2019ab, Mauras 2018). When following the limits of the 'greater' WP (which excludes the northern part of Mauritania and strictly follows country borders; cf Shirihai & Svensson 2018), this record counts as the first WP record. Although Isenmann & Moali (2000) do not mention Blue-naped Mousebird for Algeria, it may well be an irregular migratory bird and accidental summer visitor in the south of the country, based on single birds or small groups seen by me at Tin-Zaouten in previous months in 2018. The bird in July 2018, however, is the first to be documented and therefore considered the first for Algeria.

Looking at my photograph and video images, several birders noted the pale spots on the bird's

204 Blue-naped Mousebird / Blauwnekmuisvogel *Urocolius macrourus*, Tin-Zaouten, Tamanrasset, Algeria, 29 July 2018 *(Soufyane Bekkouche)*

205 Black Scrub Robin / Zwarte Waaierstaart *Cercotrichas podobe*, Tamanrasset, Algeria, 3 May 2019 *(Soufyane Bekkouche)*

wings and remarked that this could be linked to an escape from captivity (eg, Pablo Maczenga in litt). Hein van Grouw, specialist in bird plumage aberrations based at Natural History Museum at Tring, England, however, commented (in litt) that the pale spots could well have been caused by 'progressive greying' (a plumage aberration causing loss of pigment with increasing age). Progressive greying is the most common aberration in wild birds and is certainly not an indication for escaped captive birds (van Grouw 2017). Although Tamanrasset is a very isolated city in the middle of the Sahara desert, there is an active trade in captive birds and there is a risk of encountering escapes or introduced birds. For instance, Red-billed Firefinch *Lagonosticta senegala* was introduced in Tamanrasset in the 1940s and established a stable population, which is apparently expanding north in recent years (MaghrebOrnitho 2017). More recently, on 25 December 2019, visiting Algerian birders found a group of White-rumped Seedeaters *Crithagra leucopygia* close to Tamanrasset, including an adult actively feeding a young (MaghrebOrnitho 2020). This sub-Saharan species is bred and sold in many bird or pet stores in Tamanrasset (it was found in at least four shops visited by Karim Haddad and Larbi Afoutni in October 2019 and by KH, Mehdi Chetibi and a group of British birders in March 2020). Based on this information, White-rumped Seedeater is considered an escape in southern Algeria.

Black Scrub Robin, May 2019

On 3 May 2019, SB photographed a Black Scrub Robin at Tamanrasset. The photographs clearly show the species' diagnostic characters, with a thrush-like size, long fan-shaped tail (held strongly upwards), long legs, all-black plumage and prominently white-tipped tail feathers (apart from the central pair) and white-tipped undertail-coverts (cf Clement & Rose 2015, Svensson et al 2015).

The species breeds in the Sahel region, from Senegal to Eritrea, Saudi Arabia and Yemen, up to the centre of the Arabian Peninsula, and rarely as far north as Israel and Kuwait. It breeds up to an altitude of 1500 m and prefers arid sub-desert regions dotted with bushes and small trees, groves of date palms, and oases at the edge of the desert (del Hoyo et al 2005, Clement & Rose 2015). Two subspecies are recognized: nominate *C p podobe* occurs from Mauritania east to Chad, Sudan, Eritrea, Ethiopia and up to northern Somalia, and *C p melanoptera* in western Saudi Arabia and Yemen, also turning up in Egypt, Israel (where it breeds since 2015; Ottens et al 2016), Jordan, Bahrain, Kuwait, Oman, Qatar and the United Arab Emirates. However, at least 25% of the individuals that breed in the Arabian Peninsula exhibit characteristics of nominate *C p podobe*, mainly in showing rufous colouration on the inner webs of flight feathers, and are considered to belong to this subspecies or to a hybrid population (Ottens et al 2016, Mitchell 2017).

This is the second record for Algeria. The first concerned two birds seen at the Tamanrasset oasis on 8 February 1968; moreover, there was a possible sighting of one in the central Ahaggar mountains on 12 February 1968 (Gaston 1970, Isenmann & Moali 2000). Based on range, the birds in Algeria belong to *C p podobe*.

Other interesting observations in southern Algeria

As part of a programme of the environmental association ÉcoCirta/AquaCirta, which has been running for a few years, KH and LA organized an ornithological trip around Illizi in the south-east of Algeria on 1-13 December 2018. They explored the region of Djanet, Bordj El Haouass and Ihrir, hoping to find Blue-naped Mousebird. This species was not observed. However, a Rüppell's Warbler *Sylvia ruppeli* found and documented here was the first for Algeria (Haddad & Afoutni 2019).

During two other ornithological trips around Tamanrasset, from 25 September to 5 October and on 21-31 December 2019, KH and LA explored the regions of Ahaggar, Tamanrasset, In Guezzam, In Amguel, Idles and Tazrouk. No Blue-naped Mousebirds or Black Scrub Robins were found but two Jacobin Cuckoos *Clamator jacobinus* on 5 October constituted another new species for Algeria (Haddad & Afoutni 2020a; cf Dutch Birding 42: 134, plate 182, 2020). This was the second record for the WP 'sensu BWP'. The first was collected in northern Chad on 9 September 1955. A bird in Finland in September 1976 is currently classified as of 'unknown origin' (category D) (cf Lees & Mahoud 2011; Petteri Lehikoinen in litt). During these trips, at different sites groups of African Silverbill *Euodice cantans* (Haddad & Afoutni 2020b) and Sudan Golden Sparrow *Passer luteus* (Haddad et al 2020) were encountered.

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WP reports

This review lists rare and interesting Western Palearctic birds reported mainly from **February to late March 2021**. The reports are largely unchecked and their publication here does not imply future acceptance by a rarities committee. Observers are requested to submit their records to each country's rarities committee. Corrections are welcome and will be published.

GEESE TO DUCKS Analysis of hydrogen stable isotopes in feathers sampled from a first-winter **Red-breasted Goose** *Branta ruficollis* trapped on Storøya, Norway, in late April 2019 showed an origin from the Russian Arctic (Ornis Norv 43: 1-3, 2020). A spectacular ringing recovery concerned a male **Barnacle Goose** *B leucopsis* colour-ringed as a juvenile on the nest at Westplaat, Zuid-Holland, the Netherlands, in July 2019 (and observed regularly here until 9 April 2020) photographed 8200 km (!) to the east along Yellow River, Henan, eastern China, where it stayed for a few weeks during December 2020 and on 1 January together with another individual; it constituted the species' first ringing recovery for China, where it is rare. The second **Richardson's Cackling Goose** *B hutchinsii hutchinsii* for Finland at Maaviiki, Pori, on 1-15 December was refound at Aarlahti, Mynämäki, on 17 March. A **White-headed Duck** *Oxyura leucocephala* at Qaroun lake, Fayoum, from 5 February to at least 15 March was the first to be confirmed for Egypt when old Meinertzhagen reports are disregarded. If confirmed by DNA analysis, a mystery male scoter *Melanitta* shot at Skansen, Disko, Greenland, on 21 June 1977 (now in the collection of Zoological Museum Copenhagen, Denmark) may be the first hybrid **Velvet x White-winged Scoter** *M fusca x deglandi* (https://tinyurl.com/4yza66a6). For a paper on a presumed hybrid Velvet x Stejneger's Scoter *M fusca x stejnegeri*, see Dutch Birding 43: 37-39, 2021. A second calendar-year male **Velvet Scoter** photographed near Pohang on 25 January was the first for South Korea. The long-staying males **White-winged Scoter** at Keflavík, Iceland, and at Musselburgh lagoon, Lothian, Scotland, remained into February-March. An adult male **Stejneger's Scoter** was seen at Snapparp, Halland, Sweden, on 8 March. Males **Black Scoter** *M americana* were reported off Cheswick Sands, Northumberland, England, on 25 February; at Embo, Highland, Scotland, on 4 March; off Bülk, Schleswig-Holstein, Germany, on 6 March; at Snapparp on 8 March; and at Międzywodzie, Western Pomerania, Poland, on 20 March. In January-February, an influx of at least 13 **Ring-necked Ducks** *Aythya collaris* and five **Lesser Scaups** *A affinis* occurred in France. A male **Baikal Teal** *Sibirionetta formosa* photographed together with a female Garganey *Spatula querquedula* on Midway Atoll on 10-12 February was the second for

206-207 Swallow-tailed Kite / Zwaluwstaartwouw *Elanoides forficatus*, Urzelina, São Jorge, Azores, 18 March 2021 *(David Monticelli)*

208 Common Nighthawk / Amerikaanse Nachtzwaluw *Chordeiles minor*, León, Castilla y Leon, Spain, 11 November 2020 *(José Manuel Moreno Iniesta)* **209** Siberian Crane / Siberische Witte Kraanvogel *Leucogeranus leucogeranus*, adult male ('Omid'), Fereydunkenar, Mazandaran, Iran, 13 January 2021 *(Hamid Basir)*

Hawaii. Apart from a handful of unringed males this winter (eg, two in Poland and singles in Belgium, England, France and Sweden), also one unringed female occurred in north-western Europe, at Lille and Wechelderzande, Antwerpen, Belgium, on 5-11 March.

GREBES TO DOVES The long-staying **Pied-billed Grebes** *Podilymbus podiceps* on São Miguel, Azores, in Vendée, France, and at Loch Feorlin, Argyll and Bute, Scotland, were still present in February-March. The first for the Faeroes at Eiði, Eysturoy, from 16 December 2020 remained until 29 January. In England, one was photographed at Bantons lake near Dolphinstone, Lancashire, from 4 March onwards. The first **Rufous Turtle Dove** *Streptopelia orientalis meena* for Switzerland at Sulgen, Thurgau, first seen in March 2020, returned on 11 November and remained into March. The second for Poland stayed at Karłowice, Wielkopolska, from 1 February to at least 15 March (there were also one Oriental Turtle Dove *S o orientalis* and one Oriental Turtle/Rufous Turtle). In Sweden, one was reported at Tavleliden, Umeå, from 12 January to 23 February and the second for Belgium was present near Heist, West-Vlaanderen, from 14 to at least 24 March.

SANDGROUSE TO CUCKOOS A male **Pallas's Sandgrouse** *Syrrhaptes paradoxus* was photographed in a flock of Black-bellied Sandgrouse *Pterocles orientalis* at Hossein-Abad plain, Khaf, Khorasan-e Razavi, Iran, on 25 January. The second **Common Nighthawk** *Chordeiles minor* for Spain was discovered at León, Castilla y Leon, on 11 November 2020. The first **Forbes-Watson's Swift** *Apus berliozi* for Mozambique and southern Africa was found at Save Woodlands, 40 km inland of Inhassoro, on 3 March 2017 (Bull Br Ornithol Club 141: 21-38, 2021). Up to 16 wintering **Plain Swifts** *A unicolor* at Porto remained from December to late March, constituting the first record for mainland Portugal and Europe. A female **Grey-bellied Cuckoo** *Cacomantis passerinus* photographed at Dibba-Karsha farms on 5 March was the first for the United Arab Emirates (UAE) and fifth for the WP; previous ones were in Oman on 7 November 1988, on 3 November 2002, from 18 October to 3 November 2006 and on 1 April 2010.

RAILS TO CRANES A **Striped Crake** *Aenigmatolimnas marginalis* found dead at Bodrum peninsula, Muğla, on 11 December 2020 was the first for Turkey and second for the Middle East. One of this winter's **Allen's Gallinules** *Porphyrio alleni* in the Canary Islands remained on Gran Canaria from 22 January until 17 February. A first-winter at Lago Piccolo di Avigliana, Torino, on 9 February was the 10th (and most northern) for Italy. After its arrival on 4 November 2020, the last surviving **Siberian Crane** *Leucogeranus leucogeranus* of the species' western population (adult male 'Omid') left its wintering ground at Fereydunkenar, Mazandaran, Iran, on 26 February. The first-winter **Sandhill Crane** *Antigone canadensis* at

Söråsele, Västerbotten, Sweden, from 13 October to 19 November 2020 reappeared at a few sites in Sjælland, Denmark, from 27 December to 31 January and then at Gravlev, Nordjylland, on 17-19 February (cf Dutch Birding 43: 59, 2021). The **Common Crane** *Grus grus* survey in 2020 in Britain revealed a record 64 pairs with 23 fledglings.

LOONS TO CORMORANTS A **Pacific Loon** *Gavia pacifica* was seen at Falmouth, Cornwall, England, on 18 February. The world's oldest known wild bird, 'Wisdom', a female **Laysan Albatross** *Phoebastria immutabilis* aged at least 70 years, produced yet another young on Midway Atoll in February. Ringed as an adult of at least five years old in 1956, she raised 30 chicks until 2006 and then almost one a year since, and her worn rings had to be replaced five times. A **Black-capped Petrel** *Pterodroma hasitata* was photographed off Fogo, Cape Verde Islands, on 29 January. A male **Short-tailed Shearwater** *Ardenna tenuirostris* found dead in tundra 4 km from the coast of Knipovich bay, Kara Sea, northern Taimyr peninsula, on 25 June 2019 was the first for the western part of the Russian Arctic (Ornithologia 43: 110-111, 2019). If accepted, a **Barolo Shearwater** *Puffinus baroli* reported off Haifa on 30 January may be the third for Israel. A **Great Blue Heron** *Ardea herodias* on Terceira, Azores, from 21 December 2020 remained until 22 February. The second **Double-crested Cormorant** *Phalacrocorax auritus* for Ireland at Ballylongford, Kerry, from 25 November 2020 remained until at least mid-March. In the Azores, four individuals were seen on Faial on 6 February and one was on Graciosa on 15 March.

WADERS The second **American Golden Plover** *Pluvialis dominica* for Turkey was found at Kızılırmak delta on 8 March. The first **Three-banded Plover** *Charadrius tricollaris* for Israel at Ma'ayan Tzvi and HaMa'apil from 12 April to 26 October 2020 (and ringed on 9 June) was refound at Bar'am fishponds, Hula valley, on 3 February and remained into March. In Egypt, one at El Minya on 15 January was the third north of the Aswan and Abu Simbel breeding area. The third **Mongolian Sand Plover** *Anarhynchus mongolus* for Turkey was photographed at Milleyha, Hatay, on 6 March. A **Hudsonian Whimbrel** *Numenius hudsonicus* from 16 February onwards at a private golf course on Tenerife was the first for the Canary Islands. Green et al (2021) estimated the size of the world population of **Spoon-billed Sandpiper** *Calidris pygmaea* at 490 mature individuals and 773 individuals of all ages, with a decline at a mean rate of 8% per year in 2014-19; the more rapid decline of on average 26% per year prior to 2009, as shown by breeding surveys, has probably slowed as a result of conservation efforts (Wader Study 128 (1), 2021; doi.org/10.18194/ws.00218). The first **Wilson's Phalarope** *Phalaropus tricolor* for Israel at Sde Eliyahu from 18 December 2020 was relocated at Kfar Ruppin fishponds in January from where it moved to Bet Alfa in Harod valley and Neve Ur in Jordan valley before it returned to Kfar Ruppin in March. A **Spotted Sandpiper** *Actitis macularius* at Eau d'Heure lakes, Falemprise, Namur, from 31 January to 10 February was the fifth for Belgium. In Germany, one stayed at Kiel, Schleswig-Holstein, from 12 February into March. A **Lesser Yellowlegs** *Tringa flavipes* at Ein Hamifratz fishponds from 19 December 2020 and at Kfar Hamaccabi, north of Haifa, from 13 Febuary was the third for Israel. In the Azores, **Wilson's Snipes** *Gallinago delicata* were reported on Terceira on 7 February and on Santa Maria on 15 February. The third **Cream-colored Courser** *Cursorius cursor* for the Balearic Islands was found on Menorca on 26 February.

GULLS An adult **Ivory Gull** *Pagophila eburnea* was seen on Lovund, Nordland, Norway, on 9 March. In Ireland, a first-winter **Ross's Gull** *Rhodostethia rosea* was photographed at Killough, Down, on 18 February and again on 9 March. The first **Ring-billed Gull** *Larus delawarensis* for Romania at Bucharest from 8 January 2020 returned here on 15 January and remained until 4 March. In Poland, adults wintered at Ełk, Warmia-Mazury and Pruszków, Mazowsze, in February-March. An adult at Broechem, Antwerpen, from 10 to at least 20 March was (already) the 28th for Belgium.

RAPTORS Issa (2021) described the history of **Black-winged Kite** *Elanus caeruleus* expanding its range from northern Africa to western Europe, where it first bred in Portugal in 1944. Then, the first breeding in Spain took place in 1973 and the first in France in 1990. In the past 15 years, the French population sharply increased up to 986 pairs, well distributed in the western part of the country and also reaching northern and eastern regions (Alauda 89: 1-13, 2021). A **Swallow-tailed Kite** *Elanoides forficatus* photographed at Urzelina, São Jorge, from c 13 March onwards was the second for the Azores and third for the WP; previous ones were on Fuerteventura, Canary Islands, on 19-23 March 1993 and on São Miguel from 24 August to 7 September 2008. An adult **Bearded Vulture** *Gypaetus barbatus* was reported at a few sites in Norfolk, England, on 10-15 February. After a stay of almost 10 months in Denmark, one of last-year's two **Bonelli's Eagles** *Aquila fasciata* radio-tagged in France was back in Germany on 20 February and turned up at Dinslaken, Nordrhein-Westfalen, 40 km from the Dutch border, on 4 March. On Terceira, a **Northern Harrier** *Circus hudsonius* was reported on 30-31 January and 3 February. In Shetland, Scotland, the first **Long-legged Buzzard** *Buteo rufinus* for Britain was photographed on 1 September 2019 first flying over Hillwell, Mainland, and then Fair Isle.

OWLS TO KINGFISHERS A dead **Snowy Owl** *Bubo scandiacus* was discovered along the N25 east of Cork, Ireland, on 10 March. In Iran, the first **Turkish Fish Owl** *B semenowi* for Sistan and Baluchestan was found dead at Gang river, 5 km north-west of Nikshahr, on 30 January. An **Omani Owl** *Strix butleri* was photographed for the first time in UAE at Wadi Wurayah on 20 December 2020; the species is now known here from two sites 17 km apart. Last autumn's **Belted Kingfishers** *Megaceryle alcyon* remained into February and March on Pico, Azores; at Arrecife, Lanzarote, Canary Islands; and at Castletown Bearhaven, Cork, Ireland.

210 Omani Owl / Omaanse Uil *Strix butleri*, Wadi Wurayah, United Arab Emirates, 20 December 2020 *(Sami Ullah Majeed)* **211** Northern Mockingbird / Spotlijster *Mimus polyglottos*, Exmouth, Devon, England, 7 February 2021 *(Ben Lucking)* **212** Spotted Sandpiper / Amerikaanse Oeverloper *Actitis macularius*, Kiel, Schleswig-Holstein, Germany, 13 February 2021 *(Axel Halley)*

213 Ashy Drongo / Grijze Drongo *Dicrurus leucophaeus*, Bandar Abbas, Hormozgan, Iran, 24 February 2021 *(Hadi Amini)* **214** Stejneger's Stonechat / Stejnegers Roodborsttapuit *Saxicola stejnegeri*, first-winter female, Sila, Abu Dhabi, United Arab Emirates, 20 November 2020 *(Oscar Campbell)* **215** Variable Wheatear / Picatatapuit *Oenanthe picata*, first-winter male, Kabd reserve, Kuwait, 28 February 2021 *(Omar Al-Shaheen)*

ORIOLES TO CROWS A first-winter **Indian Golden Oriole** *Oriolus kundoo* photographed at Konarak, Chabahar, Sistan and Baluchestan, on 25 December 2020 was the first for Iran and the WP. Aleksi Lehikoinen reviewed the identification and European records of **Northern Shrike** *Lanius borealis* and proposed a scoring system for features to separate **American Northern** *L b borealis*, **Siberian Northern** *L b sibiricus* and Great Grey Shrike *L excubitor* (Br Birds 111: 148-165, 2021). Since some individuals show intermediate characters, the Finnish rarities committee decided to require DNA analysis for a certain identification. There are four records of Siberian Northern Shrike in Europe, including two shot in Hedmark, Norway, on 5 November 1881 and 17 October 1891 and singles at Helsinki, Finland, from 6 December 2009 to 13 January 2010 and in Lithuania on 3 December 2019 (apart from the second Norwegian specimen, all were confirmed by DNA). Moreover, Tajkova & Red'kin (2014) analysed the plumage and biometrics of seven museum specimens collected in Ukraine and considered them to be certain Siberian Northern despite the lack of DNA analysis (J Nat Mus (Prague), Nat Hist Ser 183(8): 89-107, 2014). A probable Siberian Northern specimen at Naturalis Biodiversity Center, Leiden, Zuid-Holland, collected in the Netherlands on 25 November 1909 has not yet been DNA analysed. Other claims in Europe include six from Finland and one in Belarus in January 2021. The only WP record of American Northern Shrike was a first-winter on Corvo, Azores, on 18-30 October 2014. A **Black Drongo** *Dicrurus macrocercus* was found at Bandar-e Lengeh, Hormozgan, Iran, on 26 February. An **Ashy Drongo** *D leucophaeus* photographed at Bleik, Andøy, Nordland, on 11-20 June 2019 was the first for Norway and Europe but was placed in category D (Fugleåret 8: 4-59, 2021; a paper on this record will be published in Dutch Birding). In Iran, two were seen at Bandar Abbas, Hormozgan, on 14 February of which one remained until 24 February. In northern Africa, the long-staying **Pied Crow** *Corvus albus* at Punta Blanca, Ceuta, Spain, was again seen on 25 February. After many months of absence, one first seen from 13 October 2019 into February 2020 at Olbernau, Sachsen, in extreme south-eastern Germany was reported again in early January.

PENDULINE TITS TO SWALLOWS In Iran, 18 **White-crowned Penduline Tits** *Remiz coronatus* were found at Gomishan, Golestan, on 19 January. A hybrid **Azure x Eurasian Blue Tit** *Cyanistes cyanus x caeruleus* stayed at Białowieża, Podlaskie, Poland, on 3-19 February. If accepted, a **Turkestan Short-toed Lark** *Alaudala heinei* at Bernhardsthaler Ebene, Niederösterreich, from 20 January to 10 February may be the first for Austria (faeces were collected for DNA analysis). A **Calandra Lark** *Melanocorypha calandra* photographed at Bzianka, Podkarpackie, from 20 March was the third for Poland. Recently identified photographs of an **African Dunn's Lark** *Eremalauda dunni* at Djanet in November 2018 constituted the species' first record for Algeria. A flock of c 12 **Pale Martins** *Riparia diluta* wintering at Al Asfar lake, Al Ahsa, from 30 October 2020 to 26 February constituted the first record for Saudi Arabia. Leader et al (2021) reviewed the identification, taxonomy and distribution of the three house martin *Delichon* taxa breeding in the Palearctic, ie, **Common House** *D urbicum*, **Siberian House** *D (u) lagopodum* and **Asian House Martin** *D dasypus*. They showed that these taxa differ, eg, in the size of the rump-patch and vocalisations and, because of sympatric breeding in Russia and genetic differences, should be treated as separate species. There are five WP records of *dasypus* including three in the UAE (October 1999, November 2001 and February-March 2008), one in Lithuania (found dead at Ventės Ragas on 28 October 2016 and confirmed by DNA) and one in Israel (photographed at Ma'agan Michael on 16-26 December 2016) (Br Birds 111: 72-96, 2021).

LEAF WARBLERS TO SYLVIAS In Italy, **Dusky Warblers** *Phylloscopus fuscatus* wintered at Lago di Olginate, Lecco, from December into January and at Milano on 23 January. A **Siberian Chiffchaff** *P tristis* at Les Grangettes, Vaud, was (only) the first to winter in Switzerland. The fourth in January for Morocco was found at Dar Bouazza, Casablanca, on 28 February (at the same spot as where the previous one was seen in late 2019). The first **Iberian Chiffchaff** *P ibericus* for the Canary Islands was singing and calling at Costa Calma, Fuerteventura, on 13-14 March (there may have been two). A nominate **Hume's Whitethroat** *Sylvia althaea althaea* photographed, sound-recorded and trapped at Helsinki, Finland, from 8 November to 8 December 2020 was the second for Europe and confirmed by DNA analysis. The first for Europe to be confirmed by DNA was a bird trapped in the Netherlands at Meijendel, Wassenaar, Zuid-Holland, on 16 September 2014 (Peter de Knijff in litt). The second and third **Desert Lesser Whitethroat** *S a halimodendri* for the Netherlands were confirmed by DNA on Ameland, Friesland, on 6-25 December 2020 and at Amsterdam, Noord-Holland, on 1-2 January. In eastern Germany, a **Western Lesser Whitethroat** *S curruca curruca* from 30 January to 4 February was the species' first winter record for Europe confirmed by DNA.

MOCKINGBIRDS TO STARLINGS A **Northern Mockingbird** *Mimus polyglottos* at Exmouth, Devon, from 23 January into late March was the third for England; previous WP records were in Cornwall on 30 August 1982, in Essex on 17-23 May 1988 and on Schiermonnikoog, Friesland, Netherlands, on 16-23 October 1988 (one in the Canary Islands from November 2004 to January 2006 was placed in category D). In Belgium, a **Wallcreeper** *Tichodroma muraria* was seen at Dinant, Namur, between 28 November 2020 and 16 February. If accepted as a wild bird, a **Chestnut-tailed Starling** *Sturnia malabarica* at Bandar-e Lengeh, Hormozgan, from 22 December 2020 to 26 February will be the first for Iran (the only previous WP record was at Dawkah farm, Dhofar, Oman, on 11-14 November 2010); at the same site, a **Brahminy Starling** *S pagodarum* was seen as well. A **Rosy Starling** *Pastor roseus* near Nahořany, Náchod, on 7-8 January was the first in winter for Czechia.

216 White-headed Duck / Witkopeend *Oxyura leucocephala*, Qaroun lake, Fayoum, Egypt, 26 February 2021 *(Tarek Nagah)* **217** Allen's Gallinule / Afrikaans Purperhoen *Porphyrio alleni*, first-winter, Lago Piccolo di Avigliana, Torino, Italy, 9 February 2021 *(Paolo Marotto)* **218** Hybrid Azure x Eurasian Blue Tit / hybride Azuurmees x Pimpelmees *Cyanistes cyanus x caeruleus*, Białowieża, Podlaskie, Poland, 4 February 2021 *(Paweł Białomyzy)* **219** Hume's Whitethroat / Humes Braamsluiper *Sylvia althaea althaea*, Helsinki, Finland, 8 November 2020 *(Jukka A Lahtinen)*

THRUSHES TO WAGTAILS From mid-January to 3 March, a first-winter **Eyebrowed Thrush** *Turdus obscurus* was photographed in a private garden in Kent, England. A male **Dusky Thrush** *T eunomus* was singing near Beutha, Sachsen, Germany, from 27 February to 7 March and, in Scotland, one was photographed at Fraserburgh, Aberdeenshire, on 13-14 February. In the Netherlands, a second to third calendar-year female **Black-throated Thrush** *T atrogularis* at Hoograven-Noord, Utrecht, Utrecht, first seen from 31 March to 3 April 2020 was back again on 4 December and remained to at least mid-March. In March, others were reported in Norway and Sweden (two). The first **Red-flanked Bluetail** *Tarsiger cyanurus* for Mexico was photographed at Troncones, Guerrero, on 25 February. DNA analysis confirmed the identification of the first **Stejneger's Stonechat** *Saxicola stejnegeri* for the UAE and the Middle East at Sila, Abu Dhabi, from 20 November to 17 December 2020. A **Hooded Wheatear** *Oenanthe monacha* at Çenger, Antalya, on 12 March was the fourth for Turkey. A **White-crowned Wheatear** *O leucopyga* near Selaata on 6 January was the second for Lebanon. The third **Variable Wheatear** *O picata* for Kuwait (and the WP 'sensu BWP') turned up at Kabd reserve on 28 February. The first **Eastern Yellow Wagtail** *Motacilla tschutschensis* ('sensu lato') for Malta at Salina from 21 December 2020 remained until 3 February. An **Amur Wagtail** *M leucopsis* photographed at Al Wathba, Abu Dhabi, on 21 January was the first for the UAE.

CROSSBILLS TO AMERICAN SPARROWS If accepted, a male **Scottish Crossbill** *Loxia scotica* photographed and sound-recorded (vocal type N20; cf Martin & Rochefort 2021 at https://tinyurl.com/9ewy8xsp) west of Paris in Rambouillet forest, Yvelines, on 21 February among Red Crossbills *L curvirostra* coming from Scotland and Wales (recognised by call types) will not only be the first for France but also the first outside northern Scotland,

220 Myrtle Warbler / Mirtezanger *Setophaga coronata*, first-winter male, Europa Point, Gibraltar, 27 February 2021 *(Alex Colorado)* **221** Indian Golden Oriole / Indiase Wielewaal *Oriolus kundoo*, first-winter, Konarak, Chabahar, Sistan and Baluchestan, Iran, 25 December 2020 *(Mehdi Pourabedi)* **222** Presumed Scottish Crossbill / vermoedelijke Schotse Kruisbek *Loxia scotica*, male, Rambouillet forest, Yvelines, France, 21 February 2021 *(Stanislas Wroza)* **223** Presumed Turkestan Short-toed Lark / vermoedelijke Heines Kortteenleeuwerik *Alaudala heinei*, Bernhardsthaler Ebene, Niederösterreich, Austria, 1 February 2021 *(Leander Khil)*

where it is a locally nomadic endemic resident. A **Lapland Longspur** *Calcarius lapponicus* at Kızılırmak delta on 3 March was the fifth for Turkey. The sole Norwegian **Dickcissel** *Spiza americana* (chronologically the first for the WP), an adult male at Måløy, Sogn og Fjordana, on 29 July 1981 has been removed from category A to category D because the date does not fit 'the pattern of occurrence' in the WP (Fugleåret 8: 4-59, 2021). A **White-throated Sparrow** *Zonotrichia albicollis* photographed at Ooltgensplaat, Zuid-Holland, on 6-8 January was the seventh for the Netherlands and first in winter. In England, one was photographed at Barcombe Cross, East Sussex, on 3-13 February. The **Dark-eyed Junco** *Junco hyemalis* at Heiðmörk from 27 November 2020 to 21 February was the second for Iceland.

AMERICAN WARBLERS Baiz et al (2020) examined links between genomic and plumage variation in **Blue-winged x Golden-winged Warbler** *Vermivora cyanoptera x chrysoptera* hybrids, which have traditionally been categorised into two types (Brewster's Warbler and Lawrence's Warbler). They showed that Brewster's plumage varied in levels of carotenoid, and that individuals captured in several years consistently became less yellow over time. Results supported the notion that traditional categorisation of hybrids as either Brewster's or Lawrence's oversimplifies continuous variation in carotenoid pigmentation, and its inferred underlying genetic basis, and is based primarily on the throat patch/mask phenotype (Auk 137: ukaa027, 2020). Brennan et al (2021) described two cases of a previously undocumented hybrid of **Magnolia Warbler** *Setophaga magnolia* and **American Redstart** *S ruticilla* in Ottawa county, Ohio, USA, and Laval, Québec, Canada. These two hybrids (male and female) showed a plumage intermediate between parental species, and genetic analyses showed that both had a Magnolia as mother (Wilson J Ornithol: doi.org/10.1676/19-24). The first **Myrtle Warbler** *S coronata*

224 Chestnut-tailed Starling / Grijskopspreeuw *Sturnia malabarica* (left), with Brahminy Starling / Pagodespreeuw *S pagodarum*, Bandar-e Lengeh, Hormozgan, Iran, 26 February 2021 *(Hadi Amini)*

225 Amur Wagtail / Amoerkwikstaart *Motacilla leucopsis*, male, Al Wathba, Abu Dhabi, United Arab Emirates, 21 January 2021 *(Oscar Campbell)*

for Gibraltar stayed at Europa Point from 27 February to 2 March.

For a number of reports Birdwatch, British Birds, Global Rare Bird Alert Facebook, Sovon-nieuws, www.birdguides.com, www.clanga.com, www.dutchavifauna.nl, www.go-south.org, www.magornitho.org, www.rarebirdalert.co.uk, www.tarsiger.com, www.waarneming.nl and many others were consulted. We wish to thank Omar Al-Shaheen, AbdulRahman Al-Sirhan, Mohamed Amezian, Hadi Amini, Gregory Askew, Dániel Balla, Hamid Basir, Paolo Belo, Paweł Białomyzy, Paul Bradbeer, Mika Bruun, Oscar Campbell, Kuzey Cem Kulaçoğlu, Rúben Coelho, Alex Colorado, Magnus Corell, Andrea Corso, Klaas van Dijk, Philippe Dubois, Nils van Duivendijk, Jon Dunn, Enno Ebels, Patrick Franke, Raymond Galea, Eduardo Garcia-del-Rey, Ricard Gutiérrez, Axel Halley, Nidal Issa, Josh Jones, Zbigniew Kajzer, Abolghasem Khaleghizadeh, Leander Khil, Steve Klasan, Yann Kolbeinsson, Peter de Knijff, Richard Kvetko, Jukka Lahtinen, Petteri Lehikoinen, André van Loon, Ben Lucking, Sami Ullah Majeed, Paweł Malczyk, Ahmad Mansour, Paolo Marotto, Lionel Maumary, Geir Mobakken, David Monticelli, José Manuel Moreno Iniesta, Killian Mullarney, Tarek Nagah, Tor Olsen, Gerald Oreel, Gerard Ouweneel, Yoav Perlman, René Pop, Mehdi Pourabedi, Nikos Probonas, Pedro Ramalho, Colin Richardson, Magnus Robb, Jiri Sirek, Vincent van der Spek, Rasmus Strack, Ehsan Talebi, André Vieira, Sam Viles, Roland van der Vliet, Peter de Vries, Stanislas Wroza and Emin Yoğurtcuoğlu for their help in compiling this review.

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Recente meldingen

Dit overzicht van recente meldingen van zeldzame en interessante vogels in Nederland beslaat voornamelijk de periode **januari-februari 2021**. De vermelde gevallen zijn deels niet geverifieerd en het overzicht is niet volledig.

GANZEN TOT GIERZWALUWEN Waarnemingen van **Witbuikrotganzen** *Branta hrota* kwamen uit 69 uurhokken, een flinke toename ten opzichte van de vorige periode (38). Vooral half februari werden er door het winterse weer veel waargenomen. Langs de telposten vlogen er 60, met als grootste groepen 18 op 14 februari langs De Marlijn op Schiermonnikoog, Friesland, en 16 op 13 februari langs IJmuiden aan Zee, Noord-Holland, en Bloemendaal aan Zee, Noord-Holland. Het hoogste aantal pleisteraars betrof 54 op 24 februari bij Breskens, Zeeland. Ook op andere plekken werden hoge aantallen gemeld: 17 op 13 februari bij Delfzijl, Groningen; 16 op 13 februari op de dijk bij de Lauwersmeer, Friesland, en op 19 februari bij Peazemerlannen, Friesland; 11 op 12 februari op de Brouwersdam, Zeeland; en 11 op 12 februari op de dijk van Schiermonnikoog. Zoals gebruikelijk lag het zwaartepunt van de waarnemingen van **Zwarte Rotgans** *B nigricans* in de Delta en het Waddengebied. Het hoogste aantal bestond uit een familie met twee jongen bij Scharendijke, Zeeland. Opnieuw waren er meldingen uit het binnenland, met weer (of nog) een exemplaar van 1 tot 6 februari bij Zeewolde, waar op 30 december 2020 de eerste voor Flevoland werd gezien. Verder liepen er exemplaren op 14 februari bij Surhuisterveen, Friesland, en op 21 februari bij Spaarndam, Noord-Holland. **Roodhalsganzen** *B ruficollis* werden gemeld in 114 uurhokken verspreid over het hele land. De meeste waren te vinden in het Waddengebied, waar de zes van Ameland, Friesland, de grootste groep vormden. Op 20 februari trok een exemplaar naar noord langs telpost Lauwersmeer Kustweg, Groningen. Voor het eerst sinds 2018 werden weer eens overtuigende **Taigarietganzen** *Anser fabalis* gemeld en gefotografeerd, zes in totaal, alle in het noordoosten tussen Toendrarietganzen *A serrirostris*. Op 20 januari werd een exemplaar gezien bij Onstwedde, Groningen. Op 14 februari werd een nieuwe gevonden bij Stootshorn, Groningen. Deze of een andere werd nog tot 19 februari gemeld. Op 20 februari werden er maar liefst vier gevonden in Drenthe: twee bij Exloo en twee bij Zuidvelde. **Dwergganzen** *A erythropus* werden in lagere aantallen waargenomen dan in de vorige periode, toen er maximaal 74 liepen bij Camperduin, Noord-Holland. Nu werden hier hoogstens 38 gemeld, tegen 31 in het Oudeland van Strijen, Zuid-Holland. Daarnaast waren er nog meldingen van c 15 andere locaties. In totaal werden 34 **IJseenden** *Clangula hyemalis* op telposten vastgesteld, waarvan 15 langs telpost Westerslag op Texel, Noord-Holland. Waarnemingen kwamen uit 49 uurhokken waaronder ook locaties in het binnenland. Het aantal overwinteraars bleef gering met als maximum 10 langs de Brouwersdam. Op c acht plekken zwommen **Witoogeenden** *Aythya nyroca*. Bijzonder was het groepje van vijf tussen Itteren en Borgharen, Limburg, vanaf 10 januari. Het mannetje **Ringsnaveleend** *A collaris* bij Bierum, Groningen, werd, na ruim een maand niet gezien te zijn weer waargenomen van 25 januari tot 10 februari. Op 27 februari dook hij weer op bij Appingedam, Groningen, net als in de vorige winters. Op 24 en 25 januari werd een mannetje **Amerikaanse Wintertaling** *Anas carolinensis* waargenomen bij Scherpenisse, Zeeland. Opmerkelijk is het hoge aantal van in totaal 87 langstrekkende **Kuifduikers** *Podiceps auritus* op meerdere dagen medio februari langs telpost Westerslag. Op 13 februari werd een dode **Gierzwaluw** *Apus apus* gevonden in Katwijk aan Zee.

KRAANVOGELS TOT AALSCHOLVERS Met name in het lenteachtige weekend van 20 en 21 februari trokken **Kraanvogels** *Grus grus* massaal over het uiterste zuiden

226 Ringsnaveleend / Ring-necked Duck *Aythya collaris*, adult mannetje, met Kuifeenden / Tufted Ducks *A fuligula*, vrouwtjes, Bierum, Groningen, 10 februari 2021 *(Rob Sjouken)* **227** Grote Burgemeester / Glaucous Gull *Larus hyperboreus*, vierde-kalenderjaar, Vlissingen, Zeeland, 18 februari 2021 *(Marcel Klootwijk)* **228** Witoogeenden / Ferruginous Ducks *Aythya nyroca*, mannetjes, Borgharen, Limburg, 22 februari 2021 *(Mariet Verbeek)*

en oosten van het land. Over de gehele periode werden op telposten Karstraat bij Wittem, Limburg, en Terhorst, Limburg, in totaal ruim 45 000 respectievelijk bijna 34 000 exemplaren geregistreerd. Topdag was 21 februari met 21 329 over telpost Karstraat, nog wel ver verwijderd van het landelijke record van 54 660 op 9 november 2014 over telpost Aan de Majoor bij Koningsbosch, Limburg. Niettemin was januari-februari 2021 uitzonderlijk goed, getuige het totaal van 121 869 trekkers tegenover een gemiddelde van 2950 in januari-februari over de vorige 10 jaar. Net als de vorige winter verbleef een grote groep (maximaal 27) veelvuldig roepende **Parelduikers** *Gavia arctica* langs de Brouwersdam. Zeetrektellers noteerden 80 trekkers. Naast waarnemingen langs de kust werden ook enkele in het binnenland gezien, het verst van zee bij Oost-Maarland, Limburg, tot 16 januari. Er waren veel **IJsduikers** *G immer* in het Deltagebied, met op meerdere plaatsen vier tot vijf bijeen. Daarentegen werden op zeetrektelposten slechts vijf trekkers gezien. De binnenlandvogels van de Maasplassen in de omgeving van Roermond, Limburg, bleven de gehele periode. Op zeetrektelposten werden 16 **Noordse Stormvogels** *Fulmarus glacialis* gezien, de meeste langs telpost Westerslag. Vermeldenswaard zijn de winterwaarnemingen van **Grauwe Pijlstormvogels** *Ardenna grisea* op 9 januari vanaf de Hondsbossche Zeewering bij Camperduin, op 10 januari langs telpost Tweede Maasvlakte, Zuid-Holland, en op 17 januari langs telpost Camperduin. De groep van maximaal 13 **Koereigers** *Bubulcus ibis* die langere tijd vertoefde rond Alphen aan den Rijn, Zuid-Holland, werd in de eerste helft van februari door de vorst verdreven. Na de dooi werden elders in het land weer exemplaren gemeld. Op c acht plekken werden solitaire **Zwarte Ibissen** *Plegadis falcinellus* gezien. Er werden nog steeds veel **Kuifaalscholvers** *Phalacrocorax aristotelis* gezien, met als grootste groepen 12 bij de Oosterscheldekering, Zeeland, en zeven bij de Zuidpier van IJmuiden.

229 Kleine Burgemeester / Iceland Gull *Larus glaucoides*, eerste-winter, Dordrecht, Zuid-Holland, 9 februari 2021 *(Theodoor Muusse)* **230** Kleine Burgemeester / Iceland Gull *Larus glaucoides*, eerste-winter, Westkapelle, Zeeland, 9 januari 2021 *(Arnoud B van den Berg)* **231** Rosse Franjepoot / Red Phalarope *Phalaropus fulicarius*, tweede-kalenderjaar, Scheveningen, Zuid-Holland, 1 februari 2021 *(Hans Overduin)*

STELTLOPERS TOT MEEUWEN Een adulte **Morinelplevier** *Charadrius morinellus* werd op 29 januari gezien tussen Goudplevieren *Pluvialis apricaria* bij Kerkwerve, Zeeland. De overwinterende eerstejaars **Kleine Plevier** *C dubius* bij Keent, Noord-Brabant, bleef de gehele maand januari, de derde ooit in die maand. In deze periode werden zes **Rosse Franjepoten** *Phalaropus fulicarius* waargenomen. Van 1 tot 3 januari zwom een exemplaar bij Ritthem en Vlissingen, Zeeland, en van 1 tot 9 januari verbleven twee in het Noordervroon bij Westkapelle, Zeeland. Verder was er op 6 januari één kort ter plaatse bij de Brouwersdam, vloog er op 16 januari één langs Huisduinen, Noord-Holland, en zwom er van 1 tot 6 februari één in de Binnenhaven van Scheveningen, Zuid-Holland. Tijdens de vorst in februari kwamen op veel plaatsen **Houtsnippen** *Scolopax rusticola* tevoorschijn, met name ook op de Waddeneilanden. Aantallen in de drie cijfers waren geen uitzondering en soms werden clusters van 10-tallen bij elkaar gezien. Op 6 februari werd een nationaal trektelrecord van 21 gevestigd op telpost Bloemendaal aan Zee en negen van de 10 beste trekteldagen ooit zijn nu van deze periode. In totaal zeven **Papegaaiduikers** *Fratercula arctica* vlogen langs Camperduin. Tweede-kalenderjaar **Zwarte Zeekoeten** *Cepphus grylle* werden gezien op 13 februari langs telpost Westerslag en op 19 februari langs telpost Lauwersmeer Kustweg. Verder verbleven er op Texel twee lange tijd: de eerste vanaf 5 januari in de haven van Oudeschild en soms elders langs de Waddenkust en de tweede vanaf 27 januari onregelmatig op het Marsdiep. De bekende adulte van de Brouwersdam werd op 9 februari voor het laatst gezien, in zomerkleed. De **Kortbekzeekoet** *Uria lomvia* van het Veerse Meer, Zeeland, bleef tot 6 februari. Op telposten werden één **Kleine** *Stercorarius parasiticus,* vier **Middelste** *S pomarinus* en 87 **Grote Jagers** *S skua* geteld. Een tweede-kalenderjaar **Vorkstaartmeeuw** *Xema sabini* werd op 10 januari gemeld langs Camperduin. Pleisterende

232 Steenarend / Golden Eagle *Aquila chrysaetos*, derde/vierde-kalenderjaar, Eibergen, Gelderland, 21 februari 2021 *(Roland Wantia)* **233** Grote Pieper / Richard's Pipit *Anthus richardi*, eerste-winter, Amsterdamse Waterleidingduinen, Zandvoort, Noord-Holland, 29 januari 2021 *(Jan Wierda)* **234** Kortbekzeekoet / Thick-billed Murre *Uria lomvia*, Veerse Meer, Zeeland, 9 januari 2021 *(Jan Aalders)*

tweede-kalenderjaar **Kleine Burgemeesters** *Larus glaucoides* werden gezien vanaf 8 januari in de ruime omgeving van Dordrecht, Zuid-Holland; van 8 tot 21 januari op de zeedijk bij Westkapelle; van 19 tot 26 februari in de wijde omgeving van Leiden, Zuid-Holland; en de gehele periode in de Binnenhaven van Vlissingen. Trekkende tweede-kalenderjaar vogels werden waargenomen op 1 januari langs telpost IJmuiden aan Zee; op 31 januari langs telpost De Vulkaan bij Den Haag, Zuid-Holland; en op 21 februari langs Zandvoort, Noord-Holland. De adulte **Kumliens Meeuw** *L g kumlieni* van Julianadorp, Noord-Holland, bleef de gehele periode en frequenteerde onder meer de zandsuppletie op het nabije Noordzeestrand. De vierde-kalenderjaar **Grote Burgemeester** *L hyperboreus* van de Binnenhaven van Vlissingen werd voor het laatst gemeld op 19 februari. Op ruim 10 andere locaties werden tweede-kalenderjaar exemplaren gezien, waaronder maximaal twee de gehele periode bij Medemblik, Noord-Holland, en tot 5 februari tussen Twello en Deventer, Gelderland.

ROOFVOGELS TOT HOPPEN Op 21 februari werd een derde- of vierde-kalenderjaar **Steenarend** *Aquila chrysaetos* gefotografeerd bij Enschede, Overijssel, en ongeveer een half uur later vloog deze over Eibergen, Gelderland. Op 27 februari kwam er een vervolgwaarneming boven Renkum, Gelderland. De dag erna werd de vogel opnieuw teruggevonden, ditmaal bij Duiven, Gelderland, waar hij twitchbaar was tot in de schemering en in de volgende ochtend. Dit was het derde geval in drie jaar maar de eerste twitchbare sinds 2002. Op 8 januari werd een **Zwarte Wouw** *Milvus migrans* opgeraapt bij Leiden en later die dag weer vrijgelaten. Een dag later werd hij opgemerkt bij Hazerswoude, Zuid-Holland, en weer een dag later bij Alphen aan den Rijn. Waarschijnlijk dezelfde werd op 16 januari gezien bij Elst, Utrecht, en op 17 januari bij Lienden, Gelderland. Er werden op 25 februari twee **Hoppen** *Upupa epops* gezien in de provincie Groningen: bij Uithuizen en Eekwerd.

235 Bruine Boszanger / Dusky Warbler *Phylloscopus fuscatus*, Exloërveen, Drenthe, 15 januari 2021 *(Wim van Zwieten)* **236** Zwartbuikwaterspreeuw / Black-bellied Dipper *Cinclus cinclus cinclus*, Altena, Drenthe, 6 februari 2021 *(Edwin de Weerd)* **237** Zwarte Zeekoet / Black Guillemot *Cepphus grylle*, eerste-winter, Oudeschild, Texel, Noord-Holland, 16 februari 2021 *(Siem Dijsselbloem)*

KRAAIEN TOT GRASZANGERS **Bonte Kraaien** *Corvus cornix* werden gemeld uit 24 uurhokken, voor een groot deel in het noordoosten. Er werden twee overwinterende **Bladkoningen** *Phylloscopus inornatus* gemeld: één op 6 januari bij Helenaveen, Noord-Brabant, en één van 31 januari tot 4 februari in Voorburg, Zuid-Holland. De **Humes Bladkoning** *P humei* bij Noordwijk, Zuid-Holland, bleef tot 3 januari. Een nieuwe werd gevonden bij Leiderdorp, Zuid-Holland, op 27 januari maar vervolgwaarnemingen bleven uit. De longstayer in Geldermalsen, Gelderland, werd de gehele periode waargenomen. **Bruine Boszangers** *P fuscatus* werden tot 1 februari op acht locaties gezien, waaronder vijf nieuwe: van 1 tot 5 januari in de Lepelaarplassen bij Almere, Flevoland; van 1 tot 17 januari op Schiermonnikoog; op 2 en 3 januari in de Grutte Wielen bij Leeuwarden, Friesland; van 2 tot 10 januari twee langs het riviertje de Jeker bij Maastricht, Limburg; en op 31 januari en 1 februari bij Harderwijk, Gelderland. Op 1 en 2 januari werd een braamsluiper gezien in het Diemerpark in Amsterdam, Noord-Holland; hij werd naderhand met behulp van DNA-analyse gedetermineerd als **Vale Braamsluiper** *Sylvia althaea halimodendri*. Dit betreft het derde geval; de eerste was in Vinkhuizen, Groningen, Groningen, in de twee winters van 2005/06 en 2006/07 en de tweede op Ameland, Friesland, van 6 tot 25 december 2020. **Graszangers** *Cisticola juncidis* werden behalve op de vaste locatie van het Verdronken Land van Saeftinghe, Zeeland, ook gemeld bij Nieuwvliet-Bad, Zeeland, met een maximum van drie.

BOOMKRUIPERS TOT KWIKSTAARTEN Op twee plekken werden **Taigaboomkruipers** *Certhia familiaris* waargenomen, op 18 januari in Nieuwegein, Utrecht, en van 22 januari tot 25 februari in Winkel, Noord-Holland. De **Zwartbuikwaterspreeuw** *Cinclus cinclus cinclus* bij het TT-Circuit van Assen, Drenthe, werd na een verblijf van bijna drie maanden op 31 januari voor het laatst waargenomen. Nieuwe doken op bij Altena, Drenthe, van 5 tot 18 februari en bij Staverden, Gelderland, van

238 Vale Braamsluiper / Desert Lesser Whitethroat *Sylvia althaea halimodendri*, Diemerpark, Amsterdam, Noord-Holland, 2 januari 2021 *(Hans Niekus)*

239 Zwartkeellijster / Black-throated Thrush *Turdus atrogularis*, adult vrouwtje, Hoograven, Utrecht, Utrecht, 17 januari 2021 *(Chris Schenk)*

240 Dwerggors / Little Bunting *Emberiza pusilla*, Maastricht, Limburg, 19 februari 2021 *(Frank Coenjaerts)*

241 Taigaboomkruiper / Eurasian Treecreeper *Certhia familiaris*, Winkel, Noord-Holland, 26 januari 2021 *(Ruud E Brouwer)*

23 tot 26 februari. Het vrouwtje **Zwartkeellijster** *Turdus atrogularis* van Utrecht, Utrecht, dat voor het eerst op 31 maart 2020 werd gezien, bleef de gehele periode. De op één na vroegste **Blauwborst** *Luscinia svecica* ooit werd op 22 februari aangetroffen in de netten van Vrs AW-duinen bij Zandvoort. Van 6 tot 8 januari was een tweede-kalenderjaar **Tapuit** *Oenanthe oenanthe* aanwezig bij Giesbeek, Gelderland, voor zover bekend de eerste ooit voor januari. Maandlijsters kwamen aan hun trekken met een **Gele Kwikstaart** *Motacilla flava* van 2 januari tot 6 februari bij Noordgouwe op Schouwen-Duiveland, Zeeland. Een ander exemplaar werd gefotografeerd op 23 januari bij De Lier, Zuid-Holland. De twee **Grote Piepers** *Anthus richardi* van de Houtrakpolder bij Spaarndam, Noord-Holland, bleven tot 6 februari. Een overwinteraar in de AW-duinen werd op 4 februari voor het laatst waargenomen. De twee van Havenhoofd op Goeree-Overflakkee, Zuid-Holland, werden na 2 januari niet meer gezien. Andere pleisterden op 3 en 4 januari op Ameland en van 14 januari tot 1 februari op Schiermonnikoog. Trekkers werden opgemerkt op 18 februari over telpost Kamperhoek, Flevoland, en op 22 februari over telpost Noordkaap, Groningen.

VINKEN TOT GORZEN Uit 22 uurhokken werden **Europese Kanaries** *Serinus serinus* gemeld. Het grootste groepje (zeven) was bij Nijmegen, Gelderland. Van 6 tot 8 januari foerageerde een **Witkeelgors** *Zonotrichia albicollis* in een tuin in Ooltgensplaat, Zuid-Holland (deze werd stilgehouden in verband met de covid-pandemie). Indien aanvaard betreft dit het zevende geval en de eerste in de winter. **Grauwe Gorzen** *Emberiza calandra* waren met 10-tallen te vinden op traditionele overwinteringsplekken, zoals maximaal 42 bij Sibbe, Limburg; 37 bij Doenrade, Limburg; 29 in het Verdronken Land van Saeftinghe; en 24 bij Wittem, Limburg. De twee **Dwerggorzen** *E pusilla* vanaf 17 november bij Maastricht bleven de gehele periode. Nieuwe werden gezien van 1 tot 10 januari in een tuin in Drachten, Friesland; op 10 februari tussen Utrecht en Houten, Utrecht; en van 10 tot 13 februari bij Noordwijk.

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