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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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The quantitative future of bird identification

George Sangster

Since the publication of *A field guide to the birds* (Peterson 1934), the bird identification literature has made numerous improvements. There are now field guides for all regions of the world and many regions already have second, third or fourth generation field guides. Whereas the first field guides were based almost exclusively on plumage patterns examined in museum specimens, pioneering field identification experts have added other types of characters, such as posture and proportions (Wallace 1964), primary and tail projection (Nisbet 1961, Wallace 1976) and moult stage (Spear et al 1992, Pyle 1997). The increased accessibility to powerful optical equipment and high-quality (digital) cameras has made it possible to use characters in the field that were originally intended to identify birds in the hand (eg, feather fringes and primary emarginations in small passerines, Svensson 1992). Bird identification based on vocalizations has benefitted from the affordability of digital sound-recording equipment, open-source or affordable sound analysis software and the availability of sound-recordings of almost all bird species on the internet. Difficult identification problems are now examined in detail in dedicated papers, which are often refined, corrected and expanded in follow-up papers (eg, Grant 1986, Satat & Laird 1992, Garner & Quinn 1997, Liebers & Helbig 1999, Adriaens & Mactavish 2004). Furthermore, increased mobility of observers and the online availability of vast numbers of photographs has made it much easier to become familiar with the field appearance and variability of bird species than a few decades ago.

Despite these advances, the decision-making process in bird identification is still often hampered by lack of 'hard' evidence about the reliability (performance) of characters. How to document and measure the performance of field characters are subjects that have received relatively little attention in the bird identification literature. Fortunately, the diagnostic decision-making process in bird identification is very similar to that in other fields where yes/no questions abound, including health care, economics, public safety and the military (Swets 1988, Swets et al 2000). Consequently, diagnostic decisions in bird identification may benefit from proven methods used in other fields and industries.

The most challenging identification problems are those involving partially or fully overlapping variation, or more generally when the diagnosability of characters is uncertain. In this paper, I argue that the most effective strategy to address these problems is to adopt a quantitative approach: documenting not only the range but also the frequency distribution of intraspecific variation, and express the performance of identification criteria in quantitative terms. I briefly review the importance of adequate sample size and the distinction between characters and character states using insights from the systematics literature. I then introduce ways to express the performance of identification characters, borrowing terminology from the medical statistical literature. In addition, I discuss the importance of simultaneous analysis of multiple characters. Finally, I argue for more openness in the study of bird identification criteria including greater accessibility of raw materials, character matrices and data summaries.

Why quantification?

Variation

In bird identification, the first questions to arise are typically related to variation: is there any overlap of character states (for explanation, see box 1) between the two groups (eg, species or taxa), and if so, what is the extent of their overlap, how many individuals are within the range of overlap and how many are outside? Knowledge of variation is an integral part of bird identification. To state that a bird represents an individual of a particular species or taxon means that we have ascertained that the bird falls within the range of variation of that species or taxon but outside the range of variation of all other plausible species or taxa.

By necessity, field guides can only depict a small part of the range of variation, typically just one bird per sex, morph or age class. This approach, where a single type represents an entire group, is called typological (Mayr 1942) (figure 1a). In field identification, this is a perfectly defensible approach if the two species show no overlap

BOX 1 Characters and character states

In the identification literature, the word 'character' is used to express two different notions: a feature that varies between groups (eg, bill colour) and the actual state of that feature (eg, yellow). Confusion may arise if these two notions are not clearly distinguished. For instance, consider the following statements about the value of bill colour for identification of Taiga Bean Goose *Anser fabalis fabalis* and Tundra Bean Goose *A serrirostris rossicus* in western Europe: 'Pay no attention whatever to the colour of the bill, it will only confuse and mislead, there are plenty of good characters that distinguish the two forms by their measurements.' (Coombes 1951: 187). And: 'The most important character is the pattern of black and yellow on the bill. *Fabalis* has more yellow than black on the bill whereas *rossicus* has more black than yellow. It is a fact that there is variation in both *rossicus* and *fabalis* and that variation is more pronounced in *fabalis* than in *rossicus*. Nevertheless, the yellow colouration of the bill gives the first clue.' (Huyskens 1986: 140, translated from Dutch).

These conflicting opinions cannot be attributed to differences in experience; both Coombes and Huyskens were very familiar with these taxa in the field and were aware of the variability of bill colouration in both taxa. Their viewpoints also did not stem from differences in taxonomic viewpoint because both agreed that Taiga Bean and Tundra Bean were different taxa, nor from differences in the birds themselves because there are no known geographic differences between the populations of these taxa in western Europe. How then can their opposing viewpoints be explained?

To understand this, it is useful to distinguish between characters and character states. A *character* is a 'prescription for observation' (Pimentel & Riggins 1987), a part or variable that helps to distinguish between two groups (eg, bill colouration). A *character state* is a state, value or condition of that character (eg, yellow). The importance of this distinction was pointed out in the systematics literature in the 1980s (Ghiselin 1984, Colless 1985, Fristrup 1992) but applies equally to bird identification.

Coombes (1951), aware of the wide overlap of bill colouration in the bean geese, most likely concluded that bill colour was an unreliable character because most (if not all) single birds cannot be reliably identified by bill colour alone. Huyskens (1986), however, focused on differences in the proportion of 'yellow' and 'mostly black' bills in the two taxa and realised that despite overlap between the two, 'yellow' bills were much more frequent in Taiga Bean Geese than in Tundra Bean Geese. Thus, seeing multiple individuals with 'yellow' bills in a group of geese would be a strong indication that this is a group of Taiga Bean. Huyskens's observations of a larger proportion of yellow on the bill in Taiga Bean, and greater overall variability in bill colour in Taiga Bean than in Tundra Bean, were subsequently corroborated by a quantitative study (Burgers et al 1991, figure 3). This example illustrates the importance of the distinction between characters and character states in bird identification. Even if a character (eg, bill colour) may not be able to distinguish most birds, some birds may still be identifiable to taxon if these possess a character state that is rare or absent in the other species (eg, a yellow bill).

of character states (eg, adult male Eurasian Wigeon *Mareca penelope* and American Wigeon *M americana*). However, if there is overlap (figure 1b), a typological approach is unsatisfactory because it cannot show that there is overlap, nor can it show where an illustrated character state is placed on the spectrum of intraspecific variation. Knowing the full extent of overlap between two species is crucial if we want to know which phenotypes are outside and which are within the range of variation of the other species. In addition, knowing where illustrated phenotypes are placed on the spectrum of intraspecific variation is important if a bird displays character states intermediate between the two illustrated phenotypes.

Characters

To assess the value (performance) of a character, knowing the extent of variation is necessary but not sufficient; we must also know how individual birds of a population are distributed across the spectrum of variation (the frequency distribution) (figure 1c). The frequency distribution tells us how often each character state occurs within a population. It can be used to measure the sensitivity, specificity and predictive value of identification criteria. These measures may be of great help in weighing the evidence for (or against) a particular identification.

Knowledge of the range of variation and the frequency distribution is subject to sample size; the larger the sample size, the higher the probability of finding 'extreme' phenotypes and consequently, the higher the probability of finding that the character states of two groups overlap. The statement that a character state is 'diagnostic' for a particular group represents a hypothesis which should be documented with quantitative data. Documenting full (100%) diagnosability is rarely, if ever, possible in practice because this would require the sampling of the entire population. However, even for lower levels of diagnosability (eg, 99%) a substantial number of samples is required (see box 2). Very few identification criteria have been adequately documented with quantitative data.

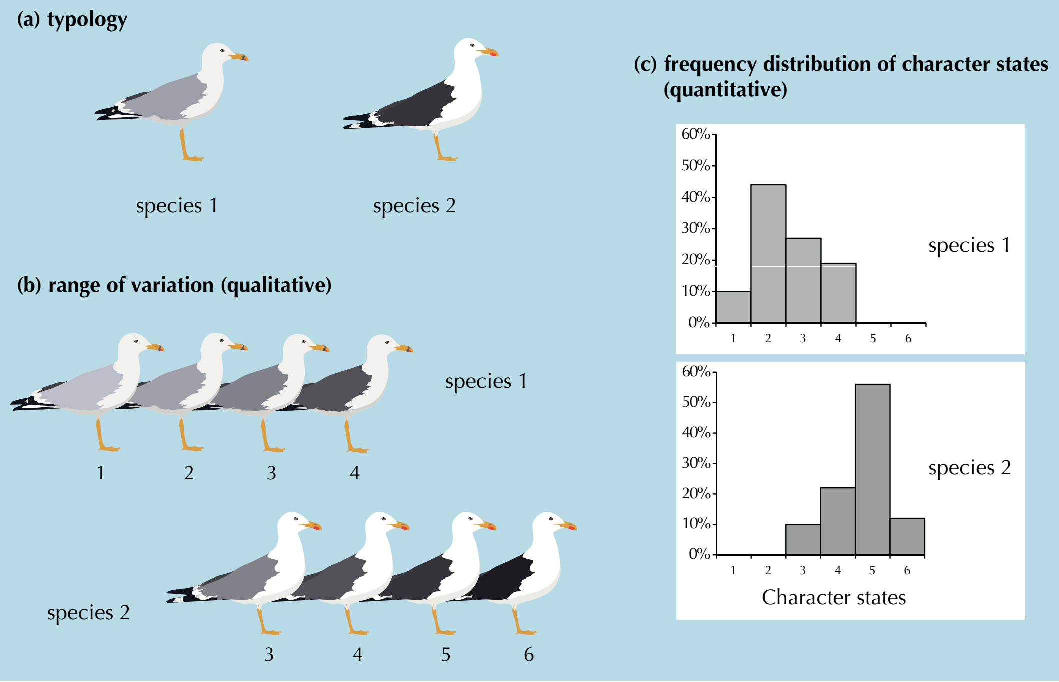


FIGURE 1 Progression from (a) typology (ie, using single birds to represent phenotypes of each group) to (b) qualitative description of range of variation to (c) quantitative description of variation in upperparts colouration of two fictional gull species. Birds with phenotype 3 or 4 are not 'intermediate' between these two species but are part of normal range of variation of both species. Gull illustrations by Quiriene Westerweel.

Field identification

Full knowledge of variation greatly assists in field identification because it is easy to determine whether a particular phenotype falls within or outside the range of variation of the species of interest and that of other closely similar species. If the full extent of variation is not known (due to poor study or poor documentation), we cannot fully rely on field characters, and this means we cannot fully trust the identifications we make. For instance, if a bird shows a combination of character states, of which some agree with a particular species and others do not *seem* to agree with that species, what does this mean? Is it a rare phenotype of a common or rare species, or perhaps a hybrid? Whenever the range and frequency distribution of variation are poorly known, identification of difficult cases is more intuitive than objective. Intuitive assessments tend to rely on assumptions about the true extent of variation, the relative 'importance' of various character states, or the predictive value of the observed combination of character states. Substituting such assumptions with quantitative data will likely clarify a large number of identification problems.

Quantification of character variation is of particular importance for the identification of hybrids. For instance, birds that are perceived to be 'atypical' are sometimes assumed to be hybrids. However, many hybrid combinations are rare, and most are *at least* rarer than their parental taxa. In addition, if the putative parental taxa show overlapping character states or if variation is not well known, a hybrid origin is often impossible to falsify without detailed DNA evidence or actual observations of mixed breeding producing hybrid offspring. Thus, a hybrid origin should not be invoked lightly; instead, it should be based on assessment of the position of each character state on the spectrum of variation of both species. A non-hybrid origin is therefore a reasonable null hypothesis that should only be rejected when there is evidence that the combination of character states of the bird is outside the range of any potential parental species. This requires quantitative data on character variation.

BOX 2 Minimum sample size required to demonstrate diagnosability

A character state is diagnostic for a particular group (eg, species, subspecies, sex or age class) if *some or all individuals in that group display the state whereas no members of another group display that state*. Thus, seeing a bird with a diagnostic character state means we can be certain it is actually a member of the group for which the state is diagnostic. Unfortunately, it is rarely possible to demonstrate full (100%) diagnosability because this requires the examination of all individuals of the other group (which may number in the 1000s or even millions). Therefore, in most cases one has to rely on a sample of the population (a series of specimens or photographs of different individuals) and settle for a slightly lower degree of diagnosability (eg, 95%, 99% or 99.9%). Needless to say, the larger the sample we examine of the other group without finding the apparently diagnostic character state, the more confident we can be that it is absent. Conversely, if we want to be very confident that a character state is diagnostic for a group, we must examine a large sample of the other group. In addition, if a character state is very rare in the other group (eg, 1 in 1000, or in statistical terms 0.001), we must examine a much larger sample to be able to detect this than if the character state is more common (eg, 1 in 20, or 0.05). This proportion is simply the inverse of the 'degree of diagnosability'.

To summarize, if we want to know how many individuals we must examine (the minimum sample size), we must first decide: ***1*** the level of confidence (p-value) we want to have in the assessment, and ***2*** the maximum proportion of individuals of the other group that possess the apparently diagnostic character state. The relationship between minimum sample size, the p-value and the maximum proportion of individuals in a group possessing the apparently diagnostic character state was independently pointed out by Walsh (2000) and Wiens & Servedio (2000). It is as follows:

$$n=\frac{\log(p)}{\log(1-a)}$$

where n is the minimum sample size, p is our chosen level of statistical confidence, and a is the maximum proportion of individuals of the other group that possess the apparently diagnostic character state. Using this equation we can calculate the minimum sample size required to detect non-diagnosability (table 1).

If we want to be able to detect a non-diagnostic character state that occurs in the population at a frequency of 0.05 ('95% diagnosability') with a confidence level of $p<0.05$ (a standard acceptable error rate in statistics), then we must examine at least 59 individuals. Note the large sample size required to demonstrate diagnosability, especially with a conservative p-value or when requiring a high level of diagnosability (ie, a low level of polymorphism). To demonstrate that two species are both diagnosable by a character (eg, species 1 always has a pale iris, whereas species 2 always has a dark iris), *both species* must fulfill the minimum sample size requirements. Scepsis is warranted about diagnostic character states that have not been documented using a sample of at least 59 individuals.

TABLE 1 Minimum sample size required to demonstrate diagnosability

frequency of non-diagnostic character state	'diagnosability'	p-value	minimum sample size
0.05	95%	0.05	59
0.01	99%	0.05	90
0.001	99.9%	0.05	135
0.05	95%	0.01	299
0.01	99%	0.01	459
0.001	99.9%	0.01	688
0.05	95%	0.001	2995
0.01	99%	0.001	4603
0.001	99.9%	0.001	6905

Quantification: the next phase in bird identification

The bird identification literature has long focused on the discovery of new characters. More recently, progress has been made towards the study of the range of variation and the frequency distribution of character states but such studies remain exceptional (eg, Evans & Sladen 1980, Burgers et al 1991, Roselaar & Gerritsen 1991, Newson et al 2004, Adriaens et al 2010, Hellquist 2014, Visscher & van Duivendijk 2015, Adriaens & Gibbins 2016). Without quantitative study, 'diagnostic' identification criteria should be treated with some scepsis because their reliability remains untested. Nevertheless, the discovery of new *potential* identification criteria represents a crucial first step. This is to be followed by a testing phase, in which the range of variation and any overlap with other species is documented, and a final quantitative phase, in which the frequency distribution of character states is documented as well as the sensitivity, specificity and positive predictive value (see below). Because the latter two steps are strongly dependent on sample size, these should be revisited whenever more material (eg, photographs, specimens, sound-recordings) becomes available.

Quantification has many benefits for bird identification: ***1*** it will shift the focus away from typical birds to the full range of variation; ***2*** it will help establish the true range of variation including diagnostic and non-diagnostic character states; ***3*** it will help establish the performance of identification

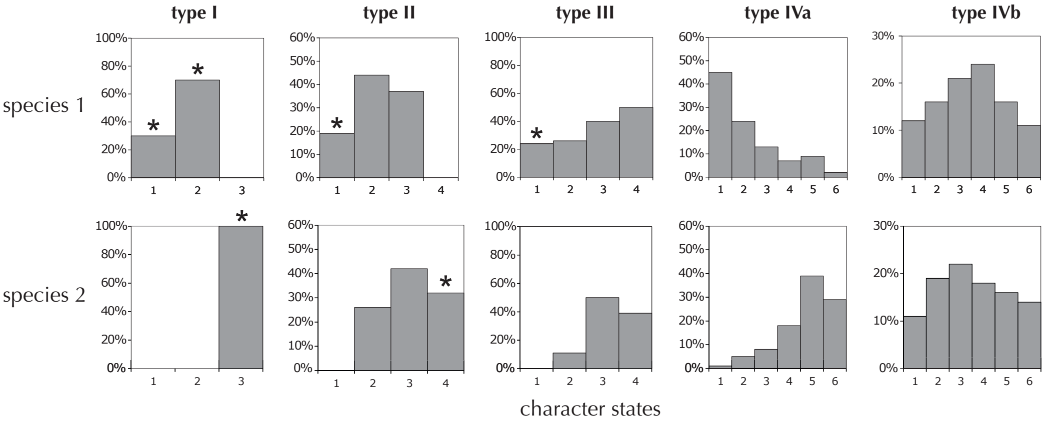


FIGURE 2 Four types of characters based on patterns of overlap of character states between two species. Asterisks indicate diagnostic character states (100% specificity).

criteria; and ***4*** it will improve the reliability of rare bird identification (including hybrids).

Performance of identification characters

What is a 'good' identification criterion? This deceptively simple question has no single answer because the value of characters can be measured in multiple ways, and which measure is most important depends on what the character is used for. An identification criterion may be considered 'good' if ***1*** it applies to all individuals of the species of interest (high *sensitivity*), or ***2*** it can rule out every other species (high *specificity*), or ***3*** it accurately predicts that a bird with a particular character state is the species of interest (high *positive predictive value*). To my knowledge, the terms sensitivity, specificity and positive predictive value have not yet been applied in the bird identification literature in a formal statistical way. However, these may prove to be very useful measures of the performance of identification criteria. In fact, formal measures of the performance of identification criteria are long overdue. A useful starting point is to assess whether there are any character states that are absent from the other species (ie, diagnostic character states).

Types of characters based on patterns of overlap

Characters are sometimes classified into diagnostic (non-overlapping) and non-diagnostic (overlapping) characters, with the latter being considered of 'dubious value' and only to be used 'with caution'. This oversimplifies the situation, not only because some 'diagnostic' characters may prove to be actually overlapping upon detailed study but also because partially overlapping characters may still be very useful.

In the context of distinguishing between individuals from two groups, four types of characters may be distinguished on the basis of patterns of overlap of character states as shown in frequency distribution bar graphs (figure 2). **Type I** characters show no overlap between groups. Thus, all character states in both groups are diagnosable and do not occur in the other group. Using a type I character, all birds, if properly seen, should be identifiable. **Type II** characters overlap between groups (ie, both groups share at least one character state) but both groups have character states which are not found in the other group. Some individuals of group 1 fall outside the range of group 2, and some individuals of group 2 fall outside the range of group 1. Thus, in both groups some but not all individuals are identifiable based on a single type II character alone, whereas other individuals cannot be identified to group based on this character alone, because their character state is also found in the other group. **Type III** characters overlap between groups (ie, both groups share at least one character state) but the degree of overlap differs between the two groups. In only one of the groups some individuals have one or more unique character states and are identifiable to group, whereas the other group shows no unique character states and cannot be identified by this character alone. **Type IV** characters overlap completely in the two groups. Thus, neither group has any unique character states. However, it may be useful to distinguish two extremes of this type. **Type IVa** shows strong differences between the two groups in the relative frequency of character states. This means that under some circumstances one or both of these groups may still be identifiable. For instance, if a character state is common in one species but very rare in the other, seeing multiple individuals with that character state (eg, in a small flock) makes it likely it is the species where this state is common. In contrast, **type IVb** characters show no major differences in the frequency distribution of character states, so that none of the individuals of these groups can be identified using this character alone (but see below for combinations of characters).

All other things being equal, a character with a type I distribution is more useful than characters with a type II, III or IV distribution, and a type IV character will be least useful. It is very likely that many identification problems involve combinations of different types of characters. Some of the most difficult identification problems may be formed by taxa that do not have any type I characters.

It is important to realise that knowledge about the frequency distribution of characters is subject to change, eg, by adding new samples to the data set. As knowledge of intraspecific variation grows, some characters with non-overlapping distribution (type I) will be shown to overlap (type II, III or IV), and some characters with partially overlapping distributions (type II or III) will be shown to overlap completely (type IV).

Examples

Examples of type I characters are the colouration of the neck of White Stork *Ciconia ciconia* and Black Stork *C nigra*, the total body length of adult Jack Snipe *Lymnocryptes minimus* and adult Common Snipe *Gallinago gallinago*, the colouration of the flank of Redwing *Turdus iliacus* and Song Thrush *T philomelos*, and the colouration of the vent and undertail-coverts of Red-rumped Swallow *Cecropis daurica* and Barn Swallow *Hirundo rustica*. In each pair of species there is no (known) overlap of the states of the aforementioned characters.

Examples of type II, III, IVa and IVb characters can be found in Adriaens & Gibbins (2016). When separating Short-billed Gull *Larus brachyrhynchus* from the three subspecies of Common Gull *L canus* (ie, *canus*, *heinei* and *kamtschatschensis*), the length of the tongue on p9 may be used to identify some individuals of both species: it is a type II character (diagram 4 in Adriaens & Gibbins 2016). Many adult Short-billed cannot be separated from adult Common by this character because their character states overlap. However, if a gull belonging to this group shows a grey tongue on p9 cutting into the white mirror, it is a Short-billed. Conversely, if the grey tongue is absent, it is a Common (of any subspecies).

An example of a type III character is the length of the black pattern on the outer web of p9 (diagram 6 in Adriaens & Gibbins 2016). Common Gull cannot be identified by this character but adult Short-billed Gull may be identifiable if the black falls >1/3 short of the primary coverts.

Adult Short-billed Gull and Common Gull show full overlap in the length of the black pattern on the outer web of p7 (diagram 12 in Adriaens & Gibbins 2016). However, the two groups show considerable differences in the frequency in which short (<1/2) and long (>1/2) wedges are found: a short wedge is much more frequent in Short-billed than in Common, whereas a long wedge is much more frequent in Common than in Short-billed. This is an example of a type IVa character.

An example of a type IVb character is the extent of the black mark on p4 in adult Short-billed Gull and Common Gull (diagram 15 in Adriaens & Gibbins 2016). There are no major differences between both groups (but note that there are differences among the three subspecies of Common). This means that there is little value in using this character for the identification of a putative Short-billed in Europe except perhaps in combination with other characters (see below).

Sensitivity and specificity

In the medical literature, the diagnostic ability of a test is often expressed by two measures: its sensitivity and its specificity (Altman & Bland 1994a). Sensitivity is the proportion of true positives that are correctly identified by the test. It reflects the test's ability to correctly detect patients who do have the condition. Specificity is the proportion of true negatives that are correctly identified as such by the test. It refers to the ability of the test to correctly detect patients without the condition. Let us apply these concepts to a real-life identification problem: the separation of bean geese *Anser* by bill colouration.

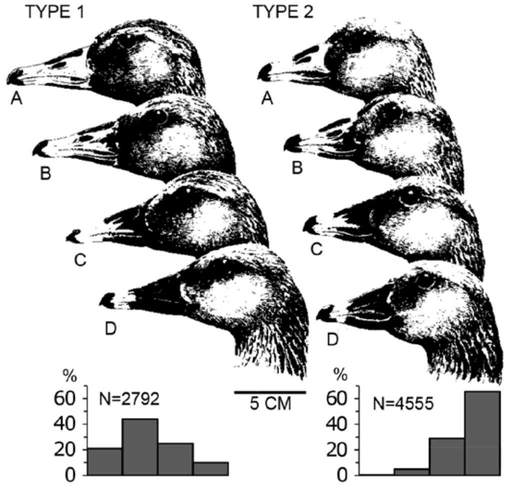
If a character state (eg, yellow bill) is used to identify a species (eg, Taiga Bean Goose *A fabalis*), its *sensitivity* represents the proportion of individuals of that species that show the character state (table 2). In Taiga Bean, sensitivity of the criterion 'yellow bill' is 0.22, which means that only 22% of the individuals of this species have this character state. In other words, a substantial proportion of Taiga Bean cannot be identified using this character and additional criteria are required to identify

TABLE 2 Confusion matrix showing distribution of four character states in 100 Taiga Bean Geese *Anser fabalis* and 100 Tundra Bean Geese *A serrirostris* (data from Burgers et al 1991, see figure 3). Sensitivity and specificity of 'yellow bill' as identification criterion for Taiga Bean are indicated.

Character	**Character state**	**True identity**	
		Taiga Bean Goose	**Tundra Bean Goose**
Bill colour	*Yellow bill*	22 (True Positive)	1 (False Positive)
	Mostly yellow bill	43 (False Negative)	5 (True Negative)
	Equally black and yellow bill	25 (False Negative)	29 (True Negative)
	Mostly black bill	10 (False Negative)	65 (True Negative)
	Total	100 (TP+FN)	100 (FP+TN)
		Sensitivity$_{\textbf{yellow bill}}$ = TP/(TP+FN) =0.22 (22%)	**Specificity**$_{\textbf{yellow bill}}$ = TN/(FP+TN) =0.99 (99%)

the other individuals. A sensitivity of 1.0 means that all individuals of the species of interest have that character state. However, this does not tell us whether members of another species (eg, Tundra Bean Goose *A serrirostris*) also possess that state. For this, we need to look at the specificity of this character state.

FIGURE 3 Bill patterns and frequency distributions of adult Taiga Bean Geese *Anser fabalis* (left) and Tundra Bean Geese *A serrirostris* (right) captured in the Netherlands (goose heads by Ed Hazebroek, reproduced from Burgers et al 1991, with permission).

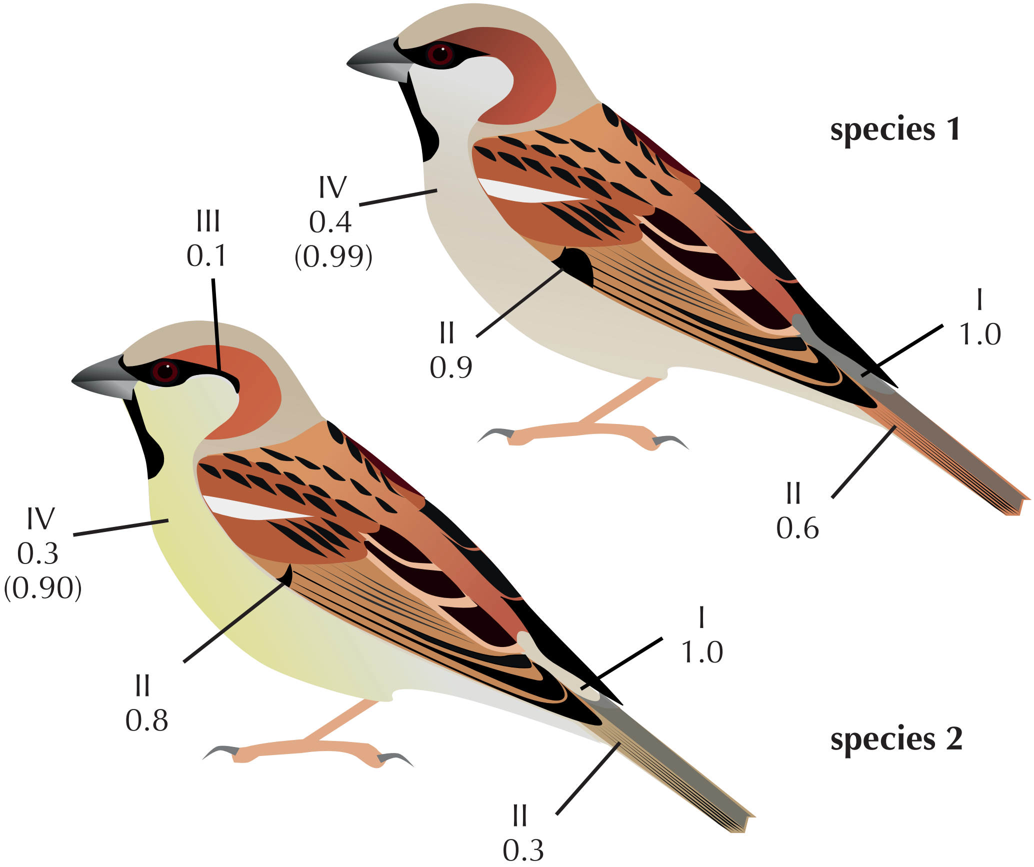


The *specificity* of a character state aimed at identifying the species of interest (Taiga Bean Goose) reflects the proportion of individuals of a very similar species (Tundra Bean Goose) that do *not* show that character state. A specificity of 0.99 means that 1% of individuals of the other species also possess this character state. A specificity of 1.0 means that the character state is not found in the other, closely similar species and thus that the character state is *diagnostic*. Character states with 1.0 specificity are therefore extremely useful for identification purposes, even if sensitivity is below 1.0, ie, not all individuals of the species of interest actually show that character state.

The diagnostic power of an identification criterion is determined by both its sensitivity and its specificity. Character states with low sensitivity will result in many birds going unidentified (false negatives), whereas character states with a low specificity will lead to misidentifications (false positives). There is often a trade-off between these measures. For example, if we not only use 'yellow bill' but also 'mostly yellow bill' (figure 3, table 2) as an identification criterion for Taiga Bean Goose, the sensitivity increases substantially (from 22% to 22+43=65%), which means that many more Taiga Bean will be detected by this revised criterion. However, this comes at a price because the number of false positives also increases (from 1% to 1+5=6%) and the specificity of this criterion decreases (from 99% to 94%). The choice between highly sensitive and highly specific criteria depends on what one aims to do with the criterion. To increase the probability of *detecting* rare birds we tend to use highly sensitive criteria, even if these have low specificity. We then switch to other criteria that are much more specific to rule out all other species. For instance, to detect and identify a Pacific Swift *Apus pacificus* in Europe, it is probably best to first look for a swift with a white rump, which has high sensitivity (all Pacific Swifts show a white rump) but not high specificity (a white rump is also found in other *Apus* species). When a swift with a white rump is found one should switch to more specific criteria (eg, depth of the tail fork, presence of pale scales on the underparts) to rule out, eg, White-rumped Swift *A caffer*, Little Swift *A affinis* and partially leucistic Common Swift *A apus*.

Depicting sensitivity and specificity in field guides
Bird illustrations in field guides often include markers that pinpoint key field characters (eg, Peterson 1934, Svensson et al 2015). This is called the Peterson Identification System and works very well with type I (diagnostic) characters. However, an arrow may be misleading if not every individual of a species shows that character state (ie, sensitivity <1.0) or if some individuals of a similar species also show that character state (ie, specificity <1.0).

FIGURE 4 Suggested method for illustrating various types of character state differences in two fictional bird species. Both illustrations reflect *idealized versions* of both species showing all diagnostic or nearly diagnostic character states. Diagnostic or nearly-diagnostic character states are indicated using roman numerals. Numbers represent sensitivity of diagnostic states (types I, II and III). For type IV character (colouration of underparts), both sensitivity and specificity (between brackets) are indicated. Sparrow illustrations modified from artwork by Shyamal L (Wikimedia Commons).



Yet, omitting the arrow would be undesirable because character states with sensitivity and/or specificity <1.0 are still potentially very useful (see, eg, box 1). Thus, a modification of the Peterson Identification System is warranted to accommodate type II-IV characters.

In field guides, it should be possible to indicate the type of characters by adding the relevant roman capital (I, II, III and IV, figure 4). Whenever space permits, and relevant quantitative data are available, the sensitivity of the depicted diagnostic character state should be indicated (ie, the proportion of individuals showing that character state, figure 4). Because diagnostic character states by definition do not occur in another species it is not necessary to also indicate the specificity. However, the states of a type IV character should indicate the specificity, if this is high enough to be relevant. Importantly, the depicted diagnostic character states should not necessarily represent the most extreme states but may simply be *the first states that lie outside the range of the other species* (in the example of figure 1 this would be birds with a back colouration of shade 2 (species 1) and shade 5 (species 2)).

In the two fictional species depicted in figure 4, rump colouration is a type I character and is therefore diagnostic at all times in both species. The size of the black patch at the basis of the primaries is a type II character: 90% of the individuals of species 1 have a diagnostic large patch, whereas 80% of the individuals of species 2 have a diagnostic tiny patch. Seeing either state would settle the identification. However, 10% of the individuals of species 1 and 20% of the individuals of species 2 have an intermediate character state and are not identifiable by this character. A long black eye line in 10% of the individuals of species 2 is a type III character. The other 90% of species 2 have a short eye line identical to that of species 1. The colouration of the underparts is a type IV character and thus shows complete overlap between the two species. However, data on sensitivity and specificity indicate that pale grey underparts are 40 times as common in species 1 than in species 2, whereas yellowish underparts are three times as common in species 2 than in species 1. Thus, a limited set of symbols and numbers can convey useful information about diagnostic character states and overlap of variation.

If the first states that lie outside the range of the other species are illustrated, the depicted birds are not necessarily the most common phenotype. For instance, in the fictional situation illustrated in figure 4, only 21.6% (1.0 x 0.9 x 0.6 x 0.4 = 0.216) of the members of species 1 and 0.72% (1.0 x 0.8 x 0.3 x 0.3 x 0.1 = 0.0072) of the members of species 2 show all (near-)diagnostic character states of their species (assuming that the characters vary independently).

Positive predictive value: relativity in bird identification

The purpose of an identification criterion is to use it to identify a bird, so we must know the probability that the identification criterion gives us the correct identification (Altman & Bland 1994b). For instance, if you see a bean goose with a yellow bill, how well does that predict that you are actually seeing a Taiga Bean Goose? To answer this, we not only need to know the sensitivity and specificity but also the *prevalence* of Taiga Bean in the area (the proportion of bean geese that are Taiga Bean). From this we can calculate the *positive predictive value* (PPV):

$$PPV= \frac{\text{sensitivity x prevalence}}{\text{sensitivity x prevalence + (1-specificity) x (1-prevalence)}}$$

If we have actual counts of birds and their character states, the positive predictive value is simply the number of true positives (Taiga Bean Geese with a yellow bill) divided by the total number of birds that were positive (all bean geese with a yellow bill).

Let us look at the distribution of character states in an area where both species are equally common and we examine 100 birds of each species (table 3). These are the same data as in table 2 but with positive predictive value indicated. Because 22 Taiga Bean Geese and one Tundra Bean Goose in this area showed a yellow bill, 96% of all birds with a yellow bill were Taiga Bean. This means that seeing a yellow bill in this area is highly predictive of the bird being a Taiga Bean.

Now let us consider a situation where one species vastly outnumbers the other. This is a common situation in birding (eg, when the species of interest is a vagrant). To illustrate what happens with the positive predictive value, we can reuse the bean geese data of table 3 but multiply the number of Tundra Bean Geese by 100 (table 4). This does not affect the sensitivity and specificity of the identification criterion ‘yellow bill’ but note that the positive predictive value has dropped dramatically (from 96% to 18%). This illustrates an important lesson: the predictive value of a character state strongly depends on the prevalence of the species under consideration. As a consequence, what may be a good identification criterion in one region may be almost useless in another region, *even if*

TABLE 3 Confusion matrix showing distribution of four character states in 100 Taiga Bean Geese *Anser fabalis* and 100 Tundra Bean Geese *A serrirostris* (data from Burgers et al 1991). Positive predictive value of 'yellow bill' is indicated.

Character	**Character state**	**True identity**		
		Taiga Bean Goose	**Tundra Bean Goose**	
Bill colour	*Yellow bill*	22 (True Positive)	1 (False Positive)	**Positive predictive value**$_{\textbf{yellow bill}}$ = TP/(TP+FP) =0.96 (96%)
	Mostly yellow bill	43 (False Negative)	5 (True Negative)	
	Equally black and yellow bill	25 (False Negative)	29 (True Negative)	
	Mostly black bill	10 (False Negative)	65 (True Negative)	
	Total	100 (TP+FN)	100 (FP+TN)	
		Sensitivity$_{\textbf{yellow bill}}$ = TP/(TP+FN) =0.22 (22%)	**Specificity**$_{\textbf{yellow bill}}$ = TN/(FP+TN) =0.99 (99%)	

TABLE 4 Confusion matrix showing distribution of four character states in 100 Taiga Bean Geese *Anser fabalis* and 10 000 Tundra Bean Geese *A serrirostris* (data from Burgers et al 1991). Positive predictive value of 'yellow bill' is indicated.

Character	**Character state**	**True identity**		
		Taiga Bean Goose	**Tundra Bean Goose**	
Bill colour	*Yellow bill*	22 (True Positive)	100 (False Positive)	**Positive predictive value**$_{\textbf{yellow bill}}$ = TP/(TP+FP) =0.18 (18%)
	Mostly yellow bill	43 (False Negative)	500 (True Negative)	
	Equally black and yellow bill	25 (False Negative)	2900 (True Negative)	
	Mostly black bill	10 (False Negative)	6500 (True Negative)	
	Total	100 (TP+FN)	10 000 (FP+TN)	
		Sensitivity$_{\textbf{yellow bill}}$ = TP/(TP+FN) =0.22 (22%)	**Specificity**$_{\textbf{yellow bill}}$ = TN/(FP+TN) =0.99 (99%)	

there is no geographic variation in either species.

Another conclusion we can draw is that if a character state is found in both species and the prevalence of the species of interest is very low, the positive predictive value will never become very high (close to 1.0), even if the sensitivity and specificity are high (Altman & Bland 1994b). Thus, if an identification criterion for a rare species is applied to a large number of individuals of a closely similar common species, it is inevitable that many individuals of the common species will 'test positive' except when specificity is 1.0 (Altman & Bland 1994b). If one is not sure whether a character state is diagnostic (and this is often the case, see box 2), one cannot rely on that character alone.

The prevalence of the species of interest in an area may be regarded as the *prior probability* that an observed bird is the species of interest. In other words, the prevalence reflects the probability that the bird is the species of interest before applying any identification criterion. The positive predictive value can be seen as the *posterior probability* that the bird is the species of interest (ie, after applying the identification criterion). Comparing the prior and posterior probabilities gives an indication of the value of the identification criterion. For instance, seeing a yellow-billed bean goose in an area where Taiga Bean Geese are much more common than Tundra Bean Geese (eg, southern Sweden) will hardly improve the probability that it is a Taiga Bean Goose because its prior probability (prevalence) was already high. However, in an area where Tundra Bean vastly outnumbers Taiga Bean (eg, the plains of Hungary and Slovakia; Huyskens 1986), seeing a yellow-billed bean goose greatly improves the posterior probability (positive predictive value) that the bird is a Taiga Bean.

Using multiple characters simultaneously

So far, we have only considered single characters but bird identification is typically based on multiple characters. Even if multiple characters are used to identify a rare bird, plumage or bare parts data have almost always been examined on a character-by-character basis (ie, one after the other). This method is potentially wasteful because in some cases, individuals may only be identifiable if multiple characters are examined *simultaneously*. Thus, rather than looking for diagnostic character states, one should look for diagnostic *combinations* of character states.

The importance of simultaneous (multivariate) analysis can be illustrated with an example from the ringing literature. Marsh Warbler *Acrocephalus palustris* and Eurasian Reed Warbler *A scirpaceus* are notoriously difficult to identify, even in the hand. Van Swelm & de Knijff (1984) and Walinder et al (1988) showed that, despite considerable overlap between adults of the two species in both wing length and length of the notch on the inner web of the second primary, there is no overlap if the two characters are considered simultaneously (figure 5). The data set by Walinder et al (1988) included 87 Marsh and 428 adult Eurasian Reed, making a total of 515 individuals. There is extensive overlap between the two species in both wing length (296 individuals in the range of overlap, 57%) and notch length (156 individuals in the range of overlap, 30%). Only the shortest-winged and longest-notched Eurasian Reed are identifiable because these are outside the range of Marsh, and only the longest-winged and shortest-notched Marsh can be identified because these are outside the range of Eurasian Reed. The diagnostic character states of these species have low sensitivity; only 14-79% of Marsh and 48-68% of Eurasian Reed can be identified to species by a single character, thus leaving 21-86% of the individuals unidentified. Even when both characters are analysed separately (ie, successively), only 89% can be identified. However, if data on both characters are assessed simultaneously, all individuals are identifiable (sensitivity 100%; figure 5).

Simultaneous analysis may also be useful if variation spans a small number of categories. Figure 6 shows variation in bare parts of two species but variation is classified into three or four categories. Iris colour of the two species overlaps partially (type II character), whereas the colouration of the orbital ring shows complete overlap (type IV character). Again, if variation in a single character is analysed, only the individuals with character states outside the range of variation of the other species are identifiable (in this case the white-eyed and red-eyed individuals). However, if variation in both species is analysed at the same time (figure 6) all individuals are identifiable to species, including the yellow- or orange-eyed birds. Despite the overlap of single characters, in species 1 the orbital ring is always brighter coloured than the iris, whereas in species 2 the orbital ring and iris are equally bright.

These examples illustrate two important points. First, if the character states of two species overlap *it may not be enough to just examine more characters; the method of analysis is also important*. Simultaneous (multivariate) analysis represents a more powerful method than separate (univariate) analysis and may reveal differences which would

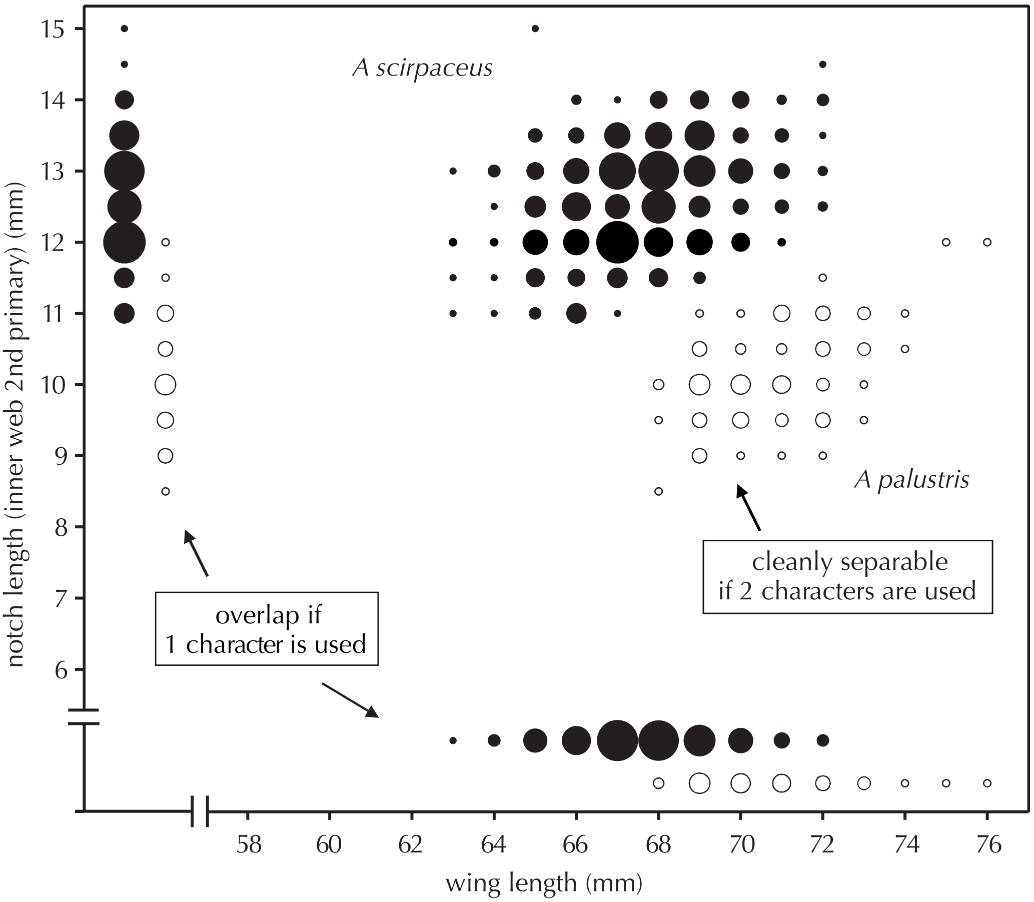


FIGURE 5 Bivariate scatterplot showing variation in wing length and length of notch on inner web of second primary of adult Marsh Warbler *Acrocephalus palustris* (n=87) and Eurasian Reed Warbler *A scirpaceus* (n=428). Size of dots is proportional to number of individuals showing character state. Strings of dots along X-axis and Y-axis indicate that both characters overlap considerably between both species. Data from Walinder et al (1988); presentation partially based on Woodley (2010).

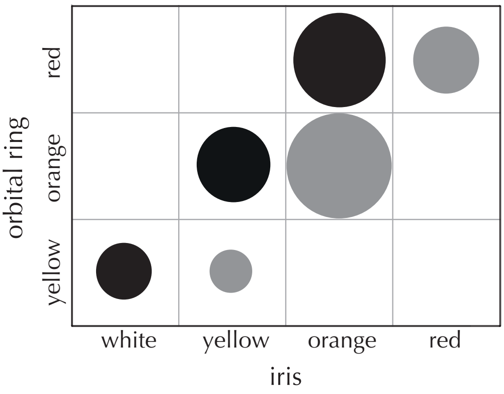


FIGURE 6 Bivariate plot showing variation in iris colour and orbital ring colour in two species (indicated by different shadings). Size of dots is proportional to number of individuals showing character state. Note that orbital ring variation shows *complete overlap* between both species (type IV character), that iris data also show considerable overlap (type II character), and that only small proportion of both species are identifiable on basis of iris colouration alone. Having information on both characters is crucial because if two characters are assessed simultaneously, both species show no overlap. Thus, even characters showing complete overlap may contribute to bird identification.

not be apparent from separate analysis. Second, *even characters showing complete overlap may contribute to field identification*. This is the case when two or more characters do not vary independently (ie, if variation in two or more characters is correlated). Characters showing complete overlap between species should not be discarded before multivariate analysis of their performance.

Bivariate plots of morphometric data (eg, figure 5) have long been made for taxonomic and other studies (eg, Roselaar & Gerritsen 1991) but it is important to also assess their value for plumage and bare parts characters (eg, figure 6). This means that reference data must be collected which includes *paired data* on two or more characters of the same individuals, so that we know which combinations of character states are found in each species. Because plumage and bare parts characters have so far only been used separately, it is possible that situations such as that illustrated in figure 6 await discovery. Characters most likely to show correlated variation may include colouration of bare parts (eg, iris and orbital ring colouration, tibia and tarsus colouration) or the pattern of outer primary or tail feathers.

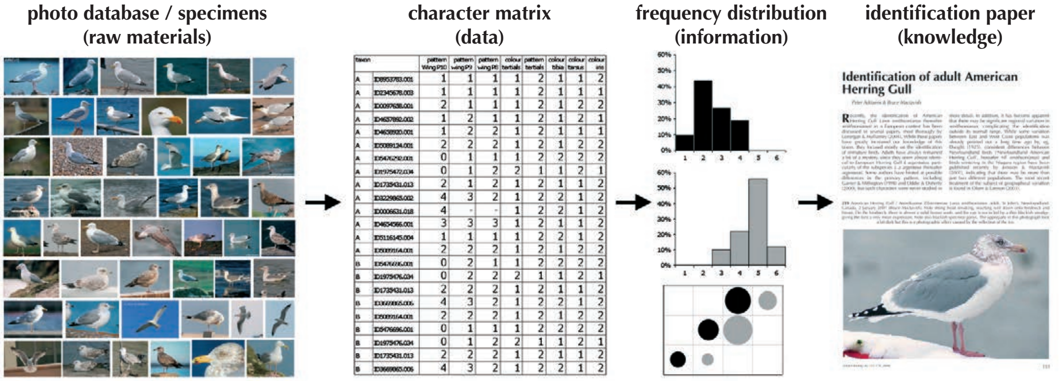
From raw materials to identification paper

The development of identification criteria is typically a four-step process: ***1*** collection of photographic material and/or examination of museum specimens; ***2*** selection of potential characters followed by scoring character states in a data matrix; ***3*** aggregation and analysis of the data, including assessment of the performance of putative characters; and ***4*** publication of findings in a paper (figure 7). A similar process can be followed with, eg, sound-recordings. Each of these steps has its own challenges and these typically involve multiple decisions relating to quality and relevance.

Considering that bird identification criteria are based on observations of character states from raw materials such as field notes, photographs and specimens, it is unfortunate that the primary materials and data (character state scores) are only rarely, if ever, made fully public. Most identification papers present a series of conclusions along with a selection of photographs but these do not typically include any links to raw materials and data matrices. Thus, identification criteria are presented but the evidence for them is not formally documented. Even if all raw materials (eg, photographs) are available online, critical information on which photographs have been examined and how characters were scored in each case is not made available for independent analysis. This makes it almost impossible to reproduce the analyses, which hampers verification of identification criteria. It also results in a practical problem: subsequent studies cannot build on an existing dataset but must start from scratch, which slows down progress and may unnecessarily limit the size of the available sample. To make the transition to quantitative identification efficient, it is necessary to have full access not only to the raw materials but also to the data matrices and aggregated data. During the last decade, similar problems have been pointed out for biodiversity studies in general and this has resulted in a series of recommendations for improved accessibility and data sharing (eg, Costello et al 2013).

The issues of accessibility and curation of photographic materials and character data have yet to be discussed in the birding community. Whereas it is highly desirable that unpublished photographs

FIGURE 7 Four-step process from raw materials to identification paper



used for identification papers are made freely available on the internet, this may be complicated by issues of ownership, copyright and curation (eg, safeguarding the integrity of the original dataset). For instance, such datasets often include photographs from third parties (eg, Visscher & van Duivendijk 2015). Photographs published on private websites are problematic because long-term preservation and curation of images and their metadata are not guaranteed. What is needed is a central, permanent, freely accessible and well-curated hosting facility for bird photographs.

A well-known archive for bird photographs is VIREO (http://vireo.ansp.org). It is hosted by the Academy of Natural Sciences of Drexel University (Philadelphia, USA) and has been in operation since 1979. It has an impressive collection of 180 000 photographs of 7300 species of which c 100 000 were online at the time of writing. However, the quality of the online material is compromised by a large watermark superimposed on each photograph which is intended to prevent unauthorised use. There are also limits to the quality of each online photograph. In a random sample of 60 photographs, all had 96 dpi resolution and file size <100 kb, which may be suboptimal for some purposes.

Millions of bird photographs reside on personal hard discs across the world but may be extremely useful to the ornithological community if these were brought together and made available for detailed quantitative study. It seems worthwhile to examine the prospects of developing a new, online community database for bird photographs, analogous to the extremely successful Xeno-Canto database (www.xeno-canto.org) for bird sound-recordings. This should not only help release and preserve photographic datasets used in published studies but also encourage the contribution of material for use in future studies. There are many issues to be considered but these are outside the scope of this paper.

Making non-photographic bird identification data available is less complicated. If publication in the main paper is not possible, these data may simply be published as online supplementary files. Such files can be permanently stored at Dryad (http://datadryad.org) or Researchgate (www.researchgate.net). These data should include: ***1*** a list of raw materials; ***2*** a data matrix with sufficient detail to connect the data to the raw materials; ***3*** tables with aggregated data (including frequency distributions); and ***4*** if possible, plots of bivariate/multivariate comparisons. The main paper should include a link to the online supplementary materials but should at least include information about the sample size of each character, which comparisons have been made, and any 'negative' results (eg, type IV characters that do not contribute to identification). Genetic data can be stored at GenBank, an annotated collection of publicly available DNA sequences (www.ncbi.nlm.nih.gov/genbank).

Prospects

Quantification of identification criteria offers a promising avenue for improving the quality and objectivity of bird identification. It would be worthwhile to document the sensitivity, specificity and positive predictive value of previously proposed identification criteria and to revisit classic identification problems with quantitative data. In addition, quantification of individual variation will likely help identify gaps in knowledge of variation, which in turn will hopefully speed up filling those gaps. In some cases, it may be useful revisiting controversial records with detailed quantitative data. In the field, access to quantitative reference data will help to identify which individuals require more in-depth study, such as in-the-hand examination and/or DNA identification. Quantitative data will also be helpful in diagnosing potential hybrids, and may benefit taxonomic assessment of the validity of subspecies and the status of putative species. When quantitative datasets become common, more elaborate methods can be employed to visualise, organise and select identification criteria or combinations thereof. The most promising of these are receiver operating characteristics (ROC) plots, a method now commonly used in medical decision making and which is revolutionising machine learning and data mining research (Swets 1988, Swets et al 2000, Fawcett 2006).

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Samenvatting

De kwantitatieve toekomst van vogeldeterminatie De veldherkenningsliteratuur heeft de laatste 10-tallen jaren veel vooruitgang geboekt. Desalniettemin wordt het nemen van beslissingen over de determinatie van veel (onder)soorten nog steeds belemmerd door het ontbreken van kennis over de betrouwbaarheid van kenmerken. De vraag hoe je de betrouwbaarheid van veldkenmerken kunt meten en documenteren heeft tot nu toe weinig aandacht gekregen. Bij veldherkenning treden de lastigste situaties op wanneer variatie gedeeltelijk of volledig overlapt of, meer in het algemeen, wanneer de diagnostische waarde van kenmerken onduidelijk is. In dit artikel wordt betoogd dat een kwantitatieve benadering van veldkenmerken de meest effectieve strategie is om zulke problemen aan te pakken. Hiermee wordt bedoeld: het documenteren van de variatiebreedte en de frequentieverdeling van variatie, en het op kwantitatieve wijze uitdrukken van de waarde van veldkenmerken.

In de veldherkenningsliteratuur wordt de term 'kenmerk' gebruikt voor twee verschillende begrippen, hetgeen voor verwarring kan zorgen. In dit artikel wordt een onderscheid gemaakt tussen kenmerken en kenmerktoestanden. Een *kenmerk* is een lichaamsdeel of een andere variabele eigenschap die kan worden gebruikt om twee groepen te onderscheiden (bijvoorbeeld snavelkleur). Een *kenmerktoestand* is een staat, toestand of waarde van dat kenmerk (bijvoorbeeld geel).

De bewering dat een kenmerktoestand 'diagnostisch' is voor een bepaalde groep dient te worden gedocumenteerd met kwantitatieve data. De vraag of een kenmerktoestand volledig (100%) diagnostisch is, kan in de praktijk overigens maar zelden worden bewezen omdat dit vereist dat de volledige populatie wordt onderzocht. Ook als de lat iets lager wordt gelegd (eg, 99% diagnostisch) is het nodig om grote aantallen individuen te onderzoeken. Zonder kwantitatieve onderbouwing moeten beweringen dat een kenmerktoestand 'diagnostisch' is met een korreltje zout worden genomen.

Drie begrippen worden besproken waarmee de 'waarde' van een veldkenmerk kan worden uitgedrukt: *sensitiviteit*, *specificiteit* en *positief voorspellende waarde*. Vier typen kenmerken kunnen worden onderscheiden op basis van de mate van overlap, variërend van geen enkele overlap (type I) tot volledige overlap (type IV). De veelgebruikte methode in veldgidsen om kenmerken met pijlen of streepjes aan te duiden kan eenvoudig worden uitgebreid door voor elk kenmerk het relevante Romeinse cijfer te vermelden en daarbij kan ook de sensitiviteit en – indien nodig – de specificiteit worden aangegeven.

Het belang van het combineren (tegelijk beoordelen) van veldkenmerken wordt besproken. In sommige gevallen is een sluitende determinatie alleen mogelijk als meerdere kenmerken *tegelijk* worden beoordeeld. Als kenmerken één voor één beoordeeld kan dit ertoe leiden dat sommige vogels ten onrechte ongedetermineerd blijven. Als kenmerktoestanden niet diagnostisch zijn, is het nog steeds mogelijk dat er diagnostische *combinaties* van kenmerktoestanden zijn. Zelfs als kenmerken volledig overlappen kunnen deze soms een belangrijke bijdrage leveren aan veldherkenning, namelijk door ze te combineren met één of meer andere kenmerken. Om te kunnen bepalen welke combinaties van kenmerken diagnostisch zijn moet eerst worden vastgesteld welke combinaties van kenmerken in de praktijk voorkomen. Hier is nog weinig over bekend en dit verdient dus aandacht.

Ten slotte wordt een pleidooi gehouden om na te gaan of het mogelijk is om een 'online community database' van vogelfoto's te creëren, analoog aan de uiterst succesvolle Xeno-Canto database met geluidsopnamen. Een dergelijke fotodatabase kan dienen als permanent archief voor de materialen die gebruikt zijn in gepubliceerde determinatiestudies maar ook als referentiebron voor zeldzaamhedencommissies en als een informatiebron voor toekomstige determinatiestudies.

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Short-tailed Shearwater at Tramore, Ireland, in June 2020

Paul Archer, Robert L Flood, Adrian Allen, Arlo Jacques, Heidi Acampora, Tereza Senfeld, Thomas J Shannon & J Martin Collinson

In the days preceding 22 June 2020, the weather along the south coast of Ireland featured strong southerly winds with mild temperatures. It was unseasonably wet and heavy rain persisted throughout the morning of 22 June. Arlo Jacques was walking on the beach at Tramore, Waterford, Ireland, at low tide, just after midday, when he noticed a distressed shearwater near the water's edge (plate 242). AJ assumed that it was a Manx Shearwater *Puffinus puffinus*. He moved it to a sheltered area in the dunes to see if it might recover. Later that afternoon, AJ returned with Adrian Allen to check on the shearwater and to assess its condition. The shearwater was still present, though in extremely poor condition, so AA and AJ retrieved it and arranged for collection next day by a rehabilitation centre. Photographs circulated to local birders showed a waterlogged, dark shearwater, thought to be an oiled Manx. Despite attempted rehabilitation, the bird did not survive the second night and a subsequent necropsy found that it most likely died from starvation. It was eventually identified as a Short-tailed Shearwater *Ardenna tenuirostris* by, in chronological order, analysis of plumage and structure, ratios of bill components, biometrics, and DNA analysis. This is the first Short-tailed to be conclusively identified in the Western Palearctic (WP; but see below).

Identification process

Introduction

Emphasis was placed on not stressing the sick shearwater. The shearwater dried overnight, so AA took some measurements and circulated additional photographs, which showed that it was not oiled

242 Short-tailed Shearwater / Dunbekpijlstormvogel *Ardenna tenuirostris*, Tramore, Waterford, Ireland, 22 June 2020 *(Arlo Jacques)*. Sick and distressed bird found near water's edge and first moved to more sheltered area in dunes.

243 Short-tailed Shearwater / Dunbekpijlstormvogel *Ardenna tenuirostris* (found at Tramore, Waterford, Ireland, on 22 June 2020), Kilmacow, Kilkenny, Ireland, 23 June 2020 *(Adrian Allen)*. Some median and lesser under secondary coverts are paler grey than rest of secondary coverts and on flying bird would result in paler region in inner wing. **244-245** Short-tailed Shearwater / Dunbekpijlstormvogel *Ardenna tenuirostris* (found at Tramore, Waterford, Ireland, on 22 June 2020), Waterford, Ireland, 25 June 2020 *(Paul Archer)*. Underbody wholly sooty-brown and thus lacking pale central belly region, found on even darkest Balearic Shearwaters *Puffinus mauretanicus*. Largely complete head and body moult, producing sooty-brown feathers, contrasting with old, worn and bleached-brown wing feathers.

246 Short-tailed Shearwater / Dunbekpijlstormvogel *Ardenna tenuirostris* (found at Tramore, Waterford, Ireland, on 22 June 2020), Waterford, Ireland, 25 June 2020 *(Paul Archer)*. Subdued underwing-covert pattern, with under primary coverts in low contrast to under primaries. Note that sepia tone is photographic artifact. **247** Short-tailed Shearwater / Dunbekpijlstormvogel *Ardenna tenuirostris* (found at Tramore, Waterford, Ireland, on 22 June 2020), Waterford, Ireland, 25 June 2020 *(Paul Archer)*. Primary moult in early stages, p1-4 shed (any new growth obscured, not looked for on bird), p5-10 old. Note that areas of wing feathers that were covered and protected on live bird are not worn and bleached brown and remain sooty-brown. Primary tips heavily abraded.

but truly dark on the underparts (plate 244). Suspecting that it might be a Balearic Shearwater *P mauretanicus*, Paul Archer arranged to visit AA where a further assessment was made of the initial measurements and overall appearance. The measurements eliminated Sooty Shearwater *A grisea* and identification began to settle on a very dark Balearic, which in itself would have proven an interesting occurrence.

However, taking an accurate measurement of the wing length was difficult. The bird was in wing moult, missing four inner primaries, and its outer primaries were heavily abraded (plate 247). Even so, it was concerning that the measurement exceeded those published for Balearic Shearwater. PA contacted Killian Mullarney to discuss the identification, at which point Short-tailed Shearwater was mentioned as a confusion species for

Sooty Shearwater and dark Balearic Shearwater (following Flood & Fisher 2019). However, although the bill ratios of the Tramore shearwater were correct for Short-tailed (Flood & Fisher 2019), the bill measurement of 36.8 mm exceeded published data for Short-tailed and the weight of 450 g was within the range for Balearic but too low for Sooty and Short-tailed (although the shearwater was sick and potentially underweight).

Additional photographs taken by AA were circulated that evening and reviewed in the light of the identification criteria given in Flood & Fisher (2019). Aside from an apparently anomalous total bill length, the characteristics of the shearwater added up to Short-tailed Shearwater (see below).

The day after the bird expired in the rehab centre, PA recovered the corpse and carefully rechecked all measurements. Remeasuring the bill with calipers maintained perfectly horizontal to the cutting edge, the length of the bill was 34.1 mm from feathering at the base of the nasal tubes to the tip of the maxillary unguis (plate 256), exclusively within the range of Short-tailed Shearwater. With all identification criteria now supporting Short-tailed, Robert Flood was contacted. RF's response was unequivocally supportive. Given the monumental nature of the identification – a first record for the WP (at the time) – RF undertook a step by step assessment of the plumage and structure of the shearwater, including gathering all measurements available in the literature. By the following day, systematic assessment had proven incontrovertibly that the shearwater was a Short-tailed. The news was made public on local birding channels and social media, and quickly became hot news in the WP and farther afield.

Feather samples were retained and sent to Martin Collinson for DNA analysis, which supported the identification as Short-tailed Shearwater. A necropsy on the corpse was undertaken by Heidi Acampora at the Galway-Mayo Institute of Technology, Ireland, and confirmed that the bird was a significantly underweight immature male, and its stomach was empty except for some plastic debris. Toxicology and pathology samples were taken for further analysis.

Full results of the identification process are set out below.

Plumage

Colour

Many body feathers had been replaced and were coloured sooty-brown (plate 244-245), consistent with Short-tailed Shearwater and Sooty Shearwater (plate 249-252), while the colour of dark Balearic Shearwater is mid-greyish-brown (plate 254).

248 Short-tailed Shearwater / Dunbekpijlstormvogel *Ardenna tenuirostris* (found at Tramore, Waterford, Ireland, on 22 June 2020), Waterford, Ireland, 25 June 2020 *(Paul Archer)*. Narrow, indistinct shaft-streaks to longest lesser and median under primary coverts, typical of Short-tailed. Sooty Shearwater *A grisea* normally has thick dark shaft-streaks in strong contrast with white feather webs. Note that sepia tone is photographic artifact.

249 Short-tailed Shearwater / Dunbekpijlstormvogel *Ardenna tenuirostris*, Wollongong, New South Wales, Australia, 27 October 2012 *(Heyn de Kock)*. Underbody wholly dark, lacking pale central lower belly. Note short bill, notwithstanding effects of foreshortening. Underwing-covert panels subdued and in low contrast with under primaries. Pale in underwing-coverts paler in inner wing than in outer wing. **250** Sooty Shearwater / Grauwe Pijlstormvogel *Ardenna grisea*, Scilly, Cornwall, England, 26 August 2018 *(Kirk Zufelt)*. Underbody wholly dark, lacking pale central lower belly. Pale in underwing-coverts paler and more extensive in outer wing than in inner wing. Longest lesser and median under primary coverts have thick dark shaft-streaks, contrasting strongly with white coverts. **251** Short-tailed Shearwater / Dunbekpijlstormvogel *Ardenna tenuirostris*, Tangung Dawai, Kedah, Malaysia, 16 May 2011 *(David Bakewell)*. General colour sooty-brown but strong sunlight here emphasising brown tone. Note relatively short bill, short mid-section gap, squarish head and steep forehead. Body relatively short. Overall result is cute-looking shearwater.

252 Sooty Shearwater / Grauwe Pijlstormvogel *Ardenna grisea*, Scilly, Cornwall, England, 3 August 2013 *(Joe Pender)*. General colour sooty-brown but strong sunlight here emphasising brown tone. Note relatively long bill, long mid-section gap and shortish, sloping forehead. Body relatively long. As a result, Sooty does not have cute look of Short-tailed Shearwater *A tenuirostris*, although beware of lightly built juvenile female Sooty that demand careful scrutiny (see plate 258). **253** Sooty Shearwater / Grauwe Pijlstormvogel *Ardenna grisea*, Scilly, Cornwall, England, 26 August 2018 *(Kirk Zufelt)*. Be aware, occasionally Sooty has darkish underwing-coverts suggesting Short-tailed Shearwater *A tenuirostris*. **254** Balearic Shearwater / Vale Pijlstormvogel *Puffinus mauretanicus*, Scilly, Cornwall, England, 13 August 2018 *(Joe Pender)*. Dark Balearic but even darker individuals occur. Underbody paler here although, on darkest birds, pale restricted to central lower belly. Underwing-coverts typically very pale grey and in fairly strong contrast with darker axillaries and under remiges.

Chin and throat

The paler, greyish chin that extended to the throat (plate 255), is typical of Short-tailed Shearwater (plate 251), whereas a paler chin tends to be small and a paler throat absent on Sooty Shearwater (plate 250).

Belly

The plumage was uniform sooty-brown with no pale area on the central belly (plate 244), consistent with Short-tailed Shearwater and Sooty Shearwater (plate 249-250). The darkest Balearic Shearwaters that we have come across have a smallish but noticeable paler area on the central belly (see caption to plate 254).

Underwing-coverts

The subdued underwing-covert panel was in low contrast with the underside of the remiges and no clean white was apparent in the coverts (plate 243, 246 and 248). This is typical of Short-tailed Shearwater, rare in Sooty Shearwater (plate 253), and atypical of Balearic Shearwater (plate 254). Also, as a rule of thumb, pale in the underwing-coverts of Short-tailed is paler and greater in extent on the inner wing than the outer wing, which is the case with the Tramore shearwater (plate 246), and is opposite to Sooty (cf plate 249-250). Further, the longest lesser and the median primary coverts in Sooty normally have thick dark shaft-streaks, contrasting strongly with the white coverts (plate 250), unlike in Short-tailed (Howell 2012). Flood & Fisher (2020) found the same with Sooty, but that Short-tailed can show narrow, darkish shaft-streaks, often inconspicuous because the coverts themselves are not white (as plate 249). The Tramore shearwater showed narrow, indistinct shaft-streaks (plate 248).

Contrast between under primaries and under primary coverts

The under primaries of Short-tailed Shearwater are not as dark as found on Sooty Shearwater, giving relatively low contrast between the subdued under primary coverts and under primaries (though affected by lighting; plate 249). Conversely, the contrast of white under primary coverts and very dark under primaries is stark on a typical Sooty (plate 250). Balearic Shearwater is intermediate (plate 254).

Structure

Not much can be said about the structure of the live Tramore shearwater. It was wet and bedraggled when found and then kept largely undisturbed until collection by the rehabilitation centre. However, plate 255 of the dried bird neatly shows the head and bill in profile.

The head shape was typical of Short-tailed Shearwater, with a squarish head and short, steep forehead (cf plate 251 and 255). Sooty Shearwater has a shortish sloping forehead (plate 252) and Balearic Shearwater has a smooth sloping forehead and crown giving a ‘drawn-out face’ appearance (plate 257). Further, the relatively short bill, coupled with the bill ratios presented below – notably the short mid-section gap – give a distinctive look to the bill of Short-tailed, unlike any Balearic or Sooty (cf plate 251-252 and 257). Also, typically, the nostrils of Short-tailed (and Sooty) face upward at c 45° from the horizontal culminicorn, forming a distinct step-up, while the nostrils of Balearic face upward c 20°, giving a smooth upward slope from the culminicorn to the base of the bill (cf plate 251-252, 255 and 257).

Be aware that juvenile Sooty Shearwater, especially females, are lightly built and may be mistaken for a Short-tailed Shearwater, so care must be taken to check head shape and bill structure. Plate 258 provides an example of a lightly built Sooty but it has a shortish sloping forehead and the bill ratio of the mid-section gap is relatively long at c 35%.

Measurements

Comparison of the biometrics of the Tramore shearwater to the published data for Short-tailed, Sooty and Balearic Shearwater are shown in the appendix. The biometrics are all consistent with Short-tailed Shearwater and eliminate Balearic and Sooty Shearwater. The main comparisons are given below.

Bill length

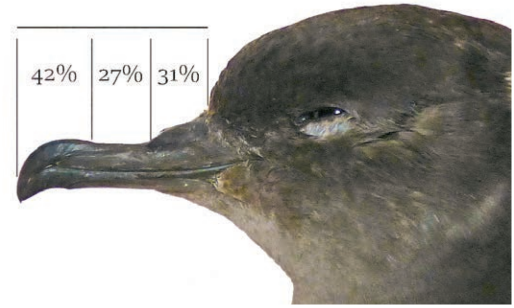
The bill length of the Tramore shearwater was 34.1 mm, consistent only with Short-tailed Shearwater (plate 256). It is shorter than, and thus falls outside of, the range 36-42 mm for unsexed Balearic Shearwater (n=49). It is also shorter than, and thus falls outside of, the range 37-47 mm for Sooty Shearwater of both sexes (n=332+). The range for all sexes of Short-tailed is 29-35.2 mm (n=95): 29.4-35.2 mm for males (n=38); 29.1-34.2 mm for females (n=30); and 29-34 mm for unsexed birds (n=27) (cf appendix). The bill length of the Tramore shearwater falls within the range for male and just within the range for female Short-tailed. This indicates that the Tramore shearwater most likely was a male (which was confirmed during the necropsy) and visually the bill is indeed at the robust end of the range for the species.

Bill ratios

The bill ratio for the mid-section gap of the Tramore shearwater was 27% and this is diagnostic for Short-tailed Shearwater (figure 1; plate 255). The mid-section gap is in the region of 28% for Short-tailed, 32% for Balearic Shearwater, and 34% for Sooty Shearwater (Flood & Fisher 2019, 2020).

Wing length

The wing length of the Tramore shearwater was 269 mm. It is longer than, and thus falls outside of, the range 235-256 mm for unsexed Balearic Shearwater (n=19, small sample size; cf appendix). The range for Sooty Shearwater of all sexes is 260-322 mm (n=303+): 281-314 mm for males (n=88); 260-318 mm for females (n=99); and 270-322 mm for unsexed birds (n=116+) (cf appendix). The shortest female wing at 260 mm is one of a sample of three females where the average was 288.8 mm and evidently the short-winged female is an exceptional outlier or the measurement is incorrect. The range for Short-tailed Shearwater is 261-288 mm (n=66): 261-288 mm for males (n=37) and 261-284 mm for females (n=29) (cf appendix). The Tramore shearwater wing length falls



255 Short-tailed Shearwater / Dunbekpijlstormvogel *Ardenna tenuirostris* (found at Tramore, Waterford, Ireland, on 22 June 2020), Kilmacow, Kilkenny, Ireland, 23 June 2020 *(Adrian Allen)*. Mid-section gap as proportion of bill length 27%, being diagnostic for Short-tailed. Head shape, with squarish head and steep forehead, relatively short bill and short mid-section gap of bill, and pale chin to throat, make for unique look to Short-tailed.

256 Short-tailed Shearwater / Dunbekpijlstormvogel *Ardenna tenuirostris* (found at Tramore, Waterford, Ireland, on 22 June 2020), Waterford, Ireland, 25 June 2020 *(Paul Archer)*. Bill length is 34.1 mm, outside of range of Balearic Shearwater *Puffinus mauretanicus* and Sooty Shearwater *A grisea*. This measurement is most typical of male Short-tailed.

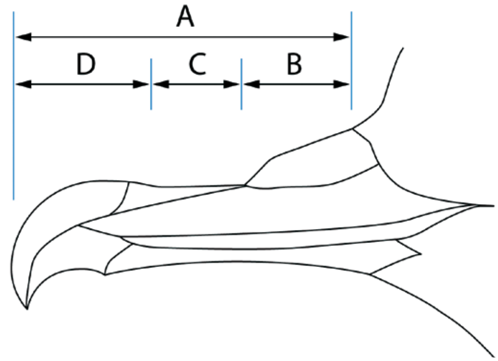


FIGURE 1 Representation of bill length and bill proportions of shearwaters to illustrate method used to calculate relative proportions of bill (from Flood & Fisher 2020) *(Ashley Fisher)*. Total length (A) is measured from feathers at base of bill to tip of maxillary unguis. Length of nasal tube (B) is measured from feathers at base of bill to where nostril meets culminicorn. Length of culminicorn is mid-section gap (C) between end of nostril on culminicorn and first perceptible rise of maxillary unguis from culminicorn. Length of maxillary unguis (D) is measured from first perceptible rise from culminicorn to tip of maxillary unguis.

within the range for both male and female Short-tailed. Also, it is consistent with mean figures for Short-tailed in Carey (2011).

Tarsus length
The tarsus length of the Tramore shearwater was 51 mm. This is at the upper extremity of the range 46-51 mm for Balearic Shearwater (n=24) (cf appendix). It is at the lower extremity of the range 50-66.5 mm for Sooty Shearwater (n=304). It falls within the range of 49-55.9 mm for Short-tailed Shearwater (n=68): 49.1-55.9 mm for males (n=38) and 49.6-55.3 mm for females (n=30) (cf appendix). The Tramore shearwater tarsus length best fits Short-tailed.

DNA analysis

DNA was isolated from a feather sample using the QIAGEN QIAamp DNA Micro Kit following the manufacturer's instructions, with 0.1 M dithiothreitol added during lysis. Two mitochondrial genes, COI and cytochrome B (cytB) were amplified by PCR using primers and protocols outlined in Hebert et al (2004) and Helbig et al (1995), respectively. PCR products were gel purified using the QIAGEN QIAquick Gel Extraction Kit and Sanger sequencing was completed by Source Bioscience (Nottingham, England). The returned sequences (642 base pairs of COI and 369 base

257 Balearic Shearwater / Vale Pijlstormvogel *Puffinus mauretanicus*, Cullera, Valencia, Spain, 18 January 2014 *(Victor Paris)*. Intermediate bird. General colour greyish-brown. Note long bill, smooth-sloping forehead and crown, giving 'drawn-out face' appearance. Nostrils face upward c 20°, giving smooth upward slope from culminicorn to base of bill, compared with typical c 45° on *Ardenna* shearwaters discussed in this paper, giving step from culminicorn to top of nasal tubes. **258** Sooty Shearwater / Grauwe Pijlstormvogel *Ardenna grisea*, Scilly, Cornwall, England, 8 August 2015 *(Joe Pender)*. Lightly built individual that could be mistaken for Short-tailed Shearwater *A tenuirostris*. However, note shortish sloping forehead and longish bill. Although difficult to measure accurately from this photograph, we estimate nasal tubes in region of under 27% of bill length, and mid-section gap c 35% of bill length, both typical of Sooty. Combined, these structural features result in 'Sooty' impression to head and bill.

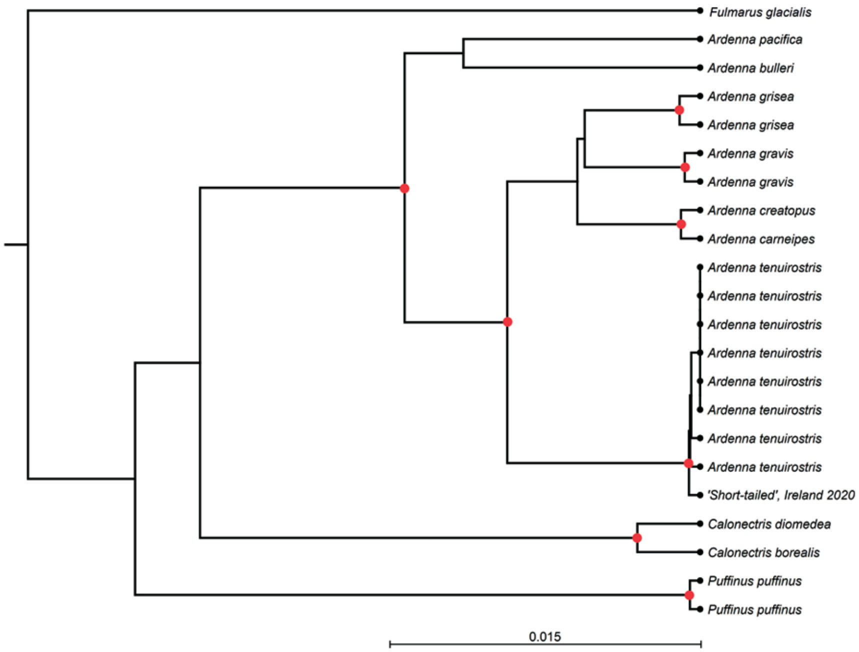
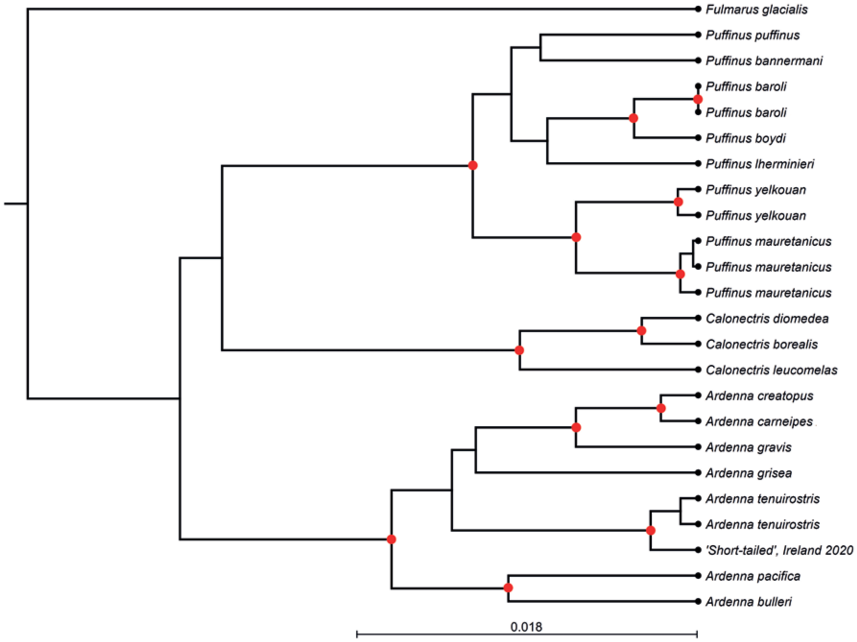


FIGURE 2 Phylogram based on 642 bp COI showing relationship of Tramore shearwater to other shearwater sequences from GenBank. Bird fell within Short-tailed Shearwater *Ardenna tenuirostris* clade. Red dots indicate >90% bootstrap statistical support.

FIGURE 3 Phylogram based on 369 bp of cytochrome B showing relationship of Tramore shearwater to other shearwater sequences from GenBank. Bird fell within Short-tailed Shearwater *Ardenna tenuirostris* clade. Red dots indicate >90% bootstrap statistical support.



pairs of cytB; Accession No LR995322 and LR995321) were compared against all publicly available shearwater sequences using NCBI Nucleotide BLAST.

The sequences were found to be a closest match for Short-tailed Shearwater (98.9-99.3% and 99.7-99.8% identity for cytB and COI, respectively). All other *Ardenna* taxa were more divergent (3.0-6.4% and 4.6-7.6% different for cytB and COI, respectively). All *Calonectris* and *Puffinus* taxa were more divergent still (minimum divergence of 8.3% for cytB and 9.3% for COI). These results confirm the Tramore bird's identification as a Short-tailed, to the exclusion of all other taxa. Phylograms were constructed separately for each gene, with the Irish bird nested within the Short-tailed clade for both genes (figure 2-3).

Moult, wear and ageing

The Tramore shearwater was in active feather moult. The 'head and body' moult was largely complete, and the new feathers were sooty-brown admixed with the occasional old, worn and bleached brown feather (plate 244-245). Possibly, a few upperwing-coverts were new and sooty-brown, although the vast majority/all were worn and bleached brown, with some of the larger coverts heavily worn (plate 247). Primary moult was in the first stages and had reached p4 (the fourth primary, the first primary being the innermost one), the secondaries were all old, and the tips to the outer primaries were heavily abraded (plate 247).

A healthy adult Short-tailed Shearwater intending to breed completes moult, including primaries, by September, in time for the long return migration. Juveniles mainly moult a few months earlier than adults, and older immatures synchronise moult timing with adults. Short-tailed moult strategy is possibly complex-basic (see Howell 2010 for a detailed introduction to moult strategies), with head and body moult of juveniles underway 4-6 months after fledging in late April, so about late August to late October. Thus, on 22 June, the plumage of a juvenile Short-tailed would be fresh and uniform with no evidence of moult and the outer primaries would not be heavily abraded. The Tramore Short-tailed was not a juvenile of the year and thus in its second moult cycle or older. The heavily worn old outer primaries could have been relatively weak juvenile primaries and, if so, the bird was undertaking its second prebasic moult (the start of the second moult cycle), replacing juvenile feathers, meaning that it was c 14 months old. However, primary moult in the second moult cycle is assumed to be several months earlier than older immatures and adults, and ought to have progressed further than p4, suggesting third moult cycle or older, although moult can be delayed in a sick bird.

Necropsy

The bird was sexed as male, concurring with the bill length measurement. The bird was aged as immature, concurring with the observed condition of the plumage, specifically the age, wear and moult of the primaries. The internal organs scored well for overall condition. However, the bird was clearly emaciated with low body weight (398 g for a bird that on average weighs 600 g) and it had very little breast muscle (score 1 out of 3), zero subcutaneous fat (score 0 out of 3) and zero intestinal fat (score 0 out of 3), giving 1 out of 9 for the total Body Condition Index (BCI; van Franeker et al 2005).

259 Natural and anthropogenic stomach sample obtained during necropsy of Short-tailed Shearwater *Ardenna tenuirostris* found at Tramore, Waterford, Ireland, on 22 June 2020 *(Heidi Acampora)*

TABLE 1 Records of Short-tailed Shearwater *Ardenna tenuirostris* in Atlantic and Western Palearctic with details on date, number, location, primary moult and approximate age (2C = second moult cycle, 3C = third moult cycle). [1]Examination of Sanibel Island bird showed that it lacked bursa of Fabricius making it 3C or older. [2]Measurements of Salvador City bird thought to suggest juvenile (Mike Imber in Souto et al 2008) but this seems unlikely given date.

Date	**Number**	**Location**	**Primary moult**	**Age**	**Reference**
7 July 2000	1	Sanibel Island, Florida, USA	p1-5 new, p6 shed, p7-10 old	3C or older[1]	Kratter & Steadman 2003
28 May 2005	1	Salvador City, Brazil	not mentioned	juv?[2]	Souto et al 2008
25 May 2014	1	Kuwait Bay, Kuwait	none, but worn	2C or older	Omar Alshaheen in litt
17 August 2014	1	55 nautical miles south of Cape Point, South Africa	in primary moult, p1-4/5 new	2C or older	Dominic Rollinson in litt
9 September 2015	1	Bretagne, France	irregular primary moult, p8-10 old	2C or older	Février et al in press
mid-March 2017	1000s	55°S, 0°E to 50°S, 8°E, vicinity of Bouvet Island	not mentioned	?	Ryan et al 2017
18 August 2017	1	Race Point, Provincetown, Massachusetts, USA	p1-5 new, p6 growing, p7 shed, p8-10 old	2C or older	Steve Arena in litt
23 September 2017	1	Race Point, Provincetown, Massachusetts, USA	p1-8/9 new, p9/10 growing	2C or older	Steve N G Howell in litt
24 September 2017	1	Race Point, Provincetown, Massachusetts, USA	p1-8 new, p9-10 growing	2C or older	Guillermo Lazaro in litt
14 October 2017	1	Race Point, Provincetown, Massachusetts, USA	p1-9 new, p10 growing	2C or older	Peter Flood & Kate Sutherland in litt
2 June 2020	1	Tramore, Waterford, Ireland	p1-4 shed (any new growth obscured in photographs, not checked on bird), p5-10 old	2C/3C or older	this paper
7 August 2020	1	Bretagne, France	in primary moult	2C or older	Février et al in press
21 May 2021	2	Garoh Island, Kuwait	none, but worn	2C or older	Omar Alshaheen in litt

The stomach was void of any food remains (no fish bones, otoliths, squid beaks). The only natural contents were pumices and stones, quite commonly found with this species, and some plastic items that weighed 0.24 g (hard plastic fragments, a pellet and rubber fragments; plate 259).

It is most likely that this bird died from starvation. It had a very poor body condition prior to its stranding. Short-tailed Shearwater normally does not feed on the wing during migration and they commonly strand, sometimes in large numbers, due to poor health and bad weather conditions. The stomach sample, body condition and BCI are very similar to those found in previous studies of stranded Short-tailed (Acampora et al 2014).

Range, movements and vagrancy

Short-tailed Shearwater breeds in Australia, with egg-laying in late November and fledging in late April. It then undertakes an epic looped migration, mainly to the Bering Sea where it moults before returning to colony from mid-September. Accordingly, the commonplace understanding is that Short-tailed is a species of the Pacific Ocean. However, recent pelagic trips off the Indian Subcontinent and Southeast Asia found that Short-tailed is a scarce, occasionally fairly numerous, regular west-east passage migrant during April-June, from the northeast Indian Ocean to the north-western Pacific Ocean (Flood & Fisher 2020). Further, recent data logger studies during the breeding season reveal that Short-tailed regularly forages west of Australia in the high latitudes of the South Indian Ocean and South Atlantic Ocean (Woehler et al 2006, Einoder et al 2011, Cleeland et al 2014, Brownlie et al in press). Indeed, in mid-March 2017, 1000s were seen in the vicinity of Bouvet Island, South Atlantic, and 'nearby' in April 2008, several flocks of dark shearwaters thought to be Sooty Shearwater with hindsight may have been Short-tailed (Ryan 2009, Ryan et al 2017).

These findings may all be linked, with birds at high latitudes of the South Indian Ocean and South Atlantic Ocean taking a shortcut to the north-western Pacific Ocean via the Indian Ocean, thus accounting for the records off the Indian Subcontinent and Southeast Asia. Birds heading northwards from the South Atlantic Ocean could enter the main body of the Atlantic Ocean and head northwards. Based on these findings, Flood & Fisher (2019, 2020) state that, 'vagrancy potential of Short-tailed Shearwater to the North Atlantic probably is greater than the handful of documented records suggest.' Another possibility is that birds may cross the Northwest Passage, from the Bering Sea to the North Atlantic Ocean, in years that the passage is ice free (McKeon et al 2016, Clairbaux et al 2019, Flood et al 2021).

Careful scrutiny of all-dark shearwaters in the WP followed Flood & Fisher (2019) and the report of the Tramore Short-tailed Shearwater. To date, two more Short-tailed have been identified off Bretagne, northern France, one retrospectively from 9 September 2015 and one on 7 August 2020 (cf Dutch Birding 42: 362, plate 478, 366, plate 482, 2020; Février et al in press). One was in Kuwait harbour on 25 May 2014, and two birds were identified off Kuwait on 21 May 2021, one by Garoh island and one 30 km away on return to the harbour. Table 1 summarises Atlantic and WP records of Short-tailed.

Acknowledgements

Killian Mullarney provided key initial guidance to PA on the eventual identification of the Tramore Short-tailed Shearwater, without which the record might have been lost. Thanks are due to Ian O'Connor at the Galway-Mayo Institute of Technology for arranging the necropsy and to Kildare Animal Foundation (www.animalfoundation.ie) for their efforts to recuperate the bird.

Samenvatting

Dunbekpijlstormvogel bij Tramore, Ierland, in juni 2020
Dunbekpijlstormvogel *Ardenna tenuirostris* is een van de talrijkste 'tubenoses', met een geschatte wereldpopulatie van meer dan 30 miljoen paren. De soort broedt in Australië en trekt voornamelijk naar de Beringzee. Op 22 juni 2020 werd een verzwakte donkere pijlstormvogel aangetroffen op het strand van Tramore, Waterford, Ierland. Ondanks pogingen om de vogel te laten herstellen overleed hij een etmaal later. Sectie wees uit dat hij waarschijnlijk was verhongerd. De pijlstormvogel werd uiteindelijk gedetermineerd als Dunbekpijlstormvogel op grond van achtereenvolgens een analyse van verenkleed en structuur, verhoudingen van onderdelen van de snavel, biometrie en DNA-analyse. Het betreft de eerste Dunbekpijlstormvogel voor het West-Palearctische gebied (later werd een geval uit 2015 bekend in Frankrijk). Een overzicht van recente informatie over het voorkomen van deze soort laat zien dat de mogelijkheden om in de noordelijke Atlantische Oceaan terecht te komen groter zijn dan aanvankelijk gedacht.

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APPENDIX Biometrics of Tramore Short-tailed Shearwater *Ardenna tenuirostris* compared with published data for Short-tailed, Sooty *A grisea* and Balearic *Puffinus mauretanicus* Shearwaters. TR = Tramore Short-tailed Shearwater. Biometrics; lengths (mm): BL = bill, WL = wing, TL = tarsus; ratios of bill (%): NT = nasal tubes, MG = mid-section gap (culminicorn), MU = maxillary unguis. Data given: average (1SD; range; sample size). U = unsexed, X = not given. [1]Marchant & Higgins (1990), [2]BWPi (2006), [3]Howell (2012), [4]Flood & Fisher (2019), [5]Carey (2011), [6]Hockey et al (2005). Bill of TR quite robust, showing clear kink at plate join culmen/maxillary unguis, permitting accurate measurement (also suggesting male). Weight not considered as Tramore Short-tailed was sick and emaciated. *Average wing length 209 mm for female Sooty is clearly incorrect as average for 281-381 mm but reported here as found in literature. **Carey (2011) evidently employed different measurement technique to measure tarsus than Marchant & Higgins (1990) and data not included in our analysis.

Biometric	TR	Short-tailed Shearwater	Sooty Shearwater	Balearic Shearwater
BL	34.1	[1]31.8 (1.26, 29.4-33.7; 20) ♂	[1]42 (0.65; 41.2-42.8; 3) ♂	
		[1]32.4 (1.11; 30.5-35.2; 18) ♂	[1]42.2 (0.43; 42-43; 4) ♂	
			[1]41.3 (0.99; 40.5-42.7; 3) ♂	
			[1]43 (X; 40-47; 78) ♂	
		[1]31.4 (1.21; 29.1-34.2; 17) ♀	[1]42.2 (1.03; 41.4-44.2; 5) ♀	
		[1]32.3 (0.69; 31-33.3; 13) ♀	[1]42.8 (0.73; 42-44; 4) ♀	
			[1]42.2 (0.72; 41.5-43.2; 3) ♀	
			[1]41.8 (X; 38-45; 87) ♀	
			[1]41.9 (1.6; 38.5-45.5; X) U	
			[1]41.2 (1.56; 38.7-45.6; 68) U	
			[1]40.8 (1.61; 37.6-43.7; 30) U	
			[2]41.4 (1.43; 38-44; 19) U	[2]38.4 (1.69; 36-42; 25) U

Biometric	TR	Short-tailed Shearwater	Sooty Shearwater	Balearic Shearwater
BL		[3]X (X; 29-35; X) U	[3]X (X; 38-47; X) U	
		[4]30.7 (1.35; 29-34; 27) U	[4]40.4 (1.37; 37-43; 28) U	[4]37.9 (1.41; 36-40; 24) U
		[5]32.7 (1.4; X; 90) ♂		
		[5]32.5 (1.2; X; 90) ♂		
		[5]33 (1.3; X; 13) ♂		
		[5]31.5 (1.1; X; 88) ♀		
		[5]31.7 (1.1; X; 87) ♀		
		[5]31.4 (1.5; X; 22) ♀		
			[6]43 (X; 40-47; 78) ♂	
			[6]42 (X; 38-45; 87) ♀	
NT	27.2%	30.9%	25.7%	28.8%
MG	26.2%	28.0%	34.4%	31.9%
MU	46.6%	41.1%	39.9%	40.1%
WL	269	[1]273 (6.8; 262-288; 19) ♂	[1]296.6 (4.78; 290-301; 3) ♂	
		[1]279 (6.3; 261-287; 18) ♂	[1]299.2 (1.78; 297-301; 4) ♂	
			[1]298 (12.02; 281-307; 3) ♂	
			[1]301 (X; 282-314; 78) ♂	
		[1]275 (5.2; 269-284; 16) ♀	[1]293 (7.82; 284-305; 5) ♀	
		[1]276 (5.5; 261-282; 13) ♀	[1]294.5 (9.17; 283-304; 4) ♀	
			[1]288.8 (20.75; 260-308; 3) ♀	
			[1]209 (X; 281-318; 87) ♀*	
			[1]304 (6.9; 287-322; X) U	
			[1]293.4 (7.83; 270-313; 68) U	
			[1]304 (5.8; 293-315; 30) U	
			[2]300 (9.87; 283-315; 18) U	[2]246 (6.02; 235-256; 19) U
		[5]272.2 (5.7; X; 90) ♂		
		[5]273.1 (6.7; X; 90) ♂		
		[5]273.2 (6.3; X; 13) ♂		
		[5]269.2 (6.2; X; 88) ♀		
		[5]269.5 (5.6; X; 87) ♀		
		[5]272.2 (5.6; X; 22) ♀		
			[6]301 (X; 282-314; 78) ♂	
			[6]299 (X; 281-318; 87) ♀	
TL	51.0	[1]52.7 (1.32; 49.5-55.9; 20) ♂	[1]56.4 (1.04; 55-57.4; 3) ♂	
		[1]52.8 (1.49; 49.1-55.3; 18) ♂	[1]55.2 (1.08; 54-57; 4) ♂	
			[1]59.1 (1.2; 57.3-60.3; 3) ♂	
			[1]53.3 (X; 50-57; 78) ♂	
		[1]51.4 (1.21; 49.6-54.3; 17) ♀	[1]56.9 (1.21; 55.5-58.5; 5) ♀	
		[1]52.3 (1.33; 50-55.3; 13) ♀	[1]54.7 (1.29; 53-56; 4) ♀	
			[1]59.4 (0.94; 58.5-60.7; 3) ♀	
			[1]53 (X; 50-56; 87) ♀	
			[1]56.6 (1.97; 54.4-66.5; 68) U	
			[1]57.3 (1.34; 54.4-59.8; 30) U	
			[2]56.7 (2.16; 53-60; 19) U	[2]48.1 (1.33; 46-51; 24) U
		[5]58.8 (1.3; X; 90) ♂**		
		[5]59.4 (1.6; X; 90) ♂**		
		[5]60.1 (1.5; X; 13) ♂**		
		[5]58.2 (1.7; X; 88) ♀**		
		[5]58.3 (1.3; X; 87) ♀**		
		[5]58.3 (1.5; X; 22) ♀**		
			[6]53.3 (X; 50-57; 78) ♂	
			[6]53 (X; 50-56; 87) ♀	

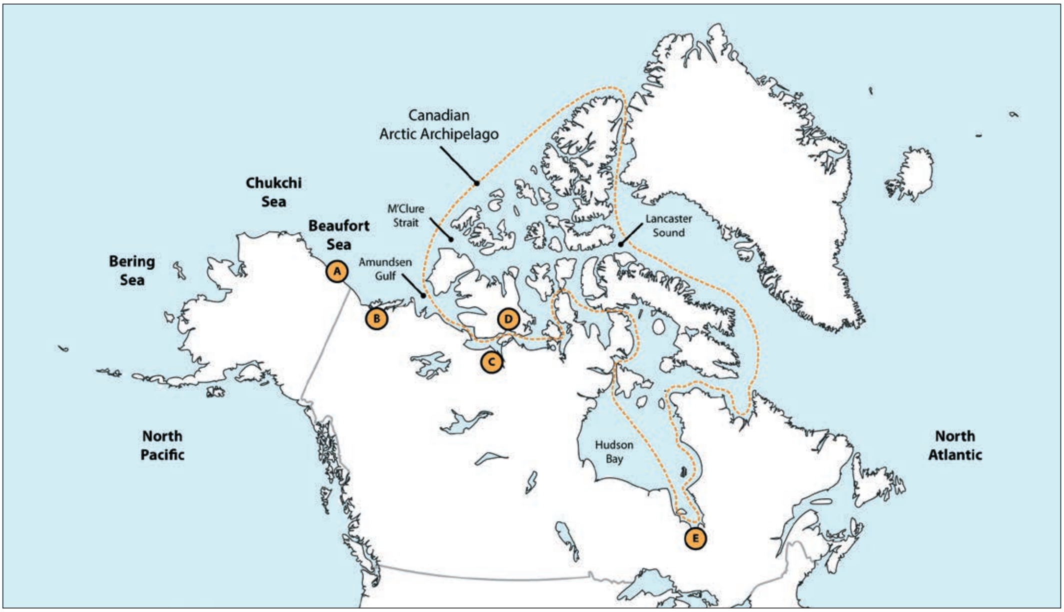
'Canadian Arctic flyway' – possible route for Short-tailed Shearwater to access North Atlantic?

Robert L Flood, James M Richards, Anthony J Gaston & Kirk Zufelt

Short-tailed Shearwater *Ardenna tenuirostris* is an abundant tubenose that breeds in Australia, in the southern summer, after which the vast majority of the population migrates to rich feeding grounds off north-eastern Japan and in the Bering Sea and Chukchi Sea (Flood & Fisher 2020; figure 1). A moribund Short-tailed found at Sanibel island, Florida, USA, on 7 July 2000 was the first for the North Atlantic (Kratter & Steadman 2003). Then, two apparently healthy individuals were photographed off Bretagne, France: one on 9 September 2015 and one on 8 August 2020 (Février et al in press), and photographs taken at Race Point, Massachusetts, USA, in 2017, on 18 August, 23 September, 24 September and 14 October, show at least two apparently healthy birds (based on primary moult timing). On 22 June 2020, a moribund individual was found at Tramore, Waterford, Ireland (Archer et al 2021).

Most of these North Atlantic records result from recent improved knowledge about the field separation of Short-tailed Shearwater from the similar-looking Sooty Shearwater *A grisea* (eg, Howell & Zufelt 2019, Flood & Fisher 2019, 2020). However, by which route did they travel to the North Atlantic? ***1*** It is possible that small numbers of Short-tailed have been regular visitors originating from the 1000s of birds now known to visit high latitudes of the South Atlantic (Flood & Fisher 2020). ***2*** It is also possible that the recent reduction of Arctic ice cover due to global warming has created new access for Short-tailed, from the Chukchi

FIGURE 1 Arctic North America showing sites mentioned in text including following locations of records of Short-tailed Shearwater *Ardenna tenuirostris (Ashley Fisher)*. **A** Collinson Head, Herschel-Qikiqtaruk Island, Yukon, Canada; **B** Inuvik, Northwest, Canada; **C** Bathurst Inlet, Nunavut, Canada; **D** Ferguson Lake, Cambridge Bay, Victoria Island, Nunavut, Canada; **E** Southern James Bay, Netitishi Point, Ontario, Canada (Short-tailed Shearwater or Sooty Shearwater *A grisea*).



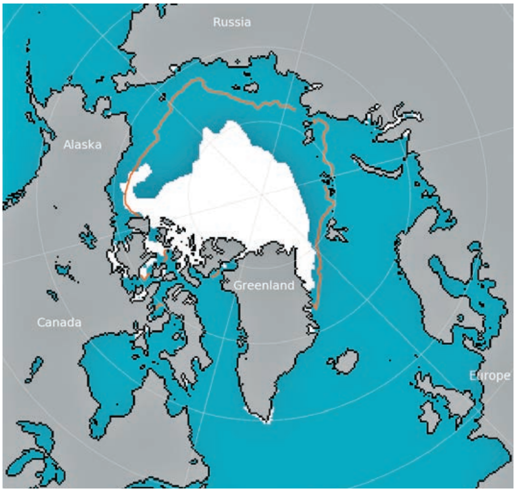


FIGURE 2 Sea ice extent in Arctic Ocean on 15 September 2020 (white area) and median ice edge in 1981-2010 (marked by orange line) (CIS 2020).

Sea to the North Atlantic via the Arctic Ocean or the waterways of the Canadian Arctic Archipelago. Both options could be true. This note considers the evidence that some Short-tailed may reach the North Atlantic by travelling over open water of the Canadian Arctic Archipelago – the 'Canadian Arctic flyway'.

Ice melt in the Arctic

Since the start of the 21st century, the Canadian Arctic Archipelago has experienced relatively ice-free conditions multiple times (Lindsey & Scott 2020). The Northwest Passage is a system of gulfs, straits, sounds and channels in the Canadian Arctic Archipelago (Haas & Howell 2015; figure 1). In summer, sea ice concentration has decreased notably through three gateways of the Northwest Passage: Amundsen Gulf, Lancaster Sound and M'Clure Strait (figure 1). Sea ice concentration in these areas is lowest in September, with a distribution pattern of high sea ice concentrations along the northern region of the Northwest Passage and low concentrations along the southern regions (CIS 2020). Further, over the past 40 years, the area of the Arctic Ocean covered by ice has shown a dramatic decline, with more ice melting away in the summers and less new ice forming in the winters (figure 2). Current models suggest that by 2050, perhaps as early as 2035, the Arctic Ocean in its entirety could be completely ice-free during September (McKeon et al 2016, Thorniley-Walker 2017, Clairbaux et al 2019).

Faunal exchange through Canadian Arctic Archipelago

Accelerating loss of sea ice in the Arctic is creating open water connecting the North Atlantic and North Pacific for longer periods each year, potentially increasing the ease and frequency with which marine mammals and seabirds can move between the two oceans. Such movements have increased in recent decades (eg, Day et al 2013, Miller & Ruiz 2014). Bowhead Whales *Balaena mysticetus* from the two oceans have come together in the Northwest Passage (Heide-Jørgensen et al 2011). There are reports of Grey Whale *Eschrichtius robustus* in the Atlantic Ocean, a species that normally occupies margins of the North Pacific Ocean, although the route by which they arrived is unknown. Orca *Orcinus orca* has expanded its range into ice-free regions of Hudson Bay, Canada (McKeon et al 2016).

Removing the ice barrier is likely to modify migration of at least some of the Arctic-breeding seabird species that currently migrate in the North Atlantic or in the North Pacific (McKeon et al 2016, Clairbaux et al 2019). A Northern Gannet *Morus bassanus* was observed twice in Alaska in 2010 (Day et al 2013) and one reached the Farallon Islands off northern California in April 2012 (McKeon et al 2016) and is still present at the time of publication.

Several Pacific auks have recently been observed in the North Atlantic. Sightings of Long-billed Murrelet *Brachyramphus perdix* and Ancient Murrelet *Synthliboramphus antiquus* have increased (eg, Haas 2012, Howell et al 2014, Peter Flood in litt); Tufted Puffin *Fratercula cirrhata* has been recorded off Maine, USA (Ralph Eldridge in litt), north-western Greenland (Burnham et al 2020), and four times in northern European waters (eg, Wright 2011, Haas 2012, Mobakken 2021, Helgi Fossdal in litt); and a Horned Puffin *F corniculata* has been recorded in north-western Greenland (Burnham et al 2020). Also, the bridled morph of Common Murre *Uria aalge*, common in some northerly North Atlantic colonies, was first recorded in the North Pacific in 2008 (Schmidt & Warzybok 2011). There is similar evidence for recent increased ocean exchange of ocean-specific (sub)species of seaducks (Haas 2012, 2017, McKeon et al 2016).

Given the above, what evidence is there that Short-tailed Shearwater has already reached or is likely to reach the North Atlantic via the Canadian Arctic flyway?

260 Short-tailed Shearwater / Dunbekpijlstormvogel *Ardenna tenuirostris*, Ferguson Lake, Cambridge Bay, Victoria Island, Nunavut, Canada, 19 June 2020 *(Shannon McCallum)*. Found dead by Roland Emingak, Dennis Kaomayok, Jamie Panioyak and Donna Tikhak. Note relatively short bill, large whitish throat and low contrast of under primaries versus adjacent underwing-coverts. **261** Short-tailed Shearwater / Dunbekpijlstormvogel *Ardenna tenuirostris*, Ferguson Lake, Cambridge Bay, Victoria Island, Nunavut, Canada, 25 June 2020 *(Shannon McCallum)*. Same bird as plate 260 and 262. Measurements by Chad McCallum. Length of bill is c 31 mm, near to mean measurements for Short-tailed Shearwater and considerably shorter than mean measurements around c 42 mm for Sooty Shearwater *A grisea* (Archer et al 2021). Mid-section gap (culminicorn) is c 28.1%, near to mean for Short-tailed, considerably less than mean of 34.4% for Sooty (Flood & Fisher 2020). Length of mid-section gap is distance between end of nostrils on culminicorn and first perceptible rise of maxillary unguis from culminicorn. **262** Short-tailed Shearwater / Dunbekpijlstormvogel *Ardenna tenuirostris*, Ferguson Lake, Cambridge Bay, Victoria Island, Nunavut, Canada, 25 June 2020 *(Shannon McCallum)*. Same bird as plate 260-261. Measurements by Chad McCallum. Approximate wing length falls somewhere within 265-275 mm, which encompasses all but one mean figure in range of mean figures for Short-tailed Shearwater and is considerably less than range of mean figures of 293-304 mm for Sooty Shearwater *A grisea* (Archer et al 2021).

Short-tailed Shearwater and Canadian Arctic Archipelago

Short-tailed Shearwaters arrive in the Bering Sea in April (non-/failed breeders) and are joined by breeders in May-June, remaining until September (breeders), or October (non-breeders) (Flood & Fisher 2020). Millions reach St Lawrence Island, in the north-eastern Bering Sea, during late August-October (Howell 2012) and large numbers enter the Chukchi Sea. For example, c 100 000 presumably non-breeders were recorded off Cape Dezhnev, on the west side of the Bering Strait, which connects the Bering Sea and Chukchi Sea, on 21 September 2017 (John Ryan in litt; figure 1). The seasonal northward movement of Short-tailed is related to krill (euphausiids) abundance (Nishizawa et al 2017) but, even so, the most northerly occurrence frequently coincides with minimum sea ice extent across Arctic Canada in September (Lindsey & Scott 2020). Interestingly, in offshore waters of the Chukchi Sea, piscivorous birds predominated in 1975-81 but planktivorous birds predominated in 2007-12, possibly related to ice melt, and Short-tailed is one of the few key planktivorous species (consuming euphausiids; Gall et al 2017).

There are numerous records of Short-tailed Shearwater from the Chukchi Sea and from the western Beaufort Sea in August-October (www.

eBird.org). An at-sea survey in northern summer months found Short-tailed throughout the Chukchi Sea and Beaufort Sea (Kuletz et al 2019). The researchers found that Short-tailed numbers drop off east of 150°W but then there is an uptick near 130°W (notably, with scant coverage in that region). More Short-tailed are using the northern Chukchi Sea in recent years (Kuletz et al 2020).

In the eastern Beaufort Sea, one Short-tailed Shearwater was observed on 3 August 2017 and another on 10 August 2017, off Collinson Head, Herschel-Qikiqtaruk Island, Yukon, Canada (www.eBird.org; A in figure 1). At the same location, 18 birds were recorded on 6 August 2019 and nine next day (www.eBird.org). One bird was found alive at Inuvik, Northwest Territories, Canada, on 25 October 1990 but later died (B in figure 1); the skin is now a specimen at the Canadian Museum of Nature, Ottawa, Ontario, Canada (NMCAV 95102; Sirois & Liepins 1991). At-sea surveys showed small numbers of shearwaters (presumably Short-tailed) reaching Amundsen Gulf in the northern autumn (Kuletz et al 2015).

There is evidence that some Short-tailed Shearwaters move even farther east into the southern Northwest Passage. One was found dead at Bathurst Inlet, Nunavut, Canada, in February 1994 (C in figure 1). It appeared to have died there the previous autumn based on the condition of the carcass. The skin is now a specimen also held at the Canadian Museum of Nature (CMNAV 96696; Wormington & Cranford 2011, Richards & Gaston 2018).

We report here, for the first time, a bird found dead and a second individual flying about at Ferguson Lake, 35 km north of Cambridge Bay, Victoria Island, Nunavut, Canada, on 19 June 2020 (D in figure 1). Photographs and measurements of the carcass confirm the identification of the dead individual (plate 260-262). Unfortunately, the carcass was not kept.

A Short-tailed Shearwater or Sooty Shearwater was observed and photographed over the waters of southern James Bay, Netitishi Point, Ontario, Canada, on 13 November 2010 (E in figure 1; Wormington & Cranford 2011), out of range of both species (however, it could have been a Sooty originating from the North Atlantic).

Conclusion

Given the sightings and specimens from the eastern Beaufort Sea and central Canadian Arctic, small numbers of Short-tailed Shearwaters may already have made their way through the Northwest Passage to the North Atlantic. We anticipate that more opportunities for such transits will arise in the future as open water continues to spread through the waterways of the Canadian Arctic Archipelago in late summer. It is also possible that Short-tailed Shearwaters have reached the North Atlantic by travelling west from the Bering Sea (we are currently researching this option). Moreover, given current scenarios for a completely ice-free Arctic Ocean in late summer in coming decades, it seems inevitable that Short-tailed and other seabirds will travel across the 'Canadian Arctic flyway' and the western route with increasing frequency.

Acknowledgements

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Samenvatting

'Canadese Arctische Trekbaan' – mogelijke route voor Dunbekpijlstormvogel om noordelijke Atlantische Oceaan te bereiken? Dunbekpijlstormvogel *Ardenna tenuirostris* broedt in Australië en de meeste vogels verblijven buiten de broedtijd in de Beringzee en de Tsjoektsjenzee (ten noorden van de Beringstraat). Dunbekpijlstormvogel is in de noordelijke Atlantische Oceaan een extreme dwaalgast. De recente reductie van de oppervlakte arctisch zee-ijs door de wereldwijde klimaatverandering heeft voor Dunbekpijlstormvogels nieuwe mogelijkheden gecreëerd om vanuit de Beringzee en de Tsjoektsjenzee de noordelijke Atlantische Oceaan te bereiken via de Noordelijke IJszee of via de wateren van de Canadese Arctische Archipel – de 'Canadese Arctische Trekbaan'. Dit artikel onderbouwt dat sommige Dunbekpijlstormvogels via laatstgenoemde route de noordelijke Atlantische Oceaan kunnen bereiken.

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Drie Kleine Sprinkhaanzangers in Nederland in 2002-16

Enno B Ebels, Tom M van Spanje, Bram Ubels & Jorrit Vlot

Kleine Sprinkhaanzanger *Locustella lanceolata* is een jaarlijkse dwaalgast in Noordwest-Europa, zowel in het voorjaar (bijna uitsluitend in Finland) als in het najaar (met name in Scandinavië en Schotland, daarbuiten zeer zeldzaam). Nederland moest het jarenlang stellen met twee oude gevallen van verzamelde exemplaren. Deze waren dood gevonden bij Haamstede op Schouwen-Duivenland, Zeeland, op 11 december 1912 en op lichtschip *Noord Hinder* op de Noordzee, Continentaal Plat, in midden-september 1958 (Smit & Voous 1959, van den Berg & Bosman 2001). Recentelijk toonde Oreel (2020) aan dat het tweede geval niet op de Nederlandse maar de Belgische lijst thuishoort omdat het lichtschip in Belgische wateren lag, zodat dit geval na revisie is geschrapt van de Nederlandse lijst (Gelling et al 2020). Bijna 90 jaar na het eerste (en enige) geval volgde een ringvangst in de Amsterdamse Waterleidingduinen, Zandvoort, Noord-Holland, op 20 september 2002 en nog weer 11 jaar daarna was er een ringvangst ver in het binnenland in de Ooijse Graaf, Gelderland, op 5 oktober 2013. Op 4 oktober 2016 volgde het vierde geval en de eerste veldwaarneming op de Tweede Maasvlakte, Zuid-Holland. Deze vogel werd door enkele 100en vogelaars gezien maar de determinatie riep veel discussie op en bleef lange tijd onzeker – het duurde tot begin 2021 totdat hij werd aanvaard. In dit artikel worden de drie gevallen in 2002-16 gedocumenteerd.

Amsterdamse Waterleidingduinen, 20 september 2002

Op vrijdag 20 september 2002 om 07:45 liep Fred Koning zijn ronde langs de netten van het vogelringstation in de Amsterdamse Waterleidingduinen. In de onderste baan van een net tussen het gras langs een met wilgen en riet begroeide infiltratiegeul trof hij een sprinkhaanzanger *Locustella* aan. De vogel viel op door het lichtere en gespikkelde kleed vergeleken met een die ochtend gevangen Sprinkhaanzanger *L naevia*. FK nam de vleugelmaat (57 mm) en dacht toen direct aan een Kleine Sprinkhaanzanger. FK en mederinger Hans Vader beseften iets bijzonders gevangen te hebben. Tot hun ontsteltenis wist de vogel echter uit de hand van FK te ontsnappen. HV begon snel de deur en de ramen van de vinkershut te sluiten. Gelukkig rende de vogel als een muis over de vloer van de keet naar een donker hoekje met mistnetstokken; daar wist FK hem weer te vangen en samen konden zij hem verder bekijken. De lichtbruine, scherpbegrensde zomen van de tertials en vleugel-

263 Kleine Sprinkhaanzanger / Lanceolated Warbler *Locustella lanceolata*, eerstejaars (verzameld te Haamstede, Zeeland, op 11 december 1912), Naturalis Biodiversity Center, Leiden, Zuid-Holland, 17 januari 2014 *(Justin J F J Jansen)*

264 Kleine Sprinkhaanzanger / Lanceolated Warbler *Locustella lanceolata*, eerstejaars (boven), met Sprinkhaanzanger / Common Grasshopper Warbler *L naevia*, Amsterdamse Waterleidingduinen, Zandvoort, Noord-Holland, 20 september 2002 *(Tom M van Spanje)* **265** Kleine Sprinkhaanzanger / Lanceolated Warbler *Locustella lanceolata*, eerstejaars, Amsterdamse Waterleidingduinen, Zandvoort, Noord-Holland, 20 september 2002 *(Tom M van Spanje)*

dekveren en de duidelijke, fijnbegrensde, lancetvormige donkere streepjes op borst, flank en onderstaartdekveren klopten met de kenmerken genoemd in Svensson (1992). Tevens was de versmalling op de binnenvlag van p2 conform Kleine. HV waarschuwde telefonisch andere ringgroepleden. Tom van Spanje bevestigde de determinatie en fotografeerde hem uitvoerig. Pas later op de ochtend beseften ze dat dit de eerste levende Kleine voor Nederland betrof. De ringers hadden het idee dat de vogel was aangetrokken door de afgespeelde iets op Kleine lijkende zang van Sprinkhaanzanger (van Eijck 2002, van Spanje et al 2002).

Beschrijving
De beschrijving is gebaseerd op aantekeningen van FK, TvS en HV en foto's van TvS (Dutch Birding 24: 388, plaat 357, 397, plaat 374, 2002).

ALGEMENE INDRUK Gestreepte *Locustella* met korte handpenprojectie en opvallende borststreping.
GROOTTE & BOUW Klein formaat. Korte handpenprojectie, c 1/3 tot 1/4 van tertial-lengte. Sterk afgeronde, relatief korte staart. P2 sterk gekromd. Notch (versmalling op binnenvlag) van p2 kort. Onderstaartdekveren lang. Staartpennen puntig.
KOP Voorhoofd ongestreept olijfbruin. Kruin meer grijsbruin met scherp afgetekende, regelmatige, zwartachtige lengtestreping. Onduidelijke crèmekleurige wenkbrauwstreep, meest duidelijk voor oog. Donkere teugel en donkere veeg achter oog. Onduidelijke lichte oogring. Kin ongestreept lichtgeel. Keel met nauwe, vage olijfbruine lengtestreping.
BOVENDELEN Mantelveren grijsbruin met contrastrijk zwartachtig centrum, tot top van veer reikend en regelmatig lijnvormig patroon op mantel vormend. Schouderveren bruin met donker centrum. Stuitveren zwaar getekend, met druppelvormig donker centrum. Bovenstaartdekveren donkerbruin met zeer smalle lichte zoom.
ONDERDELEN Bovenborst met donkerdere, bredere en scherper begrensde lengtestreepjes dan keel, borstband vormend. Flank bleek zeemkleurig, meer witachtig naar achterflank, met scherp afgetekend donker vlekje op centrum van veren. Onderstaartdekveren zeemkleurig. Langste onderstaartdekveren met lichtere top en fijne schachtstreep. Kortste en laterale onderstaartdekveren met bredere, lancetvormige vlek op schacht.
VLEUGEL Slagpennen bruin met zeer smalle lichte rand aan buitenvlag, meest opvallend aan buitenste handpennen. Tertials en grote dekveren met zwartbruin centrum en smalle scherp contrasterende bruine zoom. Overige dekveren bruin met donker centrum. Alula met opvallende lichte rand.
STAART Staartpennen donkerbruin met zeer smalle lichte zoom.
NAAKTE DELEN Iris donkerbruin. Bovensnavel donker. Ondersnavel vleeskleurig met donkere punt. Poot roze.
GEDRAG Bij ontsnapping in vinkershut als muis over grond rennend.
GELUID Niet gehoord.
BIOMETRIE Vleugellengte 57 mm.
RUI & SLEET Verse vleugelpennen en staartpennen en alleen rui op kop, borst en flank.

Ooijse Graaf, 5 oktober 2013
Op 5 oktober 2013 was Bram Ubels vogels aan het ringen op zijn vaste ringlocatie in de Ooijse Graaf. Rond 08:45 trof hij in de netten een kleine en zwaar gestreepte *Locustella* aan. Onderzoek van biometrie en verenkleed en directe vergelijking met een eveneens gevangen Sprinkhaanzanger bevestigde het vermoeden dat het een Kleine Sprinkhaanzanger betrof. De vogel werd enige tijd voor onderzoek vastgehouden en daardoor konden nog 10 vogelaars uit Nijmegen en omgeving hem bekijken en fotograferen. Om c 09:30 werd hij losgelaten en niet meer teruggezien. Een veertje werd verzameld voor DNA-onderzoek. Het vermelden waard is dat in de nacht voor de vangst de zang van Kleine werd afgespeeld.

Beschrijving
De beschrijving is gebaseerd op aantekeningen van BU, foto's van Harvey van Diek, Fabian Meijer en Erik van Winden (Dutch Birding 35: 417, plaat 539, 2013) en videobeelden van Joost van Bruggen (www.youtube.com/watch?v=-tlJ_QHEzuY).

ALGEMENE INDRUK Gestreepte *Locustella* met korte handpenprojectie en opvallende borststreping.
GROOTTE & BOUW Klein formaat. Korte handpenprojectie, c 1/3 tot 1/4 van tertiallengte. Sterk afgeronde, relatief korte staart. P2 sterk gekromd. Notch (versmalling op binnenvlag) van p2 kort. Onderstaartdekveren lang. Staartpennen puntig.
KOP Voorhoofd ongestreept olijfbruin. Kruin meer grijsbruin met scherp afgetekende, regelmatige, zwartachtige lengtestreping. Onduidelijke crèmekleurige wenkbrauwstreep, meest duidelijk voor oog. Donkere teugel en donkere veeg achter oog. Onduidelijke lichte oogring. Kin ongestreept lichtgeel. Keel met nauwe, vage olijfbruine lengtestreping.
BOVENDELEN Mantelveren grijsbruin met contrastrijk zwartachtig centrum, tot top van veer reikend en regelmatig lijnvormig patroon op mantel vormend. Schouderveren bruin met donker centrum. Stuitveren zwaar getekend, met druppelvormig donker centrum. Bovenstaartdekveren donkerbruin met zeer smalle lichte zoom.
ONDERDELEN Bovenborst met donkerdere, bredere en scherper begrensde lengtestreepjes dan keel, borstband vormend. Flank bleek zeemkleurig, meer witachtig naar achterflank, met donker vlekje op centrum van veren. Onderstaartdekveren zeemkleurig. Langste onderstaartdekveren ongetekend met witte top. Laterale onderstaartdekveren met fijne schachtstreep.
VLEUGEL Slagpennen bruin met zeer smalle lichte rand aan buitenvlag, meest opvallend aan buitenste handpen-

266-267 Kleine Sprinkhaanzanger / Lanceolated Warbler *Locustella lanceolata*, eerstejaars (links), en Sprinkhaanzanger / Common Grasshopper Warbler *L naevia*, Ooijse Graaf, Gelderland, 5 oktober 2013 *(Harvey van Diek)*

nen. Tertials en grote dekveren met zwartbruin centrum en smalle scherp contrasterende bruine zoom. Overige dekveren bruin met donker centrum. Alula met opvallende lichte rand.
STAART Staartpennen donkerbruin met zeer smalle lichte zoom.
NAAKTE DELEN Iris donkerbruin. Bovensnavel donker. Ondersnavel donker met lichtere basis. Poot roze.
GELUID Niet gehoord.
BIOMETRIE Vleugel 56 mm, staart 46 mm, vetgraad 2.
RUI & SLEET Volop in rui.

Tweede Maasvlakte, 4 oktober 2016

In de ochtend van 4 oktober 2016 waren Arie Kolders, Jorrit Vlot en Ruben Vlot al vroeg op de Maasvlakte, Zuid-Holland. Tim de Boer sloot zich bij hen aan en samen begonnen ze de vogeldag bij de welbekende greppel aan het begin van de Stuifdijk. Het was levendig, met flinke aantallen Goudhanen *Regulus regulus*, Tjiftjaffen *Phylloscopus collybita*, Zwartkoppen *Sylvia atricapilla* en Roodborsten *Erithacus rubecula* en er vlogen veel Zanglijsters *Turdus philomelos*. Na de greppel 'leeggevogeld' te hebben, vertrokken ze naar de Prinses Máximaweg op de Tweede Maasvlakte. Ook hier waren de aantallen weer goed, met de eerste Koperwieken *T iliacus* voor het najaar en veel zangvogels in de duindoorns. Na een paar kilometer besloten ze om te draaien en via de buitenkant terug te lopen door het helmgras. Om c 10:00 zag AK een zangertje vlak voor hem opvliegen en meteen was duidelijk dat het een *Locustella* was. Ze vonden hem snel terug en TdB en JV maakten enkele foto's. De vogel had redelijk wat streping op zowel de kop als flank en de vraag diende zich aan of het geen Kleine Sprinkhaanzanger was. Ondanks het feit dat hij zich steeds opnieuw op maar een paar meter of nog minder liet zien, was het een goede skulker en daardoor lastig om de kenmerken goed vast te stellen. Foto's werden geplaatst in de 'Birding Basterds'-appgroep en nog eens goed bekeken; de waarnemers raakten steeds meer overtuigd van de determinatie als Kleine. Ze kregen de melding dat een foto van de onderstaartdekveren welkom zou zijn om definitief uitsluitsel te kunnen geven. Ze gingen door het helm heen om de vogel terug te vinden, gelukkig met succes, en de eerste voorzichtige DB Alerts werden verzonden, even later gevolgd door een bevestiging toen de onderstaartdekveren waren vastgelegd. De eerste twitchers kwamen al snel aan en kregen hem meteen goed in beeld. Enkele uren liet hij zich fantastisch zien. Steeds meer mensen konden gemakkelijk aanschuiven, totdat hij naar de andere kant van de weg vloog en verdween in een uitgebreid duindoorncomplex. Na een spannend uurtje en dankzij een goed georganiseerde zoekactie werd hij teruggevonden. Bij het opvliegen deed hij vanwege het kleine formaat bij sommigen zelfs even aan een Tjiftjaf denken. Daarna ging hij foerageren waarbij hij bijna over de voeten van de aanwezigen heen kroop. Hij liet zich omringen door vogelaars en Christian Brinkman en BU hadden de tegenwoordigheid van geest om een poepje te verzamelen. De rest van de middag was hij gemakkelijk in beeld te krijgen en enkele 100en vogelaars slaagden erin om hem die dag te zien.

Aan het begin van de avond, toen iedereen weer thuis was, sloeg de stemming echter om. Na het plaatsen van vele beeldvullende foto's rees bij steeds meer criticasters twijfel: waarom was het geen (afwijkende) Sprinkhaanzanger? De discussie barstte los en de groep 'non-believers' begon gestaag te groeien. Uiteindelijk liet vrijwel iedereen zich overtuigen dat de twitchers zich met zijn allen hadden laten foppen door een gewone Sprinkhaanzanger

Vier maanden later, tijdens de Dutch Birding Vogeldag te Lunteren, Gelderland, op 4 februari 2017, zaten de aanwezigen klaar voor de lezing van Peter de Knijff over DNA-onderzoek aan moeilijk te herkennen vogels. Vrijwel niemand verwachtte dat de conclusie over de Maasvlaktevogel iets anders zou zijn dan Sprinkhaanzanger. Toen PdK de eerste woorden had uitgesproken, vroegen ze zich dan ook af of ze hem wel goed hadden gehoord: 'het mtDNA [van de sprinkhaanzanger van de Tweede Maasvlakte] komt overeen met dat van Kleine Sprinkhaanzanger'. PdK had de uit het poepje gehaalde genetische gegevens van de vogel van de Tweede Maasvlakte vergeleken met de geringde Kleine van Ooijse Graaf. Beide vogels, alsmede vijf exemplaren afkomstig uit Rusland, hadden vergelijkbaar mtDNA. Omdat mtDNA alleen via de moederlijn wordt overerfd, was op basis van deze resultaten een hybride of mtDNA-introgressie van Kleine in de populatie van Sprinkhaanzanger nog niet uitgesloten, ook al was zo'n hybridisering nog nooit aangetoond. PdK bood daarom aan aanvullend DNA-onderzoek te doen om tot een sluitend verhaal te komen. Dat was belangrijk want voor velen leek een determinatie als hybride meer voor de hand te liggen dan een zuivere Kleine (Jiguet & CHN 2019). De resultaten van dat onderzoek werden in september 2020 bekend en maakten aan alle onzekerheid een eind (zie DNA-analyse).

Beschrijving

De beschrijving is gebaseerd op notities van JV

268-269 Kleine Sprinkhaanzanger / Lanceolated Warbler *Locustella lanceolata*, eerstejaars, Tweede Maasvlakte, Zuid-Holland, 4 oktober 2016 *(Leo J R Boon)*

270 Kleine Sprinkhaanzanger / Lanceolated Warbler *Locustella lanceolata*, eerstejaars, Tweede Maasvlakte, Zuid-Holland, 4 oktober 2016 *(Arnoud B van den Berg)*

en foto's van vele 10-tallen fotografen (www.dutchbirding.nl, www.waarneming.nl) en videobeelden van Steven Wytema (www.youtube.com/watch?v=8izWDiSy2S8).

ALGEMENE INDRUK Kleine *Locustella* met fijne streping op flank en borst.
GROOTTE & BOUW Kort en gedrongen overkomend. In vlucht staart vrij lang lijkend. Staart sterk afgerond. Snavel vrij kort en licht gebogen. Neusgat tegen bevedering aan, ovaal/rond van vorm. Handpenprojectie c 50% van tertial-lengte. Onderstaartdekveren lang. Staartpennen puntig.
KOP Voorhoofd bruin, vanaf basis snavel zeer licht gestreept, overlopend in zwaardere lengtestreping (donker/zwart). Streping zwaarder wordend op achterhoofd, doorlopend op mantel en rug. Achterhoofd grijzer bruin dan voorhoofd. Vrij brede lichte rand boven oog, iets doorlopend richting snavel, overlopend in onduidelijke wenkbrauwstreep tot iets achter oog. Onderrand van oog licht, smaller dan bovenrand.
BOVENDELEN Grondkleur bovendelen grijs-geelbruin. Mantel en rug bruin met zwartbruine lengtestrepen. Duidelijke brede lengtestrepen over bovendelen vanaf nek tot aan bovenstaartdekveren, duidelijke banen vormend. Lager op bovendelen streping iets onderbroken. In veld streping zeer opvallend.
ONDERDELEN Bruin-zeemkleurig, iets lichter dan bovendelen. Bovenborst met beperkt aantal donkere lengtestreepjes. Op flank aan beide zijden enkele zwartbruine, lancetvormige flankstreepjes, met name zichtbaar als vleugel iets omhoog gehouden. Onderstaartdekveren zeemkleurig met lichtere top. Zwarte schachtstreep op alle onderstaartdekveren, aan basis versmallend.
VLEUGEL Handpennen en armpennen bruin met zeer smalle lichte rand aan buitenvlag, meest opvallend aan buitenste handpennen. Tertials zwartbruin met smalle lichtbruine zomen, licht verbredend naar basis toe. Zomen niet heel strak afgetekend, variërend op foto's. Vanaf zijaanzicht op foto's zomen veel strakker afgetekend dan vanaf achteraanzicht.
STAART Staartveren donkerbruin, met lichtere zeer smalle zomen. Bovenstaartdekveren grijsbruin met donkere schacht.
NAAKTE DELEN Iris donker grijsbruin. Bovensnavel donker. Ondersnavel geelachtig. Poot roze.
GEDRAG Zeer tam, tot minder dan 1 m te zien; uitsluitend foeragerend op de grond en als muis rondkruipend.
GELUID Niet gehoord.
RUI & SLEET Verenkleed vers. Geen zichtbare sleet.

Determinatie

Het genus *Locustella* omvat (afhankelijk van de gehanteerde taxonomische indeling) c 10 soorten, waarvan de volgende in West-Europa zijn vastgesteld als broedvogel of dwaalgast: Siberische Sprinkhaanzanger *L certhiola*, Kleine Sprinkhaanzanger, Sprinkhaanzanger, Krekelzanger *L fluviatilis*, Snor *L luscinioides* en Grote Krekelzanger *L fasciolata* (zowel nominaat *L f fasciolata* als ondersoort *L f amnicola* die vaak als aparte soort wordt beschouwd, Stepanyans Krekelzanger) (cf Cramp 1992, Clements 2000). Japanse Sprinkhaanzanger *L ochotensis*, Koreaanse Sprinkhaanzanger *L pleskei* en Japanse Grasvogel *L pryeri* zijn niet in Europa vastgesteld (cf Baker 1997). Kleine Sprinkhaanzanger is de kleinste en meest gestreepte soort uit het genus. Typische *Locustella*-kenmerken zijn de sterk afgeronde staart, de lange onderstaartdekveren, de sterk gekromde p2 en de verborgen leefwijze.

Kleine Sprinkhaanzanger lijkt sterk op Sprinkhaanzanger. Beide soorten zijn zeer variabel, zodat (bijna) geen enkel kleedkenmerk op zichzelf diagnostisch is. Naast individuele variatie is ook het kleed van invloed; juveniele exemplaren zijn minder sterk getekend op de onderdelen dan exemplaren die de rui naar eerst-winterkleed hebben afgerond (cf Norevik et al 2020). Sterk getekende Kleine zijn goed te onderscheiden maar minder sterk getekende exemplaren kunnen in uiterlijk vrijwel volledig overlappen met Sprinkhaanzanger (zie, eg, p 304 in Howell et al 2014). Een waterdichte determinatie kan dan ook alleen maar worden bereikt op basis van een combinatie van kenmerken. De verschillen tussen beide soorten zijn behandeld door onder meer Alström (1989), Robertson (1989), Galsworthy (1991), Lewington et al (1991), Vergauwen (1991), Riddiford & Harvey (1992), Svensson (1992), Bradshaw & Steele (1994), Votier (1995), Baker (1997), Mitchell & Young (1997), Madge (1999), Verbelen & De Smet (2003), Kennerley & Pearson (2010ab), van Duivendijk (2011), Stoddart (2012) en Shirihai & Svensson (2018). De hoofdkenmerken kunnen alleen op zeer korte afstand bevestigd worden maar aangezien Kleine zich meestal van zeer dichtbij laat bekijken (hetzij in het veld, hetzij in de hand), hoeft dit niet voor problemen te zorgen. Overlap in vleugelmaat is mogelijk met de kleine ondersoort van Sprinkhaanzanger *L n straminea* (Williamson 1968, Svensson 1992). Deze ondersoort komt voor in Oost-Rusland, West-Siberië en Centraal-Azië.

Sprinkhaanzanger kan in de meeste gevallen worden uitgesloten op basis van de volgende (combinatie van) kenmerken: ***1*** staart- en tarsuslengte (vallen buiten de maten van nominaat *naevia* maar kunnen overlappen met *straminea*); ***2*** vleugellengte 51-61.5 mm (soms 62 mm) (bij nominaat *naevia* 60-69 mm; Demongin 2016); ***3*** lengte van de versmalling aan p2 6-7.5 mm (bij Sprinkhaanzanger 8-11.5 mm; Svensson 1992); ***4*** tertials met donker (bruinzwart) centrum, meestal sterk contrasterend met fijne warmbruine zoom

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Amsterdamse Waterleidingduinen
Deze vogel toonde alle bovengenoemde kenmerken, met name de opvallende lichte zomen op tertials en dekveren en de smalle lancetvormige streping die zich uitstrekte van borst naar flanken en onderstaart. De zwarte vlekjes op de onderstaart waren scherp begrensd en duidelijk lancetvormig. De vlekjes liepen niet door tot op de basis van de veer. Op grond van de kleedkenmerken en biometrie (vleugellengte van 57 mm en korte lengte van notch van p2) was de vogel met zekerheid te determineren. Op grond van het gave verenkleed en de kleur van de streping op borst en flank werd hij als eerstejaars gedetermineerd.

Ooijse Graaf
Ook deze vogel toonde alle bovengenoemde kenmerken, met opvallende lichte zomen op tertials en dekveren en de smalle lancetvormige streping die zich uitstrekte van borst naar flank en onderstaart, zij het iets minder uitgesproken dan bij de vogel van 2002. De zwarte vlekjes op de onderstaart waren scherp begrensd en duidelijk lancetvormig. De vlekjes liepen niet door tot op de basis van de veer. Op de langste onderstaartdekveren ontbrak de zwarte tekening. Op grond van de kleedkenmerken en biometrie (vleugellengte 56 mm en korte notch van p2) was de vogel met zekerheid te determineren. Op grond van het gave verenkleed en de kleur van de streping op borst en flank werd hij als eerstejaars gedetermineerd.

Tweede Maasvlakte
Deze vogel was duidelijk minder getekend op de bovendelen en onderdelen dan de exemplaren van 2002 en 2013 en er konden geen biometrische gegevens worden verkregen; daardoor was dit exemplaar een stuk lastiger te determineren. Dankzij de DNA-analyse draaide de bewijslast echter om en was het alleen nog de vraag of de kleedkenmerken pasten op Kleine Sprinkhaanzanger. De volgende kenmerken waren goed voor Kleine en minder goed voor Sprinkhaanzanger: ***1*** compact formaat met relatief korte staart en vrij korte snavel; ***2*** fijne lengtestreepjes op de keel; ***3*** scherp afgetekende bruine randen aan de tertials; ***4*** donkere centra op mantelveren doorlopend tot aan top (lengtestreping op mantel accentuerend); ***5*** handpenprojectie minder dan 50% van tertiallengte; ***6*** scherp afgetekende lancet- of gasvlamvormige donkere vlekjes op flank; ***7*** stuitveren met donkere ronde schachtvlek niet doorlopend tot aan basis; en ***8*** onderstaartdekveren met donkere, lancetvormige schachtvlek niet doorlopend of verbredend tot aan basis. Op grond van het gave verenkleed en de kleur van de streping op borst en flank werd hij als eerstejaars gedetermineerd (cf Norevik et al 2020).

DNA-analyse
Uit het poepmonster van de vogel van 2016 werd DNA geïsoleerd (voor technische details en relevante informatie zie appendix en https://doi.org/10.5281/zenodo.4301524). Hierin werd een stukje van 350 baseparen van het mitochondriale cytochroom-B-gen (cytB) gesequenced en vergeleken met soortgelijke sequenties van een groot aantal *Locustella*'s die in GenBank waren gedeponeerd. Daaruit bleek dat het mtDNA van deze vogel vrijwel volledig overeen kwam met dat van Kleine Sprinkhaanzanger en duidelijk afweek van Sprinkhaanzanger. Ook kwam de cytB-sequentie volledig overeen met de cytB sequentie van de als

Kleine gedetermineerde vogel van 2013 (figuur 1). Omdat op het eerste gezicht het kleed van de vogel van 2016 niet typisch leek voor een Kleine werd besloten om de op mtDNA gebaseerde identificatie te ondersteunen met een aantal zogenaamde autosomale DNA-fragmenten. Dit zijn stukjes DNA die zowel van de vader als de moeder van de vogel afkomstig zijn (dit in tegenstelling tot mtDNA, dat een vogel alleen van zijn moeder krijgt). Deze autosomale DNA-stukjes kunnen inzicht geven in een eventuele hybride oorsprong van de vogel. Dit bleek een grote technische uitdaging omdat het DNA in het poepmonster extreem afgebroken was en omdat de autosomale DNA-concentratie erg laag was. Het kostte bijna drie jaar om een geschikt sequentieprotocol te ontwikkelen. Met dit nieuwe protocol was het mogelijk om drie korte stukken autosomaal DNA te sequensen van de vogel van 2016 dat vergeleken kon worden met dat van een kleine serie van andere Kleine en Sprinkhaanzanger (figuur 2-4). Ook in de drie autosomale DNA-fragmenten bleek de vogel van 2016 volledig te passen binnen Kleine en duidelijk af te wijken van Sprinkhaanzanger. Dus, zowel in het mtDNA van de vogel, als in drie autosomale DNA-fragmenten, bleek niets op invloeden van Sprinkhaanzanger te wijzen. Daarmee is een hybride uit te sluiten en wordt de determinatie als Kleine Sprinkhaanzanger voldoende ondersteund.

Verspreiding en voorkomen

Kleine Sprinkhaanzanger broedt in een brede strook van zuidelijk en centraal Siberië tot Noordoost-China en Noord-Japan. De soort is een zeldzame broedvogel in het westen van Europees Rusland, waarschijnlijk ten westen van het Onegameer (Cramp 1992, Kennerley & Pearson 2010b). Het overwinteringsgebied strekt zich oostwaarts uit tot de Filippijnen, met de Grote Soendaeilanden als zuidgrens (Lewington et al 1991, Cramp 1992). Het is een dwaalgast aan de westkust van Noord-Amerika en er was een broedgeval op Buldir Island, Aleoeten, Alaska, VS, in 2007 (Tobish 1985, Hickey et al 1996, Andersen et al 2008, Howell et al 2014).

In Europa is Kleine Sprinkhaanzanger in 14 landen als dwaalgast vastgesteld. Verbelen & De Smet (2003) gaven een overzicht van in totaal 184 exemplaren tot en met 2001. Veel van deze waarnemingen – inclusief alle Britse gevallen op één na – waren in de herfst, van september tot half december, waarvan meer dan 90% tussen 14 september en 14 oktober. Alleen Finland liet een heel ander patroon zien met tot en met 2007 slechts vier gevallen in het najaar en 93 in juni-augustus (Lindblom 2008). Sinds 2001 is het aantal gevallen in Europa gestegen tot meer dan c 370, met de volgende verdeling: België (zes; midden-september 1958, 10-12 september 1988, 5 oktober 1991, 14 oktober 1994, 7 oktober 1996, 1 oktober 2000), Groot-Brittannië (163 tot 2019); Denemarken (zes; 2 oktober 1932, 5 oktober 1935, 2 oktober 1943, 7 oktober 1991, 2 oktober 2004, 17 oktober 2008); Duitsland (vijf; allemaal op Helgoland, Sleeswijk-Holstein: 13 oktober 1909, 25 september 1920, 13 oktober 1979, 13 oktober 1993 en 8 oktober 2020); Frankrijk (zeven; 15-16 augustus 1986 (zingend), 11 september 1986, 18 oktober 1990, 26 oktober 2005, 15 september 2007 (twee), 9 oktober 2017); IJsland (twee; 9 oktober 1983, 13-17 oktober 2018); Faeröer (1 oktober 2016); Finland (c 140); Georgië (6 september 2010); Letland (2 september 2012); Montenegro (12 november 1907); Nederland (vier); Noorwegen (19: één in juni, drie in juli, zeven in september, acht in oktober); en Zweden (12: vier in juni-juli, drie in september, vijf in oktober) (Breife et al 1990, Dubois & Yésou 1992, Evans 1994, Debruyne et al 1996, Reeber & CHN 2009, Dierschke et al 2011, Reeber et al 2018, Holt et al 2020; Łukasz Ławicki in litt). Het patroon is hetzelfde als in de periode tot 2001 (Verbelen & De Smet 2003), met vrijwel uitsluitend gevallen in het najaar (september-oktober) behalve in Finland (en in beperkte mate in Zweden) waar bijna alleen zingende vogels in het voorjaar en de zomer zijn vastgesteld.

Twee dwaalgasten werden zeer ver noordelijk vastgesteld: een exemplaar landde op een schip c 70 zeemijl ten noorden van Bjørnøya (Bereneiland) in de Arctische Oceaan op 15 september 1982 (Slack 2009) en een lang dood exemplaar werd gevonden op Hornøya, Spitsbergen, in augustus 2018 (Schreven 2020).

Dankzegging

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Summary

THREE LANCEOLATED WARBLERS IN THE NETHERLANDS IN 2002-16 This papers documents the second to fourth record of Lanceolated Warbler *Locustella lanceolata* in the Netherlands. The first was collected at Haamstede, Zeeland, on 11 December 1912 (a bird collected on a light vessel on the Continental Shelf in mid-September 1958 was recently shown to have actually been collected within Belgian waters and was consequently deleted from the Dutch list). A first-year was ringed at Amster-

damse Waterleidingduinen, Zandvoort, Noord-Holland, on 20 September 2002 and a first-year was ringed far inland at Ooijse Graaf, Gelderland, on 5 October 2013. On 4 October 2016, the first field record was a typically confiding and ground-foraging bird at Tweede Maasvlakte, Zuid-Holland. The latter caused much controversy because it was rather poorly marked and therefore difficult to separate from Common Grasshopper Warbler *L naevia* on plumage alone. Luckily, feces were collected and DNA analysis proved that the bird was a pure Lanceolated beyond doubt. The bird from 2013 was also DNA analysed (from a feather collected) and confirmed to be a Lanceolated. This paper gives plumage descriptions of the three birds from 2002-16, discusses the identification characters to separate this species from Common Grasshopper (especially difficult in the case of poorly marked first-year Lanceolated) and gives detailed information about the DNA analysis of the birds from 2013 and 2016 (appendix).

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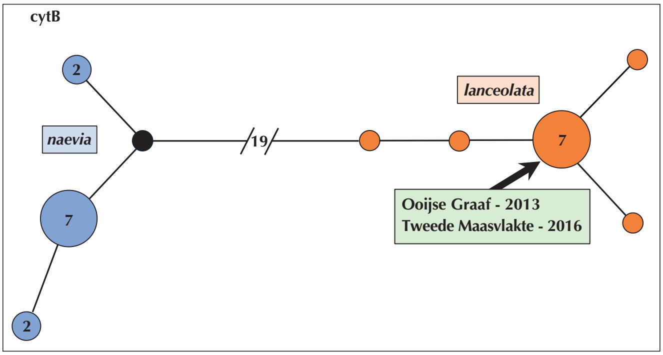
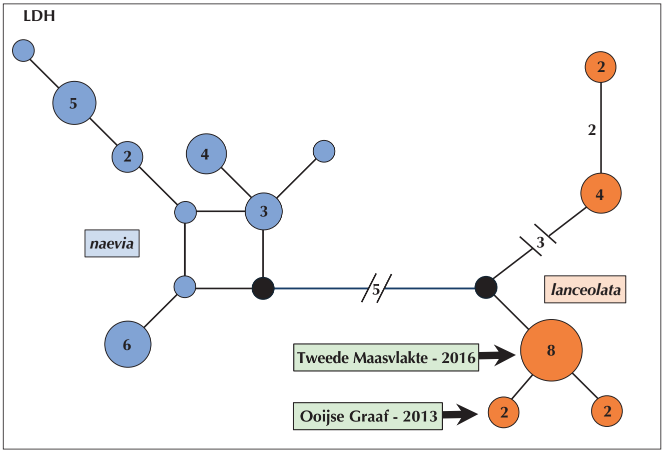
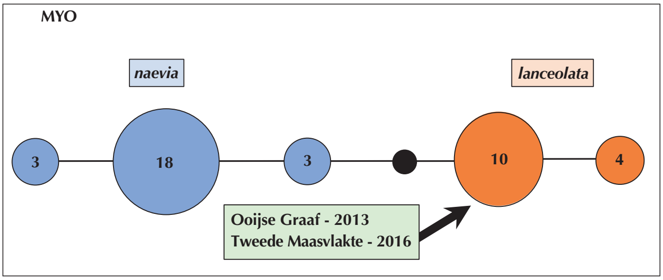
APPENDIX DNA-analyse van Kleine Sprinkhaanzangers *Locustella lanceolata* in Ooijse Graaf, Gelderland, op 5 oktober 2013 en op Tweede Maasvlakte, Zuid-Holland, op 4 oktober 2016 / DNA analysis of Lanceolated Warblers *Locustella lanceolata* at Ooijse Graaf, Gelderland, on 5 October 2013 and Tweede Maasvlakte, Zuid-Holland, on 4 October 2016



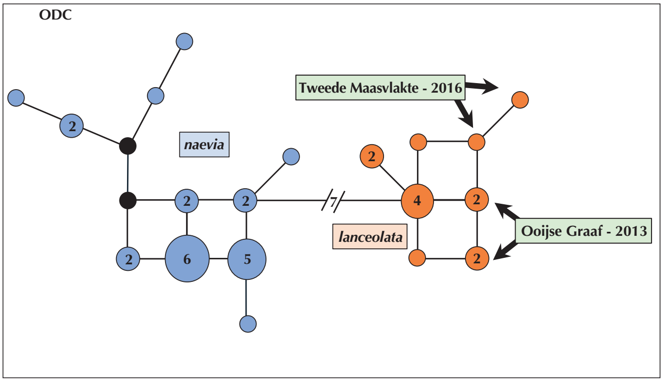
FIGUUR 1 Netwerk van variatie in cytochroom-B-genfragment (cytB; 350 baseparen) bij Sprinkhaanzanger *Locustella naevia* (in blauw) en Kleine Sprinkhaanzanger *L lanceolata* (in oranje). Nederlandse vogels (Ooijse Graaf 2013 en Tweede Maasvlakte 2016) weergegeven met groen tekstvak en zwarte pijl. Iedere cirkel is unieke cytB-sequentie van 350 baseparen. Relatieve diameter van cirkels is indicatie voor frequentie van sequentie in totale dataset (n=22 sequenties). Nummer in cirkel: aantal malen dat sequentie is waargenomen. Ongenummerde cirkels: unieke sequenties die bij slechts één exemplaar zijn waargenomen. Ongenummerde lijnen tussen cirkels markeren verschil van één positie (op 350 posities). Genummerde lijnen markeren twee of meer (aangegeven door nummer) verschillen. Zwarte cirkel: veronderstelde, (nog) niet waargenomen sequentie maar die nodig is om netwerk te construeren. Beide soorten verschillen op minimaal 19 van 350 posities van elkaar in dit mitochondriale cytB-fragment. Er is geen unieke sequentie die tussen beide soorten wordt gedeeld. / Network of variation in mtDNA cytochrome B gene fragment (cytB; 350 base pairs) of Common Grasshopper Warbler *Locustella naevia* (in blue) and Lanceolated Warbler *L lanceolata* (in orange). Dutch birds (Ooijse Graaf 2013 and Tweede Maasvlakte 2016) indicated with green text box and black arrow. Each circle represents unique cytB sequence of 350 base pairs. Relative diameter of each circle is indication of its frequency in total dataset (n=22 sequences). Numbers inside circles: number of times that sequence was observed. Circles without number: sequences found in one individual only. Lines without number between circles mark differences on one position (of maximum of 350) only, other lines mark two or more (as indicated by numbers along lines) different positions. Black dot: not (yet) observed sequence but necessary to construct network. Both species differ in at least 19 out of 350 positions in this mitochondrial cytB fragment. No unique sequence is shared between both species.



FIGUUR 2 Netwerk van variatie in autosomale lactaat-dehydrogenase-genfragment (LDH; 249 baseparen) bij Sprinkhaanzanger *Locustella naevia* (in blauw) en Kleine Sprinkhaanzanger *L lanceolata* (in oranje). Nederlandse vogels (Ooijse Graaf 2013 en Tweede Maasvlakte 2016) weergegeven met groen tekstvak en zwarte pijl. Iedere cirkel is unieke LDH-sequentie van 249 baseparen. Relatieve diameter van cirkels is indicatie voor frequentie van sequentie in totale dataset (n=42 sequenties). Nummer in cirkel: aantal malen dat sequentie is waargenomen. Ongenummerde cirkels: unieke sequenties die bij slechts één exemplaar zijn waargenomen. Ongenummerde lijnen tussen cirkels markeren verschil van één positie (op 249 posities). Genummerde lijnen markeren twee of meer (aangegeven door nummer) verschillen. Zwarte cirkels: veronderstelde, (nog) niet waargenomen sequenties maar die nodig zijn om netwerk te construeren. Deze twee soorten verschillen op minimaal vijf van 249 posities van elkaar in dit autosomale LDH-fragment. Er is geen unieke sequentie die tussen beide soorten wordt gedeeld. Aantal sequenties (n=42) is tweemaal aantal individuen (n=21) omdat LDH autosomaal DNA-fragment is. / Network of variation in autosomal lactate dehydrogenase gene fragment (LDH; 249 base pairs) of Common Grasshopper Warbler *Locustella naevia* (in blue) and Lanceolated Warbler *L lanceolata* (in orange). Dutch birds (Ooijse Graaf 2013 and Tweede Maasvlakte 2016) indicated with green text box and black arrow. Each circle represents unique LDH sequence of 249 base pairs. Relative diameter of each circle is indication of its frequency in total dataset (n=42 sequences). Numbers inside circles: number of times that sequence was observed. Circles without number: sequences found in one individual only. Lines without number between circles mark differences on one position (of maximum of 249) only, other lines mark two or more (as indicated by numbers along lines) different positions. Black dots: not (yet) observed sequences but necessary to construct network. Both species differ in at least five out of 249 positions in this autosomal LDH fragment. No unique sequence is shared between both species. Number of sequences (n=42) is twice number of individuals (n=21) because LDH is autosomal DNA fragment.



FIGUUR 3 Netwerk van variatie in autosomale myoglobine-genfragment (MYO; 234 baseparen) bij Sprinkhaanzanger *Locustella naevia* (in blauw) en Kleine Sprinkhaanzanger *L lanceolata* (in oranje). Nederlandse vogels (Ooijse Graaf 2013 en Tweede Maasvlakte 2016) weergegeven met groen tekstvak en zwarte pijl. Iedere cirkel is unieke MYO-sequentie van 234 baseparen. Relatieve diameter van cirkels is indicatie voor frequentie van sequentie in totale dataset (n=38 sequenties). Nummer in cirkel: aantal malen dat sequentie is waargenomen. Ongenummerde cirkels: unieke sequenties die bij slechts één exemplaar zijn waargenomen. Ongenummerde lijnen tussen cirkels markeren verschil van één positie (op 234 posities). Genummerde lijnen markeren twee of meer (aangegeven door nummer) verschillen. Zwarte cirkel: veronderstelde, (nog) niet waargenomen sequentie maar die nodig is om netwerk te construeren. Beide soorten verschillen op minimaal twee van 234 posities van elkaar in dit autosomale MYO-fragment. Er is geen unieke sequentie die tussen beide soorten wordt gedeeld. Aantal sequenties (n=38) is tweemaal aantal individuen (n=19) omdat MYO autosomaal DNA-fragment is. / Network of variation in autosomal myoglobine gene fragment (MYO; 234 249 base pairs) of Common Grasshopper Warbler *Locustella naevia* (in blue) and Lanceolated Warbler *L lanceolata* (in orange). Dutch birds (Ooijse Graaf 2013 and Tweede Maasvlakte 2016) indicated with green text box and black arrow. Each circle represents unique MYO sequence of 234 base pairs. Relative diameter of each circle is indication of its frequency in total dataset (n=38 sequences). Numbers inside circles: number of times that sequence was observed. Circles without number: sequences found in one individual only. Lines without number between circles mark differences on one position (of maximum of 234) only, other lines mark two or more (as indicated by numbers along lines) different positions. Black dot: not (yet) observed sequence but necessary to construct network. Both species differ in at least two out of 234 positions in this autosomal MYO fragment. No unique sequence is shared between both species. Number of sequences (n=38) is twice number of individuals (n=19) because MYO is autosomal DNA fragment.



FIGUUR 4 Netwerk van variatie in autosomale ornithine-decarboxylase-genfragment (ODC; 240 baseparen) bij Sprinkhaanzanger *Locustella naevia* (in blauw) en Kleine Sprinkhaanzanger *L lanceolata* (in oranje). Nederlandse vogels (Ooijse Graaf 2013 en Tweede Maasvlakte 2016) weergegeven met groen tekstvak en zwarte pijl. Iedere cirkel is unieke ODC-sequentie van baseparen. Relatieve diameter van cirkels is indicatie voor frequentie van sequentie in totale dataset (n=38 sequenties). Nummer in cirkel: aantal malen dat sequentie is waargenomen. Ongenummerde cirkels: unieke sequenties die bij slechts één exemplaar zijn waargenomen. Ongenummerde lijnen tussen cirkels markeren verschil van één positie (op 240 posities). Genummerde lijnen markeren twee of meer (aangegeven door nummer) verschillen. Zwarte cirkels: veronderstelde, (nog) niet waargenomen sequenties maar die nodig zijn om netwerk te construeren. Beide soorten verschillen op minimaal zeven van 240 posities van elkaar in dit autosomale ODC-fragment. Er is geen unieke sequentie die tussen beide soorten wordt gedeeld. Aantal sequenties (n=38) is tweemaal aantal individuen (n=19) omdat ODC autosomaal DNA-fragment is. / Network of variation in autosomal ornithine decarboxylase gene fragment (ODC; 240 base pairs) of Common Grasshopper Warbler *Locustella naevia* (in blue) and Lanceolated Warbler *L lanceolata* (in orange). Dutch birds (Ooijse Graaf 2013 and Tweede Maasvlakte 2016) indicated with green text box and black arrow. Each circle represents unique ODC sequence of 240 base pairs. Relative diameter of each circle is indication of its frequency in total dataset (n=38 sequences). Numbers inside circles: number of times that sequence was observed. Circles without number: sequences found in one individual only. Lines without number between circles mark differences on one position (of maximum of 240) only, other lines mark two or more (as indicated by numbers along lines) different positions. Black dots: not (yet) observed sequences but necessary to construct network. Both species differ in at least seven out of 240 positions in this autosomal ODC fragment. No unique sequence is shared between both species. Number of sequences (n=38) is twice number of individuals (n=19) because ODC is autosomal DNA fragment.

Leucistic Ural Owl at Krakovski gozd, Slovenia, in March 2020

Ural Owl *Strix uralensis* is a widely distributed species in the Palearctic region. Up to 10 subspecies have been named, three of which occur in Europe, *S u uralensis, S u liturata* (hereafter *liturata*) and *S u macroura* (hereafter *macroura*), but with low genetic differentiation (Hausknecht et al 2014, Gill et al 2021). *Macroura* is the southernmost subspecies in Europe, inhabiting the mountains of central and south-eastern Europe (Vrezec 2009). In Slovenia, it is a common species with a population size of 700-1200 breeding pairs and increasing numbers in recent years (Vrezec et al 2020). It inhabits different forest types from lowlands to high-mountain elevations (Vrezec & Mihelič 2013, Vrezec 2019). One of the most notable characteristics of *macroura* is its extremely variable plumage coloration. In Slovenia, at least four different colour morphs occur (Vrezec 2009): ***1*** pale, ***2*** grey, ***3*** partially melanistic and ***4*** melanistic. The pale morph and grey morph are the most common, while the proportion of partially melanistic and melanistic individuals is 5-15%, but this can vary locally. The occurrence of melanism appears to be unique for *macroura* (Vrezec 2009), as there are no records of dark coloured individuals from *liturata* in the northern parts of the species' range, at least in Europe (Pertti Saurola pers comm). The species might exhibit some plasticity in melanism as an answer to ecological conditions, as shown in the breeding programme of the Bavarian Forest National Park in Germany (Scherzinger 2006). It is therefore noteworthy that until now there has not been a record of leucism in this species in the wild. Here, we report the first case.

On 21 March 2020, during a field trip to the lowland riparian oak forest *Pseudostellario-Quercetum roboris* of Krakovski gozd (45°52'N, 15°24'E) in eastern Slovenia, we observed an abnormally coloured, all-white Ural Owl. At first, the bird was seen flying through the trees at a distance of c 100 m. As it settled on a branch, it was possible to note more details. The plumage seemed en-

275-276 Ural Owl / Oeraluil *Strix uralensis*, Krakovski gozd, Slovenia, 21 March 2020 *(Domen Stanič)*. Leucistic individual in lowland oak forest habitat. Note dark eyes and normally yellowish-orange bill.

tirely white, except for some darker (dirty-white) colouring on the wing's outer edge (some primary feathers and wing-coverts) and tail. The darkest feature in its plumage was a thin blackish circle encompassing the facial disk. The bill was yellowish-orange and the eyes were dark, therefore normally coloured. Because trees in the forest were still mostly leafless, the owl was quite easy to observe, even from a distance. We first watched it at c 10:00 and for c 15 minutes we managed to obtain some photographs. As it was located along one of the main paths leading through the forest, it was not difficult to find again later, at c 15:00, when we were walking the same way back. The owl showed the typical behaviour of the species: making short flights from one tree to the other, resting on horizontal branches at mid-height and sometimes looking to the ground for prey. No abnormalities in behaviour were noted. As the bird did not vocalise, we could not discern its sex. After this observation, the bird was not seen in the area again, which might indicate it was not a territorial breeding bird.

We concluded that the observed Ural Owl was leucistic. In leucism, due to an inherited disturbance disorder of the pigment transfer, the deposition of melanin in the feather cells does not occur. As a consequence, the plumage in leucistic birds appears much paler than normal or even white, while bare parts, bill and eyes retain their normal colour (van Grouw 2006). Unlike albinos, which have impaired eyesight and therefore a short life expectancy, leucistic birds often live for many years in the wild and are observed rather frequently (van Grouw 2006) and can even successfully breed as reported for a leucistic female Lapland Owl *S lapponica* in Finland (Lehto & Lehto 1995, Alaja & Mikkola 1997, Peltomäki 1998). Although colour abnormalities in owls are not as frequent as in other groups of birds, leucism still remains the commonest abnormality (Mikkola 2012). In his recent review, Mikkola (2012) reported that leucism had been recorded in 17 species of owls worldwide, including three *Strix* species, Barred *S varia*, Tawny *S aluco* and Lapland Owl, but not Ural. However, there is at least one known case of leucism in a captive Ural, an individual named 'Alana' held at a falconry collection in Germany ('Falknerei Eulenhof' at Marsberg, Nordrhein-Westfalen) that is very similar to the individual we observed at Krakovski gozd (https://tinyurl.com/uztwspuj).

We like to thank Heimo Mikkola for his kind

help in confirming our record of leucistic Ural Owl, to Pertti Saurola for information on *liturata* colouration from his long-term study in Finland, and to Fulvio Genero for informing us about the existence of the leucistic Ural held in captivity in Germany.

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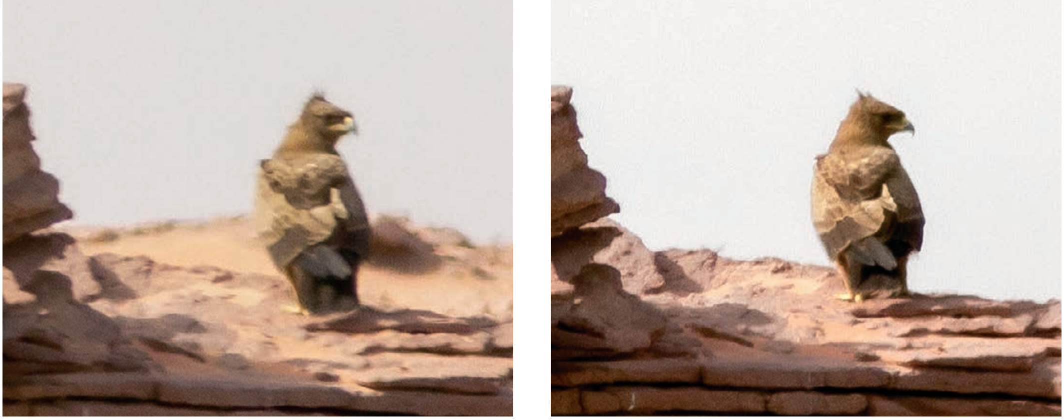
Wahlberg's Eagles at Cap Blanc, Mauritania, in September 2014 and Cap Bon, Tunisia, in April 2018

Wahlberg's Eagle *Aquila wahlbergi* is an African raptor species distributed south of the Sahara. The first Western Palearctic (WP) record was on 3 May 2013, when a pale-morph juvenile was photographed on the west coast of Gulf of Suez near Ras Shuqeir, c 120 km north of Hurghada, Red Sea, Egypt (Forsman 2014, Waheed 2016, Jiguet et al 2018; Dutch Birding 36: 196, plate 240-241, 2014). This paper documents the second and third WP record ('sensu BWP'), in Mauritania in September 2014 and in Tunisia in April 2018, respectively.

Cap Blanc, Mauritania, September 2014

In the afternoon of 23 September 2014, Kees Camphuysen, Tom van Spanje and Hans Verdaat observed a pale-looking medium-sized eagle at Cap Blanc, Mauritania (20°46'16"N, 17°02'51"W), just 200 m from the border with Western Sahara, Morocco, which bisects the peninsula (https://observation.org/observation/88202310; Dutch Birding 40: 47, plate 43, 2018). Photographs taken by HV (plate 277-278) show a rather small eagle with a relatively small head and fine bill, a conspicuous yellow gape reaching to below the centre of the eye, a short but distinctive spiky crest, long tibia feathering, rather uniform sandy-brown upperparts (feathers with diffuse darker centre and paler edges), with some paler feathers on the upper mantle and the feathers on the lower back darker than the rest of the upperparts, and dark brown uppertail and flight-feathers. The nostril (just visible in the photographs) appears rounded or possibly vertical. That evening, the observers discussed the identification in their hotel and, based on limited literature at hand, concluded that Tawny Eagle *A rapax* was the most likely identification, a very rare species in northern Mauri-



277-278 Wahlberg's Eagle / Wahlbergs Arend *Aquila wahlbergi*, Cap Blanc peninsula, Mauritania, 23 September 2014 *(Hans Verdaat)*

tania and further north. They prepared themselves for offshore seabird countings starting a few days later and forgot about the eagle...

A blog-post on the website MaghrebOrnitho in January 2018 about the status of Tawny Eagle in Morocco (https://tinyurl.com/y5cw4lzs) included a paragraph about the likelihood of vagrancy by Tawny from sub-Saharan Africa, illustrated by a few available observations from northern Mauritania (inside the WP 'sensu BWP'), including a photograph of the bird at Cap Blanc. After sharing the blog-post on the Facebook page Moroccan Birds, Tom Conzemius (in litt) questioned the identification and commented that '…the small beak and tail are perfect for Wahlberg's Eagle'. Because this was potentially the second WP record, the identification was checked with two raptor specialists: Ralph Buij and Dick Forsman. DF responded: 'I definitely do agree that the bird is a Wahlberg's Eagle. The proportions are not right for Tawny Eagle, which is a heavier bird. The slim build, longish tail, fine bill and small crest on the head all indicate Wahlberg's rather than Tawny. The uniformly worn plumage suggests that this is a young bird in its first year.' RB commented: 'I agree with Tom [Conzemius], definitely a Wahlberg's Eagle. Tawny has a much heavier bill and is a bigger bird with smaller head compared to body, small crest also indicates Wahlberg's'.

Most other eagle species could be excluded because they are even heavier and stronger billed than Tawny Eagle. Of the smaller eagle species, Booted Eagle *A pennata* and Lesser Spotted Eagle *Clanga pomarina* must be considered but Booted lacks the sandy upperparts in all plumages and immature Lesser Spotted lacks the crest and has more spotted upperparts. Furthermore, the gape only extends at maximum to the middle of the eye, whereas in Lesser Spotted it extends to the back of the eye, which is just visible in the photographs (cf Ferguson-Lees & Christie 2001, Forsman 2016, Clark & Davies 2018). Based on the characters shown in the photographs and the comments by RB and DF, the bird was identified as the second Wahlberg's Eagle for the WP. The Cap Blanc bird concerned the northernmost record of Wahlberg's for Mauritania and the first documented for the country since more than 30 years (Isenmann & Benmergui 2018, Browne 2020). Formerly, it was a resident breeder in woodland of southern Sahelian Mauritania (Senegal delta and valley, Karakoro) but its current status is unclear (cf Isenmann et al 2010).

Stretching far into the ocean, Cap Blanc peninsula is a true migrant trap, and acts as a dead-end street for raptors following the coastline and hesitant to wander over the sea; on the same day as the Walberg's Eagle, in the same area, a juvenile Egyptian Vulture *Nephron percnopterus*, a juvenile Rüppell's Vulture *Gyps rueppelli* and two Bonelli's Eagles *A fasciata* were observed.

Cap Bon, Tunisia, April 2018

El Haouaria at the tip of the natural region of Cap Bon peninsula in northern Tunisia is a known watchpoint for raptors and other soaring birds migrating through the Central Mediterranean flyway. Some rare raptor species have been observed here, including the first Eastern Imperial Eagle *A heliaca* in Tunisia and the Maghreb on 29 April 2017, photographed by Mohamed El Golli (https://tinyurl.com/yyzlseu8; Dutch Birding 40: 339, plate 453,

279-280 Wahlberg's Eagle / Wahlbergs Arend *Aquila wahlbergi*, adult, dark morph, El Haouaria, Cap Bon peninsula, Tunisia, 23 April 2018 *(Mohamed O El Golli)*

2018). About a year later, on 23 April 2018, another very rare eagle species was photographed here by MEG, identified as an adult Wahlberg's Eagle (cf Dutch Birding 41: 54, plate 66, 2019). The flight photographs (plate 279-280) show the eagle only from below, with the following characters visible: ***1*** size difficult to judge but looking like medium-sized eagle; ***2*** plumage mainly very dark chocolate-brown; ***3*** underside of flight-feathers silvery grey and almost unmarked (gradually becoming darker toward trailing edge and onto primaries), contrasting with dark underwing-coverts; ***4*** indistinct pale 'comma' at carpal joint; ***5*** central part of undertail greyish, gradually darkening to dark terminal tail band; ***6*** six long 'fingers' on outer wing; and ***7*** yellowish feet almost reaching tip of longest undertail-coverts. The tail is squarish, rather long and held closed on the photographs. The nostril shape is hard to see but appears rather vertical.

The identification was not easy and first reached no consensus, and a few species were suggested. Expert advice was asked, and DF commented: 'To me this is no doubt an adult Wahlberg's Eagle, definitely not Booted Eagle, nor Lesser Spotted Eagle. The rather narrow wings with parallel edges, the relatively long 'fingers' and square wing-tip, the longish and narrow tail and the long legs (with yellow toes reaching almost to the tips of the undertail-coverts) are key features in a typical Wahlberg's silhouette. The very dark and uniform body plumage nicely fits dark individuals of this species, as do the rather plain-looking remiges and rectrices, save for a wider dark subterminal band, also typical. A Golden Eagle *A chrysaetos* would probably show golden sides to neck and the shape of the wings is too rectangular and the wing-tip too square, and the underwing pattern is also not fitting any plumage of Golden. Silhouette/structure alone differs enough to exclude both Booted and Lesser Spotted and it is easy to find several distinctive plumage features to add.'

Wahlberg's Eagle is a highly variable species with anything from nearly white to black birds, uniformly brown being the most common. The shape is diagnostic and the underwing remiges tend to look very uniform, lacking distinct markings. Most birds, including the one in Tunisia, show a paler area at the base of the outer primaries but this may be rather indistinct (Ferguson-Lees & Christie 2001, Forsman 2016, Clark & Davies 2018). Seen only from below a dark-morph Booted Eagle comes closest to a dark Wahlberg's in plumage but the shape is different (eg, with more parallel-edged wings in Wahlberg's) and the pattern of the upperparts and upperwing differs strikingly. An unexpected pitfall for the dark adult plumage is not an eagle but dark-morph Long-legged Buzzard *Buteo rufinus* (Andrea Corso in litt). Differences include the feathered tarsus (unfeathered in Long-legged), vertical nostril (more horizontal in Long-legged; only visible on high-quality photographs), rectangular, parallel-edged wings (slightly more S-curved in juvenile) and square-cut wing tip with long 'fingers' (typical *Buteo* shape in Long-legged, with five 'fingers' visible, and less pronounced). The closed tail in flight is also typical for Wahlberg's. In addition, even the darkest Long-legged always shows a rather contrasting underwing, even from a distance, with distinct dark trailing edge and wing tip and variably wide pale area to at least the primaries, and often also the secondaries (depending on age). The underwing remiges of Wahlberg's always look very uniform from a distance; young birds have finely but usually quite indistinctly barred underwings (cf Ferguson-Lees & Christie 2001, Forsman 2016, Clark & Davies 2018; Dick Forsman in litt).

Based on the characters visible in the photographs and the comments by DF, the bird was identified as the first Wahlberg's Eagle for Tunisia and third for the WP 'sensu BWP'.

Distribution

Wahlberg's Eagle breeds in most of Africa south of the Sahara. It is a widespread species of woodland, often near water, and is probably Africa's most common eagle. It is an intra-African long-distance migrant but movements north of the range are very rare. Some populations are thought to be resident but at least South African birds migrate far north for the austral winter, almost reaching the Sahel (Ferguson-Lees & Christie 2001). With three records in northern Africa in the last eight years, it is probably more regular as a vagrant than previously thought. Identification problems may play a key role in the small number of records north of the breeding range. The fact that none of the three WP records so far has been identified by the observers at the time but only on photographs afterwards, may indicate that the species is overlooked.

Taxonomy

Wahlberg's Eagle has in the past been placed both in the genus *Hieraaetus* (together with, eg, Booted Eagle and Bonelli's Eagle) or in the genus *Aquila* and its position has been subject of discussion (see Clark 2012). Sangster et al (2005) and Redactie Dutch Birding (2006) merged the genus *Hieraaetus* with *Aquila*, solving (or avoiding) the problem where Wahlberg's should be placed; Clark (2012), however, disputed this solution and advocated the retention of *Hieraaetus* and the placement of Wahlberg's in this genus.

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Thanks go to Ralph Buij, Tom Conzemius, Andrea Corso, Dick Forsman and Valéry Schollaert for the help to identify these two birds.

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Corrigenda

In the paper 'Migrating chiffchaff taxa in the Netherlands: a 10-year genetic study' (Dutch Birding 43: 120-131, 2021) a systematic error occurred in table 2 (p 126). The correct version is given below. Note that in the online version of the issue and in the distributed pdf file of the paper this error has been corrected already. EDITORS

In het artikel 'Migrating chiffchaff taxa in the Netherlands: a 10-year genetic study' (Dutch Birding 43: 120-131, 2021) stond een systematische fout in tabel 2 (p 126). De juiste versie staat hieronder. In de online-versie van het nummer en in het verspreide pdf-bestand van het artikel is deze fout reeds hersteld. REDACTIE

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

WP reports

This review lists rare and interesting Western Palearctic birds reported mainly from **April to late May 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 A flock of as many as 21 **Snow Geese** *Anser caerulescens* (including two blue morphs) was photographed on Lewis, Outer Hebrides, Scotland, on 8 May. A record c 340 **Lesser White-fronted Geese** *A erythropus* were counted at Erçek Gölü, Turkey, between 22 November and 5 December 2020 (Sandgrouse 43: 183, 2021). Genetics revealed that **Steller's Eider** *Polysticta stelleri* may be a species of hybrid origin derived from ancestral gene flow event(s) between Long-tailed Duck *Clangula hyemalis* and true eiders *Somateria* (Mol Phylogenet Evol 161: 107164, 2021). The long-staying males **White-winged Scoter** *Melanitta deglandi* at Keflavík, Iceland, and at Musselburgh lagoon, Lothian, Scotland, remained into April. In Sweden, males **Stejneger's Scoter** *M stejnegeri* were reported at Hornsudden, Öland, on 21 April and (two) at Landsort, Södermanland, on 28 April. In Finland, males **Black Scoter** *M americana* were present at Harmaaletto, Uusikaupunki, on 11 April and at Söderskär, Porvoo, on 12 May. Others were seen off Northumberland, England, from 25 February to 27 April and at Damgan, Morbihan, France, on 20 April. A male **Ring-necked Duck** *Aythya collaris* at Königseeache Aufweitung, Salzburg, on 14-15 and 25 March was the fourth for Austria. If accepted, a male **Baikal Teal** *Sibirionetta formosa* at Hellesjøvannet, Akershus, on 3 May will be the third for Norway.

FLAMINGOS TO SWIFTS A record c 1600 **Lesser Flamingos** *Phoeniconaias minor* were counted at the Red Sea coast south of Jizan, Saudi Arabia, on 6 August 2020 (Sandgrouse 43: 180, 2021). The long-staying **Pied-billed Grebe** *Podilymbus podiceps* at Loch Feorlin, Argyll and Bute, Scotland, remained into May. The first **Rufous Turtle Dove** *Streptopelia orientalis meena* for Switzerland at Sulgen, Thurgau, first seen in March 2020 was back from 11 November until 5 April. The second for Belgium stayed at Heist, West-Vlaanderen, on 14-30 March. The fourth or fifth for Italy was video-trapped at Rondover, Friuli-Venezia Giulia, on 29-30 March. A **Red Turtle Dove** *S tranquebarica* photographed at Shahdad, Kerman, on 15 May concerned the third record (fourth individual) for Iran. At Milleyha, Hatay, the third **Spotted Sandgrouse** *Pterocles senegallus* for Turkey was discovered on 26 March and the first **Egyptian Nightjar**

281 Chinese Pond Heron / Chinese Ralreiger *Ardeola bacchus*, Givat Ram Botanical Garden, Jerusalem, Israel, 16 April 2021 *(Amir Ben Dov)*

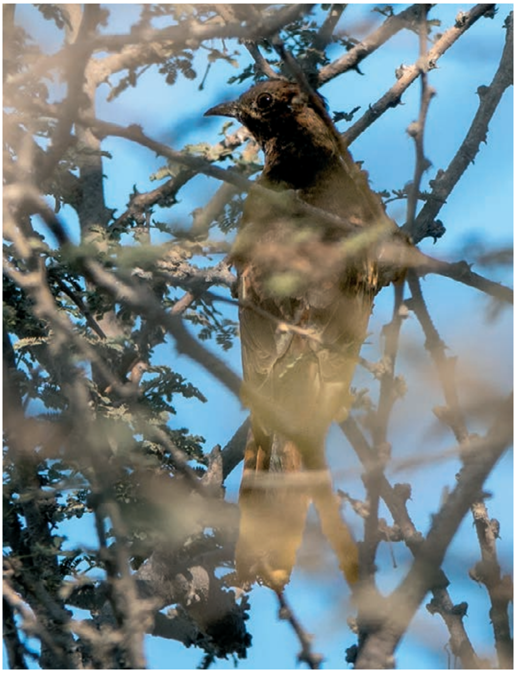
Caprimulgus aegyptius on 22 April. On 17 May, the third **White-throated Needletail** *Hirundapus caudacutus* for Denmark was photographed at Vest Stadil, south of Ulfborg, Nordjylland. The second **Little Swift** *Apus affinis* for Belgium at Blokkersdijk, Antwerp, on 15 May was apparently not the same individual as the fourth for the Netherlands at Westkapelle, Zeeland, on 18 May (the latest previous records for both countries were as recent as 26 October 2020 at Zeebrugge, West-Vlaanderen, and 27 October 2020 on Vlieland, Friesland, respectively). In Porto, Portugal, c 30 **Plain Swifts** *A unicolor* were sound-recorded in mid-May associating with breeding Common Swifts *A apus*.

RAILS TO BUSTARDS In the Azores, a **Purple Gallinule** *Porphyrio martinica* was taken into care at Ponta Delgada, São Miguel, on 12 April. If accepted, a **Lesser Moorhen** *Paragallinula angulata* photographed near a local zoo at La Lajita, Fuerteventura, on 19 March will be the second for the Canary Islands and ninth for the WP. The second **Red-knobbed Coot** *Fulica cristata* for Saudi Arabia turned up at Shibanah, Al Shaaf, Asir, on 29 December 2020 (Sandgrouse 43: 180, 2021). The **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. Later in Denmark, it was seen at Gravlev, Nordjylland, on 17-19 February and refound at Viskum on 20 March before it stayed at Lille Vildmose from 27 March to 9 April, and at Vejlerne from 12 April to early May. On 13 May, it returned to Sweden at Storsjö, Jämtland. A **Demoiselle Crane** *Grus virgo* flew over Smygedungen, Skåne, Sweden, on 30 March. In the Netherlands, an unringed and undamaged individual at Voorst, Gelderland, on 2-5 May attracted many twitchers; because a few solitary long-living escapes wearing captive rings have been roaming the country for quite a number of years, the possibility of a wild origin was almost forgotten. Apart from one in the Netherlands on 9 October 2010 (later also in France), individuals have been accepted further north in Denmark (five), Estonia (one), Finland (17), Norway (two) and Sweden (13), with six between 1857-1966, six in the 1970s, four in the 1980s, six in the 1990s, seven in the 2000s, and five in 2010-17 (Tor Olsen in litt). In Austria, a **Little Bustard** *Tetrax tetrax* was first seen at Schweizer Ried, Vorarlberg, on 8 March and then 350 km to the south-east at Feistritz im Rosental, Kärnten, on 15 March.

LOONS TO TUBENOSES A **Pacific Loon** *Gavia pacifica* was present in Elly Bay, Mayo, Ireland, from 17 March into May. The third for Norway was seen on Linesøya, Sør-Trøndelag, on 18-20 April. The second **Yellow-billed Loon** *G adamsii* for Romania stayed at Bacău reservoir from 12 April to at least 15 May. A **Wilson's Storm Petrel** *Oceanites oceanicus* photographed off l'Ametlla de Mar, Tarragona, Spain, on 29 March was the first for Catalunya. In Denmark, an adult **Black-browed Albatross** *Thalassarche melanophris* flew off Grenen, Skagen, Jylland, on 17 April, and then off Gilleleje, Hovedstaden, on 22 April. In Sweden, the bird was seen at Kråkudden, Bohuslän, on 21 April, and off Barsebäck, Skåne, on 25-26 April. On 26 April, it was watched from Malmõ, Skåne, when it was presumably killed in an attack by up to nine White-tailed Eagles *Haliaeetus albicilla* in the Øresund between Denmark and Sweden near Saltholm. Two **Short-tailed Shearwaters** *Ardenna tenuirostris* photographed separately near Garoh island on on 21 May were the second and third for Kuwait; the first was photographed on 25 May 2014. If accepted, a **Boyd's Shearwater** *Puffinus boydi* sound-recorded in a Barolo Shearwater *P baroli* colony on southern La Gomera in December 2020 will be the second or third for the Canary Islands.

HERONS TO CORMORANTS The first **Chinese Pond Heron** *Ardeola bacchus* for Israel stayed at Givat Ram Botanical Garden, Jerusalem, from 12 April to at least 16 May. In the Azores, a **Great Blue Heron** *Ardea herodias* was seen on Pico on 3 May. The first breeding of **Little Egret** *Egretta garzetta* for Saudi Arabia concerned a nest with young at Sabkhat Al Fasl in July 2020 (Sandgrouse 43: 136-138, 2021). A **Western Reef Heron** *E gularis* at Orestiada lake on 25 April was the sixth for Greece. The first for Turkey was photographed at Amik Dam, Hatay, on 13 May. A **Red-footed Booby** *Sula sula* off Abu Dhabi on 10 May was the fifth for the United Arab Emirates (UAE). The second **Double-crested Cormorant** *Phalacrocorax auritus* for Ireland at Ballylongford, Kerry, from 25 November 2020 remained until at least 17 May. In the Azores, two were seen on Pico on 8 April. A **Mediterranean Shag** *P aristotelis desmarestii* off Carmel coast, between Ma'agan Michael and Caesarea, from 22 March to at least 17 May was the second for Israel.

WADERS If accepted, an **American Golden Plover** *Pluvialis dominica* photographed at Wierciszewo, Podlaskie, on 8 May will be the third for Poland. In Iceland, a **Killdeer** *Charadrius vociferus* was found at Hamragarðar on 6 April. In Bulgaria, **Spur-winged Lapwings** *Vanellus spinosus* were seen at Mandra, Burgas, on 28 April and in Dobrogea along the northern Black Sea coast on 18 May. Shokhrin & Gluschenko (2021) analysed 95 records of **Grey-headed Lapwing** *V cinereus* in the Asian part of Russia. They were found from March to November (90% in April-June), mainly in Primorsky Krai, Russian Far East, where the species may have nested once (Russian J Ornithol 30: 1935-194, 2021). An adult **Red-wattled Lapwing** *V indicus* with four chicks at Sabkhat Al Fasl on 31 May 2020 constituted the first breeding record for Saudi Arabia (Sandgrouse 43: 136-138, 2021). A **Sociable Lapwing** *V gregarius* near Niš on 9 April was the first for Serbia. A **White-tailed Lapwing** *V leucurus* at Durankulak lake on 9 April was the third for Bulgaria and another was photographed near Bucharest, Romania, on 7 May. The 14th for Hungary was photographed at Békés on 8 May, the 12th for Sweden at Vrångö, Göteborg, on 13 May and the fifth for Finland at Hirvijärvi on 20 May. **Caspian Plovers** *Anarhynchus asiaticus* photographed at Pahkaneva, Kokkola, on 15 May and at Sandnåset, Norrbotten, on 23 May were the third for Finland and Sweden, respectively. If accepted, a **Greater Sand Plover** *A lesche-*



282 Little Swift / Huisgierzwaluw *Apus affinis*, Westkapelle, Zeeland, Netherlands, 18 May 2021 *(Toy Janssen)* **283** Grey-bellied Cuckoo / Grijsbuik-Piet-van-Vliet *Cacomantis passerinus*, female, Dibba, Fujairah, United Arab Emirates, 5 March 2021 *(Philippe Lecuyer)* cf Dutch Birding 43: 151, 2021 **284** Demoiselle Crane / Jufferkraanvogel *Grus virgo*, adult, Voorst, Gelderland, Netherlands, 4 May 2021 *(Arnoud B van den Berg)*

285 Eurasian Pygmy Owl / Dwerguil *Glaucidium passerinum*, Huesca, Aragón, Spain, 4 May 2021 *(Daniel López-Velasco)* **286** Baikal Teal / Siberische Taling *Sibirionetta formosa*, female, Lille, Antwerpen, Belgium, 10 March 2021 *(Vincent Legrand)* cf Dutch Birding 43: 151, 2021 **287** Rufous Turtle Dove / Meenatortel *Streptopelia orientalis meena*, Heist, West-Vlaanderen, Belgium, 30 March 2021 *(Filip De Ruwe)* **288** Caspian Plover / Kaspische Plevier *Anarhynchus asiaticus*, female, Pahkaneva, Kokkola, Finland, 15 May 2021 *(Petteri Hytönen)* **289** Slender-billed Gull / Dunbekmeeuw *Chroicocephalus genei*, adult, with Black-headed Gulls / Kokmeeuwen *C ridibundus* and Mediterranean Gulls / Zwartkopmeeuwen *Larus melanocephalus*, Chropyně, Zlín, Czechia, 24 April 2021 *(Zdeněk Němeček)* *naultii* reported at Schull, Ballycumisk, Cork, on 21 April will be the second for Ireland. The first **Sharp-tailed Sandpiper** *Calidris acuminata* for Mauritania was photographed on Zira near Iwik in Banc d'Arguin national park on 2 December 2018 (Bull Afr Bird Club 28: 78-79, 2021). Two **Little Stints** *C minuta* on the northern coast of Aceh, Sumatra, between 18 October 2019 and 30 January 2020 concerned the first records for Indonesia (Kukila 23: 1-5, 2020). The second **Pectoral Sandpiper** *C melanotos* for Kuwait stayed at Jahra pool reserve from 28 March to 12 April. A **Lesser Yellowlegs** *Tringa flavipes* at Silifke, Mersin, on 27 March was the second for Turkey. In Portugal, a flock of five **Long-billed Dowitchers** *Limnodromus scolopaceus* was found at Tagus estuary, Lisboa, on 3 April and the fourth for Greece was on Crete on 9 April. If accepted, one photographed at Shpindiar Depression, Kherson, on 7-8 May will be the first for Ukraine. At Klepp, Rogaland, Norway, probably the same **Oriental Pratincole** *Glareola maldivarum* was reported at Viktangen on 29 April and at Orrevatnet on 15 May.

GULLS TO TERNS A **Slender-billed Gull** *Chroicocephalus genei* at Chropyně, Zlín, on 24-25 April was the second for Czechia. From 25 March to 2 May, up to two solitary second-calendar year **Ross's Gulls** *Rhodostethia rosea* were flying back and forth along the Dutch coast between Scheveningen, Zuid-Holland, and Texel, Noord-Holland. On 8 May, one was seen at Landeyjahöfn, Iceland. An adult **Franklin's Gull** *Larus pipixcan* at IJzervallei, West-Vlaanderen, on 4-25 April was the fifth for Belgium. If accepted, an **Armenian Gull** *L armenicus* photographed at Navodari on the Black Sea coast on 25 March will be the first for Romania. The first **Iceland Gull** *L glaucoides* for Senegal and western Africa was found at Cap Skirring on 29-30 December 2019, c 1800 km south from the species' previous southernmost records in Morocco at Oued Chebeika and Khnifiss in 2014 and 2018, respectively (Bull Afr Bird Club 28: 80-82, 2021). For the 10th consecutive year, **Whiskered Terns** *Chlidonias hybrida* returned to nest in Groningen, Netherlands, this year with two **White-winged Tern** *C leucopterus* pairs present in a nearby Black Tern *C niger* colony as well; so far, up to 35 pairs of Whiskered were counted (in 2020, 65 pairs nested). A worn first-winter female **Roseate Tern** *Sterna dougallii* picked up moribund on the ferry of Terschelling, Friesland, on 24 November 1938 and on display as a mounted specimen in the island's lighthouse was first correctly identified (Ardea 28: 58-59, 1939), then (erroneously) rejected as a male Common Tern *S hirundo* (Dutch Birding 18: 181, 1996) and now reidentified as chronologically the first Roseate for the Netherlands and the latest ever in autumn. On 18 April, two **Elegant Terns** *S elegans* returned to their breeding site on Tabarca, Alicante, Spain. In France, others were reported at Saint-Clément-des-Baleines, Charente-Maritime, on 20-27 April and at Noirmoutier, Vendée, on 22 April. In May, a presumed hybrid **Sandwich x Common Tern** *S sandvicensis x hirundo* was photographed at Nieuw-Buitenheim, Texel, Noord-Holland.

RAPTORS In Schleswig-Holstein, Germany, the second **Black-winged Kite** *Elanus caeruleus* for Helgoland was photographed on 16 April and another was at Tielenhemme on 18 May. The first for Latvia flew past Kolka, Dundaga, on 1 May. As usual in recent years, quite a few were seen in Belgium and the Netherlands as well with, for instance, a total of six between 28 March and 10 May in six Dutch provinces. If accepted, a **Crested Honey Buzzard** *Pernis ptilorhynchus* flying over Istanbul on 23 April will be the fifth for Turkey. In France, 66 pairs of **Bearded Vulture** *Gypaetus barbatus* produced 24 young in 2019 (Ornithos 28-47, 2021). The first **White-backed Vulture** *Gyps africanus* for Israel photographed over Nahal Og, Judean desert, on 29 April was relocated at Sde Eliahu, Beit Shean valley, on 1 May remaining nearby until 3 May. A young **Rüppell's Vulture** *G rueppelli* first seen flying above the Azrieli Towers, Tel Aviv, in the evening of 18 May was later found lost and exhausted on the 43rd floor of a high building; it was the second for Israel but it died a few days after it had been taken into care. As so often in recent decades, southerly winds in spring and early summer brought high numbers of **Griffon Vultures** *G fulvus* to the Low Countries with, for instance in Belgium, a group of up to 30 over Oost-Vlaanderen on 9-11 May. A **Cinereous Vulture** *Aegypius monachus* photographed over Geszt, Békés, on 25 April was the second for Hungary since 1932. One photographed at Cieszanów, Podkacpackie, on 22 May was the 24th for Poland but only the second in the 21st century. A **Lappet-faced Vulture** *Torgos tracheliotos* was seen at Hai Bar, Yotvata, Israel, on 27-28 April and again on 25 May. A third-calendar female 'French tagged 26' **Bonelli's Eagle** *Aquila fasciata* photographed over Zalk, Overijssel, Netherlands, on 14 April had been before in the Netherlands in March 2020 without being seen. The first **Pallid Harrier** *Circus macrourus* for Madeira was reported on Porto Santo on 28 March and the third for the Canary Islands was on Tenerife on 1 April. A total of 114 was seen in France in March and April, including 44 at Prunete, Haute-Corse. The number of breeding wild-origin **White-tailed Eagles** in northern France is steadily increasing with just one pair in 2011-16 (producing one or two young a year), two successful pairs in 2017-18 (producing a total of two and four young, respectively), and three successful pairs in 2019 (producing a total of five to six young) (Ornithos 28: 28-47, 2021). A worn adult **Yellow-billed Kite** *Milvus aegyptius* first seen along the sea dike of Lauwersmeer, Groningen, Netherlands, on 11-12 April moved north-east to Wangeroog, Niedersachsen, Germany, on 15-16 April, then to Skagen, Nordjylland, Denmark, on 2-3 May before flying further to the north-east; if accepted, it will be the first record for Europe.

OWLS TO KINGFISHERS In the first days of May, two pairs of **Eurasian Pygmy Owl** *Glaucidium passerinum* in the Pyrenees of Huesca, Aragón, constituted the first records (and presumably first breeding) for Spain. In the Netherlands, one singing near Beekbergen, Gelderland, in April and early May was the first to be seen at the same site in two consecutive springs. A recently fledged **Tengmalm's Owl** *Aegolius funereus* at Bayman plateau on

290 Lappet-faced Vulture / Oorgier *Torgos tracheliotos*, second calender-year, Hai Bar, Yotvata, Israel, 28 April 2021 *(Noam Weiss)* **291** Black-browed Albatross / Wenkbrauwalbatros *Thalassarche melanophris*, off Barsebäck nuclear power plant, Skåne, Sweden, 25 April 2021 *(Jens Stålberg)* **292** White-backed Vulture / Witruggier *Gyps africanus*, subadult, Sde Eliahu, Beit Shean valley, Israel, 1 May 2021 *(Amir Ben Dov)*

22 June 2020 was the second for Afghanistan (Sandgrouse 43: 164, 2021). The first for Iran was photographed at Parvar protected area, Semnan, on 29-30 April. Aerial and ground surveys in Yamal and Taimyr, Russia, in 2019, revealed the presence of c 6300 adult **Snowy Owls** *Bubo scandiacus*, with an estimated c 3000 breeding pairs mainly concentrated in north-western Taimyr (Ornithologia 44: 18-25, 2020). In Scotland, females were reported on St Kilda, Outer Hebrides, from 23 March to at least 16 May and on Papa Westray, Orkney, from 8 May onwards. The **Belted Kingfisher** *Megaceryle alcyon* on Pico, Azores, from October 2020 remained until 10 April and the one at Castletown Bearhaven, Cork, Ireland, from November 2020 until 25 April.

FALCONS TO CROWS A **Sooty Falcon** *Falco concolor* at Zibliya on 16 September 2020 was the first for Iraq (Sandgrouse 43: 172, 2021). Satellite tracking of 56 **Peregrine Falcons** *F peregrinus* from six breeding populations in the Eurasian Arctic showed that they used five parallel migration routes across Eurasia, with longitudinal connectivity between breeding and wintering areas, revealing a strong fidelity to these routes and wintering sites. Once established, peregrines are remarkably site faithful, returning to the same site each winter; for example, one bird was tracked for more than seven years from its nest site in Lower Kolyma, Russia, to its winter site at a power station in South Korea (Nature 591: 259-264, 2021). A pair of **Masked Shrike** *Lanius nubicus* near Preševo on 8 May concerned the first record for Serbia. In the UAE, a **Black Drongo** *Dicrurus macrocercus* was found at Al Marmoom on 31 March and an unidentified **drongo** was seen at Heritage Park, Abu Dhabi, on 6 May. In northern Africa, the long-staying **Pied Crow** *Corvus albus* at Ceuta, Spain, was seen again on 18 April.

LARKS TO SWALLOWS The second and third **Greater Hoopoe-Larks** *Alaemon alaudipes* for Turkey were discovered at Milleyha on 26 March and 22 April. A **Bar-tailed Lark** *Ammomanes cinctura* was photographed at Albufera de València, Valencia, Spain, on 11 April. The third for Turkey was found at Riva fields, Istanbul, on 7 May. A **Temminck's Lark** *Eremophila bilopha* at Hal-Far on 23-24 April was the fifth for Malta and first since 50 years. A **Bimaculated Lark** *Melanocorypha bimaculata* at Øydve, Ulvik, Hordaland, on 8-13 May was the third for Norway. **Arabian Dunn's Larks** *Eremalauda eremodites* photographed at Milleyha on 26 March and 22 April were the first and second for Turkey. Gedeon & Töpfer (2021) reported the discovery of a **martin** *Riparia* from Ethiopia that may represent a hitherto undescribed species, with observations of at least 27 individuals from eight different sites between May 2013 and September 2019. It resembles sympatric Brown-throated Martin *R paludicola* but differs in vocalisations, all-white underparts from chin to undertail-coverts, greyer upperparts and a dark mask in front of the eyes (Bull Afr Bird Club 28: 27-36, 2021).

BABBLERS TO SYLVIAS An **Iraq Babbler** *Argya altirostris* at Osmaniye on 7 June 2020 constituted the westernmost record for Turkey (Sandgrouse 43: 184, 2021). A **Yellow-browed Warbler** *Phylloscopus inornatus* at Missisauga, Ontario, on 24 April was the second for Canada. In the Netherlands, presumed hybrids **Western Bonelli's x Wood Warbler** *P bonelli x sibilatrix* were singing at Vrouwenpolder, Zeeland, from 23 April to at least mid-May (also ringed) and at Vaals, Limburg, on at least 8-10 May; the first hybrid for the Netherlands confirmed by DNA analysis was a breeding male at Castricum, Noord-Holland, in May-June 2018. An **Eastern Bonelli's Warbler** *P orientalis* photographed at Marivan, Kordestan, on 7 May was the third for Iran. The first for Germany was trapped on Helgoland on 10 May. If accepted, a singing **Iberian Chiffchaff** *P ibericus* recorded at Devínska Nová Ves, Bratislava, on 20 April will be the first for Slovakia. Two **Willow Warblers** *P trochilus* photographed at Punchakkari wetlands near Thiruvananthapuram, Kerala, India, in November 2020 concerned the first records for South Asia (Indian Birds 17: 10-13, 2021). An **African Desert Warbler** *Sylvia deserti* at Akrotiri on 19-22 April was the first for Cyprus and at a remarkable 2400 km distance from the species' nearest breeding range, confirming its vagrancy potential. The first **Asian Desert Warbler** *S nana* for Greece was present near Thessaloniki airport on 19-22 April. A male **Sardinian Warbler** *S melanocephala* at Knockadoon Head, Cork, on 21-23 April was the fourth for Ireland. In Italy, a male **Common Whitethroat** *S communis* in its 21st calendar-year was retrapped on 25 April 2019 at Brusà-Vallette marsh nature reserve, Cerea, Verona; it had been ringed as a one-year old bird on 2 May 2000 on Palmaria, Portovenera, La Spezia, c 167 km south-west of Brusà-Vallette. It constitutes a longevity record for this species as the previous oldest was just nine years old (Ring Migrat 34: 129-130, 2019). A male **Marmora's Warbler** *S sarda* at Julianadorp, Noord-Holland, on 21 April was the first for the Netherlands and the second for the Low Countries (after one at Knokke-Heist, West-Vlaanderen, Belgium, in May 1997; Dutch Birding 24: 261-267, 2002). Phylogenetic and phylogeographic analyses by Nespoli et al (2021) strongly confirmed the split of **Marmora's** and **Balearic Warbler** *S balearica* (J Ornithol: https://tinyurl.com/cbbw7ex3).

REED WARBLERS TO THRUSHES The first **Booted Warbler** *Iduna caligata* for the UAE was photographed on Sila'a on 16 April. The first **Melodious Warbler** *Hippolais polyglotta* for Hungary was trapped at Ócsa, Pest, on 15 May. An integrative taxonomic analysis of morphology, song, and mitochondrial DNA by Alström et al (2021) shows that **Graceful Prinia** *Prinia gracilis* is two species: the south-western nominate Graceful group from Egypt to Oman, and the north-eastern **Delicate Prinia** *P lepida* group from Turkey through India. An mtDNA tree suggests a deep 2.2 million years old divide. Tail markings are among the most consistent morphological differences between both; vocally, nominate show long intervals different from the continuous reel displayed in *lepida* songs. The north-eastern Arabian Peninsula taxon *carpenteri* belongs to the *lepida* group but further south in eastern Arabia both groups may occur, albeit in separate areas (Ornithology 138: ukab014, 2021). Remark-

293 Northern Mockingbird / Spotlijster *Mimus polyglottos*, Pulborough, West Sussex, England, 8 April 2021 *(Dave Stewart)*

294 Black-throated Accentor / Zwartkeelheggenmus *Prunella atrogularis*, Miączyn, Lubelskie, Poland, 25 March 2021 *(Marzena Prokop)*

295 Greater Hoopoe-Lark / Witbandleeuwerik *Alaemon alaudipes*, Milleyha, Hatay, Turkey, 26 March 2021 *(Emin Yoğurtcuoğlu)*

296 Arabian Dunn's Lark / Arabische Dunns Leeuwerik *Eremalauda eremodites*, Milleyha, Hatay, Turkey, 26 March 2021 *(Emin Yoğurtcuoğlu)*

297 Asian Desert Warbler / Woestijngrasmus *Sylvia nana*, Thessaloniki, Central Macedonia, Greece, 20 April 2021 *(Manos Vatzolas)* **298** African Desert Warbler / Afrikaanse Woestijngrasmus *Sylvia deserti*, Akrotiri, Cyprus, 19 April 2021 *(Jane Stylianou)* **299** Temminck's Lark / Temmincks Strandleeuwerik *Eremophila bilopha*, Hal-Far, Malta, 23 April 2021 *(Raymond Galea)* **300** Eastern Bonelli's Warbler / Balkanbergfluiter *Phylloscopus orientalis*, Helgoland, Schleswig-Holstein, Germany, 10 May 2021 *(Paul Toschki)*

ably, a **Northern Mockingbird** *Mimus polyglottos* first seen at Exmouth, Devon, from 23 January to 7 April was subsequently rediscovered in different corners of England: at Pulborough, West Sussex, on 8 April and at Newbiggin-by-the-Sea, Northumberland, from 4 May. The second **Eyebrowed Thrush** *Turdus obscurus* for Lebanon was shot at Ras Al Ain near Baalbek on 30 October 2020 (Sandgrouse 43: 180, 2021). In the Netherlands, the third calendar-year female **Black-throated Thrush** *T atrogularis* at Hoograven-Noord, Utrecht, Utrecht, first seen from 31 March to 3 April 2020 and again from 4 December 2020 was last seen on 13 April.

FLYCATCHERS The first **White-throated Robin** *Irania gutturalis* for Finland was photographed at Finnhova, Kemiö, on 15 May. Between March and April, an influx of more than 20 **Semicollared Flycatchers** *Ficedula semitorquata* occurred in Italy. The second for Croatia was seen at Mirna valley, Istra peninsula, on 5 April. A female at Ichkeul national park on 10 April was the second for Tunisia; a male at Labergement-Sainte-Marie, Doubs, on 24 April the fourth or fifth for France; and one photographed at Ossiach, Kärnten, on 7-15 May the second for Austria. If accepted, a second calendar-year male **Atlas Pied Flycatcher** *F speculigera* (or perhaps an Iberian Pied Flycatcher *F hypoleuca iberiae*) paired with a European Pied Flycatcher *F h hypoleuca* at Stembert, Liège, since at least 24 April will be the first for northern Europe. A female **Common Rock Thrush** *Monticola saxatilis* was found on St Mary's, Scilly, England, on 26 April. A male at Niidi, Hiiumaa, on 4 May was the second for Estonia. The first **Isabelline Wheatear** *Oenanthe isabellina* for Serbia was photographed at Pirot on 12 April. A **Hooded Wheatear** *O monacha* at Boğazkent, Antalya, on 14 April was the sixth for Turkey. A male at Ipsilou monastery, Lesvos, on 17 April and a female on Antikythira on

301 Semicollared Flycatcher / Balkanvliegenvanger *Ficedula semitorquata*, female, Ichkeul national park, Tunisia, 10 April 2021 *(Mohamed O El Golli)* **302** Black-faced Bunting / Maskergors *Emberiza spodocephala*, male, Ludo, Faro, Portugal, 10 April 2021 *(Michael Tydén)* **303** White-crowned Wheatear / Witkruintapuit *Oenanthe leucopyga*, second calendar-year, Dwejra, Gozo, Malta, 17 April 2021 *(Raymond Galea)* **304** Hooded Wheatear / Monnikstapuit *Oenanthe monacha*, second calender-year male, Ipsilou monastery, Lesvos, Greece, 17 April 2021 *(Eleni Galinou)*

27 April were the second and third for Greece. The first for Lebanon was photographed on 17 April. In April, as many as five were recorded in Cyprus, including three at Cape Greco. Males **White-crowned Wheatear** *O leucopyga* at Dwejra, Gozo, on 15-20 April and at Hal-Far on 22-23 April were the third and fourth for Malta.

ACCENTORS TO BUNTINGS An **Alpine Accentor** *Prunella collaris* was seen at Grosnez Point, Jersey, on 27 April. The first **Black-throated Accentor** *P atrogularis* for Poland was recorded at Miączyn, Lubelskie, on 25-26 March. Shams et al (2021) confirmed that **Dead Sea Sparrow** *Passer moabiticus* and **Sistan Scrub Sparrow** *P yatii* are two species; a study in Iran revealed significant genetic differentiation in both nuclear and mitochondrial markers, supporting two genetic clusters, implying no recent or current gene flow between the two (Ibis: https://tinyurl.com/8sx748js). The first **Zarudny's Sparrow** *P zarudnyi* for Kazakhstan was a male photographed at Kyzylkum desert, Kyzylorda, on 25 October 2020 (Sandgrouse 43: 175, 2021). The first **Meadow Pipit** *Anthus pratensis* for India was seen at Leh, Ladakh, on 4-6 April. A **Siberian Buff-bellied Pipit** *A rubescens japonicus* photographed at Kungsbacka, Halland, on 11 May was (already) the seventh for Sweden. A **Trumpeter Finch** *Bucanetes githagineus* at Ponta do Pargo on 7-8 April was the first for Madeira. On 3 May, one was seen at Saintes-Maries-de-la-Mer, Bouches-du-Rhône, France. The first for Hungary was photographed at Akasztó, Bács-Kiskun, on 10 May. An exhausted male **Indigo Bunting** *Passerina cyanea* taken into care on Corvo on 22 April constituted the 61st for the Azores and the second in spring. A **White-throated Sparrow** *Zonotrichia albicollis* at Barcombe, East Sussex, England, from 3 February remained until 18 April. On 18 May, one was photographed in a garden on Unst, Shetland, Scotland. The fourth and fifth

305 Trumpeter Finch / Woestijnvink *Bucanetes githagineus*, Akasztó, Bács-Kiskun, Hungary, 10 May 2021 *(Tibor Bárdos)*

306 White-throated Sparrow / Witkeelgors *Zonotrichia albicollis*, adult, Barcombe, East Sussex, England, 14 April 2021 *(Mark Rayment)*

Dark-eyed Junco *Junco hyemalis* for the Netherlands were a singing adult male nominate **Slate-coloured Junco** *J h hyemalis* at Koudum, Friesland, on 26-27 April and a first-summer male **Cassiar Junco** *J h cismontanus* at Maasvlakte, Zuid-Holland, on 1 May; the latter originates from further west in North America and constitutes the first for the WP. In Belgium, a singing **Cirl Bunting** *Emberiza cirlus* was discovered at Frasnes, Hainaut, on 29 April. A **Black-faced Bunting** *E spodocephala* at Ludo, Faro, on 10 April was the first for Portugal and a male trapped on Nidingen, Halland, on 17 May was the fourth for Sweden. A **Little Bunting** *E pusilla* near Kremnae, Zhytkavichy, on 4 May was (only) the third for Belarus.

(MORE) RARE BREEDING BIRDS IN FRANCE In Ornithos 28: 28-47, 84-111, 2021, the results of the 2019 rare and endangered breeding bird survey in France were published. Increases were reported of **Western Swamphen** *P porphyrio* by 57% since 2014 up to 261 pairs, **Mediterranean Gull** *L melanocephalus* by 55% since 2017 up to 13 410 pairs, **Gull-billed Tern** *Gelochelidon nilotica* by 44% since 2018 up to 2018 pairs, **Common Murre** *Uria aalge* by 51% since 2018, **Razorbill** *Alca torda* by 18% since 2018, and **Lesser Kestrel** *F naumanni* by 22% since 2018 up to 515 pairs. On the down side, **Corncrake** *Crex crex* decreased by 33% since 2018 and **Common Snipe** *Gallinago gallinago* by 26% in 2018 since 2016, while the last pair of **Lesser Grey Shrike** *L minor* in France did not produce young in 2019. The breeding number of **Black Storks** *Ciconia nigra* increased to a record 58 nesting pairs with an estimated additional 22 pairs of which the nest was not found, all in the northern half of France, with the majority in the far north and north-east. Up to 2018, **Glossy Ibis** *Plegadis falcinellus* increased to 2419 pairs and **Western Osprey** *Pandion haliaetus* to 101 pairs.

For a number of reports Birdwatch, British Birds, Global Rare Bird Alert Facebook, Sovonnieuws, 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 AbdulRahman Al-Sirhan, Dániel Balla, Tibor Bárdos, Paulo Belo, Amir Ben Dov, Paul Bradbeer, Mika Bruun, Geoff Carey, Rolf Christensen, José Luis Copete, Magnus Corell, Andrea Corso, Filip De Ruwe, Jochen Dierschke, Klaus Drissner, Philippe Dubois, Nils van Duivendijk, Jon Dunn, Enno Ebels, Mohamed El Golli, Natalino Fenech, Raymond Galea, Eleni Galinou, Eduardo Garcia-del-Rey, Marcel Gil Velasco, Martin Gottschling, Dick Groenendijk, Ricard Gutiérrez, Petteri Hytönen, Toy Janssen, Jacky Judas, Zbigniew Kajzer, Abolghasem Khaleghizadeh, Leander Khil, Yann Kolbeinsson, Richard Kvetko, Philippe Lecuyer, Vincent Legrand, André van Loon, Daniel López-Velasco, Lionel Maumary, Geir Mobakken, Killian Mullarney, Zdeněk Němeček, Tor Olsen, Yoav Perlman, René Pop, Nikos Probonas, Marzena Prokop, Pedro Ramalho, Mark Rayment, Colin Richardson, Magnus Robb, Jiri Sirek, Jens Stålberg, Dave Stewart, Rasmus Strack, Jane Stylianou, József Szabó, Ehsan Talebi, Paul Toschki, Michael Tydén, Manos Vatzolas, André Vieira, Sam Viles, Roland van der Vliet, Peter de Vries, Arend Wassink, Noam Weiss, John van der Woude 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 **maart-april 2021**. De vermelde gevallen zijn deels niet geverifieerd en het overzicht is niet volledig.

GANZEN TOT EENDEN Er vlogen 16 **Witbuikrotganzen** *Branta hrota* langs de telposten, waaronder vier op 24 maart langs Huisduinen, Noord-Holland. Verder kwamen er waarnemingen uit 46 uurhokken op de klassieke plekken langs de kust en in het Waddengebied. Een groep van maximaal 56 verbleef tot 8 maart bij Breskens, Zeeland, en Westkapelle, Zeeland. In deze groep bevond zich een in Denemarken geringd individu. **Zwarte Rotganzen** *B nigricans* werden vooral gemeld in het Waddengebied maar ook in de Delta werden ze op meerdere plekken gezien. Texel, Noord-Holland, bleek de beste plek met drie in één groep op 5 maart. Er werden twee trekkers langs de telposten opgeschreven: op 23 maart langs Bloemendaal aan Zee, Noord-Holland, en op 28 maart langs Lauwersmeer Kustweg, Groningen. Waarnemingen van **Roodhalsganzen** *B ruficollis* kwamen uit 57 uurhokken, minder dan de helft van de vorige periode. De meldingen waren wederom verspreid over het hele land. Het hoogste aantal (10) werd gezien op Ameland, Friesland. Groepjes van meer dan drie werden ook gemeld bij Ternaard, Friesland (vijf); in de Oostvaardersplassen, Flevoland (vier); en in de Brabantse Biesbosch, Noord-Brabant (vier). Verder werden er vier langs telposten gemeld. In het Oudeland van Strijen, Zuid-Holland, werden **Dwergganzen** *Anser erythropus* waargenomen tot 17 maart, met een maximum van 27 op 7 maart. Verder kwamen er meldingen van zes andere locaties. In totaal 26 **IJseenden** *Clangula hyemalis* werden op telposten gezien. Waarnemingen kwamen uit 35 uurhokken, allemaal min of meer kustlocaties. Op diverse plekken werden maximaal zes exemplaren gezien. Op 6 maart dook het bekende Groninger mannetje **Ringsnaveleend** *Aythya collaris* weer op bij Delfzijl, Groningen, om vervolgens vanaf 26 april op zijn favoriete plek in Appingedam, Groningen, te verblijven. Van 6 tot 14 maart werd een vrouwtje **Kleine Topper** *A affinis* gezien in een grote groep duikeenden bij Zeewolde, Flevoland. Dit betreft pas de tweede waarneming van een vrouwtje. Het eerste vrouwtje werd op dezelfde plek (en door zelfde ontdekker) als vorig jaar teruggevonden, op 14 maart in het Nuldernauw bij Nijkerk, Gelderland. Deze vogel bleef tot in mei. Daarnaast was er een mannetje aanwezig van 4 tot 16 april bij Zuidland, Zuid-Holland. Het totaal komt hiermee op 26 gevallen (indien alle aanvaard). Op 10 april werd een mannetje **Siberische Taling** *Sibirionetta formosa* ontdekt in de Groene Jonker bij Zevenhoven, Zuid-Holland. Voor zover te zien op de foto's was hij ongeringd. Indien aanvaard is dit het 14e geval. Een terugkerend mannetje **Amerikaanse Smient** *Mareca americana* werd van 18 tot 25 maart gezien bij Zwolle, Overijssel. Op 20 maart werd een terugkerend mannetje gevonden in de Workumerwaard, Friesland, en op 30 en 31 maart werd een mannetje gezien in de Grutte Wielen bij Leeuwarden, Friesland. Op drie plekken werden mannetjes **Amerikaanse Wintertaling** *Anas carolinensis* waargenomen: op 17 en 18 april bij Ellewoutsdijk, Zeeland; van 24 april tot in mei in de Brabantse Biesbosch; en van 25 tot 30 april in de Weerribben, Overijssel.

GIERZWALUWEN TOT IBISSEN Op 18 maart werd een **Alpengierzwaluw** *Tachymarptis melba* gemeld bij Delfgauw, Zuid-Holland, gevolgd door een waarneming op 30 april op de Nederlands-Belgische grens in de Hedwigepolder bij Emmadorp, Zeeland. Ze werden niet gefotografeerd. Een **Klein Waterhoen** *Zapornia parva* werd op 2 april gefotografeerd langs de oever van de Geul ter

307 Kleine Topper / Lesser Scaup *Aythya affinis*, mannetje, met Kuifeenden / Tufted Ducks, Zuidland, Zuid-Holland, 5 april 2021 *(Martin van der Schalk)*

308 Amerikaanse Smient / American Wigeon *Mareca americana*, adult mannetje, met Smient / Eurasian Wigeon *M penelope*, Vreugderijkerwaard, Zwolle, Overijssel, 19 maart 2021 *(Eric Menkveld)* **309** Siberische Taling / Baikal Teal *Sibirionetta formosa*, mannetje, Groene Jonker, Zevenhoven, Zuid-Holland, 26 april 2021 *(Martijn Horst)* **310** Griel / Eurasian Stone-curlew *Burhinus oedicnemus*, Aagtekerke, Zeeland, 29 april 2021 *(Maarten Sluijter)* **311** Citroenkwikstaart / Citrine Wagtail *Motacilla citreola*, vrouwtje, Vlieland, Friesland, 30 april 2021 *(Henk Krajenbrink)*

hoogte van Schin op Geul, Limburg. Dit is het vroegste geval ooit. Een **Jufferkraanvogel** *Grus virgo* die op 3 april over Hattem, Gelderland, vloog was waarschijnlijk dezelfde vogel die begin mei een paar dagen verbleef bij Voorst, Gelderland (c 35 km zuidelijker); deze was ongeringd en dus een kanshebber voor aanvaarding. Maar liefst 507 **Parelduikers** *Gavia arctica* werden geteld langs zeetrektelposten. Vooral 7 april was een topdag, met onder meer 32 langs Castricum aan Zee, Noord-Holland. Langs de Brouwersdam, Zuid-Holland, zwommen er nog maximaal 13. Waarnemingen in het binnenland werden gedaan van 2 tot 6 maart op de Spiegel- en Blijkpolderplas bij Nederhorst den Berg, Noord-Holland; op 21 maart (overvliegend) in de Grutte Wielen; en van 16 tot 19 april bij Helmond, Noord-Brabant. **IJsduikers** *G immer* bleven goed vertegenwoordigd in het Deltagebied, met onder meer vier langs de Brouwersdam en eveneens vier op de Oosterschelde, Zeeland. Op 13 april werd voor het laatst een van de overwinteraars gemeld op de Maasplassen bij Roermond, Limburg. Nog eens vier werden genoteerd door trektellers. Op 7 en 8 april passeerden vier **Vale Stormvogeltjes** *Hydrobates leucorhous* enkele zeetrektelposten in Noord-Holland en Zuid-Holland en op 7 april vloog een exemplaar over de Westerschelde bij Ossenisse, Zeeland. Met name door de harde aanlandige wind begin april vlogen 292 **Noordse Stormvogels** *Fulmarus glacialis* langs telposten, met het hoogste aantal (62) langs Katwijk aan Zee, Zuid-Holland. In de 10 voorafgaande jaren lag het gemiddelde in deze periode op 24. Op 7 april werd een verzwakt exemplaar aangetroffen bij Maarssen, Utrecht. **Zwarte Ooievaars** *Ciconia nigra* werden gezien in 36 uurhokken, met een maximum van vier overvliegers op 26 april bij Leende, Noord-Brabant. **Koereigers** *Bubulcus ibis* blijven toenemen, getuige de presentie in 86 uurhokken en de waarneming van een groep van niet minder dan 17 op 21 april bij Echt, Limburg. Op telposten werden er 16 vastgesteld. **Zwarte Ibis** *Plegadis falcinellus* daarentegen lijkt weer wat minder algemeen te worden, met slechts één van 15 tot 23 maart in de omgeving van Zeewolde, Flevoland.

STELTLOPERS TOT MEEUWEN Op 24 april werd de eerste **Griel** *Burhinus oedicnemus* van het jaar gevonden bij Alphen aan den Rijn, Zuid-Holland, gevolgd door een exemplaar op 29 april tussen Westkapelle en Aagtekerke, Zeeland. In niet minder dan 110 uurhokken werden in totaal 307 **Steltkluten** *Himantopus himantopus* waargenomen; het hoogste aantal betrof 24 in de Groene Jonker. **Morinelplevieren** *Charadrius morinellus* druppelden gestaag binnen, met kleine groepjes op de traditionele pleisterplekken op Walcheren, Zeeland, en op Texel. De grootste groep bestond uit zeven bij Woldendorp, Groningen. Op telposten werden negen 'Morinellen' geteld. Van 27 tot 29 april foerageerde een adult-zomer **Gestreepte Strandloper** *Calidris melanotos* in de Natte Graslanden bij Almere, Flevoland. Opvallend waren meerdere waarnemingen van **Rosse Franjepoot** *Phalaropus fulicarius*: op 2 maart in de Riedpolder bij Roptazijl, Friesland (helaas op 3 maart dood aangetroffen); op 8 april langsvliegend bij Neeltje Jans, Zeeland; mogelijk dezelfde van 8 tot 12 april in het Noordervroon bij Westkapelle; van 14 tot 23 april twee bij Nieuwvliet-Bad, Zeeland; en op 15 april in het Zuidlaardermeergebied, Groningen. De eerste **Poelruiter** *Tringa stagnatilis* van het jaar verscheen op 10 april in de Ezumakeeg, Friesland. Meerdere volgden elders in de laatste week van april. Trektellers noteerden zeven **Papegaaiduikers** *Fratercula arctica*, waarvan vier langs telpost Westerslag op Texel. Op 18 april werd een exemplaar losgelaten in de Eemshaven, Groningen, na herstel in Faunavisie in Westernieland, Groningen; deze was hier rond 15 januari verzwakt opgepikt, nadat hij een paar dagen (voor vogelaars onopgemerkt) in de haven had gezwommen. Op Texel waren de twee tweede-kalenderjaar **Zwarte Zeekoeten** *Cepphus grylle* nog present. De ene verbleef de gehele periode in de haven van Oudeschild en de andere werd voor het laatst op 28 april gemeld op het Marsdiep. Op 19 maart vloog een exemplaar in winterkleed langs Camperduin, Noord-Holland. Op 2 april, een ongebruikelijke datum, vlogen 15 614 'alk/zeekoeten' *Alca torda/Uria aalge* langs Camperduin, wat een verbetering betekende van het landelijke record dat met 14 739 op 28 november 2012 ook al op naam van deze telpost stond. Bijzonder in deze tijd van het jaar waren de verschillende waarnemingen van **Kleinste Jager** *Stercorarius longicaudus*: op 14 maart een vrij verse dode adult op de dijk bij Kerkwerve, Zeeland; op 15 maart een adult korte tijd ter plaatse op het strand van Katwijk aan Zee; op 19 maart een adult jagend boven het Ilperveld bij Landsmeer, Noord-Holland; en op 5 april een tweede-kalenderjaar langs telpost Lauwersmeer Kustweg, Groningen. Op telposten werden 333 **Kleine** *S parasiticus,* drie **Middelste** *S pomarinus* en 16 **Grote Jagers** *S skua* geteld. Van de eerste soort lag het gemiddelde van de 10 jaar hiervoor op 69. Het nationale trektelrecord van **Kokmeeuw** *Chroicocephalus ridibundus* werd op 19 maart op 36 737 gezet op telpost Eemshaven. Op 25 maart werd een tweede-kalenderjaar **Ross' Meeuw** *Rhodostethia rosea* gefotografeerd bij het Noorderhavenhoofd van Scheveningen, Zuid-Holland. De volgende dag was deze kort ter plaatse bij IJmuiden, Noord-Holland, om vervolgens in noordelijke richting te verdwijnen. Op 30 maart werd mogelijk dezelfde gefotografeerd bij paal 14 op Texel (ingevoerd op www.waarneming.nl als Dwergmeeuw *Hydrocoloeus minutus* en pas dagen later bekend geworden). Tot dan toe was er dus nog geen kans om deze zeldzame meeuw te twitchen maar daar kwam op 19 april verandering in. Toen werd namelijk hetzelfde exemplaar als eerder bij Scheveningen daar opnieuw gezien. Op 20 april maakte deze nog een uitstapje langs de Noordzeekust en werd gezien ter hoogte van Berkheide bij Katwijk aan Zee en Langevelderslag ten noorden van Noordwijk aan Zee, Zuid-Holland, maar was daarna tot 25 april soms tot op enkele meters te bewonderen in Scheveningen. Op 26 april werd een exemplaar gemeld langs Meijendel bij Wassenaar, Zuid-Holland. Op 27 april tot in mei was er weer een tweede-kalenderjaar aanwezig bij IJmuiden. Vanwege duidelijke verschillen in verenkleed bleek het om een ander individu te gaan. Deze twee vertegenwoordigen het 19-20e geval en na exemplaren bij Westkapelle in november 1995 en in Vlissingen, Zeeland, in januari-maart 2018 pas het derde en vierde in eerste-winterkleed. Op 12 april stond een adult-zomer **Ringsnavelmeeuw** *Larus delawarensis* kortstondig op het strand van Katwijk aan Zee (11e geval). Een opvallende influx van **Kleine Burgemeester** *L glaucoides* vond plaats, resulterend in waarnemingen in maar liefst 27 uurhokken, voornamelijk langs de kust maar ook ver in het binnenland, zoals in Coevorden, Drenthe; in Zwolle; en in Deventer, Overijssel. In bijna alle gevallen ging het om kort verblijvende of langsvliegende tweede-kalenderjaar vogels. Alleen op Terschelling, Friesland, werden op 17 en 19 maart twee adulten (in zomerkleed en winterkleed) waargenomen. Op telposten werden zes trekkers gezien, waarvan vier (inclusief mogelijke dubbeltellingen) langs Bloemendaal aan Zee. De adulte **Kumliens Meeuw** *L g kumlieni* van Julianadorp, Noord-Holland, werd voor het laatst gemeld op 9 april. De vierde-kalenderjaar **Grote Burgemeester** *L hyperboreus* van de Binnenhaven van Vlissingen bleek toch nog aanwezig en werd de gehele periode gemeld. Op c 10 andere locaties werden tweede-kalenderjaar vogels gezien, waaronder nog steeds één bij Medemblik, Noord-Holland. Op telposten werden vier langstrekkers genoteerd.

ROOFVOGELS TOT VALKEN In mogelijk het laatste jaar als beoordeelsoort werden deze periode maar liefst vier **Grijze Wouwen** *Elanus caeruleus* waargenomen: op 28 en 29 maart in de Engbertsdijksvenen bij Kloosterhaar, Overijssel; op 29 en 30 maart bij De Braakman, Zeeland; op 26 april over Beugen, Noord-Brabant; en op 26 april over telpost Heidestein bij Zeist, Utrecht. Een **Schreeuwarend** *Clanga pomarina* werd op 21 april gefotografeerd bij Raalte, Overijssel, en even later opgepikt bij Dalfsen, Overijssel. De derde-kalenderjaar **Steenarend** *Aquila chrysaetos* die in februari werd ontdekt bleef de gehele periode. In de vroege ochtend van 1 maart werd hij teruggevonden op de plek bij Duiven, Gelderland, waar hij de vorige avond was gaan slapen. Daarna werd hij pas van 27 tot 29 maart weer gezien in de Engbertsdijksvenen en omgeving. Vervolgwaarnemingen kwamen op 29 maart

312-313 Ross' Meeuw / Ross's Gull *Rhodostethia rosea*, eerste-winter, Scheveningen, Zuid-Holland, 20 april 2021 *(René Pop)*

314 Ross' Meeuw / Ross's Gull *Rhodostethia rosea*, eerste-winter, IJmuiden, Noord-Holland, 30 april 2021 *(Arnoud B van den Berg)* **315** Ross' Meeuw / Ross's Gull *Rhodostethia rosea*, eerste-winter, met Dwergmeeuwen / Little Gulls *Hydrocoloeus minutus*, Dwergstern / Little Tern *Sternula albifrons*, Visdieven / Common Terns *Sterna hirundo* en Grote Stern / Sandwich Tern *S sandvicensis*, IJmuiden, Noord-Holland, 30 april 2021 *(Arnoud B van den Berg)*

316 Kleinste Jager / Long-tailed Jaeger *Stercorarius longicaudus*, adult, Noordwijk, Zuid-Holland, 15 maart 2021 *(Menno van Duijn)*

317 Poelruiter / Marsh Sandpiper *Tringa stagnatilis*, Ezumakeeg, Friesland, 17 april 2021 *(Thijs Glastra)*

318 Ringsnavelmeeuw / Ring-billed Gull *Larus delawarensis*, adult, met Kokmeeuw / Black-headed Gull *Chroicocephalus ridibundus* en Stormmeeuwen / Common Gulls, Berkheide, Zuid-Holland, 12 april 2021 *(Gijsbert Twigt)*
319 Zwarte Zeekoet / Black Guillemot *Cepphus grylle*, tweede-kalenderjaar, Oudeschild, Texel, Noord-Holland, 30 maart 2021 *(René Pop)*

320 Steenarend / Golden Eagle *Aquila chrysaetos*, derde- of vierde-kalenderjaar, Kloosterhaar, Overijssel, 29 maart 2021 *(Floris Kouters)*

321 Geelsnavelwouw / Yellow-billed Kite *Milvus aegyptius*, adult, Marnewaard, Lauwersmeer, Groningen, 11 april 2021 *(Anne van der Wal)*

322 Dwerguil / Eurasian Pygmy Owl *Glaucidium passerinum*, Beekbergen, Gelderland, 17 april 2021 *(Martin van der Schalk)*

bij Gortel, Gelderland, en Hoog-Soeren, Gelderland. Daarna was het stil tot 15 april, toen hij weer werd waargenomen op het Deelensche Veld op de Hoge Veluwe, Gelderland, waar hij tot ten minste begin mei onregelmatig in de ruime omgeving werd gezien. Fascinerend is dat de gezenderde derde-kalenderjaar **Havikarend** *A fasciata* met codenaam '26' opnieuw opdook en ditmaal wel in het veld werd waargenomen, op 14 april over Zalk, Overijssel. Eind maart vorig jaar verbleef deze enkele dagen in ons land zonder gezien te worden. In 38 uurhokken werden **Steppekiekendieven** *Circus macrourus* gezien. De veronderstelling dat deze soort snel talrijker zou worden dan **Grauwe Kiekendief** *C pygargus* werd in ieder geval in deze periode gelogenstraft getuige de 62 uurhokken waarin de laatste soort werd vastgesteld. Op 19 maart werd het landelijke trektelrecord voor **Zeearend** *Haliaeetus albicilla* gevestigd met zes (waaronder een groep van vijf roepende) over telpost de Heemtuin bij Muntendam, Groningen. Top of flop, klapper of flapper? Wat het eindoordeel wordt over de **Geelsnavelwouw** *Milvus aegyptius* die in de middag van 11 april aan de oostzijde van het Lauwersmeergebied, Groningen, werd gezien, is lastig in te schatten, temeer omdat het waarschijnlijk om de zuidelijke ondersoort *parasitus* ging, waarvan geen waarnemingen in Noord-Afrika bekend zijn. Dat de soort als potentiële dwaalgast niet direct serieus werd genomen bleek de volgende ochtend toen slechts enkele waarnemers hem terugvonden, waarna hij aan het einde van de ochtend verdween in oostelijke richting. Opmerkelijk genoeg werd hij op 15 en 16 april waargenomen op het Duitse Waddeneiland Wangerooge, Niedersachsen, en op 2 en 3 mei bij Skagen, Nordylland, Denemarken. Daarna is de vogel hoog naar het noordoosten weggevlogen, mogelijk naar Zweden. Vanaf 6 april (tot begin mei) verbleef een roepende **Dwerguil** *Glaucidium passerinum* bij Beekbergen, Gelderland, met mogelijk een tweede exemplaar nabij. **Hoppen** *Upupa epops* werden gemeld uit 53 uurhokken. De eerste werd op 27 maart in Brakel, Gelderland, gevonden. Bijzonder was de nachtelijke opname van een zingende op 25 april bij Deventer. De vroegste **Bijeneter** *Merops apiaster* ooit trok op 31 maart over Schijndel, Noord-Brabant. Bijna een maand later, op 27 april, werd pas de volgende waargenomen, op de noordpunt van Texel. Een vrouwtje **Roodpootvalk** *Falco vespertinus* op 28 april over telpost Hazewater bij Amersfoort, Utrecht, was de eerste van het jaar. Hierna volgden eveneens vrouwtjes op 29 april over Schiermonnikoog, Friesland, en het Bargerveen bij Klazienaveen, Drenthe.

BUIDELMEZEN TOT GRASZANGERS **Buidelmezen** *Remiz pendulinus* werden waargenomen in 23 uurhokken, voornamelijk in de oostelijke helft van het land. Een overvliegende **Kortteenleeuwerik** *Calandrella brachydactyla* werd gefotografeerd op 30 april bij Weurt, Gelderland. Later bleek hij toch te zijn geland en hij bleef tot de volgende dag. **Roodstuitzwaluwen** *Cecropis daurica* werden in de laatste week van april op verschillende plekken op Texel gezien, onder meer vanaf 24 april een langdurige pleisteraar in de Geul; andere werden gezien op 27 april in de Groene Jonker en op 28 april over tel-

323 Grijze Wouw / Black-winged Kite *Elanus caeruleus*, tweede-kalenderjaar, Braakman, Biervliet, Zeeland, 29 maart 2021 *(Luc Verroken)* **324** Grijze Wouw / Black-winged Kite *Elanus caeruleus*, Engbertsdijksvenen, Overijssel, 28 maart 2021 *(Toy Janssen)* **325** Havikarend / Bonelli's Eagle *Aquila fasciata*, derde-kalenderjaar, Zalk, Overijssel, 14 april 2021 *(Johan Roeland)* **326** Kortteenleeuwerik / Greater Short-toed Lark *Calandrella brachydactyla*, Weurt, Gelderland, 30 april 2021 *(Maurice Riekert)* **327** Roze Spreeuw / Rosy Starling *Pastor roseus*, tweede-kalenderjaar mannetje, Lemmer, Friesland, 18 april 2021 *(Enno B Ebels)* **328** Atlantische Provençaalse Grasmus / Atlantic Dartford Warbler *Sylvia undata dartfordiensis*, Coepelduynen, Noordwijk, Zuid-Holland, 19 maart 2021 *(Gijsbert Twigt)*

329 Dwerggors / Little Bunting *Emberiza pusilla*, Maastricht, Limburg, 31 maart 2021 *(Roy Beukers)* **330** Dwerggors / Little Bunting *Emberiza pusilla*, Terschelling, Friesland, 24 april 2021 *(Hans van Stijn)* **331** Iberische Tjiftjaf / Iberian Chiffchaff *Phylloscopus ibericus*, Noorderbos, Spaarndam, Noord-Holland, 28 april 2021 *(Arnoud B van den Berg)* **332** Iberische Tjiftjaf / Iberian Chiffchaff *Phylloscopus ibericus*, Strijensas, Zuid-Holland, 17 april 2021 *(Hans Tetteroo)* **333** Vermoedelijke hybride Bergfluiter x Fluiter / presumed hybrid Western Bonelli's x Wood Warbler *Phylloscopus bonelli x sibilatrix*, Vrouwenpolder, Zeeland, 23 april 2021 *(Toy Janssen)* **334** Humes Bladkoning / Hume's Warbler *Phylloscopus humei*, Geldermalsen, Gelderland, 2 april 2021 *(Albert Molenaar)*

335 Sardijnse Grasmus / Marmora's Warbler *Sylvia sarda*, adult mannetje, Julianadorp, Noord-Holland, 21 april 2021 *(Jan van der Laan)* **336** Izabeltapuit / Isabelline Wheatear *Oenanthe isabellina*, tweede-kalenderjaar, Kootwijkerzand, Gelderland, 28 april 2021 *(Dirk Goudkuil)* **337** Grauwe Gors / Corn Bunting *Emberiza calandra*, Aerdt, Gelderland, 3 maart 2021 *(David Spelt)*

338 Grijze Junco / Slate-coloured Junco *Junco hyemalis hyemalis*, adult mannetje, Koudum, Friesland, 27 april 2021 *(Thijs Glastra)*

339 Cassiar Junco / Cassiarjunco *Junco hyemalis cismontanus*, eerste-zomer mannetje, Stuifdijk, Maasvlakte, Zuid-Holland, 1 mei 2021 *(Co van der Wardt)*

post Lauwersmeer Kustweg. Een overwinterende **Bladkoning** *Phylloscopus inornatus* bij Voorburg, Zuid-Holland, was op 4 april aan het zingen toen hij voor het laatst werd gemeld. Er waren twee andere voorjaarswaarnemingen: op 25 maart bij Kiel Windeweer, Groningen, en op 25 april bij Ouddorp, Zuid-Holland. De **Humes Bladkoning** *P humei* van Geldermalsen, Gelderland, bleef tot 3 april. Op 23 april werd een vermoedelijke hybride **Bergfluiter** x **Fluiter** *P bonelli x sibilatrix* gevonden bij Vrouwenpolder, Zeeland. De vogel vertoonde in zowel uiterlijke als vocale kenmerken een combinatie van beide soorten. Op 1 mei werd hij geringd en werd DNA-materiaal verzameld. Er waren nog veel meldingen van **Siberische Tjiftjaffen** *P tristis* maar slechts drie bleven lang genoeg om te worden gedocumenteerd. Succesvolle overwinteraars waren er in Groningen, Groningen; in Waddinxveen, Zuid-Holland; en in Itteren, Limburg. De langst verblijvende was die bij Itteren, tot 6 april. Er zongen twee **Iberische Tjiftjaffen** *P ibericus*, van 17 april bij Strijensas, Zuid-Holland, en vanaf 26 april bij Spaarndam, Noord-Holland, beide tot in mei. Bovendien zong op 27 april een goede kandidaat ongezien bij Hellendoorn, Overijssel. Van een mogelijke eerste ringvangst ooit op 24 april op VRS Honswijkerwaard bij Houten, Utrecht, is geen DNA-materiaal verzameld. Op 21 april kwam een melding van een mogelijke Provençaalse Grasmus *Sylvia undata* in de duinen net ten noorden van Julianadorp. Aan het begin van de middag werd de vogel teruggevonden en bleek het te gaan om een **Sardijnse Grasmus** *S sarda*, een nieuwe soort voor Nederland! Na een paar uren zoeken werd hij teruggevonden in een haag van camping Hoeve Ons Lust tegen de duinrand aan, waar hij de rest van de dag vanaf de openbare weg kon worden bekeken. Een 'echte' **Provençaalse Grasmus** werd op 19 maart waargenomen in de Coepelduynen bij Noordwijk; het betrof de Atlantische ondersoort *S u dartfordiensis*. Indien aanvaard is dit het 15e geval, waarvan (ten minste) zes betrekking hebben op deze ondersoort (de andere zijn niet op ondersoort gedetermineerd). **Graszangers** *Cisticola juncidis* werden, zoals vaak, alleen gemeld uit Zeeland. Naast de bekende plekken in het Verdronken Land van Saeftinghe en bij Nieuwvliet-Bad werd ook een vogel waargenomen bij Breskens, van 26 tot 28 april.

SPREEUWEN TOT GORZEN Een tweede-kalenderjaar mannetje **Roze Spreeuw** *Pastor roseus* werd waargenomen van 17 tot 20 april in Lemmer, Friesland. De vogel was regelmatig aan het zingen. De **Zwartbuikwaterspreeuw** *Cinclus cinclus cinclus* uit de vorige periode bij Staverden, Gelderland, werd op 23 maart nog gemeld. Verder werd op 14 maart een andere gezien bij De Horst, Gelderland. **Roodbuikwaterspreeuwen** *C c aquaticus* werden opgemerkt op 13 en 17 maart in Valkenburg, Limburg, en op 21 april in het Geuldal, Limburg. Het vrouwtje **Zwartkeellijster** *Turdus atrogularis* van Utrecht, Utrecht, werd op 13 april voor de laatste keer gemeld. De vroegst gedocumenteerde **Nachtegaal** *Luscinia megarhynchos* ooit werd waargenomen op 29 maart in het Westduinpark bij Den Haag, Zuid-Holland. Een **Izabeltapuit** *Oenanthe isabellina* werd op 28 april gefotografeerd bij Radio Kootwijk, Gelderland, maar werd pas later bekend; dit betekende het eerste voorjaarsgeval. In de avond van 30 april werd een vrouwtje **Citroenkwikstaart** *Motacilla citreola* kort gezien op het Westerse Veld op Vlieland, Friesland. Op 27 april trokken **Grote Piepers** *Anthus richardi* over telpost Breskens en over Hellendoorn. Op 30 april was een exemplaar ter plaatse bij Harpel, Groningen. Uit 17 uurhokken kwamen waarnemingen van **Duinpiepers** *A campestris,* vooral in het zuidoosten. De eerste **Roodkeelpieper** *A cervinus* van het jaar werd op 12 april gevonden op de kwelder van Schiermonnikoog en bleef daar tot 25 april. Een andere pleisteraar bevond zich, als 'bijvangst' van de Kortteenleeuwerik, in het Grote Grindgat bij Weurt. Daarnaast waren er vijf meldingen van overvliegers. Het was een goede periode voor **Europese Kanarie** *Serinus serinus*, gelet op de meldingen uit 82 uurhokken verspreid over het land. In 24 uurhokken werden zingende exemplaren gemeld, ook in het westen, en op telposten werden 42 trekkers genoteerd. Op 26 april werd een mannetje **Grijze Junco** *Junco hyemalis* gevonden in Koudum, Friesland; een dag later werd het nieuws bekend gemaakt en kon hij de gehele middag worden bewonderd (soms zingend) maar hij was de volgende dag al weer verdwenen. Opvallend genoeg werd op 1 mei nóg een exemplaar gevonden, ditmaal op de Maasvlakte, Zuid-Holland. Deze vertoonde kenmerken van een niet eerder in de WP vastgestelde westelijke ondersoort, Cassiarjunco *J h cismontanus*; hij werd in de middag al niet meer gezien. Indien aanvaard zijn dit het vierde en vijfde geval. **Grauwe Gorzen** *Emberiza calandra* werden waargenomen in 24 uurhokken, waarbij de 21 op 6 maart bij Doenrade, Limburg, het hoogste aantal betrof. In totaal 11 werden op telposten waargenomen. Er werden slechts drie **Ortolanen** *E hortulana* gezien: op 24 april op telpost IJmuiden aan Zee; op 28 april op telpost Eemshaven; en op 30 april in de Bolwerksweiden bij Deventer. De twee **Dwerggorzen** *E pusilla* vanaf 17 november bij Maastricht, Limburg, werden voor het laatst gemeld op 17 april. Daarnaast was er een langdurig verblijvend exemplaar van 2 tot 23 april op de Lage Veluwe bij Doorwerth, Gelderland. Overige waarnemingen werden gedaan op 4 april ten zuiden van Den Haag; op 17 april over telpost Twaalfmorgen bij Reeuwijk, Zuid-Holland; op 20 april in de Trintelhaven op de Houtribdijk, Flevoland; en op 24 april bij Oosterend op Terschelling.

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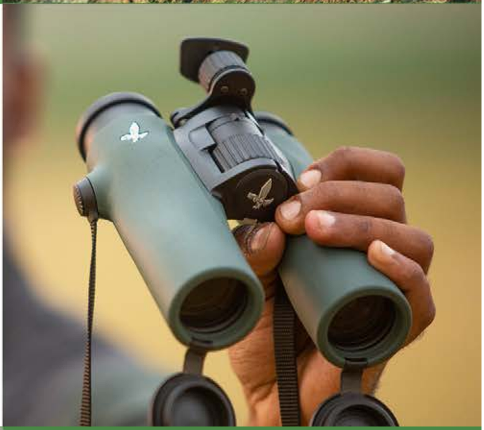

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