Identification of extralimital Siberian and Amur Stonechats

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Abstract Both Siberian Saxicola maurus and Amur (Stejneger's) Stonechat S. stejnegeri have been shown to be rare but apparently regular vagrants to western Europe. However, the separation of the species pair has proved tricky, with the identification of most birds being proved by genetic analysis rather than in the field. Research for the Swedish Rarities Committee showed that, although there is overlap between the two species, many birds can be safely identified using a combination of overall appearance and the colour and pattern of the rump and uppertail-coverts. In this paper, we present evidence to show that individuals outside the overlap zone in plumage characteristics between the two species can be safely identified as vagrants in the field. These results allowed the Swedish Rarities Committee to accept a number of records of 'Eastern Stonechats' as either Siberian Stonechat or Amur Stonechat, and it is our belief that the information presented here can be used to assess other records of vagrant 'Eastern Stonechats' for which genetic material is not available.

Introduction

The former 'Common Stonechat' is today recognised by IOC as five distinct species (Gill et al. 2022). Of these, the European Stonechat Saxicola rubicola is a common breeder and winterer across much of Europe, while the Siberian Stonechat S. maurus, from western Siberia, and the Amur (Stejneger's) Stonechat S. stejnegeri, from eastern Siberia, are recorded as rare vagrants to western Europe. Recent advances in identification and, especially, the increased use of genetic analysis have shown that Amur Stonechat may be a more regular visitor in Europe than previously thought, despite its more easterly range. Nonetheless, difficulties in the separation of the two species have clouded much of our understanding of their respective patterns of occurrence. Average differences between the species have been described (e.g. Vaurie 1959, Dement'ev & Gladkov 1968, Cramp 1988, Urquhart 2002), but the lack of a firm understanding of the variation in the two taxa has hampered the use of these features in the field. Consequently, many vagrant birds for which a genetic sample has not been taken are accepted only as 'Eastern Stonechat' (i.e. 'Siberian or Amur').

Based on data originally published in Hellström & Waern (2021), in association with a review carried out by the Swedish Rarities Committee, we show that some, though not all, vagrant Eastern Stonechats can be safely identified in the field using the coloration and pattern of the rump and uppertail-coverts in combination with the overall appearance of the plumage. In the Swedish Rarities Committee reassessment of Eastern Stonechats, just under 20% of all historical records with photographs were assigned to species. However, in many cases, documentation was not sufficient to draw a conclusion, and there was a clear bias towards acceptance of more-recent records, where numerous high-quality digital photos were available, and it is likely that a higher proportion of future records will prove to be acceptable using the criteria presented here.

The complexities and difficulties surrounding the identification and record assessment of vagrant Siberian and Amur Stonechats was summarised in Stoddart & Collinson (2019). In short, these include a lack of detailed understanding concerning hybridisation between the taxa; the fact that features suggested to separate the two species are generally described as average differences only; and that interpretation of plumage hues from photographic evidence is frequently problematic.

We agree that such caveats need to be considered. However, both species have large populations across extensive breeding ranges and, although their ranges are reported to meet (approximately) along the full length of rivers Yenisey/Angara, and intermediate birds are reported from this area (Vaurie 1959; Stepanyan 1990), there is nothing in published literature to imply

that any zone of hybridisation is extensive. On current knowledge, it seems fair to assume that the likelihood of hybrids turning up in western Europe is low compared to pure birds. Additionally, our studies confirm that, although plumage variation in the two species does overlap, the overlap is not complete and there are more than simply average differences between the two species. The plumage of a substantial proportion of birds falls outside the variation of the other species and, consequently, they can be identified as Siberian or Amur Stonechat with a high degree of certainty. Finally, we agree that goodquality photographs are a necessity when assessing plumage tones, preferably many images from different angles and in different lighting conditions. Any photo where the colour balance appears incorrect should be removed from any assessment.



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20 & 21. Typical first-winter (ICY) male Siberian Stonechat *Saxicola maurus*, Kazakhstan, September 2019 (top), and Amur Stonechat *S. stejnegeri*, Beidaihe, China, October 2013 (bottom). Note the overall warmer and darker coloration of the Amur Stonechat.

Methods

The presented model is based on field studies of stonechats over large parts of Europe, the Middle East, Russia, Kazakhstan, Mongolia and China, as well as examination of specimens in the collections at the Zoological Museum in Copenhagen and the Natural History Museum in Stockholm. Additionally, we have studied several large sets of photographs, including a significant series of images of stejnegeri from Beidaihe, China; of Siberian Stonechat, primarily hemprichii, from Aras, Turkey; and of maurus from southern Kazakhstan. In total, photographs of over 350 birds in the hand were examined. Separating female hemprichii from maurus is not possible for most individuals and we have therefore pooled the results for all Siberian Stonechats, regardless of subspecies. For consistency, males are treated the same, despite their unique tail pattern (see General identification, below). Ageing and sexing of birds was done according to criteria presented in Norevik et al. (2020).

General identification

Male Siberian Stonechats are generally pale and contrasting, often appearing notably black and white. The size of the rump patch varies but is often larger than in Amur Stonechat. In many birds, white feathering reaches up to the lower mantle; seen from behind this creates a large white oval with a dorsal length that exceeds the length of the visible black tail. Others show a more restricted distribution of white, no different from average Amur Stonechats. The coloration of the rump varies from pale rust (autumn) to white (spring) depending largely on state of wear, but to some extent also on individual variation. The uppertail-coverts are white with variably broad and variably rusty tips while fresh. They typically lack any dark streaking, but sometimes diffuse grey markings are present along the shaft.

In the Caspian region, many male 'Caspian Stonechats' *S. m. hemprichii* and 'Armenian Stonechats' *variegatus* show extensive white in the tail and are therefore rather

easy to differentiate from all other relevant taxa, including Amur Stonechat. However, the white in the tail of some individuals – notably *variegatus* – may be difficult or even impossible to see in the field and will thus be of no help in the identification process.

In spring, male Siberian Stonechats typically show large white neck-patches (plates 22–24). In the most extreme birds, they may seem to reach all the way around the hindneck (as in Collared Flycatcher Ficedula albicollis) but they are always separated by at least a narrow bridge of speckled black and white down the nape. In other birds, the white pattern is less extensive, leaving a wide black bridge on the nape. The height of the white neck-side patches may sometimes also be notable, but this is much affected by any tilting of the head. The colour of the breast in spring varies a lot but is often rather pale orange to peach, with the colour variable in its extent. It is often restricted to the upper-breast, extending diffusely onto the flanks and belly.







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22–24. Male Siberian Stonechats in spring. Adult (3CY+), Altai, Russia, June 2017 (top left), showing an extensive white rump that is greater in length than the length of the exposed tail and with a clearly extensive white neck-patch; first-summer (2CY), Sayan Mountains, Russia, June 2013 (bottom left), showing extensive white neck-sides, leaving only a narrow, broken bridge running down the nape; adult (3CY+), Altai, Russia, June 2007 (right), with a wider and more solid black bridge running down the nape.







Marcus Danielsson

25-27. Male Amur Stonechats, Beidaihe, China, May 2021. First-summer (2CY) (left), a heavily worn bird with a number of extensive dark markings to the longest uppertail-coverts; adult (3CY+) (centre), a less-worn bird, still retaining some coloration on the uppertail-coverts; adult (3CY+) (right), with the largest white rump of any male Amur Stonechat in our sample, though still smaller than that of most Siberian Stonechats. All three birds show a broad, solid bridge between the white neck-patches, broader than in most Siberian Stonechats.





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28 & 29. Female Siberian Stonechat, Aras, Turkey, April 2021 (left), and female Amur Stonechat, Beidaihe, China, May 2011 (right). The Siberian Stonechat shows paler upperparts than the Amur Stonechat, a colder-toned rump and white uppertail-coverts. White uppertail-coverts appear to be rare in female Amur Stonechat, typically developing only as a consequence of wear and bleaching by the breeding season.



30. Female Siberian Stonechat in fresh autumn plumage, Kazakhstan, September 2012. The evening light in this photo has enhanced the warmer hues on the bird and makes it look rather dark. However, it is nonetheless relatively uniform overall without the contrasting plumage seen in most female Amur Stonechats. The uppertail-coverts, other than the warmer patch in the centre of each feather, are rather sandy-coloured.

Male Amur Stonechats are generally somewhat darker with more restricted white in the plumage than Siberian Stonechats and may, therefore, tend more towards European Stonechat in appearance. The size of the rump patch is typically rather restricted (often appearing squareshaped) and does not reach up to the lower mantle. The coloration of the rump varies from deep rust (autumn) to white (spring) depending largely on state of wear, but to some extent also on individual variation. The uppertail-coverts are white with broad rusty tips when fresh (on average a darker rust colour than in

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31 & 32. First-winter (ICY) female Siberian Stonechat, Aras, Turkey, October 2021 (left), and first-winter (ICY) female Amur Stonechat, Beidaihe, China, September 2013 (right). Both birds are typical, with Siberian Stonechat being paler, sandy-coloured and rather uniform overall, while, in comparison, the Amur Stonechat is darker on the upperparts, darker and warmer on the rump and warmer on the underparts. This adds up to an overall darker and more contrasting appearance, often enhanced by a tendency to show a slightly whiter throat.

Siberian Stonechat). In autumn birds in northeast China, 44% lacked any dark pattern, 21% showed diffuse grey shaft streaks and 35% showed a distinct black pattern (wide enough to include the vane) to at least one uppertailcovert (Hellström & Norevik 2013). The bill is on average slightly broader than in other stonechat taxa, and so some birds can appear rather thick-billed as well.

Male Amur Stonechats in spring typically show a white neck-patch that is more limited (both in length and in height) than in Siberian Stonechat, leaving a wide black bridge on the hindneck. Narrower dark bridges are only occasionally seen. The orange colour of the breast in spring varies a lot but is often slightly darker than in Siberian Stonechat. The distribution of orange is also variable but on average slightly more extensive, including the flanks and belly.

Female Siberian Stonechats are, on average, slightly paler and colder-toned than Amur Stonechats, with a tendency to show white in the rump. In fresh autumn plumage, the overall appearance is pale and rather cold sandycoloured, with little contrast between the upperand underparts. Birds can sometimes resemble a female Desert Wheatear Oenanthe deserti.

The size of the rump patch varies but is generally more restricted than in males. The coloration of the rump varies from warm sandy-brown (autumn) to white (spring), largely depending on degree of plumage wear







Voel Hohenthal (centre), BBRC (right)

33-35. Three male Siberian Stonechats in autumn. The rump colour of a safely identifiable male Siberian Stonechat should be pale and cold, close to neutral sandy brown, as in the left-hand bird (Kazakhstan, September 2019) and the centre bird ('Caspian Stonechat' S. m. hemprichii, Aras, Turkey, October 2021). Some birds show a warmer, reddish hue to the uppertail-coverts, as in the righthand bird (Kazakhstan, September 2019), and these individuals will prove difficult to separate from paler Amur Stonechats in the field. Such birds are best left unidentified based on current knowledge.





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36 & 37. Two male Amur Stonechats in autumn. The left-hand bird (Beidaihe, China, September 2013) is a classic example of a safely identifiable Amur Stonechat, with warm, reddish-toned uppertail-coverts with distinct, dark markings on the two longest coverts. The right-hand bird (Beidaihe, China, September 2013) shows similarly warm, reddish-toned uppertail-coverts but lacks any dark markings; the majority of such birds should, in our opinion, be considered as not safely identifiable in a vagrancy context at present.

BBRC (left), Noel Hohenthal (centre)

Gabriel Norevik







38-40. Three female Siberian Stonechats in autumn. In order to be safely identifiable, the overall colour of the rump should be pale and cold, with neutral sandy hues, as shown by the left-hand bird (Kazakhstan, September 2019). However, many females, such as the central bird (Aras, Turkey, October 2019), show a warmer blotch at the centre of some feathers. Such birds are still safely identifiable. However, birds such as the right-hand bird (Kazakhstan, September 2019), which have a more uniformly warm-toned coloration to the uppertail-coverts, are difficult to separate from paler female Amur Stonechats in the field. Such birds are best left unidentified based on current knowledge.





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41 & 42. Two female Amur Stonechats in autumn. The left-hand bird (Beidaihe, China, September 2012) shows distinct, dark markings to at least one of the uppertail-coverts and would be safely identifiable as an Amur Stonechat in a vagrancy context. The right-hand bird (Beidaihe, China, September 2013) lacks any dark markings; the majority of such birds should, in our opinion, be considered as not safely identifiable in a vagrancy context at present.

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and, to some extent, also on individual variation. The uppertail-coverts are white at the base with, when fresh, diffuse sandy-coloured tips (often with a variably warm centre to individual feathers). The uppertail-coverts lack any distinct, dark streaking but can rarely show an ill-defined grey mark along the shaft.

Female Amur Stonechats are generally more contrasting, darker and warmer-toned overall than female Siberian Stonechats, especially on the rump. Consequently, they may approach European Stonechat in their appearance. The rump patch is restricted, often appearing rather square-shaped. The coloration of the rump is rather dark, varying from cinnamon-brown to (rarely) warm sandy-coloured, with only a few developing a white rump by late spring (in contrast to female Siberian Stonechats, which frequently show a white rump in spring). The uppertail-coverts are

rusty brown to (rarely) warm sandy brown, occasionally whiter at the feather bases. From research in northeast China in autumn, it was found that 40% of female Amur Stonechats lacked any dark markings, 34% showed diffuse grey shaft streaks and 26% showed at least one feather with distinct, black streaks (wide enough to at least encompass the vane of the feather) (Hellström & Norevik 2013). In fresh autumn plumage, the overall coloration is rather dark and often warm-toned. The contrast between (slightly darker) upperparts and (richer and warmer) underparts is usually more striking than in Siberian Stonechat. Birds often show a whitish throat, which adds to the overall rather contrasting appearance between the upper- and underparts. As in males, the bill is on average slightly broader than in other stonechat taxa, and some birds can appear rather thick-billed.



43–46. Siberian and Amur Stonechats in autumn showing typically coloured rumps and uppertail-coverts. Male Siberian Stonechat, Kazakhstan, September 2019 (top left) and female Siberian Stonechat, Kazakhstan, September 2019 (top right); male Amur Stonechat, Beidaihe, China, September 2013 (centre right) and female Amur Stonechat, Beidaihe, China, September 2013 (bottom right).







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Discussion

Safe separation between Amur and Siberian Stonechat (apart from *hemprichii* and *variegatus* males that show visible white in the tail) is not easy, although the level of similarity between the two species varies between seasons and the sexes. The fact that Siberian Stonechats are generally paler, and Amur are generally darker, needs to be translated into

something of practical use in the field, which also takes into account variation caused by, for example, different lighting. Given the extensive plumage variation and the difficulties of assessing plumage hues from photographs, this will inevitably lead to a portion of birds with intermediate plumage and/or birds for which photographic material is insufficient for evaluation.



47–50. Siberian and Amur Stonechats in autumn showing the extremes of variation in rump and uppertail-covert colour. Male Siberian Stonechat, Aras, Turkey, October 2021 (top left) and female Siberian Stonechat, Aras, Turkey, October 2021 (right), the darkest male and female Siberian Stonechats in our study; male Amur Stonechat, Beidaihe, China, September 2013 (bottom left) and female Amur Stonechat, Beidaihe, China, October 2013 (bottom right), the palest male and female Amur Stonechats in our study.

We performed a photographic review of >400 autumn birds of both species, including both birds in the hand and birds in the field. For autumn birds, we conclude that the colour of the fresh rump/uppertail-coverts showed comparatively less variation than other parts of the plumage, and using this as a primary sorting key proved successful to a degree that is meaningful. As a general rule, the rump of Siberian Stonechat is paler and colder (less rusty) than the darker and warmer (more reddish) rump of Amur. Although some darker-rumped Siberian Stonechats were inseparable from paler-rumped Amur Stonechats, the overlap is far from complete. When assessed using the colour of the rump only, 15% of 34 male Siberian Stonechats and 35% of 148 male Amur Stonechats lay outside the overlap zone. In females, this figure was 65% of 53 Siberian and 60% of 108 Amur. This assessment did not take into account the presence (or not) of distinct, dark markings on the uppertail-coverts.

In our opinion, the colour and pattern of the rump and uppertail-coverts is central to the separation of the two species. However, because of the existing overlap between the two, and the problems in establishing the true colours from photographs in various light conditions, it is necessary to make allowance for misinterpretations. We suggest that this is done in two steps: first, a 'buffer zone' needs to be added, meaning that only birds safely away from the overlap zone, at the extreme ends of variation, are considered safely identifiable (fig. 1). Secondly, the assessment of the rump should also be matched to the birds' overall appearance, as described above and, if mismatches occur, the bird should be left unidentified.

In both adult (2CY+) and first-winter (1CY) male Siberian Stonechats in autumn, the basic coloration varies considerably and only the palest birds can be considered safely identifiable. These show an overall pale and cold plumage, with the rump and the tips to the uppertail-coverts close to neutral sandy-coloured (at most with a weak warm hue). On the other hand, safely identifiable male Amur Stonechats show an overall dark and warm plumage with a combination of distinct, rust-red tips to the uppertail-coverts and rump and distinct, dark streaking on at least one of the uppertail-coverts.

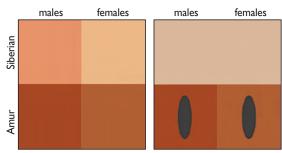


Fig. 1. Uppertail-covert colour in Siberian Saxicola maurus and Amur Stonechats S. stejnegeri in fresh autumn plumage. Left: mean colour values based on colour samples taken from photographs. Right: Suggested coloration for identification. This takes into account overlap in coloration between the two species, as well as adding a 'buffer zone' to take account of interpretation of colour. A safely identifiable Siberian Stonechat should show a close-to-neutral sandy ground colour to the uppertail-coverts (though the presence of some blotchy, warm-toned feather centres is not a problem), while a safely identifiable Amur Stonechat should show a ground colour that is at least as warm as shown here and a distinct, dark streak to at least one uppertail-covert.

Safely identifiable female (or unsexed first-winter) Siberian Stonechats show an overall pale and cold sandy-coloured plumage. The rump and uppertail-coverts are pale and cold, from close-to-neutral sandy-coloured to white (at most with some blotchy, warmer centres to individual feathers). Safely identifiable female Amur Stonechats have an overall darker and warmer plumage, with a warm, dark rusty-brown rump and distinct, dark streaking on at least one uppertail-covert.

In spring males, the unique part of the plumage variation is rather one-sided, meaning that only the palest (most white) Siberian Stonechats sit outside of the overlap zone between the two species. In order to be safely identifiable in a vagrancy context, spring males should show a combination of an extensive white rump, which reaches up the lower mantle (seen from behind, the height of the white rump – including the uppertail-coverts - should exceed the length of the visible tail) and extensive white neck-sides, with only a narrow, broken dark bridge running down the nape. Identification of Amur Stonechat is more problematic, since the more restricted white shown by this species overlaps with many Siberian Stonechats. In spring, only

Amur Stonechats showing distinct dark streaking to the uppertail-coverts in combination with otherwise typical plumage could theoretically be safely identified.

Given current knowledge, it is doubtful that any vagrant female Siberian or Amur Stonechat could be considered safely identifi-



51. First-winter (ICY) male Siberian Stonechat, Suffolk, December 2019. The bird is rather cold-toned overall and, although the rump and uppertail-coverts show some warmer tones to the feather tips, this bird would be safely identifiable using the criteria presented in this paper. The identification of this bird as a Siberian Stonechat was

supported by a genetic analysis.

able in spring. Any such bird would need to show either an extremely extensive and pure white rump (Siberian) or a restricted warm brown rump with distinct, dark streaking on the uppertail-coverts (Amur), both in combination with otherwise typical plumage. The exception is some female Caspian Stonechats, where pale buff panels may be visible at the base of the tail feathers.

Although we believe that a full set of criteria, including distinct streaking on the uppertail-coverts, is required for the safe identification of most vagrant Amur Stonechats, some autumn individuals show such dark and saturated plumage, including a warm and richly coloured rump, that the risk of misidentification seems negligible, regardless of the presence of dark markings on the uppertail-coverts. We suggest that such birds, if sufficiently documented, may warrant exception from the requirement to show distinct, dark streaks on the uppertail-coverts. Two such birds are shown in plates 57–59. Acceptance of such birds will allow for a somewhat larger portion of the most typical and otherwise unproblematic individuals to be identified with confidence.

Finally, our research found evidence of only one apparent Siberian Stonechat with any distinct streaking on the uppertail-coverts: a first-winter male, ringed in Finland in October 2015 (plates 60 & 61).



Hugh Harrop

52. Female Siberian Stonechat, Shetland, November 2017. This bird is pale with a uniform cold, sandy appearance, including the rump and uppertail-coverts. This bird would be safely identifiable using the criteria presented in this paper. The identification of this bird as a Siberian Stonechat was supported by a genetic analysis.



53. First-winter (ICY) male Amur Stonechat, Espoo, Finland, October 2018. The overall plumage is warm-toned and relatively dark, while one uppertail-covert shows distinct, dark markings. This bird would be safely identifiable using the criteria presented in this paper. The identification of this bird as an Amur Stonechat was supported by a genetic analysis.



54. Adult (3CY+) male Siberian Stonechat, Gotland, Sweden, May 2015. The combination of a large, white rump (the length of which exceeds the length of the visible tail) and the narrow, broken bridge running down the nape, allowed the Swedish Rarities Committee to accept this bird as a Siberian Stonechat.





55 & 56. First-winter (ICY) male Siberian Stonechat, Utsira, Norway, September 2020. This bird is overall rather warm-toned, with the apparent colour of the uppertail-coverts differing between the two images. This bird would not be safely identifiable using the criteria presented in this paper. However, the identification of this bird as a Siberian Stonechat was supported by a genetic analysis.





57 & 58. First-winter (ICY) female Amur Stonechat, Kabli, Estonia, September 2021. A warm, dark and overall contrasting bird with a warm breast, rather whitish throat and a rusty-brown rump, strongly suggesting Amur Stonechat. The rather extreme plumage of this bird makes the risk of misidentification as Siberian Stonechat negligible. For such birds, we suggest a possible exception from the requirement for the uppertail-coverts to show distinct, dark streaks in order to be safely identified as Amur Stonechat. The identification of this bird as an Amur Stonechat was proven by genetic analysis.

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Maria Triantafyllidou

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59. First-winter (ICY) male Amur Stonechat, Norrbotten, Sweden, September 2015. This bird shows a combination of overall warm-toned plumage and contrasting dark, rust-red tips to the uppertail-coverts, all of which suggests that the bird is an Amur Stonechat. Similar to the female in plates 57 & 58, we suggest that such extreme birds can be safely identified as Amur, despite the fact that the uppertail-coverts lack distinct, dark streaking.





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60 & 61. First-winter (ICY) male apparent Siberian Stonechat, Finland, October 2015. An odd and rather confusing bird, with a genetic analysis showing the bird's mtDNA matched Siberian Stonechat (Aleksi Lehikoinen and Martin Stervander pers. comms.). This bird shows a narrow but distinct black streak on an uppertail-covert, at odds with the identification as Siberian Stonechat. However, the overall rather pale and cold plumage is closer to Siberian than Amur, though this would be the only Siberian with such a streak known to us. Since mtDNA gives only the maternal lineage, we consider this bird is best treated as an outlier until researched further.

Next steps

Applying the criteria presented in this paper will result in a situation where the most typical birds at the extremes of variation within the two species will be safely identifiable as either Siberian or Amur Stonechat, even without genetic support. There will, however, continue to be individuals that fall within the overlap zone between the two species or are not documented sufficiently to be identified as either species.

It should be noted that the degree of overlap between Siberian and Amur Stonechat is larger in males than in females and adoption of the criteria presented here will inevitably result in an over-representation of females that are identified to species.

In our view, the criteria presented in this paper are merely a first step into the field identification of vagrant stonechats. It is likely that refinement of the criteria will evolve over time as our collective experience grows and

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knowledge accumulates, such as a greater confidence in accepting Amur Stonechats that lack dark uppertail-covert streaking. Although we agree that interpretation of photographic evidence is sometimes problematic, comparable assessment is standard for some other difficult taxa as well, such as Daurian Lanius isabellinus and Turkestan Shrikes L. phoenicuroides and female Pied O. pleschanka and Eastern Black-eared Wheatears O. melanoleuca. It is our firm belief that most observers are familiar with this issue and that they know how to handle such cases in order to reach considered conclusions.

The choice to continue to identify birds as 'Eastern Stonechat' has consequences in the long run: we will lose important data on these birds' occurrences and life histories. And, since our data imply that there is no overlap in the extreme plumages of these species, we believe it is neither constructive, nor defensible, to maintain the moratorium on acceptance of birds that lack genetic evidence that many European rarities committees apply today.

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