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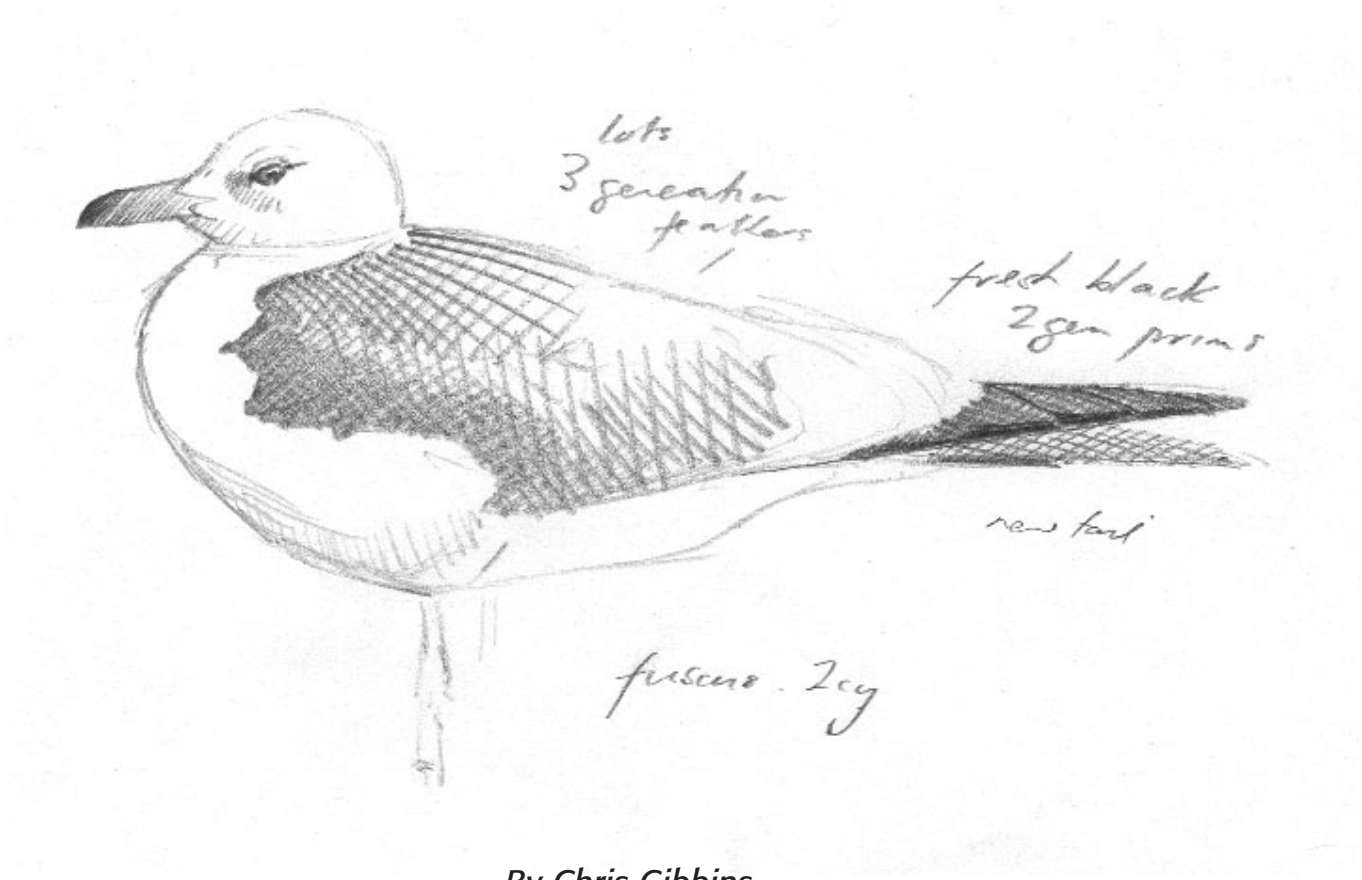


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# Is it possible to identify Baltic and Heuglin's Gulls?

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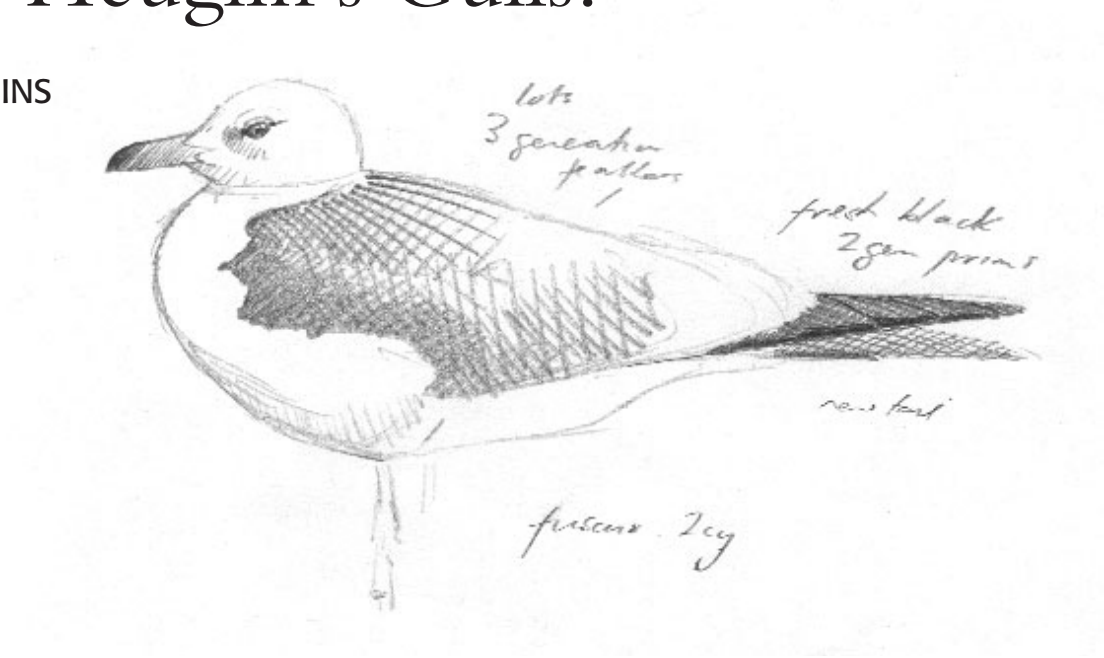

**Abstract**

In 1998 Lars Jonsson wrote a groundbreaking paper on the identification of Baltic Gull *Larus fuscus fuscus*. The paper was important because it presented new identification criteria for the separation of *fuscus* from *graellsii* and *intermedius* Lesser Black-backed Gulls. Around the same time, Visa Rauste produced a similarly important paper dealing with the separation of Baltic Gull from Heuglin's Gull *L.* (*f.*) *heuglini* (Rauste, 1999). A novel and significant aspect of these papers was that they used moult to help support identification. Other notable contributions to the identification of these gulls were made by Eskelin and Pursiainen (1998) and Gruber (1999).

Here I provide an update on the identification debate surrounding *fuscus* and *heuglini*. The paper is based on field studies of these taxa in Europe and the Middle-East and includes a review of recent ideas that have developed from research being undertaken by other gull enthusiasts, much of which is not yet formally published. The principal aim is to review progress made since the work published in the late 1990s.

## Introduction: a history of views on the taxonomy and identification of *fuscus* and *heuglini*

Baltic Gull *Larus fuscus fuscus* (hereafter *fuscus*) is the nominate form of Lesser Black-backed Gull. It was once thought to be regular visitor to the UK. For example, Buckland *et al.* (1990) listed 17 *fuscus* records in North-East Scotland between 1975 and 1984, including a pair frequenting a rooftop breeding colony in Aberdeen throughout the summer of 1982. At this time, any small, black or blackish-backed bird with only one primary mirror was considered to

be a *fuscus*. However, Jonsson (1998a) demonstrated that both the plumage and structure of *fuscus* overlap with *intermedius* Lesser Black-backed Gull, a form that occurs regularly in the UK. Thus, Jonsson's paper suddenly cast doubt on the identification and status of *fuscus* in the UK. Buckingham (1998) also questioned the credibility of many British *fuscus* records, suggesting that descriptions point strongly to birds having been *intermedius*.

Jonsson's paper was significant because it also presented new criteria for the identification of adult and immature *fuscus*. Effectively it marked a reset point, with previous records shelved and a requirement to identify future candidates using strict new criteria, including moult. At the present time this strictness is important because *fuscus* has suffered marked declines across its breeding range[1] and so is likely to be a much less frequent visitor to the UK than perhaps it once was. Based on Jonsson's criteria, candidate *fuscus* have been seen in several countries bordering the North Sea, including birds photographed in the Netherlands (www.illustrated-db-discography.nl/vogels/fuscus2c.html) and Cambridgeshire (*Birding World* 17 (5), p. 180). Most recently, a ringed *fuscus* (ring code CXVA) was seen at Westkapella in the Netherlands on 16th October 2004.

Because of differences in plumage and particularly its moult and migration strategies, the Dutch committee for avian systematics (CSNA) accorded *fuscus* species status (Sangster *et. al.*, 1998). However, more recent studies have demonstrated that there is significant gene flow between *fuscus*, *graellsii* and *intermedius* (Liebers and Helbig, 2002; Liebers *et al.*, 2004). Consequently, the rather hasty CSNA decision to split *fuscus* has now been reversed (Sangster *et al.*, 2003).

Heuglin's Gull *L.* (*fuscus*) *heuglini* is something of an enigma. It breeds in Arctic Russia, typically in rather low densities in open tundra habitat with bogs and marine islands. The most westerly known breeding areas are around the White Sea, although the possibility exists that birds may be breeding in Finland (see Summary and Discussion section). Few European ornithologists have experience of *heuglini* on its breeding grounds and it is clear that considerable uncertainty exists among UK birders concerning its identification, nomenclature and taxonomy. It is often called Siberian Gull, although to help avoid confusion with other Siberian taxa, Buzun (2002) suggested that the name West Siberian Gull should be adopted. It is also sometimes called Tundra Gull (e.g. Luoto *et al.*, 2002), reflecting habitat use on the breeding grounds. Traditionally it has been seen as comprising two forms: *heuglini* in the western part of its range and *taimyrensis* in the east. Genetic studies have shown that Heuglin's Gull is very closely related to the Lesser Black-backed Gull taxa (Liebers *et al.*, 2001; Liebers and Helbig, 2002; Liebers *et al.*, 2004). At the moment it is not entirely clear whether it should be classified as yet another subspecies of Lesser Black-backed Gull (i.e. as *L.f. heuglini*) or accorded species status (i.e. *L. heuglini*). While genetically it is more worthy of species status than *fuscus*, Liebers and Helbig (2002) argue that it is very much a borderline case and, for

1 Most recently this trend has been halted. Surveys in summer 2003 suggested that the Finnish population has remained stable over the last few years at around 8400 pairs (BirdLife Finland, 2004).

the moment, is perhaps best treated as a form of Lesser Black-backed Gull. Conversely, Yèsou (2002) suggests it should be treated as a full species. *Heuglini* is treated as a full species in the recent Helm gulls monograph (Malling Olsen and Larsson, 2003).

In his rather confusing paper, Buzun (2002) argued that the type specimen of Heuglin's Gull (i.e. the nominate *L. h. heuglini*) is in fact a *taimyrensis*. By convention, this means that the *taimyrensis* population should become the nominate form of what Buzun called West Siberian Gull (i.e. *L. h. taimyrensis* becomes *L. h. heuglini*). The western birds would therefore need a new subspecific name, for which Buzun suggested *L. h. antelius*. However, Yèsou (2002) put forward a number of persuasive arguments as to why *taimyrensis* as a form has no taxonomic validity (this is discussed in detail later). If Yèsou's arguments are correct, Buzun's re-identification and re-naming are irrelevant, as Heuglin's Gull simply comprises one form – *heuglini* from west of the Taimyr Peninsula.

The taxonomy of *heuglini* certainly seems complicated and confused, but what about its identification? On geographic grounds, anyone encountering birds with mid to dark grey upperparts in the Middle-East (birds paler than the *fuscus* but slightly darker than the *barabensis* that also winter in the region) can be reasonably confident with their identification as *heuglini*. However, the upperpart tone of *heuglini* overlaps with *graellsii* and *intermedius* (Figure 1). The separation of *heuglini* from *graellsii* and *intermedius* may initially seem an irrelevant problem for birders looking at gulls in Scotland, but birds thought to be *heuglini* are now being recorded regularly and in good numbers in Finland, further west than it was once thought to occur.

The status of *heuglini* in Finland and the fact that it is a long distance migrant suggest that this taxon is a potential vagrant the UK. Indeed it is not inconceivable that, like Caspian Gull *L. cachinnans*, it has been overlooked in the past and actually occurs regularly in the UK. Thus, it is important to be aware of how a *heuglini* might look standing within a group of *graellsii* or *intermedius*. Much of the early identification literature on *heuglini* now appears somewhat dated in its approach or is hidden away in rather obscure (often Russian) journals that are not really accessible to UK birders. In many cases this literature concentrates on biometrics and so is not particularly useful for field identification. Harris *et al*. (1996) covered the identification of *heuglini* in their book on European and Middle-Eastern birds, one of the first field guides to do so. However, the treatment of *heuglini* in this book is rather simplistic, with many statements not supported by subsequent studies. More recently, papers dealing with the field identification of *heuglini* and its status in Finland have been published in *Limicola* (Rauste, 1999) and *Alula* (Eskelin and Pursiainen, 1998). Visa Rauste's work is extremely detailed and compares both the plumage and moult of *heuglini* with *fuscus*. Unfortunately, only the summary and plate captions of this paper are in English. Garner (1997) and Kennerley *et al*. (1995) discussed the identification of *heuglini* on the wintering grounds.

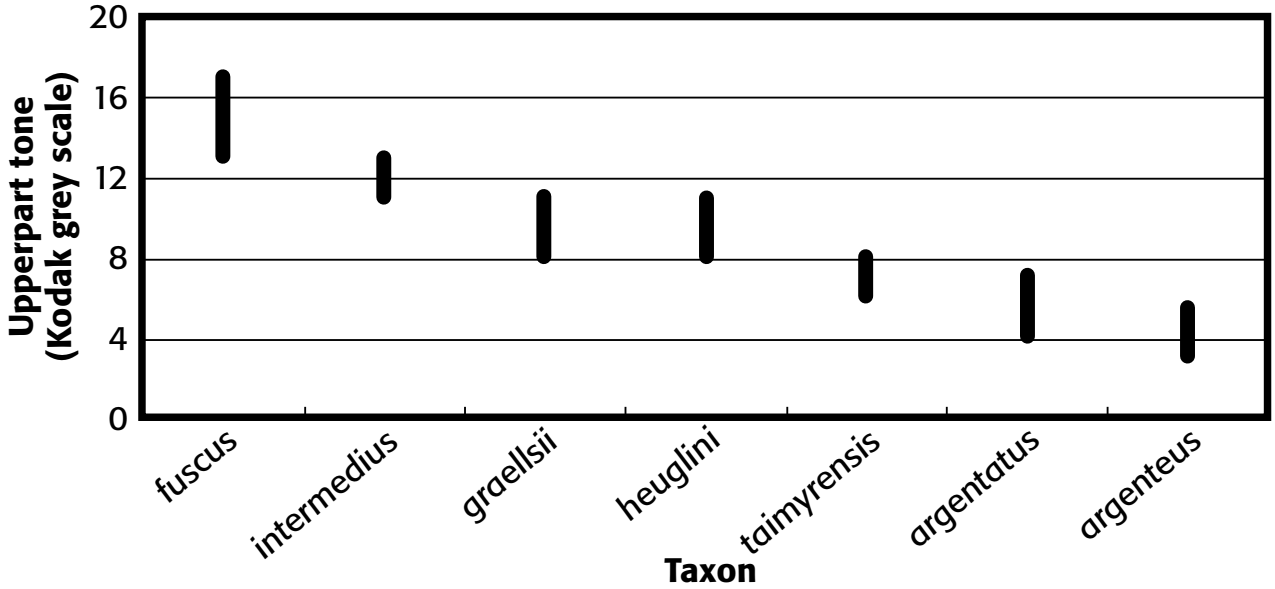


**Figure 1.** Ranges of upperpart tones shown by taxa within the Herring - Lesser Black-backed Gull complex. Values are from Malling Olsen and Larsson (2003), Jonsson (1998a) and personal observations. Note that Malling Olsen and Larsson give a maximum value of 8 for *argentatus*, indicating overlap with *graellsii*. This is not supported by other studies (e.g. Jonsson, 1998b). The value of 7 given by Jonsson (1998b) has therefore been used in the figure.

## Context and aims of the paper

To summarise the above discussion, it may be argued that both *fuscus* and *heuglini* are potential visitors to Scotland. Both have been discussed previously in this context (Gibbins and Golley, 2000). A number of papers published in the 1990's improved our knowledge of the identification of *fuscus* and *heuglini*. In particular, they suggested that moult could be used to support identification, including that of immature birds. These papers set new standards. In the case of *fuscus*, they re-awakened interest and initiated a new and more rigorous search for this taxon in Western Europe. In the case of *heuglini*, they brought the details of its field appearance to our attention for the first time and raised the possibility of its occurrence in the UK. Most recently, the gulls monograph (Malling Olsen and Larsson, 2003) was an opportunity to synthesise and consolidate knowledge of these taxa. Unfortunately, because of the mislabelling of so many plates in the first edition, this book has not proved a reliable reference point. More particularly, critical errors remain in the *heuglini* section in the revised edition (discussed on page 172).

The remainder of this paper discusses current ideas on the identification of *fuscus* and *heuglini*. It is based on the author's observations of both taxa in Finland (2001, 2002 and 2004), the United Arab Emirates (2004) and Israel (2000 and 2001) and of *graellsii* and *intermedius* in Portugal (2001, 2002, 2003 and 2004) and the UK. The paper also draws upon field studies being undertaken by gull enthusiasts around Europe, the results of which have yet to be formally published. The focus is on the extent to which this recent work has affected our perceptions of *fuscus* and *heuglini*; in this sense, the paper is essentially an update to the work of Lars Jonsson and Visa Rauste.

Because of differences in the way ideas on their identification have evolved, each taxon is treated in a slightly different way. For *fuscus* the discussion concentrates on the criteria given by Jonsson (1998a) and the extent to which these are still seen as holding true. For *heuglini* the discussion is based largely around some individual birds ('case studies') and whether they could be identified with certainty if encountered outside of the normal range of this taxon. Overall, it is hoped that the paper improves awareness of these taxa among Scottish birders who have no previous field experience of them, or not had access to the literature. It concentrates on identification in the spring to autumn period as this is when they are perhaps most likely to be encountered as vagrants in Scotland. No firm identification criteria have so far been suggested for juvenile (first calendar-year [1 cy]) *heuglini*, while there are no known diagnostic features for 1 cy *fuscus*. The paper therefore concentrates on birds in their second calendar year and older. As is now the convention for gulls, primaries are numbered outwardly, with the inner primary being P1 and the outer primary P10. As far as possible, ringed individuals (therefore of proven age and origin) are used to illustrate identification features.

## Identification of *fuscus*

Jonsson (1998a) and Gruber (1999) discussed the identification of *fuscus* relative to *graellsii* and *intermedius*. Jonsson suggested that at specific times of the year, three age groups of *fuscus* are identifiable: (i) first-summer (2 cy) birds in June, July and August, (ii) second-summer (3 cy) birds in April to May and July to August, and (iii) adult birds in late August to September. Because it is a long distance migrant, *fuscus* typically has a very different moult strategy to *graellsii* and *intermedius*. When combined with subtle plumage and structural clues, these differences in moult were argued by Jonsson to permit confident identification of out-of-range individuals. Issues surrounding the identification of each of these age groups are discussed in turn below.

### (i). First-summer birds

Juvenile *fuscus* migrate to the wintering grounds in the autumn. On the wintering grounds they undergo an extensive 'post-juvenile' moult. It seems most likely that there is a partial moult in the autumn (that in some cases may start before they leave the breeding grounds) comprising scapulars and some wing coverts, and then another more extensive moult in the late winter/early spring just prior to northward migration. In this latter moult period, scapulars and coverts may be moulted again. By the time they migrate northward in the early summer, a significant proportion of birds have a complete set of fresh, second generation primaries and a mixture of brown and blackish non-juvenile wing coverts, scapulars and mantle feathers. Rauste (1999) found that 60-70% of Finnish *fuscus* arrived back with a full set of new primaries. Primary moult in those birds that do not renew all of their primaries on the wintering grounds is variable. Some start the moult but suspend it at around P8/9 and so arrive back with the outer one or two primaries old and contrasting with the new inner eight or nine. (Other variations in primary moult [late moulting birds] are discussed

below.) Typically, the second generation coverts moulted-in on the wintering grounds are patterned rather simply and, by the early summer, are often somewhat worn. Many birds have some blackish and rather adult-like feathers in the mantle, scapulars and coverts which contrast with the worn brown ones. These feathers may be third generation, having been replaced initially in the partial autumn moult and then again in the more extensive moult just prior to migration. However, because of the lack of detailed studies from the wintering grounds, it is difficult be sure about this; it may therefore be safer just to talk about birds having a mix of brown and black feather 'types', rather than second and third generation feathers. An important point is that although these typical birds show a mixture of different feather types, in mid-summer they are not in heavy covert moult. Very typical 2 cy *fuscus* are illustrated in Plates 142-145; note in particular the blackish primaries and contrasts between the brown and blackish feathers in the wing coverts. Note also the slight variation on the patterning to the brown coverts: some are very simple (Plates 143-145) while some show evidence of slight barring (Plate 142). The tail is also moulted on the wintering grounds; in spring and early summer, the second generation tail feathers are blackish (visible in Plate 145) and much more fresh than first generation feathers would be at this time.

By late summer, some 2 cy *fuscus* have started their second primary moult. In some of these birds this commences before the first generation outer primary has been replaced, so individuals can have three generations of primaries present in the wing. The bird in Plate 144 had dropped its second generation P1 and so had already commenced its second primary moult.

Typically *graellsii* and *intermedius* moult their scapulars and either few or no wing coverts in the autumn of their first calendar year. The complete moult does not commence until the spring to early summer of their second calendar year. So, by mid-summer (Jonsson uses an example date of 1 July), they are in active moult: primaries 5-10 (approximately) are retained first generation feathers while the wing coverts are in heavy moult, with a mixture of abraded first generation and new second generation feathers (e.g. Plate 146). Unlike typical *fuscus*, these second generation coverts tend to be well marked, with internal bars and anchors (Plates 146 and 147). The general impression is therefore typically very different to *fuscus*. The moult strategy followed by some *fuscus*, where three generations of primaries can be present in the wing in late summer, is so far not known to occur in *graellsii* or *intermedius*.

The central point of Jonsson's argument was that any 2 cy bird that arrives back from its winter quarters with a full set of second generation primaries, a new tail and a mixture of rather worn brown (second generation?) and blackish (third generation?) upperpart feathers (as per Plates 142-145) should be a *fuscus*. Specifically, he stated that the combination of worn, second generation coverts and new primaries in the early summer was "impossible for *graellsii/intermedius*". However, not all *fuscus* follow this moult strategy; indeed, both Jonsson (1998a) and Rauste (1999) emphasised that the moult of *fuscus* is extremely

variable. Those 2 cy *fuscus* that have not renewed all of their primaries on the winter quarters are more difficult to identify, as acknowledged by Jonsson. Nonetheless, by mid-summer (July) these late moulting birds also typically have rather worn and simply patterned second generation coverts and a new tail. These birds often show suspended primary moult, as shown in Jonsson's Plates 3 and 4. As described above, this differs from *graellsii/intermedius* that should have a mixture of fresh second generation and worn first generation coverts and be in active tail and primary moult in mid-summer.

In the late 1990s, these new criteria stimulated interest in *fuscus* and provided the basis for a rigorous search for this taxon outside of its normal range. However, Jonsson's work was written from a Swedish perspective: it was based primarily on observations of *fuscus* in Gotland, where *graellsii* and *intermedius* occur only in relatively small numbers. Thus, he acknowledged that it was difficult for him to adequately describe the variability in moult shown by *graellsii* and *intermedius*. In the six or so years since the paper was published, it has become clear that the moult and plumage of *graellsii* and *intermedius* are in fact highly variable. Space does not permit a complete assessment of this variability in the current paper; for this, readers are urged to make use of the very comprehensive information on the web site www.birdsnaps.com. The following examples distil some of the key points from personal observations and, as detailed on the birdsnaps web site, the recent work of Mars Muusse and colleagues working in Holland. The examples illustrate one or two ways in which the variability of *graellsii* and *intermedius* can result in a *fuscus*-like appearance and how the variability of *fuscus* can make some birds extremely difficult to identify outside of their normal range.

A bird photographed in Portugal on 4 July (Plate 148) had a complete set of simply patterned second generation scapulars, wing coverts and tertials and a second generation tail. As far as it was possible to determine, it had no first generation wing coverts. It had not replaced all of its primaries on the winter quarters, as four first generation feathers were retained. Its upperparts and, in particular, tail moult on this date were consistent with Jonsson's late moulting *fuscus*. Its general appearance, with dark, simply patterned feathers was also reminiscent of *fuscus*. Its coverts were rather worn, again consistent with late moulting *fuscus* at this time. However, based on location the bird should be a *graellsii* or an *intermedius*. The fact that this individual, rather than returning north, has remained well south during its first-summer may help explain the wear on its second generation feathers. Clearly, the key point here is that this bird is strikingly different to typical *graellsii/intermedius* (Plates 146 and 147)

**Plate 142.** 2 cy *fuscus*, Stockholm, 21 July 2001 (*Chris Gibbins*). **Plate 143.** 2 cy *fuscus*, Tampere, Finland, 29 July 2001 (*Chris Gibbins*). **Plate 144.** 2 cy *fuscus*, Tampere, Finland, 29 July 2004 (*Chris Gibbins*). **Plate 145.** 2 cy *fuscus*, Tampere, Finland, 30 July 2004 (*Chris Gibbins*). **Plate 146.** 2 cy *graellsii/intermedius*, Sines, Portugal. 21 June 2003 (*Chris Gibbins*). **Plate 147.** 2 cy *graellsii/intermedius*, Peniche, Portugal. 28 June 2003 (*Chris Gibbins*). **Plate 148.** 2 cy presumed *graellsii/intermedius*, Sines, Portugal, July 10, 2004 (*Chris Gibbins*). **Plate 149.** 2 cy presumed *fuscus*, Tampere, Finland, 1 August 2004 (*Chris Gibbins*).


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and shows some features that place it within the range of late-moulting *fuscus*. An even more *fuscus*-like 2 cy *graellsii/intermedius* was seen at the Maasvlakte in the Netherlands on 29 May 2000. All of its feather tracts were second generation, including the primaries and tail, so it had followed the typical *fuscus* moult strategy in its winter quarters (see www.birdsnaps.com for details and images of this bird).

Conversely, the plumage of some *fuscus* can appear very like *graellsii/intermedius*. One such bird is shown in Plate 149. It was ringed as a nestling approximately 30 km from Tampere where the photograph was taken, and therefore on range should be a *fuscus*. However, unlike the *fuscus* in Plates 142-145, it has many well marked wing coverts and rather pale, ash-grey mantle feathers. Jonsson stated that "*fuscus* never seems to acquire scapulars which have internal dark marks" but this bird clearly has. Its primary moult (active moult: P1-P5 new, second generation feathers) overlaps with *graellsii/intermedius*. Without the ring this bird would not be identifiable as a *fuscus* if it appeared in Scotland; indeed even with a Finnish ring it is difficult accepting this bird as a *fuscus*. This individual throws up all sorts of problems, as will be detailed in the Summary and Discussion section.

An example of the type of *fuscus* that has not renewed all of its primaries on the wintering grounds is shown in Plate 150. On 1 August this bird was in active primary moult, with P1-P4 being new, second generation feathers. As described by Jonsson, birds of this late-moulting type are more difficult to identify. The bird shows the worn second generation coverts that are a feature of this type. However, the *intermedius* (ringed as a nestling in Norway) shown in Plate 151 is extremely similar, including the degree of feather wear on its second generation coverts (note that it was photographed a month earlier). Because of the problems posed by *intermedius* such as this, the bird in Plate 150 is another example of a *fuscus* that may not be identifiable out of range.

### (ii) Second-summer birds

The primary moult of 2–3 cy *fuscus* is usually described as progressing as follows. The second primary moult sometimes begins in the summer of their second calendar year (as discussed above under first-summer birds), but it seems that the majority start this moult in the autumn upon arrival on the wintering grounds. This moult is only partial: it is typically suspended or arrested before northward migration the following spring, such that when they arrive in the breeding areas as second-summer (3 cy) birds, they show a contrast - a discontinuity - between old second generation primaries and newly replaced, third generation ones. For example, the bird illustrated in Plate 8 of Jonssons paper is captioned as showing "second generation outer primaries which, from P5 inwards, have been replaced by new (third generation) feathers" (Jonsson, 1998a, p301). In late July to early August at Tampere, Finland, this discontinuity was typically around P6, 7, 8, or 9 and so was visible on standing birds (Plate 152). Third calendar year *fuscus* tend to have mostly black, adult-like wing coverts, with only a few retained brown feathers.

Third calendar year *graellsii* and *intermedius* typically arrive back in the spring with all of their second generation primaries in place and then commence moult. In early May, *graellsii* and *intermedius* should have dropped P1-2; by early July, P1 and 2 will be new (with P3 and 4 re-growing and missing respectively); and by the end of July, P1-5 will be new (with P6 and 7 re-growing and missing respectively). Thus, during these periods their primaries are typically very different to 3 cy *fuscus* which show suspended or arrested moult. Third calendar year *graellsii* and *intermedius* have mainly brown coverts (some have a row of grey medians) which contrast with a grey saddle of mantle and scapulars. A very typical individual is shown in Plate 153 and illustrates well how the general impression is very different to *fuscus*.

The suspended or arrested moult of *fuscus*, leading to a discontinuity in the primaries, was one of the most important new criteria given by Jonsson (1998a); it appeared to allow the confident identification of 3 cy *fuscus*, when supported by other features. However, as with 2 cy birds, recent studies of large numbers of *graellsii* and *intermedius* have revealed much greater variability in moult and plumage than previously thought. In an article on Surfbirds, Peter Adriaens (www.surfbirds.com/mb/Features/gulls/LBB) emphasised that 3 cy Lesser Black-backed Gulls with suspended or arrested primary moult are not rare; he cited observations by Rik Winters who has recorded up to 30 such birds on a single day in The Netherlands. This variability means that there is extensive overlap with *fuscus*. An example of a bird in France with a *fuscus*-like primary moult is shown in Plate 154. It is also a rather small and very dark individual, so closely resembles a *fuscus*. It could of course be an out of range *fuscus*? Problems raised by such birds are considered in the Summary and Discussion section.

**Plates overleaf: Plate 150.** 2 cy *fuscus*, Tempere, Finland, 1 August 2004 (*Chris Gibbins*). **Plate 151.** 2 cy *intermedius*, Peniche, Portugal. 1 July 2003 (*Chris Gibbins*). **Plate 152.** 3 cy *fuscus*, Tampere, Finland, 12 July 2003 (*Mars Muusse*). The contrast between brown and blackish primaries is usually interpreted as being between second and third generation feathers. However, it may be between third and fourth generation ones (see appendix for details). **Plate 153.** 3 cy *graellsii*, Maasvlakte, the Netherlands, June (*Mars Muusse*). **Plate 154.** Unidentified 3 cy Lesser Black-backed Gull, May 5, 2002, Dannes, France (*Mars Muusse*). On range this bird should be *intermedius* but it shows several pro-*fuscus* features. **Plate 155.** 3 cy *fuscus*, Tampere, Finland, 12 July 2003 (*Mars Muusse*). Note the different feather types present in the primaries of this bird and, in particular, that the moult seems to have progressed differently in each wing. **Plate 156.** Adult *fuscus*. Stockholm, Sweden, 21 July 2001 (*Chris Gibbins*). **Plate 157.** Adult *fuscus*. Tampere, Finland, 28 July 2001 (*Chris Gibbins*). **Plate 158.** Adult *fuscus*, Tampere, Finland, 1 August 2004 (*Chris Gibbins*). **Plate 159.** Adult *fuscus*, Tampere, Finland, 29 July 2004 (*Chris Gibbins*). **Plate 160.** Adult *fuscus*, Tampere, Finland, August 1 2004 (*Chris Gibbins*). **Plate 161.** Adult *fuscus*, Tampere, Finland, 29 July 2004 (*Chris Gibbins*). **Plate 162.** 3 cy *fuscus*, Tampere, Finland, 31 July, 2004 (*Chris Gibbins*). **Plate 163.** Adult (presumed) *fuscus* Tampere, Finland, 6 August 2002 (*Chris Gibbins*). **Plate 164.** 'Sub- adult' *intermedius*, Brouwersdam, the Netherlands, 19 October 2002 (*Mars Muusse*). **Plate 165.** Adult *heuglini*, Archangelsk, Russia, 10 June 1999 (*Visa Rauste*).


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Many 3 cy *fuscus* show extensive brown in the coverts, so a candidate should not be dismissed just because it does not show the textbook blackish wing. It is also important to recognise that the primary moult strategy followed by *fuscus* is extremely complicated and variable; for example, some birds show three feather types in the wing, suggesting that primary moult has occurred in waves. A particularly complicated bird is shown in Plate 155; it is extremely difficult to reconstruct the moult history of individuals such as this. A more lengthy discussion of the moult of 2–3 cy *fuscus*, particularly the ages of the feathers producing the discontinuity in the primaries, is given in the appendix. Leaving aside the complexities of moult shown by *fuscus,* the key point to emerge from recent studies is that *graellsii* and *intermedius* frequently show a discontinuity in their primaries and so, on its own, this feature is not diagnostic of *fuscus*.

### (iii) Adults

The classic view of adult *fuscus* is of a small blackish bird with only one white primary mirror (e.g. Grant, 1982 and 1986). There is little doubt that they can be extremely striking: some individuals are very small, elegant and black (Plates 156-159). Such birds are perhaps as beautiful as any 'large' gull. However, others are less obvious and some can appear quite robust (Plate 160). Bill size and shape are rather variable (Plates 156-162) and because of the rather small head, the bill on some birds can actually look disproportionately large (Plates 157 and 160). Thus, not all *fuscus* are structurally different to *intermedius*. Jonsson (1998a) also pointed out that many *intermedius* only have one primary mirror, while approximately 15% are as dark as a pale *fuscus* and *vice versa* (Figure 1). Plate 163 shows a presumed *fuscus* (ringed as chick in a *fuscus* colony in Finland) but a rather pale individual with a distinct contrast between the upperparts and the primaries. Conversely, Plate 164 shows a rather dark *intermedius*. Some *fuscus* (25-30%) have a mirror on both P9 and P10 and so in this respect do not differ from *intermedius*.

Because of this overlap, Jonsson (1998a) suggested that adult *fuscus* can only be identified reliably in the autumn, a time when differences in primary moult stage should be apparent. The late moult of adult *fuscus* has been known for some time. Birds either do not moult or moult only one or two inner primaries before migrating south in the autumn. On 1 August 2004, none of 100 adult *fuscus* observed at Tampere, Finland, had commenced primary moult (personal observation). Jonsson found that by late August/September, 40% of *fuscus* had still not commenced primary moult while the remainder had dropped only P1-2. Detailed assessment of moult in *graellsii* seen in Holland (see www.birdsnaps.com) indicated that by 1 September, 77% had three or more fully grown new primaries ($n = 137$). The most common moult stages in these Dutch birds were; (i) P1-3 new and fully grown, with P4 re-growing and P5 missing (34% of birds) and (ii) P1-4 new and fully grown, with P5 re-growing and P6 missing (27% of birds). Unlike *fuscus*, at this time *graellsii/intermedius* have started to develop winter head streaking and should have commenced covert moult, with white feather

bases often visible in the wing. Thus, any blackish bird with an unstreaked head, little or no covert moult and a full set of primaries (or with only P1-2 dropped) in September or later is a strong *fuscus* candidate. This was one of the key points made by Lars Jonsson (1998a). Note that on an individual bird, once moult has commenced it tends to occur in parallel in different feather tracts. Thus, the extent of head streaking, the extent of covert moult and the stage of primary moult are directly correlated; i.e. no wing moult also probably means a white(r) head.

As with other age groups, recent observations of *graellsii* and *intermedius* have shown variation in moult, such that there is overlap with *fuscus*. For example, around 1% of adult *graellsii/intermedius* observed on 8-12 October ($n$ = 591; www.birdsnaps.com) had either still not commenced their primary moult or had dropped only P1. Jonsson recognised the problem of late-moulting *intermedius*, stating that "anyone continuously checking *intermedius/graellsii* during the period mid-August to mid-September will, sooner or later, encounter a dark, late-moulting *intermedius*…" (p. 308). Data from the Netherlands indicate that such encounters are likely to be sooner rather than later; even by October, one in one hundred *graellsii/intermedius* will still have either not started primary moult or will have dropped only one feather. The implication of this is that observers need to base identification on the range of features suggested by Jonsson (structure, upperpart tone and primary pattern) rather than relying too heavily on primary moult. However, these other features also overlap between *fuscus* and *intermedius*, so identification of some birds may be extremely difficult.

### (iv) Wing length of *fuscus*

The wing length of *fuscus* may be helpful in identification, although this has not been fully explored in the literature. Gruber (1999) stated that the primary length of *fuscus* is more than 150% of the length of the exposed tertials, with up to six primaries visible beyond the longest tertial. He continued by saying that the wing projects noticeably beyond the tail, with the projection often corresponding to the distance from the bill tip to the rear corner of the eye. Unfortunately he did not detail exactly how these proportions differ from *graellsii/intermedius*. Also, the problem with comparing the primary projection beyond the tail to the bill length is that bill length varies markedly in *fuscus*; thus, a long-billed (male) *fuscus* may appear to have a relatively short primary projection. For example, personal observations indicate that on some birds the primary projection beyond the tail is less than the distance from bill tip to rear eye.

A better way to assess the wing length of *fuscus* is to relate it to leg length. This allows the long-winged, short-legged appearance of *fuscus* to be quantified. In *fuscus*, the projection of the primaries beyond the tail is appreciably greater than the length of the tarsus (measured from the centre of the knee joint to the ground on a standing bird; best done from photographs). The average ratio of primary projection to tarsus length,


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**Plate 166.** Adult *heuglini*, Archangelsk, Russia, 12 June 1999 (*Visa Rauste*). **Plate 167.** Adult *heuglini*, Archangelsk, Russia, 11 June 1999 (*Visa Rauste*). **Plate 168.** Adult *heuglini*, Archangelsk, Russia, 10 June 1999 (*Visa Rauste*). **Plate 169.** Adult *heuglini*, Archangelsk, Russia, 1 September 1998 (*Visa Rauste*). **Plate 170.** 2 cy *heuglini*, Tampere, Finland, 1 August 2004 (*Chris Gibbins*). **Plate 171.** 2 cy *heuglini*, Tampere, Finland, 1 August 2004 (*Chris Gibbins*). Same bird as Plate 170. **Plate 172.** 2 cy *heuglini*, Tampere, Finland, July 31 2001 (*Chris Gibbins*). **Plate 173.** 2 cy *heuglini*, Tampere, Finland, 3 August 2004 (*Chris Gibbins*). Most of the coverts are second generation and of the anchor-patterned type. It is likely that the mantle and scapulars are a mix of second (brown) and third (grey) generation feathers. Scapulars are replaced from the front to the back, so the long, pointed rearmost scapulars are usually the last to be replaced. In this bird, these are brown (second generation) feathers, so the grey feathers (in front of these) are most likely to be newer (third generation) ones.

measured from photographs of 15 birds, was 1.3:1 (min ratio was 1:1, max was 1.37:1). Thus, in *fuscus* the primary projection beyond the tail is typically 1.3 times the tarsus length. In *graellsii* ($n$ = 15), the mean ratio was 0.98:1 (min 0.78:1, max 1.1:1); i.e. primary projection was less than or equal to the tarsus length. The maximum and minimum values of these ratios indicate that there is little or no overlap between *graellsii* and *fuscus*. *Intermedius* lies closer to *fuscus*, with a mean ratio of 1.16:1 (min 1.1, max 1.2; $n$ = 10). From these data, it seems that a bird with a primary projection:tarsus ratio greater than 1.2 is most likely a *fuscus*, assuming it matches this taxon in other ways. Of course it is important to stress that assessment of wing length should be avoided on birds moulting their outermost primaries and those individuals whose primaries are excessively worn. Also, the bird needs to be perfectly side-on for accurate assessment. Observations of ringed birds indicate that the structure of *intermedius* is far from homogeneous across its range (Mars Muusse, *pers comm*.) Consequently, a larger sample is necessary to determine the extent of overlap in the wing length:tarus ratio between this taxon and *fuscus*. Nonetheless, the data analysed so far suggest that the ratio may be useful in helping to identify a suspected *fuscus*.

There appear to be no consistent differences between the three taxa in the spacing of the exposed primaries or in which of the primaries falls level with the tail. For example, in all three the tip of the tail is level with or extends just beyond P6. In *fuscus*, P10 often extends noticeably beyond P9 but, like *graellsii* and *intermedius*, on some individuals it is almost equal in length with P9 and so is hardly visible. Wear and moult stage greatly affect the relative lengths of P9 and 10 so this is not a particularly safe feature to use in identification.

## Identification of *heuglini*

Although treated by Grant (1986) as a subspecies of Herring Gull, *heuglini* is essentially a Lesser Black-backed Gull. As its separation from Herring Gull is therefore not a real problem, the following discussion concentrates on identification relative to the other Lesser Black-backed Gull taxa.

There are contrasting statements in the literature about the appearance (particularly the size, structure and upperpart tone) of Heuglin's Gull. It seems most likely that, as with all other large white-headed gulls, it is rather variable. However, some of the apparent variability of Heuglin's Gull may actually reflect descriptions based on misidentified birds, while some results from the inclusion of *taimyrensis* as the eastern form of Heuglin's. There are relatively few photographs of *heuglini* in the English language literature. This and the contrasting statements about its appearance have lead to some uncertainty among UK birders as to what the field characteristics of *heuglini* are. The following text therefore attempts first to build a general image of the appearance of *heuglini* and concentrates on the issue of its apparent variability. This is followed by a discussion of the identification of some individual birds – the 'case studies'.

### (i) Size and structure

Grant (1986) described *heuglini* as large and long legged, "readily separated from *fuscus* by (its) much larger size and heavier build". The structure of *taimyrensis* was described by Grant as being "much like *heuglini*". However, biometric data indicate that *taimyrensis* is appreciably larger than *heuglini*, and in fact is larger than many Herring Gulls (Table 1).

**Table 1.** Biometric data for selected taxa within the Herring – Lesser Black-backed Gull complex. All data are taken from Malling Olsen and Larsson (2003).

| | Wing length (mm) | | Weight (g) | | Bill length (mm) | |
|---|---|---|---|---|---|---|
| | min. | max. | min. | max. | min. | max. |
| *fuscus* | 393 | 455 | 452 | 1095 | 42 | 56 |
| *intermedius* | 390 | 542 | 535 | 1025 | 45.1 | 58 |
| *graellsii* | 383 | 456 | 620 | 1100 | 45.5 | 57.2 |
| *heuglini* | 405 | 469 | 745 | 1300 | 44.7 | 57.3 |
| *taimyrensis* | 420 | 476 | 880 | 1360 | 48.4 | 64.8 |
| *argenteus* | 381 | 460 | 600 | 1150 | 44.4 | 63.9 |
| *argentatus* | 394 | 480 | 717 | 1525 | 44.6 | 64.9 |

Kennerley *et al.* (1995) and Garner (1997) separated wintering *heuglini* and *taimyrensis* based on these differences in size and structure, as well as upperpart tone (as per Figure 1). Despite the field identification by these authors, the question of what '*taimyrensis*' represents is controversial. If *heuglini* is the western and *taimyrensis* the eastern subspecies of Heuglin's Gull, then Heuglin's is an unusually variable species (evident from Figure 1 and Table 1). However, much of this variability results from the classification of *taimyrensis* as the eastern form of Heuglin's, since *taimyrensis* is both different to the 'statistical average' *heuglini* and is itself highly variable. Yèsou (2002) uses the marked variability of *taimyrensis* to argue that it does not exist as a taxon. To summarise his argument, Yèsou suggests that '*taimyrensis*' comprises either birds from a hybrid zone between western *heuglini* and Vega Gull *L. vegae* (as argued by earlier workers), or yellow-legged individuals that were identified as *taimyrensis* but were actually either pure *vegae* or pure *heuglini*. Yèsou's argument is a

logical interpretation of the extremely variable descriptions of *taimyrensis* given in the literature. If correct, his argument helps simplify matters as it means that *taimyrensis* has no taxonomic validity and so should be left out of the Heuglin's Gull equation. Thus, to understand what Heuglin's Gull looks like, it is necessary only to consider the western birds – *heuglini*. So what is known of the field characters of these birds?

The average western *heuglini* is larger than *fuscus*, *intermedius* and *graellsii* (Table 1). While it is most similar in size to *graellsii*, the average bird has rather more elegant proportions, typically appearing to have a smaller, sleeker head and a slimmer neck (e.g. Plate 165). Unfortunately there is marked individual variation in the absolute size and relative structure of *heuglini*, such that overlap with the other taxa is extensive. Structurally, some *heuglini* appear very similar to *intermedius* and female *graellsii* (Plate 166) while others appear large and even hulking (Plate 167). A particularly small, delicate *heuglini* seen in the UAE (March 2004) was very similar to *fuscus*. Conversely, the *fuscus* in Plate 160 was larger and more robust than some *heuglini*. Bill size and proportions are also variable in *heuglini*, as evident in Plates 165-167.

**(ii) Field characters of adult *heuglini***

The average and range of upperpart tones shown by *heuglini* match almost exactly those of *graellsii* (Figure 1). Like *graellsii* there is individual variation, such that the darkest *heuglini* overlap with paler *intermedius* and the palest birds are only fractionally darker than the darkest *argentatus*. Thus, *heuglini* does not have a diagnostic upperpart grey tone.

Usually *heuglini* is described as having a white mirror only on P10 (e.g. Plate 168); this is unlike the average *graellsii* which has mirrors on both P9 and P10. Harris *et al*. (1996) suggested that in *heuglini* the white mirror on P10 is smaller and further from the feather tip than in *graellsii*. Eskelin and Pursiainen (1999) found that this was the case with most of the *heuglini* they encountered. It is not unusual to find *graellsii* in which the P10 mirror is merged with the spot at the feather tip to form an extensive white tip to the feather, unlike the pattern described for typical *heuglini*. However, there is variability and overlap between these taxa in the pattern of white in the primaries. For example, *intermedius* (probably female) usually has only 1 mirror, while *heuglini* (probably male) can sometimes have two. Moreover, *heuglini* can have a large mirror on P10, as shown by the bird in Plate 18 of Rauste (1999). The implication of this overlap is discussed with respect to the case study birds.

Figure 1 in Buzun (2002) illustrates what is described as "the most common wingtip pattern" in *heuglini*. The figure shows a bird with black on 8 primaries, with the black extending as a complete band across P4 and to the outer web of P3. From the limited published data available, it is clear that both *heuglini* and *graellsii* can have black on a total of either 6, 7 or 8 primaries (*heuglini* data published in Panov and Monzikov, 2000; *graellsii* data in Rauste (1999), given in Hario, *in litt*.). These data indicate that black on

7 primaries is the most frequent pattern in both taxa (58% of *graellsii*, 54% of *heuglini*), but that a larger proportion of *heuglini* (23%) have black on 8 primaries than do *graellsii* (18%). However, sample sizes are so small ($n$ = 38 and 26 respectively) that this apparent difference in the frequency of black on 8 primaries may not be representative; in fact *BWP* states that 25% of *graellsii* have black on 8 primaries. Even if a larger sample supported the values of 23% (*heuglini*) and 18% (*graellsii*), a bird with black on 8 primaries is only fractionally more likely to be a *heuglini* than a *graellsii*. Clearly, a measure of the number of primaries with black pigmentation does not provide a firm basis for field identification. Note that in Malling Olsen and Larsson's book (2003), the text describing the frequency of black on P4 in *heuglini* appears to be erroneous (revised edition p 395). They state that "Less than 5% black markings on P4". This implies that more than 95% of *heuglini* lack black on P4 and so have black on only 6 primaries (P10-5 inclusive). This is at odds with both the published literature (Rauste, 1999 and Panov and Monzikov, 2000) and personal observations.

As with the pattern of white in the wingtip, it is clear that there is much individual variation and overlap between taxa in the extent of black in the primaries. It is also apparent from differences in published values that larger samples are needed before we can be confident about the significance of small apparent differences between *heuglini* and *graellsii*. The problem that individual birds can show differences between their right and left wing should also be borne in mind when using primary pattern to help identify individual birds; indeed, Plate 562 in Malling Olsen and Larsson (2003) shows one such *graellsii*. Unpublished studies also continue to show that the extent of white in the wingtip of British *graellsii* varies with age (adult birds continue to develop more white as they get older) and with sex (males typically have more white than females). While on average *heuglini* shows more black and less white in the wingtip than *graellsii* (Rauste, 1999), overlap with *graellsii* and *intermedius* is extensive. Adult *heuglini* have a greater tendency to have dark marks on the primary coverts (visible in Plate 169) but as with other features, frequency statistics are needed before its value in field identification can be assessed.

In general terms, the bare part colouration of adult *heuglini* is similar to other Lesser Black-backed Gull taxa: legs are typically yellow, the bill bright yellow with a red gonys spot and the orbital ring is red. Some gull species (e.g. *cachinnans*) have dark iris spotting ('peppering') such that in the field their eyes can look dark. The dark-eyed appearance of some *heuglini* has been mentioned by several authors (e.g. Lindholm,1997) and this has been suggested as something that might be useful for separating *heuglini* from *graellsii* and *intermedius*. However, data do not support the use of this feature. Rauste (1999) found that around 10% of adult *heuglini* have eyes which have brown iris peppering but analysis of unpublished data collected by Mars Muusse ($n$ = 137) indicates that a very similar proportion (11%) of *graellsii* also have some degree of iris spotting.

Field discussions with delegates at the International Gull Meeting held in Finland in August 2002 considered the possibility that *heuglini* might show a tendency to have the red gonys spot restricted to the lower mandible, in contrast to *graellsii* and *intermedius* in which the red frequently extends onto the upper mandible. Analysis of photographs of *heuglini* taken either on the breeding grounds or in the Middle-East ($n = 31$) indicated that 71% lack red on the upper mandible. Analysis of data supplied by Mars Muusse, together with assessment of published photographs ($n = 310$) indicated that 56% of *graellsii/intermedius* lack red on the upper mandible. The data for *graellsii/intermedius* suggest that the presence of red on the upper mandible is season specific, being much more frequent in mid-summer when birds are feeding young than it is in winter (Figure 2). Because of the relatively small sample size, it was not possible to disaggregate the *heuglini* data in the way necessary to conduct this seasonal analysis. However, Plate 166 indicates that *heuglini* can have red on the upper mandible in mid-summer. While these analyses suggest that there may be average or population-level differences in the frequency of red on the upper mandible (less frequent in *heuglini*), they also indicate that because of overlap this feature is not particularly useful for identifying individual birds. Buzun (2002) argued that red on the upper mandible of *heuglini* is a feature of young adults, being present on a part of the bill that was previously black. However, this is not the case in *graellsii*: for example, studies by Mars Muusse and colleagues in the Netherlands have shown that birds in their 19th calendar year can have red on the upper mandible, while birds in their 15th calendar year can have both red and black on the upper mandible.

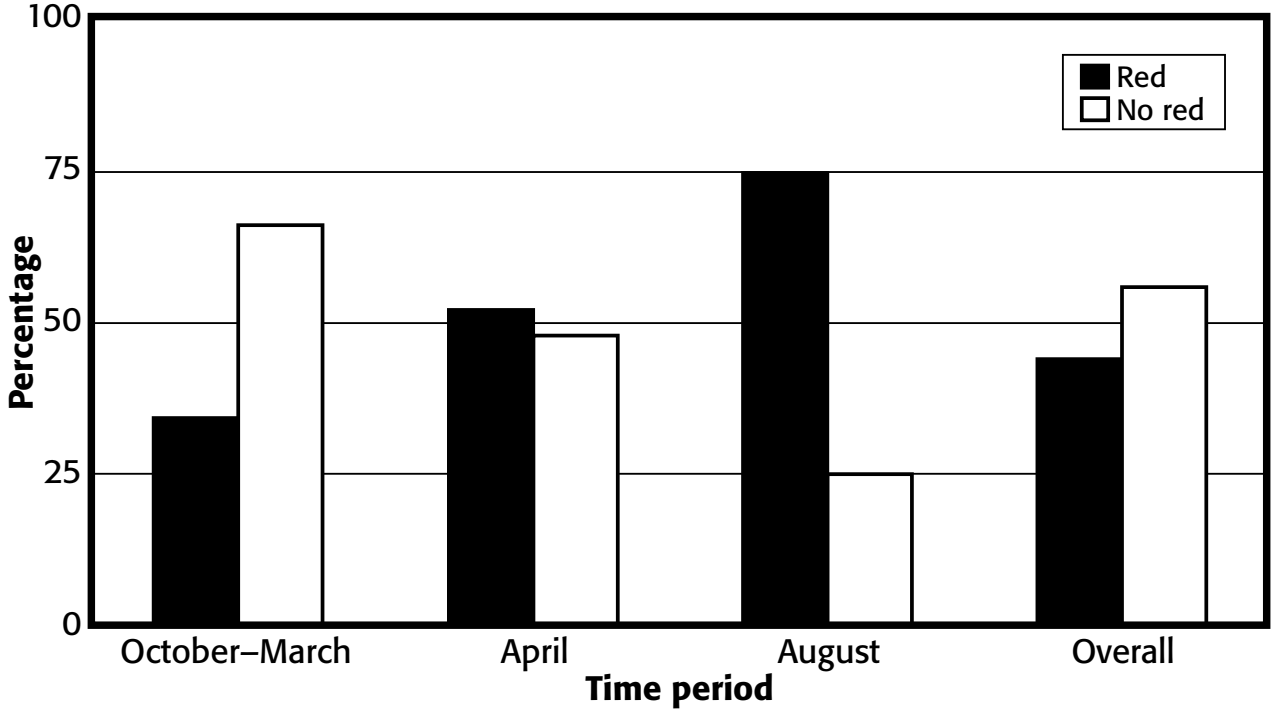


**Figure 2.** Frequency of red on the upper mandible of Lesser Black-backed Gulls (*graellsii* and *intermedius*) at different times of the year. The October to March, April and August values are based on a sample of 104 birds; the overall values (i.e. data combined across all times of the year) are from a sample of 310 birds. All sample birds are from The Netherlands.

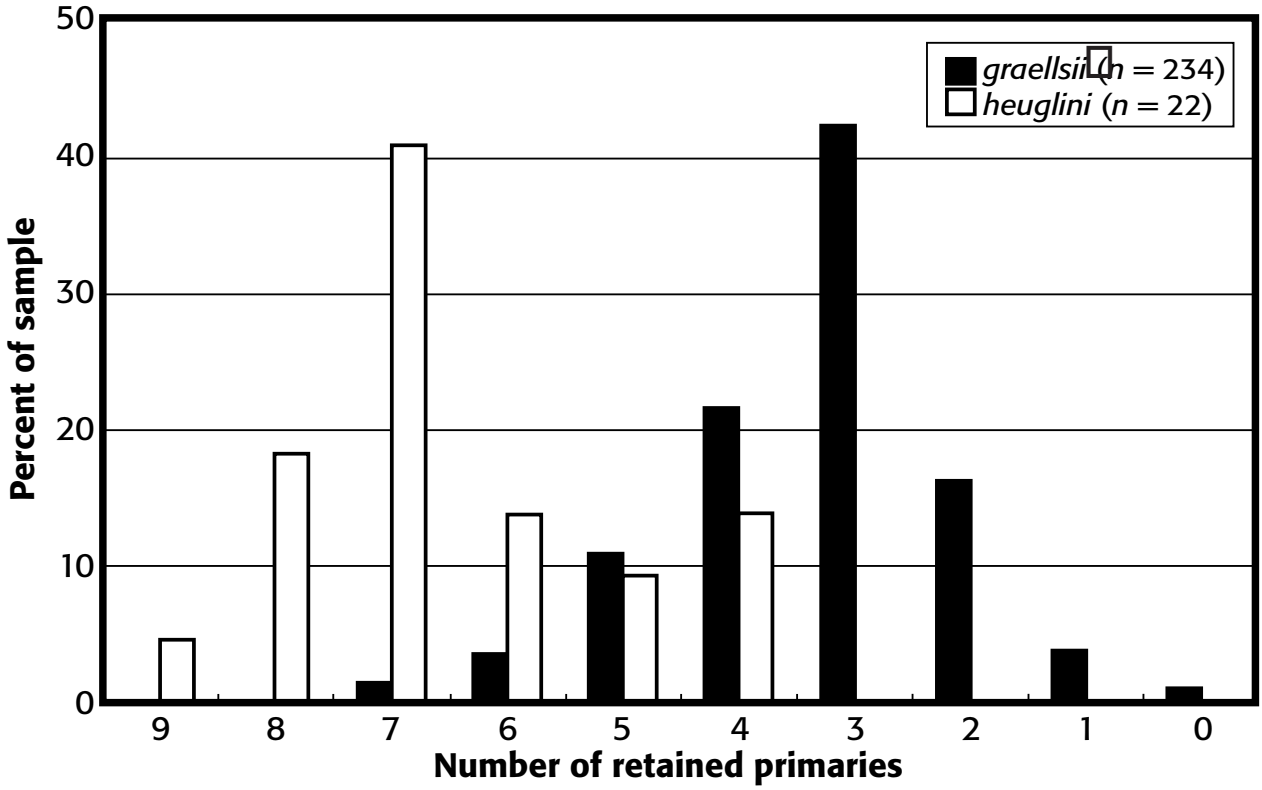


**Figure 3.** Primary moult stage in adult *heuglini* and *graellsii* in September. The diagram has been produced from raw data given by Rauste (1999) and Stewart (in press). The *graellsii* data are from around the Severn Estuary, UK, 1-15/9, while the *heuglini* data are from Archangelsk, Russia, 1-4/9/.

The timing of the primary moult of adult birds is frequently cited as one of the key differences between *heuglini* and *graellsii/intermedius*. The primary moult of *graellsii* and *intermedius* usually commences in May and continues until November/December. The moult of *heuglini* is later, commencing in June/July and often not being completed until January/February. Two birds from around 100 *heuglini* seen in UAE in the period 28 February–16 March 2004 still had P10 regrowing, illustrating how late the completion of primary moult can be in this bird. The primary moult of *heuglini* is usually suspended prior to southward migration in the autumn whereas in *graellsii* it is usually continuous. At the population level, the difference in moult between *heuglini* and *graellsii* is illustrated nicely in data given by Rauste (1999) and Stewart (in press). These data have been used to produce Figure 3. Plate 169 shows a *heuglini* photographed on 1 September; it is very typical, with seven retained old primaries and only one fully grown new one (P2 is not yet fully grown and P 3 is missing). On this date, the majority (77%) of *graellsii* have three or more fully grown new primaries (as per pages 166–167).

The relatively late primary moult of *heuglini* has been used in the search for out or range individuals. For example, a dark-backed gull on Shetland on 28 November 1999 was initially mooted as a possible *heuglini* for this reason. The value of population-level differences in primary moult for the identification of individual birds is discussed with respect to the first case study bird (see part iv below).

### (iii) Field characters of immature *heuglini*

Like *fuscus*, a proportion of immature *heuglini* return to northern areas during the summer. Such birds may wander or be displaced while on passage and so are possible vagrants to Western Europe. It is therefore useful to consider their identification. Some examples of 2 cy and 3 cy *heuglini* are shown in Plates 170-174.

The post-juvenile moult of *heuglini* is rather variable. The first generation (juvenile) scapulars are usually all replaced on the wintering grounds. The pattern on the second generation scapulars is typically rather simple, with a brownish-grey feather centre and a diffuse paler fringe and tip; darker patterning usually comprises a simple shaft streak, although some can have a prominent anchor pattern. Anything from 0-100% of the first generation wing coverts and tertials may be moulted out on the wintering grounds, so birds can arrive back in the spring of their second calendar year with either first or second generation feathers; usually there is a mixture of both. In the UAE it was not possible to determine the dominant pattern of covert moult in *heuglini* because of the difficulty of separating *heuglini* from *barabensis* in their first winter (personal observations, March 2004). Like the scapulars, the pattern on the second generation coverts of *heuglini* tends to be simple, although again there is individual variation. Many *heuglini* in the summer of their second calendar year have some silvery-grey scapulars and coverts which appear paler than adult feathers. It is difficult to know whether these are second or third generation feathers. It may be that like some other gulls, feathers of the same generation can have a different pattern, depending on when they are moulted in. Thus, the grey feathers may be third generation (perhaps most likely), or they may be late-moulted second generation feathers that contrast with the earlier-moulted, brown ones (this is discussed in the caption to Plate 173). Birds usually return north with a complete set of first generation primaries and start moulting them in May or June (Rauste, 1999). However, 5-10% of birds undergo some primary moult during their first winter. In June 2002 Visa Rauste observed two 2 cy birds in Komi, Russia, each with a full set of second generation primaries (Rauste, *pers. comm*.). In other respects they were typical *heuglini*. These two birds suggest that *heuglini* can undergo a complete primary moult during their first winter and so, in this respect, overlap with *fuscus*.

Overall, *heuglini* appear white-headed and white-bodied in the summer of their second calendar year, with dark streaking usually restricted to the hind neck and, to a lesser extent, the head. The bill usually has a pinkish base and dark tip. Sometimes the dark tip is rather diffuse, sometimes it is rather sharp and Glaucous Gull-like. Some individuals can have yellow pigment beginning to develop in their bill and even some red around the gonys. As with *fuscus*, the underwing is usually rather white compared to *graellsii* and *intermedius*. Nonetheless, some second generation underwing coverts can show quite strong marks or barring; set against the white feathers, this can produce a rather contrasting underwing (Plate 171).

For UK birders used to dealing with *graellsii*, *heuglini* in the summer of their third calendar year tend to look old for their age. Typically they have many grey, adult-like coverts and so sometimes look more reminiscent of 4 cy *graellsii* (Plate 174). This greyer wing is shared by many 3 cy *intermedius* (Mars Muusse, *pers. comm*., from observations of ringed birds). As with other large gulls, the bare parts of this age group are rather variable. In some the legs have already developed strong yellow tones, in others they are pinkish. The bill usually has yellow tones, with a variable combination of black around the tip and signs of the red gonys spot developing. Note also the dark eyes of the bird in Plate 174. The tail pattern of 3 cy *heuglini* is rather variable: usually there is some blackish or dark brown patterning on the feathers but some have a wholly white tail.

**(iv) Case studies**

The key question is whether any of the general characteristics discussed above could be used with confidence to identify an out of range *heuglini*. Four case study birds serve to address this question.

Plates 175 and 176 show a gull photographed at Tampere dump, Finland on 1 August 2004. Its upperparts are clearly paler than *fuscus* so on range it is most likely to be a *heuglini*. However, unlike the 'average' *heuglini* it has mirrors on both P9 and 10. It has commenced its primary moult and has replaced P1 and P2 (P3 is regrowing, P4 is missing), leaving six old feathers. On this date, this moult stage could be shown by either *heuglini* or *graellsii* so primary moult is not particularly useful in this instance. It has also commenced covert moult, with gaps visible in the median and primary coverts. The absence of P3 and P4 means that the pattern of black on these feathers cannot be used to help with identification. Its eye lacks the dark iris peppering shown by some (<10%) *heuglini* while its bill has red extending onto the upper mandible. Its structure is unremarkable and offers no real clues – it certainly falls within the range of a small female *graellsii*. In combination, these features rather count against *heuglini*; in fact it is only the location that makes *heuglini* more likely than *graellsii* or one of the so-called 'Dutch intergrades' (it is rather too pale for a typical *intermedius*). This is a very difficult bird. If it is a *heuglini*, on current knowledge it would not be identifiable in Scotland.

Plate 177 shows another bird photographed on Tampere dump, Finland. The *fuscus* in the background give an idea of its upperpart tone; it is darker than the previous case study bird but still clearly paler than the *fuscus* in the background. It has a small mirror on P10, located quite far from the tip of the feather. There is no mirror on P9. (Unfortunately the pattern of black on P3-P5 was not seen.) It shows no primary moult while the red on the bill is restricted to the lower mandible. In combination, these points favour *heuglini*. It is rather too small and dark and its primary projection is certainly too long for *graellsii* (primary projection:tarus ratio 1.2), but can *intermedius* be ruled out with certainty? Because of the overlap in all of these features, the answer is that it probably can't. Again, if it is a *heuglini*, this bird would not be identifiable as such in Scotland.

Plate 178 shows a 2 cy bird with pale, silvery grey feathers in its upperparts and six retained first generation primaries; this combination is less likely in *fuscus*. In Finland, where the photograph was taken, *heuglini* is then the most likely candidate, but can *graellsii* or *intermedius* look like this? Typically they don't (see Plates 146 and 147 for example) but, as can be seen from the *graellsii/intermedius* in Plate 179, some do. There appear to be no substantive differences between the Finnish bird in Plate 178 and the Portuguese bird in Plate 179. Both have grey mantle and scapular feathers, some brown lesser and greater coverts and a mixture of brown and grey feathers in the median coverts. The photographs were taken four weeks apart, so some slight differences in moult stage could be expected. Allowing for this, the progression of primary moult in these two individuals seems to be very similar. There is a suggestion that the Portuguese bird is in heavier covert moult, with many more moult gaps than the Finnish bird. Its greater coverts are more worn and bleached, although this could be explained more by location (summering in Portugal where sun bleaching and sand blasting hasten wear) than the age of these feathers. In Finland, the bird in Plate 178 stands out from the neighbouring *fuscus*, but it is unlikely to stand out as anything unusual in a flock of *graellsii/intermedius*.

Plate 180 shows a particularly interesting bird, photographed on 31 July in Finland. It is an individual of the type of 2 cy bird that returns from the wintering areas with first generation primaries largely still in place and moults-in the second generation feathers during the summer. For this reason, it does not match *fuscus* of the most diagnostic type (the type that arrives back with fresh, black second generation primaries). Although it could be *fuscus* of the late moulting type, the pale grey feathers in the mantle, the dark internal marks in the scapulars and the barring on the new median coverts appear, in combination, to count against *fuscus*. However, its plumage and moult stage are shared by the bird in Plate 149, an individual that was ringed as a nestling in a Finnish *fuscus* colony. Its grey feathers are more indicative of *heuglini*, but it is also extremely similar to *graellsii/intermedius*. By 31 July when their covert moult is nearly complete, the *graellsii/intermedius* in Plates 146 and 147 will look very like this case study bird. This bird continues to tax gull watchers at Tampere: it is unclear whether it is a *heuglini*, a variant *fuscus* or a Lesser Black-backed Gull of westerly origin. The issues raised by this and the other case study birds are considered in more detail in the Summary and discussion section below.

## Summary and discussion

Clugston *et al*. (2001) described *fuscus* as a passage visitor to Scotland, although they suffixed this statement with a question-mark. Because of the overlap with *intermedius*, at least some of the records upon which this statement is based may not hold up to critical scrutiny. For the moment, it may be best to regard the status of *fuscus* in Scotland as uncertain. There have been one or two claims of *heuglini* in both England (e.g. Yorkshire) and Scotland (e.g. Montrose) over the last few years but none of these records have yet been formally documented or accepted. Meinertzhagen (1950)

reported collecting a Heuglin's Gull in Fife but of course his records have now been discredited. Continuing uncertainties over the taxonomic status of *fuscus* and *heuglini* should not deter us from undertaking field studies that aim to develop robust identification criteria; indeed, the development of such criteria may help future decisions over their taxonomic rank. The identification of these birds is certainly challenging and views on whether it is possible to identify them at all have changed over time.

The identification of adult *fuscus* was thought to be straightforward until Jonsson (1998a) illustrated the extent of overlap with *intermedius*. He suggested that adults could be identified in the autumn by their moult and proposed new criteria for the identification of immature birds during the summer months. However, more recent field studies have indicated that some of these criteria may not be 100% safe. In particular, there seems to be more overlap in moult than realised at the time that Jonsson undertook his work. Rather than seeing Jonsson's paper as somehow flawed, it is preferable to recognise that it generated some very important testable hypotheses. By stimulating interest and subsequent detailed study, these hypotheses have undoubtedly improved our knowledge of *fuscus*. Much of what Jonsson said remains insightful and valid and his work stands as a key paper on this taxon.

The story of *heuglini* is a very different one. Its field characters have only slowly and recently become known and there remains very little in the mainstream English language literature about this bird. There are now many web sites with images of '*heuglini*' taken on the wintering grounds, particularly the Middle-East. For a number of reasons, these images are not particularly useful for birders looking for *heuglini* in Western Europe. Observers working on the wintering grounds do not have the problem of *graellsii* or *intermedius* to deal with, so the web sites tend to concentrate on the separation of *heuglini* from other local taxa such as *barabensis*. Also, the separation of immature *heuglini* from *barabensis* is far from clear and in many cases it is difficult to demonstrate conclusively that images of '*heuglini*' on the wintering grounds are not *barabensis*. The work of Visa Rauste made it clear that adult *heuglini* are extremely similar to *graellsii* and *intermedius*. He made the point that while many 2 cy *heuglini* are separable from *fuscus* in the field, some individuals can be difficult to tell with certainty. *Heuglini* is currently being studied in considerable detail in Finland. This work is painstaking and, consequently, slow to yield results. Quite rightly, field-workers are reluctant to publish until they have a clear understanding of *heuglini* and are thus able to present identification criteria with a high degree of confidence. This may take considerable time, so for the time being Visa Rauste's paper is likely to remain the most comprehensive account of the identification of *heuglini*. The *heuglini* section in the gulls monograph (Malling Olsen and Larsson, 2003) includes critical errors (as detailed on p 172) and should not be used as a primary source of reference for this taxon.

Separating typical *fuscus* from typical *heuglini* in Finland is not difficult, but in the UK the problem of *graellsii* and *intermedius* needs to be considered. So, could a *heuglini* or a *fuscus* be identified with confidence in Scotland? This is not an easy question to answer. It is clear from the material presented above that identification can be difficult and is complicated by intra-taxon variability. The following seven points attempt to summarise current views on the identification of out of range *fuscus* and *heuglini*.

1. A bird in the early to mid-summer of its second calendar year with a full set of fresh new primaries, a new tail and a mixture of slightly worn brown and fresh, blackish feather types in its upperparts should be a *fuscus*. As yet, there is no evidence that an individual *graellsii* or *intermedius* can show all of these features in combination, although it is now clear that some can show one or two of them. Thus, although it needs to be applied with slightly more care than previously thought, the basis for the identification of 2 cy *fuscus* given by Jonsson (1998a) remains valid. Recent studies have shown that a number of *graellsii* and especially *intermedius* can follow a *fuscus*-like moult during their first winter, so moult alone is not sufficient for identification.

2. Recent data suggest that suspended or arrested primary moult is not rare in 3 cy *graellsii* and *intermedius*. Thus, while a small, blackish bird in the summer of its third calendar year showing a discontinuity in its primaries may be a *fuscus*, it could also be an *intermedius*. It is not clear whether unringed individuals seen outside of the range of *fuscus* (e.g. Plate 154) are *fuscus*-like *intermedius* or out of range *fuscus*. For this reason, it remains a matter of opinion whether 3 cy *fuscus* can be identified out of range with 100% confidence.

3. No single feature is diagnostic of adult *fuscus*; a balance of probability approach is necessary for identification, using the combination of a number of features. A confident identification is only really possible in September or later when the late moult of *fuscus* may be useful. However, late moulting *intermedius* are perhaps not as rare as suggested by Jonsson, so again caution is needed. Records committees are likely only see a 'perfect' (ideally ringed) bird as being acceptable. Structurally, a small female *fuscus* is most likely to stand out; if the bird is also blackish, has only one primary mirror and shows no or limited primary moult and no sign of winter head streaking or covert moult, then it represents a very strong candidate *fuscus*. Not all *fuscus* fit this mould, so some genuine birds may go unnoticed or be deemed unacceptable by records committees.

4. The wing length of *fuscus* is often mentioned in the literature but this has not been assessed in a way that allows the long-winged, short-legged appearance of this taxon to be quantified. Personal observations suggest that the ratio of primary projection to tarsus length, measured from photographs of standing birds, may be used to help support identification. Based on the sample of birds measured so far, a bird with a ratio greater than 1.2 (i.e. primary projection greater than 1.2 times the tarsus length) should prove to be a

*fuscus*. Because of moult and feather wear, the primary projection of many *fuscus* appears shorter than this and overlaps with *intermedius*. A bird with a ratio in the range 1.1 to 1.2 could be either a *fuscus* or an *intermedius*. A larger sample is necessary to be fully confident about these values, but so far the ratio approach seems to have promise.

5. On average, adult *heuglini* show a number of small structural, plumage and moult differences from *graellsii*. While these may be used at the population level to distinguish between these taxa, they are of little use in the identification of individual birds. Thus, based on current knowledge the confident identification of adult *heuglini* outside of its normal range does not seem possible.

6. So far the pattern of black and the extent of white mirrors in the primaries of *heuglini* and *graellsii* have only been analysed in a simplistic way, dealing with one variable at a time. For example, various authors have looked for differences in the number of primaries with black pigmentation, the pattern of black on P4 or the number of primary mirrors. On the basis of these univariate analyses, there seems to be no diagnostic differences between *heuglini* and *graellsii* (i.e. no differences in ***either*** the number of primaries with black pigmentation ***or*** the pattern of black on P4 ***or*** the number of mirrors). However, our understanding would benefit from a multivariate approach which looked at whether a particular ***combination of these features*** allowed separation of these taxa. For example, a multivariate analysis may indicate that the combination of only one primary mirror, black on 8 primaries and a complete black band across P4 ruled out 95% of *graellsii*. This analysis is not possible from data currently published in the literature; it therefore requires new empirical studies, either from examination of museum skins, trapped birds or in-flight photographs. These are all difficult, not least because of the sample size required for a rigorous analysis. Nonetheless, until such analysis is undertaken it may be premature to say that no diagnostic differences between *heuglini* and *graellsii* exist.

7. Some 2 cy *heuglini* are extremely similar to some *graellsii* and *intermedius*. Anyone looking through large numbers of birds in the UK will come across individuals that match some of the *heuglini* illustrated here. Further work is needed to determine whether there are any consistent differences upon which confident identification of 2 cy *heuglini* can be based. Again, a multivariate approach that allowed features to be dealt with in combination may be most fruitful.

This paper has concentrated on adults and birds in the summer to autumn of their second and third calendar years. For *fuscus*, this was because of the necessity to revisit the ideas put forward by Lars Jonsson concerning birds of these age groups during the summer to autumn period. This period is also relevant for *heuglini* because, like *fuscus*, perhaps the most likely chance of a vagrant appearing in Western Europe is during the summer, when birds return to northern areas, or in the autumn when they are migrating southward again.

However, an adult *heuglini* may be more identifiable in the winter when its late moult, compared to *graellsii*, may be useful – in February, a sleek, dark-eyed bird with only one small primary mirror and one or two regrowing outer primaries may be worthy of close attention. Of course it is now widely acknowledged that not all individuals conform to standard moult timing: illness or injury can delay moult, while it is increasingly recognised that out of range birds may track the moult cycle of taxa present in their new location. Vagrant Lesser Black-backed Gulls in North America, for example, moult at a different time to the birds in Europe. So, a displaced *heuglini* may not show late primary moult, particularly if it has been in Western Europe for some time.

The problem of separating *heuglini*, *fuscus*, *graellsii* and *intermedius* is complicated by the recent discovery that *graellsii* and *intermedius* occur occasionally in Finland. This was proven by the arrival in Finland of birds ringed as pulli in England, the Netherlands and Norway. Consequently, developing criteria to separate these taxa based upon observations in Finland may be problematic, since an unknown proportion of the *fuscus* and *heuglini* may be *graellsii* or *intermedius*. Thus, it could be argued that none of the Finnish '*heuglini*' pictured here (Plates 170-174) can be considered as proven. While this is a rather extreme stance (the breeding ranges of *heuglini* and *graellsii* suggests that *graellsii* should be much less abundant in Finland), it serves to illustrate this problem. If the Finnish bird in Plate 181 is a *fuscus* or *heuglini*, it extends the range of variability thought to exist for these taxa. It most resembles one of the western forms, but it is unringed so its origin cannot be proven. An adult bird seen at Tampere in August 2004 with upperparts matching *heuglini* had the P10 mirror merged with the white tip, forming an extensive white tip to the feather. This is not proven to occur in *heuglini* but is frequent in *graellsii*. Although on range this individual is more likely to be a *heuglini*, it would be unwise to argue that *heuglini* can have a wholly white tip to P10 based on this one bird observed in Finland. Clearly, more research is needed on the breeding grounds to determine the nature and extent of variation in the primary pattern of *heuglini*. Another adult *heuglini*-like bird seen at Tampere on 29 July 2004 showed five newly moulted primaries, so was more advanced in its moult than generally accepted for this taxon. Is this bird evidence that *heuglini* can moult early or was it a *graellsii*? These three examples illustrate the problem thrown up by the proven occurrence of *graellsii* and *intermedius* in Finland when trying to assess patterns of variability of *fuscus* and *heuglini* and so clarify their identification.

Unfortunately, identifying individuals such as the bird in Plate 181 based upon the characteristics of ringed birds (whose origin is therefore known) also raises problems. The bird shown in Plate 149 also looks very unlike typical *fuscus*, but it was ringed as a chick in a *fuscus* colony and so should be a *fuscus*. So why does it not look like one? Three possibilities exist. The first is that it is a *fuscus*, but a rare variant that is inseparable from western Lesser Black-backed Gulls at this age. The second possibility is that *heuglini* may be breeding in Finland and this bird, a *heuglini*, was incorrectly identified

when it was ringed as a chick. Misidentification of this bird as a nestling is possible since gulls of this age are notoriously difficult to identify and its parents were not necessarily seen while it was being ringed. The third possibility is that it is a hybrid *heuglini* x *fuscus*, again ringed incorrectly as a nestling. As well as the birds in Plates 149 and 181, one of these explanations could account for the unusually pale adult '*fuscus*' ringed in Finland and shown in Plate 163. Clearly, the possibility of birds ringed incorrectly being used develop identification criteria is alarming; the possibility of hybridisation as an explanation for the odd appearance of some individuals is also worrying, but it needs to be borne in mind. For the moment, it seems prudent to leave such individuals aside and develop identification criteria based on the more typical birds.

Ringing recoveries (listed in Yésou, 2002) prove the occurrence of *fuscus* outside of its normal range. The large proportion of Finnish *fuscus* that are ringed (approximately one in eight birds seen at Tampere in 2004; Markku Kangasniemi *pers. comm*.) raises the possibility that identification of a suspected vagrant *fuscus* may be clinched by the presence of a ring. For some, this is the only way that the identification of an out of range bird can be made with 100% certainty. For others, the accumulation of a number of known *fuscus* features is sufficient. The caption to the plate of the 3 cy Cambridgeshire bird (*Birding World* 17 (5), p. 180) exemplifies the latter philosophy; the caption read "it has to be a *fuscus*". Those who spend a lot of time looking at gulls and are aware of their variability tend to be rather more cautious. The evidence presented above indicates that 3 cy *intermedius* can show one or two *fuscus* features, although it is yet to be demonstrated conclusively that they can show the full suite apparently present in the Cambridgeshire bird. Of course the fact that no *intermedius* with the full range of *fuscus* features has yet been seen does not mean they do not exist. For this reason, some may argue that records of unringed vagrants should be shelved until the full range of variability shown by all taxa is known. It may appear a semantic point, but while the Cambridgeshire bird appears from the photograph to almost certainly be a *fuscus*, it does not 'have' to be one.

Overall, the work published in the late 1990s added much to our knowledge of *fuscus* and *heuglini*. However, there remains much to learn. As emphasised earlier, the current paper has been written to provide an update to the very detailed accounts given by Jonsson (1998a) and Rauste (1999). Hopefully it is judged and used in this context. It is important to reiterate that there are a number of issues that have not been considered here. First, the identification of 1 cy *heuglini* and *fuscus* and of 3-4 cy *heuglini* has not been covered. Very little is currently known about how these age groups can be identified; their plumage is described in the literature but there is little in the way of critical comparative analysis, relative to *graellsii* and *intermedius* (note their treatment in Malling Olsen and Larsson, 2003). This comparative analysis is necessary for field identification. Second, identification of birds during the winter months has not been

considered. Like many large gulls, the identification criteria for *fuscus* and *heuglini* are very time-specific, so many of the features described here will not hold true during the winter. It is important therefore to not apply features carelessly at times when they may be inappropriate. Finally, issues of the taxonomic rank of *fuscus* and *heuglini* have intentionally been left aside. Both taxa have and continue to be treated in different ways in the literature; they are treated as subspecies of Lesser Black-backed Gull by some authors and as full species by others. Whatever their taxonomic rank, improving our understanding of their status in Scotland is only possible if observers are aware of what is currently known of their field characteristics and are encouraged to look in detail for candidate birds. Hopefully this paper has helped in a small way towards this goal.

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## Postscript

At the time of going to press (November 2004), the birdsnaps web site (www.birdsnaps.com) was being updated and was unavailable. Once up, it can be found directly using this URL or via the links on the surfbirds web site (www.surfbirds.com).

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**Plate 174.** 3 cy *heuglini*, Tampere, Finland, 31 July 2004 (*Chris Gibbins*). **Plate 175.** Unidentified gull, Tampere, Finland, 1 August 2004 (*Chris Gibbins*). **Plate 176.** Unidentified gull, Tampere, Finland, 1 August 2004 (*Chris Gibbins*). Same bird as Plate 175. **Plate 177.** Unidentified adult gull, Tampere, Finland, 1 August 2004 (*Chris Gibbins*). **Plate 178.** 2 cy *heuglini*, Tampere, Finland, 3 August 2004 (*Chris Gibbins*). **Plate 179.** 2 cy *graellsii/intermedius*, Peniche, Portugal 1 July 2003 (*Chris Gibbins*). **Plate 180.** Unidentified 2 cy gull, Tampere, Finland, 31 July 2004 (*Chris Gibbins*). **Plate 181.** Unidentified 2 cy gull, Tampere, Finland, 1 August 2004 (*Chris Gibbins*).


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## Appendix: Reconstructing the moult history of 3 cy *fuscus*

While the discontinuity in the primaries is undoubtedly obvious in many *fuscus* during the summer of their third calendar year, it may actually result from a contrast between third generation (old outer) and fourth generation (new inner) feathers, rather than second and third generation ones as conventionally thought (Annika Forsten, *pers. comm*.). If this is the case, the moult strategy can be reconstructed as follows. A bird would arrive back on the wintering grounds in the autumn of its second calendar year with the set of second generation primaries used to make southward journey; at least some and possibly the majority of these feathers would also have been used to make the northward journey the previous spring. These second generation feathers are therefore unlikely to stand the equatorial sun for a whole winter and so are all moulted out in the autumn, leaving the bird with a full set of third generation primaries. These are kept through the winter. Another moult then begins in the spring of the bird's third calendar year, bringing in fourth generation feathers. It is this moult that is suspended prior to the northward migration, leaving the discontinuity present in many 3 cy birds. A number of points support this theory. First, it means that the outer primaries in the wing of 3 cy *fuscus* seen in, say, July have only been used for one (a northward) migration and been in place for 7-9 months. Conversely, if the discontinuity on a July bird was between second and third generation primaries, then the second generation outer primaries could have been in place for up to 16 months and have carried the bird on three migrations (south-north in the spring of its 2nd cy, north-south in the autumn of its 2nd cy and then south-north again in the spring of its 3rd cy). This feather age and use in three long migrations could be expected to leave the primaries excessively worn, which is not the case on most birds seen in Finland (e.g. Plate 152). Second, it would help explain why some 3 cy *fuscus* seen in Northern Europe have a mirror on P10: i.e. this would be a third generation feather rather than a second generation one. Finally, if the discontinuity was between second and third generation feathers, then 2 cy birds arriving on the wintering grounds in the autumn (typically October) would moult only some of their primaries before the northward migration the following spring (probably March–April). This is a very slow rate, equating approximately to one feather per month. These points suggest that *fuscus* may undergo a full and then a partial primary moult while on the wintering grounds, with 3 cy birds arriving back with a contrast between third and fourth generation primaries rather than second and third generation ones. This is a logical interpretation of moult stage and patterns of wear observed on many 2 and 3 cy birds in Finland during the summer months. Unfortunately, because of the paucity of sample material from the wintering grounds, our knowledge of the pattern of moult is incomplete. Consequently, although these interpretations make sense, the ages of the feathers producing the discontinuity in the primaries of summer 3 cy *fuscus* remains open to question.

It is also worth noting that those 2 cy *fuscus* that only commence their first primary moult upon reaching the breeding grounds in the summer (a minority of birds) may follow a different (slower) moult pattern through to the summer of their third calendar year. Again we can only really speculate as to the possible reasons for this (maybe they winter further north?). Moreover, the moult followed by those birds that commence their second primary moult in the late summer of their second calendar year (i.e. those birds that have dropped their inner one or two second generation primaries by the time they migrate south) may also be different. The reality is that studies from the wintering areas are needed before we can be sure about the ages of the primaries in summer 3 cy *fuscus*. In particular, it remains unclear how, for an individual bird, the time of its first primary moult affects subsequent moults, and hence, its appearance during the summer of its third calendar year.