

their juvenile feathers shortly after fledging in July-August. In September-October (occasionally into November), birds were observed in complete, rather fresh juvenile plumage. These birds are assumed to be migrants from more northerly populations (plate 176) (Jonsson 1998, Gruber 1999, Rauste 1999).

During December to early February, wintering birds photographed in Morocco did not show signs of moult but from the end of February onwards, many birds were moulting juvenile feathers again. Apparently even birds that may have suspended their moult twice – during migration and mid winter – continue moulting where they stopped.

During the spring of their second calendar-year, Lesser Black-backed Gulls arrive in the Netherlands with the first moult arrested at widely differing stages. Of the colour-ringed birds observed, the most advanced *graellsii* had replaced all scapulars and about half of its coverts but no tail-feathers. Birds belonging to this taxon more typically had replaced just the scapulars and sometimes some wing-coverts. All known *intermedius* were more advanced, having replaced at least two-thirds of the coverts. Only one out of six of these birds had not replaced any tail-feathers, and the most advanced had replaced all of its tail-feathers and a few inner secondaries. The remainder showed a variable number of moulted tail-feathers and mostly new coverts.

From mid-May onwards, birds with new tail-feathers were numerous, and birds showing completely renewed tails were easy to find. Also, even more extensive moult patterns were observed as several birds showed a number of replaced secondaries, or even primaries, although these latter birds were scarce. Typically, at most a few 10s of birds with new primaries were observed during a single spring among several 1000s of birds in this age class.

All moult shown by the Lesser Black-backed Gulls birds observed seems to be part of a single 'round of replacement', with no feathers apparently being replaced twice. All this moult is thus best regarded as belonging to a single moult. Traditionally, the moult performed during the late winter and early spring of the second calendar-year has been regarded as a separate moult, the moult into first-summer plumage. Based on my observations, I found no confirmation of this view.

When the variation in the extent of the first moult in the upperparts (ie, back, tail and upperwing) is considered, all patterns observed form a continuum fitting a front-to-back and inside-out sequence of replacement, in which the front-to-back (mantle to tail) and inside-out line (scapulars to primaries) develop more or less simultaneously. This sequence is similar to that of the 'post-juvenile moult' of many bird species. It should be noted, however, that this sequence is largely inferred from birds showing arrested moult in spring. I lack

184 Lesser Black-backed Gulls / Kleine Mantelmeeuwen *Larus fuscus* and European Herring Gulls / Zilvermeeuwen *L. argentatus*, Wijster, Drenthe, Netherlands, 10 June 2000 (Theo Bakker). On second calendar-year Lesser Black-backed Gull, all visible feathers moulted, except outer two primaries and their coverts. Plumage rather typical for birds observed with this moult pattern.





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185 Lesser Black-backed Gulls / Kleine Mantelmeeuwen *Larus fuscus*, second calendar-year, Wijster, Drenthe, Netherlands, 10 June 2001 (*Rik Winters*). *Intermedius*-type. No signs of active moult on rather late date and only few lesser coverts and all visible primaries retained juvenile. Plumage overall rather *fuscus*-like. **186** Lesser Black-backed Gull / Kleine Mantelmeeuw *Larus fuscus*, second calendar-year, Terschelling, Friesland, Netherlands, 17 June 2000 (*Theo Bakker*). *Intermedius*-type. Most coverts moulted but visible tail-feathers and primaries juvenile. **187** Lesser Black-backed Gull / Kleine Mantelmeeuw *Larus fuscus*, second calendar-year, Terschelling, Friesland, Netherlands, 17 June 2000 (*Theo Bakker*). Same bird as in plate 186. Note renewed median tail-feathers, but no active tail moult. **188** Lesser Black-backed Gull / Kleine Mantelmeeuw *Larus fuscus*, second calendar-year, Wijster, Drenthe, Netherlands, 18 June 2000 (*Rik Winters*). Note all coverts and tail renewed but primaries retained juvenile.

information on actively moulting *intermedius* and *fuscus* during their first winter, so it is unknown whether the tracts are actually renewed following this sequence or whether the feathers have been replaced more or less simultaneously during a rapid moult of a sometimes limited temporal extent.

The replacement of the underwing-coverts seems to run more or less simultaneously with the moulting of the upperwing-coverts. New tail-feathers were not observed before the spring of the second calendar-year and were found on birds that had renewed at least two thirds of the wing-coverts. Secondaries were moulted only following the moult of all previously mentioned tracts. Remarkably, however, the few birds observed that had partially replaced their secondaries had apparently started moulting this tract from the inside out.

Primary moult during the first winter is somewhat ambiguous: all birds observed in the Netherlands that showed (any number of) new primaries had moulted all other feathers, and some birds had replaced all feathers except the primaries and their coverts, suggesting that the primaries are the last tract to be replaced in a sequential scheme. Photographs of one (first-winter) bird in South Africa in winter, however, show simultaneous moult in the primaries and other feather tracts, resulting in a plumage with new primaries and juvenile feathers in other tracts.

From my observations, it is unclear whether or not birds with partially replaced primaries complete this moult after arresting it during migration, although at least three birds resumed moulting this tract after arresting moult during migration. These birds had all renew-



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189 'Lesser black-backed gull' / 'kleine mantelmeeuw' *Larus fuscus/heuglini*, second calendar-year, Wijster, Drenthe, Netherlands, 24 June 2000 (Theo Bakker). Suspected to be *intermedius*. Moult and plumage rather typical for late arriving birds. Note rather pale plumage, upperparts lacking any obvious markings, and all coverts and tertials renewed, but primaries juvenile. **190** 'Lesser black-backed gull' / 'kleine mantelmeeuw' *Larus fuscus/heuglini*, second calendar-year, Wijster, Drenthe, Netherlands, 24 June 2000 (Theo Bakker). Suspected to be *intermedius*. Same bird as in plate 189. Note new tail and all secondaries but one replaced. Status of primary moult somewhat ambiguous: p1-2 second generation and nearly fully grown, p3 missing, p4-10 juvenile, suggesting primary moult arrested during migration. Rather pale underwing typical for this type of birds. Moult pattern unproven for *intermedius*, very atypical for *fuscus*, but similar patterns known from *heuglini*. **191** Lesser Black-backed Gull / Kleine Mantelmeeuw *Larus fuscus*, second calendar-year, Wijster, Drenthe, Netherlands, 7 July 2000 (Rik Winters) **192** Lesser Black-backed Gull / Kleine Mantelmeeuw *Larus fuscus*, second calendar-year, Wijster, Drenthe, Netherlands, 7 July 2001 (Rik Winters). *Intermedius*-type. Note both coverts and scapulars show mix of new brown grey, rather plain feathers and worn brown and pale, but non-juvenile feathers.

ed about half their primaries before arrival and resumed moult by dropping the innermost juvenile primary. The birds with partially renewed primaries were also the only ones that showed active first moult during late spring.

Among Lesser Black-backed Gulls, moulting primaries during the first winter has, as yet, only been proven to occur in *fuscus* and this seems to be the only moult pattern that exclusively occurs in this taxon. On the other hand, *intermedius* has a much more extensive first moult than previously believed, strongly narrowing the gap with *fuscus*.

Altogether, all birds seem to perform the same

moult, but at different times and locations and of varying extent. From this point of view, the complete moult of many *fuscus* during the first winter is best regarded as a 'normal' but exceptionally extensive first moult rather than a time-shifted complete moult. It is the extreme in a continuous chain of moult patterns of which typical *graellsii* forms the other end.

Second moult

During the spring/summer of the second calendar-year all birds start their second moult. The shared feature of this moult is that it is started by dropping the inner primary and some upper scapulars, irrespective of