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Introduction

Geographical scope of this book

This book deals with all gull taxa that have been recorded in the wider Western Palearctic at least once. The ‘wider Western Palearctic’ is defined in the *Handbook of Western Palearctic Birds* (Shirihai and Svensson 2018) as the area covering Europe (including European Russia west of the Ural Mountains and the Caspian Sea), Asia Minor, the Middle East, North Africa (Morocco, western Sahara, Algeria, Tunisia, Libya, and Egypt), Iran, and the Arabian Peninsula. Also included are the Cape Verde Islands, Azores, Canary Islands, Madeira, Iceland, Jan Mayen, Svalbard, and Franz Josef Land.

Taxonomy

In general, the taxonomy in this book follows that of the International Ornithological Committee (IOC; www.worldbirdnames.org), with two notable exceptions:

- Short-billed Gull *Larus brachyrhynchus*. Referring back to Zink et al. (1995)¹, the IOC stated that DNA of *brachyrhynchus* has been compared only with that of *kamtschatschensis*, but this is incorrect. There are several more recent references in which the DNA of all Common Gull taxa is compared with that of *brachyrhynchus* and in which the genetic distinctiveness of the latter is confirmed (Johnsen et al. 2010; Sternkopf 2011; Kwon et al. 2012; Sonsthagen et al. 2012). Short-billed Gull is also morphologically and vocally distinct (Adriaens and Gibbins 2016) and we therefore treat it as a full species.
- Thayer’s Gull *Larus thayeri*. This taxon has a checkered taxonomic history and has recently been ‘downgraded’ to a subspecies of Iceland Gull *Larus glaucooides* by the North American

Classification Committee. The IOC World Bird List now includes it as *Larus glaucooides thayeri*. We question this decision, however, since we have not seen any strong evidence that these two taxa (nominate *glaucooides* and *thayeri*) behave like subspecies; large-scale interbreeding has not been demonstrated, not even with the intermediate taxon *kumlieni*. On the other hand, field studies have indicated clear morphological differences between all three taxa (Howell and Elliott 2001; Howell and Mactavish 2003; Howell and Dunn 2007; Gibbins and Garner 2013) as well as vocal differences (Pieplow 2017). None of these references were mentioned in the NACC proposal. The three taxa also have separate breeding ranges, wintering ranges, and migration routes. The differences in morphology, vocalisations, and distribution are differences that are expected between species, not subspecies, and we have therefore maintained Thayer’s Gull as a full species.

How to identify gulls

Gulls can be a challenging group of birds to identify. To the untrained eye they all look alike, yet, at the same time, in the case of the large gulls, one could say that no two birds look the same! It is true that most gulls give either a white and grey impression or a brown one, and that the key field marks can be subtle and variable. Then again, the number of species is relatively small; for example, this book deals with 34 species (and 10 subspecies), of which only 12 are regular in Western Europe. Geographic location already limits the number of possible candidates for that difficult gull that you are looking at. Also, gulls often flock together, which means that odd birds can often be compared with the gulls next to it. There is no denying, however, that gull identification can be difficult, and that is particularly true for the so-called ‘large white-headed gulls’.

There are several reasons why identification of large white-headed gulls can be challenging but inspiring at the same time:

- The different taxa have evolved relatively recently. Gull taxonomy is still in its infancy, and visible differences between the species are often subtle and sometimes not well understood. Then again, this means that all observations of gulls may contribute to our general knowledge about this group.

1. As of July 2021, IOC have accepted the split between Short-billed and Common Gull.

SMALL	MEDIUM-SIZED	LARGE	
Black-headed Gull	Black-legged Kittiwake	American Herring Gull	Lesser Black-backed Gull – <i>graellsii/intermedius</i>
Bonaparte's Gull	Common Gull – <i>canus</i>	Armenian Gull	
Brown-headed Gull	Common Gull – <i>heinei</i>	Audouin's Gull	Lesser Black-backed Gull – <i>heuglini</i> ('Heuglin's Gull')
Franklin's Gull	Common Gull – <i>kamtschatschensis</i>	Caspian Gull	
Grey-headed Gull	Ivory Gull	European Herring Gull	Pallas's Gull
Laughing Gull	Relict Gull	Glaucous Gull	Slaty-backed Gull
Little Gull	Ring-billed Gull	Glaucous-winged Gull	Thayer's Gull
Mediterranean Gull	Short-billed Gull	Great Black-backed Gull	Vega Gull
Ross's Gull	Sooty Gull	Iceland Gull – <i>glaucoides</i>	Yellow-legged Gull – <i>atlantis</i> ('Azores Gull')
Sabine's Gull	White-eyed Gull	Iceland Gull – <i>kumlieni</i> ('Kumlien's Gull')	Yellow-legged Gull – <i>lusitanicus</i> ('Cantabrian Yellow-legged Gull')
Slender-billed Gull		Kelp Gull	Yellow-legged Gull – <i>michahellis</i>
		Lesser Black-backed Gull – <i>barabensis</i> ('Steppe Gull')	
		Lesser Black-backed Gull – <i>fuscus</i> ('Baltic Gull')	

Table 1. Classification of the gull taxa treated in this book according to size category

- Another consequence of their recent taxonomic evolution is that some species may hybridise in certain areas on a fairly regular basis, and that hybrids may be fertile makes identification even more fun.
- Large gulls take several years (3–5) to acquire their adult plumage. Simply speaking, their plumage gradually and slowly evolves from all-brown to white with grey and/or black throughout the years. Their general aspect therefore varies not only according to species but also with age. The often slow and protracted transitions from one plumage to the next make gulls an excellent subject for learning about moult in birds.
- There is also extensive regional variation in most species. Such subtle but extensive regional variation is fascinating because it often allows for guessing the origin of the bird.
- Adult and subadult birds do not have many identification features, and they may be more difficult to identify than younger birds (contrary to popular belief). The primary pattern is one of the main features, but it is more easily studied from photographs than in the field.
- In addition, there is a lot of individual variation within each species. The plumage varies so extensively that in some cases two individuals of the

same age and same species may look completely different. As a result, all plumage features overlap with those of similar species, and identification will not normally be possible on the basis of a single feature only. Careful examination of plumage details will therefore be necessary (feather group by feather group), and identification should be based on a combination of as many characters as possible. The good news is that gulls are often quite approachable and lend themselves well to such detailed study. Also, the seemingly endless variation means that you never get bored looking at gulls!

So where to start? How do you learn to identify gulls? The key elements here are patience and practice. Take the time to become familiar with your local gulls, to gain experience and study their variable plumages. Once you really know the common birds, it becomes easier to spot the odd one out. Don't be afraid to make mistakes, since that is an inevitable part of gaining experience. Rest assured that nobody in the world can correctly identify each and every gull that they come across.

Identifying gulls is a step-by-step process. The first step is to assign the gull to the right size category. There are small gulls, medium-sized gulls, and large gulls.

Smaller gulls

This group includes one of the most familiar and abundant gulls in Eurasia, the Black-headed Gull. This species is slightly bigger than a feral pigeon, though with a clearly larger wingspan. The species in this group are listed in **Table 1**. They are all roughly comparable in size, while Little Gull is the smallest. Most of these species show a dark hood in breeding plumage and a dark ear spot or other dark head markings in nonbreeding plumages. Most are also characterised by showing more white than black on the outer wing. In flight, they are agile and more quickly manoeuvrable than larger gulls, and their wingbeats are faster.

Medium-sized gulls

The most familiar species representing this group is Common Gull, which is approximately one head bigger than Black-headed Gull. Sooty and White-eyed Gulls are outliers having dark plumage with dark head in all plumages, but the other species in this group lack strong head markings and show relatively pale plumage with a small, at least partly yellowish bill (when adult). With the exception of Ivory Gull, all species in this group show black wingtips.



Plate 1. A quick glance is enough to see that the bird in the foreground, right, looks different from the two Black-headed Gulls to the left; overall, it appears whiter and bulkier. This quick, holistic view may be enough to suspect it is a Mediterranean Gull. A closer, more analytical look reveals white instead of largely black wingtips, a differently shaped hood, and a stronger, brighter red bill, which confirm the identification. This bird was ringed in Poland. Belgium, 25 March 2008 (Peter Adriaens)



Plate 2. Even at a cursory glance, the central gull in this small flock looks 'different': its white head and breast stand out like a sore thumb when compared with the brown gulls left and right of it. A brief, holistic view is therefore enough to suspect that it may be a different species. However, closer scrutiny and an analytical approach are needed to make sure that the perceived difference is not due just to bleaching or a different age class. Bill shape and the pattern of the wing coverts, tertials, and scapulars confirm that the central bird is a (first-cycle)* Caspian Gull; the birds immediately left and right are (first-cycle) European Herring Gulls. The Netherlands, 1 March 2020 (Mars Muusse)

* See the glossary on p.12 and age terminology on p.13.

Large gulls

All the other species in this book can be considered large gulls, with European Herring Gull as their main representative. They are clearly larger and bulkier than Common Gull, with an obviously heavier bill. With the exception of Audouin's Gull, which has a red bill, all species in this group are characterised by a yellow bill with red spot on the gonyx when adult. All show a white head in breeding plumage, except for Pallas's Gull, which has a black hood. The wingtip can be all white (Glaucous and Iceland Gull), but in most species it is mainly black.

Holistic versus analytical approach

Some recent books on bird identification have put strong emphasis on a holistic approach, in which they recommend looking at the whole bird rather than studying its plumage part by part. This kind of birding by impression rather than by analysis is advocated in, for instance, the recent *Gulls Simplified* (Dunne and Karlson 2018). As described above, assigning the bird to the right size category is an example of a holistic approach. So which one is best, identifying the bird by impression, or by careful study of its feathers? With gulls the answer is: you need to do both, and in the right order.

The first step consists of putting the bird into the right size category. Assessing the whole bird is the second step in the identification process. Compare its

size and shape to the gulls next to it. Do you see any subtle differences? Does it have a slightly stouter bill? A bulkier body with shorter rear end? A different head shape? Also look at the overall colour of the plumage, for example, the grey tone of the upperparts. In immature large gulls, which often look mainly brown, try to assess the amount of contrast in the plumage, for example, between the upperparts and underparts, or between the upperparts and head. The holistic step often seems easier to many people, since it requires no memorisation of plumage details. However, it is also very prone to error. For instance, a juvenile Lesser Black-backed Gull can easily give the impression of a Yellow-legged Gull, and vice versa.

The third and final step consists of plumage analysis. It involves looking at the plumage in detail, feather group by feather group. Especially when trying to identify immature large gulls this is an essential step. The field marks of immature large gulls are like pieces of a puzzle, and all pieces may be needed to solve it. This is where knowledge of topography, ageing, and moult comes in. In adult large gulls, plumage analysis often means studying the primary pattern, which is easiest from photographs of the bird in flight. However, useful information can often be gleaned from looking at the underside of the wingtip on a perched bird (Plate 3).

We have tried to make this final step of identification easier by indicating important field marks on the photos themselves and captioning them.

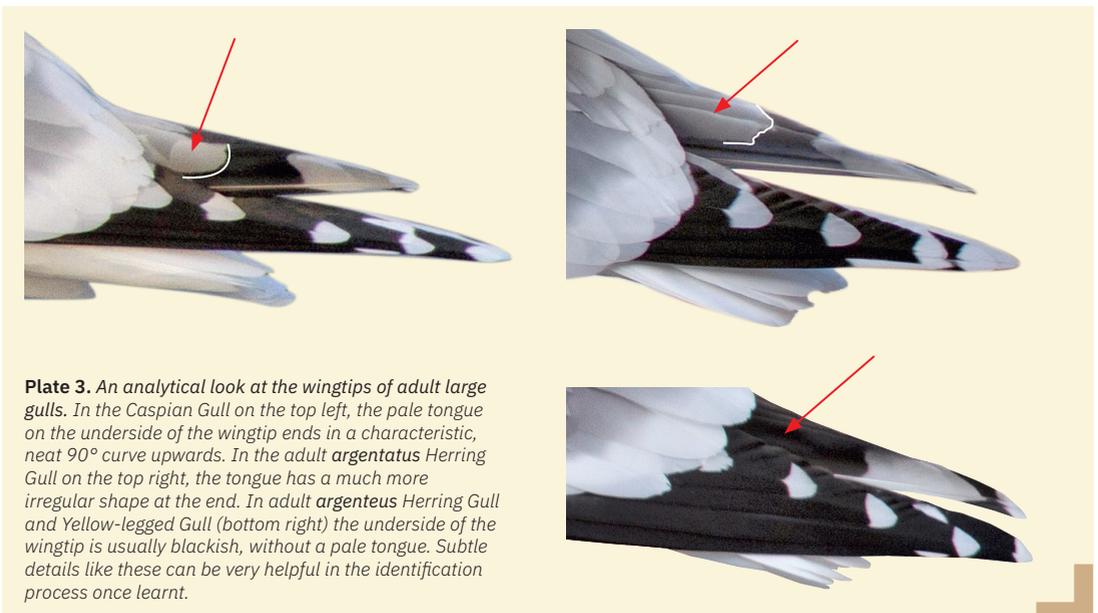


Plate 4. Adult Yellow-legged Gull, Portugal, 16 November 2018. In many gulls the secondaries are not visible at rest because they are completely covered by the greater coverts, but here their white tips extend just beyond these coverts. Note that the first primary past the tertials on a full-grown wing is usually P6.

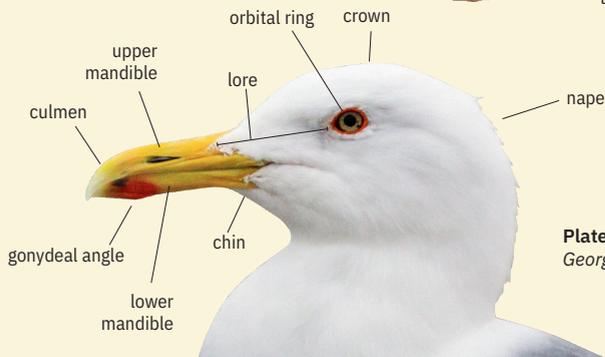
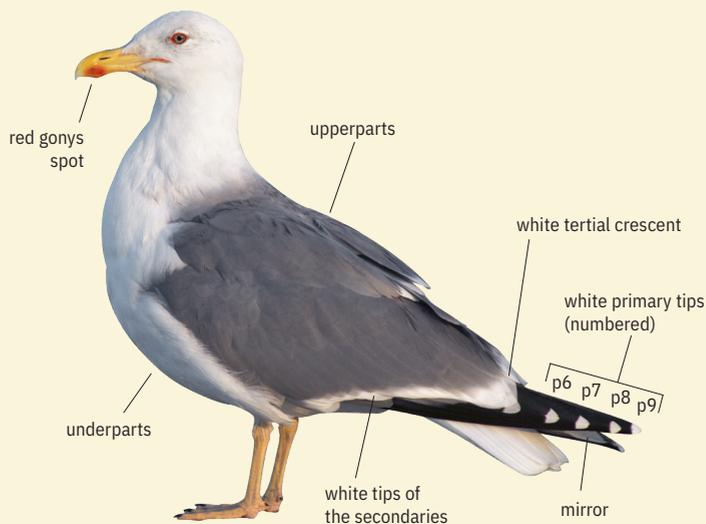


Plate 5. Head of an adult Caspian Gull, Georgia, 30 January 2014.

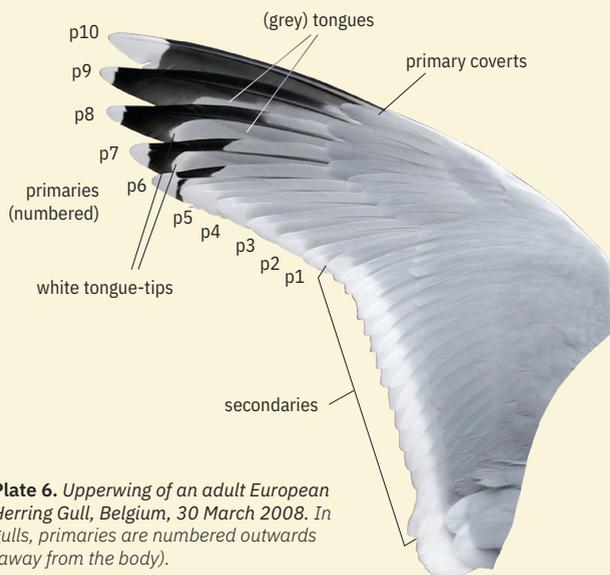


Plate 6. Upperwing of an adult European Herring Gull, Belgium, 30 March 2008. In gulls, primaries are numbered outwards (away from the body).



Plate 7. Underwing of an adult Thayer's Gull, California, USA, 28 January 2011. A dark medial band is an important field mark in some gulls like Thayer's Gull and Caspian Gull.

(Birds not to scale)

Plate 8. First-cycle Common Gull, Netherlands, 24 November 2019.

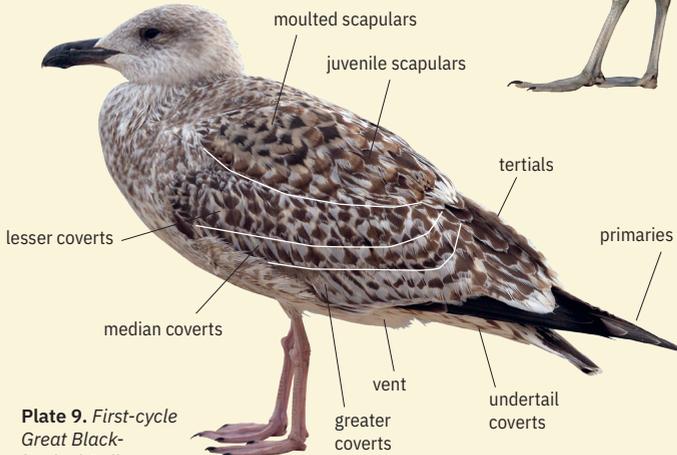
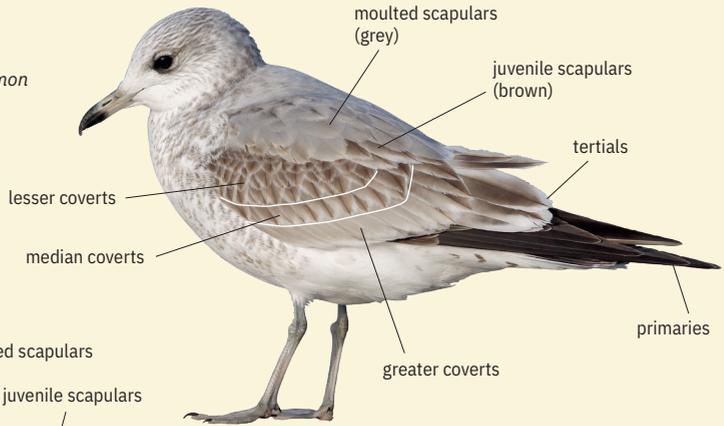


Plate 9. First-cycle Great Black-backed Gull, Portugal, 7 December 2016.

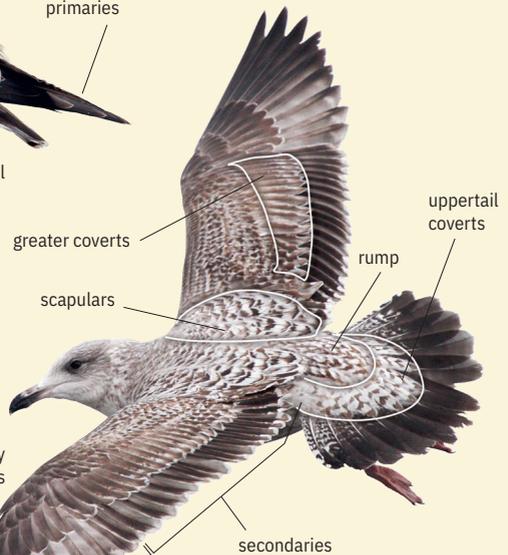


Plate 10. First-cycle European Herring Gull, Boulogne, France, 5 March 2016. An individual with unusually dark tail.

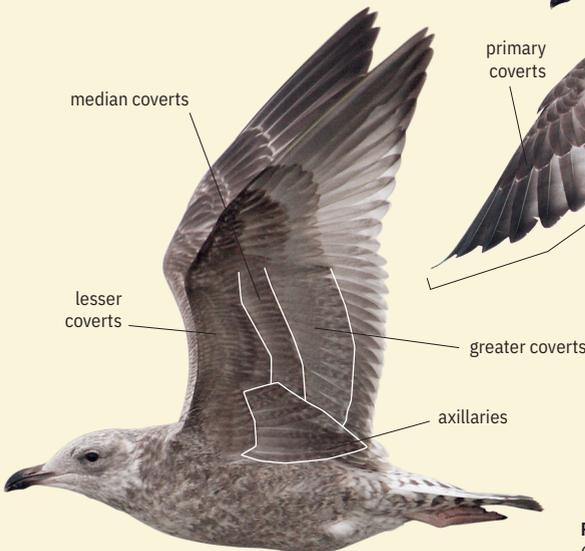


Plate 11. First-cycle European Herring Gull, Belgium, 11 October 2009.

Glossary of topographical terms

arrested moult a complete moult that stops before it is completed and is not resumed later on. Typically, the moult stops when new feathers are fully grown; there are no obvious moult gaps

axillaries the feathers in the armpit, at the base of the underwing (Plate 11)

backcross offspring of a hybrid and a pure individual of one of the hybrid's parent species

chin the part of the head immediately below the base of the lower mandible (Plate 5)

complete moult a moult that involves the whole plumage, including primaries and primary coverts

crescent something shaped like a crescent moon

crown the top part of the head

culmen the dorsal ridge of the upper mandible (Plate 5)

cycle approximately one-year period extending from one complete moult to the following complete moult (i.e., when the innermost primary has been dropped); typically runs from one spring to the following spring

ear coverts small feathers behind the bird's eye which cover the ear opening

ear-spot a dark spot behind the eye, as seen for example in nonbreeding Black-headed Gull

eyelids the movable folds of skin and muscle that can be closed over the eyeball

gape the side of the mouth

gonydeal angle the angular expansion on the lower ridge of the lower mandible (Plate 5)

gonys the prominent ridge along the line of union of the two halves of the lower mandible

greater coverts the largest wing coverts. In a perched bird they are located between the tertials and the flank (Plate 8; Plate 9); in a flying bird they can be seen on the inner wing, on top of the secondaries (on both upper-

and underwing) (Plate 10; Plate 11)

hand (on spread wings), the outermost, backward-angled portion of a bird's wing, consisting of the carpal area, primary coverts, and primaries

hindneck the lower rear part of the neck, close to the mantle

hood a dark colour that covers the head and sometimes neck, and that is conspicuously different from the rest of the body

immature all of the non-adult plumages, from juvenile to subadult

juvenile the first plumage acquired when all of the downy feathers have been replaced by 'real' feathers

lesser coverts the smallest wing coverts, located between the scapulars and median coverts in a perched bird (Plate 8; Plate 9), and along the front of the arm in flight. Unlike the greater and median coverts there are several rows of lesser coverts

lore the area between the eye and bill (Plate 5)

malar the part of the head immediately below the gape; also 'cheek'

mandible either the upper or lower part of the bill of a bird (Plate 5)

mantle the top part of the body, between the hindneck and scapulars

medial band a dark band crossing the pale areas of a feather (Plate 7)

median coverts the row of coverts between the greater and lesser coverts (Plate 8; Plate 9)

mirror a white subterminal spot on the outermost primaries (Plate 6). It is usually surrounded by black, but in some birds the white mirror merges with the white primary tip

nape the rear of the head (Plate 5)

orbital ring a ring of bare skin immediately surrounding a bird's eye (Plate 5). Not to be confused with eye-ring, which consists of tiny feathers that surround the orbital ring

partial moult a moult that involves only parts of the plumage, often only the body contour feathers

prebreeding moult a moult conducted sometime between the autumn migration and the spring migration, generally on the wintering grounds

post-juvenile moult the first partial moult after fledging, in which the juvenile scapulars are replaced

primaries the outer flight feathers of the wing, which are attached to the fused bones of the bird's 'hand' (Plate 6). Gulls have 11 primaries, but only 10 are visible in the field. Primaries in gulls are numbered outwards; that is, P1 is closest to the body and P10 is the outermost visible feather

primary coverts the feathers covering the bases of the primaries (Plate 6)

primary projection the extension of the primaries beyond the tertials in a perched bird. Not to be confused with wing projection (which see). Beware that moulting birds may lack their outermost primaries and thus exhibit a much shorter primary projection than usual

primary tip the very tip of the primary. In adult gulls, this tip is often white (Plate 7)

rectrices tail feathers

remiges the flight feathers of the wing: the primaries, secondaries, and tertials

retarded plumage plumage that looks more immature than usual. Note that the immature look is most likely the result of a retarded hormonal state of the bird, not delayed moult. Healthy gulls replace their entire plumage annually; they do not skip a moult. There are a few exceptions, but after the annual complete moult, gulls as a rule do not retain feathers from a previous plumage or cycle. Even though the plumage of some birds can look more retarded than that in other birds of the same age, in reality it is just as old. Conversely, advanced plumages also occur, in which birds look older, more adult-like than they really are

rump the part of the body immediately above the tail

scapulars body feathers that cover the top of the wing when the bird is at rest; 'shoulder feathers'

secondaries inner flight feathers of the wing, located on the 'arm' of the bird.

These feathers form the trailing edge of the wing between the primaries and the body

secondary skirt part of the secondaries extending beyond the greater coverts on folded wing

shaft the stem or central axis of a feather

stepwise moult the presence of more than one moult wave within the same set of primaries

string of pearls a string of rounded white subterminal spots across the outer primaries, formed by the white tongue-tips (as in, e.g., adult Slaty-backed Gull)

subadult a bird that is not fully adult yet, but shows very similar plumage

suspended moult a complete moult that stops before it is completed, but is resumed later on

tarsus part of the leg between knee and foot

tertials the innermost secondaries, adjacent to the body on the spread

wing; prominent on folded wing, with primaries projecting beyond them (Plate 8; Plate 9)

throat part of the head between the chin and neck

tibia part of the leg above the knee

tongue on a feather: a pale (usually grey) wedge into the black pattern of the outer primaries. Tongues are usually restricted to the inner webs of the primaries and therefore most visible on underwing

tongue-tip the point at which the tongue reaches the subterminal black pattern on primaries. In many (sub) adult gulls, most tongue-tips are white (Plate 6)

underparts the lower parts of the body, including breast, belly, flanks, vent, and undertail coverts

undertail coverts the feathers covering the underside of the tail base

upperparts the upper parts of the body, including mantle, scapulars, back, rump, and uppertail coverts

uppertail coverts the feathers covering the upperside of the tail base

vent the part of the body between the undertail coverts and belly. In a standing bird, it is often the area immediately behind the legs

web the part of the feather on either side of the shaft. The inner web is closest to the body, while the outer web is away from the body. On a spread wing, the outer webs of the flight feathers cover most of the inner webs; therefore, on the upperwing it is mainly the outer webs that are visible, while on the underwing it is mainly the inner webs

window refers to the inner primaries when they form a pale patch between dark outer primaries and dark secondaries

wing coverts the contour feathers that cover the bases of the flight feathers of the wing

wing projection the extension of the primaries beyond the tail in a perched bird. Not to be confused with primary projection

Topography

Studying a gull's plumage is possible only if the important parts of that plumage can be named. On the upperparts and, especially, wings, the feathers are arranged in rows, and each row has its own name. The outermost, longest feathers (primaries) of the wing can also be conveniently numbered. This is normally done from the inside out, with 1 being the innermost primary and 10 the outermost visible one.

Ageing

Ageing is a helpful step in the process of gull identification. In the small gulls it is relatively straightforward because these species take only one year to attain an adult-like plumage. Also, the immature plumages are clearly different from adult plumages. Large gulls, however, take about 4–5 years to mature, and they replace feathers almost continuously. This makes the characters that may be useful for ageing tremendously variable. In addition,

identification characters such as colour of the bare parts and pattern of scapulars and wing coverts may depend on the hormonal state of the bird, not just on its age.

In this book we avoid lengthy descriptions of age criteria in the species chapters. We focus primarily on identification features, and while we fully acknowledge that ageing is important, we feel that in many cases it is not essential. Instead, we present general guidelines on determining age here.

Age terminology

(For a comprehensive overview, see the section on moult cycles in gulls on p.19.) We use the term 'cycle' to describe age classes. This term helps to avoid problems with using calendar years or terms such as 'first-winter', 'second-winter', etc. Large gulls do not abruptly change their plumages but have rather continuous, protracted moults that can last for 6 months or more. It is not always realistic to divide their plumages into separate winter and summer plumages, since these birds are in transition from one plumage

to the next for much of their lives. We have therefore adopted the cycle terminology, which has the added benefit that it can be used to describe age across both hemispheres. A first-cycle bird is a first-cycle bird, whether it lives north or south of the equator. Simply put, 'first cycle' is more or less synonymous with the first 12 months in gulls, 'second cycle' with 'second year' and so on, but the cycle terminology is better defined. A plumage cycle runs from a given plumage or complete moult to the next occurrence of a complete moult. The first cycle starts with juvenile plumage, the second with the onset of the complete moult in the bird's second calendar year, and so on. The start of a complete moult is indicated by the replacement of the innermost primary. Over the next 12 months, the plumage changes slowly but dramatically, especially in immature birds. In fact, when you compare birds in May of one year to birds in March of the next year, the plumage may be completely different, though technically it still occurs within the same cycle. In most gulls, a cycle consists of one complete moult (into nonbreeding plumage) and one or two partial moults. One important caveat that should be added here is that several taxa in this book may replace a number of flight feathers twice during their annual cycle, including the inner primaries: once during the complete, postbreeding moult, and once during an extensive prebreeding moult. The latter is not considered the start of a new moult cycle, since it is a second moult in the annual cycle and is not complete in all birds.

Ageing the small gulls

In their first cycle, small gulls can be readily aged by their brown lesser and median upperwing coverts, dark tertial centres, black tail band, dark secondaries (except in Ross's and Sabine's Gulls), and dark pattern on the primary coverts. Adults have plain grey upperwing coverts and tertials (the latter with white tips), white tail, and pale secondaries, and, except for Sabine's Gull, they lack dark markings on the primary coverts. Mediterranean Gull and Little Gull have distinct second-cycle plumages, similar to adults, but with a variable amount of black on the outer primaries. In all other small gulls the second-cycle plumages are (nearly) identical to those of the adult, and their identification is therefore not discussed separately here.

First-cycle Laughing and Mediterranean Gulls replace wing coverts rather early with fresh grey feathers, which make the plumage look superficially

similar to adult. The odd Slender-billed and, rarely, Black-headed Gull may also replace wing coverts during the post-juvenile moult. Such birds can still easily be aged in flight when they reveal the black tail band, dark secondaries, and dark pattern on the primary coverts.

Some Brown-headed and Grey-headed Gulls may undergo an extensive partial moult during their first cycle, resulting in an advanced plumage in spring with plain grey wing coverts, tertials, and secondaries, as well as an all-white tail. At rest, such birds may look very much like adults, but most will show a dark iris (pale in adults), and in flight they will reveal a dark pattern on the primary coverts.

Two exceptions in this group are Sabine's Gull and Franklin's Gull. These species have a (nearly) complete moult already during their first cycle. As a result, they attain adult-like plumage much sooner. First-nonbreeding Sabine's Gulls show plain grey upperwing coverts and white tail, and can only be told from nonbreeding adults if their bill tip is dark instead of yellow. In Franklin's Gull, it is the first-breeding plumage that is similar to adult, but with more extensive black pattern on the outer primaries and no white mirrors. Also, the white band across the outer primaries is lacking.

An unresolved question is whether adult Franklin's Gulls always show a white mirror on the outermost primary. Given the large amount of white in the wings of adult birds, we suspect that they do. In this book, any adult-looking bird that lacks the mirror on P10 is therefore labelled as 'second-cycle type'. It is hoped that future research, such as the colour-ringing of pulli in breeding colonies, will shed more light on this issue.

Ageing the medium-sized gulls

Except for Ivory Gull, birds from this group can be categorised into three age classes: first cycle, second cycle, and adult. The differences between the age classes are relatively clear, due to distinct patterns on the wing coverts, tail, and outer wing.

First-cycle Black-legged Kittiwake is easily aged by its black bar on the upperwing coverts, black tertial centres, black collar on hindneck, black tail band, and large, whitish wing panel. Adults have grey wings, small black wingtips, and a clean white tail. Second-cycle birds differ only subtly from adult by showing dark markings on the primary coverts, among other characters.

Plate 12. *Wingtips of second-cycle (left) and adult Common Gull (right). The folded wingtip is a useful feature for ageing; second-cycle birds lack the bold white tips on the longer (i.e., outermost) primaries.*



In Common, Short-billed, and Ring-billed Gulls, first-cycle birds show brown lesser and median upperwing coverts, dark tertial centres, dark secondaries, and black tail band. In adults, the wings are plain grey with broad white trailing edge, the wingtips are black with white mirrors and primary tips, and the tail is all white. Second-cycle birds differ from adults in showing narrower white tertial crescent, blackish marks on the primary coverts, smaller white mirrors, and in lacking a white tip on P8–P9. Some birds show remnants of the black tail band. A few birds looking almost identical to adults but with a little black on the alula or in the primary coverts could be labelled ‘third-cycle types’, but a few fully adult birds (even when more than 20 years old) may retain such immature traits too, and some advanced second-cycle birds can look very similar as well. For identification purposes, it is important to realise that the primary pattern of second-cycle birds (and some retarded third cycle) is not as developed as that of adults and therefore somewhat less useful.

A few second-cycle Common and Short-billed Gulls can show very retarded plumage, with all-brown wing coverts and complete black tail band. Such birds can be similar to first-cycle birds although they usually show a number of advanced, adult-like secondaries (bluish-grey, with broad white tips) and often a bluish tinge on the innermost primaries. The presence of two white mirrors on the wing (on P9–P10) should exclude first-cycle birds, but note that one white mirror (on P10) can be shown by some of the latter, just as in many second-cycle birds. Conversely, mirrors may be lacking (almost) completely in a few second-cycle Kamchatka and Short-billed Gulls. If any juvenile scapulars are retained, this should safely exclude a second-cycle bird. A few first-cycle birds may already show an advanced, adult-like pattern on some of their secondaries and inner primaries, and such birds, when they have already replaced all of their juvenile scapulars, can be near-impossible

to age correctly. If they retain a brown rump they can be more easily told from retarded second-cycle birds, but otherwise ageing comes down to correct assessment of the median and lesser coverts: juvenile feathers have a warm brown centre with a neatly defined pale fringe, while in retarded second-cycle birds the coverts are paler, more washed out, and lacking the solid brown centre. In addition, many second-cycle birds already show a number of plain grey, adult-like lesser coverts.

Sooty and White-eyed Gulls have rather dark plumage throughout their entire life and are therefore less easily aged. First-cycle birds show pale fringes on the brown wing coverts, a dark tail band, and only thin white tips on the secondaries. Adults show plain brown-grey wing coverts and tertials without any hint of pale fringing, an all-white tail, and a broad white trailing edge on the secondaries. In breeding plumage, adults also show a prominent white patch on both sides of the neck. Second-cycle birds are similar to adults, and it is probably best to age only those birds that still retain some black marks on the tail.

Ivory Gull shows only two types of plumage: juvenile (which is spotted black all over) and adult (which is entirely white). During the moult from juvenile to adult, the plumage may be a mixture of white and spotted feathers.

Ageing the large gulls

Two of the most consistent ageing features in the large white-headed gulls are the shape and colour of the primaries. Another important aspect is wear, which can sometimes be used to estimate the age of feathers. Juvenile feathers in particular are less resistant and durable than older feathers. This may even cause an essentially brown gull to become whitish in some parts near the end of its first cycle. Worn feathers show frayed edges and tips, as if they have been eaten by moths.

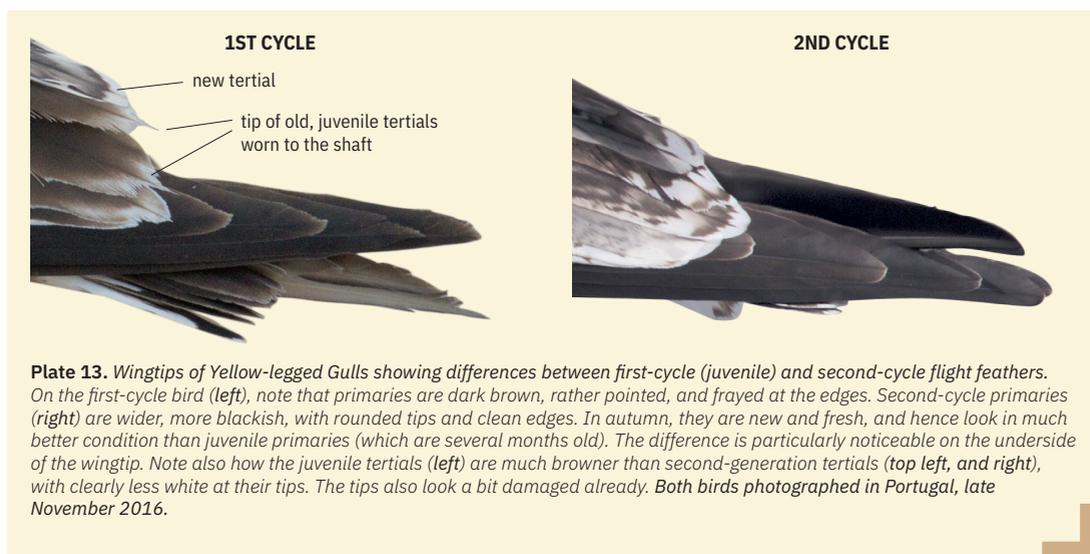


Plate 13. Wingtips of Yellow-legged Gulls showing differences between first-cycle (juvenile) and second-cycle flight feathers. On the first-cycle bird (left), note that primaries are dark brown, rather pointed, and frayed at the edges. Second-cycle primaries (right) are wider, more blackish, with rounded tips and clean edges. In autumn, they are new and fresh, and hence look in much better condition than juvenile primaries (which are several months old). The difference is particularly noticeable on the underside of the wingtip. Note also how the juvenile tertials (left) are much browner than second-generation tertials (top left, and right), with clearly less white at their tips. The tips also look a bit damaged already. Both birds photographed in Portugal, late November 2016.

GENERAL

► First cycle

Juvenile primaries are characterised by their rather thin and pointed shape. They are often also less blackish and more brownish than older primaries (except in the taxa that show white wingtips, of course). The rest of the plumage shows a regular pattern; the greater coverts, for instance, often show neat dark bars that run parallel to one another. The dark tertials have moderately thin, pale tips, whereas the white tertial tips are often clearly wider in the second cycle. The juvenile median and lesser coverts usually have large dark (brown) centres, and this is also true of the juvenile scapulars. New scapulars (acquired during the post-juvenile moult) lack this brown centre and usually show a dark anchor pattern instead. When most of the scapulars have been replaced, they often create the impression of a 'saddle' that contrasts with the juvenile wing coverts, which look less strongly patterned and more worn. The iris remains dark (it may become paler near the end of the first cycle in a few birds), and the bill usually lacks an obvious pale tip.

In some taxa, like Yellow-legged Gull, many birds undergo a rather extensive post-juvenile moult (see 'Moult' below) in which they acquire new wing coverts and tertials that look very much like those in second-cycle birds, and which contrast with any retained brown, juvenile wing coverts. In Kelp Gull

and *graellsii/intermedius* Lesser Black-backed Gull, the post-juvenile moult may even include all tail feathers and secondaries. This may complicate correct ageing, but these new feathers contrast with the retained brown juvenile primaries. The shape and colour of the primaries remain the most reliable age criteria. See also the paragraph about Baltic and Heuglin's Gulls below.

► Second cycle

Second-generation primaries are broader and more rounded than juvenile ones. The outer primaries are blackish (except in the taxa that show white wingtips), while the inner primaries look more dirty greyish or brownish, at least on their inner webs. In some taxa, notably Caspian, Great Black-backed, Scandinavian Herring, and Kumlien's Gull, many birds already show a white mirror on the outermost primary (P10). The plumage looks less regular than in first cycle; the greater coverts may show many thin, dark, wavy bars that converge and diverge (like vermicelli or spaghetti). The tertials show broad whitish tips, and so do the secondaries. Many (but far from all!) birds of this age acquire an adult-like mantle feathers and scapulars, creating a bluish-grey or blackish saddle (depending on the species) that makes them obviously different from first-cycle birds. The bill often has a wide pale tip or may gain some yellow colour, especially towards the end of the second cycle.

Plate 14. Wings of first-cycle (left) and second-cycle Glaucous Gull. Note the thin, dark 'arrowheads' near the tips of the flight feathers on the first-cycle wing. The primaries are also more pointed, and the greater coverts show distinct, parallel barring. Left: Belgium, 7 November 2010; right: Newfoundland, Canada, 1 February 2013.



► Third cycle

The primaries generally differ from second-generation feathers in their bold white tips, visible at rest (except in the taxa that show white wingtips). However, some birds have a more retarded look, and in that case the inner primaries need to be studied: third-generation feathers usually show the same colour as in adults, with broad white tips, while in second cycle they are dirty greyish or brownish without the prominent white tips. A few third-cycle birds look so retarded all over that the colour of the inner primaries may be the only clue to their true age. Generally, though, third-cycle birds have acquired more adult-like wing coverts and tertials than younger birds, as well as rather adult-like bare parts. A few birds may show two white mirrors already on the outer primaries (P9–P10), which is never the case in second cycle. Yet another few birds may look so advanced at this age that they cannot reliably be told from fourth-cycle birds.

► Fourth cycle

As in adult birds, the outer primaries have prominent, rounded white tips and usually at least one mirror (on P10). The rest of the plumage and the bare parts are usually as in adults too, but fourth-cycle birds more often retain immature markings on the primary coverts, on the tail, and near the bill tip. Fourth-cycle birds often show more pigmentation in the primaries than adults. Advanced birds may look very similar to adults, which may occasionally retain immature markings, and in such cases distinguishing between the two age classes will not be possible. At the other extreme, retarded fourth-cycle birds retaining, for example, brown markings in the tertials or greater coverts may not be possible to tell from

third-cycle birds. Therefore, we often use the term 'subadult' to refer to both third-cycle and fourth-cycle birds.

For identification purposes, it should be kept in mind that the primary pattern of third- and even some fourth-cycle birds is not as developed as in adults, and therefore less helpful.

► Adult

The upperparts show a uniform colour without any brown, immature markings. The tail is all white. There are usually no extensive dark markings on the primary coverts (but see previous paragraph). The underwing coverts are all white (including the primary coverts).

The above criteria are less applicable to a few taxa in this group; these are discussed below.

SPECIFIC CASES

► White-winged gulls (Iceland and Glaucous Gull)

The shape of the primaries is a good ageing feature in these two species, but the colour of these feathers remains pale at all ages. However, first-cycle birds often show a thin, brown subterminal spot on the inner primaries, shaped like an arrowhead—a pattern that is absent at all other ages. First-cycle birds also show brown axillaries (white in other age-classes) and their iris is dark. The greater coverts show more regular, parallel barring than in second cycle. If any clean grey feathers are present on the upperparts, this rules out first-cycle birds. Third-cycle birds differ from second cycle by their adult-like, bluish-grey inner primaries, while the outer primaries show less extensive bluish-grey colour than in adults (often none).

	First cycle	Second cycle	Third cycle	Adult
Primaries	dark brown; pointed	blackish; at most 4 grey inner primaries	black, with small white tips; 5–6 grey inner primaries; usually no mirror on P10	black, with white tips; white mirror on P10 (rarely lacking)
Secondaries	dark brown	black, with distinct white tips	(partly) grey	grey
Upperwing coverts	many brown feathers	largely grey; just a few brown lesser and outer greater coverts	grey	grey
Primary coverts	dark	dark	inner feathers grey; outer feathers dark	grey, or with just a few black marks
Tail	dark	white, with black tail band	white, sometimes with short black tail bar	white
Underwing coverts	pale panel framed by dark pattern	white, with dark trailing edge	pale	pale (grey)
Bill	dark to yellowish	yellowish to orange	yellowish to red	red
Head and body	clouded brown pattern on breast	mainly white, with brown streaks on head/neck	often faint streaks on head in winter	white head pale grey body

Table 2. Summary of age criteria for Audouin's Gull (based on Reyt & Prunier 2021)

► Audouin's Gull

This species acquires adult-like features more quickly than most of the other large gulls. From midwinter on in the first cycle, some birds acquire many plain grey scapulars and wing coverts, making the bird look more mature than it really is. In the second cycle the inner primaries can already have an adult-like grey colour, and the central primaries can show small white tips. Still, ageing is not too difficult if the right criteria are used. In first-cycle birds, this includes the shape and colour of the primaries, the all-dark tail, extensive brown lesser and median underwing coverts, and dull bill colour. Second-cycle birds are characterised by more rounded primary tips, all-white underwing coverts, a white tail with a thin black band, broad white tips on the secondaries, and yellowish to orange-red bill colour. A maximum of 4 inner primaries can be bluish-grey. When perched, advanced first-cycle birds can look similar to second cycle, but they usually show a few remaining brown wing coverts, as well as dull bill colour. Second-cycle birds have cleaner grey, more adult-like upperparts and upperwing, although often with a few dark marks on the lesser coverts and blackish streaks on the outer greater coverts, unlike third cycle. They also show all-dark primary

coverts, unlike older birds. When perched, third-cycle Audouin's Gulls strongly resemble adults, but nonbreeding birds show delicate dark streaks or spots on crown and nape, as well as slightly duller bill colour. The absence of a white mirror on P10 is a sign that the bird is likely not a full adult, although a few adults do lack the mirror. The size of the white primary tips is not a good age character. In flight, third-cycle birds differ from adults by their blackish outer primary coverts, and sometimes partly blackish secondaries. They differ from second cycle in that 5–6 inner primaries are adult-like bluish-grey, and the inner primary coverts are clean grey. The tail is often all white.

► Pallas's Gull

This species also acquires many clean grey scapulars and wing coverts early on in the first cycle. When perched, advanced first-cycle birds differ from second cycle in their pointed and brown primaries, as well as in their few remaining brown wing coverts and dark bill tip. In flight, they show dark secondaries, dark primaries, and dark primary coverts. Second-cycle birds have clean grey upperwing coverts, black outer primaries with one or two white mirrors, largely white primary

coverts creating a white leading edge on the outer wing, and adult-like, bluish-grey secondaries and inner primaries. The plumage therefore looks one year older than in most second-cycle large gulls. It differs from third cycle by the black spots on primary coverts, black tail band, and shorter tongue on the underside of P10. Third-cycle birds are very similar to adults, but show more extensive black pattern on outermost primaries, covering more than half the length of the outer web of P9–P10.

Note that the age criteria for this species have never been studied on ringed birds, so the degree of overlap between second- and third-cycle birds is unknown.

► Baltic and Heuglin's Gulls

Baltic Gulls and a few Heuglin's Gulls acquire a much more advanced plumage during their first cycle than most other Lesser Black-backed Gulls. Some birds have already moulted their whole plumage including all primaries at the end of their first winter, and thus resemble second-cycle *graellsii/intermedius*. However, at that time of year (late winter–spring) they show fresh, glossy jet black primaries, while in

second-cycle *graellsii/intermedius* these feathers are old and look dull blackish. The colour of the bill and legs is often duller, and scattered brown spots may be present on the mantle, scapulars, or flanks. Second-cycle Baltic Gulls (and some advanced Heuglin's) cannot safely be aged since they already look very similar to adults and their plumage overlaps completely with that of a few (retarded) third-cycle birds. Most third-cycle birds, however, are so similar to adults that they too cannot safely be aged.

Moult

Knowledge of moult can be very useful for ageing and identifying birds (not just gulls!). For instance, a skua with two simultaneous moult waves in its primaries should be a Pomarine Skua, since simultaneous moult waves have not been found in other skua species. For some gull taxa, like Baltic and Heuglin's Gulls, moult is even an essential part of the identification process.

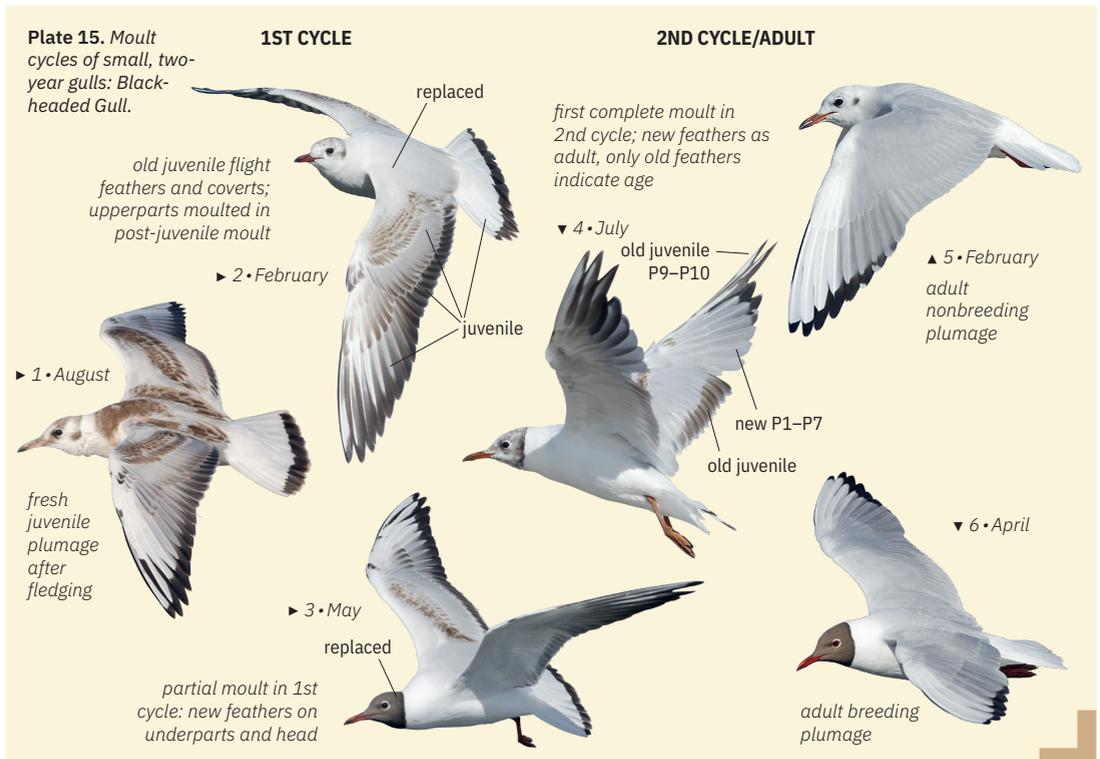


Plate 16. Moults cycles of medium-sized, three-year gulls: Common Gull.

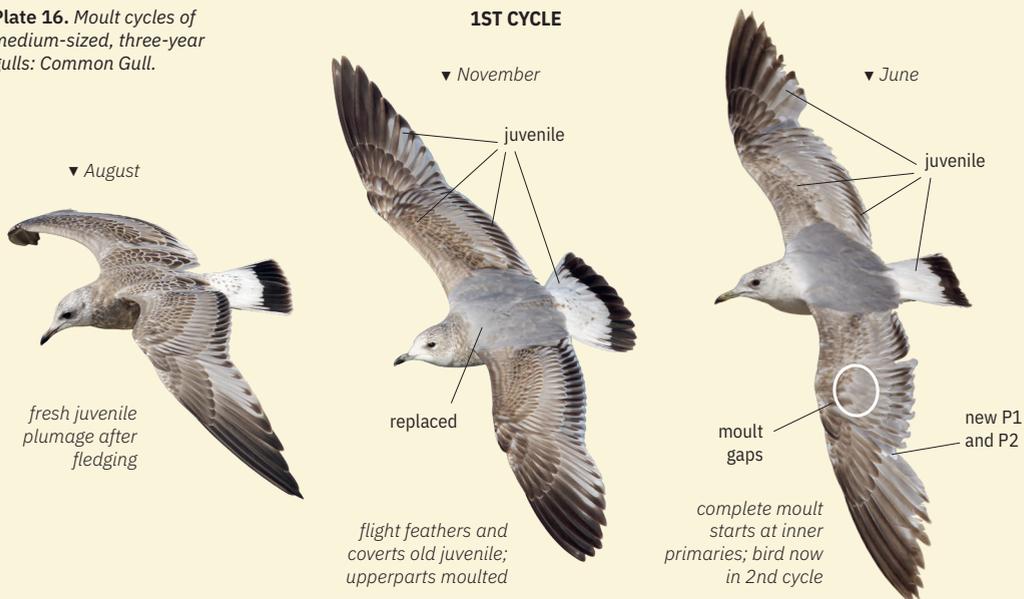


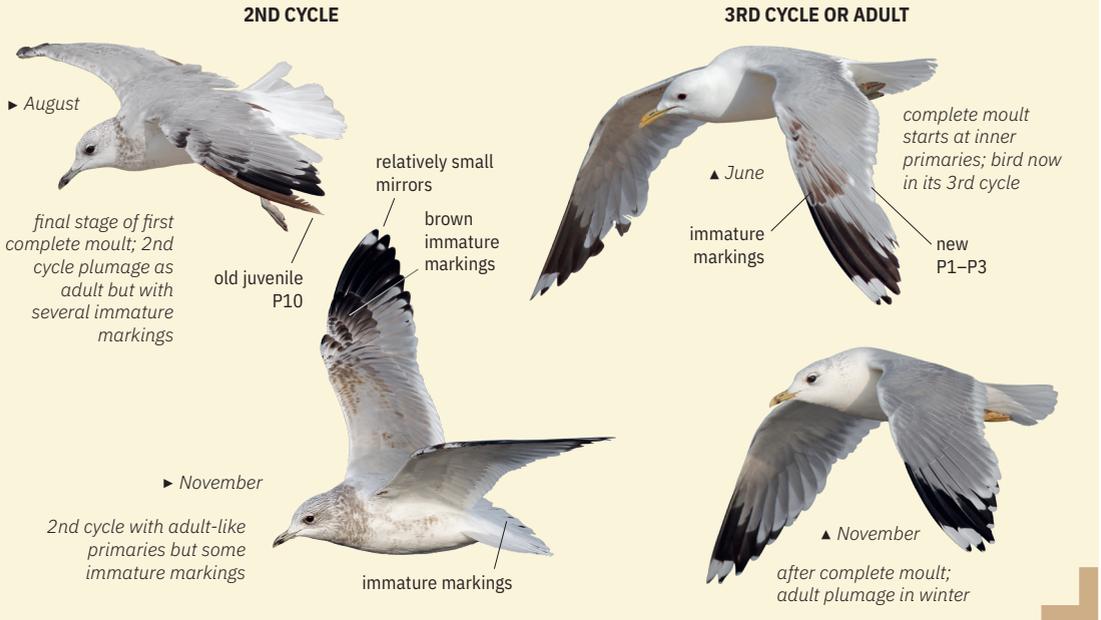
Plate 17. First-cycle Franklin's Gull after the extensive first prebreeding moult. Nearly all feathers were replaced, except for the outermost primary (1) and one inner secondary (2), which are still juvenile. Before the northbound migration, moult was arrested. Texas, USA, 14 May 2005 (Greg Lavaty)

Moult in small gulls

Adult (and second-cycle) birds undergo a complete moult to nonbreeding plumage, which starts during the breeding season and finishes 3–4 months later. The moult to breeding plumage is partial and occurs mostly during late winter and spring.

First-cycle birds undergo two partial moults: an autumn moult ('post-juvenile'), in which the juvenile plumage is replaced, and a spring moult to 'first-breeding plumage'. The latter may produce an adult-like hood in some 'advanced' birds, but many others again show a nonbreeding head pattern, even though they underwent the same moult. Moult and plumage colours are not necessarily intertwined; the plumage aspect depends more on the hormonal state of the bird. The first spring moult may include a number of wing coverts and tail feathers. In Brown-headed and Grey-headed Gulls, it may even include all of these feathers and all secondaries, resulting in a unique combination of adult-like plumage with 10 juvenile primaries.

Two exceptions in this group are Sabine's Gull and Franklin's Gull. Sabine's Gull moults mainly in its winter quarters, south of the equator. Adult birds often start moulting their head and body feathers during southward migration, but wing moult starts only when they have reached the wintering grounds. While they are replacing their primaries



(in December–March), they also undergo the partial prebreeding moult (in which they acquire their characteristic head pattern). In first-cycle birds, the post-juvenile moult is protracted and complete. The juvenile plumage is retained during the southward migration; body moult does not start until October–November. Wing moult occurs from December to March or April, immediately followed by the partial first prebreeding moult in April–May. Franklin’s Gull is unique in that it has two complete moults annually, except in its first cycle. The post-juvenile moult is the only partial one; the first prebreeding moult is (nearly) complete, unlike in the other small gulls. As a result, the ‘first-summer’ plumage already resembles that of adults.

Moult in the medium-sized and large gulls

Moult in the larger gulls is often a slow and protracted process (the complete moult may take about 6 months) and the partial and complete moults may overlap to some extent, which makes it difficult to perceive how many moults really occur in a year, especially in first-cycle gulls. Research has shown that there is basically only one moult during the first cycle, which means that there is no distinct ‘first-summer’ plumage. Instead, the whole plumage just gradually wears and bleaches during the first spring.

Some birds (e.g., some Yellow-legged Gulls) do appear to undergo a second moult during their first cycle, but it is very limited, for example, restricted to the head and neck.

► First cycle

During the first cycle, most taxa undergo a protracted partial moult between late July and May, which may be slowed or suspended over midwinter. In European Herring Gulls and most Great Black-backed Gulls, typically only body feathers (including scapulars) are replaced, and all wing coverts are usually retained at least until April. Some (northern) *argentatus* and Great Black-backed Gulls, however, retain full juvenile plumage until March. The same is true for many birds of other northern taxa, such as Glaucous, Iceland, Kumlien’s, Thayer’s, and Glaucous-winged Gulls. Black-legged Kittiwake also retains its juvenile plumage for quite a long time, until midwinter, after which the plumage changes little.

In ‘southern’ taxa, such as Sooty, White-eyed, Audouin’s, Kelp, Pallas’s, Yellow-legged, Steppe, Armenian, and Caspian Gulls, the partial moult is not limited to the body but often includes some or even all wing coverts and tertials too. Some birds also replace a number of tail feathers. The post-juvenile moult is also quite extensive in Ring-billed Gull. In Lesser Black-backed Gull, this moult is very



Plate 18. A first-cycle Ring-billed Gull that underwent an extensive partial post-juvenile moult, including the upper tertials and a number of inner wing coverts. Replaced feathers are grey and contrast with the pale brown, juvenile coverts that remain. The primaries are still juvenile (brown, narrow, and pointed). California, USA, 30 December 2016 (Alex Abela)

variable. In *graellsii* it may include a number of wing coverts, tertials, and tail feathers; in *intermedius* it may also include the secondaries and—very rarely—a few inner primaries. In many *fuscus* it is postponed or suspended during autumn migration and resumed in the winter quarters. It may then be very extensive, including all wing coverts, some or all tail feathers, some or all secondaries, and a variable number of primaries. First-cycle *fuscus* may replace all primaries during the first prebreeding moult. Wing moult is then arrested, which may result in a moult contrast with two generations of primaries (second generation and juvenile), all fully grown. Heuglin's Gull may replace all wing coverts, tail feathers, and secondaries during the first prebreeding moult, but usually no primaries. Some birds, however, do replace a variable number of primaries. A unique feature of such birds is that primaries may be replaced in a random order; for example, primaries P5 and P7 can be renewed, after which moult is arrested, leaving all other primaries juvenile. In all other large gull taxa, primaries are normally replaced in a systematic order, that is, from P1 outwards.

► Second cycle

The second cycle starts with a complete moult during the breeding season, when P1 is dropped. Moult of

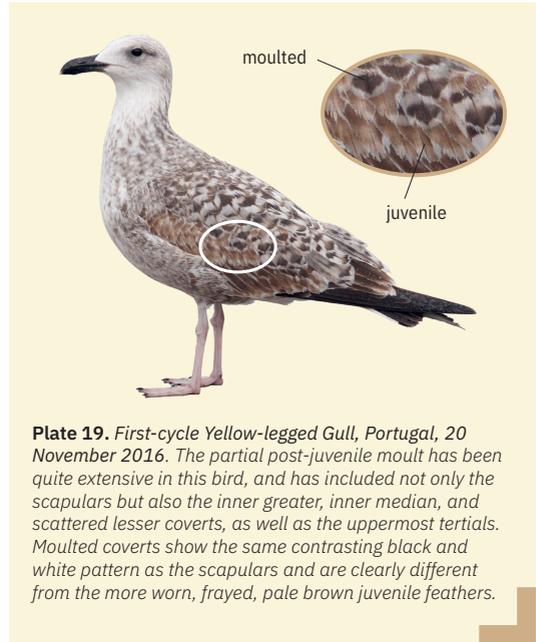


Plate 19. First-cycle Yellow-legged Gull, Portugal, 20 November 2016. The partial post-juvenile moult has been quite extensive in this bird, and has included not only the scapulars but also the inner greater, inner median, and scattered lesser coverts, as well as the uppermost tertials. Moulded coverts show the same contrasting black and white pattern as the scapulars and are clearly different from the more worn, frayed, pale brown juvenile feathers.

the tail feathers starts approximately when P7 and P8 are growing in, which is roughly the moment when the secondary moult also starts. Overlapping with the end of the complete moult, replacement of body feathers and a number of wing coverts occurs in a partial prebreeding moult, which may be suspended in midwinter.

This sequence is not followed by many *fuscus*, some *intermedius*, some Heuglin's, and some Kelp Gulls, though. As birds of these taxa (particularly *fuscus*) may have already moulted some primaries during their first cycle, the complete moult of the second cycle may be postponed until summer and then suspended, which means that these birds may migrate to their wintering area with a few (outer) juvenile primaries left. Before moult is suspended, a third moult wave may start in a few autumn *fuscus*, resulting in three different generations of primaries.

► Third cycle

The medium-sized gulls attain adult plumage in this cycle. In large gulls, the third-cycle moult is similar to second cycle but slightly later (by approximately 1 month). The plumage acquired by the complete moult is highly variable; newly grown tail feathers, for instance, may range from all white to all dark. A few *graellsii* temporarily suspend their primary moult during spring (Stewart 2006; Muusse et al 2011).



Plate 20. *Second-cycle Lesser Black-backed Gull.* The partial prebreeding moult in this bird was extensive: it included not only a large number of wing coverts, but also all tail feathers and all secondaries. The latter are grey with broad white tips and contrast clearly with the old, brown, second-generation primaries. This bird was ringed as a pullus in Belgium in July 2008; its age is therefore confirmed. Belgium, 11 May 2010 (Peter Adriaens)

Again, many *fuscus*, some *intermedius*, and some Heuglin's Gulls follow a different moult timing and strategy. As in second cycle (and older), these taxa tend to partly postpone primary moult to later in the year (e.g., to summer rather than spring) and then suspend for migration. Most of the primary moult continues in the wintering quarters. In order to finish their moult in time for the northbound migration, they often use stepwise moult, which involves replacing the primaries in two simultaneous waves outwards (e.g., one starting from the innermost primary and one from the suspension point).

► Fourth cycle

The fourth-cycle moult (in large gulls) is similar to third-cycle moult but slightly later, although this timing does not apply to many *fuscus* and some *intermedius*. Some *graellsii* temporarily suspend their primary moult during spring.

► Adult cycle

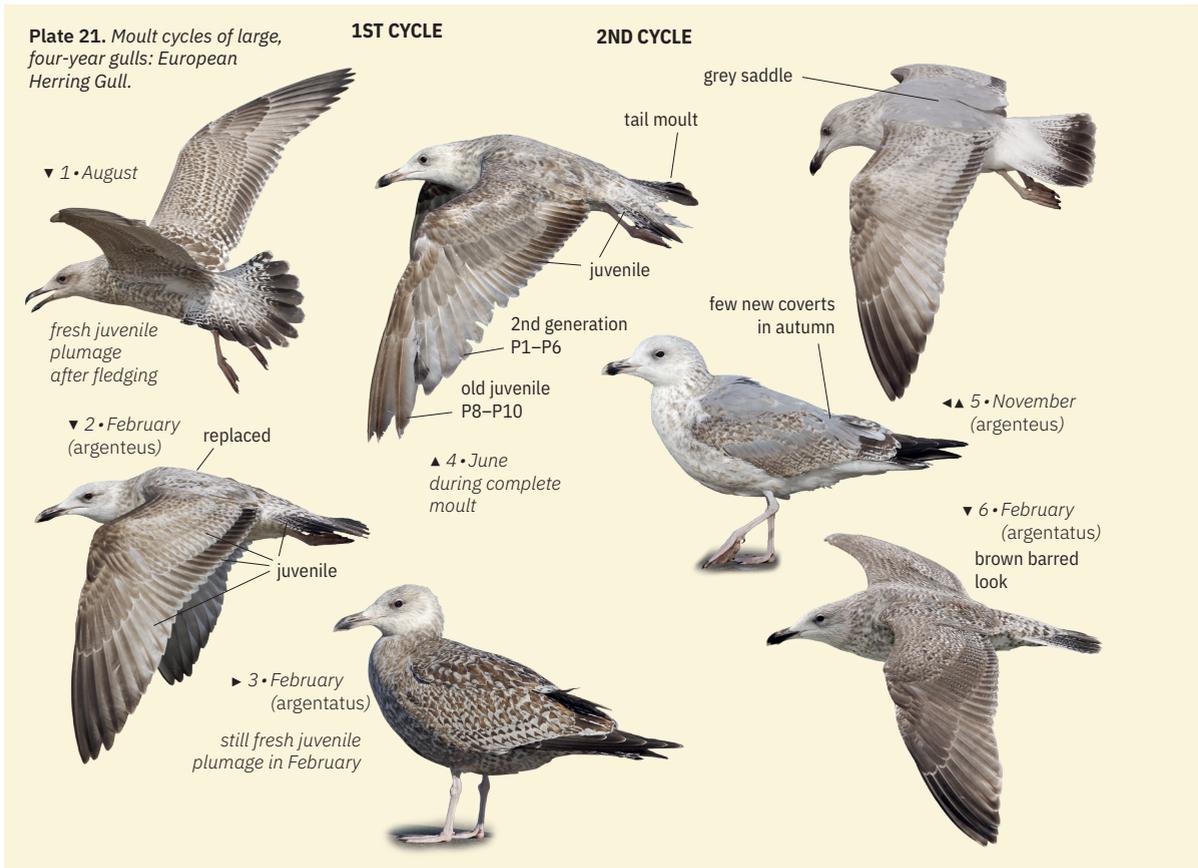
In most large gulls, the fifth cycle leads to the adult plumage and starts with the inner primaries during the breeding period. The timing is variable and also depends on the taxon involved: in some adult Yellow-legged Gull, it has already started in mid-April, whereas in a few *graellsii* it does not start until early August. Tail and secondary moults

start approximately when P6 is growing. Dusky winter head markings usually appear when P7 to P8 are shed. The complete moult finishes when the outermost primary becomes full grown. At this moment, the partial prebreeding moult starts and is followed by gradual whitening of the head. This results in the full breeding plumage, usually well before the breeding season starts. Bare parts become brighter too.

Adult *fuscus* and *intermedius* may postpone the complete moult until after the breeding season, moult a few inner primaries, and then suspend for the southward migration. Their primary moult continues in the winter quarters. Some adult *graellsii* appear to moult one or two inner primaries earlier than usual (sometimes even as early as February–March, prior to northbound migration) and then temporarily suspend.

► Exceptions

One major exception to the above pattern is the Ivory Gull, which has no partial moults, only complete moults. In this high-Arctic species, the primary moult is mostly completed in spring, *before* the breeding season. Adult Ivory Gulls suspend their wing moult during breeding and then finish moult of the outer primaries in August–September, before the Arctic winter sets in. Some birds do not succeed in replacing



all primaries on time, and they retain one or two old outer primaries through to the next spring. Ivory Gull also differs from all other gulls in that it has no partial prebreeding moult and therefore lacks a separate breeding plumage. There is also no partial moult during the first cycle; birds retain their juvenile plumage throughout winter and then moult straight into adult plumage.

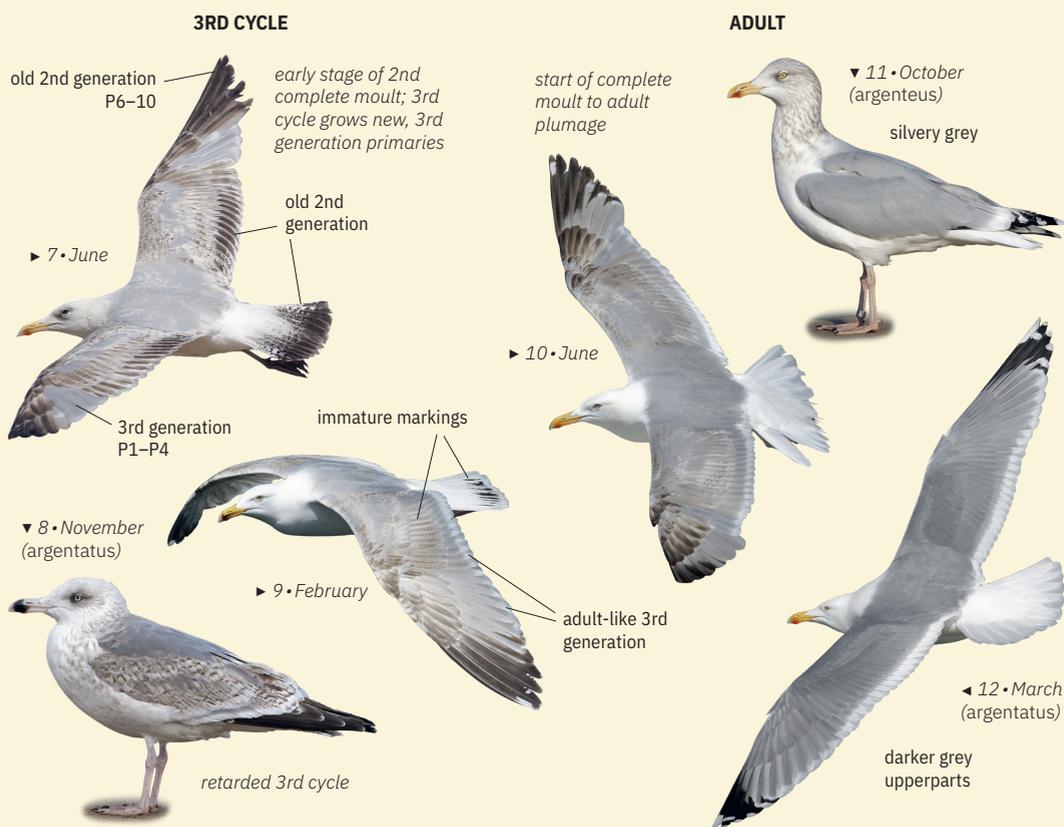
Final comments on moult

We would like to conclude this section with some general remarks. It is important to know that the appearance of feathers acquired in the same moult cycle can change depending on the hormonal state of the bird. Thus, feathers of the same generation may look very different in some cases. For example, new scapulars grown early in the second cycle of a large white-headed gull will usually have a rather 'immature' look (e.g., pale, with a dark brown anchor pattern), while those acquired later in the

same cycle may be plainer and greyer (slightly more adult-like).

It is also important to realise that moult is a process that may vary depending on external factors, probably the most important of which is the daylight period. When the days are getting longer, moult is stimulated. Thus, the location of the wintering areas may influence the moult activity and extent. A gull that winters in the Southern Hemisphere (as some *fuscus* do) may be more prone to replacing all its plumage in winter than a gull staying in Western Europe.

Lastly, factors like illness, lack of nutrition, etc., may cause a bird to get behind in its moult schedule. Moult requires a lot of energy, but it is a yearly necessity or the feathers become inadequate for insulation and flight. For large gulls, which have numerous and often large feathers to replace, moult is a default ongoing activity that is interrupted only during energy-demanding phases, such as breeding and migration.



How to learn more

The best way to make progress in identification is to study your local gulls in the field and become familiar with their variations. Taking photographs and submitting them to knowledgeable people for advice will speed up the learning process. Nowadays there are online databases where you can upload your photos, which will be reviewed by a panel of validators. A few of the biggest are the following:

www.observation.org
www.ebird.org

Do not be afraid to ask for feedback if you picked the wrong species or age and cannot see where you went wrong.

Another important part of the learning path is self-study. Many specialised papers are freely available on the internet these days, for example, on <http://gull-research.org/papers/paper.html>. The main website (www.gull-research.org) presents hundreds of photos

of most gull species, ordered by month, so you can see the changes in plumage throughout the year and compare the gull you observed to photos from the same time of year. The online databases mentioned above also hold lots of photographs, which can be filtered by month or by season.

One more way to make progress is to focus on colour-ringed gulls. Many gulls in Europe have been fitted with a plastic ring around one of their legs, on which an individual code is engraved. This is for scientific research, but anyone reading and reporting the code will get the life history of the specific bird, which will normally include the name of the species and the age. Contact details of the various ringing projects can be found at www.cr-birding.org.

MAPS

Maps are shown for those taxa that breed within the borders of the Western Palearctic. Breeding ranges are shown in red, wintering ranges in dark blue.