

= European storm petrel =

The European storm petrel , British storm petrel or just storm petrel (*Hydrobates pelagicus*) is a seabird in the storm petrel family , *Hydrobatidae* . It is the only member of the genus *Hydrobates* . The small , square @-@ tailed bird is entirely black except for a broad white rump and a white band on the underwings , and it has a fluttering , bat @-@ like flight . The large majority of the population breeds on islands off the coasts of Europe , with the greatest numbers in the Faroe Islands , United Kingdom , Ireland and Iceland . The Mediterranean population is a separate subspecies , but is inseparable at sea from its Atlantic relatives ; its strongholds are Filfla Island (Malta) , Sicily and the Balearic Islands .

The storm petrel nests in crevices and burrows , sometimes shared with other seabirds or rabbits , and lays a single white egg , usually on bare soil . The adults share the lengthy incubation and both feed the chick , which is not normally brooded after the first week . This bird is strongly migratory , spending the northern hemisphere winter mainly off the coasts of South Africa and Namibia , with some birds stopping in the seas adjoining West Africa , and a few remaining near their Mediterranean breeding islands . This petrel is strictly oceanic outside the breeding season . It feeds on small fish , squid and zooplankton while pattering on the sea 's surface , and can find oily edible items by smell . The food is converted in the bird 's stomach to an oily orange liquid which is regurgitated when the chick is fed . Although usually silent at sea , the storm petrel has a chattering call given by both members of a pair in their courtship flight , and the male has a purring song given from the breeding chamber .

The storm petrel cannot survive on islands where land mammals such as rats and cats have been introduced , and it suffers natural predation from gulls , skuas , owls and falcons . Although the population may be declining slightly , this petrel is classified by the International Union for Conservation of Nature as being of Least Concern due to its high total numbers . Its presence in rough weather at sea has led to various mariners ' superstitions , and , by analogy , to its use as a symbol by revolutionary and anarchist groups .

= = Taxonomy = =

The storm petrels , *Hydrobatidae* , are one of the four major families of the *Procellariiformes* or "tubenoses" , an order of seabirds that also includes the albatrosses , the *Procellariidae* , and the diving petrels . The family is an ancient group of small species which is thought to have diverged early from the rest of the tubenoses ; the supporting fossil record is poor , with specimens from California dating back only to the Late Miocene (11 @.@ 6 ? 5 @.@ 3 million years ago) . The *Hydrobatidae* are often divided into two subfamilies , the mainly southern hemisphere *Oceanitinae* and the northern *Hydrobatinae* ; cytochrome b DNA sequence analysis suggests that these might be full families . The European storm petrel is the only member of the genus *Hydrobates* , the remainder of the *Hydrobatinae* being placed in *Oceanodroma* , although the least storm petrel is sometimes separated as the sole member of *Halocyptena* . The relationships within the *Hydrobatinae* are complex and uncertain , and it has been suggested that all the members of the subfamily could be subsumed into an enlarged *Hydrobates* .

The storm petrel was first described from by Linnaeus in his *Systema naturae* in 1758 as *Procellaria pelagica* . It was moved to the genus *Hydrobates* by Friedrich Boie in 1822 . Petrel , first recorded in 1602 , is a corruption of pitteral , referring to the bird 's pitter @-@ pattering across the water . The suggestion that the word refers to St Peter walking on the waves is a later invention . Storm arises from seamen 's association of this bird with bad weather . In English , the name of the species was written as " stormy petrel " by some 19th @-@ century authors .

The scientific name derives from Greek ; *Hydrobates* is from *hudro* , water , and *bates* , walker , and *pelagicus* is from *pelagikos* , of the sea . There are two recognised subspecies , the North Atlantic nominate subspecies , *H. p. pelagicus* (Linnaeus , 1758) , and the Mediterranean *H. p. melitensis* (Schembri , 1843) . Although there is some genetic support for classifying the southern form as a separate species , the morphology is not considered sufficiently different from that of the

nominate subspecies to justify a split .

= = Description = =

The storm petrel is a small bird , 14 ? 18 cm (5 @. @ 5 ? 7 @. @ 1 in) in length with a 36 ? 39 cm (14 ? 15 in) wingspan . It weighs 20 ? 38 g (0 @. @ 71 ? 1 @. @ 34 oz) , with an average of 28 g (0 @. @ 99 oz) . It is square @-@ tailed and has all @-@ black plumage except for a snow @-@ white rump that extends to the sides of the tail base and a broad white band on the underwings . Juveniles in fresh plumage can also show a narrow white bar on the upperwing . The plumage becomes dark brown rather than black as it becomes worn . There are no obvious differences between the sexes , although in the Mediterranean subspecies , at least , most captured birds can be sexed using a formula which involves multiplying the wing length by the length of the white rump band ; females are slightly larger and have a longer white rump than males . The Mediterranean subspecies has longer wings and a heavier bill on average than the nominate form , but neither sex nor subspecies can be determined by observation at sea .

Moult is prolonged in all tubenoses , since they must maintain an ability to fly . Northern populations start replacing their plumage after those further south , reflecting the later start to their breeding season . Birds in a Welsh colony commenced moulting in early August , while populations in northern Spain and the Balearics started in early July and mid @-@ June respectively . Breeding birds moult later than non @-@ breeders .

The storm petrel 's large nasal olfactory bulbs facilitate a keen sense of smell , and the birds themselves have a distinctive musty aroma which can help researchers to locate breeding colonies . Individual petrels recognise their own body scent and can use it to locate their nest in the dark .

The flight is weak @-@ looking and resembles that of a bat , with fluttering interspersed with short glides . When feeding , the birds hang with raised wings and patter on the surface with their feet , but , unlike the Wilson 's storm petrel , do not look as if they are walking on the water . Birds will sometimes settle on the sea . Like other petrels , the European storm petrel cannot walk properly on land , but shuffles on its tarsi ; once there is enough room , the bird flaps its wings to support itself on its toes .

The European storm petrel can be distinguished from related Western Palaearctic species by the white bar on its underwing and its distinctive fluttering flight . Compared to Leach 's storm petrel , band @-@ rumped storm petrel , and the recently described Monteiro 's storm petrel , it is also smaller , darker , shorter @-@ winged and has a square tail . Wilson 's storm petrel lacks an underwing bar , and has long legs with the feet visible beyond the tail .

= = Voice = = =

In its display flight , the storm petrel gives a call consisting of eight or more repetitions of a fast ter @-@ CHICK sounds ending in a trill (rapid alternation of notes) . This chattering , staccato call is highly variable in pitch , stress and length . Both sexes make the call , which is used as an advertisement for a mate , for pair recognition , and in the nuptial flight . The details of the vocalisation vary geographically , including between the Atlantic and Mediterranean populations , and birds recognise calls from their own breeding area . The chatter @-@ call of the Mediterranean subspecies is distinctive . It has the first two notes running into each other , and the final element is sometimes doubled . The storm petrel is usually silent at sea , but sometimes gives the chattering call . A purring song arrr @-@ r @-@ r @-@ r @-@ r @-@ r @-@ r ? ending with a sharp chikka is given in the burrow by the male only ; it was described by Charles Oldham as " like a fairy being sick " . Other vocalisations include a fast wick @-@ wick @-@ wick , sometimes given in flight , and an up @-@ CHERRK alarm which resembles the chatter @-@ call . Chicks give a whistling pee @-@ pee @-@ pee call when being fed , and a faster version of this vocalisation is used by adults and young to signal distress .

= = Distribution and habitat = =

Storm petrels breed only in the Western Palaearctic on islands off the Atlantic and Mediterranean coasts of Europe . The largest colonies are in the Faroe Islands (150 000 - 400 000 pairs) , United Kingdom (20 000 - 150 000) , Ireland (50 000 - 100 000) and Iceland (50 000 - 100 000) , with smaller breeding areas off Norway , Malta , Spain , the Canary Islands , Italy , France and Greece . The strongholds of the *melitensis* subspecies are the island of Filfla (Malta) , Sicily and the Balearic Islands , with smaller sites elsewhere in the Mediterranean . This latter form also breeds in North Africa ; definitely in Tunisia , probably in Algeria and possibly in Morocco . Because of its nocturnal habits and the problems of accessing some of the small islands on which it breeds , the distribution is poorly known . A colony was discovered as recently as 2009 , on Lampedusa . The storm petrel has been recorded as a vagrant in several European countries as far east as the Ukraine , in the Guinea region of West Africa , and in Turkey , Israel , Lebanon , and the US . Although there were no North American records for more than 30 years after the first in 1970 , this bird has been more or less annual in small numbers since 2003 .

The storm petrel breeds on exposed and usually uninhabited islands which it visits only at night . It otherwise frequents mid depth waters away from the coastal zone , but not over the ocean deeps . In the breeding season , it is mainly found between the 10 ° - 25 ° C July isotherms . In Europe , it is rarely seen from land except in autumn storms .

The storm petrel is migratory , spending the northern hemisphere winter mainly in cool waters off the coasts of South Africa and Namibia , south to latitude 38 ° S and east to KwaZulu Natal . Some birds stay north of the equator in the seas adjoining Mauritania and Rio de Oro , and a few remain near the breeding islands , especially in the Mediterranean . It is strictly oceanic outside the breeding season , although it is described as regularly seen from land in West Africa . Young birds do not return to the breeding colonies until their second or third year . Birds mostly head south from the breeding islands between September and November , reaching West Africa by mid November and the south Atlantic by the end of the year . The return passage starts in April , with late records from the tropics and further south probably representing sub adult birds that will not breed that year .

= = Behaviour = =

= = = Breeding = = =

The storm petrel is sexually mature at age 4 ? 5 years , with the Mediterranean subspecies typically breeding a year earlier than the Atlantic form . Breeding happens in colonies and normally begins in late May or June . Pairs have a repeated nocturnal display flight in which the male chases the female , the chase being accompanied by flight calls . Some near adult birds may pair up and occupy a hole at the same time , prior to breeding in the following year .

Storm petrels normally nest in crevices between or under rocks , or burrow in the soil . When they make their own tunnels , they loosen the earth with their bills and kick out the debris with their feet . The birds less commonly nest in walls , under buildings or down rabbit burrows . Disused or occupied burrows of Atlantic puffins and Manx shearwaters are sometimes used , and the petrel pair may share a common entrance with those seabirds , rabbits or other pairs of its own species . Where other occupants are present , the petrels dig a side burrow or use an existing low roofed tunnel which the larger birds or rabbits cannot easily enter . Even so , puffins and shearwaters will sometimes access and destroy nests , and adult petrels may be killed by their larger neighbours . Human made plastic nesting tubes are readily used , and may provide protection against predators . Birds usually mate for life and use the same hole every year .

The nest tunnel is 10 ? 300 cm (3 . 9 ? 118 . 1 in) long and 5 ? 8 cm (2 . 0 ? 3 . 1 in) across , with a slightly narrower entrance . The nest chamber is typically unlined , although pairs may bring in some grass , bracken or seaweed . Although the storm petrel is generally non

@-@ territorial when breeding , a pair will defend the nest chamber itself after the eggs have been laid .

The clutch is a single egg , usually pure white , sometimes with some reddish brown spots that soon disappear . The average size of the egg is 28 mm × 21 mm (1 @. @ 10 in × 0 @. @ 83 in) , and it weighs 6 @. @ 8 g (0 @. @ 24 oz) , of which 6 % is shell . If an egg is lost early enough , on rare occasions a replacement may be laid . This is very unusual for tubenoses . The eggs are incubated by both parents for 38 ? 50 days , the longer periods arising when the eggs have become chilled through adult absence . One adult typically spends three days at a time on the egg while its partner feeds at sea . The chicks are altricial and covered with silver @-@ grey down , and are fed by both parents with their regurgitated oily stomach contents . The adults do not normally stay with the chick after first week , visiting only to bring food . After about 50 days , the chicks are fed less regularly , sometimes with gaps of several days , and the parents may stop visiting completely shortly before the chick leaves the nest . The chicks fledge about 56 ? 86 days after hatching , and receive no parental support after leaving the nest hole .

Tubenoses have smaller egg clutches and much longer and more variable incubation and fledging times than passerines with similarly sized eggs , resembling swifts in these developmental factors . Tubenoses and swifts have generally secure nest sites , but their food sources are unreliable , whereas passerines are vulnerable in the nest but food is usually plentiful . In the particular case of the storm petrel , it has a body temperature perhaps 3 ° C lower than other small birds , and this may also contribute to the lengthy incubation .

The adult petrel 's annual death rate is 12 ? 13 % , and the typical life span is 11 years . Longevity records established from bird ringing recoveries include a bird aged 31 years 11 months 9 days , and another aged more than 33 years .

= = = Feeding = = =

The storm petrel normally flies within 10 m (33 ft) of the water surface and typically feeds by picking items off the sea as it patters over the surface . Birds have been observed diving for food to a depth of not more than 0 @. @ 5 m (20 in) . and it is claimed , using indirect measurements , that the Mediterranean subspecies reaches depths of up to 5 m (16 ft)) . A bird may range up to 200 km (120 mi) over the course of two or three days in search of food . Although the bird usually feeds during the day , in the breeding season petrels will often feed at night close to the shore .

The typical prey consists of surface organisms such as small fish , squid , crustaceans and jellyfish . The storm petrel will also eat offal and oily food , often located by smell , and will follow ships . In the Atlantic , more than half the food items are zooplankton and the fish caught include small herring and sprats ; whale carcasses are scavenged where available . During digestion , the plankton is quickly converted to an oily orange liquid that owes its colour to carotenoids . Larger prey items take longer to digest . The oil , rich in vitamin A , is produced by a large gland in the stomach . The Mediterranean subspecies ' diet is mainly fish , particularly Mediterranean sand eels . Petrels also catch opossum shrimps from waters close to the colony . Bluefin tuna farms are exploited on the Maltese island of Filfla ; birds from the large local colony feed on the unwashed food fed to the farmed tuna , a mixture of fish , squid and prawns which produces a sizeable oily slick . Small numbers of insects are caught near breeding colonies , and some plant material , including angiosperm seeds and sorrel , has been found in the stomach contents . A study on Leach 's storm petrel , which consumes similar items , showed that the petrels were snipping pieces off plant leaves in flight , but it could not be confirmed that this was in the course of catching insects . Nasal glands remove excess salt from seawater consumed by the petrel as a concentrated solution excreted through the nostrils .

Petrels can be attracted to boats with " chum " , a malodorous mixture typically containing fish heads , bones and offal , with added fish oil and popcorn to aid flotation . An apparently empty ocean will soon fill with hundreds of birds attracted by the smell . The attraction of the fishy odour is sometimes enhanced by the addition of dimethylsulphide (DMS) a chemical also naturally produced by some planktonic organisms , although there are doubts about the safety of this

possible carcinogen .

= = Predators and parasites = =

Adults and young are vulnerable to predation at the breeding colonies , their only defence being to spit oil . Petrels cannot breed on islands where rats have been introduced , and feral cats frequently kill these birds on Foula in the Shetland Islands . The American mink , a non @-@ native species in Europe , is a strong swimmer , and can colonise islands up to 2 km (2 @,@ 200 yd) from the mainland . Natural predators of petrels and other seabirds include skuas and large gulls . The yellow @-@ legged gull is a particular problem in the Mediterranean , and great skuas were estimated to kill 7 @,@ 500 petrels a year on St Kilda , an unsustainable number . Some great black @-@ backed gulls on the Atlantic islands specialise in taking seabird chicks at night , and peregrine falcons hunt adults at sea . Localised predators include Eleonora 's falcon on the Columbretes Islands and the nocturnal barn owl on the Balearics ; a few owls can wipe out a colony . The little owl is also a predator of both adults and young where it occurs .

Feather mites of at least two species have been found on the storm petrel , with *Halipeurus pelagicus* occurring at much higher densities than *Philoceanus robertsi* . The flea *Xenopsylla gratio*sa and dermanyssid mites are commonly found , with lower numbers of ticks . These blood @-@ sucking parasites slow the growth rate of nestlings and may affect their survival rate .

Storm petrels seem to be largely free of blood parasites , even when in close proximity to carrier species such as the yellow @-@ legged gull . It has been suggested that seabird species with long incubation periods and long lives have well @-@ developed immune systems that prevent serious blood parasitism .

= = Status = =

The European population of the storm petrel has been estimated at 430 @,@ 000 ? 510 @,@ 000 breeding pairs or 1 @,@ 290 @,@ 000 ? 1 @,@ 530 @,@ 000 individual birds and makes up 95 % of the world total numbers . The population estimate includes about 11 @,@ 000 to 16 @,@ 000 breeding pairs of the Mediterranean subspecies .

Although this species ' population now appears to be declining , the decrease is not rapid or large enough to trigger conservation vulnerability criteria . Given its high numbers , this petrel is therefore classified by the International Union for Conservation of Nature as being of Least Concern . The perceived decline may be due increased predation from gulls , skuas and introduced mammals . Eradication of rats protects seabird colonies and may enable recolonisation of islands cleared of rodents . Predation of cave @-@ nesting petrels in the Balearics by yellow @-@ legged gulls is restricted to relatively few individual gulls specialising in this prey item ; this means that the problems can be controlled by selective culling and the provision of plastic nest boxes .

Because it feeds in flight , the storm petrel is less affected by oil pollution than other seabirds , and may be able to use its good sense of smell to avoid slicks , although a large spill near a breeding colony could have serious consequences .

= = In culture = =

Its association with storms makes the storm petrel a bird of bad omen to mariners ; they are said to either foretell or cause bad weather . A more prosaic explanation of their appearance in rough weather is that , like most oceanic seabirds , they rely on the winds to support them in flight and just sit on the water surface when becalmed . The birds were sometimes thought to be the souls of perished sailors , and killing a petrel was believed to bring bad luck . The petrel 's reputation led to the old name of witch , although the commonest of the folk names is Mother Carey 's Chicken , a name also used for storm petrels in general in the UK and USA from at least 1767 . This is believed to be a corruption of mater cara (dear mother , the Virgin Mary) , a reference to the supernatural Mother Carey , or a superstitious modification of an earlier Mother Mary 's Chicken to reduce the

potency of the religious name . The Mother Carey character appears a number of times in literature . In the Cicely Fox Smith poem " Mother Carey " , she calls old sailors to return to the sea , but in John Masefield 's poem of the same name she is seen as a wrecker of ships . She appears as a fairy in Charles Kingsley 's The Water Babies and is depicted in one of Jessie Willcox Smith 's illustrations for the book .

The association of the storm petrel with turbulent weather has led to its use as a metaphor for revolutionary views , the epithet " stormy petrel " being applied by various authors to characters as disparate as Roman tribune Publius Clodius Pulcher , a Presbyterian minister in the early Carolinas , an Afghan governor , or an Arkansas politician .

A 1901 poem by Russian writer Maxim Gorky is invariably titled in English as " The Song of the Stormy Petrel " , although that may not be a perfectly accurate translation of the Russian title " ????? ? ?????????????? " , because " ?????????????? " (the name of the bird in Russian) translates to the English general term " storm bird " . The poem was called " the battle anthem of the revolution " , and earned Gorky the nickname " The Storm Petrel of the Revolution " .

Various revolutionary anarchist groups adopted the bird 's name , either as a group identifier , as in the Spanish Civil War , or for their publications . The Stormy Petrel (Burevestnik) was the title of the magazine of the Anarchist Communist Federation in Russia around the time of the 1905 revolution , and is still an imprint of the London group of the Anarchist Federation (Britain and Ireland) . To honor Gorky and his work , the name Burevestnik was bestowed on a variety of institutions , locations , and products in the USSR .