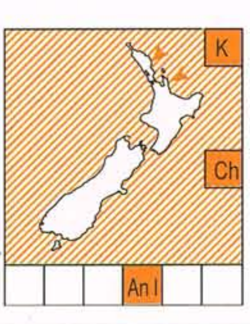
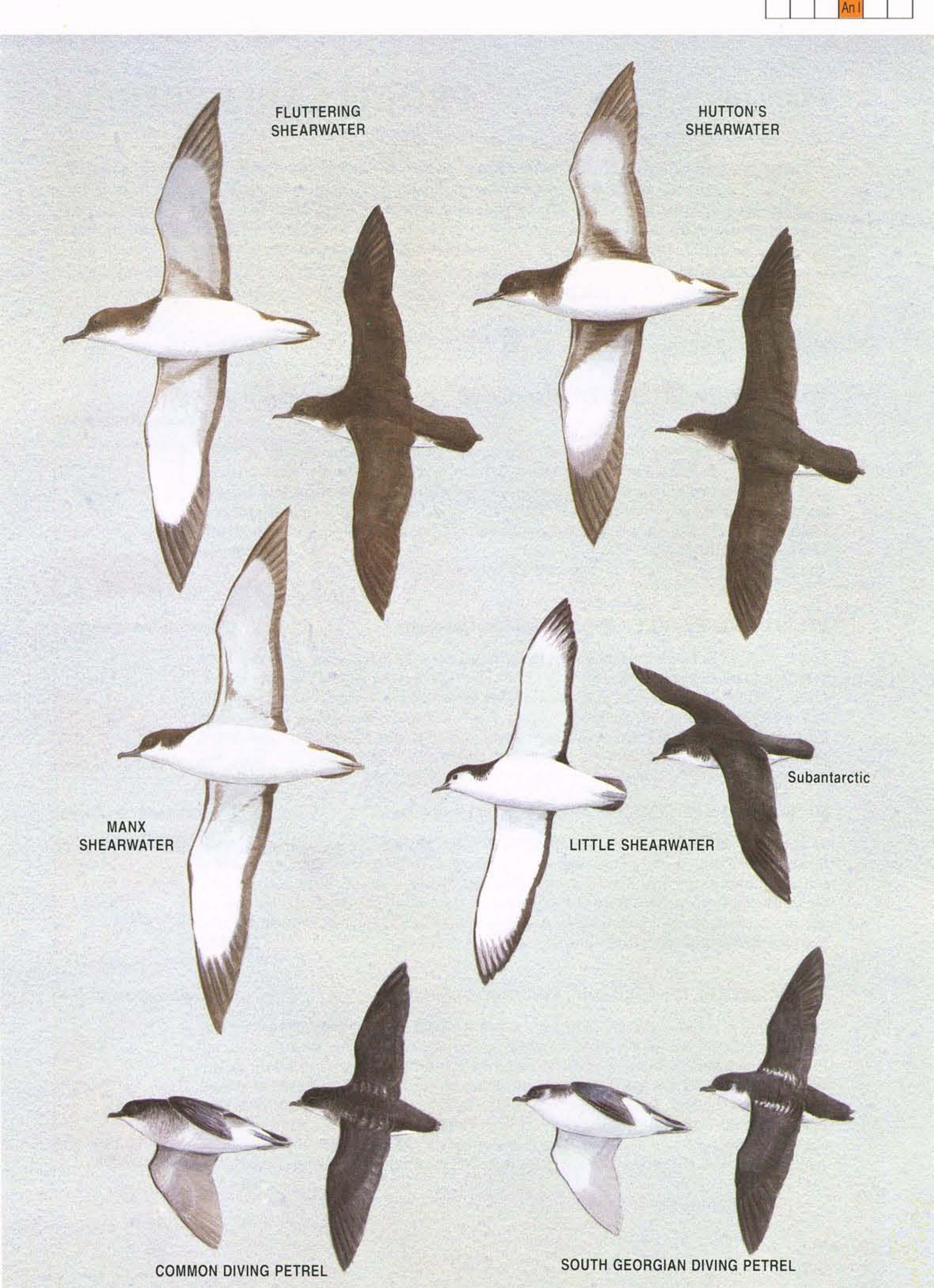
Text and images extracted from Heather, B.D. & Robertson, H.A. (2005)
The Field Guide to the Birds of New Zealand. Penguin Books, Auckland.
Pages 30, 34, 35, 184, 185, 195.

Medium to large seabirds with long slender bill and nostrils encased in a short flattened tube. Sexes and ages alike; most are dark above and mainly white below, but some are all dark. Many species form large feeding flocks. Usually fly close to the surface, often with a series of rapid wingbeats followed by a glide, but in windy conditions can wheel high on stiffly held wings. Clumsy on ground; legs and webbed feet set well back. Range from coastal to oceanic. Some species are highly migratory. Most species very vocal at breeding colonies at night. Lay 1 large white egg, usually deep in a burrow. Long incubation and fledging periods.

LITTLE SHEARWATER *Puffinus assimilis* **Common native**

30 cm, 200 g. Head to *above* eye, and upperparts dark bluish black; eyebrow, face and underparts white; underwing white except for thin black border on trailing edge. Bill slender (25 x 8 mm), dull lead blue with black ridge and tip; *legs and feet pale blue* with fleshy webs. **Habitat:** Breeds widely in Atlantic and southern oceans. Main NZ colonies at Kermadecs, off Northland, Mercury Is, Chathams and Antipodes. Mostly sedentary but rarely seen in coastal waters. **Breeding:** Jul–Jan. **[Sp 28]**





SHEARWATERS, FULMARS, PRIONS and PETRELS Procellariidae

The Procellariidae is the largest and most diverse family of seabirds, with about 72 species. In the New Zealand region, 49 species have been recorded, including 11 endemic species and 23 other breeding species.

The Procellariidae includes a wide variety of seabirds from the giant petrels to the diving petrels. All have distinctive external nostrils encased in a tube on the top or sides of the bill. They have 11 primaries. The 11th (outermost) is minute, but the 10th is at least as long as the 9th, giving the wing a pointed tip. All seabirds have webbed feet with three forward-pointing toes of about the same length.

Most species nest in burrows or crevices, normally clumped into colonies. Birds return to their colony months before egg-laying to claim their nest sites (usually the same site is used year after year) and to court. After copulation, females leave the colony for one to six weeks on a 'pre-laying exodus' to form the egg. Males also leave but often make occasional visits to the nest site.

All species lay one white egg, which is very large relative to the female's size. The few instances of two eggs in a nest are from two females using the same site. A long incubation period is typically split up into several incubation stints lasting from several days to several weeks between changeovers. Occasionally the changeovers do not coincide and the egg is left unattended for several days; however, eggs have hatched successfully after

being chilled for six days. Incubation stints shorten as incubation proceeds, and when the egg hatches the downy chick is brooded and guarded for only a few days in hole-nesting species, but for several weeks in surface-nesting species, until it is able to maintain body temperature.

Throughout its development, the chick is fed large meals at irregular intervals. It gains weight rapidly, becoming much heavier than its parents, but this declines towards adult weight before it fledges. Chicks normally spend some time on the surface exercising their wings before they eventually leave the colony. Once they have flown, they are completely independent of their parents. Young birds usually return to their home colony at 2–7 years old, and spend several years visiting the colony, especially when breeders are incubating or feeding chicks, before attempting to breed. The Procellariidae are typically long-lived, with several species known to live over 25 years.

Most species now breed only on offshore and outlying islands because mainland colonies have been ravaged by introduced mammalian predators. They generally return to their colonies at night, and once on land they are clumsy and unable to take flight rapidly; their only defence is by biting or by spitting stomach oil. The nestling is particularly vulnerable to predators because it is often left unattended for long periods while the parents feed at sea and it emerges from the nest at night to exercise its wings in the week or two before it can fly.

The Procellariidae feed on a wide variety of sea life, ranging from some of the prions, which sieve zooplankton on comb-like lamellae along the edge of their bills, to the giant petrels, which scavenge on dead marine mammals and occasionally kill small seabirds. Most species feed within a few metres of the sea surface, but some shearwaters dive to at least 20 m. These seabirds have well-developed nasal glands for extracting salt from their blood and exuding it out of the prominent nostrils.

The shearwaters (*Calonectris*, *Puffinus*) include about 15 medium to large species with long slender bills and flat nasal tubes. They are usually brown to black above and white or brown below. Some have large sternums and dive well for fish and squid, using their wings for propulsion, while others have small sternums and feed on, or close to, the surface.

The four species of diving petrel (*Pelecanoides*) are small, stocky black and white seabirds with short wings adapted for propulsion under water. They have a fast, direct, whirring flight and readily dive for small krill and copepods.

The four species of *Procellaria* are large stocky seabirds with large, heavily hooked pale bills with dark markings and prominent nostrils. They feed mainly at night on bioluminescent squid but also now take offal discarded from fishing boats.

The three species of *Pseudobulweria* are medium-sized seabirds with exceptionally large feet and a notch on the cutting edge of the upper bill caused by the latericorns having blunt ends.

The fulmarine petrels (*Lugensa*, *Pagodroma*, *Daption*, *Thalassoica*, *Fulmarus* and *Macronectes*) are a diverse group of 8 species, all of which have robust bills with prominent joined nasal tubes, rising from the base.

The six species of prion (*Pachyptila*) are small seabirds pale blue above and white below with a prominent M-shaped mark across the upperwings and a dark-tipped tail. Comb-like lamellae on the inside of the bill are used to filter zooplankton.

The single *Halobaena* species looks like the prions but has a white-tipped tail and the upper bill has small tooth-like serrations at the base.

The gadfly petrels (*Pterodroma*) consist of 29 species of highly agile seabirds with long wings and short, laterally compressed black bills with a strongly hooked nail. They feed mainly on squid and small fish.

Reading: Harrison, P. 1987. *Seabirds of the World: a photographic guide*. London: Christopher Helm. Harrison, P. 1988. *Seabirds: an identification guide*. London: Christopher Helm. Imber, M.J. 1985. *Ibis* 127: 197–229. Murphy, R.C. 1936. *Oceanic Birds of South America*. New York: MacMillan. Serventy, D.L. *et al*. 1971. *The Handbook of Australian Seabirds*. Sydney: Reed. Warham, J. 1990. *The Petrels: their ecology and breeding systems*. London: Academic Press.

28. LITTLE SHEARWATER *Puffinus assimilis* Plate 9

Other name: Allied Shearwater
Size: 30 cm, 200 g
Geographical variation: Seven subspecies, three of which breed in the New Zealand region: the Kermadec Little Shearwater *kermadecensis*, the North Island Little Shearwater *haurakiensis* and the Subantarctic Little Shearwater *elegans*. The Norfolk Island Little Shearwater *assimilis* occasionally visits New Zealand waters.
Distribution: Little Shearwaters have a highly disjunct breeding distribution; on islands in the North and South Atlantic Oceans, in the Indian Ocean at St Paul Island and on islands off the coast of Western Australia, on Lord Howe, Norfolk and Kermadec Islands, around northern and subantarctic New Zealand including the Chathams, and at Rapa Island in the central South Pacific Ocean. All subspecies are quite sedentary, except for the Subantarctic Little Shearwater, which ranges widely in subantarctic waters.

Kermadec Little Shearwaters breed on the Herald Group, on Macauley Island and have an especially large colony on Curtis Island; young birds are sometimes beach-wrecked on western and northern North Island beaches in November–December.

North Island Little Shearwaters breed on islands around the northern North Island, with main colonies on the Poor Knights, Chickens, Mokohinau, Mercury and Aldermen Islands, and smaller colonies on the Cavalli Islands and Ohena Island; they are commonly seen in the outer Hauraki Gulf and the Bay of Plenty.

Subantarctic Little Shearwaters breed on the Star Keys and probably Little Mangere in the Chathams, and on islands around Antipodes Island (especially Bollon's Island); this race has been seen off the Auckland and Bounty Islands and is occasionally wrecked on South Island and southern North Island beaches.

Norfolk Island Little Shearwaters, which breed at Lord Howe and Norfolk Islands, stray to the west coast of the North Island.
Population: The Kermadec race has 100,000+ breeding pairs, with most on Curtis Island, and several hundred on Macauley and the Meyer Islands. The North Island race has c. 10,000 pairs, with moderate numbers on the Poor Knights, Hen and Chickens (especially Lady Alice Island), Mokohinau group (especially Lizard Island), Mercury Group (e.g. c. 1000 pairs on Red Mercury Island) and the Aldermens (4000+ pairs). The Subantarctic race has only c. 150 pairs on the Star Keys and Little Mangere in the Chathams, but 100,000+ pairs on Bollons, Archway and Inner Windward Islands of the Antipodes.
Conservation: Protected native. Being the smallest shearwater, Little Shearwaters are easily preyed on by introduced mammals and do well only on islands without mammalian predators, although they survive in reduced numbers in the presence of Pacific rats. They have become extinct on Raoul Island since cats and Norway rats became established.
Breeding: Mostly winter or spring breeders, but birds return to their colonies irregularly all year. Laying is from mid-June to late July in the Kermadecs, from early July to mid-August around the northern North Island, and in September in the subantarctic. They lay **1** white egg (54 x 37 mm) in a burrow 0.3–2 m long. Eggs hatch after 52–58 days. Chicks fledge at 70–75 days old, in mid-October to late November on the Kermadecs, November–December around the northern North Island, and January–February on the subantarctic islands.
Behaviour: Breed in colonies ranging from small, loose aggregations mingling with Grey-faced Petrels and Pycroft's Petrels on such islands as Red Mercury Island, to large, dense colonies on Curtis Island (Kermadecs) and Bollons Island (Antipodes). At sea, Little Shearwaters are usually solitary or in small flocks, and seldom associate with other seabirds. They are noisy over and at their breeding colonies, particularly just after dusk and before dawn, with their main call being a rapidly repeated 'kakakakakakak-urrr'.
Feeding: Diet is mostly small fish, krill, squid and octopuses, taken mainly by diving from the surface or by plunging from a few metres above the surface.

In the hand: This is the only shearwater with bright blue feet. The subspecies are impossible to determine at sea, and even in the hand plumage differences are slight and measurements overlap extensively. *kermadecensis*: bill 24–**25.3**–27 mm, wing 180–**189**–195 mm; *haurakiensis*: bill 23–**26.1**–29 mm, wing 181–**192**–201 mm, greater upperwing coverts have white tips; *elegans*: bill 23–**24.5**–26 mm, wing 170–**187**–197 mm, many lower back feathers and upperwing coverts have distinctive narrow white tips; *assimilis*: bill 22–**23.3**–24.3, wing 173–**182**–189 mm.

Reading: Fleming, C.A. & Serventy, D.L. 1943. *Emu* 43: 113–125. Imber, M.J. 1983. *Notornis* 30: 283–298. Powlesland, R.G. & Pickard, C.R. 1992. *Notornis* 39: 27–46. Warham, J. & Bell, B.D. 1979. *Notornis* 26: 121–169.