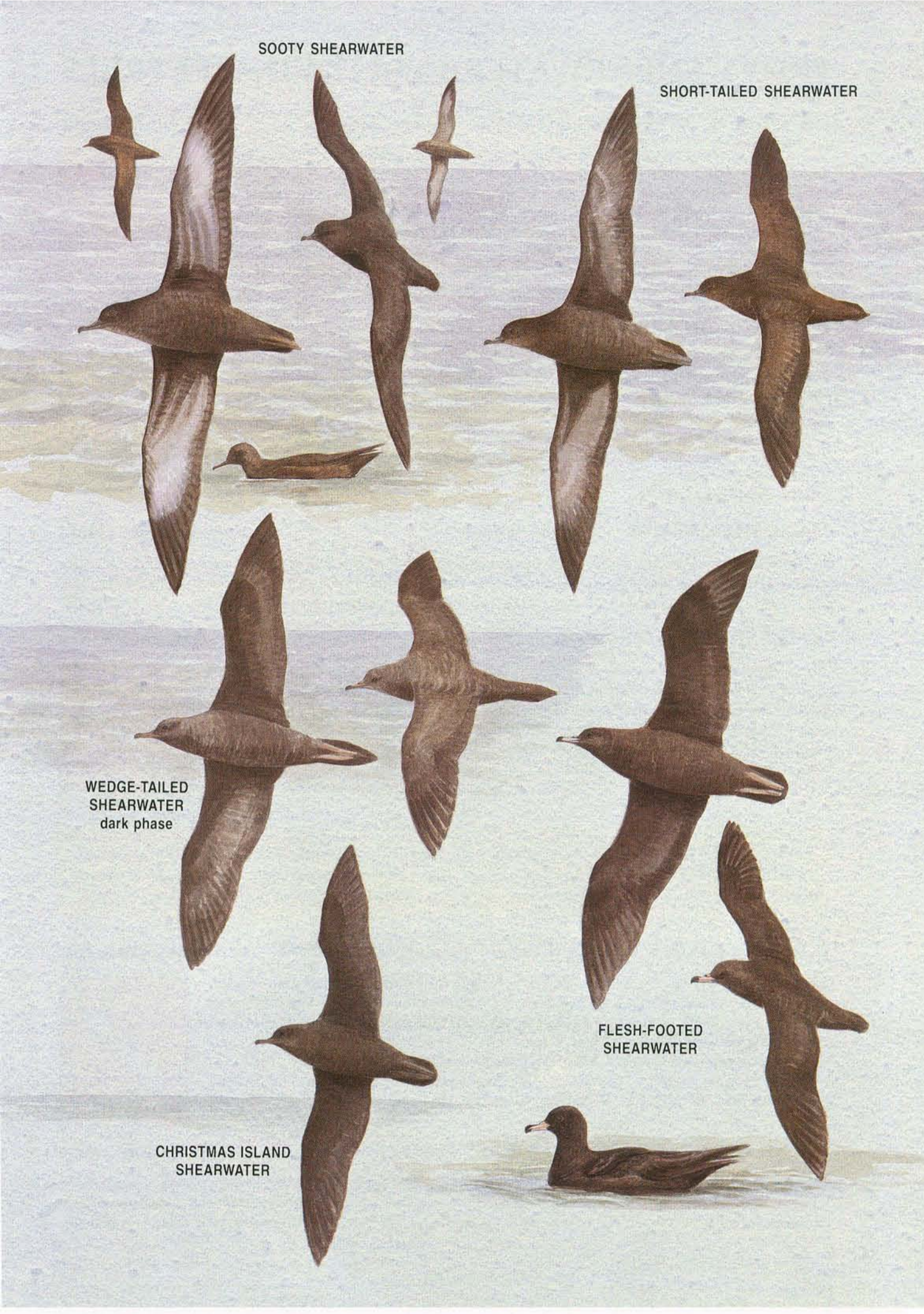


Medium to large seabirds with long slender bill and nostrils encased in a short flattened tube. Sexes and ages alike; most are dark above and mainly white below, but some are all dark. Many species form large feeding flocks. Usually fly close to the surface, often with a series of rapid wingbeats followed 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.

SHORT-TAILED SHEARWATER *Puffinus tenuirostris* Common Australian migrant

42 cm, 550 g. Like small Sooty Shearwater but shorter-billed (32 x 11 mm) and *underwings are normally dull grey and do not flash prominently*. Feet dark lilac with brown markings on the outer side. **Habitat:** Breeds southern Australia, especially on islands in Bass Strait. Migrates to N Pacific, but some pass through NZ waters on the outward and return journeys, and are often beach-wrecked around May and October. [Sp 23]



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

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

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

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 Zealand*. The York: MacMillan. Serventy, D.L. et al. 1971. *New Handbook of Australian Seabirds*. Sydney: Reed. Warham, J. 1990. *The Petrels: their ecology and breeding systems*. London: Academic Press.

23. SHORT-TAILED SHEARWATER *Puffinus tenuirostris* Plate 8

Other name: Tasmanian Muttonbird
Size: 42 cm, 550 g
Distribution: Breed only on islands off southern Australia from Western Australia to northern New South Wales, especially in Bass Strait and around Tasmania. Subfossil and midden records from the North, South and Chatham Islands suggest they may have once bred in the New Zealand region. From September to April, adults range through waters south of Australia to the edge of the pack ice and across the Tasman Sea to continental-shelf waters of the Hauraki Gulf and Bay of Plenty. They are occasionally beach-wrecked on the New Zealand coast in October-March.

Adults go directly to the northern North Pacific and the Bering Sea in March-April, but fledglings leave between late April and mid-May, and some drift across the Tasman and are wrecked on the west coast of New Zealand in May-June. Adults return past Fiji and Samoa to their colonies in Australia in late September, but subadults return a month or two later. Many pass through New Zealand waters as far south as Foveaux Strait, and in

some years (e.g. 1968 and 1986) many are beach-wrecked in October-December.

Population: c. 23 million birds. The main colonies are on islands in Bass Strait and around Tasmania, with vast colonies (1 million+ pairs) on Babel Island and Trefoil Island. Each year an estimated 500,000 chicks are harvested, and a similar number of birds, mainly subadult, were accidentally caught in gill nets in the North Pacific in the 1980s; however, the population is apparently stable or even expanding.

Behaviour: At sea, they are seen in large flocks of up to 500,000 birds while on migration.

Feeding: Diet is mainly krill, amphipods, and small fish and squid. Although similar to that of the Sooty Shearwater, this diet probably has more plankton. They catch most food beneath the surface after plunging in or diving from the surface.

Reading: Bradley, J.S. et al. 1991. *Ibis* 133 Suppl 1: 55-61. Holmes, G. 1977. *Notornis* 24: 286-287. Serventy, D.L. 1967. *Proc 14th Int Orn Congr* 165-190. Skira, I.J. 1986. *Aust Wildl Res* 13: 481-488. Wooller, R.D. et al. 1990. *J Anim Ecol* 59: 161-170.