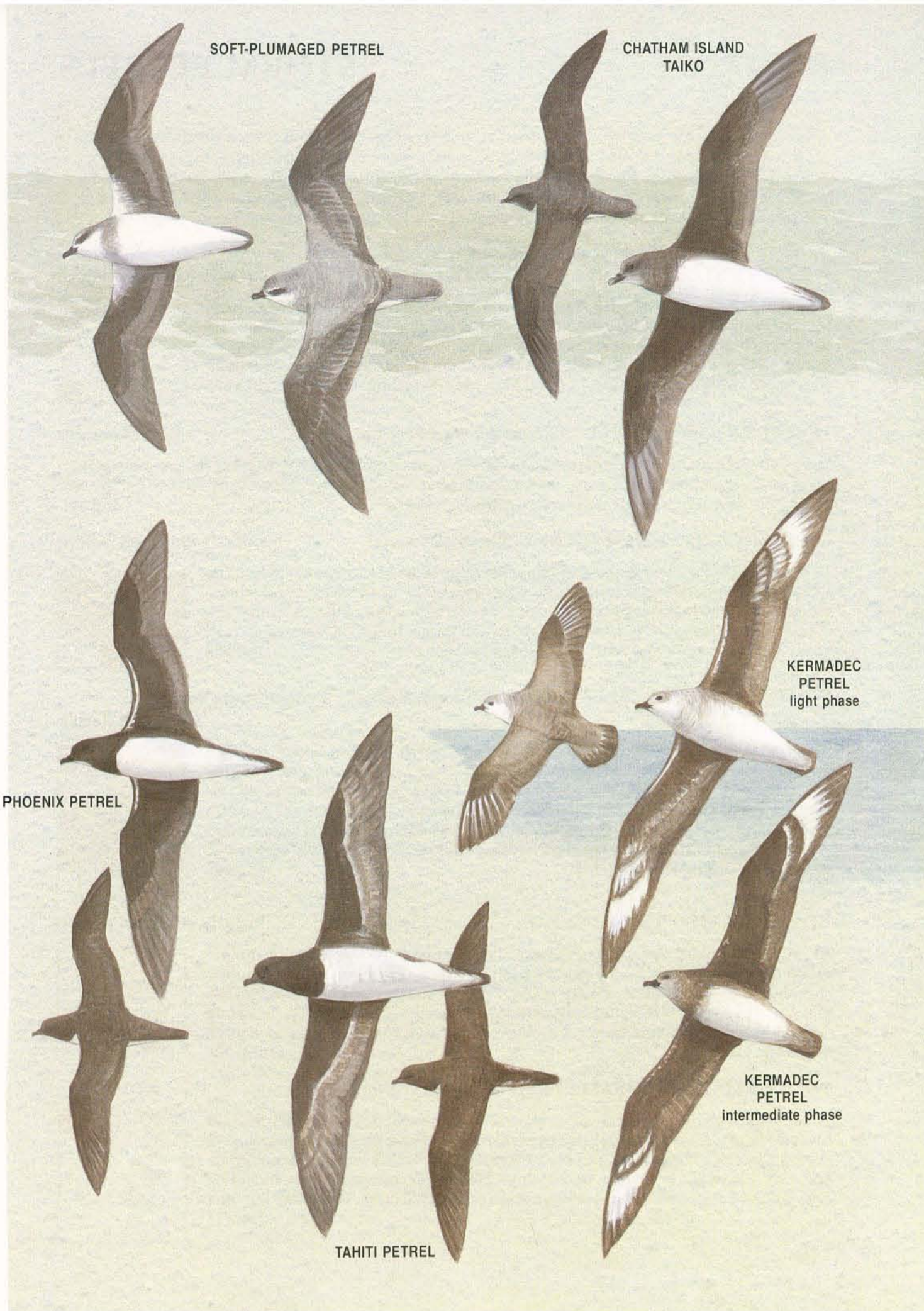
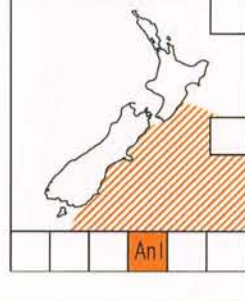


Medium to large seabirds with mostly short deep and heavily hooked bill, nostrils encased in a tube, joined at the base of the bill. Most are dark above and mainly white below. Sexes and ages alike; males slightly larger. Underwing patterns are often distinctive. In flight, long narrow wings held stiffly and appear graceful as they glide and wheel in huge arcs. Generally oceanic; rarely seen near land. Many species highly migratory. Many species give high-pitched repetitive calls over breeding grounds at night. Lay 1 large egg, usually deep in a burrow. Long incubation and fledging periods.

SOFT-PLUMAGED PETREL *Pterodroma mollis*

Uncommon native

34 cm, 300 g. Head including patch below and behind eye greyish brown; forehead scaled white; eyebrow, chin, sides of neck and throat white. Upperparts slaty grey with a broad blackish band across wing coverts; underparts white except for a narrow grey band completely or partially across the chest; underwing grey. Bill stout (35 x 12 mm), black; feet and legs pinkish with dark outer toe and tips to webs. **Habitat:** Breeds subantarctic in Atlantic and Indian Oceans, and at Antipodes Is. Ranges through southern oceans but not common in S Pacific, although increasing numbers seen off southern and eastern coasts of NZ since 1970s. **Breeding:** Dec–May. [Sp 65]



SHEARWATERS, FULMARS, PRIONS and PETRELS Procariidae

The Procariidae 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 Procariidae 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 Procariidae 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 in the week or two before it can fly.

The Procariidae 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 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.

65. SOFT-PLUMAGED PETREL *Pterodroma mollis* Plate 16

Size: 34 cm, 300 g

Geographical variation: Two closely related species (*P. feae* and *P. madeira* in the North Atlantic) are sometimes treated as part of this species.

Distribution: Subtropical and subantarctic islands of the South Atlantic and South Indian Oceans, and in the New Zealand subantarctic, on Antipodes Island. They range mainly between 25 and 60°S in the Atlantic and Indian Oceans but are rare in the South Pacific Ocean; however, now regularly seen on subantarctic cruises near the Antipodes. They have straggled to the mainland of New Zealand only recently, with 12 records since 1971, mainly on the east coast and around Cook Strait in May–June, when fledglings have just left their colony on the Antipodes, or in November–December. Three records from on or near the Chatham Islands (1980, 1987, 1997).

Population: Several thousand pairs breed on Antipodes Island, where the population is growing rapidly, and very large numbers breed at Gough Island and on Indian Ocean islands.

Conservation: Protected native. Soft-plumaged Petrels were first discovered in the New Zealand region in February 1969, when they were seen flying over Antipodes Island. In 1978, burrows were located and the colony

appeared to be expanding, and by 1994 there were several thousand pairs breeding.

Breeding: Not studied in New Zealand. Elsewhere, adults return to their colonies in August–September to clean out their burrows and to court. Laying is generally in December, and apparently some time after 5 December on the Antipodes. They lay 1 white egg (60 x 43 mm, 54 g) in a burrow 1–1.5 m long, under dense tussock and fern. Eggs hatch in January–February after c. 50 days, and most chicks depart in May at c. 90 days old.

Behaviour: Call over the nesting area with strange, mournful, low-pitched, fluting cries like a lamb bleating; this call is also uttered on the ground and in burrows.

Feeding: Diet is mainly squid, with some small fish and crustacea.

In the hand: Soft-plumaged Petrels have pale and dark phases, but all recorded from the New Zealand region have been of the pale phase. White-headed Petrels and Chatham Island Taiko are the most similar species, but Soft-plumaged Petrels are much smaller (wing 235–255–275 mm, bill 25.5–28.4–32 mm). The rare dark phase is similar to the Kerguelen Petrel but lacks the silvery outer underwing.

Reading: Harper, P.C. 1973. *Notornis* 20: 193–201. Imber, M.J. 1983. *Notornis* 30: 283–298. Jouventin, P. et al. 1985. *Notornis* 32: 157–220. Warham, J. & Bell, B.D. 1979. *Notornis* 26: 121–169.