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 42, 44, 45, 184, 185, 214.

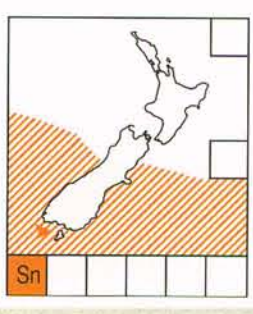
Plate 13

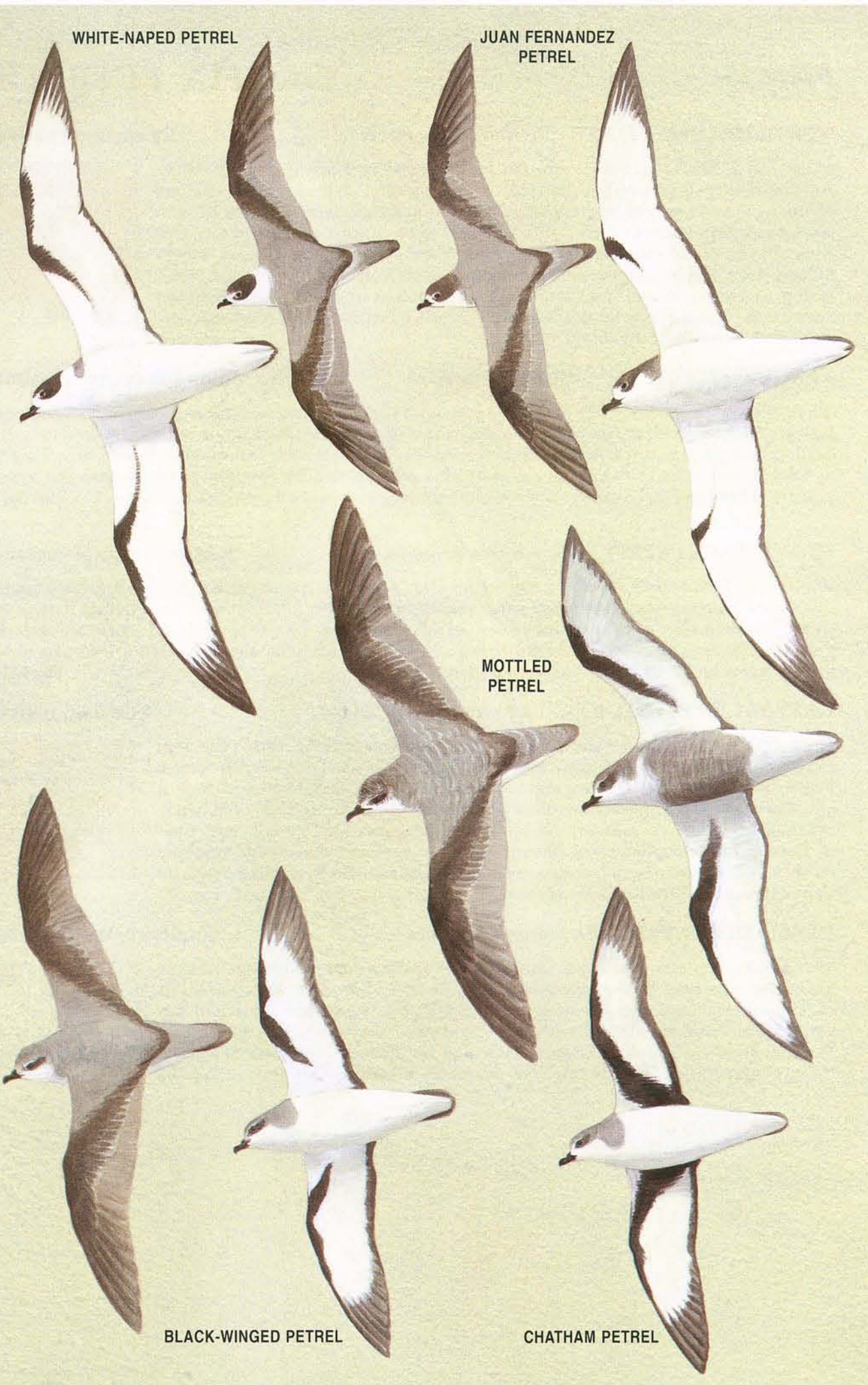
GADFLY PETRELS

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.

MOTTLED PETREL (Korure) *Pterodroma inexpectata* **Common endemic**

34 cm, 325 g. *Face white, heavily mottled grey*; upperparts dark frosty grey, with darker M across wings; dark eye patch; *underparts white except grey patch on the lower breast and belly*. Underwing white with broad black diagonal band from bend of wing to near body. Bill small (27 x 12 mm), black; legs and feet fleshy pink with black toes and ends of webs. **Habitat:** Breeds Fiordland, Codfish I and other islands off Stewart I, and at The Snares. Ranges to pack ice, around NZ mainland and to Chathams in breeding season. Migrates to N Pacific. **Breeding:** Dec–Jun. **[Sp 56]**





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.

56. MOTTLED PETREL *Pterodroma inexpectata* — Plate 14

Other name: Korure
Size: 34 cm, 325 g
Distribution: Breed only on islands in southern New Zealand; in Fiordland (Shag and Front Islands and an island in Lake Hauroko), Solander Islands, islands around Stewart Island, including Codfish and Big South Cape, and The Snares. Subfossil, midden and historical records indicate a former breeding distribution through the North, South and Chatham Islands. During the breeding season, Mottled Petrels range through subantarctic waters to the pack ice, but some, mainly non-breeders, are found up to about 35°S, and cross the Tasman Sea to southeastern Australia. In March–June they migrate to subarctic waters of the North Pacific Ocean and the Bering Sea, where they stay until September. They return directly to New Zealand, arriving back from mid-October to November. A few non-breeders follow the American coast south to reach cool waters of the Humboldt Current and the seas off Cape Horn. About 30 Mottled Petrels are beach-wrecked in New Zealand each summer, mostly on Southland beaches (notably Mason Bay, Stewart Island).
Population: Common. The largest colony is on Codfish Island (Whenua Hou) with 300,000–400,000 pairs. Other major colonies of 10,000+ pairs are on Main Island (The Snares) and Big South Cape Island.
Conservation: Protected endemic. Maori used to harvest chicks in the inland North Island, but colonies on the mainland have gone as a result of forest clearance, fires and predators. Weka kill many birds on islands around Stewart Island, and so breeding success has improved on Codfish Island since Weka were removed in 1985.
Breeding: Adults return to their colonies in late October and early November to prepare burrows and to court. Eggs are laid from early December to early January, mostly 15–23 December. They lay **1** white egg (61 x 44 mm, 61 g) in a burrow or crevice. Both sexes share incubation in stints of 2–**13**–22 days. Eggs hatch in early February after 48–**50**–53 days. The chick is brooded for the first couple of days and fed about every second day during the first 3 weeks of life. Chicks leave in May and early June at 90–105 days old.
Behaviour: Nest in colonies and sometimes share their cavity with Fairy Prions. At sea, they are usually alone or in small flocks. They arrive at their breeding colonies about 50 minutes after sunset, much later than Sooty Shearwaters. They are very vocal over their colonies, with rapid 'ti-ti-ti . . .' or 'kek-kek-kek . . .' calls and rarer 'oooi' and 'gorr' calls. On the ground, a wide range of calls is given, including the main flight call and the resonant 'gorr', followed by a short staccato 'wik'.
Feeding: Diet is mainly lantern fish, with some crustaceans and squid. Most prey is taken while sitting on the sea surface or by dipping or plunging from the air.
In the hand: Mottled Petrels are distinctive, with their grey belly patch and prominent black band running diagonally across the underwing from the bend in the wing towards the body. The wing length (245–275 mm) is greater than that of most petrels with a similar underwing pattern. Juveniles are paler than adults and have white mottling on most tail feathers, whereas only the outer tail feathers of adults are mottled.

Reading: Harper, P.C. 1987. *Notornis* 34: 169–192. Imber, M.J. 1991. *Acta Int Orn Cong* 20: 1402–1412. Warham, J. *et al*. 1977. *Auk* 94: 1–17.