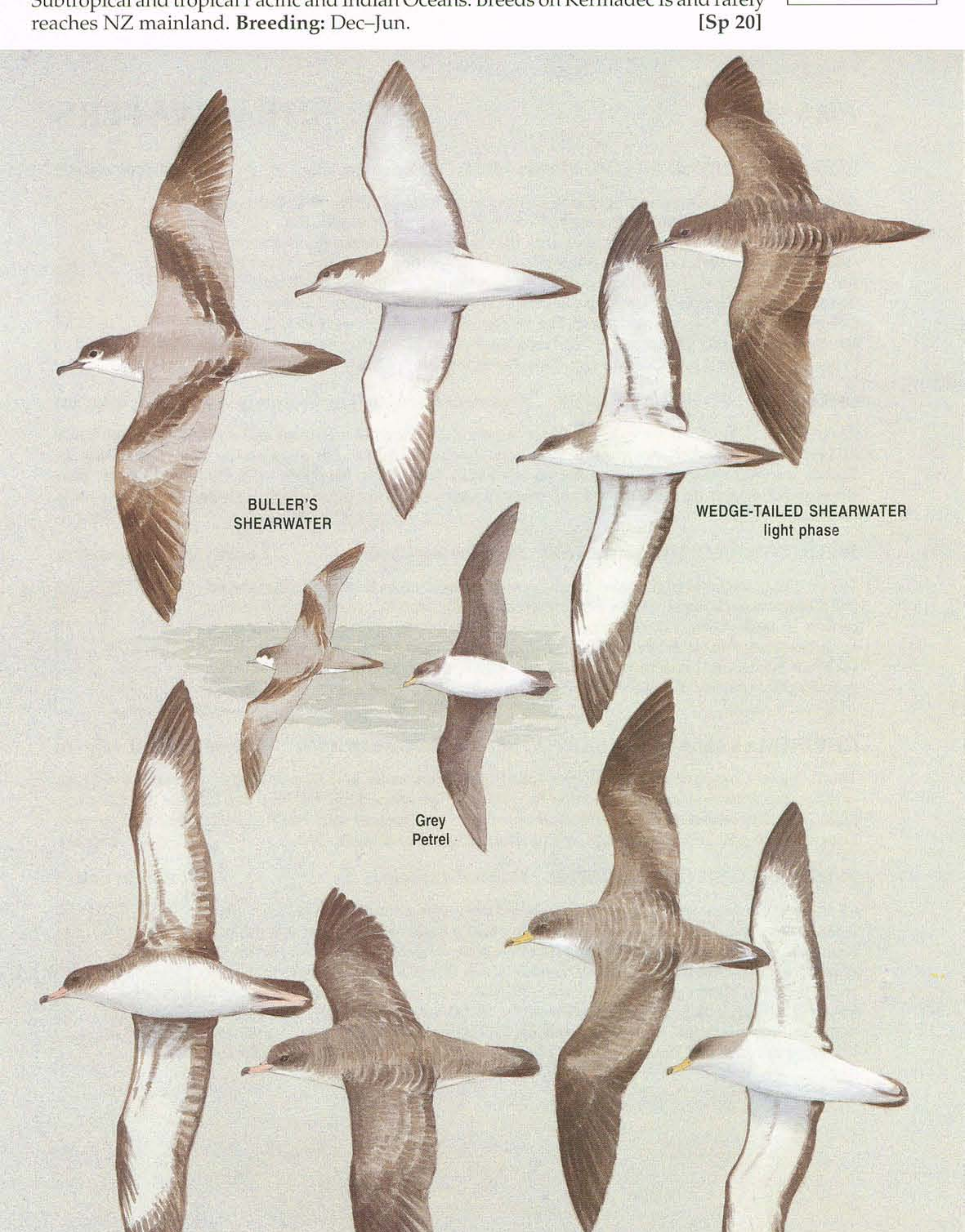
Text and images extracted from Heather, B.D. & Robertson, H.A. (2005) *The Field Guide to the Birds of New Zealand*. Penguin Books, Auckland. Pages 30-33, 184, 185, 187, 188.

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.

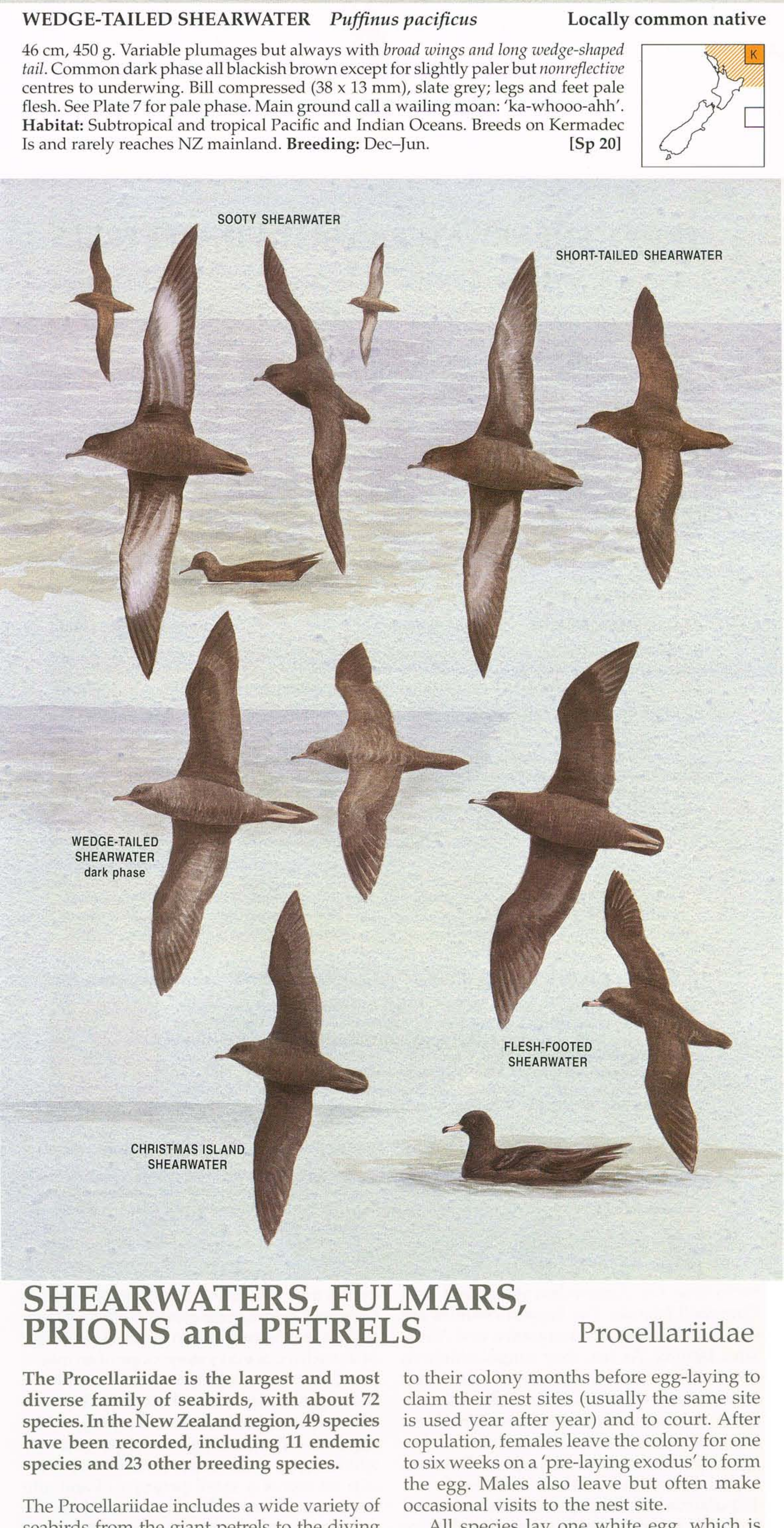
WEDGE-TAILED SHEARWATER *Puffinus pacificus* **Locally common native**

46 cm, 450 g. Variable plumages but always with *broad wings and long wedge-shaped tail*. Rare pale phase has head, hindneck and upperparts dark brown with a sharp line of demarcation from white chin and throat; underparts mainly white but variably mottled brown on sides of breast, flanks and undertail; underwing white with dark borders and tip, mottled brownish grey on underwing coverts. Bill compressed (38 x 13 mm), slate grey; legs and feet pale flesh. See Plate 8 for dark phase. **Habitat:** Subtropical and tropical Pacific and Indian Oceans. Breeds on Kermadec Is and rarely reaches NZ mainland. **Breeding:** Dec–Jun. **[Sp 20]**



WEDGE-TAILED SHEARWATER *Puffinus pacificus* **Locally common native**

46 cm, 450 g. Variable plumages but always with *broad wings and long wedge-shaped tail*. Common dark phase all blackish brown except for slightly paler but *nonreflective* centres to underwing. Bill compressed (38 x 13 mm), slate grey; legs and feet pale flesh. See Plate 7 for pale phase. Main ground call a wailing moan: 'ka-whooo-ahh'. **Habitat:** Subtropical and tropical Pacific and Indian Oceans. Breeds on Kermadec Is and rarely reaches NZ mainland. **Breeding:** Dec–Jun. **[Sp 20]**



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.

20. WEDGE-TAILED SHEARWATER *Puffinus pacificus* Plates 7 and 8

Size: 46 cm, 450 g

Geographical variation: Two subspecies: *pacificus* breeds only in the southwest Pacific, at the Kermadecs, Norfolk, Fiji and Tonga; *chlororhynchus* breeds widely in the South Indian Ocean, around Australia and across the subtropical and tropical Pacific, including Lord Howe Island and New Caledonia.

Distribution: Breed on islands of the tropical and subtropical Indian and Pacific Oceans and range widely in adjacent seas. Some populations are migratory; band returns show that birds from southeastern Australia migrate to the western North Pacific. In the New Zealand region, Wedge-tailed Shearwaters breed only at the Kermadec Islands and apparently migrate to the southeastern part of the North Pacific. Recorded at sea to the northeast of New Zealand in autumn, and a few stragglers of both subspecies have been recorded beach-wrecked on the North Island coast, mainly November–April.

Population: A very common and widely distributed shearwater. In New Zealand, they breed only at the Kermadec Islands, where a few still breed on Raoul Island on headlands and along the tops of coastal cliffs, but they are very common on the smaller offshore islands without cats and rats such as the Meyer Islets (e.g. c. 10,000 pairs on North Meyer) and Dayrell Island. The largest colonies are in the southern Kermadecs, where c. 40,000 pairs nest on Macauley Island and 2500 pairs nest on Curtis Island.

Conservation: Protected native. Virtually extinct on Raoul Island, where 'immense numbers' were recorded in 1908, but its status was only 'abundant' in 1944, because of predation by feral cats and Norway rats. Numbers breeding on predator-free islands elsewhere in the group have probably remained stable, except for an increase on Macauley Island since the removal of goats.

Breeding: No detailed studies in New Zealand through the whole season. In the Kermadecs, timing of breeding varies a week or two from year to year. Birds return to their colonies in October and clean out their burrows in November. The colony is virtually abandoned during the first half of December while birds are on their pre-laying exodus, but they return and lay in mid- to late December, mostly c. 18 December. They lay **1** white egg (67 x 43 mm) in a burrow up to 2.5 m long, but sometimes they lay on the surface under an overhanging rock, in a small cave or under vegetation. Both sexes incubate for c. 54 days.

Chicks hatch in early February and are initially covered in pale grey down. They are left unattended within days after hatching and fledge from late May to early June, at c. 90 days old, at which time they are immediately independent of their parents. Some yearlings attend colonies, but they do not start breeding until at least 4 years old. The oldest bird recorded was an Australian one aged over 19 years.

Behaviour: Breed in large dense colonies on some islands, sometimes interspersed with other petrels and shearwaters, especially Black-winged Petrels at the Kermadecs. At sea, Wedge-tailed Shearwaters are usually solitary but sometimes form small feeding flocks or large rafts off colonies. They are generally silent at sea and over their colonies, but occasional wails are given by circling birds. Wedge-tailed Shearwaters are very noisy on land at the colony. They often come ashore in the late afternoon, with numbers increasing towards dusk, and the noise builds to a peak in the first couple of hours of darkness. The main call given on the ground is a soft wailing moan: 'ka-whoooo-ahh'.

Feeding: Diet is mainly fish, but squid, krill and jellyfish are also taken. Feeding birds sometimes look for prey by gliding along with head and neck just under the water. Prey is seized near the surface or sometimes by pursuit-plunging. They scavenge around whales and dolphins, and from behind boats.

Reading: Crockett, D.E. 1975. *Notornis* 22: 1–9. Jenkins, J.A.F. 1979. *Notornis* 26: 331–348. Merton, D.V. 1970. *Notornis* 17: 147–199.