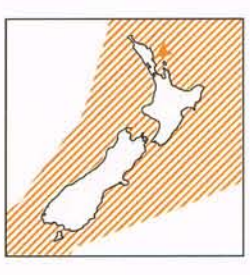
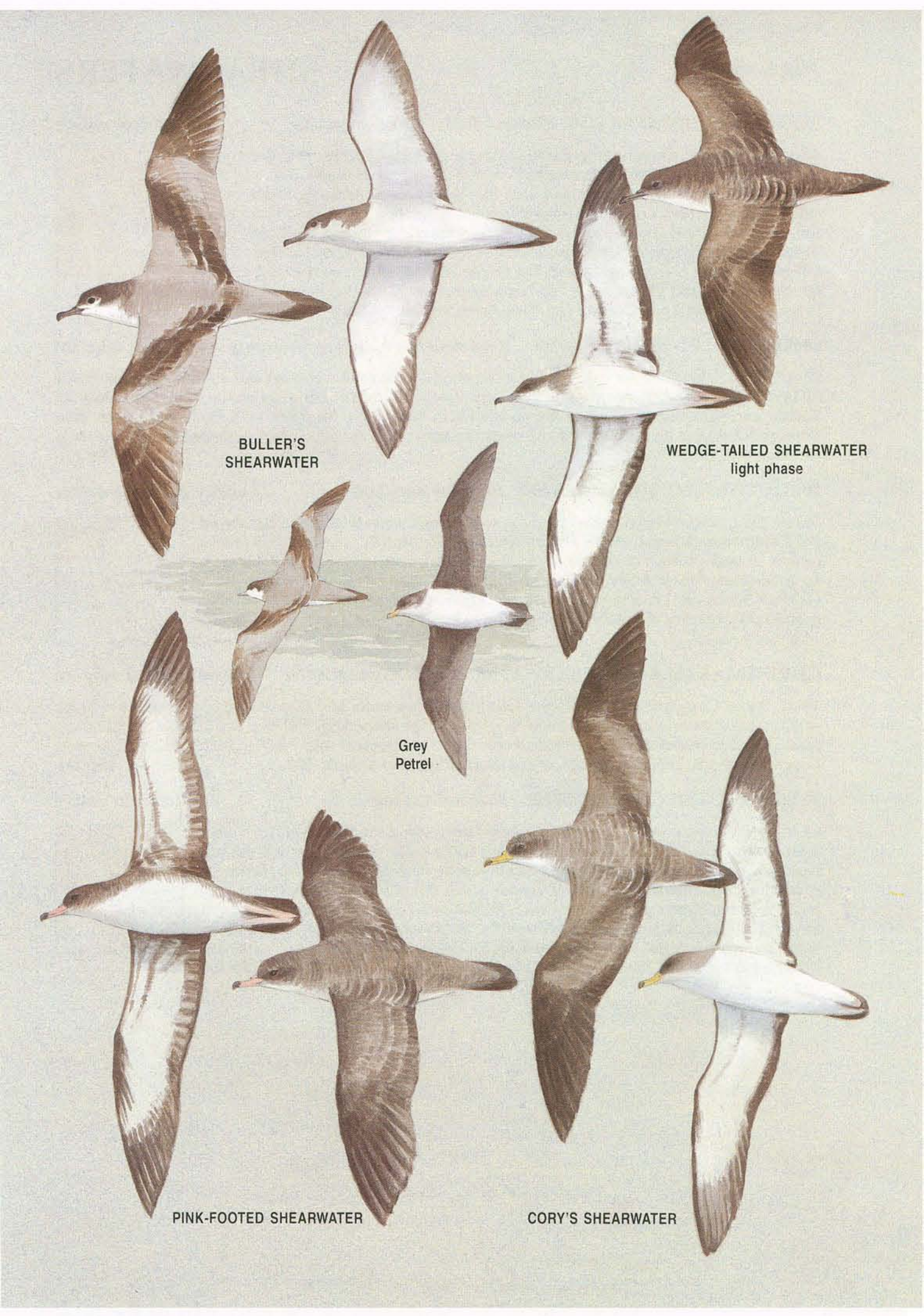
Text and images extracted from Heather, B.D. & Robertson, H.A. (2005) *The Field Guide to the Birds of New Zealand*. Penguin Books, Auckland. Pages 30, 31, 184, 185, 188, 189.

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.

BULLER'S SHEARWATER *Puffinus bulleri* **Common endemic**



46 cm, 425 g. Head and hindneck blackish brown; *back and upperwings frosty grey with bold dark M across wings, lower back and rump*; uppertail light grey with broad black tip to long wedge-shaped tail; sharp line of demarcation from white underparts and underwing. Bill long and slender (41 x 12 mm), bluish grey with darker tip; legs and feet pink with dark outer toes and outer edge of tarsus. **Habitat:** Breeds only at Poor Knights Is. Ranges widely around NZ coast and migrates to northern and eastern Pacific. **Breeding:** Nov–May. **[Sp 21]**



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.

21. BULLER'S SHEARWATER *Puffinus bulleri* Plate 7

Other name: New Zealand Shearwater (North America)
Size: 46 cm, 425 g
Distribution: Breed only on the Poor Knights Islands off the eastern coast of Northland. Between early September and mid-May, birds disperse widely throughout New Zealand seas, mainly over North Island continental-shelf waters, particularly off Northland, in the Hauraki Gulf and the Bay of Plenty, and off East Cape; but they reach Foveaux Strait, seas off Fiordland and the Chatham Islands. From December, some birds move across the Tasman Sea to coastal waters off eastern Australia.

During April to late May, Buller's Shearwaters depart on migration to the northern and eastern North Pacific, from Japan across to the western coast of North America. The migration route is not known exactly, but most seem to reach the subarctic waters of the northwestern Pacific in June, then many drift northwards to the Gulf of Alaska and eastwards to be off the North American coast by August, and then they head directly back in early September. Some non-breeders remain all year in the North Pacific, with many seen off the west coast of North America in September–October, and some move south to spend the summer in the Humboldt Current, off Peru and Chile.

Population: c. 2.5 million birds, breeding only at the Poor Knights Islands.
Conservation: Protected endemic. Numbers breeding on the Poor Knights Islands have increased greatly since the removal of feral pigs from Aorangi Island in 1936. On Aorangi Island, the population was estimated at 100 pairs in 1938, but c. 200,000 pairs were breeding by 1981, the increase probably coming from a mix of recruitment and immigration from nearby Tawhiti Rahi Island. The Poor Knights Islands are protected as a Nature Reserve and are predator-free.
Breeding: Birds return to their colonies in mid-September and court and clean out their burrows during October. They are then virtually absent from the colony for c. 30 days from late October on their pre-laying exodus, but return and most eggs are laid during just a few days from 26 to 30 November. They lay **1** white egg (65 x 43 mm, 67 g) in a burrow 0.5–**1**–3 m long, but occasionally in caves, cavities and old stone-walls. Both sexes incubate in stints of 4–7 days for c. 51 days. The chick is initially covered in smoky blue-grey down and is left unattended within days after hatching between 17 and 26 January. Most chicks fledge in the second half of May, at c. 90 days old.

Behaviour: Breed in large dense colonies, interspersed with Fairy Prions. They have apparently ousted Fluttering Shearwaters and Grey-faced Petrels from Aorangi Island since the 1930s as their numbers have increased. At sea, Buller's Shearwaters are usually found alone or in small flocks, but they migrate across a broad front in ones and twos and in groups of up to 12 birds. Feeding aggregations or resting rafts of 50–600 birds are often seen off the east coast of New Zealand in summer, and occasionally flocks of 5000–10,000 birds are seen off the eastern coast of Northland and off North America. They are generally silent at sea but noisy in the air and on the ground at their colonies, especially when they return in the first couple of hours of darkness.
Feeding: Diet is small (9–17 mm) krill, small fish, salps and jellyfish, taken while sitting on the surface. Birds searching for food glide along with head and neck just under the water. Buller's Shearwaters rarely plunge into the sea or dive underwater. They have recently started to scavenge scraps from around fishing boats.

Reading: Harper, P.C. 1983. *Notornis* 30: 299–318. Jenkins, J.A.F. 1974. *Notornis* 21: 109–120. Jenkins, J.A.F. 1988. *Notornis* 35: 203–215. Wahl, T.R. 1985. *Notornis* 32: 109–117.