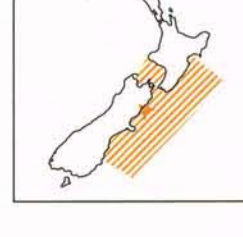


Medium to large seabirds with long slender bill and nostrils encased in a short flattened tube. Sexes and ages alike; most are dark above and mainly white below, but some are all dark. Many species form large feeding flocks. Usually fly close to the surface, often with a series of rapid wingbeats followed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

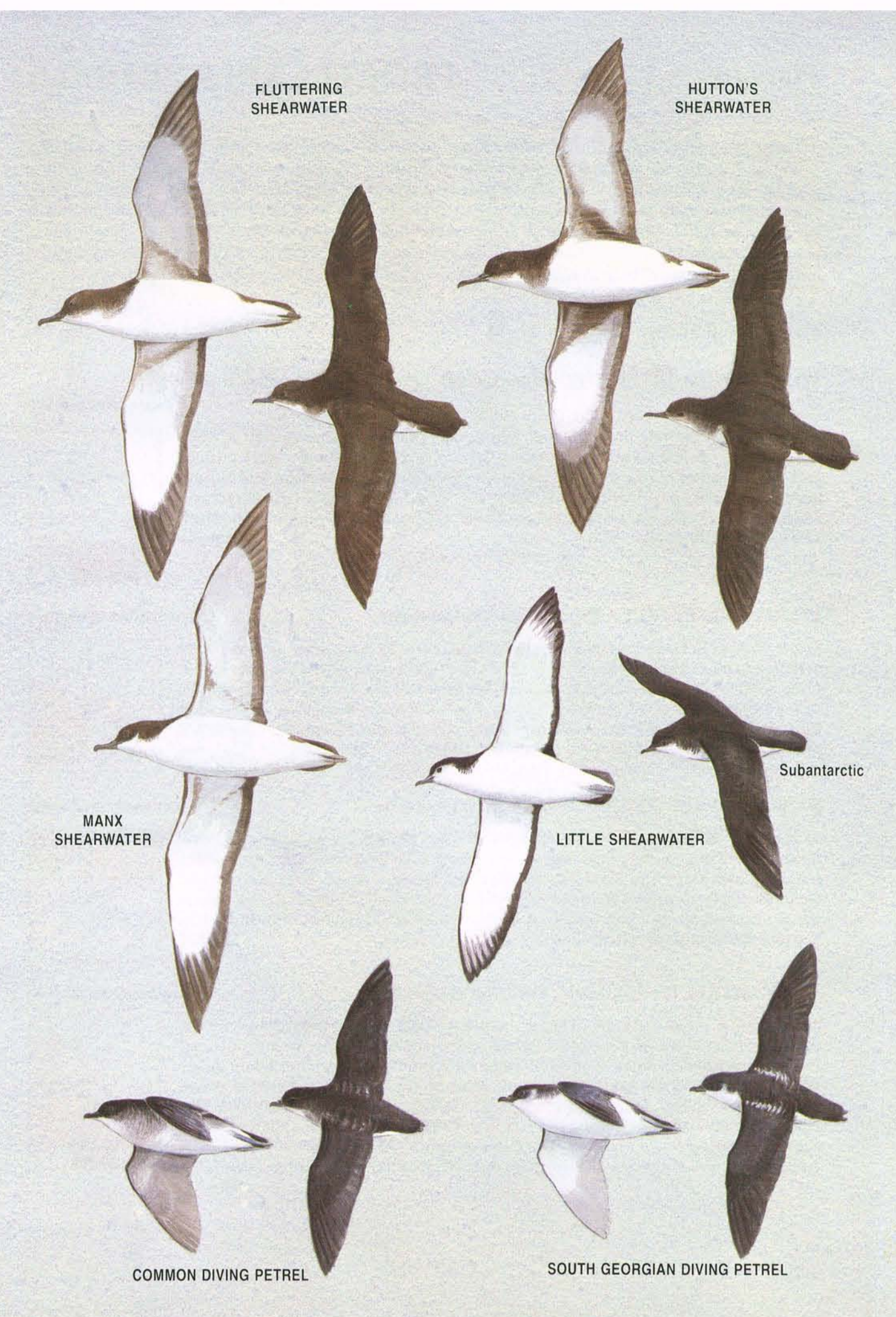
HUTTON'S SHEARWATER *Puffinus huttoni*

Locally common endemic

36 cm, 350 g. Head to below eye, upperparts and thigh patch blackish brown merging into white underparts and flank patch; faintly mottled broad collar; underwings centred off-white with indistinct broad brownish borders and extensive dusky-grey armpits. Bill (37 x 9 mm). Like Fluttering Shearwater at sea but larger; darker underwings. In hand, sides of undertail coverts brown. Main colony call 'ko-uw ko-uw ko-uw ko-uw, kee kee kee kee - aaah'. **Habitat:** Breeds only in Seaward Kaikoura Range. In NZ waters, mainly off east coast South I and in Cook Strait but migrates to Australian waters in winter. **Breeding:** Oct-Apr.



[Sp 27]



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.

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.

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.

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

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.

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.

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 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 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 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 shearwaters (*Calonectris*, *Puffinus*) include about 15 medium to large species with long slender bills and flat nasal tubes. They

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.

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.

breeding grounds were not found until 1965. Reports from high-country runholders indicated that Hutton's Shearwaters formerly bred in the Inland Kaikoura Range, where Maori formerly collected the young as muttonbirds. Recent studies have shown that stoat predation on adults and young is sometimes very intense and some subcolonies have declined seriously. Some parts of the colonies are in steep, unstable sites, and erosion (perhaps induced by the heavy browsing of deer, chamois, goats, hares and possums) has obliterated some of them. Stoats are now trapped at the accessible main subcolonies, but many nesting sites are too remote to be protected. Control of browsing mammals has led to better vegetation cover at the colonies.

Breeding: Birds return to their colonies on soil-covered slopes high in the mountains from late August to mid-September. In some years the colonies are still snow-covered and birds wait up to a month before they can clean out their burrows. Eggs are usually laid between 25 October and 18 November, but later in some subcolonies where snow persists longer. The whole population may breed later in years when snow persists long into the spring. They lay 1 white egg (60 x 41 mm) in a burrow 0.6-1.2-2.5 m long, but usually running parallel with and just below the surface. Eggs hatch in late December-January and most chicks fledge during March-early April. Young return to the colony from 3 years old but probably do not start breeding until 4-6 years old.

merged, then diving with their partly opened wings used for propulsion.

In the hand: Hutton's Shearwaters can be separated from Fluttering and Manx Shearwaters on measurements and on undertail and underwing colours. Bill length is 32-36 mm and wing length is 210-225-235 mm, the side feathers of the undertail coverts have dark brown edges in most birds, the longest axillaries reach near the trailing edge of the wing and are dark brown, rounded at the tip, and only rarely or slightly tipped with buff or white, and the underwing is smudged with brown, especially near the base of the wing.

Reading: Halse, S.A. 1981. *Emu* 81: 42-44. Halse, S.A. & Halse, N.J. 1988. *West Aust Nat* 17: 97-106. Harrow, G. 1965. *Notornis* 12: 59-65. Harrow, G. 1976. *Notornis* 23: 269-288. Kinsky, F.C. & Fowler, J.A. 1973. *Notornis* 20: 14-20. Powlesland, R.G. & Pickard, C.R. 1992. *Notornis* 39: 27-46. Tarburton, M.K. 1981. *Notornis* 28: 9-10.

Behaviour: Breed in large, patchily dense colonies. At sea, Hutton's Shearwaters are difficult to distinguish from Fluttering Shearwaters, with which they may mix. Large flocks of 20,000 birds, presumed to be primarily of this species, have been seen feeding and roosting off the Marlborough coast. Off Australia, they have been seen in small flocks, sometimes intermingling with other shearwaters. When circling above their breeding colonies they are noisy, uttering a rapid staccato cackle, more wheezy than that of the Fluttering Shearwater. There is much variation on the main call: 'ko-uw ko-uw ko-uw ko-uw, kee kee kee kee - aaah'.

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.

Feeding: Diet is mostly small fish and krill, taken mainly by plunging from a few metres above the surface or by paddling slowly forwards searching with their head sub-

27. HUTTON'S SHEARWATER

***Puffinus huttoni* Plate 9**

Size: 36 cm, 350 g

Distribution: Breed only in New Zealand, 1200-1800 m asl in the Seaward Kaikoura Range of the northeastern South Island. Formerly they also bred in the Inland Kaikoura Range. As subfossil and midden material is not readily distinguishable from that of Fluttering Shearwaters, it is not possible to tell if they used to have an even wider breeding distribution. During spring and summer, they range over continental-shelf and deeper waters mainly east of the South Island from Cook Strait to Otago, especially north of Banks Peninsula.

breeding grounds were not found until 1965. Reports from high-country runholders indicated that Hutton's Shearwaters formerly bred in the Inland Kaikoura Range, where Maori formerly collected the young as muttonbirds. Recent studies have shown that stoat predation on adults and young is sometimes very intense and some subcolonies have declined seriously. Some parts of the colonies are in steep, unstable sites, and erosion (perhaps induced by the heavy browsing of deer, chamois, goats, hares and possums) has obliterated some of them. Stoats are now trapped at the accessible main subcolonies, but many nesting sites are too remote to be protected. Control of browsing mammals has led to better vegetation cover at the colonies.

In autumn, Hutton's Shearwaters migrate to coastal and continental-shelf waters of Australia as far north as Torres Strait and around the southern and western coasts to off northwestern Western Australia. It is not yet clear whether they circumnavigate the continent or follow the same route outwards and back. Adults return to New Zealand in August, followed by subadults in October-November, but younger pre-breeders apparently remain in Australian waters all year. The pattern of recovery of beach-wrecked birds reflects this migration pattern; very few specimens are found between April and August, but numbers increase to peak in October-November, when the subadults return.

Breeding: Birds return to their colonies on soil-covered slopes high in the mountains from late August to mid-September. In some years the colonies are still snow-covered and birds wait up to a month before they can clean out their burrows. Eggs are usually laid between 25 October and 18 November, but later in some subcolonies where snow persists longer. The whole population may breed later in years when snow persists long into the spring. They lay 1 white egg (60 x 41 mm) in a burrow 0.6-1.2-2.5 m long, but usually running parallel with and just below the surface. Eggs hatch in late December-January and most chicks fledge during March-early April. Young return to the colony from 3 years old but probably do not start breeding until 4-6 years old.

Population: c. 100,000 breeding pairs, nesting in one large and one small, scattered colony in the Seaward Kaikoura Range.

Conservation: Protected endemic. Although the species was first described in 1912, its

Behaviour: Breed in large, patchily dense colonies. At sea, Hutton's Shearwaters are difficult to distinguish from Fluttering Shearwaters, with which they may mix. Large flocks of 20,000 birds, presumed to be primarily of this species, have been seen feeding and roosting off the Marlborough coast. Off Australia, they have been seen in small flocks, sometimes intermingling with other shearwaters. When circling above their breeding colonies they are noisy, uttering a rapid staccato cackle, more wheezy than that of the Fluttering Shearwater. There is much variation on the main call: 'ko-uw ko-uw ko-uw ko-uw, kee kee kee kee - aaah'.

Feeding: Diet is mostly small fish and krill, taken mainly by plunging from a few metres above the surface or by paddling slowly forwards searching with their head sub-

merged, then diving with their partly opened wings used for propulsion.

In the hand: Hutton's Shearwaters can be separated from Fluttering and Manx Shearwaters on measurements and on undertail and underwing colours. Bill length is 32-36 mm and wing length is 210-225-235 mm, the side feathers of the undertail coverts have dark brown edges in most birds, the longest axillaries reach near the trailing edge of the wing and are dark brown, rounded at the tip, and only rarely or slightly tipped with buff or white, and the underwing is smudged with brown, especially near the base of the wing.

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