

Subantarctic Adams Island and its birdlife

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ABSTRACT: Adams Island (9,693 ha) is the second-largest island in the Auckland Islands group, and the largest island in New Zealand on which introduced mammals have never become established. Adams Island is forested on the northern sheltered parts of its coastline, and has shrubland, grassland, and fellfield at higher altitudes, and herb-field in fertile open sites. Sheer cliffs dominate the exposed, southern side of the island, and above them, narrow shelves support lush herb-fields. This diversity of habitat in close proximity supports unique communities of birds, with most species in remarkable abundance due to the absence of introduced predators. With the notable exception of the Auckland Island merganser (*Mergus australis*), the island's birdlife is close to what it would have been in pre-human times, and includes high densities of species that are now rare or missing on nearby Auckland Island. This paper describes the island, the history of ornithological exploration, and the past and current state of the avifauna. The 48 extant bird species recorded from the island comprise 22 land birds and 26 seabirds, of which 34 species (16 land birds and 18 seabirds) have been recorded breeding or are likely to be breeding there. Eight species introduced to New Zealand have also made their way to Adams Island, and six probably breed there.

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Introduction

Adams Island (50°53'S, 166°03'E) is globally important for its pristine condition and abundance of wildlife. It is the second-largest (9,693 ha) and southernmost island in the Auckland Islands archipelago (Fig. 1), 360 km south of New Zealand. Despite the richness of its fauna and flora, and absence of introduced mammals, no systematic account of the island's abundant birdlife and the history of its discovery has been published, nor have accounts of the nature of the island itself. This paper seeks to address these gaps.

The Auckland Islands were never connected to mainland New Zealand. They are the eroded remnants of two large shield volcanoes, which erupted 20–10 million years ago. Their overlapping lava flows form the highest peaks on the mostly submerged Campbell Plateau and are centred on the collapsed calderas at Disappointment Island in the north and at Carnley Harbour in the south (Turnbull 2006; Scott & Turnbull 2019). Present-day topography of the islands reflects both marine erosion, which has formed the coastline, especially

the great western and southern cliffs; and severe glacial erosion, which has shaped Carnley Harbour and the fjords of the eastern coast. The islands underwent repeated and prolonged cycles of glaciation during the Pleistocene and possibly earlier, with glaciers probably extending to the shelf edge. These were followed by drowning of the glacial valleys and the resumption of marine erosion of the coastal cliffs during warmer inter-glacial spells (Turnbull 2006; Scott & Turnbull 2019).

Adams Island consists of a 'main range' running west to east, and moderately sloping northern faces that descend to the sheltered Carnley Harbour. It has large areas of gently sloping land south of the main range that end in precipitous cliffs up to 400 m high (Fig. 1). Its highest point, Mt Dick (705 m) is also the highest point in the New Zealand sub-antarctic region. The island was formed from the southern flanks of the Carnley volcano. The upper sections of the northern faces nearest the vent of the volcano have been eroded by ice into cirques with lateral moraines. The southern side of the island shows the impact of glaciation even more clearly, with some of the gentle outer slopes of the

154

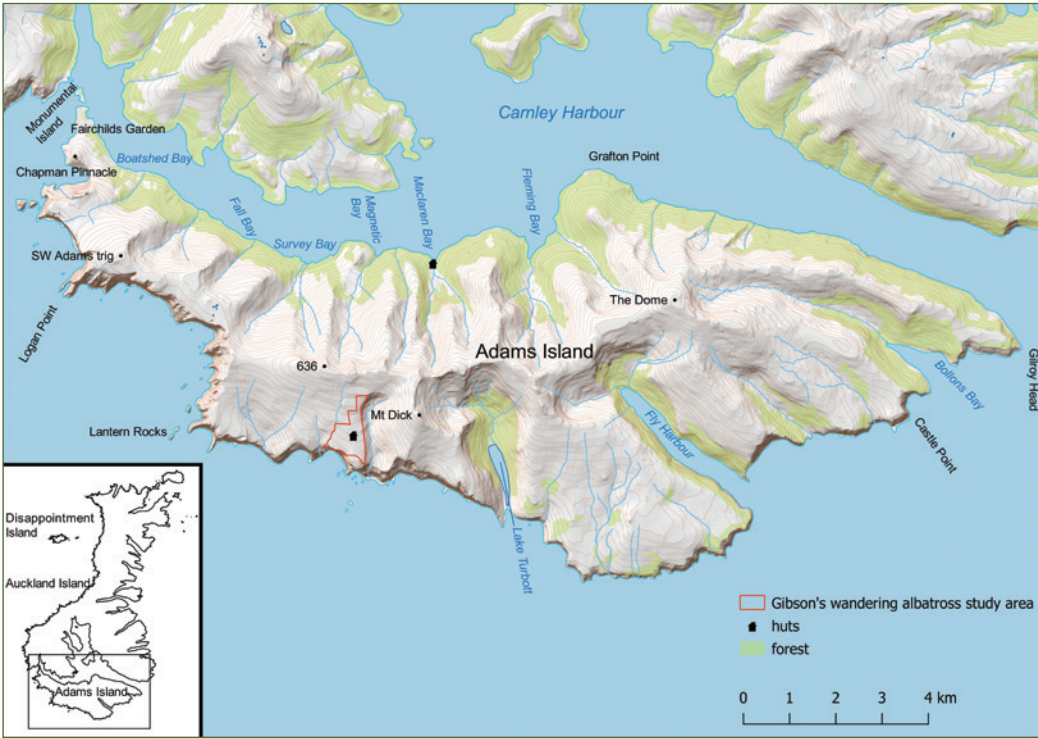


FIGURE 1. Adams Island, showing places named in the text.



FIGURE 2. Lake Turbott, shaped by glacial ice into a classic U-shaped valley, on the southern slopes of Adams Island. The horizontal lines of bluffs are not glacial moraines but the harder volcanic rocks in differing lava flows. Image: Kath Walker.

155

Carnley volcano gouged by glaciers into classic over-deepened U-shaped valleys, most obviously at Lake Turbott (Fig. 2), Fly Harbour, and Bollons Bay. The island's volcanic origin is visible in long parallel lines of rock outcrops in the upper reaches of those U-shaped valleys, where lava flows have been exposed by glacial action.

Adams Island has a cool, wet, windy climate with little sunshine. Weather records made in the 1940s at Tagua Bay, on the southern end of the main Auckland Island near Adams Island, found extreme temperatures of -2°C and 18°C , some rain on most days (331 days per year) and an average of 2,100 mm of rain per year (de Lisle 1965). Adams Island is very exposed to the prevailing westerlies: north-westerlies bring strong winds and rain, and squally cold south-westerlies bring showers of hail and snow, and sudden patches of blue sky. The high main ridgeline is often swathed in wet mist.

At low altitude on the more sheltered northern side, the island is clothed in southern *rātā* (*Metrosideros umbellata*) and *inaka* (*Dracophyllum longifolium* and *D. cockayneanum*) forest (Fig. 3)

up to 5 m tall, with important understorey woody species including *Raukaua simplex*, *Coprosma foetidissima*, and *Myrsine divaricata*. At about 200 m above sea level (a.s.l.), or at sea level in a few very exposed sites, the forest gives way to dense tangled scrub of *Myrsine divaricata* with scattered stunted *rātā* and *inaka*, and above that the snow tussock *Chionochloa antarctica* becomes dominant. At about 450 m a.s.l. the grassland tussocks give way to fellfield with scattered herbs, and eventually, on the highest and most exposed parts, to bare rock (Fig. 3).

Fellfield (Fig. 4) covers a significant proportion of Adams Island. The main ridgeline is broad and nearly flat in places, with small tarns in the flattest sites east of South-west Adams trig (Fig. 5) and west of The Dome. It is exposed to near-constant high winds, which ensures that any plants present are very low-growing. Large flat areas are covered in the silvery-green rosettes of *Pleurophyllum hookeri*, with occasional mounds of *Phyllachne clavigera*, the daisy *Damnamenia vernicosa*, and the rush *Marsippospermum gracile*.



FIGURE 3. Southern rātā and inaka forest at Maclaren Bay, with tussock grassland and, above that, fellfield on the rocky crest of Adams Island. *Image: Kath Walker.*

156



FIGURE 4. Fellfield on the exposed tops near Mt Dick on Adams Island, looking north at unusually calm waters in Carnley Harbour, with Masked Island prominent. *Image: Kath Walker.*

In better-drained sloping sites, *Veronica benthamii*, *Myosotis capitata*, *Gentianella cerina*, and *Bulbinella rossii* grow in the fellfield. The decaying leaves of all these herbs quickly rot, supplying shelter and food in leaf sheaths for many earthworms (Cockayne 1904), leaf-vein slugs (family Athoracophoridae), and weevils (Curculionidae).

On the exposed southern side of the island there are high, sheer cliffs (Fig. 5). Among and above the cliffs are ledges that are sometimes wide enough for white-capped mollymawks and light-mantled sooty albatrosses to nest on (scientific names of birds are given in Table 1 and in the species accounts, below). The ledges are on such steep ground that they are both free-draining and perpetually wet due to the waterfalls blown back and upwards by the prevailing winds. This creates perfect conditions for dense fields of megaherbs, spring-flowering perennial plants about 50–100 cm high, dominated by *Pleurophyllum criniferum*, *P. speciosum*, *Anisotome antipoda*, *A. latifolia*, and *Stilbocarpa polaris*. The fertility of these megaherb fields is enriched by guano, and they provide cover and abundant food for insectivorous

land birds alongside the nesting seabirds.

However, the most famous megaherb field is Fairchilds Garden (Fig. 6), near sea level beside Victoria Passage, the narrow seaway separating the western end of Adams Island from the main Auckland Island. Here, barren rocky lava flows, exposure, and salt spray keep some vegetation low, while high numbers of marine mammals and birds bring abundant nutrients to other parts. In spring, a large area

is packed with beautiful flowering herbaceous plants ... in splendid profusion ... stopping the progress of pedestrians. ... Over the whole country Pleurophyllum speciosum sends up, amid huge ribbed leaves, 2 ft [0.6 m] long, its spikes of beautiful lilac or purple flowers. ... They form deep cups of crisp foliage, which gives way with a crash as you set your foot on it. We long endeavoured to avoid crushing these splendid plants until they grew too thick, and we too callous. ... No doubt other parts of Adams Island ... are equally beautiful, but the day we spent here can never be forgotten. (Chapman 1891)



FIGURE 5. Looking west along the near-vertical southern cliffs of Adams Island towards the stepped cliffs at Logan Point and South-west Adams trig on the skyline. The land above the cliffs is so gently sloping and exposed that the usual tall tussock is replaced by fellfield here. Image: Kath Walker.

In close proximity to Fairchild's Garden are the exposed high cliffs of Chapman Pinnacle, salt-spray-lashed coastal turfs near Victoria Passage, a sheltered boulder beach inside Carnley Harbour, and scrub and tussock uphill and out of the wind's full force. The wide range of habitats in such a small area supports a diversity of wildlife, which combined with its easy accessibility, has made Fairchild's Garden one of the most visited and best-known parts of Adams Island.

Several of the islands in the Auckland Islands archipelago, including the very large main island, have (or had) house mice (*Mus musculus*), cats (*Felis catus*), pigs (*Sus scrofa*), rabbits (*Oryctolagus cuniculus*), sheep (*Ovis aries*), goats (*Capra hircus*), and cattle (*Bos taurus*) introduced to them during the nineteenth century (R.H. Taylor 1968). These animals extirpated many bird species, reduced populations of others, and caused dramatic changes to the vegetation (Godley 1965; Johnson & Campbell 1975; Miskelly *et al.* 2020 – Chapter 2 in this book; Russell *et al.* 2020 – Chapter 6 in this book). There was a short-lived attempt at sheep farming on Adams Island in the 1900s (Eden 1955) but it is unclear whether any stock were ever

released on the island, and no other mammals were introduced. Adams Island is the largest island in New Zealand that has no history of modification by introduced mammals. Enderby Island (695 ha), in the northern part of the Auckland Island group, as well as Antipodes (2,000 ha) and Campbell (11,300 ha) Islands in the New Zealand subantarctic, are now free of introduced mammals following successful eradication efforts, and are recovering.

The lack of pigs, cats, and mice on Adams Island is not only fortuitous but also surprising. Adams Island is less than 600 m from the main Auckland Island at its closest point (Fig. 1) and there are stepping-stone islands, meaning that these mammals would have to swim no more than about 100 m at a time to get to Adams Island. However, although the distances each side of Monumental Island are small, Victoria Passage funnels strong tidal currents and winds, and so the seas through the strait are often rough. While there is a risk that one or more of these mammals will eventually find their way to Adams Island, they have already been on the main Auckland Island for nearly 200 years without reaching Adams Island. A lack of

158



FIGURE 6. The crisp foliage of *Pleurophyllum speciosum* (inset image: Kath Walker) at Fairchild's Garden, looking south into the spray-scoured Gutter, across the sward where giant petrels gather to roost, towards Chapman Pinnacle. An extensive meadow of tall megaherbs (out of sight) spreads east from the ridge behind the researcher's tent (main image: Graham Parker).

sheltered anchorages near Adams Island means that boats seldom linger nearby, reducing further the opportunity for stowaway rodents to reach the island.

Due to the absence of exotic mammalian predators throughout its history, Adams Island supports all but one of the birds that were known to be present at first human contact. Three land birds highly vulnerable to mammalian predators, Auckland Island snipe, Auckland Island teal, and Auckland Island rail, are still common, as are all the susceptible burrow-nesting seabirds. Only the Auckland Island merganser has disappeared. Adams Island is a nature reserve to which access is restricted in order to prevent the accidental introduction of pests (animals and weeds) that could devastate its flora and fauna.

History of ornithological observation on Adams Island

Since the discovery of the Auckland Islands, there have been four main periods when ornithologists have spent significant times ashore. These periods have been interspersed with many much briefer visits, usually of only a few hours and mostly at either the accessible megaherb fields at Fairchild's Garden or, more recently, the hut site at Maclaren Bay. A full list of visits that yielded the information used in this paper is given in the Appendix, while the four major periods of ornithological reporting are described below.

The first period of recorded ornithological observation on Adams Island started with shipwrecked sailors in the 1860s (Raynal 1880). Observations continued between 1887 and 1927 by naturalists who travelled on the government steamers that serviced castaway depots for shipwrecked mariners on New Zealand's subantarctic islands (Greig 1886; Reischek 1889a, b; Chapman 1891; Wilson 1891; Lukins 1896; Ogilvie-Grant 1901; Cass 2014). The Philosophical Institute of Canterbury's 1907 trip was the best documented of those trips (Waite 1909).

The second period of intensive ornithological observation was during the Second World War, when coastwatching bases in the Auckland Islands were permanently occupied during 1941–45.

Team members, including ornithologists Charles Fleming, Graham Turbott, Robert Falla, and Jack Sorensen, visited Adams Island and recorded their observations (Sorensen 1951; Turbott 2002; McEwen 2006). A topographical survey team, also part of the war-time coastwatching effort, spent some days camped on Adams Island in 1945 (Eden 1955; Turbott 2002).

Two significant trips to the Auckland Islands in the 1960s and 1970s comprise the third period of intensive ornithological observation. In 1966 a scientific party including Brian Bell and John Kendrick spent 19 days on Adams Island based at a camp at Magnetic Bay. They made many ornithological observations, including the rediscovery of the Auckland Island rail (Falla 1967; Godley 1975). In the summer of 1972–73 as part of a major Auckland Islands expedition (Yaldwyn 1975), there were many brief visits to Adams Island, including overnight stays at Magnetic Bay and Fairchild's Garden (Bell 1975; Robertson 1975; G.R. Williams 1975; Soper 1976).

The beginning of the fourth (modern) period of investigation began in Nov 1989, with a 6-week expedition principally aimed at finding the Auckland Island rail (Moore & Walker 1990; Moore 1990, 1992; Buckingham *et al.* 1991; Elliott *et al.* 1991; Walker *et al.* 1991a, b). This resulted in the establishment of near-annual c. 6-week trips to study Gibson's wandering albatross on Adams Island (1991–2019). These expeditions allowed a variety of other flora and fauna studies to be undertaken at the same time. Ornithological observations have been recorded in field notebooks, logbooks, trip reports, and published reports and papers (Walker *et al.* 1991a, 1995a, b, 2002a, b, 2017; Hamilton *et al.* 2002; Walker & Elliott 2002a, b, 2006, 2015; Elliott & Walker 2005, 2013, 2014; Elliott *et al.* 2016, 2018; Rexer-Huber *et al.* 2019). Most of the bird observations described in this paper come from these two decades of regular visits by a variety of observers (see Appendix).

In addition to these lengthy ornithological expeditions based on the island, there have also been several systematic sea- and air-based programmes to observe Adams Island birdlife. Since 1992, Heritage Expeditions has run annual tourist expeditions to Carnley Harbour. Although tourists are not allowed to land on Adams Island, many ornithological observations have been made from

their small-boat cruises along the northern shoreline of the island. The Department of Conservation (DOC) spent several days each November in 2009, 2012, 2014, and 2015 counting yellow-eyed penguins on the north coast of Adams Island from boat-based expeditions (Hiscock *et al.* 2009, 2012; King 2014; Zammit-Ross 2015). Photographic surveys of the white-capped mollymawk colony at Logan Point on Adams Island have been conducted from a helicopter each summer from 2007 to 2016 (Baker *et al.* 2013, 2014, 2015; Baker & Jensz 2016), and in 2015 and 2016 trials assessing the efficacy of aerial photography from a helicopter to count nests of Gibson's wandering albatross and light-mantled sooty albatross were also undertaken (Baker *et al.* 2015, 2017; Walker & Elliott 2015; Rexer-Huber *et al.* 2020a – Chapter 12 in this book).

Despite this activity, physical signs of humans on Adams Island are few. The only marks left by pre-1910 visitors are a camp oven and some raised ground indicating the outline of a tiny hut built at Fleming Bay during an unsuccessful attempt to farm sheep; some wood and iron from a collapsed boatshed built to help shipwrecked sailors reach castaway depots on the main Auckland Island; and four fingerposts pointing to Boatshed Bay (Fig. 7) (Dingwall *et al.* 2009). The coastwatcher period is

marked by a few rātā stumps where a camp was established at Survey Bay in 1946. Several rātā stumps and the remains of a stone fireplace at the mouth of the stream are the only signs of the campsite at Magnetic Bay, used first by the 1966 Department of Scientific and Industrial Research (DSIR) and Wildlife Service expedition, and later by the Gibson's wandering albatross monitoring teams in 1989–99. After eight summers of camping at Magnetic Bay to undertake Gibson's wandering albatross research, researchers finally built a hut at Maclaren Bay in 1999 and placed a small bivouac in the albatross study area in 2002. Since 2013, a small temporary camp has periodically been used at Fairchild's Garden by white-chinned petrel researchers, but no physical sign of this campsite remains.

Species list

Forty-nine bird species have been recorded from Adams Island (Table 1). One, the Auckland Island merganser, is extinct. Of the rest, 34 have been recorded breeding or are probably breeding, and two species (Antarctic tern and white-fronted tern) are often seen on Adams Island but have

160



FIGURE 7. Graeme Elliott in 2006 beside the Survey Bay fingerpost pointing to the boatshed. Wind-blasted forest with *Dracophyllum* and the common coastal shrub *Veronica elliptica* is regenerating in the light gap. Image: Kath Walker.

TABLE 1. Birds recorded on Adams Island.

Species	Status	Species	Status
Extinct		Subantarctic skua (<i>Catharacta antarctica</i>)	common breeding
Auckland Island merganser (<i>Mergus australis</i>)*	extinct	Southern black-backed gull (<i>Larus dominicanus</i>)	common breeding
Breeding		Red-billed gull (<i>Chroicocephalus novaehollandiae</i>)	common breeding
Auckland Island teal (<i>Anas aucklandica</i>)*	common breeding	Red-crowned parakeet (<i>Cyanoramphus novaeseelandiae</i>)	common breeding
Mallard (<i>Anas platyrhynchos</i>)†	uncommon, probably breeding	Bellbird (<i>Anthornis melanura</i>)	common breeding
Grey duck (<i>Anas superciliosa</i>)	uncommon, probably breeding	Auckland Island tomtit (<i>Petroica macrocephala marineri</i>)*	common breeding
Eastern rockhopper penguin (<i>Eudyptes filholi</i>)	common breeding	Eurasian blackbird (<i>Turdus merula</i>)†	common breeding
Yellow-eyed penguin (<i>Megadyptes antipodes</i>)	common breeding	Song thrush (<i>Turdus philomelos</i>)†	uncommon breeding
Gibson's wandering albatross (<i>Diomedea antipodensis gibsoni</i>)*	common breeding	Common starling (<i>Sturnus vulgaris</i>)†	uncommon breeding
Southern royal albatross (<i>Diomedea epomophora</i>)	uncommon breeding	Auckland Island pipit (<i>Anthus novaeseelandiae aucklandicus</i>)	common breeding
White-capped mollymawk (<i>Thalassarche cauta steadi</i>)	uncommon breeding	Dunnock (<i>Prunella modularis</i>)†	uncommon breeding
Light-mantled sooty albatross (<i>Phoebastria palpebrata</i>)	common breeding	Common redpoll (<i>Carduelis flammea</i>) †	uncommon breeding
Northern giant petrel (<i>Macronectes halli</i>)	uncommon breeding	Recorded, but not breeding	
Cape petrel (<i>Daption capense</i>)	breeding on offshore stacks	King penguin (<i>Aptenodytes patagonicus</i>)	vagrant from subantarctic
White-headed petrel (<i>Pterodroma lessonii</i>)	common breeding	Snares crested penguin (<i>Eudyptes robustus</i>)	vagrant from subantarctic
Antarctic prion (<i>Pachyptila desolata</i>)	common breeding	Erect-crested penguin (<i>Eudyptes sclateri</i>)	vagrant from subantarctic
White-chinned petrel (<i>Procellaria aequinoctialis</i>)	common breeding	Buller's mollymawk (<i>Thalassarche bulleri</i>)	vagrant from subantarctic
Sooty shearwater (<i>Ardenna grisea</i>)	common breeding	Southern giant petrel (<i>Macronectes giganteus</i>)	vagrant from subantarctic
Grey-backed storm petrel (<i>Garrodia nereis</i>)	uncommon breeding	White-faced heron (<i>Egretta novaehollandiae</i>)	vagrant from New Zealand
Black-bellied storm petrel (<i>Fregetta tropica</i>)	common breeding	White-fronted tern (<i>Sterna striata</i>)	common, not breeding
Common diving petrel (<i>Pelecanoides urinatrix</i>)	common breeding	Antarctic tern (<i>Sterna vittata</i>)	common, not breeding
Auckland Island shag (<i>Leucocarbo colensoi</i>)*	common breeding	Yellow-crowned parakeet (<i>Cyanoramphus auriceps</i>)	vagrant from Auckland Island
New Zealand falcon (<i>Falco novaeseelandiae</i>)	common breeding	Tui (<i>Prosthemadera novaeseelandiae</i>)	vagrant from Auckland Island
Auckland Island rail (<i>Lewinia muelleri</i>)*	common breeding	Eurasian skylark (<i>Alauda arvensis</i>)†	vagrant from New Zealand
Auckland Island snipe (<i>Coenocorypha aucklandica aucklandica</i>)*	common breeding	Silvereye (<i>Zosterops lateralis</i>)	vagrant from Auckland Island
Auckland Island banded dotterel (<i>Charadrius bicinctus exilis</i>)*	common breeding	European goldfinch (<i>Carduelis carduelis</i>)†	vagrant from New Zealand

* subspecies endemic to the Auckland Islands;

** species endemic to the Auckland Islands;

† introduced to New Zealand.

not been recorded breeding there. The rest are rare vagrants from the main Auckland Island, New Zealand, or other subantarctic islands. The list includes 22 land birds. Two additional species, house sparrow (*Passer domesticus*) and white-faced storm petrel (*Pelagodroma marina*), were reported in pellets regurgitated by falcons (Hyde & Worthy 2010) but have never been seen alive on the island. Recent reassessment of the bones suggests that the initial identifications of these two species were incorrect (Miskelly *et al.* 2020 – Chapter 2). The fulmar prion has never been recorded on Adams Island, although it is known to breed on other islands in the Auckland Islands group. In 1978, Robert Falla and Rowley Taylor found a well-feathered fulmar prion chick on Monumental Island, less than 100 m off the Adams Island coast (Miskelly *et al.* 2020 – Chapter 2), and it is possible the birds breed on Adams Island.

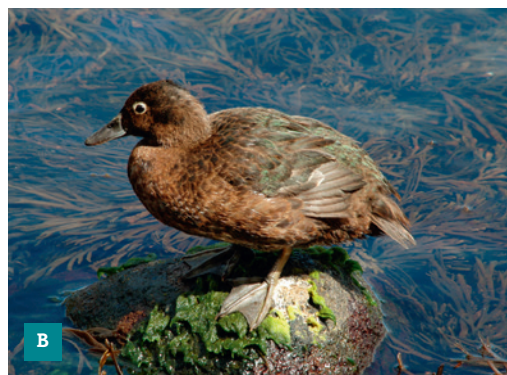


FIGURE 8. The relatively sheltered northern coastline west of Maclaren Bay, Adams Island (**A**; image Kath Walker), which is occupied by pairs of Auckland Island teal (**B**; image Graeme Elliott) every few hundred metres.

Adams Island communities

Coast

The north coast of Adams Island (Figs 3, 7, 8) is relatively gentle, sheltered, accessible, and well known. It is possible to walk along more than half of the north coast, which comprises wave platforms, and pebble and boulder beaches. It is also possible to get to the shore from almost anywhere in the interior, as there are few cliffs. The south coast, in contrast, is cliff-bound, exposed to the Southern Ocean, constantly pounded by waves, inaccessible, and poorly known (Figs 2, 5). It can be accessed from the land at only three places (Bollons Bay, Fly Harbour, and Lake Turbott) and is rarely visited.

Auckland Island teal (Fig. 8B) are relatively common along the north coast, as are Auckland Island shags, southern black-backed gulls, and southern skua. Skuas and black-backed gulls nest along the coast. Red-billed gulls are less common but regularly present, and they sometimes also nest there. Antarctic and white-fronted terns are often seen just offshore, as are large flocks of sooty shearwaters. Yellow-eyed penguins nest well into the forests along the northern shore and are often seen crossing the beaches and rocky shorelines. New Zealand falcons are frequently heard and seen flying along the northern coast. At night, Auckland Island snipe and Auckland Island banded dotterels sometimes forage at the top of the beaches. Common diving petrels and Antarctic prions nest in burrows at the forest edge just above the littoral zone or above low cliffs.

The south coast is notable for the eastern rock-hopper penguin colonies that occur in jumbles of boulders at the bottom of cliffs in at least two places. There are also small colonies of Auckland Island shag and red-billed gull in the coastal cliffs around most of the island.

Forest

Forests dominated by rātā and inaka trees up to about 5 m high occur all along the north coast (Figs. 3, 8A, and 9) and also at Bollons Bay, Fly Harbour, and Lake Turbott on the south coast (Fig. 2). The dominating feature of these forests for daytime visitors is the abundance and noise of bellbirds, which occur at very high densities (see bellbird section below). Other conspicuous birds



FIGURE 9. Southern rātā and inaka forest (**A**), which is teeming with bellbirds (adult female shown in **B**) during the day and white-headed petrels (**C**) and other seabirds at night. The forest also shelters the Adams Island research hut. Images: Kath Walker.

are red-crowned parakeets and falcons. Auckland Island tomtits are rarely seen in the forest in early summer, but are common and conspicuous from about the end of January, at the time when bellbirds become less aggressive following breeding. Yellow-eyed penguin colonies are also a noisy feature of the forests. Penguins can be heard calling at any time of the day or night, and there are tracks several hundred metres in length going inland from the northern coast to their small breeding colonies. Falcons hunt in the forest, where they also nest, mostly on the ground under leaning boughs or trunks of rātā trees.

The forests are transformed at night. Thousands of sooty shearwaters fly into the forests, where they nest in burrows mostly near the coast, while thousands of white-headed petrels land in the forest near their burrows at the tree line. The calls of these two species make up most of the night-time cacophony. Antarctic prions, common diving petrels, grey-backed storm petrels, and black-bellied storm petrels also land and nest in the forest, and contribute to the characteristic sound of the night.

Above the treeline

Gibson's wandering albatrosses are one of the most conspicuous birds above the treeline, and their presence changes the landscape (Fig. 10). They cannot land or take off in the forest or scrub, and require soil and plant material to build their nests, and so their nesting is confined to the windier parts of the tussock band between 250 m

and 450 m a.s.l. Ridge crests are favoured on the northern side of the island, and the gently sloping clifftop plateaus on the southern side. The year-long nesting activities of both parents and chicks kills vegetation and fertilises the soil around each nest, and so the tussock-land is pock-marked with gaps made by albatrosses. These take several years for plants to recolonise, initially by megaherbs, until soil fertility drops and the tussock takes over. Between December and April, the tussock country is dotted with courting and incubating adult albatrosses, then for the remainder of the year with white downy chicks that eventually turn into black-feathered fledglings, exercising their wings and practising flying for a few metres at a time.

Skuas nest above the treeline as well as on the coast, and nesting pairs are scattered around in the open areas of Adams Island. Falcons, too, nest under rock overhangs above the treeline, in deep tussock at lower altitudes, and also in the cirque basins near the summit ridge. They hunt Auckland Island pipits, snipe, dotterels, and rails, as well as any smaller seabirds they encounter. Uncommon but resident in the tall tussock are Auckland Island teal, with birds nesting in the damper areas laced with tiny streams. Snipe are numerous in the tussock zone, which is their favoured habitat.



FIGURE 10. A. Gamming Gibson's wandering albatrosses on the tussock slopes south-west of Mt Dick, Adams Island. **B.** Megaherbs revegetating a former Gibson's wandering albatross nest site. Images: Kath Walker.



FIGURE 11. A. *Bulbinella rossii* (with a leaf vein slug *Pseudaneitea martensi*, which are common on Adams Island. **B.** The buttercup *Ranunculus pinguis* growing in the windswept fellfield on the crest of Adams Island, where Auckland Islands banded dotterel (**C**) breed. Images: Graeme Elliott (**A**) and Kath Walker (**B**, **C**).

Like pipits, they are common and conspicuous in the tall tussock country, but also occur at higher altitudes in fellfield.

The fellfields have a distinctive bird community. Banded dotterels nest and later flock in the wide swathes of exposed fellfield along the main range (Fig. 11C), and are the most common species there. While breeding they occur in pairs and small flocks, but larger flocks of up to 75 birds have been seen in late summer. Snipe also breed in the exposed fellfield, and black-bellied storm petrels nest in cracks in the rocks along the summit ridge, where their piercing calls can be heard at night. A few pairs of skuas breed near the small tarns on the flat fellfield near South-west Adams trig.

Herb-fields

Damp areas dominated by megaherbs near the coast, among the tussock grassland, and on narrow shelves on the southern cliffs (Figs 10 and 12A) are the main home of the Auckland Island rail. It is in this vegetation that the only active nest has been found (Elliott *et al.* 1991). Since the rails are quite vocal, their calls are one of the characteristic sounds of the herb-fields. Auckland Island teal, snipe, and tomtit (Fig. 12B) are also found there, and the probes of snipe are frequently seen in the mud under the tall herbs. Herb-fields on steep ground on the southern cliffs and at Fairchilds Garden are intensively burrowed by white-chinned petrels.

Southern cliffs

The southern cliffs have a surprisingly diverse avifauna. The most conspicuous daytime presence is the light-mantled sooty albatross, which nests in its hundreds on the upper shelves and ledges (Fig. 13C). The birds fly in synchronised pairs above the cliffs, and their haunting calls are the most memorable sound of this environment. There is a colony of about 200 white-capped mollymawks on the stepped cliffs at Logan Point. Rails are often heard on the heavily vegetated megaherb-dominated shelves, and tomtits are a common sight. Falcons hunt along the top of the southern cliffs, and a nest has been found on a shelf on the cliffs. Petrels, particularly white-chinned petrels, nest on the cliff shelves (Fig. 13B).

Accounts of the birds that breed (or bred) on Adams Island

COMMON AND FORMERLY COMMON BREEDING BIRDS

Auckland Island merganser *Mergus australis*

The Auckland Islands was the last refuge of New Zealand mergansers. This bird, or a similar species, was wiped out on the New Zealand mainland following changes wrought by the arrival of Māori. Similarly, Adams Island was probably the last refuge for this species on the Auckland Islands, when predatory cats and pigs were introduced to Auckland Island and Enderby Island. A small population centred on Adams Island might have persisted until today had its fate not been sealed by enthusiastic collection for museum specimens around the beginning of the twentieth century (M. Williams 2012). The last known birds were shot in Carnley Harbour in 1902 (Kear & Scarlett 1970; Miskelly *et al.* 2020 – Chapter 2).

Despite its apparent extinction, ornithologists visiting Adams Island up until the late 1980s dreamed of its rediscovery. Until 1989 Adams Island was only rarely visited, and a succession of ornithologists enthusiastically searched for the species on those occasions. The rediscovery of the Auckland Island rail in 1966 (see below) perhaps fuelled the notion that the merganser might also have escaped detection. However, since 1989 the island has been visited almost annually for periods of at least 5 weeks by albatross researchers, including occasional visits to the most remote corners of the island (Bollons Bay and Fly Harbour). Sadly, the Auckland Island merganser is undoubtedly extinct.

Auckland Island teal *Anas aucklandica*

Auckland Island teal (Fig. 8B) are frequently seen on Adams Island. They are most often seen close to the shore on the sheltered rocky coasts and pebbly beaches of Carnley Harbour, but they also occur in Fly Harbour and on Lake Turbott. They are not confined to the sea and waterways, with birds being recorded in forest, scrub, tussock, and



FIGURE 12. **A.** Megaherb communities, here in flower on the southern cliffs of Adams Island, are densely burrowed by nesting seabirds. **B.** Land birds such as this Auckland Island tomtit are also common. *Images: Kath Walker.*



FIGURE 13. The ledges on the southern cliffs of Adams Island (**A**; image Kalinka Rexer-Huber), with some of their most characteristic inhabitants: the white-chinned petrel (**B**; image Kalinka Rexer-Huber) and the light-mantled sooty albatross (**C**; image Colin O'Donnell).

herb-fields right up to the altitude limit of tall tussock, although nowhere on Adams Island is far from flowing water. They have not been recorded on the steep cliff-bound southern coasts, but these places are rarely visited.

Moore & Walker (1991) estimated that there were 160–220 teal on Adams Island, but subsequent observations suggest that teal are much less confined to the sea and waterways than they supposed, and the numbers are probably higher than that. Teal are found on all the major islands of the Auckland Islands group except the main island, where they have been exterminated by cats and pigs (Miskelly *et al.* 2020 – Chapter 2). Because of its large size relative to the other islands on which teal occur, Adams Island probably supports the majority of the Auckland Island teal population. No nests have been found on Adams Island, but ducklings have frequently been observed Dec–Feb, with most in January. Teal are eaten by New Zealand falcons (Hyde & Worthy 2010), and their remains have been found in skua middens.

Eastern rockhopper penguin *Eudyptes filholi*

Two rockhopper penguin colonies are known on the south coast of Adams Island, among the jumbled rocks at the bottom of high cliffs just below the Gibson's wandering albatross study area (Fig. 1). The colonies were first noted in 1973, and since 1990 they have occasionally been counted from the clifftops using binoculars, and once in 2003 from a yacht. However, only a small proportion of the birds can be seen from the clifftops or from the sea, and the counts give no indication of any change in population size. The largest 'count' was 550–600 from the yacht in 2003 (Colin O'Donnell, *pers. comm.*). Rockhopper penguins on Campbell and Antipodes Islands have been declining for at least the past 40 years (Hiscock & Chilvers 2014; Morrison *et al.* 2017) and it is unknown whether rockhoppers on Adams have similarly declined.

Yellow-eyed penguin *Megadyptes antipodes*

Yellow-eyed penguins nest in many small colonies in the forest along the Carnley Harbour shore of Adams Island. Single birds have also been seen at Fly Harbour, Bollons Bay, Fairchild's Garden, and

the outlet to Lake Turbott, and they may also nest at these places.

In 1944 they were described as '*common and coming ashore in large numbers*' on Adams Island (Turbott 2002). Attempts were made to systematically count the birds attending colonies along the north shore of Adams Island in late-Oct to early-Nov in 1989 (Moore 1990), and in 2012–15 (Zammit-Ross 2015). In 1989, counts at 19 colonies found 64 birds, and Moore (1990) suggested that about 7% of the penguins in the Auckland Islands nested on the northern shores of Adams Island. The highest counts in recent years were of 42 birds in 2013 and 54 birds in 2015, but inconsistencies in counting methodology make population trend assessment difficult.

Gibson's wandering albatross *Diomedea antipodensis gibsoni*

The first detailed descriptions of Gibson's wandering albatross behaviour were made by Chapman (1891) after a brief visit to the southern slopes of Adams Island in 1890. He probably visited the area which later became the albatross study area (Fig. 1). Chapman (1891) wrote:

I could not help stopping to admire the grandly beautiful birds, whose sole idea of protection [for its nest] is the utter isolation of its nesting home. [Its] one plan for protecting its egg is to sit on it and never leave it.

This was not enough to prevent the crew of the *Hinemoa* that day collecting each egg from more than 100 nests (Chapman 1891).

Adams Island is the main home for Gibson's wandering albatross, with 94% of the population nesting there. About 5% nest on Disappointment Island, and a few scattered pairs on the main Auckland Island make up the remaining 1% (Walker & Elliott 1999). All nests are among tussock above the treeline, and most (77%) are on the gentle southern slopes of Adams Island. Gibson's wandering albatross may once have been more abundant on the main Auckland Island, before the population was reduced by pigs introduced in 1807. There is, however, little evidence that there were ever large numbers of Gibson's wandering albatrosses on the main Auckland Island (Walker & Elliott 1999), possibly because of the effect its

north–south orientation has on landing and take-off opportunities for these long-winged, heavy birds. By contrast, the west–east orientation of Adams Island and exposure to the south seems to provide particularly suitable conditions for wandering albatrosses, given that the prevailing winds are from the north-west and south-west. In strong southerly conditions the breeding grounds on the extensive southern slopes of Adams Island are ideal for albatrosses landing and taking off, and most courting occurs in such conditions. In rare calm weather, albatrosses are still able to reach the breeding grounds by catching updrafts associated with the steadily rising land at the outlet of Lake Turbott's U-shaped valley (Fig. 2), gliding upwards as though on an escalator. During unfavourable northerly gales, which make landings on the southern breeding grounds dangerous, albatrosses retreat to the lee of the southern cliffs. In north-west gales, great rafts of several hundred birds at a time can be seen offshore near Lantern Rocks, and at the mouths of Lake Turbott and Fly Harbour. On 1 Mar 2003, albatrosses were seen rising from these rafts in huge spirals up to about 400–500 m a.s.l. (Colin O'Donnell, *pers. comm.*). Gibson's wandering albatrosses are rarely seen on Carnley Harbour and the sheltered waters east of the main Auckland Island, presumably because there is not enough wind here for them to take off.

Gibson's wandering albatrosses have been studied and monitored annually since 1991. This research was prompted by high incidental by-catch of wandering albatrosses in tuna longline fisheries, and concern that this was causing a population decline (Walker & Elliott 1999). It initially involved whole-island nest counts, with the most comprehensive counts in 1991 and 1997. A mark-recapture study of all the birds breeding in a 61 ha study area west of Mt Dick began in 1991. In 1998 the whole-island censuses were replaced by annual counts of nests in three representative blocks, which together support about 10% of the total Adams Island population.

When the size of the population was first assessed by binocular and transect checks in 1973, Robertson (1975) estimated that there were 7,000 pairs nesting on Adams Island. A series of whole-island counts in the early 1990s, and a repeat of the 1973 transect counts, suggested that the size of the population in 1973 had been

under-estimated, but by 1991–97 had declined to 5,831 nesting pairs (Walker & Elliott 1999). Between 1997 and 2004 the population increased to 8,728 nesting pairs, but from 2005 there was an abrupt change in population trajectory. Nesting success plummeted, and in 2006 and 2008 there was a high mortality rate among adult females. This led to a 68% decline in the number of nesting pairs between 2004 and 2006, and subsequently a slow recovery, so that by 2018 there were still only 55% of the number of nesting pairs that had been present in 2004 (Elliott *et al.* 2018).

Between 1994 and 2004, the distribution of Gibson's wandering albatross at sea was studied using satellite telemetry (Walker & Elliott 2006), and since 2009 has been studied using geolocator data loggers (Walker *et al.* 2017). There is a substantial difference in the foraging range of Gibson's wandering albatrosses pre-2004 and post-2009, with birds foraging over a larger area of ocean since 2009, and many non-breeding birds foraging in the Great Australian Bight, an area previously rarely visited (Walker *et al.* 2017).

Gibson's wandering albatross clearly suffered a catastrophic decline between 2005 and 2008. At about the same time, their at-sea distribution expanded and their nesting success declined. It appears that birds were travelling further, having difficulty raising chicks, and suffering high mortality. This may have been due to reduced food, linked to changing conditions in the Tasman Sea, and possible exposure to new fishing activity putting them at high risk in their expanded foraging range. In the past 2 years, nesting success has returned to pre-2004 levels, adult female survivorship has recovered, and the number of birds nesting is slowly rising (Elliott *et al.* 2018).

Southern royal albatross *Diomedea epomophora*

Southern royal albatrosses have been recorded nesting at six places on Adams Island, and, in 1973, 18 nests were recorded (Robertson 1975). Most nests were at two places: above Gilroy Head, and south-west of the head of Fly Harbour. No census of the nests has subsequently been undertaken, although the sites where the albatrosses were recorded nesting have been occasionally revisited. Birds have been recorded again at four sites, and the two sites from which they have disappeared

each had only a single nest in 1973. The birds nesting on Adams Island comprise only 0.2% of all southern royal albatrosses. Many more birds nest on Enderby Island in the Auckland Islands group, but more than 99% of the population nests on Campbell Island (Moore 2013).

White-capped mollymawk *Thalassarche cauta steadi*

A small colony of white-capped mollymawk on cliffs at Logan Point on the south coast of Adams Island was first noticed in 1973 (Robertson 1975) and was estimated to contain about 200 nests. In 2003, another small colony of about 20 birds was spotted from a boat near Lantern Rocks. Most nests are on inaccessibly steep cliffs and cannot be counted accurately from the land. Sea-based counts are little better as the stepped shelves obscure the birds when viewed from below. More accurate counts of the Logan Point colony were obtained from photographs taken from a helicopter almost every year during 2007–15 (Baker *et al.* 2013, 2014, 2015), with the estimated number of nesting birds ranging from 79 to 193. However, ground counts of accessible nests in the top of the colony in 1993, 1995, and 2001 all reported that a significant proportion (around 25–30%) of birds on the colony at the time were non-breeders or failed breeders, which may be difficult to distinguish from nesting birds in aerial photographs. The Adams Island colony comprises less than 0.1% of the total Auckland Islands population, with about 64,000 nests on Disappointment Island (Walker *et al.* 2020 – Chapter 5 in this book) and c. 5,000 at South West Cape on the main Auckland Island (Baker *et al.* 2015).

Light-mantled sooty albatross *Phoebastria palpebrata*

Light-mantled sooty albatrosses (LMSAs) breed on cliffs all over Adams Island, and it is a very important site for the species (Fig. 13C). About a quarter of the global LMSA population is estimated to breed on the Auckland Islands (ACAP 2012), and most of these birds are on Adams Island. Counts of a small proportion of the Adams Island population on the southern cliffs have been undertaken since 1999. There were 35 nests in 1999, but numbers have declined by about 4% per annum since then (Rexer-Huber *et al.* 2020a

– Chapter 12). A contraction in the area used for nesting also seems to have occurred. In 1944, Hugh Wenham described LMSAs flying close by on the ‘Mt Dick tops’ and ‘probably breeding in the cirque face’. In 1966, John Kendrick noted that many birds were nesting ‘on the rock ledges, all around and above Lake Turbott’, and in 1989 birds were found nesting on the cliffs at the head of Fly Harbour and in the cirque under Mt Dick. Since 1989, the scattered nests on inland cliffs have become fewer or disappeared altogether. LMSA nests are now mostly confined to coastal cliffs, with the greatest concentrations on the southern cliffs.

Northern giant petrel *Macronectes halli*

A relatively large breeding colony of northern giant petrels at Fairchild's Garden seems to have declined in recent decades (Table 2; Parker *et al.* 2020 – Chapter 13 in this book). A *Leptinella plumosa* meadow near Fairchild's Garden has been recorded as a gathering site for non-breeding northern giant petrels since the 1940s (McEwen 2006), and during 2013–19 up to 100 non-breeding

169

TABLE 2. Northern giant petrel observations from Fairchild's Garden since 1907.

Date	Description	Source
Feb 1907	‘many young ones’	Waite 1907
Mar 1927	‘extensive [giant petrel] breeding grounds at Fairchild's Garden’	Guthrie-Smith 1936
Sep 1941	‘large colony, many eggs, not all laid’	Miskelly <i>et al.</i> 2020*
Sep 1942	About 200 nests with eggs	McEwen 2006
Oct 1954	22 chicks at nearby Chapman Pinnacle	Rowley Taylor, <i>pers. comm.</i>
Jan 1966	66 chicks	Miskelly <i>et al.</i> 2020*
Jan 2004	30 nests with chicks	Logbooks
Dec 2013–18	5–16 chicks	Parker <i>et al.</i> 2020**

* Chapter 2 in this book; ** Chapter 13 in this book.

birds have been seen there annually. Small numbers of northern giant petrel have been recorded breeding further afield than Fairchild's Garden. One or two nests were recorded in the Gibson's albatross study area (see Fig. 1) on five occasions. Six nests were recorded on the ridge above Grafton Point in 1991, but none has been seen there since. Adams Island is large and mountainous, and so it is possible that a few northern giant petrel may nest in areas that are infrequently visited.

White-headed petrel *Pterodroma lessonii*

White-headed petrels (Fig. 9C) have been reported by nearly every visitor to Adams Island, reflecting their abundance and wide distribution there. White-headed petrels come ashore well after dark, and their loud and distinctive calls form much of the night-time soundscape of Adams Island.

White-headed petrels are summer breeders and appear to dig their burrows almost anywhere with relatively well-drained peat. There is a band of white-headed petrel burrows on steep slopes just below the treeline, and throughout the woody-shrub belt just above it, around most of the northern slopes of Adams Island. There are also clusters of burrows in well-drained tussock-covered areas elsewhere on the island. They are absent from the damper sites dominated by megaherbs and *Poa foliosa*. No attempt has been made to estimate the size of the population on Adams Island, but there are likely to be many thousands of birds nesting there, and probably many tens of thousands. Most of Auckland Island's white-headed petrel population probably now nests on Adams Island and Disappointment Island (Walker *et al.* 2020 – Chapter 5) following their extermination on Auckland Island by introduced cats and pigs (Miskelly *et al.* 2020 – Chapter 2).

In 2011–14, ten white-headed petrels nesting near the treeline above Maclaren Bay were tracked using geolocator data loggers (see Taylor *et al.* 2020 – Chapter 14 in this book). This provided information on both their at-sea movements and on the breeding behaviour and timetable. In 2011, most eggs hatched around 24 Jan, and by 31 Jan most chicks were alone in the burrows during the day. Biennial breeding behaviour was revealed by the ten tagged birds, which is likely the reason why

many burrows investigated in 2011 were not in use. White-headed petrel remains are frequently found in middens associated with skua nests, and they appear to form an important part of the diet of some nesting skuas. Remains of white-headed petrels have also been recorded in falcon pellets (Hyde & Worthy 2010).

Antarctic prion *Pachyptila desolata*

Antarctic prions appear to be very common along the northern shores of Adams Island. In 1944, Graham Turbott observed that the bulk of this '*common Auckland Island species was breeding in the forest fringe of main and Adams Island*' (Turbott 2002). They have frequently been seen at night by researchers using spotlights around Magnetic and Maclaren Bays. Their burrows have been found at the coastal edge of the forest on top of the low cliffs on the northern shore of Adams Island, in steep stream banks near the mouth of Maclaren Stream, and on the ledges of the southern cliffs that are vegetated by megaherb species and *Poa foliosa* tussock. They probably also nest in many other places on the island.

White-chinned petrel *Procellaria aequinoctialis*

The largest burrowing seabird, the white-chinned petrel (Fig. 13B), is a significant earthmover. The birds dig tunnels up to 2.5 m long, typically starting with a shallow muddy 'moat' and ending at a large chamber with a raised nest mound. Vegetation is trimmed back for display areas, often near the burrow entrance, where petrels sit at night to call and court. White-chinned petrels favour areas with *Poa foliosa* tussock and *Anisotome latifolia* megaherbs around the south coast. Colonies are dense with burrows, sometimes reaching 1,000 burrows per hectare. Although some colonies are at sea level (Fairchild's Garden and the mouth of Lake Turbott), most white-chinned petrels are found on the steep shelves of the southern cliffs (Fig. 13A). Adams Island is home to around 28,000 white-chinned petrels, or 15% of the Auckland Island population, with most of the rest nesting on Disappointment Island (Rexer-Huber *et al.* 2020b – Chapter 15 in this book).

White-chinned petrels lay in early-Dec and raise chicks between Feb and late-Apr. Breeding petrels tracked from Adams Island regularly

foraged in the Tasman Sea and in coastal waters around the South Island of New Zealand. Once chicks fledge, the adults fly as much as 11,000 km to winter off the coast of South America, remaining in a zone between Ecuador and northern Chile before returning to New Zealand waters in October (Rexer-Huber 2017).

Sooty shearwater *Ardenna grisea*

Sooty shearwaters breed in moderate numbers at many places on Adams Island. Their burrows are common in the rātā forest on the northern slopes of the island, and in *Poa litorosa* tussock on some southern cliff-shelf areas. No estimate has been made of the numbers nesting on the island. Large rafts comprising many hundreds of birds are a common sight in Carnley Harbour during Jan–Feb.

Grey-backed storm petrel *Garrodia nereis*

Grey-backed storm petrels have been seen by many visitors to Adams Island, particularly at Magnetic and Maclaren Bays when a spotlight has been used to attract seabirds at night. However, most of the nests found have not been in these areas near Carnley Harbour, but rather in tussock on the southern slopes and in megaherbs on the southern cliffs. The birds appear to be widespread on the island, although too few nests have been found to make any useful assessment of their abundance. Grey-backed storm petrels were identified in the pellets of falcons (Hyde & Worthey 2010) and one was observed being carried by a falcon.

Black-bellied storm petrel *Fregetta tropica*

Black-bellied storm petrels are common and widespread on Adams Island. They have been found at sea level, nesting in rocky cracks by the sea at Fairchild's Garden, in the castaway boatshed, and in a tiny hole in a large rātā tree, but also in tiny cracks between rocks in the highest fellfield. They have often been detected by spotlight at Maclaren and Magnetic Bays, and low numbers nest in the coastal forest, with many also heard at the treeline above Maclaren Bay. However, they seem most common well above the forest. Their high-pitched calls have been heard coming from between rocks

on the ridge crests from point height 636 to The Dome, with many birds recorded by multiple observers near the rocky summit of Mt Dick.

Common diving petrel *Pelecanoides urinatrix*

Diving petrels have frequently been heard and detected by spotlight at Magnetic and Maclaren Bays, and heard or seen at Fairchild's Garden, on the southern cliffs, and among bluffs high on the island. Nests attributable to diving petrels have been found in tussock and scrub (Buckingham *et al.* 1991), and along the coastal forest edge at Maclaren Bay.

Auckland Island shag *Leucocarbo colensoi*

Every ornithologist visiting Adams Island since the 1940s (Miskelly *et al.* 2020 – Chapter 2) reports seeing small groups of Auckland Island shags along the Carnley Harbour coast of Adams Island, either just offshore or roosting on rocks, although no nests have been found on this shore. There are small breeding colonies on cliffs along the south coast, including colonies at Chapman Pinnacle, Logan Point, and Gilroy Head, with 50–80 reported from the last in 1973 (Rodney Russ, *pers. comm.*). On 1 Mar 2003, during a boat trip around the south coast, c. 700 birds were counted at four colonies between Monumental Island in the west and Castle Point in the east (Colin O'Donnell, *pers. comm.*).

New Zealand falcon *Falco novaeseelandiae*

Falcons (Fig. 14A) have been reported from Adams Island more frequently than from other islands in the Auckland Islands group (Rexer-Huber & Parker 2019; Miskelly *et al.* 2020 – Chapter 2). That falcons thrive on Adams Island is a reflection of the absence of exotic mammalian predators and of the high density of prey (both land birds and seabirds). Falcons are regularly seen in every habitat on Adams Island. Their nesting territories occur equally in forests near sea level, in tall tussock and scrub on the southern slopes, in short tussock in the cirques near the main crest of the island, and in sheltered sites above the megaherbs on the southern cliffs. Nesting territories are sometimes used year after year, and nests can be

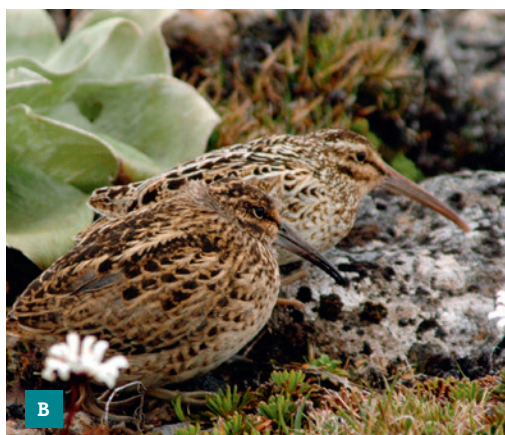


FIGURE 14. New Zealand falcon adult (**A**) and one of its frequent prey, Auckland Island snipe (**B**; an almost down-free chick following a parent) in the fellfield north-east of Mt Dick, Adams Island. Images: Kath Walker.

as little as 1.2 km apart in the productive coastal rātā forest, with each territory having access to substantial catchments of open grassland and fellfield for hunting.

The bulk of their prey comprises the most common small birds on Adams Island: snipe, bellbirds, rails, small petrels (black-bellied storm petrels, diving petrels, and Antarctic prions in particular), and less often teal, tomtits, parakeets, and dotterels (Hyde & Worthy 2010; Miskelly *et al.* 2020 – Chapter 2). Falcons hunt seabirds on land, but limited observations suggest that seabirds are also hunted over water. Feeding records from Maclaren Bay over several years show that falcons are crepuscular feeders, with feeding ceasing at the last of the light, around 2300 h in the subantarctic summer, resuming only with dawn from around 0445 h (GCP, *unpubl. data*). Falcon are frequently seen in encounters with skua, their main competitor on Adams Island, both taking the role of aggressor at times, occasionally in the same attack.

Auckland Island rail ***Lewinia muelleri***

The Auckland Island rail (Fig. 15) is perhaps the most famous of Adams Island's birds. The history of its discovery is closely linked with the island and, like the island, it is difficult to get to see. It is also rather unusual among Auckland Island land

birds in that its closest relative is in Australia, not New Zealand (Elliott *et al.* 1991; Garcia-R *et al.* 2015).

The first possible Auckland Island rail observations were made by crew from the wrecked ship *Grafton* when they visited Adams Island in 1864 (Raynal 1880), and 8 days later on the main Auckland Island (Musgrave 1866). Both reports are of 'water-hen'. However, it is likely that these records were of snipe rather than rail, as neither Raynal nor Musgrave recorded snipe, yet snipe are much more conspicuous than rails. Furthermore, one 'water-hen' was killed with a stone (Musgrave 1866), when the secretiveness and speed of rails makes killing a rail with a stone almost inconceivable (in contrast, the slower-moving snipe could readily be killed with a stone).

Falla (1967) described the bird's initial confusing scientific discovery in 1874 when two (or maybe only one) specimens from the Auckland Islands ended up in the possession of European ornithologists and were described by Rothschild (1893). From then until 1966 the bird went undetected, although in 1942 Charles Fleming saw a bird near Fairchilds Garden on Adams Island that might have been the rail (McEwen 2006: 123).

In 1966 the rail was rediscovered at Magnetic

Bay on Adams Island (Falla 1967; Godley 1975), and a bird was captured and returned to New Zealand where it lived at Mt Bruce for 9 years (M.J. Williams 1985; Miskelly & Taylor 2020 – Chapter 1 in this book).

During the 1972-73 Auckland Islands expedition, searches on Adams Island were undertaken but the rail was not found (G.R. Williams 1975), though Rodney Russ (*pers. comm.*) probably saw one. At the time, G.R. Williams (1975) recognised that the rail was unlikely to occur on the main Auckland Island, or Ewing or Enderby Islands, and that, although none was found, it was '*probably in reasonable numbers*' on Adams and might exist on other predator-free islands in the group.

In 1989 the rail was again rediscovered during a 5-week expedition to look for it on Adams Island (Elliott *et al.* 1991). Rails were caught, calls identified and recorded, and the birds' distribution mapped. Since 1993 there have been annual trips to Adams Island by albatross researchers and, with the advantage of recorded calls and repeated visits, the species has become much better known. In 1993 rails were also found on Disappointment Island (Walker *et al.* 2020 – Chapter 5).

Rails are widespread on Adams Island. Although

173



FIGURE 15. Auckland Island rail, Adams Island. Image: Kath Walker.

they are elusive and difficult to see, they make frequent loud, distinctive calls. They are found in any vegetation that includes tight cover less than about 1 m high. This includes megaherb fields near the coast and on the southern cliffs, swampy areas dominated by the cutty grass *Carex appressa*, grasslands of *Chionochloa antarctica* with variable amounts of woody shrubs, and scrubby forest with a dense understorey of fern and cutty grass. Suitable habitat was thought to cover about 10% of Adams Island, and in 1991 it was suggested that there were probably several hundred birds (Elliott *et al.* 1991). However, a wider survey since then suggests that this was an underestimate, with perhaps 500 birds or even more on Adams Island.

It is likely that the rail once occurred on most or all of the islands in the Auckland Islands group, but since the arrival of pigs, goats, cattle, cats, rabbits, and mice it has been confined to Adams and Disappointment Islands. The vegetation in which it is common on Adams Island is all but absent from the main Auckland Island and Enderby Island, where that habitat has been destroyed by pigs, cattle, and rabbits.

Rails are eaten by New Zealand falcons in surprisingly large numbers given the species' secretiveness (Hyde & Worthy 2010). Only one nest has ever been found, in the *Carex*-dominated vegetation behind Maclaren Bay. It contained two eggs and appeared to be a complete clutch. The eggs were probably laid in mid-Nov (Elliott *et al.* 1991).

The mystery that used to surround the rail was further increased by the difficulty of knowing what to call it; it has had seven scientific names since it was discovered (Gill *et al.* 2010). The Auckland Island rail is clearly closely related to Lewin's rail (*Lewinia pectoralis*) of Australia, and both Falla (1967) and Elliott *et al.* (1991) referred to it as a subspecies of Lewin's rail. However, Holdaway *et al.* (2001) promoted it to a full species with little explanation. A subsequent study found the genetic distance between the Auckland Island rail and *Lewinia* rails elsewhere to be very small (<1%) (Garcia-R *et al.* 2015). Regardless, the Auckland Island rail has relatively small wings for its mass, implying rapid evolution towards flightlessness following its dispersal to the subantarctic in the mid-Pleistocene (Garcia-R *et al.* 2015).

Auckland Island snipe *Coenocorypha aucklandica aucklandica*

Snipe (Fig. 14B) were first recorded on Adams Island by Andreas Reischek in 1888 (Reischek 1889a). Surprisingly, they were not recorded by Francois Raynal (1880), who visited the island in 1864; perhaps his record of a 'water-hen' was in fact a snipe (see Auckland Island rail section above).

Snipe are common on Adams Island, and have been seen by almost every visitor to the island. They were described as 'numerous on the main ridge west of Mt Dick' in 1890 (Chapman 1891) and, 130 years later, the tussock of the upper Astrolabe basin still has one of the densest populations of snipe. While they are most often observed in the tussock, scrub, and herb-fields, some are also present on the coast, in the forest, on the cliffs, and on the fellfield above the tussock. Snipe were almost certainly once present on all the islands in the Auckland Islands group, but today are found only on those islands without introduced mammalian predators (see Miskelly *et al.* 2020 – Chapter 2). Due to its large size, Adams Island supports the majority of the subspecies' population, perhaps comprising tens of thousands of birds (Miskelly 2013).

Snipe appear secretive, but perhaps it is just that they normally inhabit dense cover. When they are seen in the open, they do not always flee and their main defence is to freeze. However, they are often flushed from tussock and herb-fields if approached at speed. Snipe make a distinctive trilling call, mostly in the evening, but also occasionally during the day. They also make the 'hakawai' display (Miskelly *et al.* 2006a) which comprises a distinctive call and a roaring sound made by vibrating tail feathers. On Adams Island this display has been heard only at night.

The breeding of Auckland Island snipe has been described by Miskelly *et al.* (2006b), with most of the data coming from Adams Island. Auckland Island snipe lay clutches of two eggs from mid-Sep to the end of Jan, peaking in late-Nov. Chicks probably stay with their parents for up to 90 days after laying, and so evidence of breeding can probably be detected until April.

Snipe are eaten by New Zealand falcons, and by weight they make the greatest contribution to the falcon's diet of any of the species that the raptors have been observed eating (Hyde & Worthy 2010).

Auckland Island banded dotterel *Charadrius bicinctus exilis*

When the Auckland Island banded dotterel (Fig. 11C) was first described as a separate subspecies in 1978, it was thought that there were only about 100–200 individuals in total (Falla 1978). However, in 1989 at least 730 birds were counted on the Auckland Islands, including at least 273 on Adams Island, with the rest on Enderby and Rose Islands (Walker *et al.* 1991b). Conditions have not changed on Adams Island since its discovery, and it is likely that there have always been a few hundred banded dotterels living and breeding on Adams Island.

Banded dotterels are most often encountered on Adams Island in the fellfields at altitudes above 400 m a.s.l., where there is open bare ground or low-growing vegetation dominated by cushion plants and rosettes of *Pleurophyllum hookeri*. This is also where they breed, laying 1–4 eggs in a nest in the lee of rocks or vegetation. Nests with eggs have been found in Nov–Jan, although mostly in November. Early in their breeding season, dotterels occur in pairs as well as small flocks of up to 20 birds, but by February they mostly occur in flocks. They are highly vigilant and wary of both falcon and skua.

Although dotterels are mostly observed at high altitude on Adams Island, in both summer and winter, a few birds are seen at night under *Veronica elliptica* at the top of pebbly beaches on the northern coast, fossicking among the litter left by the tide. They have not been recorded at these places during the day (Walker *et al.* 1991b), presumably because in such confined space they would make easy prey for falcons and skua.

Walker *et al.* (1991b) speculated that dotterels might leave the breeding grounds on the tops of Adams Island during the winter to spend their time on the coast. Dotterels were still resident on the high ground of Adams Island on 30 Apr 1999 (Alan Wiltshire, *pers. comm.*) and during May in 1981 (Robertson & Jenkins 1986), but only one was seen during four visits to the Adams Island tops in Jun 2001 (GPE, KJW, *pers. obs.*). They were recorded on the tops in breeding plumage in August by the coastwatchers in the 1940s. While it seems that dotterels do not completely abandon the tops during the winter, they are rare in June.

Subantarctic skua *Catharacta antarctica*

Skuas are fairly common in open country from sea level to the tops on Adams Island, and are occasionally seen flying over forest. They are most often seen in pairs, although groups of birds are sometimes seen on the coast, at Fairchild's Garden, and at the outlet of Lake Turbott, where they gather to bathe. They nest on the coast and above the treeline on Adams Island, and nesting territories are often used year after year. Nests with eggs have been recorded in Nov–Dec and nests with chicks in Dec–Apr. It is thought that skuas leave the islands in winter, as they do in other regions, but the winter movements of Auckland Islands' birds remain unknown.

Skuas have been seen preying on, scavenging, or chasing a wide range of Adams Island wildlife, including Gibson's wandering albatross adults, chicks, and eggs, northern giant petrel eggs, white-chinned petrels, sooty shearwaters, white-headed petrels, black-bellied storm petrels, grey-backed storm petrels, Antarctic prions, banded dotterels, and falcons. Some skuas, however, develop specialist skills: for example, two pairs at Fairchild's Garden successfully and regularly took white-chinned petrel adults, while skuas elsewhere appeared to have little success preying on these large, aggressive birds.

Southern black-backed gull *Larus dominicanus*

Black-backed gulls are common along the northern coast of Adams Island, where their nests are often found. The main nesting concentrations in 2018 were on the coast between Boatshed Bay and Fairchild's Garden, and between Magnetic and Survey Bay (Rexer-Huber & Parker 2019). Black-backed gulls have also been seen at Bollons Bay and Fly Harbour on the south coast.

Red-billed gull *Chroicocephalus novaehollandiae*

Red-billed gulls are present in small numbers around the coast of Adams Island. Small breeding colonies have been seen on both the northern and southern coasts. A boat-based survey around the whole island on 1 Mar 2003 produced a count of 130 birds (Colin O'Donnell, *pers. comm.*).

Red-crowned parakeet *Cyanoramphus novaezelandiae*

Red-crowned parakeets are relatively common on Adams Island, and are found in the forest and tussock grasslands, and less often in the megaherbs at high altitudes. Red-crowned parakeets on the Auckland Islands are genetically inseparable from the red-crowned parakeets of the New Zealand mainland (Rawlence *et al.* 2014). However, most birds on Adams Island have small amounts of yellow around their red crowns (Fig. 16), probably as the result of some past hybridisation with yellow-crowned parakeets (*C. auriceps*) (see Rawlence *et al.* 2014).

Nests have been found in Dec–Jan in holes in rātā trees, in fern clumps, and in peaty mounds on the ground. In summer, small flocks of about 5–10 parakeets move through the flowering rātā

and inaka forest, feeding on nectar alongside large numbers of bellbirds. In winter, they destroy some of the bellbird's food supply by eating the scale insects on the *Dracophyllum*. The scale insects produce honeydew on which the bellbirds seem to depend. Parakeets also feed on the berries of *Coprosma foetidissima*, and the seeds of hook grass (*Uncinia* sp.). In the tussock and herb-fields, parakeets feed on gentian (*Gentianella concinna*) flowers, the fruits of *Astelia linearis*, and the seeds of *Pleurophyllum criniferum*. They are preyed on by falcons (Hyde & Worthy 2010).

Bellbird *Anthornis melanura*

Bellbirds (Fig. 17) are found throughout the rātā and inaka forest on Adams Island (Figs 8A, 9A, and 9B). They are occasionally seen in scrubby woody vegetation just above the forest, but never

176



FIGURE 16. Red-crowned parakeets on Adams Island showing yellow feathers in the crown, probably resulting from past hybridisation with yellow-crowned parakeets. Images: Kath Walker (A, B) and Kalinka Rexer-Huber (C).

in the tussock or fellfield at higher altitudes.

The species appears to be more common on Adams Island than almost anywhere else in New Zealand, including on other pest-free offshore islands. An indication of this is the ten bellbird nests found within 40 m of the hut at Maclaren Bay in 2013, giving a density of about 13 nests per hectare. During 5-min bird counts undertaken in transects through the forest near Maclaren Bay in 2003, an average of 8.9 bellbirds per count was recorded (Colin O'Donnell, *pers. comm.*). For comparison, 5-min bird counts at Nelson Lakes National Park in the South Island of New Zealand averaged 2.8 bellbirds per count during 1974–84, and 1.7 during 2002–07 (Elliott *et al.* 2010). The dawn chorus on Adams Island comprises hundreds of bellbirds in every small bay, all chiming a single melodic syllable. It is beautiful and ethereal, and so characteristic of this island that 'Bellbird Island' would be a more appropriate name for it.

Many of the 48 nests found on Adams Island were on the ground. Of 14 nests for which information on nest site was recorded, ten were on the ground or in grasses within 20 cm of the ground, and the rest were in rātā or inaka trees up to 7 m off the ground. Twenty-one percent of bellbird nests on predator-free Poor Knights Island were also on the ground (Sagar 1985), but among mainland bellbirds ground-nesting seems rare. Bellbirds on Adams Island lay late-Oct to early-Feb, but most eggs are laid before mid-Jan. In this period bellbirds could raise two or even three broods.

Bellbirds are part of the diet of falcons, although seabirds, snipe, rail, and teal comprise a much larger proportion (Hyde & Worthy 2010).

Auckland Island tomtit ***Petroica macrocephala marrineri***

Tomtits occur throughout the island, breeding in the forest, scrub/tussock, and herb-fields, including the clifftops and megaherb shelves on the southern cliffs of Adams Island (Fig. 12). They probably raise only one brood per year on Adams Island, and tomtit fledglings are often observed for the first time in late-Dec, although at least one nest with chicks has been seen as late as 15 Jan.

During Nov–Dec tomtits are rarely seen in the tall forest along the northern coasts of Adams Island, although they are frequently seen in the



FIGURE 17. Bellbird, perhaps the most conspicuous of all the birds on Adams Island. Image: Kath Walker.

herb-fields during that time. In mid- to late-Jan, both adults and juveniles suddenly appear in the low-altitude forest, where they remain in good numbers through February. They may be secretive in forest habitat in spring to avoid harassment by bellbirds; tomtits become conspicuous in forest only when the bellbird breeding season is waning.

Auckland Island tomtits are large and intensely coloured compared with the mainland New Zealand tomtit *P. m. macrocephala*, and strikingly so in the case of females. Charles Fleming was the first ornithologist to describe the lack of sexual dimorphism in Auckland Island tomtits, after being confounded by an apparent lack of female tomtits thanks to these 'male-plumaged females' (McEwen 2006).

Eurasian blackbird *Turdus merula*

Blackbirds are common in the forest, tussock, herb-fields, and vegetated cliffs on Adams Island, and are frequently recorded foraging at the top of the beaches at Maclaren Bay, Fall Bay, and Fairchild's Garden. Nests have been found Nov–Jan.

Auckland Island pipit ***Anthus novaeseelandiae aucklandicus***

Pipits are relatively common and tame on Adams Island. They occur in open areas above the treeline and along the coast, but do not appear to be as numerous as they are on some other islands in the New Zealand subantarctic, such as the Antipodes

Island (GPE, KJW, pers. obs.). Nests have been found in Nov–Jan. Pipits are eaten by New Zealand falcons (Hyde & Worthy 2010) but form only a small proportion of the falcon's diet.

UNCOMMON BIRDS ON ADAMS ISLAND

Mallard *Anas platyrhynchos* and grey duck *A. superciliosa*

Mallards and grey ducks have been reported often enough from Adams Island to suggest that there are always a few there, or at least that the suitable habitat on Adams Island is regularly used by ducks from a larger Auckland Island population. Most of these duck sightings have been made at Lake Turbott. Like elsewhere in New Zealand and the Auckland Islands, there has been a shift over time from predominantly grey ducks to predominantly mallards (M.J. Williams 2013; Miskelly *et al.* 2020 – Chapter 2). In the 1940s and 1960s grey ducks were recorded, whereas more recently the reports have been of mallards.

178 Yellow-crowned parakeet *Cyanoramphus auriceps*

Yellow-crowned parakeets are rare or possibly even absent from Adams Island. Only three parakeets with yellow crowns have been observed on the island, all between 2004 and 2013. At least one of these birds was large and most probably a hybrid between yellow- and red-crowned parakeets (yellow-crowned parakeets are much smaller than red-crowned parakeets). Most apparently red-crowned parakeets on Adams Island show some evidence of hybridisation (Fig. 16) and it seems likely that all originated from hybrid stock.

Yellow-crowned parakeets are known from Auckland Island (Rawlence *et al.* 2014; Miskelly *et al.* 2020 – Chapter 2) and it at first seems surprising that few, if any, yellow-crowned parakeets occur on Adams Island. However, yellow-crowned parakeets are mostly birds of forest, while red-crowned parakeets are birds of the forest edge, scrub, and grassland (Taylor 1975). While there are substantial areas of forest on Auckland Island, that on Adams Island is small compared with scrub and grassland. Adams Island therefore seems to provide more suitable habitat for red-crowned than for yellow-crowned parakeets.

Tui *Prosthemadera novaeseelandiae*

Tui are rare on Adams Island, with only 11 sightings recorded. They have been seen only in or flying above the tall rātā forest on the shores of Carnley Harbour. The albatross research teams have spent a combined total of more than 3 years on Adams Island over the past 31 years but have seen only five tui. They are infrequent visitors rather than rare residents, and are certainly much more common in forest on the main Auckland Island, which is less than 1 km away. As with some other passerines, tui may be scarce on Adams Island due to competition with the abundant bellbirds living here.

Silvereye *Zosterops lateralis*

Silvereyes must have arrived in the Auckland Islands within 40 years of their colonisation of New Zealand and were first reported on Adams Island in 1888 (Reischek 1889a). However, they are quite uncommon, with most observers seeing only single birds, and some experienced observers (e.g. Charles Fleming and Brian Bell) seeing none (Edgar 1972; McEwen 2006). In contrast, they are relatively common on the main Auckland Island less than 1 km away (Edgar 1972; GPE, pers. obs.). They have not been recorded breeding on Adams Island.

The scarcity of silvereyes is consistent with Heather & Robertson's (1996) observation that silver-eyes are scarce on some offshore islands with relatively intact forests and native bird communities, and Armitage's (2017) observation that they are 'only irregularly or seasonally present on islands with high densities of bellbirds and other passerines'. Bellbirds are super-abundant on Adams Island and are frequently observed chasing other passerines. Silvereyes clearly visit Adams Island irregularly or are resident in very low numbers, and it is likely that the high numbers of bellbirds prevent them from becoming established or more numerous.

Song thrush *Turdus philomelos*

Song thrushes are relatively rare on Adams Island. They have been recorded frequently enough (six times) that it is likely that there is a resident breeding population, but no nests have been found.

Dunnock *Prunella modularis*

Dunnocks are relatively uncommon on Adams Island, being seen most often in the megaherb vegetation on the southern cliffs, and almost never in the forest. They have been seen feeding fledglings, and so definitely breed on the island.

Common redpoll *Carduelis flammea*

Redpolls are relatively uncommon on Adams Island, but they have been recorded all over the island and they breed there. They are eaten by falcons (Hyde & Worthy 2010).

Discussion

The Auckland Islands have never had a land-bridge connection to the rest of New Zealand, and so the avifauna of Adams Island is entirely derived from species that have flown there: a collection of seabirds and relatively strong-flying land birds from New Zealand. One species, the Auckland Island rail, has its closest relative in Australia and probably arrived in the Auckland Islands direct from there. Among the islands in the Auckland Islands group, Adams Island is a jewel because no predatory mammals have ever established on this very large island. Apart from the extinct Auckland Island merganser, the island retains all the bird species it would have had in pre-human times.

However, Adams Island is a paradox: a seabird island deep in the Southern Ocean that for much of the time feels more like a forested island closer to mainland New Zealand or a biodiversity-rich part of it. This comes in part from the conspicuous presence on Adams Island of land birds that are still relatively widespread in forests on the New Zealand mainland: bellbirds, tomtits, falcons, and to a lesser extent parakeets. The other reason is that the land underfoot is mostly firm rather than fragile. With the notable exception of ground near the treeline and in some megaherb communities, collapsing seabird burrows are not part of the usual experience of walking on Adams Island. While millions of seabirds probably nest there, Adams Island is so large that burrows tend to be concentrated in local patches, rather than being spread all over as they are on smaller seabird islands in the group, such as Disappointment Island.

In every other way Adams Island is as unlike contemporary mainland New Zealand as it is possible to be. It is a magical place where a skua might chase a falcon that is chasing a light-mantled sooty albatross around 400 m sea cliffs, where waterfalls are roaring upwards instead of downwards. The absence of exotic mammals has led to the survival of species that now feel archaic, such as snipe, and to confiding behaviour in species that on the mainland are quite wary. It is striking that everything seems 'to be in its right place'. The geomorphology of Adams Island and its climate shapes plant communities and thus the distribution of its fauna. While this must be true almost everywhere, it is particularly obvious on Adams Island due to the amount of open ground and, more importantly, to the lack of human modification.

Adams Island has a distinct and rather unusual bird assemblage, with an overwhelming abundance of a few species, particularly bellbirds, red-crowned parakeets, and Gibson's wandering albatrosses, and a scarcity of species that occupy similar niches, e.g. tui, yellow-crowned parakeet, and southern royal albatross.

The diversity of environments on Adams Island, from tall forest to fellfield, from tussock to swamp, from sheltered harbour to towering cliffs, means that a great range of terrestrial and marine bird species can occupy this one island, which by happenstance has just enough of a seaway to be spared from invasion. It remains an environment from which to evaluate all that New Zealand has lost.

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APPENDIX. Visits to Adams Island when ornithological observations were recorded, and from which species accounts were generated. 'Logbook' refers to private logbooks retained by G.P.E. & K.J.W. Scientific names of all species are provided in the main text and Table 1.

Date	Who	Main purpose and area visited	Length of visit	Source
1864	Crew of the <i>Grafton</i>	Shipwrecked sailors	few hours	Raynal 1880
1882–86	John Greig, skipper of government steamer	Servicing castaway depots	few hours	Greig 1886
Jan 1888	Andreas Reischek	Collecting birds	1 day	Reischek 1889a, b
Jan 1890	Frederick Chapman	Servicing castaway depots and science	2 days	Chapman 1891
Jan 1890	Captain John Fairchild, skipper of government steamer	Servicing castaway depots and collecting eggs	few hours	Chapman 1891
Oct 1890	Ethel Richardson	Servicing castaway depots	few hours	Cass 2014
Oct 1891	Robert Wilson	Servicing castaway depots	few hours	Unpublished diary – see Miskelly <i>et al.</i> 2020*
May 1896	E. Lukins	Servicing castaway depots	few hours	Lukins 1896
Jan 1901	Earl of Ranfurly, Frederick Hutton	Collecting birds	3 days	Ogilvie-Grant 1905
Feb 1907	Edgar Waite	Servicing castaway depots	few hours	Waite 1907
Nov 1907	Edgar Waite	Scientific exploration	few hours	Waite 1909
Feb 1929	Edgar Stead, Reginald Oliver	Scientific exploration at Fairchild's Garden	few hours	Oliver 1955
1942–45	Charles Fleming, Robert Falla, Graham Turbott, Jack Sorensen, Bill Dawbin, Hugh Wenham, Alan Paine	Second World War coastwatching, topographical surveys	many day visits and overnight camps	Sorensen 1951; Eden 1955; Turbott 2002; McEwen 2006; Falla's papers & Cape Expedition diaries – see Miskelly <i>et al.</i> 2020*
Nov 1954	Rowley Taylor, Kazimierz Wodzicki, Robert Falla	Ornithological expedition, Fairchild's Garden	4 hours	Falla 1975
Jan–Feb 1966	Brian Bell, John Kendrick	Ornithological expedition. Magnetic Bay camp and island-wide wildlife survey	19 days	Godley 1975; Falla 1967
1972–73 summer	Brian Bell, Rodney Russ, Ron Nilsson, Gordon Williams, Milton Weller	Ornithological expedition. Magnetic Bay camp and island-wide wildlife survey	many day visits and overnight camps	Yaldwyn 1975; Bell 1975; Robertson 1975; G.R Williams 1975; Soper 1976
Jan 1976	M.J. Gardiner	<i>General Grant</i> salvage Fairchild's Garden	few hours	Gardiner 1986
Jan 1978	Rowley Taylor, Robert Falla	Fairchild's Garden	few hours	Penniket <i>et al.</i> 1986
April 1980	Ray Pierce	Fairchild's Garden	few hours	Pierce 1986
Dec 1980	Maggie Wassilieff, Martin Cawthorn	Fairchild's Garden	few hours	Wassilieff 1986
May 1981	Chris Robertson, John Jenkins	Fairchild's Garden	few hours	Robertson & Jenkins 1986
Feb–Mar 1982	Four geologists	Geology	day visits	Gamble <i>et al.</i> 1986
Dec 1983	Pauline Mayhill, Jim Goulstone	Malacology, Fairchild's Garden	few hours	Mayhill & Goulstone 1986
Feb 1985	Rowley Taylor	Fairchild's Garden	few hours	Robertson & Jenkins 1986
2 Nov 1989–7 Dec 1989	Rhys Buckingham, Graeme Elliott, Kath Walker, Lou Sanson, Andris Apse	Search for Auckland Island rail, based in Magnetic Bay; island-wide wildlife observations	35 days	Moore & Walker 1990; Moore 1990, 1992; Buckingham <i>et al.</i> 1991; Elliott <i>et al.</i> 1991; Walker <i>et al.</i> 1991b

Lost Gold: ornithology of the subantarctic Auckland Islands

Date	Who	Main purpose and area visited	Length of visit	Source
5–24 Feb 1991	Graeme Elliott, Kath Walker, Peter Dिल्s, Jean-Claude Stahl	Gibson's wandering albatross island-wide census	19 days	Walker <i>et al.</i> 1991a
Jan–Feb 1993	Graeme Elliott, Kath Walker, Pete McClelland, Alison Davis	Gibson's wandering albatross island-wide census; falcon nest search	24 days	Logbook
Nov 1993	Noel Hyde	Falcon diet, Maclaren Bay	2.5 days	Hyde & Worthy 2010
22 Jan–17 Feb 1994	Peter Dिल्s, Judy Grindell, Paul Pearson, Richard de Hamel, Andy Cox	Gibson's wandering albatross census	26 days	Logbook
29 Dec 1994–26 Feb 1995	Graeme Elliott, Kath Walker, David Nicholls, Pete McClelland, Derek Brown, Kaye Stark	Gibson's wandering albatross census and satellite tracking	60 days	Logbook
May 1995	Peter Dिल्s, Andy Cox	Gibson's wandering albatross satellite-tag recovery	1 day	Logbook
3–21 Dec 1995	Peter Gaze, Mike Avis, Jo Joice, Nic Joice	Banding Gibson's wandering albatross chicks, Mt Dick to Astrolabe	18 days	Logbook
2 Jan–16 Feb 1996	Jason Malham, Jo Joice, Nic Joice	Gibson's wandering albatross monitoring	45 days	Logbook
Nov 1996	Murray Williams	Auckland Island teal research	17 days	M. Williams 1997
16 Dec–18 Feb 1997	Jacinda Amey, Gus McAllister, Hamish McFarlane, John Henderson	Island-wide Gibson's wandering albatross census	64 days	Logbook
1–15 Nov 1997	Gus McAllister, Janice Molloy	Gibson's wandering albatross chick banding	15 days	Logbook
14 Jan–22 Feb 1998	Jacinda Amey, Gus McAllister	Gibson's wandering albatross census, light-mantled sooty albatross census	39 days	Logbook
30 Nov–22 Dec 1998	Gus McAllister, Wally Hockley, Murray Martin, Rob Mason	Building hut at Maclaren Bay and Gibson's wandering albatross chick banding	22 days	Logbook
3 Jan–6 Feb 1999	Graeme Elliott, Kath Walker	Gibson's wandering albatross monitoring and satellite tracking	34 days	Logbook
28 Apr–5 May 1999	Alan Wiltshire	Gibson's wandering albatross monitoring and satellite tracking	7 days	Logbook and trip report
30 Nov–9 Dec 1999	Graeme Elliott, Kath Walker	Gibson's wandering albatross chick banding	9 days	Logbook
3 Jan–6 Feb 2000	Josh Kemp, Rhys Buckingham, Pip Aplin	Gibson's wandering albatross partial census	34 days	Logbook
17–24 Feb 2000	Sheryl Hamilton, Alan Wiltshire	Gibson's wandering albatross satellite tracking	7 days	Logbook
29 Dec 2000–7 Feb 2001	Sheryl Hamilton, Alan Wiltshire	Gibson's wandering albatross monitoring and satellite tracking	40 days	Logbook and trip report
Mar 2001	Ian Flux	Blood-sampling white-capped mollymawks at Logan Point	1 day	Flux 2002
Dec 2001–Feb 2002	Graeme Elliott, Kath Walker	Gibson's wandering albatross monitoring and tracking	52 days	Logbook and trip report
14 Dec 2002–4 Mar 2003	Graeme Elliott, Kath Walker, Colin O'Donnell, Jane Sedgely	Gibson's wandering albatross chick banding and monitoring	80 days	Logbook and trip report

Date	Who	Main purpose and area visited	Length of visit	Source
30 Dec 2003–5 Mar 2004	Josh Kemp, Erica Sommer, James Armstrong	Gibson's wandering albatross monitoring and juvenile survival. Giant petrel and red-crowned parakeet blood-sampling	65 days	Logbook and trip report
15 Dec 2004–16 Jan 2005	Graeme Elliott, Kath Walker	Gibson's wandering albatross chick banding and adult population monitoring	32 days	Logbook and trip report
14 Jan–30 Mar 2005	Chrissy Wickes, Phil Tisch	Gibson's wandering albatross juvenile survival; blood-sampling albatrosses, petrels and shearwaters	75 days	Logbook and trip report. Elliott & Walker 2005
3 Jan–11 Feb 2006	Graeme Elliott, Kath Walker	Gibson's wandering albatross monitoring	39 days	Logbook and trip report
30 Dec 2006–27 Feb 2007	Graeme Elliott, Kath Walker	Gibson's wandering albatross monitoring	28 days	Logbook and trip report
1 Jan–4 Feb 2008	Graeme Elliott, Kath Walker	Gibson's wandering albatross monitoring, snipe counts	34 days	Logbook and trip report
9 Jan–15 Feb 2009	Graeme Elliott, Kath Walker	Gibson's wandering albatross monitoring, bellbird blood-sampling	37 days	Logbook and trip report
10 Jan–20 Feb 2010	Graeme Elliott, Kath Walker	Gibson's wandering albatross monitoring, red-crowned parakeet blood-sampling	41 days	Logbook and trip report
9 Jan–16 Feb 2011	Graeme Elliott, Kath Walker	Gibson's wandering albatross monitoring, blood-sampling white-headed petrel and rail	36 days	Logbook and trip report
9 Jan–15 Feb 2012	Erica Sommer, Richard Cuthbert	Gibson's wandering albatross monitoring, white-headed petrel research	37 days	Logbook and trip report
6 Jan–16 Feb 2013	Colin O'Donnell, Don Geddes	Gibson's wandering albatross monitoring, rail blood-sampling, 5-min bird counts	41 days	Elliott & Walker 2013
13 Dec 2013–14 Feb 2014	Graham Parker, Kalinka Rexter-Huber	White-chinned petrel research, Gibson's wandering albatross monitoring	70 days	Elliott & Walker 2014
1 Jan–4 Feb 2015	Peter Moore, Moira Pryde	Gibson's wandering albatross monitoring	35 days	Walker & Elliott 2015
13–18 Jan 2015	Graham Parker, Kalinka Rexter-Huber	White-chinned petrel research	6 days	Logbook and trip report
5 Dec 2015–22 Feb 2016	Graham Parker, Kalinka Rexter-Huber	White-chinned petrel research, Gibson's wandering albatross monitoring, giant petrel counts	77 days	Elliott <i>et al.</i> 2016
22 Dec 2016–11 Feb 2017	Graham Parker, Kalinka Rexter-Huber	White-chinned petrel research, Gibson's wandering albatross monitoring	50 days	Walker <i>et al.</i> 2017
17 Dec 2017–2 Feb 2018	Graham Parker, Kalinka Rexter-Huber	Gibson's wandering albatross monitoring, light-mantled sooty albatross counts	47 days	Elliott <i>et al.</i> 2018
2 Dec 2018–8 Feb 2019	Graham Parker, Kalinka Rexter-Huber	White-chinned petrel research, Gibson's wandering albatross, falcon, giant petrels and skua monitoring	68 days	Rexter-Huber & Parker 2019