

Rakitu (Arid) Island acoustic survey 2017

Chris Gaskin



This report has been prepared for:

Aotea Great Barrier Island Office, Department of Conservation, Okiwi, Great Barrier Island

Report prepared by:

Chris Gaskin
Project Coordinator
Northern New Zealand Seabird Trust
400 Leigh Road, RD5, Warkworth 0985
PO Box 155, Leigh 0947 AUCKLAND
Phone: 09 4226868 Mob: 021 668811
Email: chris@nzseabirds.com
Website: www.nzseabirdtrust.com

Cover photo: Rakitu Island western coast. Photo: Edin Whitehead; spectrograph of grey-faced petrel calls, Te Pau Point. NNZST



Overall Project Objectives

- Determine if Procellariiform species are present on Rakitu, and overflying or prospecting;
- Confirm presence of little penguin and pied shag breeding on Rakitu;
- Identify which species could potentially be established on the island using acoustic attraction;
- Record other birds seen during visits; and
- Assess shoreline and sea caves for treatment needs during the proposed aerial toxin operation in 2018.

Figure 1. Cliffs on western side of island, Te Pau Point.



Methods

Six automated acoustic recorders were installed at locations shown in figure 2. All were pre-set to record for two hours from dusk, and two hours before dawn at 'Low' setting for audio sampling rate. Locations were well- marked (flagging tape) and GPS waypoints taken.

Timing

- Deployment of recorders – 24-25 August (NNZST)
- Replace batteries and SD cards – 27-28 October (NNZST & DOC)
- Retrieve recorders – 29 November (DOC staff)

Fieldwork

First install

Dates: 24-25 August 2017

Personnel: James Ross, Cathy Mitchell, Peter Mitchell, Chris Gaskin (all NNZST)

24 August

We used the private launch *Waimania* (James Ross, owner/skipper) during our visit to the island, leaving Omaha Wharf, Whangateau Harbour at 0830 and arriving Rakitu Cove 1130hrs. CM and PM installed two recorders at the south-western end of the island (one at high point above Papakoura point, the other on a ridge overlooking Cathedral Cove); JR installed one recorder to the ridge overlooking Weka Bay, and CG installed two recorders, one to Hautapu Point, the other to the trig above Moehau Point. In the late-afternoon-early evening we took the boat around to the west side of the island and deployed a sixth recorder on Te Pau Point – a promising looking bush-covered headland opposite a large pied shag colony under the base of huge cliffs. On landing PM discovered two active grey- faced petrel burrows close to where he installed the recorder (he brought back a fresh-looking feather). We returned to Rakitu Cove for the night. Locations for recorders are shown in fig 1 and were marked with flagging tape. Recorders are set for 1900-2100hrs and 0400-0500hrs each night.

25 August

We headed for Te Pau Point in the morning and whole party landed to survey for petrel burrows. Figure 3 shows extent of burrows found – 11 medium-large burrows (grey-faced petrel) and one smaller burrow (i.e. too small for a grey-faced petrel). Most appeared active (i.e. fresh digging, smell and feathers), but the many the burrows were very deep, and without a burrowscope, it was impossible to assess occupancy. One, however, was confirmed occupied with the bird just within reach of an arm and stick. All but two burrows were found on the headland itself. A limited search of the slope below the cliff-face overlooking the cove and headland (figure x) revealed two more burrows close to each other – one with grey-faced petrel feathers; the other smaller and appeared active. The latter, potentially fluttering shearwater going on size of burrow. All burrows are marked by flagging tape and locations in GPS. We changed the SD card in the recorder so we could review the night's recordings. We left Te Pau Point at 10:45am, then completed a circuit of the island before heading back to Omaha/Whangateau Harbour on the mainland.

Figure 2. Locations of recorder and burrows at Te Pau Point.

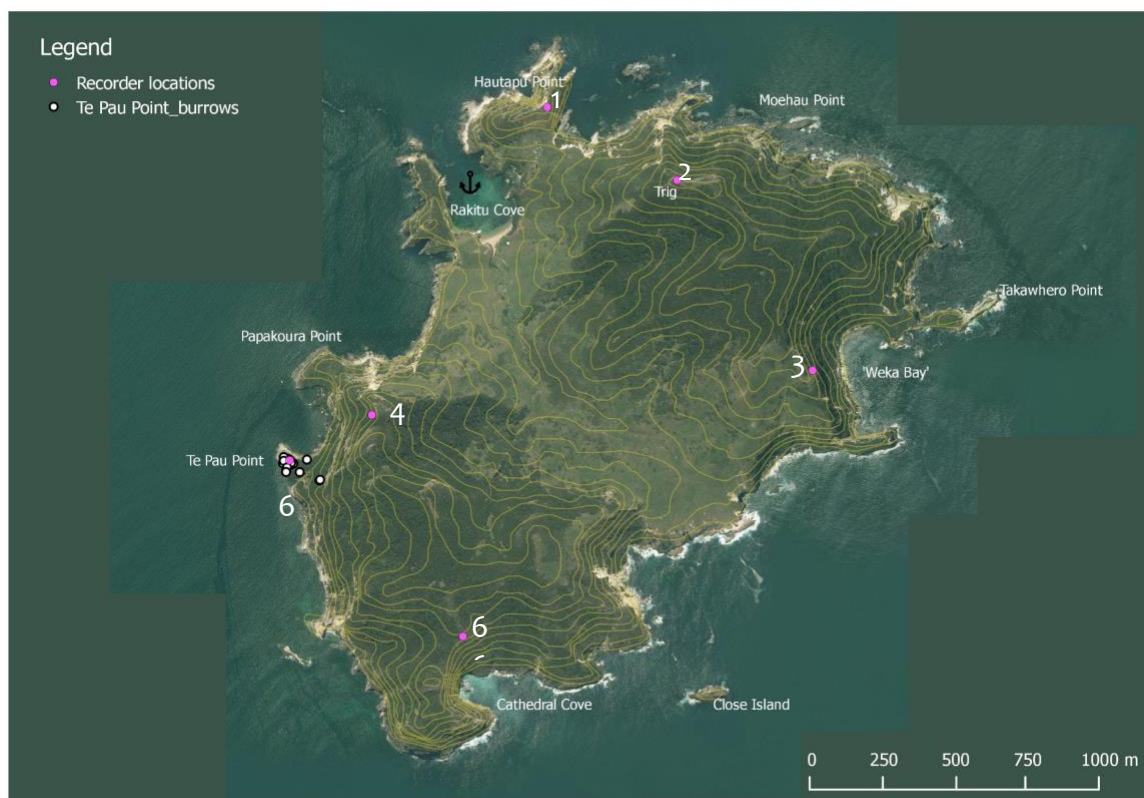
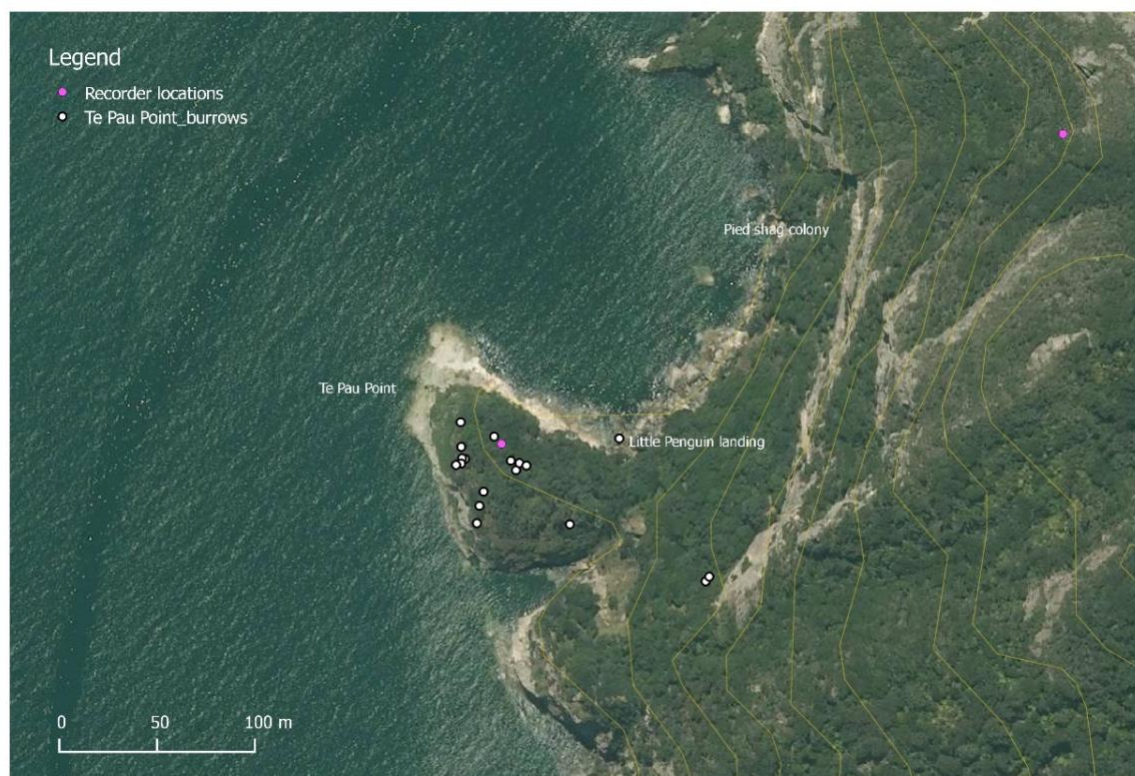


Figure 3. Burrows at Te Pau Point



Field Inspection – Rakitu (Arid) Island

Dates: 27- 28 October 2017

Personnel: Keith Hawkins (DOC NNI Planning team), Chris Gaskin, James Ross (both NNZST), Edin Whitehead (University of Auckland), Abby McBride (Fulbright National Geographic Storytelling Fellow).

27 October

We used the private launch *Waimania* (James Ross, owner/skipper) again for second visit to the island, leaving Omaha Wharf, Whangateau Harbour at 1330hrs and arriving Rakitu Cove 1700hrs. Parties went ashore with CG, EW and AM walking up the main valley to the saddle in the evening.

28 October

All ashore to change batteries and SD cards in the recorders with EW up to Hautapu Point, CG to the trig, JR to the ridge overlooking Weka Bay, and KH and AM went to recorders at the south-western end of the island and checked out a report of two land caves in the west tributary of the main stream. Late morning, went around to Te Pau Point with EW, AM, KH and CG going ashore to check burrows using a burrowscope and to search for more. A large sea cave on the south coast of the island was checked by KH, AM and CG (fig. 8) – purpose was to assess for treatment needs during the proposed aerial toxin operation in 2018 (refer DOC-3200722).

Data download and analysis

All SD cards were downloaded onto a hard drive and Wildlife Acoustics Song Scope 3.4 software was used to review the recordings. A visual scan of the recordings detected individual calls and these were entered in Excel.

Results

Ground search

On 25 August 11 grey-faced petrels were found at Te Pau Point, most appearing active with one bird confirmed in a burrow (see notes above).

On 28 October EW used a burrow scope to assess the grey faced petrel burrows found in August 2017. While the entrances to some burrows appeared to have been recently used, there was no evidence of birds, chicks or eggs were located. Similarly, no evidence of egg shell membrane, bird skeleton or carcass (i.e. possible remnants of weka or rat predation) was seen.

Recordings

Grey-faced petrels were detected at all sites. Most of the calls were at Te Pau Point (site 6), the site overlooking Pukekoura Point (4) and Hautapu Point (1) (see fig. 2 and Table 1). Calls were detected from installation (24 August) through to 22 September. After that, no grey-faced petrel calls were detected at any site. Fluttering shearwaters were detected at two sites (Trig and South Coast – overlooking Cathedral Cove). A Cook's petrel was the only other Procellariiform found in the visual scans of recordings. Both little penguins (4 sites) and pied shag (one site) were also detected (Table 1). Other birds recorded during nocturnal hours were weka (all sites), kaka (4 sites), morepork (5 sites) and tui (3 sites).

Note, about 60% of the recordings were scanned visually in the time allocated to this contract. A complete scan could potentially detect more calls, especially those that are faint and distant, and barely showing up on the spectrographs. Also, some nights were very stormy, wind and rain obliterating any calls. Recordings on those nights were not scanned.

Table 1. Species recorded at the six recorder sites (24 August to 29 November). GFPE – grey-faced petrel, FLSH – fluttering shearwater, COOK – Cook’s petrel, LIPN – little penguin, PICO – Pied shag (cormorant), BBGU – black-backed gull, with weka, kaka and tui as named.

Location		Species recorded									
		GFPE	FLSH	COOK	LIPN	PICO	BBGU	WEKA	MOPK	KAKA	TUI
1	Hautapu Point	X			X			X	X		
2	Trig		X					X	X	X	X
3	Weka Bay	X						X	X	X	
4	South Coast – Cathedral Bay	X	X	X	X			X	X	X	X
5	Papakoura Point (high point)	X			X		X	X	X	X	
6	Te Pau Point	X			X	X		X	X		

Figure 4. Spectrogram showing grey-faced petrel calls recorded at Te Pau Point 1908hrs 24 August.

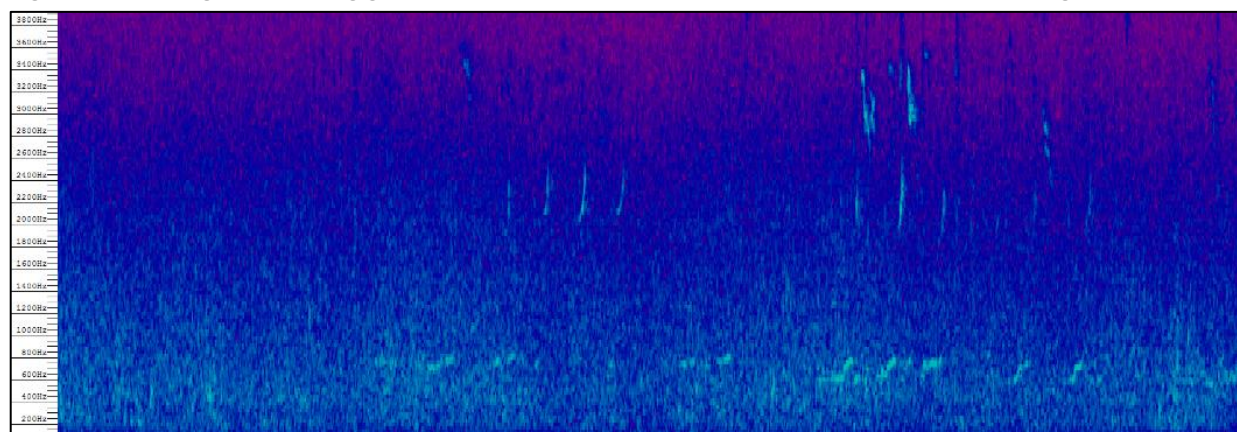
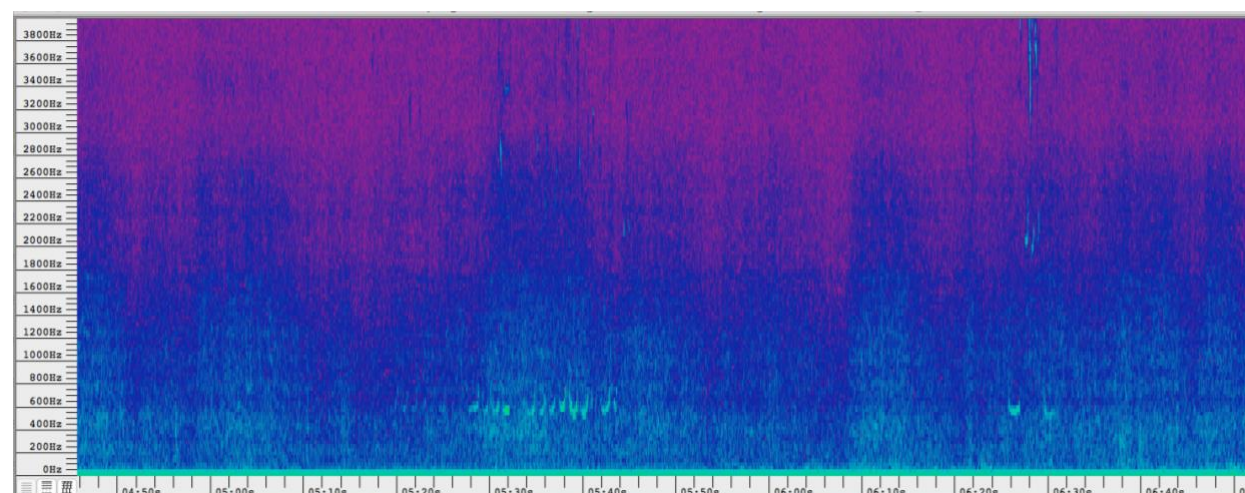


Figure 5. Spectrogram showing grey-faced petrel calls recorded at Hautapu Point 1906hrs 5 September.



Discussion & recommendations

Rakitu offers enormous potential as a breeding site for a number of seabird species, provided black (ship) rats and kiore are removed, and a solution is found regarding the future of the weka on the island. Were they to remain, or to be returned to the island after rat eradication, the future for ground-nesting, burrowing seabirds breeding in significant numbers would be bleak. Currently, on Rakitu burrowing seabirds are either struggling and in very small numbers due to predation pressure from the rats and weka, or they are absent altogether. Bellingham et al (1982) reported finding 'recently vacated' grey-faced petrel burrows (unspecified sites) and calls from overflying birds were heard 'occasionally' during their visit 31 December 1980 to 8 January 1981. Little appears to have changed since then, although their record of calling from grey-faced petrels late in the season (December-January) suggests the population could have been larger at the time. Generally, grey-faced petrels are fairly quiet, though not silent from October on.

During a preliminary visit in March 2017 fluttering shearwaters were heard in the vicinity of Close Island, c. 300m from the south coast of Rakitu at Cathedral Cove (DOC-3003798). The calls were from birds presumed to be breeding on the small island, which Bellingham et al (1982) recorded with common diving petrels during their visit. Fluttering shearwater calls were detected at two recorder sites during this 2017 survey – Cathedral Cove (south coast) and at the Trig (northeast coast) indicating that this species is active in close vicinity to Rakitu Island with Close Island a valuable, if small source population.

Our finding active grey-faced petrel burrows at Te Pau Point in August shows that they are continuing to attempt to breed, albeit in small numbers at that location. This is supported by the frequency of calling, particularly at Te Pau Point and Hautapu Point, calling which drops away completely after 20 September. The lack of any remains (either eggshell or carcasses) in or near the burrows at Te Pau Point suggested rat predation, removal of eggs or small chicks (G. Taylor pers. comm.). Failed breeders would have abandoned the burrows. The frequency and closeness of calling at Hautapu Point suggests a second possible site for this species. The recorder was sited at the very lip of a massive face facing southeast (fig 6). One section of the sloping face below is pohutukawa clad and it is possible grey-faced petrels have a toe-hold there. In fact, there are areas of forested, steep to very steep slopes on the eastern, southern and western sides of the island which would be attractive to Procellariiforms, although any breeding in those areas is not supported by this survey.

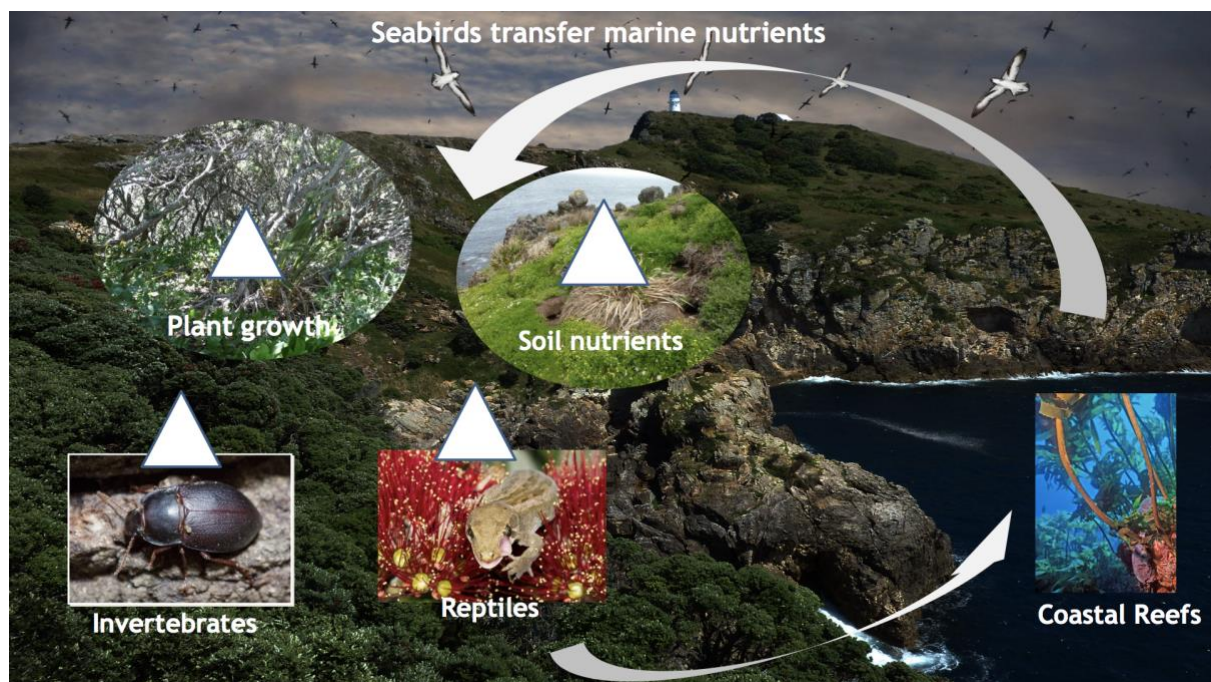
The significance of fluttering shearwaters and Cook's petrels detected during this survey is that there is the potential for attracting these species to Rakitu using acoustic attraction methods (i.e. use of playback of recorded calls to attract prospecting birds and for them to start breeding). This is a very cost-effective method that is showing extremely positive results at several restoration projects (e.g. Raoul island, Young Nicks Head, Tawharanui Peninsula). Other observations made during this survey were the large numbers of Buller's shearwaters flying past the island and around The Needles at the northern end of Aotea Great Barrier Island, birds en route to and from the Poor Knights Islands and foraging areas further south along the Coromandel and Bay of Plenty coasts. Given their high threat classification (Vulnerable IUCN; At Risk, Naturally Uncommon NZTCS), largely because of only one breeding location, this is one species that would benefit immensely with the establishment of a second breeding location. Furthermore, black petrel (Vulnerable IUCN, Threatened, Nationally Vulnerable NZTCS) have a decreasing population and are known to breed only on Great Barrier (Aotea) and Little Barrier (Te Hauturu-o-Toi) Islands, also has the potential of being attracted to Rakitu which is on their flight path between known foraging areas along the continental shelf edge and their colonies. Overflying Cook's petrels, and the more threatened Pycroft's petrels which breed on the Mercury Islands and Cuvier Island could also be attracted to Rakitu using this method. Other species that could ultimately benefit from a completely predator-free Rakitu Island are black-winged petrel, little shearwater, fairy prion, common diving petrel and white-faced storm-petrel, all known to be

breeding in the wider Hauraki Gulf region. However, these ground, burrow-nesting seabirds are highly vulnerable to predation, especially during early stages of establishing colonies, from both flightless weka and mammalian predators (e.g. rats, cats, pigs). Their establishment on Rakitu could only be achieved with the removal of all known predators.

Figure 6. View from the Trig towards Hautapu Point with Rakitu Cove on the left. Recorder site (red star), with pohutukawa clad slope below and to the right.



Figure 7. Seabird transfer of marine-derived nutrients to land and resulting impacts on terrestrial ecosystem productivity. Graphic from Rayner, M.J., Gaskin, C.P. (2013). Hunting the New Zealand Storm Petrel in a world centre for seabird diversity. Presentation at the Australasian Ornithological Conference, 4-7 December 2013, Auckland, New Zealand.



However, the restoration of Rakitu should not be limited to seabirds, although a flourishing seabird fauna on the island would ultimately have major benefits for the island's ecosystems. Although studies of seabirds at their breeding sites can provide a picture of trends in the marine environment, fluctuations of these populations can have important implications for the ecology of the terrestrial ecosystems in which they are situated. The lifestyles of seabirds operate on strikingly divergent spatial scales with individuals foraging over vast areas, yet concentrating their breeding efforts to spatially restricted (often island) breeding sites that are often reused year after year. Accordingly, seabirds play a major role in shaping the ecology of terrestrial communities by acting as links between the land and sea; importing sources of marine derived nutrients into terrestrial communities (Mulder et al 2011). At sites where seabirds are present, soil fertility and plant growth can be enhanced through the concentration of minerals (provided by guano and dead adults, chicks and eggs) and in the case of burrowing species through the tilling of the soil and incorporation of leaf litter into the soil by burrow nesting. Colonies provide habitat and food sources for a range of invertebrate and small vertebrate fauna and this enhancement of the biodiversity can travel up the food chain enriching the diversity and abundance of species at higher trophic levels (fig. 7) (Gaskin & Rayner 2013).

In DOC-3003798, G. Taylor noted: 'Key species that I see being able to be established on Rakitu would include Chevron skink, possibly short-tailed bats, Duvaucel's gecko, Whitakers and robust skinks, tuatara, wetapunga, tusked weta, Mokohinau stag beetle, Karo weevil, Placostylus snails, brown teal, little spotted kiwi, crakes, banded rail, and a range of passerines (hihi, possibly kokako, saddleback, North Island kaka, whitehead and robins). Seabirds species that could be considered for reintroduction if weka were absent include black petrel, grey-faced petrel, common diving petrel, and fluttering, Buller's shearwater, flesh-footed and little shearwaters.'

Rakitu, is also known as Arid Island. It is the latter name which encapsulates its current depauperate nature (i.e. lacking in numbers or variety of species). Rakitu has enormous potential as a fully-fledged restoration island.

Figure 8. Cathedral Cove on southern coast. Photo: Edin Whitehead



References

Bellingham, P. J., Hay, J.R., Hitchmough, R.A., McCallum, J. 1982. Birds of Rakitu (Arid) Island. *Tane* 28: 141-147

Gaskin, C.P., Rayner, M.J. 2013. Seabirds of the Hauraki Gulf: Natural history, research and conservation. Report for the Hauraki Gulf Forum.

Mulder, C.P.H., Anderson, W.B., Towns, D.R., Bellingham, P.J. (2011) *Seabird islands: ecology, invasion and restoration*. Oxford University Press, Oxford

Hawkins, K., McArthur, P., Taylor, G.A., Gaskin, C.P. 2017. Field inspection – Rakitu (Arid) Island 23-24 March 2017. DOC-3003798 – Northland Office, Department of Conservation

Hawkins, K. 2017. Field inspection – Rakitu (Arid) Island 27-28 October 2017. DOC-3200722 – Northland Office, Department of Conservation

Appendix 1 - other birds seen during survey

24-25 August

Brown teal

Mallard

White-faced heron

Australasian gannet

Australasian harrier

North Island weka

Variable oystercatcher

Spur-winged plover

Black-backed gull

Red-billed gull

NZ pigeon (including a flock of c.10 at Te Pau Point)

Feral pigeon

NZ kingfisher

Tui

Australian magpie

NZ fantail

Grey warbler

Silvereye

Welcome swallow

Song thrush

Blackbird

European starling

Chaffinch



27-28 October

Brown teal
Little penguin
White-faced heron
Australasian gannet
Australasian harrier
North Island weka
Variable oystercatcher
Spur-winged plover
Black-backed gull
Red-billed gull
Caspian tern
North Island Kaka
NZ pigeon
Feral pigeon
NZ kingfisher
Tui
Australian magpie
NZ fantail
Grey warbler
Silvereye
Welcome swallow
Song thrush
Blackbird
European starling
Chaffinch
Yellowhammer



Fluttering shearwaters. Artwork by Chris Gaskin