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**Peter J. de Lange, Clay D. Heath,
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Manukau Institute of Technology and Unitec

Private Bag 92025, Victoria Street West

Tāmaki Makaurau Auckland 1142

Aotearoa New Zealand



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The terrestrial vegetation and biota of Rangimata / Shag Rock, Te Whanga, Rēkohu / Wharekauri / Chatham Island

Peter J. de Lange^{1*} , Clay D. Heath¹ , Campbell J. James¹ , Andrew J. Marshall¹ ,
Hamish Tuanui-Chisholm²

Affiliations:

1. Applied Molecular Solutions Research Group, School of Environmental and Animal Sciences, Manukau Institute of Technology and Unitec, Private Bag 92025, Victoria Street West, Auckland 1142, New Zealand
 2. 1007 Waitangi–Tuku Road, Chatham Islands 8016, New Zealand
- * Corresponding author: pdelange@unitec.ac.nz

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Abstract

The vegetation associations and landforms of Rangimata / Shag Rock, Te Whanga, Rēkohu / Wharekauri / Chatham Island are described, and the avifauna, flora and mycobiota (lichenised and non-lichenised) documented. Rangimata / Shag Rock is one of 21 karst (limestone) islands, islets and rock stacks that fringe the western side of Te Whanga, the largest enclosed water body within the Chatham Islands group. Rangimata / Shag Rock is an important refuge and nesting ground for the threatened endemic papua / Chatham Island shag (*Leucocarbo onslowi*) and the kawau o Rangihau / Pitt Island shag (*Phalacrocorax featherstoni*), as it seems to be free of introduced predators. Eighteen vascular plants (Tracheophyta), two green algae (Chlorophyta), one rust fungus and six lichenised mycobiota were found on Rangimata / Shag Rock over three visits in between 2023 and 2025. Five landforms and vegetation associations are recognised for Rangimata / Shag Rock. The importance of this karst ecosystem within the context of the terrestrial ecosystems of Rēkohu / Wharekauri / Chatham Island is discussed and the plea made for more documentation of the Chatham Islands karst biota and ecosystem, which is one of the more seriously threatened of that island group's ecosystems.

Keywords

Chatham Islands, Te Whanga, limestone, karst islands, biota, vegetation associations

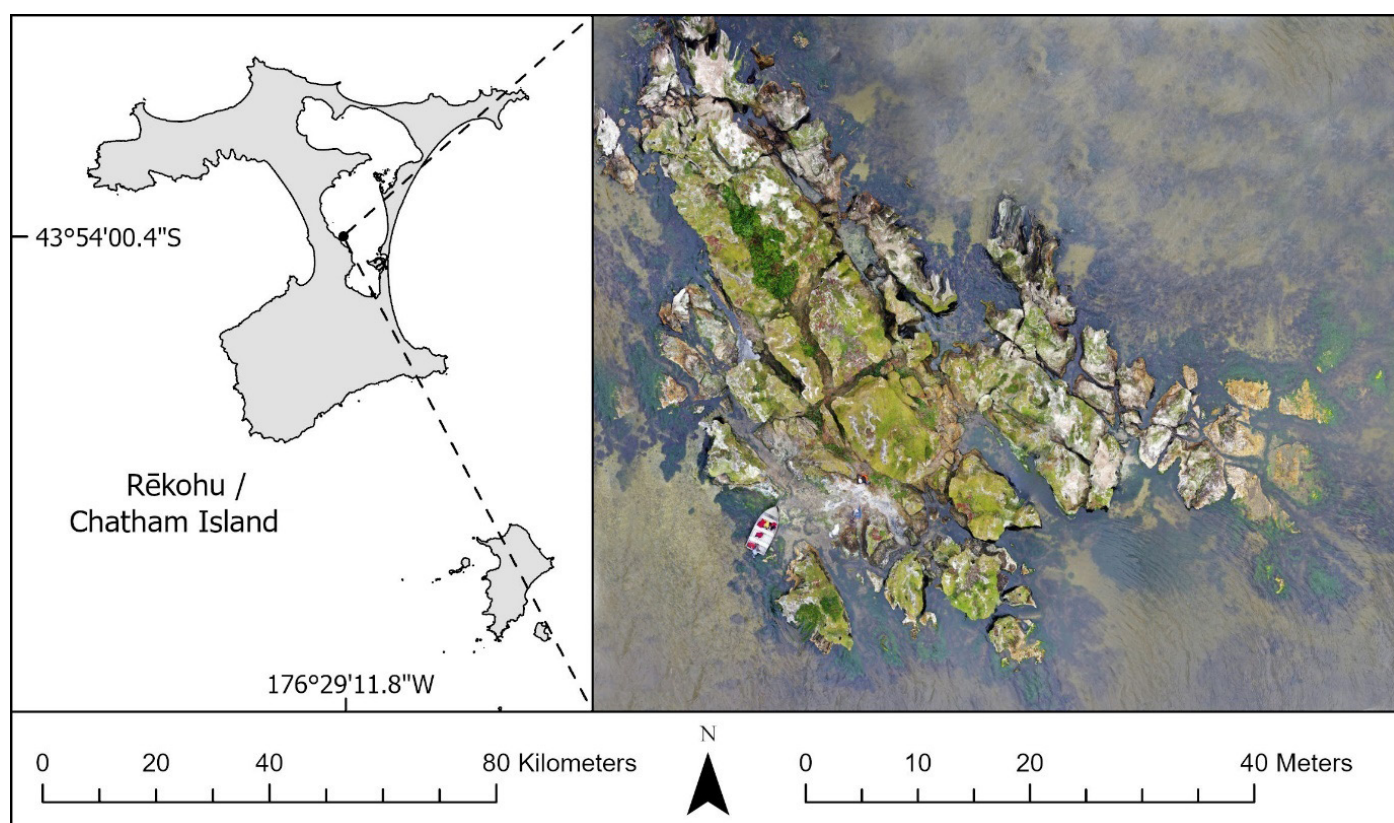


Figure 1. The location of Rangimata / Shag Rock, Te Whanga, Rēkohu / Wharekauri / Chatham Island.

Introduction

Te Whanga (160 km²), the largest water body within the Chatham Islands group, greater Aotearoa / New Zealand, dominates the landscape of Rēkohu / Wharekauri / Chatham Island (hereafter Rēkohu). While most of Te Whanga is open water, there is a series of vegetated sand bars, sand islands and islets on the eastern side, and along the western side from Pana / Blind Jim's south to Te Matarae there are 21 small (mostly ≤ 0.01 ha) limestone islands and rock stacks (de Lange et al. 2026). One of these islets (Figure 1), located 390 m west of Plum Tree at 43.900102°S, 176.486618°W, is known to imi and iwi as Rangimata and also as Shag Rock by some islanders and visiting ornithologists. Rangimata (the name used in preference here) is a sparsely vegetated uplifted limestone reef that reaches a maximum elevation of 4 m (Figure 2). It is an important refuge for two endemic threatened shags (Figures 3–5): pāpua / Chatham Island shag (*Leucocarbo onslowi* (Forbes, 1893)) and kāwau o Rangihau / Pitt Island shag (*Phalacrocorax featherstoni* Buller, 1873), both species of which use Rangimata as a nesting site. As such, there have been annual censuses taken of both



Figure 2. Rangimata / Shag Rock viewed from north-eastern side (10 February 2023).

species by the Bell brothers, Mike and David (M. Bell, pers. comm., 2 October 2023) for at least 20 years.

Prior to this publication, the vegetation and biota of Rangimata seem not to have been formally documented. The only information we can find is a file note written by Rob Chappell, who, in his role as Department of Lands and Survey Ranger, visited Rangimata on 16 December 1986. This file note, made accessible by the New Zealand Plant Conservation Network, may be viewed here:



Figure 3. Ten papua / Chatham Island shags (*Leucocarbo onslowi*) and two kawau o Rangihau / Pitt Island shags (*Phalacrocorax featherstoni*) on Rangimata / Shag Rock (18 April 2023).



Figure 4. Papua / Chatham Island shags (*Leucocarbo onslowi*) on Rangimata / Shag Rock (18 April 2023).



Figure 5. Kawau o Rangihau / Pitt Island shags (*Phalacrocorax featherstoni*) on Rangimata / Shag Rock (18 April 2023).

https://www.nzpcn.org.nz/site/assets/files/0/85/780/motuhinahina_island_chatham_island.pdf?34ewsj. It states (with our comments in square brackets):

Some five hundred metres south of Motuhinahina Island lies an outcrop of limestone stacks and short ridges only some fifty metres by twenty metres in size [c. 0.05 ha] and no more than 3.5 [4] metres at its highest point.

There is one 'beach' or flat limestone landing on the eastern end [actually the western end].

Vegetation is totally restricted to: Ice plant (*Disphyma papillatum* [Chinnock])

Salt horn [saltwort] (*S[alicornia] australis* [quinqueflora Bunge ex Ung.-Sternb subsp. quinqueflora]).

The island is primarily a shag colony as is indicated by the number of adult and young birds and the number of recently vacated Chatham Island Shag nest sites or mounds.

Many of the valleys [grykes in limestone] appear

to contain more than 300 mm of iguano [sic] indicating a colony of long standing.

Aside from papua / Chatham Island (“16 adult, 17 juvenile and two nestlings”) and kawau o Rangihau / Pitt Island shags (“45 birds of indeterminate age”), Chappell recorded four adult tara / white-fronted terns (*Sterna striata* Gmelin, 1789), with indications of breeding, and ten adult and two fledgling tarāpunga / red-billed gulls (*Chroicocephalus novaehollandiae scopulinus* (J.R. Forster 1843)).

Chappell’s documentation provides an important insight into the vegetation, flora and fauna of Rangimata some 38 years before two of the authors (P. J. de Lange and H. Tuanui-Chisholm) visited it on 18 April 2023 and made the first herbarium collections from the island. Since that visit, we have made two more visits to Rangimata, on 10 February 2024 (P. J. de Lange, C. D. Heath, C. J. James and H. Tuanui-Chisholm) and 2 February 2025 (C. J. James and H. Tuanui-Chisholm). In this paper we document our findings in the hope that they will provide useful information for future conservation management, not only of Rangimata but also Te Whanga.

Geology and Physiography

Rangimata (c. 0.05 ha) is a low-lying, roughly north-westerly–south-easterly aligned, triangular series of limestone outcrops and associated rock stacks that rise

to a maximum elevation of 4 m a.s.l. (Figure 2). Toward the south-western end of Rangimata is a small beach of limestone sand (Figure 6) that has accumulated on a hard, flat, shallowly dipping (3°SSW) limestone shelf that extends out into Te Whanga. The island is apparently formed from the same limestone that forms nearby Motuhinahina (de Lange et al. 2026), which has been mapped as “Undifferentiated Te Whanga limestone” of early Eocene to Oligocene age by Hay et al. (1970) (see also James et al. 2011). This is an extremely hard, coarse-textured biosparite (Campbell et al. 1988), which on Rangimata has been heavily weathered not only by wind, waves and salt spray, but also by the acidity of the guano left by nesting birds. This has resulted in much of the exposed limestone outcrop tops and margins being deeply pitted and flagged, with the weathering of the flags leaving sharply sculpted surfaces (Figure 3). These can be extremely hard, providing excellent foot holds, or, just as often, can be prone to collapse, depending on the degree of chemical weathering. The summits of most of the guano-encrusted outcrops are usually capped with heavily weathered limestone saprolite, guano, and roosts or nesting sites for papua / Chatham Island shags. These sites are sometimes sparingly vegetated with spring and early-summer annuals such as *Senecio radiolatus* F.Muell., and sufficiently unstable as to make travel across these surfaces difficult without risking injury. In between the outcrops is a series of deeply weathered north-western–south-eastern and



Figure 6. The small limestone and shell beach on the south-western side of Rangimata / Shag Rock provides the most sheltered and secure place to moor a boat and work from. In this image the lee of the beach is covered in a dense growth of mostly *Atriplex australasica* and *Oxybasis ambigua*; both are short-lived spring and summer green halophytes (10 February 2024).

south-western–north-eastern grykes, the largest of which has infilled with saprolite and guano to a depth of 2 m and is vegetated with a 1-m-tall tangle of mostly *Muehlenbeckia* aff. *australis*, taupata (*Coprosma repens* A.Rich.) and velvet nightshade (*Solanum chenopodioides* Lam.).

Methods

Rangimata was visited for one hour on 18 April 2023, two hours on 10 February 2024, and one hour on 2 February 2025. Observations of the geology, vegetation, fauna, flora and lichenised mycobiota were made during those visits, and that data collated for this paper. Collections made were lodged in AK and UNITEC herbaria (herbarium codes follow Thiers from 2008 onwards). Taxa observed are arranged taxonomically by family as follows: alga (Nelson 2020), avifauna (Miskelly 2022), flowering plants (APG 2003; APG 2009; APG 2016), fungi (Mycobank, <https://www.mycobank.org/page/Home>) and lichenised mycobiota (Kraichak et al. 2018). Vegetation associations were distinguished in the field using the empirical field-based vegetation classification system of Atkinson (1985). Aerial images of the island were obtained during the February 2025 visit using a DJI Mavic Pro 2 (Shenzhen, China) drone. The images were obtained using the software Site Scan LE mapping set

at 40-metre height with an 80% overlap. The final image of the island was curated using WebODM.

Results

Flora

Over three visits to Rangimata we recorded 18 vascular plants (Tracheophyta), and two green algae (Chlorophyta) (Table 1). The green algae, belonging to the genus *Prasiola* Meneghini (Figure 7) and *Rosenvingiella* P.C.Silva, are members of the Prasiolaceae. These are terrestrial algae that grow in marine environments on nitrogen-rich substrates such as guano (Womersley 1984; de Lange 1994; Nelson 2020), where they frequently form conspicuous green bands beneath bird nests and perches. In the waters surrounding Rangimata, especially on submerged limestone blocks and the bases of the towers forming Rangimata, two other green algae, *Codium fragile* subsp. *novae-zelandiae* (J.Agardh) P.C.Silva and an unnamed species of *Ulva* L. were extremely common. We did not collect specimens of these, as they were not part of the terrestrial biota of Rangimata, and beyond the scope of our survey. Of the 18 vascular plants, there were no lycophytes or pteridophytes present, only flowering plants, of which eight are naturalised to the Chatham Islands and ten

Table 1. Terrestrial flora and mycobiota of Rangimata / Shag Rock, Te Whanga, Rekohu / Wharekauri / Chatham Island.

* Denotes naturalised to the Chatham Islands.

Taxon	Family	Voucher
Chlorophyta (2) (I:2 N:0)		
<i>Prasiola</i> Meneghini	Prasiolaceae	UNITEC 14272
<i>Rosenvingiella</i> P.C.Silva	Prasiolaceae	UNITEC 14274
Angiosperms (18)		
Monocots II – Commelinids (1) (I:0 N:1)		
* <i>Poa annua</i> L.	Poaceae	UNITEC 14288
Core Eudicots (17) (I:10 N:7)		
<i>Atriplex australasica</i> Moq.	Amaranthaceae	UNITEC 14280
* <i>Atriplex prostrata</i> Boucher ex DC.	Amaranthaceae	UNITEC 14282
<i>Oxybasis ambigua</i> (R.Br.) de Lange & Mosyakin	Amaranthaceae	UNITEC 14281
<i>Salicornia quinqueflora</i> (Bunge ex Ung.-Sternb.) A.J.Scott subsp. <i>quinqueflora</i>	Amaranthaceae	UNITEC 14283

<i>Disphyma papillatum</i> Chinnock	Aizoaceae	UNITEC 14073
<i>Apium prostratum</i> subsp. <i>denticulatum</i> P.S.Short	Apiaceae	UNITEC 14070
<i>Senecio lautus</i> Willd.	Asteraceae	UNITEC 14284
<i>Senecio radiolatus</i> F.Muell.	Asteraceae	UNITEC 14074
* <i>Sonchus oleraceus</i> L.	Asteraceae	UNITEC 14285
* <i>Lepidium didymum</i> L.	Brassicaceae	UNITEC 14286
* <i>Stellaria media</i> (L.) Vill. subsp. <i>media</i>	Caryophyllaceae	UNITEC 14077
<i>Crassula moschata</i> G.Forst.	Crassulaceae	UNITEC 15169
* <i>Plantago coronopus</i> L.	Plantaginaceae	UNITEC 14287
* <i>Coprosma repens</i> A.Rich.	Rubiaceae	UNITEC 14290
<i>Muehlenbeckia</i> aff. <i>australis</i>	Polygonaceae	UNITEC 14072
* <i>Solanum chenopodioides</i> Lam.	Solanaceae	UNITEC 14078
<i>Urtica australis</i> Hook.f.	Urticaceae	UNITEC 14291
Mycobiota (6)		
Basidiomycota (1) (I:0 N: 1)		
* <i>Peristemma pseudosphaeria</i> (Mont.) Jørst.	Pucciniaceae	UNITEC 14952
Lichenised Mycobiota (5)		
<i>Bacidia plesia</i> (C.Knight) Zahlbr.	Ramalinaceae	UNITEC 14956
<i>Caloplaca johnwhinrayi</i> S.Y.Kondr. & Kärnefelt	Teloschistaceae	UNITEC 14955
<i>Caloplaca</i> cf. <i>papanui</i>	Teloschistaceae	UNITEC 14962
<i>Hydropunctaria maura</i> (Wahlenb.) C.Keller, Gueidan & Thüs	Verrucariaceae	UNITEC 14953
<i>Opegrapha rupestris</i> Pers.	Roccellaceae	UNITEC 14957



Figure 7. Dense growth of *Prasiola* (dry state) just below guano-encrusted roost and nesting site for papua / Chatham Island shag (*Leucocarbo onslowi*), Rangimata / Shag Rock (10 February 2024).

indigenous (two of these, *Disphyma papillatum* and *Senecio radiolatus*, are endemic to the islands) (de Lange et al. 2011). These plants were spread across 16 genera (six exclusively naturalised to the islands, eight exclusively indigenous, and two, *Atriplex* L and *Coprosma* J.R.Forst. & G.Forst., with both indigenous and naturalised representation on the Chatham Islands. Collectively, these taxa belong to 12 families, none exclusively naturalised to the Chatham Islands (de Lange et al. 2011).

Fungi

Peristemma pseudosphaeria (Mont.) Jørst. (Figure 8) is an introduced species of rust fungus that is commonly found on species of *Sonchus* L. in Aotearoa / New Zealand, and by extension the Chatham Islands. It is a species that is especially common on two of the naturalised species of *Sonchus*, *S. asper* (L.) Hill and *S. oleraceus* L.; however, it occasionally attacks the



Figure 8. The rust fungus *Peristemma pseudosphaeria* was commonly seen on its host plant *Sonchus oleraceus* on Rangimata / Shag Rock (10 February 2024).

Aotearoa-endemic *S. kirkii* Hamlin (McKenzie & Johnston 2004, as *Miyagia pseudosphaeria* (Mont.) Jørst.) that is locally present on the Chatham Islands (de Lange et al. 2011). While the genus is naturalised to the Chatham Islands, the family is not exclusively so, having indigenous and naturalised representation on the islands.

Lichens

Based on a single dedicated lichen survey (10 February 2024), searching for less than two hours yielded five species. These were all saxicolous crusts and none of them were visually conspicuous or abundant. Of the five, *Hydropunctaria maura* (Wahlenb.) C.Keller, Gueidan & Thüs was the most seen, and then mostly on shaded limestone in places exposed to saltwater spray or periodic immersion. Even so, it was not seen in sites crowded with algal (*Codium* Stackhouse and *Ulva*) growth. *Caloplaca johnwhinrayi* S.Y.Kondr. & Kärnefelt and *Opegrapha rupestris* Pers. were collected from three spots on the island, often in partly shaded spots, though higher on the limestone (2 m), and again in areas of limited algae growth (in this case *Rosenvingiella*). A single specimen of *Bacidia plesia* (C.Knight) Zahlbr. was found on bare limestone in a sunny location beneath open growth of *Disphyma*. This is such an inconspicuous species that is easily overlooked, so it may have been more common than our survey suggests. We also made a single collection of *Caloplaca* c.f. *papanui*, although identity of this sample is not quite certain, as the specimen found only had a single apothecium so limiting the reliability of spore measurements we obtained. This

Caloplaca was collected growing on limestone directly beneath an overhanging *Disphyma papillatum* in a shaded, narrow gryke in a site where there was minimal algae growth.

Fauna

As noted earlier, Rangimata is a key nesting site for the threatened endemic shags of the Chatham Islands (Figures 3–5). Both shag species have been seen on all visits – though we have timed our visits to minimise disruption during their nesting season (August–September) (Bell & Bell 2000; Bell 2013a, Bell 2013b). Of the birds reported by Rob Chappell in December 1986, we have seen all of the species he saw (though no evidence of nesting by white-fronted terns), and we have also seen a juvenile karoro / southern black-backed gull (*Larus dominicanus* Lichtenstein, 1823) in April 2023 and two adult birds in February 2024. An account of the species and number of birds seen on Rangimata during February 2023 and 2025 is provided by Baling et al. (2023) and Klein et al. (2025).

Vegetation associations

Using the Atkinson (1985) vegetation description framework, we distinguished five vegetated landforms and vegetation associations (Figure 9):

Limestone outcrops and talus

This landform is the dominant feature of Rangimata, presenting as mostly bare or sparingly vegetated limestone tors and outcrops (Figure 10) separated by grykes infilled with rubble or cut down to water level (Figure 11). The often pitted and / or sharply weathered limestone tends to be guano-splattered, the sides of the outcrops and towers being utilised by kawau o Rangihau / Pitt Island shags, and the summits by papua / Chatham Island shags. In such places there may be a sparse covering of lichens (less than 5 cm²), mostly *Hydropunctaria maura* in areas where the algae does not cover all the limestone. In bare patches of limestone, restricted growth of *Caloplaca johnwhinrayi* and *Opegrapha rupestris* can be found.

Limestone and shell beaches

In a small area on the western side of Rangimata, limestone sand and chip, and shell have accumulated on a gently shelving rock platform that extends several metres out into the water from the shoreline before it is sharply truncated by deeper water (Figure 6). This landform was described by Rob Chappell during his

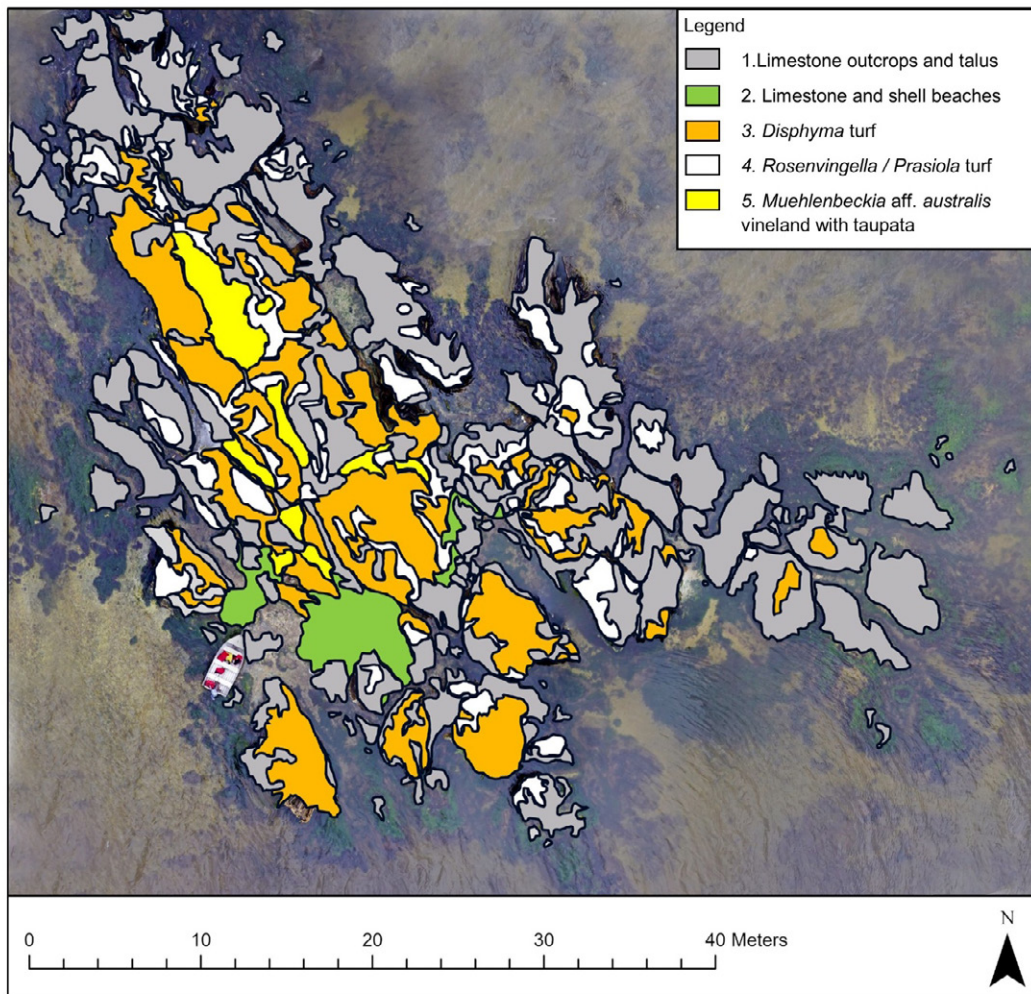


Figure 9. Vegetation associations and landforms of Rangimata / Shag Rock, Te Whanga, Rēkohu / Wharekauri / Chatham Island.



Figure 10. Rangimata / Shag Rock looking from the north-eastern side south-west. Note the steep-sided limestone outcrops and tors eroded into deeply pitted, fluted and flagged karren field. This is the most exposed side of Rangimata, as is evident by the sparsely vegetated rock surface, which is deeply undercut from wave action (12 February 2023).

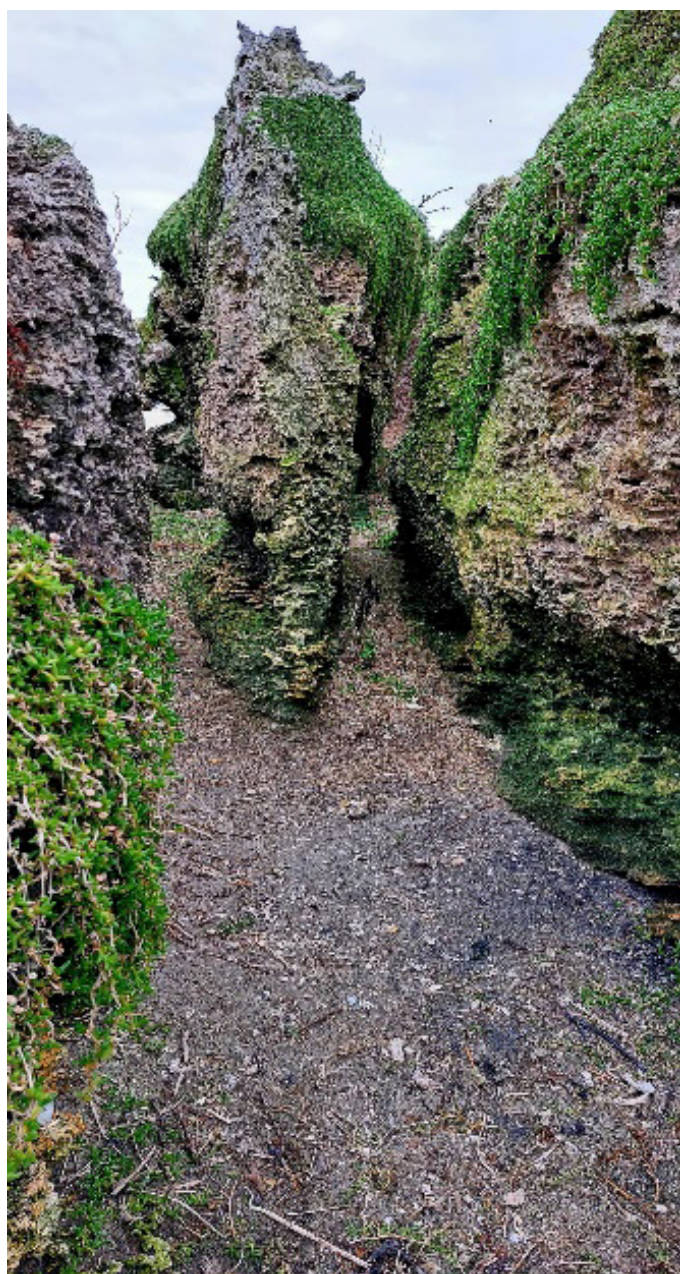


Figure 11. A deeply cut gryke (in this case cut almost to water level) infilled with limestone sand and chip (18 April 2023).

December 1986 visit; however, his file note located it on the eastern side of Rangimata, presumably in error – here there are only steep-sided rock tors that plunge into water three or more metres deep. During our summer visits the beach was dominated by *Atriplex australasica*, *Oxybasis ambigua* (R.Br.) de Lange et Mosyakin and small quantities of the weeds *Atriplex prostrata* Boucher ex DC. and *Lepidium didymum* L.; and in one place we found two seedlings of *Urtica australis* Hook.f. During the April 2023 visit, aside from a small patch of *Apium prostratum* subsp. *denticulatum* P.S.Short, the beach was devoid of vegetation.

Disphyma turf

The dominant vegetation association on the island (Figure 12), comprising 90–100% *Disphyma papillatum*, or, especially toward the base of the outcrops, a mosaic of 80% *Disphyma* N.E.Br. and 10% (or less) *Salicornia* L. Both are halophytic plants well suited to the extreme conditions on Rangimata / Shag Rock. In some places the turf is disrupted by taupata shrubs up to 1 m tall, and by seasonal occurrences of *Atriplex australasica* Moq., *Senecio lautus* Willd., *S. radiolatus* (all annuals), *Crassula moschata* (usually a perennial, but on Rangimata it is killed by summer drought, so behaves there as an annual) and velvet nightshade (*Solanum chenopodioides* Lam.). Taupata has presumably colonised Rangimata from bird-dispersed fruit (taupata is also the dominant woody cover on nearby Motuhinahina (de Lange et al. 2026) and along the coastline of Te Whanga). At the tops of the limestone outcrops and tors where bird nests are common, *Disphyma* turf is usually displaced by guano deposits, nest and roost sites.

Rosenvingiella / *Prasiola* turf

Next to *Disphyma* turf, this association is the only other dominant cover on Rangimata; though it is not immediately obvious without closer inspection, presenting from a distance as a green tint to the rock outcrops. Therefore, its mapped extent is probably much greater than our mapping indicates (Figure 9). This vegetation was visually estimated to comprise 80% *Rosenvingiella* and 10–15% *Prasiola*. As is typical of these genera, their growth is most conspicuous below bird-nesting and perch sites. The identity of both green algae remains at genus level, because of uncertainty over the application of species names (W. A. Nelson, pers. comm., September 2024). Resolution of this will require DNA sampling, so duplicate samples have been lodged in the Auckland Museum Herbarium (AK) for analysis.

Muehlenbeckia aff. *australis* vineland with taupata

The largest gryke on Rangimata, which is infilled with limestone saprolite, chips and rock, supports a vineland (Figure 13) dominated by the as-yet-unnamed *Muehlenbeckia* found throughout the Chatham Islands, and in a few places in Aotearoa. The vineland extends for about 4 m along the highest point of the gryke, and in places is nearly 1 m tall. Associated with the *Muehlenbeckia* are a few shrubs of taupata and velvet nightshade, and *Poa annua* L. Outside this area there are small pockets of taupata and velvet nightshade, sometimes with *Muehlenbeckia*, other times without. As



Figure 12. *Disphyma* turf. In this image *Disphyma* covers 80% of the limestone. The dead patches are mostly dried off *Senecio radiolatus* (a spring–early summer annual) and drought-stricken *Atriplex australasica*. Occasional mats of *Salicornia* are also evident. *Taupata* (*Coprosma repens*) and velvet nightshade (*Solanum chenopodioides*) are also present in places where saprolite has accumulated (10 February 2024).



Figure 13. *Muehlenbeckia* aff. *australis* vineland with *taupata*, an association that is best developed in the largest elevated gryke on Rangimata / Shag Rock. In this view (looking north to Ohuru) the gryke is almost completely infilled with *Muehlenbeckia* (10 February 2024).

their extent is < 1% of Rangimata, these occurrences are included in the vineland association.

Discussion

Collectively, the karst islands and islets of Rēkohu are an important part of a hitherto unrecognised, naturally uncommon ecosystem endemic to that island that occupies c. 1.584 ha (c. 0.0018%) of the land area of Rēkohu. While comparable coastal karst systems to these islands and islets are present along the western shoreline of Te Whanga, most of these are severely degraded due to unrestricted stock access, possums (*Trichosurus vulpecula* (Kerr, 1972)), pigs (*Sus scrofa* Linnaeus, 1758) and goats (*Capra hircus* Linnaeus, 1758) browsing the vegetation, a plethora of invasive weeds, and the virtual absence of indigenous avifauna and invertebrate communities due to rodent, hedgehog (*Erinaceus europaeus* Linnaeus, 1758) and cat (*Felis catus* Linnaeus, 1758) predation. Collectively, this has resulted in the complete collapse of the Rēkohu ornithocoprophilous (and associated marine mammal [pinniped]) ecosystem from these sites. This ecosystem would have once been a major part not only of the karst landscape of Rēkohu, but of the majority of other terrestrial ecosystems of that island, as it was once throughout greater Aotearoa (Norton et al. 1997). With few exceptions, most of this karst coastal vegetation is now at risk of total destruction. Without fencing, restoration planting and long-term wild-pest animal and weed control, these associations will soon only be represented by the karst islands and islets of Te Whanga. Critical, then, to raising the profile of the coastal karst of the Chatham Islands is documentation of their vegetation, biota, geology, condition and threats (short and long term). This is the purpose of this paper.

However, aside from Motuhinahina (de Lange et al. 2026), Rangimata is the only other of the 21 Chatham Island karst islands, islets and rock stacks to receive a full and published assessment of its biodiversity values. Although Rangimata is the least vegetated of the two, it is an important refuge for two endemic threatened species of shag, especially as it is free of introduced predators. Aside from taupata, a highly invasive species introduced to the islands from Aotearoa, which should be removed, Rangimata could also serve as a secure site for ornithocoprophilous endemic plants threatened on the main islands of the Chatham group, e.g., *Lepidium panniforme* de Lange & Heenan, *L. rekohuense* de

Lange & Heenan and *Leptinella featherstonii* F.Muell. We suggest that seeds of these plants be broadcast on the island in autumn as the least disruptive way of translocating them. For *Leptinella featherstonii*, we recommend that seed be taken from Kaingaroa Point, the last known site for this species on Rēkohu, rather than from the other outer islands and islets in which this species occurs. This is because there is considerable variation in this species across the secure part of its range (see comments in Lloyd 1972) that is best left undisturbed by ‘muddling’ populations, at least until this variation is subjected to modern DNA-based population genetic and phylogenetic analyses.

Though our survey time for lichens was limited, it was clear that lichens are not nearly as abundant on Rangimata as they are on Motuhinahina (c. 354 m north of Rangimata), though species such as *Caloplaca johnwhinrayi*, *Hydropunctaria maura* and *Opegrapha rupestris* do occur at both locations (de Lange & Blanchon 2025; de Lange et al. 2026). Lack of lichen species could potentially relate to the abundance of nesting birds and the nitrogen-enriched habitat their guano causes. While the guano may not directly impact lichen species, it has been shown that the abundance of *Hydropunctaria maura* is affected by competition of green algal growth in coastal areas with high nitrogen input (Higgins et al. 2014). Such would be the case on guano-encrusted Rangimata, run-off from which would encourage the dense shoreline green algal growth we observed that is dominated by the nitrophilous *Ulva* (Nelson 2020) and *Codium* – which is also known to fix nitrogen (Head & Carpenter 1975). Nevertheless, the island holds two taxa yet to be collected elsewhere on the Chatham Islands: *Bacidia plesia* and *Caloplaca* c.f. *papanui*. The *Bacidia* is probably more overlooked than it is likely to be restricted to Rangimata. Similarly, the *Caloplaca* is likely more widespread in the habitat in which it is found on the island; however, it is probably *Caloplaca papanui* D. J.Galloway, a species that was named from Papanui Inlet, Otago Peninsula, Te Waipounamu / South Island, where it was collected growing on maritime coastal rocks associated with *Hydropunctaria maura* (Galloway 2007).

Finally, we stress the importance of getting full documentation of the other karst islands and islets. We see these sites, if adjacent shoreline karst does eventually receive protection and long-term security from external pressures, as providing a critical reference ecosystem (following the concept of Balaguer et al. 2014) for their future restoration.

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Data Accessibility Statement

No additional database.

Author Contributions

Peter J. de Lange: Conceptualisation (lead); data curation (lead); validation (lead); visualisation (lead); writing – original draft (lead); writing – review and editing (lead).

Clay D. Heath: Investigation; writing – review and editing.

Campbell J. James: Conceptualisation (equal); validation (equal); visualisation (equal); writing – original draft (equal); writing – review and editing (equal).

Andrew J. Marshall: Figure and image preparation; writing – review and editing.

Hamish Tuanui-Chisholm: Transport; field assistance; writing – review and editing.

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