

Freyinetia banksii
*Hedychium gardnerianum**
*Juncus tenuis**
Lepidosperma australe
Lepidosperma laterale
Machaerina rubiginosa
Microlaena avenacea
Microlaena stipoides
Morelotia affinis
Oplismenus hirtellus
Phormium tenax

Pterostylis agathicola (AK97372, 1962)
Pterostylis alobula (AK151691, 1980)
Pterostylis banksii (AK151845, 1980)
Pterostylis trullifolia (AK151884, 1980)
Rhopalostylis sapida
Ripogonum scandens
*Schedonorus arundinaceus**
Schoenus maschalinus
Schoenus tendo
Thelymitra longifolia (AK154357, 1980)

Algae recorded from Whatipu, Manukau Heads, Auckland

M.D. Wilcox

The BioBlitz held at Whatipu 27–28 October 2017 provided an opportunity to compile a list of algae recorded from the Whatipu coast, and from the freshwater areas (Fig. 1).

Exposed rocky shores of conglomerate rock are a feature of Whatipu, the sites being Burnett Head (Wonga Wonga Bay) and adjoining Paratūtai Island within the Manukau Harbour entrance (Fig. 2), and Ninepin Rock (Te Toka-Tapu-a-Kupe) with its three associated smaller rocky islets (Fig. 3).

The seaweed flora of this area has been the subject of just a few investigations and collections. The University of Auckland Field Club made a visit in April 1950 with Jane Trevarthen (1952) incorporating some observations on seaweeds. Max H. Hommersand in August 1974 and W. Cole in October

1974 collected at the Manukau Harbour entrance, the specimens being deposited in the herbarium of the University of North Carolina, Chapel Hill, USA. Bruce Hayward and Margaret Morley included Whatipu in their survey of the Waitakere coast (Hayward & Morley 2004) and made some collections, visiting there in January 2000 and September 2001. Mei Nee Lee of the Auckland Museum did some collecting there in April 2008. I have investigated the seaweeds at Whatipu on four occasions: 24 March 2007, 22 March 2008, 2 January 2015, and 28 October 2017. Here are my brief diary notes on these visits.

24 March 2007: Paratūtai Island, Whatipu, 7.30 am to 9.30 am, low tide. The eastern (harbour) side has a fringe of *Ecklonia radiata* and *Carpophyllum maschalocarpum*. The more exposed north side has *Carpophyllum maschalocarpum* as the fringe.



Fig. 1. Whatipu map (from NZ Topo Maps). Scale: grid in 1 km squares.



Fig. 2. Burnett Head and Paratūtai Island, Whatipu, 22 March 2008. All photographs by author.



Fig. 3. Oblique aerial view of Whatipu, taken from Flight NZ124 from Melbourne, 30 March 2012.

Interestingly, no typical west coast species such as *Durvillaea antarctica*, *Pachymenia lusoria*, *Psilophycus alveatus*, *Sarcothalia atropurpurea*, or *S. marginifera* were to be seen. High tidal rocks have abundant "Porphyra" – mainly *Pyropia plicata* (Fig. 4). *Ulva australis* (rosette species) is common. *Chaetomorpha aerea* occurs in rock pools. There is a lot of short *Petalonia binghamiae* growing amongst green-lipped mussels (*Mytilus canaliculus*). *Capreolia implexa* occurs higher up the shore, in shady places amongst abundant little black mussels (*Limnoperna pulex*). There is a low tidal turf on wave-tossed rocks of *Gigartina* cf. *laingii* and *Gymnogongrus furcatus*. The marine lichen *Lichina intermedia* can be found high up on rocks, with periwinkles. The rock is andesitic conglomerate. Some *Apophlaea sinclairii* was found, and some *Glossophora kunthii* in low tide pools. Surprisingly, it is not a very rich algal shore – perhaps the constant build-up of sand prevents large perennial algae becoming established.

22 March 2008: Paratūtai Is and Ninepin Rock (Te Toka-Tapu-a-Kupe), Whatipu. *Petalonia binghamiae* and mussels are the dominant feature. The rocks



Fig. 4. *Pyropia plicata*, Paratūtai Island, upper-intertidal, 24 March 2007.

seem to have a limited seaweed flora. High tide *Pyropia plicata*, then a turf of *Gymnogongrus furcatus* (Fig. 5). High tide pools with erect *Codium fragile* subsp. *fragile* (Fig. 6), *Ulva australis*, with some red algae (*Centroceras clavulatum*, *Polysiphonia strictissima*) and *Chaetomorpha aerea* in pools. Some *Carpophyllum maschalocarpum* and a few *Sargassum sinclairii*. Plentiful *Glossophora kunthii*. *Sarcothalia atropurpurea* prominent. *Gymnogongrus torulosus* on Ninepin, near beach. Plentiful *Gigartina* cf. *laingii*. *Lyngbya majuscula* in high tide pool on Ninepin. Alan Esler has a 2003 aerial photo showing Ninepin Rock high and dry. Its intertidal position is therefore recent, and accounts for its low algal diversity.

2 January 2015: Whatipu. Noted *Ulva intestinalis* ("green icicles") at Wonga Wonga Bay. Lots of the yellow lichen *Dufourea ligulata* on the conglomerate cliffs. *Carpophyllum maschalocarpum* dominant at Wonga Wonga Bay (Fig. 7). On the beach and in the brackish lagoon were piles of brownish algal skeins, which turned out to be the green freshwater alga *Oedogonium*, washed down the creek. Other things found on the rock faces were the cyanobacteria *Rivularia atra* at Wonga Wonga Bay and *Phormidium papyraceum* on Paratūtai.

28 October 2017: BioBlitz, Whatipu. Wonga Wonga Bay, Paratūtai Island, and Ninepin. New records from Wonga Wonga Bay were the red algae *Herposiphonia ceratoclada* and *Lophurella caespitosa*, though I have found these before in the Manukau Harbour (e.g. Daniel Bay and Destruction Gully). *Laurencia thyrsoifera* was also present there (recorded by Hayward and Morley 2004), growing as short chunky thalli. Another notable record was the brown alga *Scytothamnus australis* growing in a stunted, diminutive form quite high up on the shore with abundant *Caulacanthus ustulatus*. There were three species of *Ulva* there: *Ulva intestinalis* on the cliff



Fig. 5. *Gymnogongrus furcatus*, Paratutai Island, low intertidal, 24 March 2007.



Fig. 6. *Codium fragile* subsp. *fragile*, Ninepin, Whatipu, intertidal rock pool, 22 March 2008.

bases in freshwater seeps, and smallish rosettes of *Ulva australis* and some short tufts of *Ulva acanthophora* in the *Caulacanthus* turf amongst the barnacle *Chamaesipho columna*. Yellowish tufts of *Pyropia plicata* grew on top of large boulders. Following the BioBlitz, Wilma Blom of the Auckland Museum, made a return visit to Wonga Wonga Bay on 3 November 2017 and found the green alga *Lychaete herpestica* with the coralline encrusting alga *Phymatolithon repandum* on rock at low spring tide.

Only a brief inspection was made of Paratūtai Island (western side), where *Corallina officinalis* and *Dictyota kunthii* were found in a shallow rock pool and further sightings made of *Pyropia plicata*.

Likewise, the visit to the Ninepin and adjoining small rock stacks was rather brief, the main records of note from mid-upper tidal rock faces being *Petalonia binghamiae*, *Ulva australis*, *Pyropia plicata*, and a rather broadly-bladed large cellophane-like *Porphyra* species. A smooth, pink coralline “paint” species was observed here (and at Wonga Wonga Bay), its identity undetermined but likely to be *Phymatolithon repandum* and/or *Heydrichia homalopasta*.

The lagoon behind the main Whatipu beach had very plentiful skeins of the green alga *Rhizoclonium riparium*. Interestingly, it seems to have displaced the *Oedogonium* which was so abundant there in

January 2005. Within the freshwater ponds further inland, Angela Simpson during the BioBlitz collected the green alga *Zygnema*. See the Appendix for a full list of all algae recorded for the Whatipu area.

Acknowledgements

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Fig. 7. *Carpophyllum maschalocarpum*, Wonga Wonga Bay, Whatipu, low intertidal, 2 Jan 2015.

References

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APPENDIX: LIST OF SEAWEEDS RECORDED FROM WHATIPU: BURNETT HEAD (WONGA WONGA BAY), PARATUTAI ISLAND AND NINEPIN ROCK (TE TOKA-TAPU-A-KUPE)

RED ALGAE

<i>Abroteia suborbiculare</i>	Whatipu, as <i>Myriogramme oviformis</i> (Trevvarthen 1952); Whatipu, <i>M.H.Hommersand</i> , 28 Aug 1974, NCU-A-0000013
<i>Antithamnion pectinatum</i>	Manukau Harbour entrance, <i>W.Cole</i> , Oct 1974, NCU-A-0001076
<i>Apophlaea sinclairii</i>	Paratūtai Island. <i>M.D.Wilcox</i> , 24 Mar 2007 (sight record)
<i>Bostrychia gracilis</i>	Whatipu, as <i>Bostrychia arbuscula</i> (Trevvarthen 1952)
<i>Caloglossa vieillardii</i>	Wonga Wonga Bay, high intertidal, <i>M.D.Wilcox</i> , 28 Oct 2017 (sight record)
<i>Capreolia implexa</i>	Paratūtai Island. <i>M.D.Wilcox</i> , 24 Mar 2007 (sight record)
<i>Caulacanthus ustulatus</i>	Whatipu, Paratūtai Island, <i>M.D.Wilcox 2693</i> , 24 Mar 2007, AK 307996; Whatipu, Paratūtai Island, on green-lipped mussels, <i>M.D.Wilcox 2611</i> , 22 Mar 2008, AK 308212; Wonga Wonga Bay, <i>M.D.Wilcox 6199</i> , 28 Oct 2017, AK 370457
<i>Catenellopsis oligarthra</i>	Ninepins, Aug. 1950 (Trevvarthen 1952); Ninepin Rock, <i>M.D.Wilcox</i> , 22 Mar 2008 (sight record)
<i>Centroceras clavulatum</i>	Ninepin Rock, Whatipu, <i>M.D.Wilcox 2609</i> , 22 Mar 2008, AK 308529
<i>Chondracanthus chapmanii</i>	Whatipu (Trevvarthen 1952); Whatipu, Paratūtai Island, on green-lipped mussels, <i>M.D.Wilcox 2610</i> , 22 Mar 2008, AK 308211; Whatipu, Ninepin Rock, <i>M.D.Wilcox 2565</i> , 22 Mar 2008, AK 308571; Whatipu, Paratūtai Island, <i>M.D.Wilcox 2591</i> , 22 Mar 2008., AK 308211
<i>Clymene coleana</i>	Paratūtai Island, Whatipu, <i>M.N.Lee</i> . 7 Apr 2008, AK 302332
<i>Corallina officinalis</i>	Paratūtai Island, <i>M.D.Wilcox 6209</i> , 28 Oct 2017, AK 370454
<i>Dasyclonium bipartitum</i>	Manukau Harbour entrance, <i>W.Cole</i> , Oct 1974, NCU-A-0009571
<i>Dasyclonium incisum</i>	Manukau Harbour entrance, <i>W.Cole</i> , Oct 1974, NCU-A-0009624
<i>Dipterosiphonia dendritica</i>	Ninepin, (Trevvarthen 1952); Manukau Harbour entrance, <i>W.Cole</i> , Oct 1974, NCU-A-0010773
<i>Gelidium caulacanthum</i>	Whatipu, Paratūtai Island, <i>M.N.Lee</i> , 7 Apr 2008, AK 302343
<i>Gigartina</i> cf. <i>laingii</i>	Whatipu, Paratūtai Island, <i>M.D. Wilcox 2773</i> , 24 Mar 2007, AK 307994; Whatipu, Ninepin Rock, <i>M.D.Wilcox 2565</i> , 22 Mar 2008, AK 308571; Whatipu, Paratūtai Island, <i>M.D.Wilcox 2591</i> , 22 Mar 2008, AK 308187
<i>Gymnogongrus furcatus</i>	Whatipu, Ninepin, <i>B.W.Hayward & M.S.Morley</i> , 21 Jan 1999, AK 247608; Whatipu, Paratūtai Island, <i>M.D.Wilcox 2772</i> , 24 March 2007, AK 307995, WELT A031965; Whatipu, Ninepin Rock, <i>M.D.Wilcox 2578</i> , 22 Mar 2008, AK 308560; Whatipu, Ninepin Rock, <i>M.D.Wilcox 2566</i> , 22 Mar 2008, AK 308570; Whatipu, Paratūtai Island, <i>M.D.Wilcox 2612</i> , 22 Mar 2008, AK 308213
<i>Gymnogongrus torulosus</i>	Whatipu, Ninepin, <i>M.D.Wilcox 2567</i> , 22 Mar 2008, AK 308655; Whatipu, Ninepin, <i>M.D.Wilcox 2577</i> , 22 Mar 2008, AK 308569
<i>Herposiphonia ceratoclada</i>	Wonga Wonga Bay, <i>M.D.Wilcox 6205</i> , 28 Oct 2017, AK 370459

<i>Heydrichia homalopasta?</i>	A crustose coralline (pink paint), Ninepin, M.D.Wilcox, 28 Oct 2017 (sight record)
<i>Laurencia thyrifera</i>	Wonga Wonga Bay, M.D.Wilcox 6203, 28 Oct 2017, AK 370456
<i>Lophurella caespitosa</i>	Wonga Wonga Bay, M.D.Wilcox 6200, 28 Oct 2017, AK 370464
<i>Melanthalia abscissa</i>	Whatipu, M.H.Hommersand, 28 Aug 1974, NCU-A-0019963
<i>Metamorphe colensoi</i>	Manukau Harbour entrance, W.Cole, Oct 1974, NCU-A-0020156, 20157
<i>Microcladia novae-zelandiae</i>	Whatipu, in rock pools (Trevvarthen 1952)
<i>Phymatolithon repandum</i>	Whatipu, Wonga [Wonga] Bay, on rock, low spring tide, W.Blom, 3 Nov 2017, AK 370448
<i>Polysiphonia strictissima</i>	Whatipu, Ninepin Rock (Te Toka-Tapu-a-Kupe), in rock pools, M.D.Wilcox 2605, 22 Mar 2008, AK 308703; Whatipu, Ninepin Rock (Te Toka-Tapu-a-Kupe), epiphytic on <i>Codium fragile</i> subsp. <i>fragile</i> M.D.Wilcox 2606, 22 Mar 2008, AK 308702
<i>Porphyra</i> sp.	Ninepin, M.D.Wilcox 6208, 28 Oct 2017, AK 370450
<i>Pterocladia lucida</i>	Manukau Harbour entrance (Whatipu), W.Cole, Oct 1974, NCU-A-0025616
<i>Pterocladia capillacea</i>	Manukau Harbour entrance, W.Cole, Oct 1974, NCU-A-0025560
<i>Pyropia plicata</i>	Whatipu, Paratūtai Island, M.D.Wilcox 2753, 24 Mar 2007, AK 307993; Ninepin, M.D.Wilcox 6207, 28 Oct 2017, AK 370449; Wonga Wonga Bay, M.D.Wilcox 6198, 28 Oct 2017, AK 370467
<i>Rhodymenia leptophylla</i>	In rock pools, Whatipu (Trevvarthen 1952)
<i>Sarcothalia atropurpurea</i>	Whatipu, Ninepin Rock, M.D.Wilcox 2701, 22 Mar 2008, AK 308254; Whatipu, Ninepin, M.D.Wilcox 2931, 22 Mar 2008, AK 308377; Whatipu, Ninepin Rock, M.D.Wilcox 2700, 22 Mar 2008, AK 308253
<i>Vidalia colensoi</i>	Whatipu (Trevvarthen 1952); Manukau Harbour entrance, W.Cole, Oct 1974, NCU-A-0029940, NCU-A-00229945–46
GREEN ALGAE	
<i>Chaetomorpha aerea</i>	Whatipu, Paratūtai Island, M.D.Wilcox 2070, 24 Mar 2007, AK 307539; Whatipu, Ninepin Rock, high-tidal rock pools, M.D.Wilcox 2134, 22 Mar 2008, AK 308302; Wonga Wonga Bay, M.D.Wilcox 6206, 28 Oct 2017, AK 370466 (and observed by D.Gordon).
<i>Codium convolutum</i>	Whatipu (Trevvarthen 1952); Manukau Harbour entrance, W.Cole, Oct 1974, NCU-A-0007581
<i>Codium fragile</i> subsp. <i>fragile</i>	Whatipu, Ninepin Rock, intertidal pools, M.D.Wilcox 2119, 22 Mar 2008, AK 304760
<i>Lychaete herpestica</i>	Whatipu, Wonga Wonga Bay, subtidal fringe, W.Blom, 3 Nov 2017
<i>Ulva acanthophora</i>	Ninepin, B.W.Hayward & M.S.Morley, 21 Jan 1999, AK 247607; Wonga Wonga Bay, M.D.Wilcox 6201, 28 Oct 2017, AK 370460
<i>Ulva australis</i>	Whatipu, Ninepin Rock, in high-tidal pools, M.D.Wilcox 2121, 22 Mar 2008, AK 307314; Ninepin, M.D.Wilcox 6213, 28 Oct 2017, AK 370452

<i>Ulva intestinalis</i>	Whatipu, Wonga Wonga Bay, <i>M.D.Wilcox 5349</i> , 2 Jan 2015, AK 356039; Wonga Wonga Bay, <i>M.D.Wilcox 6202</i> , 28 Oct 2017, AK 370458
<i>Ulva laetevirens</i>	Whatipu, Paratūtai Island, <i>M.D.Wilcox 2196</i> , 24 Mar 2007, AK 307315; Whatipu, Ninepin Rock, <i>M.D.Wilcox 2198</i> , 22 Mar 2008, AK 307316; Whatipu, Ninepin Rock, <i>M.D.Wilcox 2182</i> , 22 Mar 2008, AK 316875; Whatipu, Paratūtai Island, <i>M.D.Wilcox 2165</i> , 22 Mar 2008, AK 316874
BROWN ALGAE	
<i>Bachelotia antillarum</i>	Whatipu, Ninepin Rock (Te Toka-Tapu-a-Kupe), in high-tide rock pools, <i>M.D.Wilcox 3172</i> , 22 Mar 2008, AK 307846
<i>Carpophyllum maschalocarpum</i>	Whatipu, <i>M.H.Hommersand</i> , 28 Aug 1974, NCU-A-0003538
<i>Dictyota kunthii</i>	Whatipu, Paratūtai Island, <i>M.D.Wilcox 2281</i> , 24 Mar 2007, AK 308431; Whatipu, Ninepin Rock (Te Toka-Tapu-a-Kupe), <i>M.D.Wilcox 2378</i> , 22 Mar 2008, AK 308732
<i>Ecklonia radiata</i>	Whatipu, <i>M.H.Hommersand</i> , 28 Aug 1974, NCU-A-0010923-24
<i>Landsburgia quercifolia</i>	Whatipu, April 1950 (Trevarthen 1952)
<i>Petalonia binghamiae</i>	Whatipu, <i>B.W.Hayward & M.S.Morley</i> , 21 Jan 1999, AK 247609; Whatipu, Paratūtai Island, <i>M.D.Wilcox 2288</i> , 24 Mar 2007, AK 308437, WELT A031853; Whatipu, Ninepin Rock (Te Toka-Tapu-a-Kupe), dominant, <i>M.D.Wilcox 2392</i> , 22 Mar 2008, AK 308719; Whatipu, Paratūtai Island, <i>M.N.Lee</i> , 7 Apr 2008, AK 30233; Ninepin, <i>M.D.Wilcox 6210</i> , 28 Oct 2017, AK 370453
<i>Sargassum sinclairii</i>	Whatipu, <i>M.H.Hommersand</i> , 28 Aug 1974, NCU-A-0027583; Whatipu, Ninepin Rock (Te Toka-Tapu-a-Kupe), <i>M.D.Wilcox 2377</i> , 22 Mar 2008, AK 308733
<i>Scytothamnus australis</i>	Wonga Wonga Bay, <i>M.D.Wilcox 6197</i> , 28 Oct 2017, AK 370462
<i>Splachnidium rugosum</i>	Manukau Harbour entrance, <i>W.Cole</i> , Oct 1974, NCU-A-0028356
CYANOBACTERIA	
<i>Lyngbya majuscula</i>	Ninepin, <i>M.D.Wilcox</i> , 27 Mar 2008 (sight record)
<i>Nostoc</i>	Whatipu, by freshwater pond in sand dunes, <i>E.K.Cameron 4141</i> , 5 Oct 1986, AK 345790
<i>Phormidium papyraceum</i>	Whatipu, Paratūtai Island, spray zone, <i>M.D.Wilcox 5354</i> , 2 Jan 2015, AK 356041
<i>Rivularia atra</i>	Whatipu, Wonga Wonga Bay, cliff seep, <i>M.D.Wilcox 5348</i> , 2 Jan 2015, AK 356037
MARITIME LICHENS	
<i>Buellia cranwelliae</i>	Whatipu, <i>P.J.de Lange</i> , 16 Jan 2014, AK 348109
<i>Caloplaca allanii</i>	Whatipu, Paratūtai Island, on matrix of volcanic conglomerate, 2 m, <i>P.J. de Lange & D.J. Blanchon</i> , 15 Jan 2013, UNITEC 5502
<i>Dufourea ligulata</i>	Wonga Wonga Bay, <i>M.D.Wilcox</i> , 2 Jan 2015 (sight record); Ninepin, <i>M.D.Wilcox</i> , 28 Oct 2017 (sight record)
<i>Lichina intermedia</i>	Paratūtai Island, <i>M.D.Wilcox</i> , 24 Mar 2007 (sight record)

TERRESTRIAL AND FRESHWATER ALGAE

Charophytes

<i>Chara corallina</i>	Whatipu, <i>T.C.Chambers</i> , 12 Apr 1950. AK 239396 (as <i>C. australis</i>)
<i>Chara globularis</i>	Whatipu, <i>G.W.Mason</i> , Apr 1950, AK 346808; Whatipu, large pool at cave entrance, <i>T.C.Chambers</i> , 12 Apr 1950, AK 238569; Whatipu, <i>E.M.Dickson</i> , 1 Mar 1972, AK 346839; Whatipu Sands, <i>E.K.Cameron</i> , 11 May 2003, AK 282338, AK 282339, AK 284895
<i>Nitella hyalina</i>	Whatipu Sands, <i>E.K.Cameron</i> , 11 May 2003, AK 282332, AK 282340, WELT A031853

Other green algae

<i>Cephaleuros lagerheimii</i>	Whatipu, parasitic on mahoe leaves, <i>B.Goodwin</i> , (MW6211), 28 Oct 2017, AK 370455
<i>Microsora</i> sp.	Whatipu beach lagoon, <i>M.D.Wilcox</i> , 2 Jan 2015 (sight record)
<i>Oedogonium</i> sp.	Whatipu, Manukau Heads, in brackish creek, <i>M.D.Wilcox</i> 5351, 2 Jan 2015, AK 356040
<i>Rhizoclonium riparium</i>	Whatipu, freshwater/saline lagoon, <i>M.D.Wilcox</i> 6196, 6204, 28 Oct 2017, AK 370461
<i>Spirogyra</i> sp.	Whatipu beach lagoon, <i>M.D.Wilcox</i> , 2 Jan 2015 (sight record)
<i>Zygnema</i> sp.	Lake in wetland, <i>A.Simpson</i> , MW 6212, 28 Oct 2017, AK 370451

Botany of the Lynfield Coast, Manukau Harbour, Auckland

Mike Wilcox & Jack Warden

Introduction

A series of native bush reserves borders the Manukau Harbour from west of Wattle Bay Reserve (Wilcox & Kowhai 2015) to Lynfield Cove. To the west of Lynfield Cove is Gittos Domain (Wilcox 2016). These reserves (Fig. 1) form part of a more-or-less continuous belt of coastal forest stretching from Hillsborough Bay westwards to Green Bay and includes the more inland Wairaki Stream Reserve and the adjoining Ryman Healthcare Tropicana Bush ("Subritzky's Bush").

Access to these reserves is via a main coastal walkway, bush tracks, and directly from the ends of cul-de-sac streets or from the coast.

Manukau Domain

This council reserve covers 5.83 ha and extends steeply down from Halsey Drive via a circuit track towards the coast where it adjoins Halsey Esplanade Reserve. The vegetation here (see Appendix) has been briefly mentioned by Cameron (2001), and Gardner (2007) who made note of a very large titoki

(*Alectryon excelsum*), a huge pohutukawa (*Metrosideros excelsa*) – which has since fallen over – and plentiful puriri (*Vitex lucens*). There is a grassed area at the top, a small area of gumland scrub, and extensive regenerating coastal forest.

The best-preserved forest is in deep, damp, shaded gullies where the aforementioned trees are the dominants, with associated karaka (*Corynocarpus laevigatus*), kohekohe (*Dysoxylum spectabile*), rewarewa (*Knightia excelsa*), kowhai (*Sophora chathamica*) and kahikatea (*Dacrycarpus dacrydioides*). Elsewhere there is much low secondary forest with an abundance of pigeonwood (*Hedycarya arborea*), mapou (*Myrsine australis*), kawakawa (*Piper excelsum*), lacebark (*Hoheria populnea*), and toward the coast, karo (*Pittosporum crassifolium*) and houpara (*Pseudopanax lessonii*). Rarities here are tanekaha (*Phyllocladus trichomanoides*), tawapou (*Planchonella costata*), milk tree (*Streblus heterophyllus*) and mamangi (*Coprosma arborea*). *Veronica macrocarpa* is frequent beside tracks.