Algae recorded during the Katikati BioBlitz, Uretara Stream catchment, 6-7 March 2015

Mike Wilcox

Introduction

A 24 hour BioBlitz was held in the Uretara Stream catchment, Katikati, Bay of Plenty, 6-7 March 2015 (Fig. 1). It was organised by Peter Maddison, and Sue Morris of Uretara Estuary Managers, and also involved several other Western Bay of Plenty community groups, the Bay of Plenty Regional Council, and the Western Bay of Plenty District Council. The objective was to record plant and animal species from throughout the catchment, from the headwaters in the Kaimai Range to the outlet of the Uretara Stream in Tauranga Harbour. My particular responsibility was algae.

Marine algae of the Uretara Estuary and adjoining Tauranga Harbour shores

Marine algae were recorded at low tide on the harbour shore at Kauri Point (No.1 on Fig. 1); along the edges of the Uretara estuary (2); Park Road (3); Beach Road (4); Tetley/Wills Road (5); and at Tutaetaka Island (6)(urupa of Ngai Tamawhariua, a local hapu). The habitats were high-tidal low coastal cliffs of ignimbrite and tuff; shaded margins and brackish backwaters of the main lower estuary; mangroves and salt marshes; and the harbour sand and mudflats with extensive washup of seaweeds. The dominant shoreline assemblage was the extensive free-floating washup comprising *Ulva laetevirens* as the major component , with *Ulva australis* , *Spyridia filamentosa* , *Gracilaria truncata* , and *Hypnea nidifica* . Another prominent assemblage was present on the surface of mud in salt marsh and mangroves where there was freshwater influx, the dominant species being *Ulva ralfsii* , *Rhizoclonium implexum* and *Gracilaria chilensis* curled, free-living form , and at the base of salt marsh plants, *Bostrychia harveyi* .

Freshwater algae of the Uretara catchment

Streams examined in the Uretara catchment were McKinney Stream (Busby Rd, No.7 on Fig. 1), Boyd Stream (8, Findsen and Bain native bush block, 360 Busby Rd), Quarry Stream (9, Brian Gordon's property, Wharawhara Rd), as well as the main Uretara Stream (10, 11, 12). Fast-flowing headwater streams shaded by bush had few algae, though *Hildenbrandia* occurred on rocks, and some patches of *Vaucheria bursata* were found. *Spirogyra* was found commonly in open, well-lit stretches of water, where there was a good flow of water over stones. No charophytes were seen.

Collecting numbers are given for voucher specimens that have been deposited in the Auckland Museum herbarium (AK).

List of species recorded

MARINE ALGAE

Red algae

Aeodes nitidissima
Washed up at Kauri Point. Tauranga Harbour is the type locality of this seaweed.

Bostrychia gracilis
Upper intertidal coastal cliffs, Kauri Point. MW 5388.

Bostrychia harveyi
Common at the bases of salt marsh plants (*Juncus kraussii*, *Apodasmia similis*), Uretara Estuary and along boardwalk from Wills Rd (Fig. 2). MW 5373, MW 6002, MW 6006.

Bostrychia moritziana
Mangrove pneumatophores, Wills Rd. MW 5375, MW 6021.

Caloglossa vieillardii
On mangrove pneumatophores, end of Park Rd and along Wills Rd boardwalk. MW 6009.

Capreolia implexa
Common on upper intertidal rocks and also tree trunks. Tutaetaka Island and adjacent estuary shore. MW 6013.

Catenella nipae
On mangrove pneumatophores, end of Park Rd. MW 6001.

Gelidium caulacantheum
Tutaetaka Island.

Gracilaria chilensis [slender, normal form)
Attached to shells and a jetty pontoon, and cast up, Uretara estuary (Fig. 3). MW 5376, MW 5377, MW 6016.

Gracilaria chilensis [curled, unattached mangrove form]
Common in the salt marsh along the Wills Rd boardwalk. It grows in dense mats, yellow-green in colour, on the surface of mud where the water is brackish (Fig. 4). MW 5372.

Gracilaria truncata
A prominent component of the extensive seaweed washup on the shore at Tutaetaka Island and Kauri Point (Fig. 5). MW 5385, MW 6014.

Hypnea nidifica
A prominent component of the extensive seaweed washup on the shore at Tutaetaka Island (Fig. 6). MW 6010.

Neosiphonia harveyi
Washed up on a beach near end of Park Rd. MW 5378.

Plocamium angustum
Washed up at Kauri Point.

Spyridia filamentosa
An abundant component of the beach washup on all the shore lines (Fig. 7). MW 5384, MW 6008, MW 6020.

Stylonema alsidii
A minute, filamentous epiphyte, common on the blades of *Gracilaria truncata*. MW 6018.

Brown algae

Carpophyllum maschalocarpum
Drift near Tutaetaka Island. Uncommon.

Ecklonia radiata
Drift near Tutaetaka Island. Uncommon.

Hormosira banksii
Drift at Kauri Point.

Green algae

Codium fragile* subsp. *fragile
Drift on shore at Kauri Point and Tutaetaka Island. Uncommon. MW 6015.

Gayralia oxysperma
On stones along shaded edge of lower Uretara Estuary. Common. MW 6004.

Rhizoclonium africanum
Upper intertidal coastal banks and on bark of overhanging pohutukawa trees, Kauri Point and Tutaetaka Island. MW 5386, MW 6017.

Rhizoclonium implexum
Abundant yellow-green skeins in the brackish channels and pools adjoining the lower Uretara Estuary. Common on the surface of mud in the brackish salt marsh at start of boardwalk, Wills Rd. MW 5374, MW 6003.

Rhizoclonium riparium
Upper intertidal coastal banks, Kauri Point and Tutaetaka Island.

Ulva australis (*Ulva pertusa*)
A minor component of the sea lettuce washup at Tutaetaka Island (Figs. 8, 9), MW 6011.

Ulva intestinalis
Uretara Estuary, mouth of a small entering creek. Also at Kauri Point, on coastal cliffs with freshwater seepage. MW 5382.

Ulva laetevirens (*Ulva* sp. 1)
The dominant sea lettuce in Tauranga Harbour. Abundantly washed up on the shore at Kauri Point (Figs. 10, 11) and Tutaetaka Island, and more sparsely at Beach Rd and Park Rd. The thalli comprise large, broad sheets with numerous holes, or long ribbons. MW 5383, MW 6007, MW 6012. It also washes up on the ocean beach at Mt Maunganui (Fig. 12).

Ulva procera
Coastal cliffs, Kauri Point and Tutaetaka Island.

Ulva ralfsii
Common on the surface of mud beside the Wills Rd boardwalk, particularly where mangroves have been removed (Fig. 13). MW 5371.

Wittrockiella salina
In seeps on shaded coastal banks, Kauri Point. Uncommon. MW 5389.

CYANOBACTERIA

Lyngbya sp.
Uretara Island, upper intertidal rock faces. MW 6019.

SUBAERIAL ALGAE

Two green algae were recorded from forest, and two from the coastal margin of Kauri Point.

Cephaleuros lagerheimii [mahoe leafspot]
Common as yellowish blotches on the leaves of mahoe (*Melicytus ramiflorus*). Recorded from Haiku Pathway (Fig. 14).

Cephaleuros parasiticus
On the leaves of rewarewa (*Knightia excelsa*), native forest in upper Uretara catchment.

Trentepohlia abietina
A reddish-orange fur on the bark of pohutukawa (*Metrosideros excelsa*), Kauri Point. MW 5390.

Trentepohlia aurea
On sandstone rock wall, Kauri Point (Figs. 15, 16). MW 5387, MW 5391.

FRESHWATER ALGAE

Hildenbrandia rivularis
Red "paint" on stones in Boyd Stream, in native bush.

Microspora sp.
Identified from Uretara Stream, at weir, mixed with *Spirogyra*. MW 5394.

Mougeotia sp.
Identified from Uretara Stream, mixed with *Spirogyra*.

Spirogyra sp.
This was the commonest alga recorded in the Uretara streams. It was found at several localities, attached to large stones in the swifter-flowing, open stretches (Figs. 17, 18, 19), MW 5379, MW 5381, MW 5395, MW 6005.

Vaucheria bursata
Recorded in the McKinney Stream, Busby Rd. MW 5380.

Zygnema sp.
Identified from Uretara Stream, mixed with *Spirogyra*.

Other records of algae from Tauranga Harbour

1. **de Winton, M.D.; Clayton, J.S.; Hawes, I. 1996: Subtidal *Ulva* within Tauranga Harbour: 1995/1996. *NIWA Consulting Report FPRC 70205/1*.**
   Mention is made of *Hypnea nidifica*, *Rhodymenia dichotoma*, *R. novazelandica*, *Spyridia filamentosa*, and *Gigartina atropurpurea*.

2. **Hamill, K.D. 2014: *Kaituna River Re-diversion project: Ongatoro/Maketū estuary condition and potential ecological effects*. Prepared for Bay of Plenty Regional Council. River Lake Ltd, Whakatane.**
   Extensive growth of *Gracilaria* was recorded, together with several species of *Ulva* (*U. flexuosa* subsp. *pilifera*, *U. clathrata*, *U. intestinalis*, *U. pertusa*), and cyanobacteria (*Lyngbya*, *Oscillatoria*).

3. **Heesch, S.; Broom, J.; Neill, K.; Farr, T.; Dalen, J.; Nelson, W. 2007: Genetic diversity and possible origins of New Zealand populations of *Ulva*. *Biosecurity New Zealand Technical Paper* 2007/01. New Zealand Ministry of Agriculture & Forestry, Wellington.**
   Ulva species recorded from Tauranga Harbour were: *Ulva compressa* (Tanners Point), *U. intestinalis* (Tanners Point), *U. pertusa* (Tauranga Port), *Ulva* sp. 1 (Tauranga Port, Tanners Point, Omokoroa), *Ulva* sp. 3 (Tauranga Port).

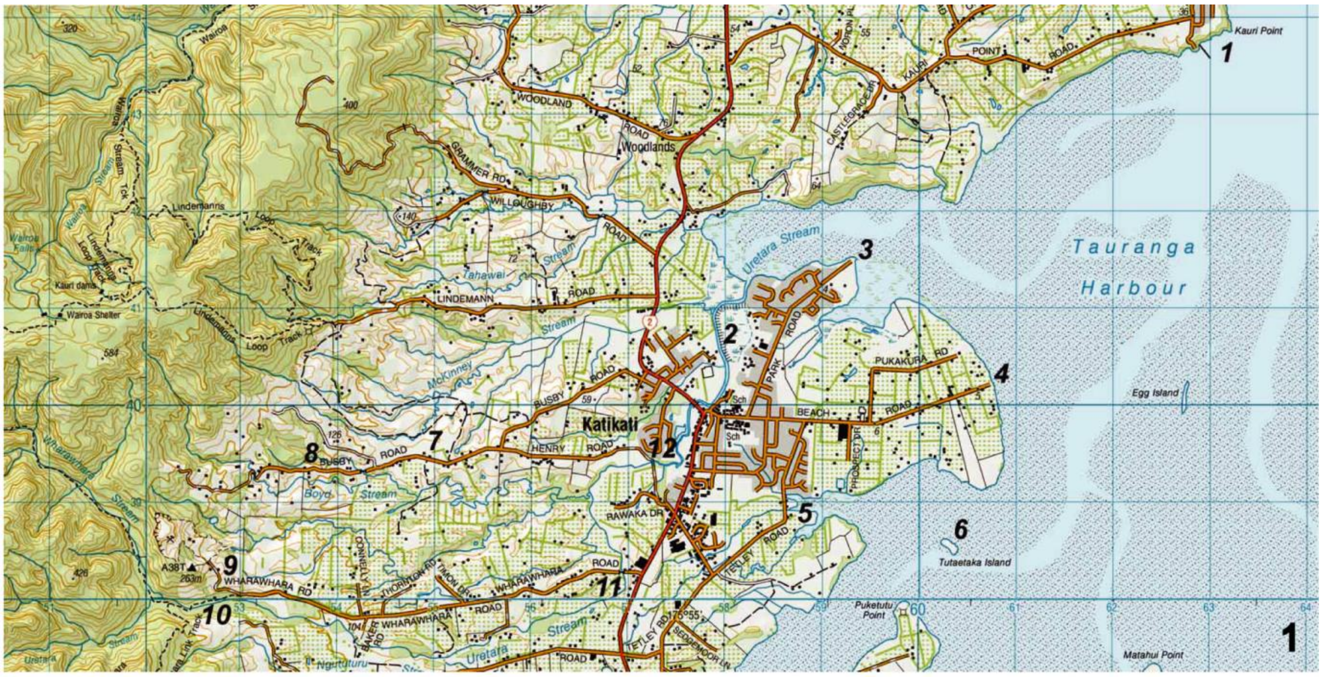
4. **Inglis, G.; Gust, N.; Fitridge, I.; Floerl, O.; Woods, C.; Hayden, N.; Fenwick, G. 2006: Port of Tauranga Baseline survey for non-indigenous marine species (Research Project ZBS2000/04) Biosecurity New Zealand Technical Paper No: 2005/05.**
   Codium fragile subsp. *tomentosoides* (now subsp. *fragile*) was recorded from a breakwall at the wharves.

5. **Nelson, W.A.; Kim, S.Y.; D'Archino, R.; Boo, S.M. 2003: The first record of *Grateloupia subpectinata* from the New Zealand region and comparison with *G. prolifera*, a species endemic to the Chatham Islands. *Botanica Marina*. 56 (5-6): 507–513.**
   The Asian red alga *Grateloupia subpectinata* was found on a tugboat in Tauranga Harbour.

6. **Pratt, S.J.; Lundquist, C.J.; Nelson, W.; Gemmill, C.E.C. 2013: A new record of *Percursaria percusa* (Ulvaceae, Ulvales) on the North Island, New Zealand. *New Zealand Journal of Botany* 51(1): 71-74.**
   The green algae *Percursaria percusa* was recorded from Omokoroa.

7. **Sinner, J.; Clark, D.; Ellis, J.; Roberts, B.; Jiang, W-M.; Eric, E.; Hale,L.; Rolleston, S.; Patterson, M.; Hardy, D.; Prouse, E.; Brown, S. 2011: Health of Te Awanui**

Figures 1-9: **1:** Map showing location of the Uretara estuary and adjoining surveyed shores of Tauranga Harbour. Numbers indicate the twelve locations visited (see introduction). Prepared by Joshua Salter, from Topo50 maps BC35, BD35, BC36, BD36. **2:** *Bostrychia harveyi* draped around the base of sea rush and oioi on shaded banks of the Uretara Estuary, where it is abundant, 6 Mar 2015. Unless otherwise stated, all photos are by the author. **3:** The two contrasting forms (ecads) of *Gracilaria chilensis*. Lower: slender elongate, attached form of harbour flats. Upper: tightly curled, bushy, unattached form from brackish mud amongst mangroves (see Fig. 4). **4:** *Gracilaria chilensis*, free-living curled form from mangroves and salt marsh, Wills Rd boardwalk, Katikati, 10 Feb 2015. **5:** *Gracilaria truncata*, drift, Tutaetaka Island, Tauranga Harbour, 6 Mar 2015. **6:** *Hypnea nidifica*, drift, Tutaetaka Island, Tauranga Harbour, 6 Mar 2015. **7:** *Spyridia filamentosa*, drift, Kauri Point, 9 Feb 2015. This seaweed regularly washes up on the harbour shores, mixed with *Ulva*. **8:** *Ulva australis*, collected from drift, Tutaetaka Island, 6 Mar 2015. It is generally smaller and a much brighter green colour than *U. laetevirens*. **9:** Surface view of cells of *Ulva australis*, Tutaetaka Island, 6 Mar 2015.


Kauri Point
Tauranga Harbour
Woodlands
Katikati
Egg Island
Tutaetaka Island
Puketutu Point
Matahui Point
Uretara Stream
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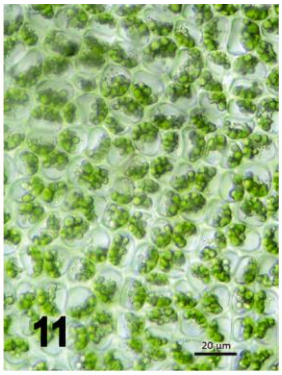
11
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13


14


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16
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17


18
50 µm


19
20 µm

Tauranga Harbour. *Manaaki Taha Moana Research Report No. 1.* Cawthron Report No.1969. Palmerston North: Massey University.

Species noted as having been recorded from Tauranga Harbour were: *Dictyota dichotoma* var. *intricata*, *Hormosira banksii* (Neptune's necklace), *Hymenena variolosa*, *Cladhymenia lyallii*, *Catenella nipae*, *Gigartina atropurpurea*, *Stenogramme interrupta*, *Trematocarpus aciculare*, *Gracilaria truncata*, *Cryptonemia latissima*, *Plocamium angustum*, *Codium fragile* subsp. *novae-zelandiae*, *Codium fragile* subsp. *tomentosoides*, *Ceramium* sp. , *Griffithsia* sp., *Polysiphonia* sp., *Hypnea* sp., *Lomentaria* sp., *Rhodymenia* sp. , *Enteromorpha* sp., *Ulva* sp.

8. Te Papa Herbarium (WELT), Wellington.

Aeodes nitidissima, Tauranga Harbour, *S.Berggren*, 1874, WELT A001268 (isotype); Whareroa Point, *W.Nelson*, Mar 2002, WELT A026254.

Capreolia implexa, Anzac Cove, *G.Knight*, 12 Apr 1998, WELT A024805.

Chaetomorpha linum, Tauranga, S.Berggren, 1874, WELT A000011.

Cladhymenia lyallii, Port of Tauranga, *W.Nelson*, 8 Mar 2002, WELT A026540.

Cladophora daviesii, Tauranga, *S.Berggren*, 1874, WELT A000008.

Codium fragile subsp. *novae-zelandiae*, Port of Tauranga, *W.Nelson*, 8 Mar 2002, WELT A026259.

Cryptonemia latissima, Port of Tauranga, *W.Nelson*, 8 Mar 2002, WELT A026255.

Dictyota dichotoma, Port of Tauranga, *W.Nelson & J.Phillips*, 4 Mar 2002, WELT A026566.

Gelidium caulacantheum, Anzac Cove, *G.Knight & W.Nelson*, 12 Apr 1998, WELT A024836; old stone jetty, *W.Nelson*, 31 Jul 2003, WELT A026824.

Hypnea nidifica, Tauranga Harbour, *S.Berggren*, 1874, WELT A001290 [this specimen is cited as *H. seticulosa* (now *H. charoides*) in Adam's "Seaweeds of New Zealand", 1994].

Plocamium angustum, Port of Tauranga, *W.Nelson*, 8 Mar 2002, WELT A026261.

Spyridia filamentosa, Tauranga Harbour, *S.Berggren*, 1874, WELT A001538.

Stenogramma interruptum, Tauranga Harbour, *S.Berggren*, 1874, WELT A001284; Port of Tauranga, *W.Nelson*, 8 Mar 2002, WELT A026260; Port of Tauranga, *W.Nelson*, Mar 2002, WELT A026542; Port of Tauranga, *K.Neill*, May 2002, WELT A026539.

Ulva compressa, Tanners Point, *W.Nelson*, 8 Mar 2006, WELT A027791.

Ulva intestinalis, Tanners Point, *W.Nelson*, 8 Mar 2006, WELT A027413.

Ulva sp. 1, Tanners Point, *W.Nelson*, 8 Mar 2006, WELT A027870.

9. Auckland Museum Herbarium (AK)

Aeodes nitidissima, Tauranga Harbour, *B.Inglis*, 12 Jan 1946, AK 345789.

Carpophyllum maschalocarpum, Mt Maunganui harbour beach, *V.W.Lindauer*, 12 Jan 1946, AK 339731.

Chondracanthus chapmanii, Tauranga Harbour, *M.D. de Winton*, 15 Dec 1993, AK 221587.

Cladhymenia oblongifolia, Tauranga Harbour, *J.S.Clayton*, 6 Oct 1993, AK 221588.

Codium fragile subsp*. fragile,* Tauranga Harbour, *M.D. de Winton*, 15 Dec 1993, AK 221589.

Grateloupia urvilleana, Tauranga Harbour, *S.Berggren*, 1874, AK 128714; Tauranga, *V.W.Lindauer*, Sept 1940, AK 340035–6, AK 346947; Mt Maunganui, Tauranga Harbour, *B.Inglis* (*V.W.Lindauer Herb.*), 12 Jan 1946, AK 340038, AK 345734, AK 347921.

Hypnea seticulosa, Tauranga Harbour, *S.Berggren*, 1874, AK 147583; Tauranga Harbour, *M.D. de Winton*, 24 Feb 1994, AK 221590.

Microcladia pinnata, Mt Maunganui harbour beach, *V.W.Lindauer*, 12 Jan 1946, AK 334868.

Percursaria percusa, Omokoroa*, Tauranga Harbour, S.J.Pratt*, 23 Jan 2012, AK 345621.

Plocamium cirrhosum, subtidal, Tauranga Harbour, *R.D.S.Wells*, 6 Oct 1993, AK 221586.

Rhizoclonium riparium (as *R. elongatum*), Tauranga, *M.Hodgkins,* AK 58243 (holotype), 1930, CHR 67323.

Schizoseris hymenena, Tauranga Harbour, *S.Berggren*, 1974, AK 148300.

Spyridia filamentosa, Tauranga Harbour, *M.D. de Winton*, 24 Feb 1994, AK 221592.

Stenogramma interruptum, Tauranga Harbour, *M.D. de Winton*, 24 Feb 1994, AK 221591

Figures 10-19: **10:** *Ulva laetevirens* washed up at Kauri Point, 9 Feb 2015. **11:** Surface view of cells, *Ulva laetevirens*, Tutaetaka Island, 6 Marc 2015. **12:** Sea lettuce (*Ulva laetevirens*) washed up on the ocean beach at Mt Maunganui. Photo: Ewen Cameron, 12 Jan 2009. **13:** *Ulva ralfsii* on the surface of mud, Wills Rd boardwalk, 6 Mar 2015. **14:** *Cephaleuros lagerheimii* on leaf of mahoe. Photo taken in Kirks Bush, Papakura, 19 Mar 2015. **15:** *Trentepohlia aurea* on a bank at Kauri Point, 9 Feb 2015. **16:** *Trentepohlia aurea* on a bank at Kauri Point, 9 Feb 2015. **17:** Uretara Stream, Wharawhara Rd bridge. *Spirogyra* grows on the submerged stones. 10 Feb 2015. **18:** *Spirogyra*, Uretara Stream, 10 Feb 2015. **19:** *Spirogyr*a, showing conjugation of adjacent filaments and formation of zygospores, upper Uretara Stream near weir, 20 Feb 2015.

(Fig. 6); Tauranga Harbour, Bowentown, *P.J. de Lange*, 28 Feb 2010, AK 310772.

10. British Museum (BM)

Hymenena variolosa, Tauranga Harbour, *S.Berggren*, 1874, BM 001039333.

Acknowledgements

Thanks to Peter Maddison, Andrew Jenks, Sarah Beadel and Sue Morris for help with the visits to various sites, and to Rosalie Smith for arranging access to Tutaetaka Island, and to the herbaria cited for providing their relevant records of the specimens that they hold.

Lichens of a Significant Ecological Area (SEA) in Kohimarama

Dan Blanchon and Nadine Leddy

Fig. 1. Location of the Allum Street Significant Ecological Area, Kohimarama, Auckland. A) Kepa Bush, B) Allum Street SEA, C) Dingle Dell. Map produced from NZMS 260 map series, sheet R11, modified by D. Blanchon.

Fig. 2. *Porina exocha* on *Melicytus ramiflorus* trunk in Allum Street SEA. Photo: D. Blanchon, 13 Apr 2015.

Introduction

On Monday 13th of April 2015, a brief survey (c. 3 hours) was carried out in the Significant Ecological Area bounded by Allum Street, Kohimarama Road, William Fraser Crescent and Pamela Place (Fig. 1), with the permission of the landowners. The site is a forest remnant largely made up of impressive old, large mahoe (*Melicytus ramiflorus*), kanuka (*Kunzea robusta*), ngaio (*Myoporum laetum*), totara (*Podocarpus totara*), large ponga (*Cyathea dealbata*), hangehange (*Geniostoma ligustrifolium*), kawakawa (*Piper excelsum*) and cabbage trees (*Cordyline australis*), as well as a range of invasive species, with tree privet (*Ligustrum lucidum*), jasmine (*Jasminum polyanthum*) and ginger (*Hedychium gardnerianum*) the most prominent. Lichens, mosses, liverworts (e.g. *Frullania fugax* and *Porella* aff. *elegantula*), fungi, ferns and fern allies such as *Tmesipteris* sp. are common in the forest remnant. Some of the mahoe, cabbage trees, ponga and one large totara at 96 and 98 Allum Street are not technically within the current boundaries of the SEA, but as they are part of the same forest remnant, these were also investigated. The objective of the survey was to opportunistically collect lichen species from all available substrates to gain an understanding of the lichen species richness of the site to determine if it would be a useful reference ecosystem for a nearby lichen restoration project with Ngati Whatua at the Whenua Rangatira.

Species collected

The lichen flora of the area totalled 32 distinct taxa, with 28 able to be identified to species level and a further four were not able to be given species names, indicating possible new records for the New Zealand lichen flora, and bringing the total to 32 taxa (see Appendix). Twenty-eight of these taxa (including three unnamed species) were collected from the Significant Ecological Area. Seventeen species and three unnamed taxa were collected from the adjacent area of the same vegetation type within