

Coprosma spathulata
Coprosma tenuicaulis
Coriaria arborea
Corokia buddleioides
Corynocarpus laetus
Dracophyllum latifolium
Dysoxylum spectabile
Elaeocarpus dentatus
Elatostema rugosum
Fuchsia excorticata
Gamochaeta simplicicaule *
Gaultheria antipoda
Geniostoma ligustrifolium
Griselinia lucida
Hebe stricta
Hedycarya aborea
Hoheria populnea
Ixerba brexioides
Knightia excelsa
Kunzea robusta
Laurelia novae-zelandiae
Leucanthemum vulgare *
Leucopogon fasciculatus
Litsea calicaris
Melicope simplex
Melicytus macrophyllus
Melicytus micranthus
Melicytus ramiflorus
Metrosideros albiflora
Metrosideros carminea

Metrosideros diffusa
Metrosideros fulgens
Metrosideros perforata
Metrosideros robusta
Mida salicifolia
Myrsine australis
Myrsine salicina
Nestegis lanceolata
Nestegis montana
Olearia furfuracea
Olearia rani
Parsonia sp.
Piper excelsum
Pittosporum cornifolium
Pittosporum tenuifolium
Prunella vulgaris *
Pseudopanax arboreus
Pseudopanax crassifolius
Quintinia serrata
Raukaua edgerleyi
Rubus australis
Schefflera digitata
Toronia toru
Weinmannia silvicola

Monocotyledons

Acianthus sinclairii
Astelia hastata
Astelia microsperma
Astelia solandri

Astelia trinervia
Bulbophyllum pygmaeum
Carex solandri
Carex vulpinoidea *
Cordyline australis
Cordyline pumilio
Dendrobium cunninghamii
Dianella nigra
Drymoanthus adversus
Earina autumnalis
Earina mucronata
Freycinetia banksii
Gahnia setifolia
Gahnia xanthocarpa
Glyceria striata *
Juncus tenuis *
Microlaena avenacea
Microlaena stipoides
Pterostylis agathicola
Pterostylis banksii
Pterostylis graminea
Rhopalostylis sapida
Ripogonum scandens
Rytidosperma gracile
Tradescantia fluminensis *
Uncinia banksii
Uncinia uncinata
Uncinia zotovii

Botany of the Hillsborough coast bush reserves, Manukau Harbour, Auckland

Mike Wilcox and Jack Warden



Fig. 1. Map showing the reserves on the north coast of Manukau Harbour, between Onuhunga foreshore and Aldersgate Road. Auckland City Council website.

Introduction

The northern coastal land of the Manukau Harbour from Hillsborough to Green Bay is the largest area of indigenous forests remaining in urban Auckland (Esler 1983, 1990; Wilcox 2012). It lies in the Tamaki Ecological District. The biodiversity management plan for the 26 Auckland Council reserves in this network of Manukau coastal reserves, from Bamfield Reserve in the east to Taunton Terrace in the west, records a total of 110 ha of more or less continuous vegetation (Forbes 2012). In this present article are described the reserves of Hillsborough as far west as Aldersgate Point (Fig. 1). It is the third in a series covering the vegetation and flora of the Manukau Harbour's northern urban forest margin (Wilcox and Kowhai 2015; Wilcox 2016).

The Auckland Botanical Society had an excursion through these reserves on Saturday 18 February 2017. Those attending were: *Jenny Andrew, Maureen Bourke, Bruce Calvert, Brian Cumber, Bev Davidson, Geoff Davidson, Frances Duff, Ben Goodwin, Sharen Graham, John Millett, Peter Moosberger, Sam Sutherland, Alison Wesley, Joshua Salter, John Staniland, Karen Staniland, Jack Warden, Mike Wilcox, Dave Wilson and Maureen Young*. The reserves explored were White Bluff, Grannys Bay, Wesley Bay Glade, Aldersgate, Hillsborough, Hillsborough Cemetery, Belfast, and Taylors Bay Road.

Hillsborough Bay Coastal Reserves

Starting at the newly-reclaimed Taumanu Reserve beside the motorway, the reserves of Hillsborough Bay are Seacliffe Bay Foreshore Reserve, Bamfield Reserve and Frederick Street Esplanade Reserve. The terrain is steep sea cliffs, with pockets of salt meadow.

Seacliffe Bay Foreshore Reserve is skirted by a new 450m-long boardwalk constructed in 2016-2017 and officially opened to the public on 27 January 2017, from Taumanu Reserve (reclaimed land) on Orpheus Drive to Bamfield Reserve (Fig. 2). The coastal vegetation has some big pohutukawa (*Metrosideros excelsa*) trees and a few other native trees and shrubs such as houpara (*Pseudopanax lessonii*), karo (*Pittosporum crassifolium*), kawakawa (*Piper excelsum*), mahoe (*Meliccytus ramiflorus*), and occasional wharangi (*Melicope ternata*), and also some fine patches of *Poa anceps* – one of the more resilient native monocots on the Manukau coast. Otherwise, it is fairly weedy with the main intruders being *Agapanthus orientalis*, wild ginger (*Hedychium gardnerianum*), pampas (*Cortaderia selloana* subsp. *selloana*), climbing asparagus (*Asparagus scandens*), Japanese spindle tree (*Euonymus japonicus*), brush wattle (*Paraserianthes lophantha*) and tree privet (*Ligustrum lucidum*). There is also a particularly big patch of ladder fern (*Nephrolepis cordifolia*) near the start of the boardwalk and several clumps of walking stick bamboo (*Phyllostachys aurea*). The last 120 m of the boardwalk encompasses Bamfield Reserve which features a continuous cover of very large pohutukawa trees on steep cliff faces, with accompanying houpara, and one good-sized taraire (*Beilschmiedia tarairi*) – a rarity on the Manukau coast. Monterey cypress (*Cupressus macrocarpa*) has naturalised there.

In Frederick Street Esplanade Reserve there are small areas of salt meadow near the exit of a stormwater drain beside a Watercare pumping station (Fig. 3). These are noteworthy because such vegetation is rare along this coast. The plants here include sea rush (*Juncus kraussii* subsp. *australiensis*), saltwater paspalum (*Paspalum vaginatum*), *Atriplex prostrata*, *Bolboschoenus medianus*, *Isolepis cernua*,



Fig. 2. Onehunga to Bamfield Place boardwalk, 27 Jan 2017. All photos by Mike Wilcox unless stated otherwise.



Fig. 3. Salt meadow, Hillsborough Bay, 9 Jan 2017.

Lythrum hyssopifolia, *Plantago coronopus*, *Potentilla reptans*, *Samolus repens*, *Sarcocornia quinqueflora* and *Triglochin striata*.

The coastal cliffs from below Bamfield Place westwards to and including Frederick Street Esplanade Reserve have dense but highly modified cliff vegetation. There are a few big pohutukawa, and other natives trees such as houpara, karo, karamu (*Coprosma robusta*), kohekohe (*Dysoxylum spectabile*), mahoe, and rangiora (*Brachyglottis repanda*), but the dominant plants are weeds, with masses of *Agapanthus orientalis*, *Arundo donax*, *Asparagus scandens*, *Elaeagnus × reflexa*, Japanese spindle tree, *Jasminum polyanthum*, tree privet, brush wattle and *Tradescantia fluminensis*. More unusual weeds there are *Fatsia japonica*, *Monstera deliciosa*, *Tetrapanax papyrifer* and mountain pawpaw (*Vasconcellea pubescens*). Much of this land is private, and it is one of the botanically most degraded stretches of the Manukau coastline. However, there is one good patch of karaka (*Corynocarpus laevigatus*) forest in which there are also single specimens of totara (*Podocarpus totara*) and tanekaha (*Phyllocladus trichomanoides*).



Fig. 4. Hillsborough Bay to Grannys Bay, with Belfast Reserve, Hillsborough Reserve, Hillsborough Cemetery and White Bluff (aerial photo 1952, from Mt Roskill Borough Council 1984).



Fig. 5. *Sequoia sempervirens*, Belfast Reserve, 12 Jan 2017.



Fig. 6. *Elatostema rugosum*, Belfast Reserve, 12 Jan 2017.

Belfast Reserve

This Auckland Council reserve of 6.5 ha is an urban forest patch on steep land in Hillsborough between Goodall Street and Belfast Street (Fig. 4). The land was originally part of the 392-acre (159 ha) Carlton Block owned by James Carlton Hill (1798-1858). Hill arrived from Ireland in 1843, purchased this land in 1844 from Maori chiefs, farmed some of it for a time with sheep and cattle, and bequeathed it to Auckland as public domains, most of which subsequently became the residential suburb of Hillsborough (Reidy 2014). The reserve features some of Auckland's earliest plantings of native and exotic trees in a native bush setting. Kauri (*Agathis australis*), rimu (*Dacrydium cupressinum*) and totara are the main native species there, the latter two attaining impressive size, with stem diameters of the largest specimens being 1.0 m. It is not known if Hill himself planted these trees or they were planted later on. However, it would seem that their age could easily be 150 years or more, as they are similar in size to trees of that age planted in the Auckland Domain.

The exotic plantings are more diverse, with many trees of great size. The largest trees are coast redwood (*Sequoia sempervirens*) – 2.07 m diam. (Fig. 5), Monterey pine (*Pinus radiata*) – 1.30 m diam., brown barrel (*Eucalyptus fastigata*) – 1.9 m diam., and tulip tree (*Liriodendron tulipifera*) – 1.2 m diam. Others present are European beech (*Fagus sylvatica*), London plane (*Platanus × acerifolia*), white poplar (*Populus alba*), camphor laurel (*Cinnamomum camphora*), pedunculate oak (*Quercus robur*), saw-tooth oak (*Quercus acutissima*), rhododendron (*Rhododendron arboreum* hybrid cv. 'Sir Robert Peel'), Canary Island pine (*Pinus canariensis*), eastern white pine (*Pinus strobus*), Bishop pine (*Pinus muricata*), Japanese black pine (*Pinus thunbergii*), Norfolk Island pine (*Araucaria heterophylla*), Momi fir (*Abies firma*) and Himalayan spruce (*Picea smithiana*). There is no other forest like this in Auckland – a planted mixture of exotic trees with a diverse native understorey. The *Eucalyptus fastigata* trees are of impressive girth and grow in a line along part of the eastern boundary. Perhaps of different origin are several large monkey apple trees (*Syzygium smithii*) behind houses in Goodall Street, and a few big black wattle trees (*Acacia mearnsii*), successfully killed by ring-barking (the ABS group found a large conk of the bracket fungus, *Ganoderma applanatum*, on one such tree).

The prevailing understorey vegetation and low secondary forest comprises species very typical of all the regenerating native bush remnants along the northern Manukau coast: silver tree fern (*Cyathea dealbata*), mapou (*Myrsine australis*), pigeonwood (*Hedycarya arborea*), mahoe, hangehange (*Geniostoma ligustrifolium*), kawakawa, karamu, coastal karamu (*Coprosma macrocarpa*) and pate (*Schefflera digitata*). The main native

broadleaved trees are kohekohe, karaka, and puriri (*Vitex lucens*), while kahikatea (*Dacrycarpus dacrydioides*) and totara are the only native conifers naturally occurring here.

Belfast Stream flows down through the reserve and then passes beneath Frederick Street to Taylors Bay by an underground culvert. A feature of the stream is the dense growth of parataniwha (*Elatostema rugosum*) (Fig. 6), colonies of hairy legs fern (*Lastreopsis hispida*) and hen & chickens fern (*Asplenium bulbiferum*), and a few king ferns (*Ptisana salicina*). There is a small wetland where the stream enters the grassed area (reclaimed land) of the reserve, and beside it can be found alligator weed (*Alternanthera philoxeroides*), lesser joyweed (*Alternanthera denticulata*), bulrush (*Schoenoplectus tabernaemontani*), water purslane (*Ludwigia palustris*) and creeping cinquefoil (*Potentilla reptans*).

Other noteworthy native plants present in the reserve are tree fuchsia (*Fuchsia excorticata*), passion vine (*Passiflora tetrandra*), mangeo (*Litsea calicaris*), and the filmy fern *Hymenophyllum flabellatum* is fairly plentiful on silver tree fern trunks. The worst weed is African club moss (*Selaginella kraussiana*).

Taylors Bay Road Reserve

Taylors Bay Road Reserve is a narrow 0.7 ha strip of land bordering the shore, and includes a children's playground and parking area. Botanically, its main interest is the landscape planting of native monocots (Fig. 7): *Apodasmia similis*, *Astelia banksii*, *Ficinia nodosa*, *Juncus pallidus*, *Juncus sarophorus*, *Machaerina arthropylla* and flax (*Phormium tenax*). Other plantings feature *Alectryon excelsum*, *Brachyglottis greyi*, *Coprosma acerosa*, *C. propinqua*, *Lagunaria patersonii*, *Metrosideros excelsa*, *M. kermadecensis*, *Muehlenbeckia astonii*, *Pseudopanax ferox* and *Vitex lucens*. Several weedy grasses occur there, such as *Aira caryophyllea*, *Cenchrus clandestinus*, *Cynodon dactylon*, *Parapholis incurva* (on the beach), *Sporobolus africanus* and *Vulpia myuros*.

White Bluff Reserve

This is a narrow strip of coastal cliffs stretching from Taylors Bay to Grannys Bay, and covering 1.2 ha. The first part from Taylors Bay to the base of White Bluff is one of the weediest stretches of vegetation on the Manukau coast, with a rogue's gallery of Auckland's main coastal cliff weeds: *Agapanthus orientalis*, moth plant (*Araujia hortorum*), climbing asparagus (*Asparagus scandens*), spider plant (*Chlorophytum comosum*), boneseed (*Chrysanthemoides monolifera*), *Cotoneaster glaucophyllus*, pampas, pink pampas (*Cortaderia selloana* subsp. *jubata*), pitted crassula (*Crassula multicava*), cocksfoot (*Dactylis glomerata*),

German ivy (*Delairea odorata*), veldt grass (*Ehrharta erecta*), Mexican daisy (*Erigeron karvinskianus*), Japanese spindle tree, wild gladiolus (*Gladiolus undulatus*), tree privet, Chinese privet (*Ligustrum sinense*), Japanese honeysuckle (*Lonicera japonica*), Swiss cheese plant (*Monstera deliciosa*), brush wattle, cineraria (*Pericallis × hybrida*), wallaby grass (*Rytidosperma racemosum*), bamboo (*Phyllostachys aurea*), blackberry (*Rubus fruticosus*), Cape honeysuckle (*Tecoma capensis*) and gorse (*Ulex europaeus*). An unusual, very vigorous woody high-climber found wild there is giant Burmese honeysuckle (*Lonicera hildebrandiana*), probably arising as a discard from a garden on White Bluff. Another noteworthy exotic species there is a planted grove of *Leptospermum morrisonii*.

Despite all the weeds, there are native species on these cliffs, too, among which are coastal astelia (*Astelia banksii*), needle grass (*Austrostipa stipoides*), coastal karamu, karaka, plume grass (*Dichelachne crinita*) (Fig. 8), kohekohe, *Ficinia nodosa*, hangehange, *Gahnia lacera*, *Isolepis cernua*, *Machaerina sinclairii*, mingimingi (*Leucopogon*



Fig. 7. Taylors Bay, coastal monocot plantings, 23 Dec 2016.



Fig. 8. *Dichelachne crinita*, White Bluffs, 23 Dec 2016.

fasciculatus), *Lobelia anceps*, mahoe, pohutukawa, ngaio (*Myoporum laetum*), mapou, coastal flax (*Phormium cookianum*), kawakawa, karo (*Pittosporum crassifolium*), *Poa anceps*, houpara, *Samolus repens*, and glasswort (*Sarcocornia quinqueflora*). These native species become more prominent and the weeds less so towards Grannys Bay.

Grannys Bay Reserve

Large pohutukawa trees fringe the shore at Grannys Bay, with the reserve covering 0.7 ha. The history of this area is mentioned by Pishief and Shirley (2015). Common trees and shrubs near the shore are houpara, coastal karamu, and Japanese spindle tree (Fig. 9), while shore astelia (*Astelia banksii*) grows in large clumps on the pohutukawa trees and *Gahnia lacera* abounds. A plant of great interest there is the native tussock grass *Chionochloa flavicans*, with several plants growing near the shore on steep banks (Fig. 10). It is not recognised as naturally occurring in Auckland, so it is presumably naturalised there. Other unusual plants here are tall trees in the bush of sweet chestnut (*Castanea sativa*) and water gum (*Tristaniopsis laurina*), and a planted puka (*Meryta sinclairii*) above the beach. Deeper into the bush the ABS group came across a large drift of maidenhair fern (*Adiantum cunninghamii*), the filmy fern *Hymenophyllum flabellatum* on the trunks of silver fern, and several plants of native broom (*Carmichaelia australis*).

A small stream tumbles down a rock face at the western end of the shelly beach at Grannys Bay, and an assemblage of small plants grows on the dripping rocks: the mosses *Bryum clavatum* and *Fissidens rigidulus*, the liverwort *Marchantia foliacea*, the green alga *Pseudorhizoclonium africanum*, the grasses *Poa anceps* and *Polypogon fugax*, coastal flax, the sedges *Isolepis cernua* and *Machaerina sinclairii*, and the herbs *Apium prostratum*, *Lobelia anceps* and *Samolus repens*.

Hillsborough Reserve

This 13.8 reserve comprises 12.6 ha of scrubby regenerating forest and 1.2 ha of coastal forest. It was part of the original 392-acre Carlton Block (Reidy 2007) and appears to have been partially cleared and readied for settlement many years ago, and now reverted back to forest (Fig. 11). Esler (1991) discusses the role of fire and the abandonment of farming in the formation of such secondary forest, including the role of manuka, kanuka and bracken in initiating the succession.

The main vegetation comprises silver tree fern, with mamaku (*Cyathea medullaris*) in damper areas, and typical small trees of developing secondary forest: rangiora (*Brachyglottis repanda*), hangehange, pigeonwood, mahoe, mapou, shining karamu (*Coprosma lucida*), kawakawa (*Piper*



Fig. 9. *Euonymus japonicus*, Grannys Bay, 18 Feb 2017.



Fig. 10. *Chionochloa flavicans*, Grannys Bay, Hillsborough, 19 Dec 2016.



Fig. 11. Hillsborough Reserve Dec 2010.



Fig. 12. Rimu, Hillsborough Reserve, 19 Dec 2016.

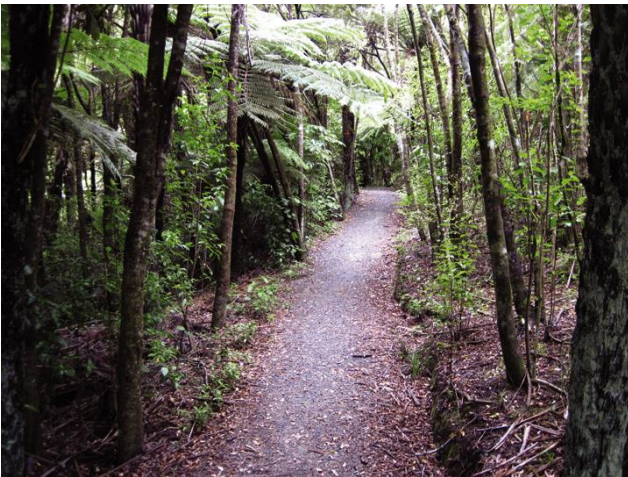


Fig. 13. Hillsborough Reserve, 19 Dec 2016.

excelsum), and pate (*Schefflera digitata*) near creeks. The canopy height of this regenerating forest is 6-8 metres. There is one large emergent rewarewa (*Knightia excelsa*) and several huge pohutukawa, some sizeable trees of lemonwood (*Pittosporum eugenioides*) and kohuhu (*Pittosporum tenuifolium*), several stands of kanuka (*Kunzea robusta* [probably]) and patches of manuka (*Leptospermum scoparium*) with bracken (*Pteridium esculentum*), and cutty grass (*Gahnia setifolia*), and a few small *Fuchsia excorticata* and tawapou (*Planchonella costata*). Kohekohe is strongly regenerating in damper areas, and five-finger (*Pseudopanax arboreus*), akepiro (*Olearia furfuracea*) and mingimingi (*Leucopogon fasciculatus*) are present. *Parsonsia heterophylla* is an abundant climber, and there are patches of *Muehlenbeckia australis*.

Silver ferns are important hosts for epiphytic trees and shrubs, especially pohutukawa, five-finger, mingimingi and hangehange. Other native trees of note are several well-grown rimu (*Dacrydium cupressinum*) which may well have been planted there (Fig. 12), and a few kahikatea (*Dacrycarpus dacrydioides*) and totara (*Podocarpus totara*), the latter two with seedlings present throughout much of the reserve.

There is an attractive path through part of the reserve starting from Clifton Road at the bottom of the cemetery, and coming out at Grannys Bay (Fig. 13). Some other plants to be seen beside the path are the sedge *Machaerina sinclairii*, dwarf cabbage tree (*Cordyline pumilio*), and several native grasses (*Deyeuxia avenoides*, *Deyeuxia quadriseta*, *Microlaena stipoides*, *Rytidosperma gracile* and *Oplismenus hirtellus*). Along a path from the cemetery to Clifton Road there is a small patch of pygmy tree fern (*Diploblechnum fraseri*), otherwise unrecorded in the Manukau coastal reserves.

Exotic trees and shrubs present are Monterey pine (*Pinus radiata*), gorse (*Ulex europaea*), boneseed, prickly Moses (*Acacia verticillata*), willow-leaved hakea (*Hakea salicifolia*) and prickly hakea (*H. sericea*), and black wattle – with a grove of 10 large old trees of this latter growing on a prominent knoll.

The track through the reserve from the cemetery to Goodall Street passes through manuka with abundant *Gahnia setifolia* and then by a small, weedy wetland, the dominant plant there being *Carex lessoniana*. The rush *Juncus prismatocarpus* is present there, along with *Juncus articulatus*. Brazilian fireweed (*Erechtites valerianifolia*) occurs on the wetland margins, and native willow weed (*Persicaria decipiens*) is also present.

Ferns are well represented in the reserve. A small gumland-like area has *Gleichenia dicarpa* and *Lycopodium deuterodensum*. Kiokio (*Parablechnum novae-zelandiae*) is prevalent in the more open damp gullies, while gully fern (*Pneumatopteris pennigera*) is abundant in more shaded gullies. Common ground ferns are *Pteris macilenta* and *P. tremula*, and *Lastreopsis microsora* and luxuriant *Asplenium polyodon* occur in a patch of kohekohe forest on a steep slope below the cemetery. Several king ferns (*Ptisana salicina*) have been found in a narrow gully. The miniature filmy fern *Trichomanes venosum* clothes the lower trunks of *Cyathea dealbata* in one major gully system – a filmy fern that has not been recorded by us from elsewhere in the Hillsborough Coast reserves.

Hillsborough Cemetery

The cemetery covers 7.5 ha and was used for burials from 1916 to 1974 (Reidy 2007). It is on steep ground, with wonderful views south to Mangere

Mountain, Ambury Park and Puketutu Island. The vegetation comprises landscape plantings on the margins and at certain places within the cemetery; the various flowers that adorn many of the old graves (Fig. 14); weeds growing in and around the graves; and an area of 1.3 ha of scrub and regenerating bush adjoining Hillsborough Reserve, some of which was planted.

Among the landscape plantings in the cemetery are numerous Australian Myrtaceae: eucalypts (*Eucalyptus cinerea*, *Eucalyptus cladocalyx*, *E. conferruminata*, *E. globulus*, *E. leucoxylon*); brush box (*Lophostemon confertus*), water gum (*Tristaniopsis laurina*), monkey apple (*Syzygium smithii*), juniper myrtle (*Taxandria juniperina*), lemon tea tree (*Leptospermum petersonii*), *Leptospermum morrisonii*, *Melaleuca citrinus* and *M. hypericifolia*. Other broadleaved exotic trees present are *Acacia floribunda*, *Betula pendula*, *Casuarina cunninghamiana*, *Lagunaria patersonii*, *Metrosideros collina*, *Nerium oleander*, *Prunus campanulata* and *Quercus robur*. Exotic conifers of note are *Callitris rhomboidea*, *Cupressus forbesii*, *Pinus densiflora* and *Pinus radiata*. There is also an assortment of planted native trees and shrubs: wineberry (*Aristotelia serrata*), native broom (*Carmichaelia australis*), cabbage tree (*Cordyline australis*), akeake (*Dodonaea viscosa*), broadleaf (*Griselinia littoralis*), puka (*G. lucida*), lacebark (*Hoheria populnea*), rewarewa (*Knightia excelsa*), kanuka (*Kunzea robusta*), wharangi (*Melicope ternata*), *Olearia albida*, *O. paniculata*, totara (*Podocarpus totara*), *Pseudopanax laetus*, poroporo (*Solanum laciniatum*), *Sophora tetraptera* and puriri .

In amongst the graves there are beds of flowers, mostly colourful African daisies such as *Arctotis stoechadifolia*, *Dimorphotheca sinuata*, and *Gazania linearis*, but also *Heterocentron elegans*, garden sedum (*Hylotelephium telephium*), statice (*Limonium perezii*) , *Lobelia cardinalis*, *Lobularia maritima*, *Salvia uliginosa* (naturalised) (Fig. 15), *Verbena bonariensis*, and some roses. Weedy sedges and grasses abound in the more neglected graves, with *Cyperus eragrostis*, *C. congestus*, *Polypogon fugax* and *P. viridis* being particularly common. Other wild monocots at the cemetery include *Agapanthus orientalis*, *Allium roseum* subsp. *bulbiferum* and *Ornithogalum thyrsoides*. The Puketāpapa Local Board has taken a keen interest in the Cemetery and has organised the planting of numerous swan plants (*Gomphocarpus fruticosus*) to encourage monarch butterflies.

Wesley Bay Glade

This area covers 2.5 ha of deep gullies and steep cliffs that were unfit to be built on during the subdivision of the area into house sites, many set in native bush (Fig. 16). Access is from Ben James Drive, Wesley Bay Glade (a private road), and the



Fig. 14. Hillsborough Cemetery, 20 Dec 2016.

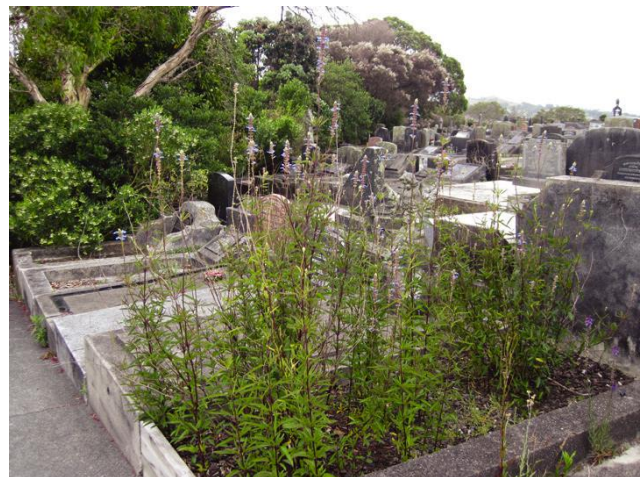


Fig. 15. *Salvia uliginosa*, Hillsborough Cemetery, 29 Dec 2016.



Fig. 16. Wesley Bay Glade Reserve, Aldersgate Reserve, and Kingswood Reserve to Aldersgate Point. 'Leptinella Gully' is the inlet on the far right, lined with pine trees (aerial photo 1952, from Mt Roskill Borough Council 1984).

coast below Aldersgate Reserve and from Grannys Bay. The most botanically noteworthy feature is a site on the coast where a substantial stream cuts its way on to the shore (Fig. 17). We called this 'Leptinella Gully' for here can be found a colony of the native herb *Leptinella tenella* (Fig. 18) and a fine patch of the native iris *Libertia grandiflora*. Also there are a few plants of the native herb *Lobelia angulata*, which, like *Leptinella tenella*, has not been recorded

elsewhere along the Manukau coast. Between Grannys Bay and Leptinella Gully the ABS group came across substantial patches of throatwort (*Trachelium caeruleum*) (Fig. 19) near the base of steep bush-clad cliffs. Coastal flax was common on the cliffs and we found one patch of oiio (*Apodasmia similis*).

The upper part of the glade is a very steep and formidable urban jungle, but has a large colony of kiekie (*Freycinetia banksii*) and a few kahikatea and rimu. A small waterfall has colonies of bryophytes, which includes the large moss *Cyathophorum bulbosum* and the thallose liverwort *Lobatiriccardia alterniloba*. Old Monterey pines there date back to the 1950s. Where the reserve borders on several suburban streets the margins are infested with moth plant, climbing jasmine, garden nasturtium, blue morning glory, ginger, ladder fern, climbing asparagus, brush wattle, gorse, montbretia and pampas.



Fig. 17. Exploring a very slippery 'Leptinella Gully', below Wesley Bay Glade, 18 Feb 2017. Photo: Joshua Salter.



Fig. 18. *Leptinella tenella*, Wesley Grove, 18 Feb 2017.



Fig. 19. *Trachelium caeruleum*, Wesley Grove Reserve, 18 Feb 2017.

Aldersgate Reserve

This reserve of 0.83 ha comprises a narrow strip of native bush extending steeply from Aldersgate Road beside a pylon down towards the coast where it adjoins Wesley Bay Glade. It has a stepway through it and a scour-prone creek fed by storm water, and features generally common and typical bush species of the northern Manukau coast: abundant *Selaginella kraussiana*; the ferns *Asplenium oblongifolium*, *Austroblechnum membranaceum*, *Cyathea dealbata*, *Microsorium pustulatum*, *Microsorium scandens*, *Pneumatopteris pennigera*, *Pteris macilenta* and *Pteris tremula*; the monocots *Carex uncinata*, *Cordyline banksii*, *Oplismenus hirtellus* and nikau palm (*Rhopalostylis sapida*) and also the introduced bangalow palm (*Archontophoenix cunninghamiana*); and the trees and shrubs coastal karamu, *Coprosma rhamnoides*, karaka, kohekohe, hangehange, mahoe, pohutukawa, mapou, kawakawa, and puriri. Queen of the night (*Cestrum nocturnum*) and mile-a-minute (*Dipogon lignosus*) are unwelcome weeds here. The biggest native trees are pohutukawa and kohekohe, with some old branchy Monterey pines on the eastern boundary. The moss *Hypnodendron arcuatum* occurs locally on the creek banks.

Kingswood Reserve

Part of this coastal reserve extends from the stepway at the bottom of Aldersgate Reserve westwards to Aldersgate Point. It is a narrow piece of coastal bush with a good track through it. It is typical coastal forest with impressively large pohutukawa overhanging the shore. The commonest associate throughout is houpara, and there is also plentiful karo, coastal karamu, hangehange, mapou, pigeonwood, mahoe, karaka, rangiora and kawakawa, the latter forming dense thickets, and some small nikau in gullies. Other than pohutukawa, the only larger trees present are occasional kohekohe and puriri, and a sole kahikatea. The dominant forest floor plant is *Gahnia lacera*, and the

ferns *Cyathea dealbata*, *Doodia australis* and *Pteris tremula* are frequent. Alongside the track there are some lacebarks (*Hoheria populnea*), cabbage trees (*Cordyline australis*) and karamu, and a number of weeds such as veldt grass, African clubmoss (*Selaginella kraussiana*), *Cyperus eragrostis*, a few clumps of moth plant, and the weedy native *Haloragis erecta*. Akepiro (*Olearia furfuracea*) occurs close to the sea.

The coastal cliff fringe has an unusually gently sloping profile, but is difficult of close access because of the slippery growth of algae. Monocots are the feature plants here: coastal flax, flax, coastal astelia (*Astelia banksii*) – terrestrial and as a low epiphyte on pohutukawa, knobby sedge (*Ficinia nodosa*), *Machaerina sinclairii*, *Poa anceps*, umbrella sedge (*Cyperus ustulatus*), *Carex testacea*, *Carex flagellifera*, and occasional rengarenga lily (*Arthropodium cirratum*). Where small streams tumble down the cliffs, and in other spots with freshwater seepage, there is a well-defined community of small plants: *Apium prostratum*, *Cymbalaria muralis*, *Isolepis cernua*, *Lobelia anceps* (very common), *Samolus repens* and *Selliera radicans*, together with the mosses *Amblystegium serpens* and *Fissidens leptocladus*. In a few places the permanent seeps support populations of the exotic plants *Hydrocotyle tripartita*, water celery (*Apium nodiflorum*) and procumbent pearlwort (*Sagina procumbens*).

This stretch of coast is free of most of the serious weeds encountered on several other parts of the northern Manukau coastline (e.g. *Asparagus scandens*, *Cotoneaster glaucophyllus*, Japanese spindle tree, tree privet, brush wattle), and the few patches of pampas have been dealt with effectively by herbicide spraying. However in some damper spots there can be found wild ginger, occasional

patches of purple plectranthus (*Plectranthus ciliatus*), and arum lily (*Zantedeschia aethiopica*).

Conclusion

These coastal reserves are a great recreational and ecological asset to this part of Auckland. Thanks to the efforts of the Puketāpapa Local Board, the Auckland Council (and its contractors) and community groups, the walkways (principally the Waikōwhai Walkway) give excellent access, and strenuous efforts are being made to control animal pests and weeds. Large pohutukawa trees dominate the coastal fringe, but most of the forest is a secondary association of small broadleaved trees, typified by the likes of mapou, pigeonwood and mahoe, and the omnipresent silver fern (*Cyathea dealbata*).

The tally of terrestrial plants we have recorded here (Dec 2016 to April 2017) can be summarised as follows, the numbers including cultivated species:

Group	Native	Introduced	Total
Bryophytes and lichens	35	1	36
Ferns and lycophytes	40	4	44
Conifers	5	16	21
Monocots	60	80	140
Dicots	101	205	306
TOTAL	241	306	547

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Appendix. List of plants of Hillsborough coast bush reserves, Manukau Harbour, Auckland (based on field observations Dec 2016 –April 2017) and earlier herbarium specimens.

A = Aldersgate Reserve
 B = Belfast Reserve
 G = Grannys Bay Reserve
 HB = Hillsborough Bay Coastal Reserves

HC = Hillsborough Cemetery
 HR = Hillsborough Reserve
 K = Kingswood Reserve (eastern part)
 T = Taylors Bay

WB = White Bluff Reserve
 WG = Wesley Bay Glade
 * = adventive species
 ABS = Auckland Botanical Society

FUNGI

Auricularia cornea (B, on dead mahoe)

LICHENS

Cladonia darwinii (B, G, HR, WG, clay banks, base of trees)

Collema kauaiense (A, on cabbage tree trunk)

Dufourea ligulata (HB, on basalt sea walls)

Flavoparmelia soredians (HC, on marble and granite grave stones)

Lepraria incana (A, B, HR, K, on silver fern trunks)

Parmotrema perlatum (HR, on wooden seat)

Parmotrema reticulatum (HB, on pohutukawa bark; HR, on rewarewa bark)

Parmotrema cristiferum (HC, old grave, JK Bartlett AK 192119, Apr 1981) (not seen by ABS)

Usnea rubicunda (B)

Xanthoparmelia scabrosa (HC, on marble and granite grave stones)

LIVERWORTS

Bazzania adnexa (B, on base of *Cyathea dealbata* trunk)

Chiloscyphus erosus * (G, coastal seepage, AK 307002, R.O. Gardner, Sep 2009) (not seen by ABS)

Heteroscyphus coalitus (B, carpet on old rotting log)

Heteroscyphus supinus (A, B, G, HR, K, abundant on banks in forest and beside tracks)

Lobatiriccardia alterniloba (HR, WG, damp, dark places in forest, on soil)

Lunularia cruciata (B, open sites beside track)

Marchantia foliacea (G, damp rock face)

Metzgeria furcata (B, on damp ground, mixed with *Schistochila balfouriana*)

Pallavicinia (HR, damp, shaded creek bank, on soil)

Schistochila balfouriana (B, on damp ground in bush)

Spruceanthus olivaceus (A, B, HR, on tree trunks)

Symphyogyna hymenophyllum (B, on ground, damp bank in bush; HR, on ground beside track, and on creek bank)

MOSESSES

Amblystegium serpens (K, freshwater seep on coastal bank)

Bryum clavatum (G, dripping wet coastal banks)

Campylopus clavatus (G, beside track on clay)

Cyatophorum bulbosum (WG, waterfall)

Distichophyllum microcarpum (B, on ground, damp dark places in forest)

Echinodium hispidum (B, on damp bank)

Fissidens leptocladus (K, freshwater seep on coastal bank)

Fissidens rigidulus (G, aquatic, waterfall)

Fissidens taxifolius * (B, G, beside bush tracks)

Hypnodendron arcuatum (A, B, HR, creek banks)

Hypopterygium rotulatum (HR, on ground beside track from Goodall St)

Leucobryum javense (B, on roots at base of big Rhododendron tree)

Racopilum cuspidigerum var. *convolutaceum* (B, base of *Liriodendron* tree, and on banks)

Polytrichadelphus magellanicus (HR, beside track, open clay bank)

Thamnobryum pandum (B, damp dark places, forest)

LYCOPHYTES

Lycopodium deuterodensum (*Pseudolycopodium densum*) (HR)

Lycopodium volubile (*Pseudodiphasium volubile*) (G)

Selaginella kraussiana * (A, B, G, HR, K)

Ferns

Adiantum cunninghamii (A, B, G, HB, HR, K, WB, WG)

Adiantum raddianum * (HB, HR, WB, WG)

Adiantum viridescens (WG)

Asplenium bulbiferum (B)

Asplenium flaccidum (B, WG)

Asplenium lamprophyllum (G)

Asplenium oblongifolium (A, B, HB, HR)

Asplenium polyodon (B, HR)

Austroblechnum lanceolatum (*Blechnum chambersii*) (B, HR)

Austroblechnum membranaceum (*Blechnum membranaceum*) (A, B, K, WG)

Cyathea dealbata (A, B, G, HR, K, WB, WG)

Cyathea medullaris (*Sphaeropteris medullaris*) (B, HR, K, WB, WG)

Deparia petersenii (B)

Dicksonia squarrosa (G, HR, WG)

Diploblechnum fraseri (*Blechnum fraseri*) (HR)

Doodia australis (*Blechnum parrisiae*) (A, B, HB, HR, G, K)

Gleichenia dicarpa (HR)

Histiopteris incisa (B)

Hymenophyllum flabellatum (B, G)

Icarus filiformis (*Blechnum filiforme*) (B, G, HR, WG)

Lastreopsis glabella (G, HR)

Lastreopsis hispida (B)

Lastreopsis microsora (B, G, HR)

Microsorium pustulatum (A, B, G, HR, K)

Microsorium scandens (A, B, HR, WG)

Nephrolepis cordifolia * (A, HB, HC, WG)

Paesia scaberula (A)

Parablechnum novae-zelandiae (*Blechnum novae-zelandiae*) (A, B, G, HR, K)

Parablechnum triangularifolium (*Blechnum triangularifolium*) (WB)

Pneumatopteris pennigera (A, B, HR, WG)

Polystichum neozelandicum (G)

Pteridium esculentum (HR)

Pteris cretica * (B)

Pteris macilentata (A, B, G, HR, WG)

Pteris tremula (A, B, HB, HC, HR, K, WG)

Ptisana salicina (B, HR)

Pyrrosia eleagnifolia (G, HB, HR, WB, K)

Tmesipteris elongata (B, G, HR)

Tmesipteris lanceolata (B, HR, WG)

Tmesipteris tannensis (G, HR)

Trichomanes venosum (*Polyphlebium venosum*) (HR)

Conifers

Abies firma * (B, cult.)
Agathis australis (B cult., HC cult.)
Araucaria heterophylla * (B cult., G seedlings)
Callitris rhomboidea * (HC cult.)
Cupressus forbesii * (HC cult.)
Cupressus ×leylandii * (B cult.)
Cupressus macrocarpa * (HB, HR cult.)
Dacrycarpus dacrydioides (B, HR, K, WG)
Dacrydium cupressinum (B cult., HR, WG)
Ginkgo biloba * (B cult.)
Juniperus sp. * (HC cult.)
Phyllocladus trichomanoides (B, HB)
Picea smithiana * (B cult.)
Pinus canariensis * (B cult.)
Pinus densiflora * (HC cult.)
Pinus muricata * (B cult.)
Pinus radiata * (B cult., HB cult., HB, HC cult., HR cult., WG)
Pinus strobus * (B cult.)
Pinus thunbergii * (B cult.)
Prumnopitys ferruginea (HR)
Podocarpus totara (B cult. and wild, HB, HC cult, HR)
Sequoia sempervirens * (B cult.)

Monocots

Agapanthus orientalis * (HB, HC, HR, WB)
Agrostis capillaris * (HR)
Agrostis gigantea * (HR)
Agrostis stolonifera * (A, B, HR, K)
Aira caryophyllea * (HR, T)
Allium roseum subsp. *bulbiferum* * (HC)
Allium triquetrum * (HB)
Anthoxanthum odoratum * (G, HC, HR)
Apodasmia similis (T cult., WG)
Archontophoenix cunninghamiana * (A, G, seedlings)
Arrhenatherum elatius * (HC)
Arthropodium cirratum (HR cult., K)
Arundo donax * (HB)
Asparagus scandens * (B, G, HB, HR, WB, WG)
Astelia banksii (A, G, HB, HR, K, T cult., WB)
Austrostipa stipoides (WB)
Avena barbata * (HC)
Avena fatua * (HC)
Axonopus fissifolius * (HC)
Bolboschoenus medianus (HB)
Briza maxima * (HR)
Briza minor * (G, HC, HR)
Bromus catharticus var. *elatius* * (G, HC)
Bromus hordeaceus * (HC, HR)
Bromus catharticus var. *catharticus* * (*Bromus willdenowii*)
(G, HC, HR)
Carex breviculmis (HR, AK 97506) (not seen by ABS)

Carex dissita (B, HG, K)
Carex divulsa * (HC)
Carex flagellifera (K)
Carex lambertiana (HR)
Carex lessoniana (HR)
Carex ochrosaccus (HR)
Carex secta (G, HC cult.)
Carex solandri (G)
Carex testacea (G, K)
Carex uncinata (A, B, HR, K)
Carex virgata (HR cult.)
Cenchrus clandestinus * (*Pennisetum clandestinum*)
(A, HC, T)
Chionochloa flavicans (G)
Chlorophytum comosum * (HB, WB)
Cordyline australis (A, B, HC cult., HR, K, WG)
Cordyline banksii (A, HR, K, WG)
Cordyline pumilio (B, G, HR)
Cordyline rubra * (B)
Cortaderia selloana subsp. *jubata* * (G, WB, WG)
Cortaderia selloana subsp. *selloana* * (HB, HC, HR, K, WB)
Crinum moorei * (B, HB)
Crocasmia ×crocosmiiflora * (A, B, G, HB, HR, K, WG)
Cynodon dactylon * (HC, T)
Cynosurus cristatus * (HC, HR)
Cyperus congestus * (A, HC)
Cyperus eragrostis * (A, B, HC, HR, K)
Cyperus ustulatus (B, G, K)
Dactylis glomerata * (HC, HR, K, WB)
Deyeuxia avenoides (G)
Deyeuxia quadriseta (HR)
Dianella nigra (B, G, HR)
Dichelachne billardierei (WG)
Dichelachne crinita (G, WB)
Digitaria sanguinalis * (HC, HR)
Dracaena draco * (G, seedling)
Echinochloa crus-galli * (HC, HR)
Echinochloa crus-pavonis * (HC)
Ehrharta erecta * (B, G, HB, HC, HR, K, WB)
Eragrostis brownii * (HR)
Festuca glauca * (HC cult.)
Ficinia nodosa (HB, K, T cult., WB)
Freycinetia banksii (WG)
Gahnia lacera (B, G, HB, HR, K, WB)
Gahnia setifolia (B, HR, WG)
Gastridium ventricosum * (HR)
Gladiolus undulatus * (HR, WB)
Hedychium gardnerianum * (B, G, HB, HR, K, WG)
Isolepis cernua (G, HB, K, WB)
Isolepis inundata (HR)
Isolepis reticularis (B, HR)

Isolepis sepulcralis * (B, HR)
Juncus australis (HR)
Juncus articulatus * (HC)
Juncus bufonius * (HC)
Juncus dichotomus * (HC)
Juncus effusus * (HR)
Juncus kraussii (HB)
Juncus pallidus (T cult.)
Juncus planifolius (HR)
Juncus prismatocarpus (HR)
Juncus sarophorus (T cult.)
Kyllingia brevifolia * (HC)
Lachnagrostis billardierei (G, WG)
Lachnagrostis filiformis (HR)
Lepidosperma australe (HR)
Libertia grandiflora (WG)
Libertia ixioides (WG)
Libertia peregrinans (HC cult.)
Lilium formosanum * (HC, HR)
Liriope muscari * (HC cult.)
Lolium multiflorum * (HC, HR)
Lolium perenne * (HC)
Lolium rigidum * (HR)
Machaerina arthropophylla (T cult.)
Machaerina sinclairii (A, G, K, HR, WB, WG)
Machaerina tenax (HR)
Microlaena stipoides (G, HR, WB)
Microtis unifolia (HC, HR)
Monstera deliciosa * (HB, T, WB)
Oplismenus hirtellus (A, B, G, HR, WG)
Ornithogalum thyrsoides * (HC)
Parapholis incurva * (T)
Paspalum dilatatum * (HC, HR)
Paspalum vaginatum * (HB)
Phormium cookianum (K, WB, WG)
Phormium tenax (B, G, HB, HC cult., K, T cult., WG cult.)
Phyllostachys aurea * (HB, T, WB)
Poa anceps (G, HB, K, WB)
Poa annua * (B)
Poa trivialis * (HC)
Polypogon fugax * (HC, HR, WG)
Polypogon viridis * (B, HC, HR)
Pseudosasa japonica * (G cult., HR)
Pterostylis banksii (B, HR, WG)
Rhopalostylis sapida (A, B, HR, K)
Rytidosperma biannulare (G, HR)
Rytidosperma caespitosum * (HR)
Rytidosperma gracile (G)
Rytidosperma racemosum * (HR, WB)
Schedonorus arundinaceus * (G, HR)
Schoenoplectus tabernaemontani (B)

Schoenus maschalinus (B, HR, WG)
Schoenus tendo (HR)
Setaria gracilis * (HC, HR)
Setaria palmifolia * (WG)
Sisyrinchium iridifolium * (HR)
Sporobolus africanus * (HR, T)
Stenotaphrum secundatum * (HB, T)
Strelitzia reginae * (HC cult.)
Tetradlea capillaris (HR)
Thelymitra sp. (HR)
Tradescantia fluminensis * (A, B, HB, HR, K, WG)
Triglochin striata (HB)
Vulpia myuros * (HR, HC, T)
Zantedeschia aethiopica * (A, B, G, HR, K, WG)

Dicot trees, shrubs and climbers

Acacia floribunda * (HC cult.)
Acacia mearnsii * (B cult., HC, HR)
Acacia verticillata * (HR)
Acer negundo * (HC)
Ackama rosifolia (WG cult.)
Actinidia deliciosa * (HR)
Alectryon excelsum (HR, seedling, T cult.)
Araujia hortorum * (HC, HR, K, WB, WG)
Aristolelia serrata (B cult., HC cult.)
Avicennia marina (HB, T)
Beilschmiedia tarairi (B, HB, HR seedling)
Betula pendula * (G cult., HC cult.)
Brachyglottis greyi (T cult.)
Brachyglottis repanda (B, G, HB, HR, K, WG)
Calystegia sepium (HC, HR, WG)
Carmichaelia australis (G, HC cult.)
Castanea sativa * (G cult.)
Casuarina cunninghamiana * (B cult., HC cult.)
Cestrum nocturnum * (A, B, HR)
Choisya ternata * (HC cult.)
Chrysanthemoides monolifera * (HR, WB)
Cinnamomum camphora * (B cult.)
Citrus * (HR)
Coleonema pulchellum Sunset Gold' * (HC cult.)
Coprosma acerosa (HC cult., T cult.)
Coprosma × *cunninghamii* (T cult.)
Coprosma × *kirkii* (HC cult.)
Coprosma lucida (HR)
Coprosma macrocarpa (A, G, HC cult., HR, K, WB)
Coprosma propinqua (T cult.)
Coprosma repens (B cult., HC cult.)
Coprosma rhamnoides (A, HR, WG)
Coprosma robusta (A cult., B, HB, HC cult, HR, K, WG)
Coprosma hybrids (various) (HC cult.)
Coriaria arborea (HB, WG)
Corokia buddleoides (HC cult.)

Corokia chathamica (HC cult.)
Corokia ×cheesemaniae (B, HC cult.)
Corynocarpus laevigatus (A, B, G, HB, HR, K, T, WB, WG)
Cotoneaster glaucophyllus * (HB, WB, WG)
Crassula multicava * (K, WB)
Crataegus monogyna * (B)
Delairea odorata * (WB)
Dipogon lignosus * (A)
Dodonaea viscosa (G, HC cult.)
Duranta erecta 'Sapphire Showers' * (HC cult.)
Dysoxylum spectabile (A, B, K, HB, HR, WB, WG)
Elaeagnus ×reflexa * (HB, K)
Entelea arborescens (WG)
Eriobotrya japonica * (G)
Erythrina ×sykesii * (WG)
Eucalyptus cinerea * (B cult., HB cult., HC cult.)
Eucalyptus cladocalyx * (HC cult.)
Eucalyptus conferruminata * (HC cult.)
Eucalyptus fastigata * (B cult.)
Eucalyptus globulus * (HC cult.)
Eucalyptus leucoxylon * (B cult., HC cult.)
Eucalyptus saligna * (HR cult.)
Eucalyptus viminalis * (B cult.)
Euonymus japonicus * (B, G, HB, HC cult., K, WB)
Euryops pectinata * (HC cult.)
Euryops virgineus * (HC cult.)
Fagus sylvatica * (B cult, G cult.)
Fatsia japonica * (B, G, HB, HR)
Ficus carica * (K)
Fuchsia excorticata (B, HR)
Geniostoma ligustrifolium (A, B, G, HB, HR, K, WB, WG)
Grevillea sp. * (HC cult.)
Griselinia littoralis (HC cult.)
Griselinia lucida (HC cult.)
Gomphocarpus fruticosus * (HC cult.)
Hakea salicifolia * (HR)
Hakea sericea * (HR)
Hedera helix * (HC)
Hedycarya arborea (A, B, HR, K, WG)
Hoheria populnea (B, HB, HR, HC cult., K)
Homalanthus populifolius * (HR)
Hydrangea macrophylla * (B, K)
Hymenosporum flavum * (B cult.)
Hypericum androsaemum * (B, K)
Impatiens sodenii * (HB)
Ipomoea indica * (A, WG)
Jasminum polyanthum * (HB, HR, WG)
Knightia excelsa (HC cult., HR)
Kunzea robusta (B, HC cult., HR)
Lagunaria patersonii * (G cult., HC cult., T cult.)
Lantana camara * (B, G)

Lavandula dentata * (HC cult.)
Lavandula stoechas * (HC cult.)
Leucopogon fasciculatus (A, B, HR, WB)
Leptospermum morrisonii 'Copper Sheen' * (HC cult., WB cult.)
Leptospermum petersonii * (HC cult.)
Leptospermum scoparium (HR)
Ligustrum lucidum * (HB, HC, WB, WG)
Ligustrum sinense * (B, T, WB)
Liriodendron tulipifera * (B cult.)
Litsea calicularis (B)
Lonicera hildebrandiana * (G, WB)
Lonicera japonica * (G, HB, HR, WB)
Lophostemon confertus * (B cult., HC cult.)
Melaleuca citrinus * (HC cult.)
Melaleuca hypericifolia * (HC cult.)
Melicope ternata (HC cult.)
Meliccytus ramiflorus (A, B, G, HB, HC, HR, K, WB, WG)
Meryta sinclairii (B naturalised, G cult., HC naturalised)
Metrosideros collina * (HC cult.)
Metrosideros excelsa (A, B, G, HB, HC cult., HR, K, T cult., WB, WG)
Metrosideros kermadecensis (G cult., T cult.)
Metrosideros perforata (B)
Muehlenbeckia astonii (HC cult., T cult.)
Muehlenbeckia australis (B, HR, K, WG)
Muehlenbeckia axillaris (HC cult.)
Myoporum laetum (B, T, WB)
Myrsine australis (A, B, G, HC, HR, K, WB, WG)
Nerium oleander * (HC cult.)
Olea europaea subsp. *cuspidata* * (B cult.)
Olearia albida (HC cult.)
Olearia furfuracea (G, HR, K)
Olearia paniculata (HC cult.)
Pomaderris amoena (HR)
Paraserianthes lophantha * (G, HB, HC, HR, WB, WG)
Parsonsia heterophylla (A, B, HR, G, K, WG)
Passiflora tarminiana * (HR)
Passiflora tetrandra (B)
Physalis peruviana * (HR)
Phytolacca octandra * (HR, K)
Piper excelsum (A, B, G, HB, HR, K, WB, WG)
Pittosporum crassifolium (B, G, HB, HC cult., HR, K, WB)
Pittosporum eugenioides (HC cult., HR, WG cult.)
Pittosporum tenuifolium (HC cult., HR)
Planchonella costata (HR)
Platanus ×acerifolia * (B cult.)
Podranea ricasoliana * (K)
Populus alba * (B cult.)
Prunus campanulata * (HC cult.)
Prunus serrulata * (B, HR)
Pseudopanax arboreus (A, B, HR, K, WG)

Pseudopanax ferox (T cult.)
Pseudopanax laetus (HC cult.)
Pseudopanax lessonii (A, B cult., G, HB, HR, K, WB, WG)
Pseudopanax lessonii × *P. crassifolius* (A)
Quercus acutissima * (B cult.)
Quercus ilex * (HB)
Quercus robur * (B cult., HC cult.)
Rhabdothamnus solandri (WG)
Rhaphiolepis indica * (HC cult.)
Rhaphiolepis umbellata * (HB)
Rhamnus alaternus * (HC)
Rhododendron arboreum hybrid cv. 'Sir Robert Peel' * (B cult.)
Roldana petasitis * (HB)
Rosa cultivars* (HC cult.)
Rosmarinus officinalis "Weeping Rosemary" * (HC cult.)
Rubus cissoides (B, HR, WG)
Rubus fruticosus * (HB, HR, WB)
Salvia leucantha * (HC cult.)
Schefflera digitata (B, HR, WG)
Senna septemtrionalis * (HC)
Solanum laciniatum (HB, HC cult.)
Solanum mauritianum * (B, HB, WG)
Solanum pseudocapsicum * (HR)
Sophora (HC cult., HR cult.)
Sophora chathamica (G, HB)
Sophora tetraptera (HC cult.)
Syzygium smithii * (A, B, HC cult., HR)
Taxandria juniperina * (HC cult.)
Tecoma capensis * (T, WB)
Tetrapanax papyrifer * (HB)
Toona sinensis * (B cult.)
Tristaniopsis laurina * (G cult., HC cult.)
Tropaeolum majus * (HB, HC, K, WG)
Ulex europaeus * (B, HB, HR, WB, WG)
Ulmus ×hollandica * (A)
Vasconcellea pubescens * (HB)
Veronica macrocarpa (G)
Veronica parviflora (HC cult.)
Veronica speciosa (HC cult.)
Veronica stricta (A, HC cult., HR)
Veronica hybrid cultivars (various) (HC cult.)
Vitex lucens (A, B, G, HB, HC cult., HR, T cult.)

Dicot herbs

Acanthus mollis * (HB)
Ageratina riparia * (G, HR)
Alternanthera denticulate (B)
Alternanthera philoxeroides * (B)
Amaranthus lividus * (HC)
Anagallis arvensis * (B, HC)
Anthemis cotula * (HC)

Apium nodiflorum * (W)
Apium prostratum (G, K, WG)
Arctotis stoechadifolia * (HC cult.)
Atriplex prostrata * (HB, T)
Begonia ×semperflorens-cultorum hybrid * (B)
Bellis perennis * (B, HC, T)
Callitriche muelleri (B, HR)
Callitriche stagnalis * (B)
Capsella bursa-pastoris * (T)
Cardamine hirsuta * (B)
Centaurium erythraea * (HR, WB)
Centella uniflora (B, WG)
Ciclospermum leptophyllum * (B, HC, HR)
Cirsium vulgare * (HC)
Crepis capillaris * (B, HB, HC)
Cymbalaria muralis * (B, G, HB, HC, K)
Daucus carota * (HB, HR, HC)
Dimorphotheca sinuata * (HC, on graves)
Elatostema rugosum (B)
Epilobium ciliatum * (B, HC, HR)
Epilobium cinereum (HC)
Erechtites hieracifolia * (HR)
Erechtites valerianifolia * (HC, HR)
Erigeron karvinskianus * (HB, HR, WB)
Erigeron sumatrensis * (HC, HR, K)
Euphorbia helioscopia * (HC)
Euphorbia peplus * (HC)
Euphorbia platyphyllos * (G)
Foeniculum vulgare * (HR)
Fumaria capreolata * (T)
Galinsoga quadriradiata * (HC)
Galium aparine * (HR)
Galium divaricatum * (B, HC, HR)
Galium palustre * (B)
Gamochaeta coarctata * (B, HR)
Gamochaeta simplicicaulis * (B, HR)
Gazania linearis * (HC cult.)
Geranium dissectum * (B)
Geranium homeanum (B)
Geranium purpureum * (HR)
Gonocarpus incanus (HR)
Haloragis erecta (B, G, HB, HR, WG)
Helminthotheca echioides * (HB, HC, HR, K)
Heterocentron elegans * (HC cult.)
Hydrocotyle moschata (A, B, HC, HR)
Hydrocotyle tripartita * (HC, K, WG)
Hylotelephium telephium * (HC cult.)
Hypochaeris radicata * (HC)
Jacobaea vulgaris * (G)
Kickxia elatine * (HC, HR)
Lactuca serriola * (K)

Lapsana communis * (A, B, HC, K, WG)
Leontodon saxatilis * (B, HC, HR, WG)
Leptinella tenella (WG)
Limonium perezii * (HC cult.)
Linaria purpureum * (HC)
Linum bienne * (HC)
Lobelia anceps (A, B, G, HB, HC, HR, K, WB, WG)
Lobelia angulate (WG)
Lobelia cardinalis 'Queen Victoria' * (HC cult.)
Lobularia maritima * (HC cult.)
Lotus angustissimus * (HC)
Lotus pedunculatus * (A, G, K)
Lotus suaveolens * (HR)
Leucanthemum vulgare * (HC, HR)
Ludwigia palustris * (B)
Lythrum hyssopifolia * (HB, HC, HR)
Medicago nigra * (HC)
Medicago lupulina * (HC, HR)
Melilotus indica * (HC)
Mentha pulegium * (HC, HR)
Modiola caroliniana * (A, HC)
Myosotis arvensis * (HR)
Myosotis laxa * (B)
Oenanthe pimpinelloides * (B, HC)
Oxalis corniculata (HC)
Oxalis incarnata * (HB, WB)
Peperomia urvilleana (WG)
Pericallis × hybrida * (G, HB, WB)
Persicaria decipiens (HR)
Persicaria maculosa * (HR)
Plantago australis * (HR)
Plantago lanceolatus * (HC)
Plantago coronopus (HB)
Plantago major * (HC, T)
Plectranthus ciliatus * (K, W)
Portulaca oleracea * (A, HC)
Potentilla indica * (A, B)
Potentilla reptans * (B, HB)
Prunella vulgaris * (G, HC, HR)
Pseudognaphalium luteo-album (HC)
Ranunculus reflexus (G)
Ranunculus repens * (A, B, HC)
Rorippa nasturtium-aquaticum * (B)
Rumex crispus * (HC)
Rumex flexuosus * (HC)
Sagina procumbens * (K, WG)
Salvia uliginosa * (HC)
Samolus repens (G, HB, K, WB, WG)
Sarcocornia quinqueflora (HB, T, WB)
Selliera radicans (K)
Senecio bipinnatisectus * (HR)
Senecio esleri (B, HC)
Senecio hispidulus (HC, HR)
Senecio skirrhodon * (HC)
Senecio vulgaris * (HC)
Sherardia arvensis * (HC)
Silene gallica * (HR)
Solanum nigrum * (B, HC, HR)
Solanum nodiflorum (A, B, HR)
Sonchus oleraceus * (HB, HC)
Trachelium caeruleum * (WG)
Trifolium dubium * (HC)
Trifolium pratense * (HR)
Trifolium repens * (A, HC, T)
Verbena bonariensis * (fragrant) (HC cult.)
Verbena incompta * (HC)
Veronica arvensis *
Veronica persica * (B)
Veronica plebeian (G)
Vicia sativa * (B, HC)
Vicia tetrasperma * (HR)
Wahlenbergia violacea (B)

Field Trip to Awhitu's Northern Pohutukawa Forest 18 March 2017

P. (Tricia) A. Aspin

Participants: Jenny Andrew, Tricia Aspin (leader), Ewen Cameron, David Court (visiting spider expert from Singapore), Frances Duff, Shelley Heiss-Dunlop, Wendy John, Alistair MacArthur, Peter Moosberger, Dhahara Ranatunga, Joshua Salter, Jenni Shanks, Adrienne Stanton, Sam Sutherland, Lara May Thorne.

Our plan was to visit what is locally referred to as Awhitu's northern pohutukawa forest in John Burrill's

property. We met at the end of Hamilton Road on a fine and near windless morning. An easy walk took us across paddocks to overlook the near-pure open forest of large old pohutukawa trees (*Metrosideros excelsa*) (Fig. 1) established on old high-level stable sand dunes. There is rough pasture underneath and the area is open to light grazing by cattle. However a previous landowner had grazed the land very hard and many of the old trees suffered damage from