

Botany of Gittos Domain, Blockhouse Bay

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Introduction

Gittos Domain is an Auckland Council Reserve of 13.5 ha at Blockhouse Bay, Manukau Harbour (Fig. 1). It was earlier known as Avondale South Domain but was re-named Gittos Domain in 2009 (*Western Leader*, 3 December 2009 page 16) in honour of Francis Gittos (1843-1924) who with J. Greenwood leased this land from the Crown in 1890. He stayed there until 1920, and it was he who planted many of the original pines and also the black wattles – the latter possibly as a source of bark tannin for the family leather tannery business at Oakley Creek, in Avondale. With Greenwood he set up a wool-scouring factory in 1894 at the bottom of Lewis Road, and was also involved there with leather tanning. Regarding the row of old Monterey pine trees on the northern boundary, it is believed that they were planted by the Borough Council c. 1912-1920 as a shelterbelt to protect the camping ground and school site (Bill Glen, Blockhouse Bay Historical Society, pers. comm.).

Described as “an unknown and neglected treasure” (*The Aucklander*, 31 October 2007), the Domain has been controversial with local residents, the issues of concern to them being the perceived fire hazard to adjoining properties, weeds, erosion in streams from

stormwater flooding, the unsightly old pine trees, and the poor state of the tracks.

There are numerous tracks (Fig. 2), and a mixed flora of gumland plants (with pines and wattles), coastal plants, and damp ferny gullies. The largest stream in the Domain runs down through bush parallel to Lewis Street (approximately from points 3 to 4, Fig. 2) and enters the Manukau Harbour at Flounder Bay.

The Auckland Botanical Society (ABS) previously briefly visited the area on 18 August 2007 (Gardner 2007). On this latest field trip (Saturday 20 August 2016), those attending were *Maureen Burke, Bruce Calvert, Ewen Cameron, Brian Cumber, Bev Davidson, Geoff Davidson, Gael Donaghy, Frances Duff, Jacqui Geux, Ben Goodwin, Sharen Graham, Joe Grieg, Richard Hursthouse, Graeme Jane, Wendy John, Dongmei Li, Alistair MacArthur, John Millett, Dhahara Ranatunga, Juliet Richmond, Joshua Salter, Michelle Sime, Claire Stevens, Valerie Tomlinson, Jack Warden, Mike Wilcox, Maureen Young and Zeng Zhao*. We traversed the area along most of the different tracks (Fig. 2), starting from Armanasco House (point 1) and finishing at the Gills Crescent corner exit (point 15, Fig. 2).



Fig. 1. Location of Gittos Domain, Blockhouse Bay, Auckland.



Fig. 2. Walking tracks in Gittos Domain. Numbers indicate track exits and junctions. (Map supplied by Te Ngahere Ltd).

Gumland plants

Kauri must have grown here once, and there is a history of gum-digging. The gumland vegetation occupies about 20% of the area, good examples being between points 2 & 5, 6 & 7 and 6 & 15 in Fig. 2. Gumland native species much in evidence were pipe-cleaner moss (*Ptychomnion aciculare*) (see Appendix); two clubmosses, *Lycopodium deuterodensum* – Fig. 3), and less commonly, *L. volubile*; ferns such as tangle fern (*Gleichenia dicarpa*) with patches of *G. microphylla* and hybrids (*G. × punctulata* – Perrie & Brownsey 2015), bracken (*Pteridium esculentum*), *Lindsaea linearis* and *L. trichomanoides*. The monocots blue-berry (*Dianella nigra*), gumland gahnia (*Gahnia setifolia*), square sedge (*Lepidosperma australe*), sword sedge (*L. laterale*), *Schoenus tendo* and *Tetraria capillaris* are also typical gumland species common in the Domain. Dicots included the wiry herb *Gonocarpus incanus*, and the shrubs or small trees shining karamu (*Coprosma lucida*), gumland grass-tree (*Dracophyllum sinclairii*) (Figs. 4, 5), prickly mingimingi (*Leptecophylla juniperina* – Fig. 6), manuka (*Leptospermum scoparium*), mingimingi (*Leucopogon fasciculatus*), kumarahou or gumdigger's soap (*Pomaderris kumeraho*) and *Pomaderris amoena*. Kumarahou was particularly conspicuous along the edges of the tracks, flowering in September (Fig. 7). Akepiro (*Olearia furfuracea*) seems to be rare. Both mingimingi species and manuka were in flower during the ABS visit.

Throughout most of the gumland the Australian exotics, Sydney wattle (*Acacia longifolia*) and black wattle (*Acacia mearnsii*), are common, with more localised occurrence of prickly hakea (*Hakea sericea* – Fig. 8). Just a few trees of willow-leaved hakea (*Hakea salicifolia*), gossamer wattle (*Acacia floribunda*) and *Callistachys lanceolata* were observed – the latter a legume from Western Australia where it is known as native willow. *Acacia longifolia* has regenerated profusely after felling of pines and black wattles, and small trees < 1 m tall flower abundantly (Fig. 9).

The ecological features of gumland scrub have been investigated by the late Dr Ross Beever (Beever 1988), and his findings have direct relevance to Gittos Domain. Gumland scrub develops on clay soils impoverished by the past occurrence of ancient kauri forests and subjected to frequent burning. Perpetuation of gumland vegetation in the face of periodic fires owes much to the different dispersal and survival mechanisms of the component plants. The sedges *Lepidosperma laterale*, *L. australe*, *Gahnia setifolia* and *Schoenus tendo* (and probably likewise *Dianella nigra*), and tangle fern, bracken, and *Lycopodium deuterodensum* regenerate after fire by sprouting up from buried rhizomes. Akepiro can grow back from basal sprouts. Manuka and kumarahou are killed by fire but grow back quickly either from seed released from woody capsules (manuka), or in the case of kumarahou, from seed

dispersed and buried in the soil by ants (Gardner 1996). Kumarahou in particular, and also manuka and mingimingi (as well as gorse and prickly hakea), have been experimentally shown to be highly flammable (Wyse et al. 2016). It seems that the seeds of mingimingi and prickly mingimingi are dispersed by birds, with the seed source coming from nearby unburnt areas. The small seeds of *Dracophyllum sinclairii* are wind-dispersed (Thorsen et al. 2009), and Beever suggested that its re-colonisation following burning would be from seed blown in from unburnt populations of the species. The exotic *Acacia* and *Hakea* species are highly adapted to fire, with regeneration triggered by burning. In *Acacia* germination of seed in the soil seedbank is stimulated by heat, while in *Hakea* airborne seed is released by heat-induced opening of the woody serotinous capsules. Table 1 shows the flammability of some of the main native species in Gittos Domain, based on Fogarty (2001) and Wyse et al. (2016). There have been no fires there for several years.

Regenerating forest with pines

A feature of Gittos Domain is Monterey pine (*Pinus radiata*). There are also considerable numbers of maritime pine (*Pinus pinaster*) and a big Monterey cypress (*Cupressus macrocarpa*). The pine trees are old and frequently huge and branchy, with many dating from the original Gittos and Borough Council plantings. Beneath the pines and in the gaps between the scattered individuals is regenerating native forest. Of the podocarps, totara (*Podocarpus totara*) is particularly common and present as medium-sized trees, poles and seedlings. Rimu (*Dacrydium cupressinum*) and kahikatea (*Dacrycarpus dacrydioides*) are much less common, and tanekaha (*Phyllocladus trichomanoides*) is sparse.

Towai (*Weinmannia silvicola*) is plentiful throughout and is one of the feature native trees of Gittos Domain. It occurs mostly as mature emergent trees (Fig. 10), with occasional saplings, and frequent seedlings on the trunks of silver fern (*Cyathea dealbata*) – the dominant tree fern here (Fig. 11). We observed that, as well as towai, silver fern trunks here abounded in a variety of other epiphytes, including four species of *Tmesipteris* (*T. elongata*, *T. lanceolata*, *T. sigmatifolia* and *T. tannensis*), hangehange (*Geniostoma ligustrifolium*), both species of mingimingi, mapou (*Myrsine australis*), and also five-finger (*Pseudopanax arboreus*) and pohutukawa (*Metrosideros excelsa*). Tree ferns are thus playing a role in the regeneration of the forest (Brock et al. 2016). Abundant smaller trees or shrubs are karamu (*Coprosma robusta*), hangehange, pigeonwood (*Hedycarya arborea*), mahoe (*Melicytus ramiflorus*), mapou, karo (*Pittosporum crassifolium*), five-finger and houpara or coastal five-finger (*Pseudopanax lessonii*).

Table 1: Flammability ratings of some common native species in Gittos Domain, based on data from Fogarty (2001) and Wyse et al. (2016).

= No data available; ratings inferred by Mike Wilcox.

LOW	
<i>Coprosma robusta</i>	karamu
<i>Corynocarpus laevigata</i>	karaka
<i>Geniostoma ligustrifolia</i>	hangehange
<i>Piper excelsum</i>	kawakawa
<i>Pseudopanax arboreus</i>	five-finger
<i>Pseudopanax lessonii</i>	houpara
LOW/MODERATE	
<i>Coprosma lucida</i> #	shining karamu
<i>Hedycarya arborea</i> #	pigeonwood
<i>Melicytus ramiflorus</i>	mahoe
<i>Myrsine australis</i>	mapou
<i>Pittosporum crassifolium</i>	karo
MODERATE	
<i>Metrosideros excelsa</i>	pohutukawa
<i>Phormium cookianum</i>	coastal flax
<i>Phormium tenax</i>	flax
<i>Vitex lucens</i>	puriri
<i>Weinmannia silvicola</i>	towai
MODERATE/HIGH	
<i>Cyathea dealbata</i>	silver fern
<i>Dacrydium cupressinum</i>	rimu
<i>Podocarpus totara</i>	totara
HIGH	
<i>Dracophyllum sinclairii</i> #	gumland grass-tree
<i>Kunzea robusta</i>	kanuka
<i>Leucopogon fasciculatus</i>	mingimingi
<i>Leptocophylla juniperina</i>	prickly mingimingi
<i>Leptospermum scoparium</i>	manuka
<i>Pomaderris kumeraho</i>	kumarahou

Cordyline australis and *C. banksii* are both present, and also a few plants of *C. pumilio*. Supplejack (*Ripogonum scandens*), putaputaweta (*Carpodetus serrata*), bush lawyer (*Rubus cissoides*) mamaku (*Cyathea medullaris*), gully fern (*Pneumatopteris pennigera*), kiokio (*Blechnum novae-zelandiae*) and *Deparia petersenii* can be found in damp gullies. *Pteris tremula* is frequent on track margins. Kanuka (*Kunzea robusta*) is fairly plentiful, with both large and small trees present. In contrast to the gumland sedges mentioned, the sedges of the forest are predominantly species of *Carex*, with *C. solandri* particularly common.

Some pines and wattles were removed in 2006 from a 20 m strip south of the northern boundary area adjoining residences in Donovan Street, following which, replacement native species – flax (*Phormium tenax*), karamu, houpara and karaka (*Corynocarpus laevigatus*) – were planted as a firebreak. These species, and also hangehange which abounds in the Domain, and five-finger have high moisture content and low flammability (Wyse et al. 2016). In more open areas south of this boundary



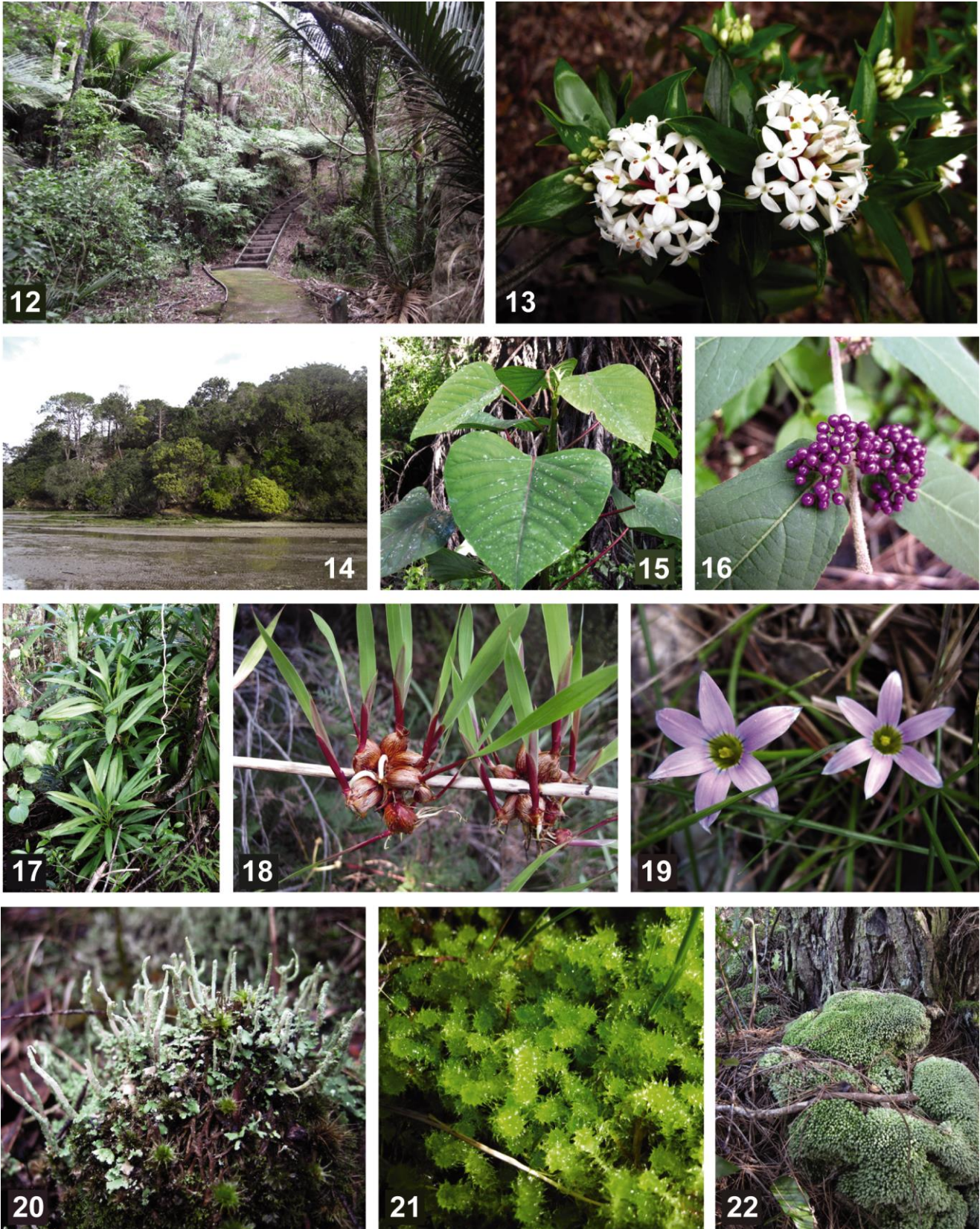
Figs. 3-11: **3.** *Lycopodium deuterodensum*, 24 June 2016. Unless otherwise stated all photos taken at Gittos Domain by the author. **4.** Gumland grass-tree (*Dracophyllum sinclairii*), adult foliage, 15 Aug 2016. **5.** Gumland grass-tree (*Dracophyllum sinclairii*), juvenile foliage, 20 Aug 2016. **6.** Prickly mingimingi (*Leptecophylla juniperina*), 24 Jun 2016. **7.** Kumarahou (*Pomaderris kumeraho*) flowering abundantly along one of the tracks, 23 Sep 2016. **8.** *Hakea sericea*, 15 Jul 2016. **9.** *Acacia longifolia*, 15 Jul 2016. **10.** Towai (*Weinmannia silvicola*) is a prominent native tree in Gittos Domain, 20 Aug 2016. **11.** Seedlings of towai (*Weinmannia silvicola*) epiphytic on a *Cyathea dealbata* trunk, 20 Sep 2016.

there were additional infill plantings carried out with kanuka, manuka, mahoe, and again, karamu and houpara (report to Auckland City Council by Te Ngahere, 20 November 2006).

Coastal vegetation

Pohutukawa, puriri (*Vitex lucens*), karaka, and kohekohe (*Dysoxylum spectabile*) and towai are the main large native trees in the coastal forest, though here again there are some large old *Pinus radiata* and *Acacia mearnsii*. Thanks to Sharen Graham we were surprised and delighted to see two fine specimens of swamp maire (*Syzygium maire*) in a damp spot close to the shore near point 8 in Fig. 2.

Smaller trees and shrubs present include wharangi (*Melicope ternata*), kawakawa (*Piper excelsum*), coastal karamu (*Coprosma macrocarpa*), karo and houpara, the ubiquitous mapou and pigeonwood, and just a few mamangi (*Coprosma arborea*). A small area of bush above Sandy Bay (Fig. 12) has nikau (*Rhopalostylis sapida*) and kiekie (*Freycinetia banksii*). *Veronica macrocarpa* grows beside the coastal bush tracks, the winter greenhood orchids (*Pterostylis alobula* and *P. trullifolia*) can be found near the wooden walkways on the approach to Sandy Bay, and a fine colony of *Pterostylis graminea* occurs between points 4 and 5 in Fig. 2. *Carex flagellifera* and *Gahnia lacera* are common sedges,



Figs. 12-22: **12.** Coastal track, Sandy Bay, 9 Aug 2016. **13.** *Pimelea longifolia* in flower, 26 Sep 2016. **14.** Flounder Bay shoreline, with pines and wattles in evidence, 12 Aug 2016. **15.** Bleeding heart (*Homalanthus populifolius*), 17 Jul 2016. **16.** Beauty berry (*Callicoma rubella*), 15 Jul 2006 (Joseph Kowhai). **17.** Australian narrow-leaved palm lily (*Cordyline rubra*), off end of Gills Crescent, 5 Aug 2016. **18.** Aerial bulbils, *Watsonia meriana* var. *bulbillifera*, 7 Aug 2016. **19.** *Romulea rosea* in flower beside the old pine trees at the northern end of Gittos Domain, 13 Sep 2016. **20.** A terrestrial lichen, *Cladonia darwinii*, found on clay at the edges of tracks, 16 Sep 2016. **21.** Pipe-cleaner moss (*Ptychomnion aciculare*), 5 Aug 2016. **22.** Milk moss (*Leucobryum javense*) forming a hummock at the base of an old Monterey pine tree, 15 Aug 2016.

Poa anceps grows on banks, while *Pteris macilenta* is a prominent ground fern. A cliff-top site above Sandy Bay harboured three specimens of the rare shrub *Pimelea longifolia* – possibly the same plants noted by Gardner (2007). It was flowering in mid - September (Fig. 13). Whau (*Entelea arborescens*) was also seen by us at Sandy Bay.

The shoreline from Flounder Bay (at the bottom of Lewis Street) around to Sandy Bay has modified coastal vegetation (Fig. 14). There are mangroves (*Avicennia marina*), oioi (*Apodasmia similis*), *Machaerina sinclairii* and *Isolepis cernua* at Flounder Bay, and on coastal cliffs can be found coastal astelia (*Astelia banksii*), *Phormium cookianum* (and *P. tenax*, too), with *Lilaeopsis novae-zelandiae*, shore lobelia (*Lobelia anceps*) and *Triglochin striata* in seeps.

Weeds

Pinus pinaster and *P. radiata* have already been mentioned. Though plentiful, these are mostly trees planted many years ago, and apart from an occasional seedling, they have not regenerated to any extent. Mention should be made of a large *P. pinaster* near the upper entrance track on Lewis Street, this tree sporting an impressive witches' broom. *Acacia mearnsii* trees are mostly large ageing specimens, with only occasional regeneration – but *Acacia longifolia* is very weedy, with scattered old trees and abundant regeneration, mainly in gumland areas disturbed when trees have been removed. Gorse (*Ulex europaea*) is not very common.

Other woody weeds are mostly to be seen on disturbed sites such as openings on the Domain boundaries or where gaps have been created by the removal of pines and wattles. Brush wattle (*Paraserianthes lophantha*), Queensland poplar or bleeding heart (*Homalanthus populifolius* – Fig.15), woolly nightshade (*Solanum mauritianum*) and Chinese privet (*Ligustrum sinense*) are the main invaders, but an interesting discovery was beauty berry (*Callicarpa rubella* – Fig. 16). Monkey apple or lilly pilly (*Syzygium smithii*) occurs in the regenerating bush area, and there is a sparse presence of queen of the night (*Cestrum nocturnum*) in shady places. Australian narrow-leaved palm lily (*Cordyline rubra*) has become established, perhaps from a garden discard, in the bush off the end of Gills Crescent (Fig. 17). Wandering Jew (*Tradescantia fluminensis*), climbing asparagus (*Asparagus scandens*), arum lily (*Zantedeschia aethiopicum*) and wild ginger (*Hedychium gardnerianum*) are the main monocot weeds.

The coastal forest has some weeds too, the main ones being *Acacia longifolia*, elaeagnus (*Elaeagnus × reflexa*) and climbing asparagus. Weedy climbers present are Japanese honeysuckle (*Lonicera japonica*), climbing jasmine (*Jasminum polyanthum*)

and mile-a-minute vine (*Dipogon lignosus*), with the occasional semi-scandent blackberry (*Rubus fruticosus*) and Cape ivy (*Senecio angulatus*).

Other forest weeds present are selaginella (*Selaginella kraussiana*) and Cretan brake (*Pteris cretica*), and one ominous patch of *Plectranthus ciliatus* near the lower entrance off Lewis Street. Many other exotic plants grow on the grassy verges of the Domain, and near the various entrance points, some noteworthy ones being wild garlic (*Allium triquetrum*), montbretia (*Crocsmia × crocosmiiflora*), *Gladiolus undulatus*, *Ixia maculata* (cerise-flowered form), ladder fern (*Nephrolepis cordifolia*), *Romulea rosea* and *Watsonia meriana* var. *bulbillifera* (Fig. 18).

Romulea rosea – a weedy South African iris (sometimes called rosy sand crocus or onion grass) that spreads by seeds and corms – is particularly common beside the entrance path leading from Armanasco House passed the tall, old pine trees, and also as dwarf plants on the mown verge at the lower end of Gill Crescent. It was not in flower by the old pines during the ABS visit, but was abundantly so mid-morning on 13 September (Fig. 19), though curiously, not a few days later. This behaviour has been explained by Goldblatt et al. (2002) who noted that in *Romulea* a mature flower bud expands at a specific time of day, usually mid-morning, and closes in the late afternoon, always before sunset. A flower typically lasts three to four days but maintains the pattern of opening and closing at specific times of day. Ambient temperature influences anthesis and on cold (< 15°C), overcast, or misty days flowers may not open completely the entire day or the normal time of opening may be delayed until conditions are more favourable.

Hairy galinsoga or Peruvian daisy (*Galinsoga quadriradiata*) was found in the Domain in March 2007. *Galium divaricatum* occurs commonly beside some of the tracks.

Fungi, lichens, bryophytes and an alga

Whilst no specialists in these "small fry" were to hand on the day to help with identifications, a number of the more conspicuous species were recorded during this ABS trip and on earlier visits. The winter **fungal 'flora'** included two colourful bracket-like species growing on the wood of felled *Acacia mearnsii*, namely *Podoscypha petalodes* and *Trametes versicolor*, while *Pycnosporus coccineus* was found on fallen pine branches. Abundant **lichens** were *Parmotrema reticulatum* forming grey crusts and *Chrysothrix candelaris* forming yellow powdery coatings on the fissured bark of old pine trees (both Monterey and maritime pines). *Cladonia darwinii* was found on the ground on track margins (Fig. 20). White crustose lichens adorned the trunks of mapou, towai, and mahoe.

Mosses were fairly plentiful in a variety of habitats, none more so than pipe-cleaner moss (*Ptychomnion aciculare*) which was commonly seen in colonies on the ground in the gumland areas (Fig. 21), sometimes with *Dicranoloma billardierei* and *Campylopus introflexus*. Milk moss (*Leucobryum javense*) formed impressive hummocks at the base of old pine trees (Fig. 22). **Liverworts** were not particularly noticeable, though *Bazzania adnexa* was found growing amongst milk moss, and *Lepidozia laevifolia* formed dense low mats just above the high water mark at the base of cliffs above Flounder Bay (an unusual site for this species as it is mostly found at higher elevations). The hardy *Chiloscyphus semiteres* was common in places on bark at the base of old pine trees and a patch of *Symphyogyna hymenophyllum* – a thallose species with flabellate, flattened fronds – was found beside a track. Mention should also be made of the **green alga** *Cephaleuros lagerheimii*, which was abundant throughout the Domain as parasitic leaf spots on the leaves of mahoe.

Comparison with Wattle Bay Reserve

Gittos Domain differs botanically in many respects from nearby Wattle Bay Reserve at Lynfield, which ABS visited in 2015 (Wilcox & Kowhai 2015), some obvious ones being:

- The dominant wattles at Wattle Bay are *Acacia decurrens* and *A. mearnsii*, while in Gittos Domain the dominant wattles are *A. mearnsii* and *A. longifolia*.
- Gumland vegetation is very limited at Wattle Bay, but extensive in Gittos Domain where species such as *Dracophyllum sinclairii*, *Gleichenia dicarpa*, *Lycopodium deuterodensum*, *Leptecophylla juniperina* and *Pomaderris kumeraho* are prominent. Kanuka and manuka are also much more widespread in Gittos Domain.
- Towai (*Weinmannia silvicola*) is completely absent from Wattle Bay, yet is the commonest of the larger native trees throughout Gittos Domain, though the trees are mostly ageing, with only sparse regeneration except for seedlings on tree fern trunks – see Gardner 2007.

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■ Totara (*Podocarpus totara*) is insignificant at Wattle Bay, but is common as small trees, saplings and seedlings throughout Gittos Domain.

■ Wattle Bay has a substantial area of mixed broadleaved native bush with a good complement of epiphytes, climbers and ferns, whereas Gittos Domain has pines and wattles throughout, with a lower diversity of forest ferns, and few epiphytes or climbers.

Acknowledgements

I am very grateful to our group for helping to compile the species list, with particular thanks for new records (i.e. plants I missed on my June-August 2016 reconnaissance visits, or on earlier visits I made there in June 1998, March 2007 and August 2007) to Bruce Calvert (*Gleichenia ×punctulata*), Sharen Graham (*Syzygium maire*), Gael Donaghy (*Pterostylis trullifolia*), Maureen Young (*Drosera auriculata*, *Pterostylis graminea*, *Schoenus maschalinus* and *Tmesipteris* spp.), Ben Goodwin (*Breutelia pendula*, *Gonocarpus incanus*, *Lindsaea linearis*, *L. trichomanoides* and *Pyrrosia eleagnifolia*), Geoff Davidson (*Lilaeopsis novae-zelandiae*), Jack Warden (*Coprosma arborea*, *Schizaea dichotoma*) and Ewen Cameron (*Symphyogyna hymenophyllum*, *Toxicodendron succedaneum* and *Washingtonia robusta*). Thanks to Joseph Kowhai for help in preparing the route for the ABS visit. Thanks to Jessica Beever for a moss identification (*Rosulabryum subtomentosum*) and to John Braggins for liverwort identifications (*Lepidozia laevifolia* and *Symphyogyna hymenophyllum*). Catherine Farmer (Chairperson, Whau Local Board) and Helen Biffin (Auckland Council Parks) are kindly thanked for supplying environmental reports on Gittos Domain. Sarah Gibbs and Richard Mairs of Te Ngahere Ltd are kindly thanked for providing a map of the tracks and for a list of species that were subject to weed control operations. Blockhouse Bay Historical Society members Bill Glen and Brian Goodwin provided information about the old pine trees. Thanks to the editors and also to Jenni Shanks for suggesting improvements to the text.

Appendix: Gittos Domain plants and fungi species list (seen in 2016, unless otherwise stated)

* = introduced; pl. = planted; c = exotic species subject to control by Te Ngahere Ltd, 2008-2012

Fungi

Gliophorus viridis, ABS visit 18 Aug 2007
Ileodictyon cibarium Lewis Street,
grassy verge, 28 June 2016
Podoscypha petalodes, 17 July 2016 &
20 Aug 2016, on *Acacia mearnsii* log
Pycnosporus coccineus, 5 Aug 2016,
on fallen pine branch
Trametes versicolor, 25 July 2016,
on *Acacia mearnsii* log

Lichens

Chrysothrix candelaris (yellow powdery
lichen on bark of old pine trees and on
dead frond bases of *Cyathea dealbata*)
Cladonia darwinii (on ground, track side)
Parmotrema reticulatum (abundant
on bark of old pine trees)

Subaerial terrestrial algae

Cephaleuros lagerheimii (yellowish
leaf spots on mahoe leaves).

Liverworts

Bazzania adnexa (amongst *Leucobryum
javense* at base of a pine tree)
Chiloscyphus semiteres (on bark at
base of pine trees)
Lepidozia laevifolia (Flounder Bay,
base of cliffs)
Lunularia cruciata * (on soil, Sandy Bay)
Symphogyna hymenophyllum (on clay)

Mosses

Breutelia pendula
Campylopus introflexus
Dicranoloma billardierei
Fissidens taxifolius *
Hypnum cupressiforme
Kindbergia (Stokesiella) praelonga *
Leptostomum macrocarpon
Leucobryum javense
Pseudoscleropodium purum *
Ptychomnion aciculare
Rosulabryum subtomentosum

Lycophytes

Lycopodium deuterodensum
Lycopodium volubile
Selaginella kraussiana *c

Ferns

Adiantum cunninghamii
Asplenium flaccidum
Asplenium oblongifolium
Asplenium polyodon
Blechnum chambersii
Blechnum filiforme
Blechnum novae-zelandiae
Blechnum parrisiae
Cyathea dealbata
Cyathea medullaris
Deparia petersenii
Dicksonia squarrosa
Gleichenia dicarpa
Gleichenia microphylla
Gleichenia × punctulata
(*Gleichenia dicarpa* × *G. microphylla*)
Lindsaea linearis

Lindsaea trichomanoides
Lygodium articulatum
Microsorium pustulatum
Nephrolepis cordifolia *
Paesia scaberula
Pneumatopteris pennigera
Pteridium esculentum
Pteris cretica *
Pteris macilentata
Pteris tremula
Pyrrhosia eleagnifolia
Schizaea dichotoma
Tmesipteris elongata
Tmesipteris lanceolata
Tmesipteris sigmatifolia
Tmesipteris tannensis

Conifers

Agathis australis (pl.)
Cupressus macrocarpa * (pl.)
Dacrycarpus dacrydioides
Dacrydium cupressinum
Phyllocladus trichomanoides
Pinus pinaster * (pl. and naturalised)
Pinus radiata * (pl. and naturalised)
Podocarpus totara

Monocots

Agapanthus praecox subsp. *orientalis* *c
Agrostis capillaris *
Allium triquetrum *
Anthoxanthum odoratum *
Apodasmia similis
Archontophoenix cunninghamiana *c
Aristea ecklonii *c
Arthropodium cirratum (pl.)
Asparagus aethiopicus *c
Asparagus scandens *c
Astelia banksii
Astelia hastata
Austrostipa stipoides
Axonopus fissifolius *
Bambusa oldhamii * (pl.)
Briza minor *
Bromus catharticus var. *elatus* *
Bromus willdenowii *
Canna indica *c
Carex banksiana
Carex flagellifera
Carex geminata
Carex ochrosaccus
Carex secta (cult.)
Carex solandri
Carex uncinata
Carex virgata
Cenchrus clandestinus *
Cortaderia jubata *c
Cortaderia selloana *c
Cordyline australis
Cordyline banksii
Cordyline pumilio
Cordyline rubra *
Crocsmia × crocosmiiflora *c
Cyperus congestus *
Cyperus eragrostis *
Dactylis glomerata *

Danthonia decumbens *
Deyeuxia quadrisetata
Dianella latissima
Dianella nigra
Dichelachne crinita
Digitaria sanguinalis *
Dracaena draco * (seedlings)
Ehrharta erecta *
Ensete ventricosum *
Freesia refracta *
Freycinetia banksii
Gahnia lacera
Gahnia setifolia
Gahnia xanthocarpa
Gladiolus undulatus *
Glyceria declinata *
Hedychium gardnerianum *c
Holcus lanatus *
Iris foetidissima *c
Isolepis cernua (Flounder Bay)
Isolepis levynsiana *
Isolepis sepulcralis *
Ixia maculata *
Juncus edgariae
Juncus effusus *
Juncus planifolius
Juncus tenuis *
Lepidosperma australe
Lepidosperma laterale
Machaerina Sinclairii (Flounder Bay
and gumland)
Machaerina tenax
Machaerina teretifolia
Microlaena stipoides
Microtis unifolia
Monstera deliciosa *
Morelotia affinis
Musa sp. *
Narcissus tazetta *
Oplismenus hirtellus
Paspalum dilatatum *
Paspalum urvillei *
Phoenix canariensis * (seedlings)
Phormium cookianum
Phormium tenax (some pl.)
Phyllostachys aurea *(pl.)
Poa anceps
Poa annua *
Poa trivialis *
Pterostylis alobula
Pterostylis graminea
Pterostylis trullifolia
Polypogon viridis *
Rhopalostylis sapida
Ripogonum scandens
Romulea rosea *
Rytidosperma biannulare *
Rytidosperma racemosum *
Schoenus apogon
Schoenus brevifolius
Schoenus maschalinus
Schoenus tendo
Setaria gracilis *
Setaria palmifolia *
Setaria pumila *

Sporobolus africanus *
Tetraria capillaris
Thelymitra sp.
Tradescantia fluminensis *c
Triglochin striata
Vulpia myuros *
Washingtonia robusta * (seedling)
Watsonia meriana var. *bulbillifera* *c
Zantedeschia aethiopica *c
Zantedeschia aethiopica 'Green Goddess' *c

Dicot trees, shrubs and climbers

Acacia floribunda *
Acacia longifolia * c (pl. and naturalised)
Acacia mearnsii * (pl. and naturalised)
Alectryon excelsus (seedlings)
Anredera cordifolia *c
Araujia sericifera *c
Avicennia marina (Flounder Bay)
Beilschmiedia tarairi (seedling)
Brachyglottis kirkii (seen 21 June 1998)
Brachyglottis repanda
Callicarpa rubella *
Callistachys lanceolata *
Carpodetus serratus
Cestrum nocturnum *c
Choisya ternata * (pl.)
Coprosma arborea
Coprosma × *cunninghamii* (pl.)
Coprosma × *kirkii* (pl.)
Coprosma lucida
Coprosma macrocarpa
Coprosma repens (pl.)
Coprosma rhamnoides
Coprosma robusta
Corokia × *cheesemaniae* (pl.)
Corynocarpus laevigatus
Cotoneaster franchetii *
Cotoneaster glaucophyllus *
Crassula multicaeva *
Dipogon lignosus *
Dracophyllum sinclairii
Dysoxylum spectabile
Elaeagnus × *reflexa* *c
Entelea arborescens (Sandy Bay)
Eriobotrya japonica *c
Eucalyptus globulus * (pl.)
Euonymus japonicus *c
Fatsia japonica *c
Geniostoma ligustrifolium
Genista monspessulana *
Griselinia littoralis (pl.)
Griselinia lucida
Hakea gibbosa *c
Hakea salicifolia *
Hakea sericea *c
Hedera helix *c
Hedycarya arborea
Hoheria populnea (pl. and naturalised)
Homalanthus populifolius *c
Hydrangea sp. *c
Impatiens sodenii *
Ipomoea indica *c
Jasminum polyanthum *c
Knightia excelsa (natural and pl.)
Kunzea robusta
Leptecophylla juniperina

Leptospermum scoparium
Leucopogon fasciculatus
Ligustrum lucidum *c (school)
Ligustrum sinense *c
Lonicera japonica *c
Melicope ternata
Meliccytus ramiflorus
Meliccytus ramiflorus × *M. micranthus*
 (A.E.Esler, 15 Aug 1983, AK 215948)
Metrosideros excelsa
Metrosideros perforata
Muehlenbeckia complexa (Sandy Bay)
Myrsine australis
Nestegis lanceolata (pl.)
Olearia furfuracea
Olearia lineata (pl.)
Olearia rani
Paraserianthes lophantha *c
Pimelea longifolia
Passiflora tripartita *c
Piper excelsum
Pittosporum crassifolium
Pittosporum eugenioides (pl.)
Pittosporum tenuifolium
Pomaderris amoena
Pomaderris apetala (pl.)
Pomaderris kumeraho
Populus yunnanensis * (pl., school)
Prunus campanulata *c
Pseudopanax arboreus
Pseudopanax crassifolius
Pseudopanax crassifolius × *P. lessonii*
Pseudopanax discolor (pl.)
Pseudopanax lessonii
Rhaphiolepis × *delacourii* [*R. indica* ×
R. umbellata] * (Flounder Bay cliffs)
Ricinus communis * (school)
Roldana petasitis * (school)
Rubus cissoides
Rubus fruticosus *c
Senecio angulatus *
Solanum mauritianum *c
Sophora chathamica
Sophora microphylla (some pl.)
Syzygium australe *c
Syzygium maire
Syzygium smithii *c
Toxicodendron succedaneum *(seedling)
Ulex europaeus *c
Veronica macrocarpa
Veronica parviflora (pl.)
Veronica stricta (pl.)
Vitex lucens
Weinmannia silvicola

Dicot herbs

Acanthus mollis *c
Ageratina riparia *c
Anagallis arvensis *
Apium prostratum
Atriplex prostratum *
Bellis perenne *
Callitriche stagnalis *
Cardamine flexuosa *
Cardamine hirsuta *
Centaureum erythraea *
Centella uniflora
Cerastium glomeratum *

Ciclospermum leptophyllum *
Crassula decumbens *
Crepis capillaris *
Cymbalaria muralis *
Drosera auriculata
Erigeron karvinskianus *c
Erigeron sumatrensis *
Euchiton japonicus
Euphorbia peplus *
Foeniculum vulgare *
Fumaria capreolata *
Gamochaeta coarctata *
Galinsoga quadriradiata *
Galium aparine *
Galium propinquum
Galium divaricatum *
Geranium dissectum *
Geranium molle *
Geranium robertianum *
Gonocarpus incanus
Haloragis erecta
Helminthotheca echioides *
Hydrocotyle moschata
Hydrocotyle tripartita *
Hypochaeris radicata *
Lamium purpureum *
Lapsana communis *
Leontodon saxatilis *
Lepidium didymum *
Leucanthemum vulgare *
Lilaeopsis novae-zelandiae
Lobelia anceps
Lotus pedunculatus *
Myosotis arvensis *
Myosotis laxa *
Myosotis sylvatica *
Oenanthe pimpinelloides *
Oxalis incarnata *
Persicaria capitata *
Persicaria maculosa *
Phytolacca octandra *
Plantago lanceolata *
Plantago major *
Plectranthus ciliatus *c
Prunella vulgaris *
Ranunculus parviflorus *
Ranunculus repens *
Ranunculus sardous *
Rumex obtusifolius *
Rumex sagittatus *
Senecio bipinnatisectus *
Senecio biserratus
Senecio glomeratus
Senecio hispidulus
Senecio vulgaris *
Sherardia arvensis *
Solanum nigrum *
Solanum nodiflorum
Sonchus oleracea *
Taraxacum officinale *
Tetragonia tetragonioides (Auckland Council record)
Trifolium repens *
Trifolium subterraneum *
Tropaeolum majus *c
Vicia sativa *