Botany of Craigavon Park, Blockhouse Bay, Auckland

Mike Wilcox

Introduction

Craigavon Park is an Auckland Council reserve in the Whau Local Board area (Fig. 1). It covers 11.8 ha and was gifted as a park to Auckland in 1929 by Mrs W.H. (Caughey) Smith to commemorate the visit by Lord Craigavon, the Prime Minister of Northern Ireland. William Henry Smith originally acquired the land from 1897 to 1905 (Blockhouse Bay Historical Society 2018). Landscape architect Fred Tschopp designed the park in 1929–1932 (Adam 2002). The park is a very popular off-leash dog-walking area and features a children's playground, a fitness trail, and a network of wide paths and bush tracks. It is in the Avondale Stream catchment of the Whau River.

There are five main types of vegetation here: open grass and verges; kanuka/gumland; old pine and black wattle woods; wetland, including stream margins; and cultivated native and exotic trees.

Combined visit by the Auckland Botanical Society and the Auckland branch of the N.Z. Entomological Society, 15 September 2018

Those attending were *John Adam*, *Stephanie Angove-Emery*, *Paul Bell-Butler*, *Frances Duff*, *Alan Flynn*, *Luke Flynn*, *Molly Flynn*, *Beth Gibbs*, *Bill Goldstone*, *Ben Goodwin*, *Leslie Haines*, *Peter Hutton*, *Sandra Jones*, *Dongmei Li*, *Huimin Lin*, *Anna Mairs*, *Dylan Mairs*, *Richard Mairs*, *Nicholas Martin*, *Alistair MacArthur*, *Sharon Osman*, *Juliet Richmond*, *Joshua Salter*, *Stephen Thorpe*, *Liz Walker*, *Alison Wesley*, *Mike Wilcox*, *Dave Wilson*, *Maureen Young*.

Botanical highlights from the visit were the discovery of several ferns not previously recorded there, namely *Adiantum raddianum*, *Diplazium australe*, *Lastreopsis glabella* and *Pteris cretica* on creek banks; the abundance on the grassy margins of pink romulea (*Romulea rosea*) in full flower; the presence of two well-grown saplings of tawa (*Beilschmiedia tawa*) in regenerating bush; and numerous large-leaved mahoe (*Melicytus macrophyllus*) including one in flower.

Lichens

The bark of old pine trees provides a significant habitat for lichens, common species being *Chrysothrix candelaris, Lepraria finkii*, *Parmotrema reticulatum*, *Ramalina celastri* and *Usnea pusilla*. The only terrestrial lichen recorded here is *Cladonia darwinii* (Fig. 2).

Bryophytes

The liverwort *Heteroscyphus coalitus* is particularly conspicuous after rain (Fig. 3). It grows in colonies in shade, its main habitats being the base of old Monterey pine trees (*Pinus radiata*), and at the base of old or dead silver fern trunks (*Cyathea dealbata*). *Chiloscyphus semiteres* also grows at the base of old pine trees, on cabbage tree trunks, and on logs, and with it the moss *Rhaphidorrhynchium amoenum. Hypnum cupressiforme* and *Wijkia extenuata* are other mosses found here in on exposed tree roots. Trunks of mahoe (*Melicytus ramiflorus*) and titoki (*Alectryon excelsus*) trees in semi-shade commonly

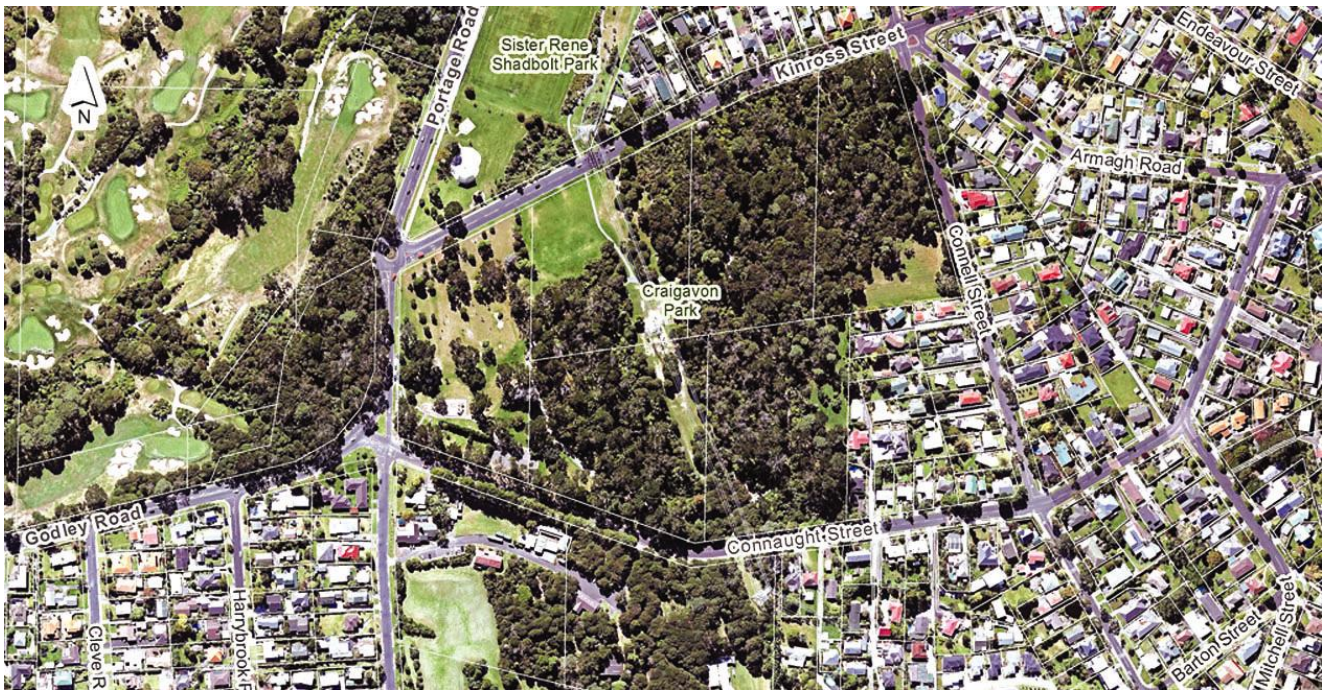

Fig. 1. Map of Craigavon Park.

Fig. 2. *Cladonia darwinii,* 19 Sep 2018. All photos taken in Craigavon Park by the author.

Fig. 3. *Heteroscyphus coalitus*, 14 Feb 2018.

Fig. 4. *Lycopodium deuterodensum*, 14 Feb 2018.

have a green mat-like coating of the liverwort *Metzgeria furcata*. The liverwort *Frullania solanderiana* forms green mats on the bark of kanuka (*Kunzea robusta*) and mahoe. Pipe cleaner moss (*Ptychomnion aciculare*) and milk moss (*Leucobryum javense*) are conspicuous terrestrial mosses of the kanuka/gumland community, the latter also occurring at the base of large old pine trees. *Thuidiopsis furfurosa* is another terrestrial moss found here in rather open scrub, and with it, the exotic thalloid liverwort *Lunularia cruciata*. The introduced European feather moss *Pseudoscleropodium purum* has been found on the ground in pine forest, *Eurhynchium praelongum* occurs commonly amongst grass, sometimes with *Breutelia pendula,* while a colony of sphagnum moss (*Sphagnum falcatulum*) occurs on the eastern forest edge (see cover illustration). A fine patch of *Lopidium concinnum* occurs on an old culvert pipe in deep shade.

Ferns & Lycophytes

By far the commonest fern is silver tree fern (*Cyathea dealbata*) which occurs scattered and in groves in the understorey of the pine/wattle woods and in kanuka forest and regenerating mixed bush (following felling of pines). Mamaku (*C. medullaris*) is uncommon with a preference for damper sites and is represented mostly as naked stems following die-off of the crowns after felling of pine trees. *Dicksonia squarrosa* is also uncommon here. *Deparia petersenii* is a prominent fern of the stormwater creek banks, where also grow much less commonly gully fern (*Pneumatopteris pennigera*), kiokio (*Parablechnum novae-zelandiae*), *Adiantum raddianum*, *Diplazium australe* and *Austroblechnum membranaceum*.

The gumland (beneath kanuka, pines and wattle) vegetation of the north-eastern section of the park has extensive colonies of the club-moss *Lycopodium deuterodensum* (Fig. 4), and occasional *Gleichenia microphylla* and *Lindsaea linearis*. Epiphytic ferns are not at all prominent, but *Asplenium flaccidum*, *A. oblongifolium, A. polyodon* and *Microsorum pustulatum* are often seen as very low epiphytes or on the ground, and *Tmesipteris lanceolata* has been observed on silver fern trunks. The filmy fern *Hymenophyllum flabellatum* has been found in shade at the base of an old Monterey pine. This is the only filmy fern that regularly occurs in modified open bush habitats in the Manukau Harbour forest fringes at Hillsborough and Lynfield (Wilcox & Kowhai 2015; Wilcox & Warden 2017a, 2017b), where it is a small plant with short, crowded pinnae. *Selaginella kraussiana* is present in damp areas beside the tracks.

Gymnosperms

Monterey pine and maritime pine (*Pinus pinaster*) are dominant trees of the park. They were planted in the early days on what was mostly then gumland scrub

on phosphate-deficient clay soil. The maritime pines are clearly the better adapted to this site, with numerous large healthy trees of noble appearance and with very attractive bark. The Monterey pines (Fig. 5) have struggled, and though attaining a large size, are mostly very branchy, and several had to be felled in 2005 because they had become moribund and hazardous (Auckland City Council 2005). Both species bear huge numbers of cones, but very few wildings have appeared. *Pinus radiata* sheds pollen in late July–early August, while *P. pinaster* sheds its pollen in mid–late September.

Of the native conifers, kahikatea (*Dacrycarpus dacrydioides*) stands out for its good growth, excellent health and elegant straight trunks. These have been mostly planted. Rimu (*Dacrydium cupressinum*) is occasionally seen as vigorous tall saplings in kanuka forest, while totara (*Podocarpus laetus* and *P. totara*) are widespread. Kauri (*Agathis australis*) is represented by a few smallish specimens planted on the margins, and tanekaha (*Phyllocladus trichomanoides*) is a rarity in kanuka/gumland forest. One approx. 5 m tall juvenile specimen of matai (*Prumnopitys taxifolia*) was recorded beside the path alongside the main stream.

There are two cultivated specimens of African yellowwood (*Afrocarpus falcatus*) growing near the carpark and playground, one of which is a very impressive spreading female tree.

Monocots

The only monocot trees in the park are cabbage tree (*Cordyline australis*), nikau palm (*Rhopalostylis sapida*), and phoenix palm (*Phoenix canariensis*). Cabbage trees are common in the planted native bush areas, including the swamps by the creeks, and are regenerating in the pine forests. Nikau seedlings occur occasionally, and there are a few big specimens, probably planted. Phoenix palm has been recorded just as young seedlings.

Grasses are well represented, with the native *Microlaena stipoides* being particularly abundant, and a feature species of the park. The only other native grasses recorded are *Oplismenus hirtellus* in gumland/kanuka forest and near creeks, *Deyeuxia quadriseta*, *Rytidosperma unarede* in kanuka/gumland//pine forest, and toetoe (*Austroderia fulvida*) – planted beside a wetland. Prominent exotic grasses are narrow-leaved carpet grass (*Axonopus fissifolius*) which is the dominant summer species in the mown grass areas, and the very tall Vasey grass (*Paspalum urvillei*) found abundantly on bush and wetland margins. Common spring grasses are sweet vernal (*Anthoxanthum odoratum*), shivery grass (*Briza minor*), Yorkshire fog (*Holcus lanatus*) and annual poa (*Poa annua*).

Sedges are very conspicuous in the park, particularly in the kanuka/pine gumlands and along the creeks. Sword sedge (*Lepidosperma laterale*) is a standout species here, being very common in the pine and kanuka forest (Fig. 6). Other gumland-type sedges present are *Gahnia setifolia*, *G. xanthocarpa*, *Schoenus tendo* and *Tetraria capillaris.* The introduced yellow sedge (*Carex demissa*) grows in a thriving colony on the eastern margin of the park; *Carex lessoniana, C. secta* and *C. virgata* are abundant along the central creek; and *C. lambertiana* and *C. ochrosaccus* occur in regenerating forest and *C. dissita* by creeks. The weedy *Cyperus eragrostis* occurs abundantly on the damp margins of roads and tracks. Damp patches on the park margins have an assemblage of soft sedges, mainly *Isolepis distigmatosa*, *I. levynsiana* and *I. sepulcralis*.

Rushes are not particularly common in the park, the introduced soft rush (*Juncus effusus*) being the only tall leafless species occurring in the central wetland. A wood rush, *Luzula multiflora* (flowering in late August / early September), occurs in the open grassy area at the entrance at the corner of Kinross and Connell Streets, and near the children's playground.

Fig. 5. Pines, 15 Sep 2018.

Fig. 6. *Lepidosperma laterale*, 8 Feb 2018.

Fig. 7. *Sparaxis bulbifera*, 17 Sep 2018.

Fig. 8. *Melicytus macrophyllus*, 14 Feb 2018.

Fig. 9. Some kanuka (*Kunzea robusta*) forest has lush undergrowth, 4 Feb 2018.

Of the remaining miscellaneous monocots, arum lily (*Zantedeschia aethiopica*), montbretia (*Crocosmia* ×*crocosmiiflora*) and wandering Jew (*Tradescantia fluminensis*) are weeds of damp shaded places, flax (*Phormium tenax*) is common (probably planted) along the central stream, blue iris (*Aristea ecklonii*) is a weed of forest margins, and the native *Dianella latissima* and *D. nigra* are widespread in the kanuka/pine gumland vegetation. Near the entrance on the corner of Kinross and Connell Streets and by the children's playground the spring bulb *Sparaxis bulbifera* is found in impressive drifts (Fig. 7), and with it, *Gladiolus undulatus*, while *Romulea rosea* is another abundant wildflower in early spring (flowering spectacularly during the ABS visit).

Dicot trees, shrubs and woody climbers

The park has a range of dicot trees, planted as early pioneers, as amenity specimens, as restoration of former open sites and following removal of pines, or naturally occurring. Firstly, black wattle (*Acacia mearnsii*) was planted early on in mixture with the pines, and the trees have reached a large size. Many have been felled in recent years.

Secondly, there are numerous exotic trees in the amenity areas (playground, carparks, grassed fringes). Several Australian trees feature here, notably willow myrtle (*Agonis flexuosa*), silver dollar gum (*Eucalyptus cinerea*), brush box (*Lophostemon confertus*), giant honey myrtle (*Melaleuca armillaris*), brush cherry (*Syzygium australe*), lilly pilly (*S. smithii*) – of the Myrtaceae; silky oak (*Grevillea robusta*) of the Proteaceae; and river she-oak (*Casuarina cunninghamiana*) and swamp she-oak (*C. glauca*) of the Casuarinaceae. Other exotic amenity trees are London plane (*Platanus* ×*acerifolia*), claret ash (*Fraxinus angustifolia* var. *oxycarpa* 'Raywood', box elder (*Acer negundo*), European beech (*Fagus*

Fig. 10. Kanuka forest where undergrowth has been destroyed by trampling, 19 Sep 2018.

sylvatica), tulip tree (*Liriodendron tulipifera*), Yunnan poplar (*Populus yunnanensis*), and corkscrew willow (*Salix matsudana* 'Tortuosa'). The best performers are brush box and Yunnan poplar.

Native trees too have been planted for amenity, the commonest being pohutukawa (*Metrosideros excelsa*), together with a specimen of narrow-leaved maire (*Nestegis montana*) and several puriri (*Vitex lucens*) and titoki (*Alectryon excelsus*).

Thirdly, the trees planted for ecological restoration are, with some exceptions, typical species native to Auckland. Abundantly represented are karo (*Pittosporum crassifolium*), lemonwood (*P. eugenioides*), kohuhu (*P. tenuifolium*), houpara (*Pseudopanax lessonii*), pohutukawa, karamu (*Coprosma robusta*), lacebark (*Hoheria populnea*), kowhai (*Sophora chathamica*) and wharangi (*Melicope ternata*). Non-local natives noted are *Griselinia littoralis*, *Olearia albida*, *Olearia paniculata*, *Sophora tetraptera* and *Streblus banksii*, and there is also an Australian shrub, *Leptospermum polygalifolium*, in the mixture. Koromiko (*Veronica stricta*) has commonly been planted on the margins. Within these maturing planted forests can be found self-established native shrubs, notably kawakawa (*Piper excelsum*), pigeonwood (*Hedycarya arborea*), mahoe (*Melicytus ramiflorus*), broad-leaved mahoe (*M. macrophyllus*) (Fig. 8), *M. micranthus*, hangehange (*Geniostoma ligustrifolium*), and coastal karamu (*Coprosma macrocarpa*). Naturally occurring silver fern is widely present in these planted forests, the trunks providing a foothold for the epiphytic establishment of pohutukawa, mingimingi (*Leucopogon fasciculatus*) and five-finger (*Pseudopanax arboreus*). Wet areas adjoining the main creek have successful (though still young) plantings of pukatea (*Laurelia novae-zelandiae*) and swamp maire (*Syzygium maire*). Kohekohe (*Dysoxylum spectabile*) has regenerated profusely from presumably planted parent trees, forming an impressive mini-forest on the eastern boundary. And fourthly, the native trees natural to the area, the prime tall species being kanuka (*Kunzea robusta*). It occurs in pure groves (Fig. 9), some of which have been badly trampled (Fig. 10), and as a sub-canopy in the pine/wattle forest. Understorey associates are mapou, hangehange (*Geniostoma ligustrifolia*), pigeonwood, mahoe, mingimingi (*Leucopogon fasciculatus*) – in flower August and September (see Gardner 2013 for observations on its sexual dimorphism), shining karamu (*Coprosma lucida*) and *Coprosma rhamnoides*, this last being extraordinarily abundant. Kumerahou (*Pomaderris kumeraho*) is widely present on bush margins and was in flower during the September 2018 visit. Small saplings of *Coprosma arborea* occur in some of the better stands of kanuka, and putaputaweta (*Carpodetus serratus*) has been noted (though may have been planted). The only native lianas present are *Metrosideros perforata* clothing the naked trunk of a dead silver tree fern, and straggly examples of *Clematis paniculata* and *Parsonsia heterophylla*.

Fig. 11. *Acacia longissima*, 14 Feb 2018.

Mention also needs to be made of some exotic shrubs that have colonised the area, some of which are weeds. Four Australian plants – sweet hakea (*Hakea drupacea*), prickly hakea (*Hakea sericea*), long-leaved wattle (*Acacia longissima*) (Wilcox 2011) (Fig. 11), and native willow (*Callistachys lanceolatus*) – have been recorded as naturalised plants in the park, and there is sparse presence of moth plant (*Araujia hortorum*), *Elaeagnus ×reflexa*, *Fatsia japonica*, Japanese spindle berry (*Euonymus japonica*), *Cotoneaster glaucophyllus* and gorse (*Ulex europaea*). The Australian *Leptospermum polygalifolium* is represented by a stout, multi-trunked specimen (probably planted) laden with seed, and with a second tree close by growing on an old pine stump. Black wattle has not regenerated much, but a fire would see it come up thickly. Woolly nightshade (*Solanum mauritianum*) appears to be confined to a few corners on the south-eastern side, where some seedlings have sprung up, and Jerusalem cherry (*Solanum pseudocapsicum*) is occasional in shaded undergrowth.

Herbaceous dicots

Only four native dicot herbs are at all common here. These are *Centella uniflora* in most forest areas, *Hydrocotyle moschata* beside paths, *Dichondra repens*, and *Persicaria decipiens* in wetland. Others recorded are *Callitriche muelleri, Calystegia sepium* subsp*. roseata*, *Geranium homeanum*, *G. retrorsum*, *Gonocarpus incanus*, *Oxalis exilis,* the fireweeds *Senecio bipinnatisectus* and S*. esleri*, and *Veronica plebeia*.

Fig. 12. *Hypericum mutilum*, 2 Feb 2018. Flowers are c. 4 mm in diameter.

Exotic dicot herbs are abundant in the open grassed areas, on the bush edges, and in the wetland. There is a rather long list of these, mostly of commonplace species, though there are some that are noteworthy. Selfheal (*Prunella vulgaris*) is particularly abundant, being found in grassland, on the bush edges, and beside every track and road. Another in this category is parsley dropwort (*Oenanthe pimpinelloides*) much in evidence on the bush edges and on the fringe of wetland. Chamomile (*Chamaemelon nobile*) is local here, forming a few patches within grassland. Dwarf St John's wort (*Hypericum mutilum*) is not well-known in Auckland, but there is a thriving colony not far from the main parking area (Fig. 12). Perhaps Craigavon's most famous plant is the Australian composite *Solenogyne gunnii*, a pilose flat weed reported from there by Rhys Gardner (1993, 1995). For a complete species list see the Appendix.

Feature plants

1. *Lepidosperma laterale*: very common in the kanuka forest and pine/wattle woodlands.
2. *Microlaena stipoides*: abundant on forest margins and in shaded places.
3. *Coprosma rhamnoides*: very common in kanuka forest and pine/wattle woodland.
4. *Kunzea robusta*: the only common, large native tree.
5. *Pinus radiata*: the signature large tree, commonly with *Pinus pinaster*.
6. *Acacia mearnsii*: many large old trees have been felled, though there are numerous ones still there. There are wildings, but these are not abundant, and unlikely to result in a resurgence of black wattle. Long-leaved wattle (*Acacia longissima*) was seen during the Sept 2018 visit.
7. *Lophostemon confertus*: worthy of mention as it is among the healthiest and handsomest of the various amenity trees that have been planted.
8. *Melicytus macrophyllus*: unusually, this tree, which is more at home in kauri and upland forest forests in Auckland, is coming away in some numbers in parts of the pine woodlands, and seemingly natural. *Melicytus micranthus* is also present, along with the common *Melicytus ramiflorus*.
9. *Centella uniflora*: the commonest native herb.
10. *Hypericum mutilum*: one large colony on a shady roadside. A little-known plant in Auckland.
11. *Solenogyne gunnii*: an Australian flat weed related to *Lagenophora.* Not seen in the present survey.
12. *Hakea drupacea*: a famous Blockhouse Bay plant recorded from Craigavon Park but not in recent years.

Acknowledgements

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Appendix: List of plants in Craigavon Park, Blockhouse Bay.

List compiled over numerous visits by the author from Dec 1999 to Oct 2018; and ABS visit on 15 Sep 2018.
* = naturalised, cult. = planted

Fungi	
Corynelia tropica	on leaves of a totara tree
Gymnopilus spectabilis	on old cut stumps in pine/wattle forest
Lichens	
Chrysothrix sp.	on bark of pine trees
Cladonia darwinii	on ground beside a track
Cladonia floerkeana	on bark of old log
Dirinaria picta	on bark of *Cupressus sempervirens*
Lepraria finkii	on bark of pine trees and *Myrsine australis*, and on *Cyathea dealbata*
Parmotrema reticulatum	on bark of pine trees and on old pine stumps in open
Ramalina celastri	on bark of dead twigs of pine trees
Strigula schizospora	on titoki leaves
Usnea pusilla	on bark of dead twigs of pine trees
Usnea rubicunda	on dead twigs of *Leucopogon fasciculatus* and *Pittosporum tenuifolium*
Algae	
Cephaleuros lagerheimii	on leaves of *Melicytus ramiflorus*
Spirogyra sp.	in the main pond near the pylon clearing
Mosses	
Breutelia pendula	damp ground in open grassy area
Calliergonella cuspidata *	in damp grassy area, eastern side
Campylopus clavatus	on ground in kanuka forest
Campylopus introflexus	on old stump in open
Eurhynchium praelongum *	in grass areas, common
Fissidens taxifolius *	on soil
Hypnum cupressiforme	on raised root of pine tree
Leucobryum javense	on ground in kanuka gumland and at the base of old pine trees
Lopidium concinnum	on old culvert pipe by stream
Pseudoscleropodium purum *	on ground in pine forest, and in open grassy margins
Ptychomnion aciculare	on ground in kanuka gumland
Rhaphidorrhynchium amoenum	at base of old pine trees
Rhizogonium distichum	on exposed tree roots
Rosulabryum subtomentosum	on stone pillar, entrance on corner of Connell and Kinross Streets
Sphagnum falcatulum	damp ground on eastern forest edge
Syntrichia antarctica	on stone pillar, entrance on corner of Connell and Kinross Streets
Thuidiopsis furfurosa	on ground in open scrub
Thuidiopsis sparsa	on ground in forest on track edge
Wijkia extenuata	on exposed tree roots
Liverworts & hornworts	
Bazzania adnexa	eastern kanuka/gumland, growing on exposed tree roots
Chiloscyphus semiteres	on bases of old pine trees, on cabbage tree trunks and old pine logs
Frullania solanderiana	on bark of kanuka and mahoe trees
Heteroscyphus coalitus	common at base of large pine trees
Lobatiriccardia alterniloba	on exposed roots of a pine tree in shaded forest, near a small stream
Lunularia cruciata *	on ground in open scrubby area
Megaceros sp.	vertical section of stream bank, in bush
Metzgeria furcata	on bark of mahoe and titoki trees
Neolepidozia patentissima	on rotting pine stump
Symphyogyna hymenophyllum	on bank in shaded forest
Trichocolea mollissima,	on an old log

Lycophytes

Lycopodium deuterodensum
Phlegmariurus varius
Selaginella kraussiana *

Ferns

Adiantum raddianum *
Asplenium flaccidum
Asplenium oblongifolium
Asplenium polyodon
Austroblechnum membranaceum
Cyathea dealbata
Cyathea medullaris
Deparia petersenii
Dicksonia squarrosa
Diplazium australe
Doodia australis
Gleichenia microphylla
Hymenophyllum flabellatum
Icarus filiformis
Lastreopsis glabella
Lindsaea linearis
Microsorum pustulatum
Nephrolepis cordifolia *
Paesia scaberula
Parablechnum novae-zelandiae
Pneumatopteris pennigera
Pteridium esculentum
Pteris cretica *
Pteris tremula
Pyrrosia elaeagnifolia
Tmesipteris lanceolata

Gymnosperms

Agathis australis (cult.)
Afrocarpus falcatus * (cult.)
Cryptomeria japonica * (cult.)
Cupressus sempervirens * (cult.)
Dacrycarpus dacrydioides
Dacrydium cupressinum
Ginkgo biloba * (cult.)
Phyllocladus trichomanoides
Pinus pinaster * (cult.)
Pinus radiata * (cult.)
Podocarpus laetus (cult.)
Podocarpus totara (cult. and natural)
Prumnopitys taxifolia (cult.)

Monocots – grasses

Agrostis stolonifera *
Anthoxanthum odoratum *
Austroderia fulvida (cult.)
Axonopus fissifolius *
Briza minor *
Cenchrus clandestinus *
Cortaderia selloana *
Cynodon dactylon *
Danthonia decumbens *
Deyeuxia quadriseta (R.O.Gardner, 1982, AK 171998; S.Astridge, 1975, AK 216382)
Digitaria sanguinalis *
Echinochloa crus-galli *
Ehrharta erecta *
Eleusine indica *
Eragrostis brownii *
Glyceria declinata *
Holcus lanatus *
Microlaena stipoides
Oplismenus hirtellus subsp. *imbecillis*
Panicum dichotomiflorum *
Paspalum dilatatum *
Paspalum orbiculare (A.Esler & S.Astridge, 1975, CHR 276364)
Paspalum urvillei *
Poa annua *
Poa trivialis *
Rytidosperma biannulare *
Rytidosperma racemosum *
Rytidosperma unarede
Setaria pumila *
Sporobolus africanus *
Vulpia bromoides *

Monocots – restiads, rushes and sedges

Apodasmia similis (cult.)
Carex demissa *
Carex dissita
Carex divulsa *
Carex flagelliformis
Carex lambertiana
Carex lessoniana
Carex ochrosaccus
Carex secta
Carex uncinata
Carex virgata
Cyperus brevifolius * (Connaught St verge)
Cyperus congestus *
Cyperus eragrostis *
Cyperus ustulatus
Gahnia setifolia
Gahnia xanthocarpa
Isolepis inundata
Isolepis levynsiana *
Isolepis distigmatosa
Isolepis sepulcralis *
Juncus articulatus *
Juncus dichotomus *
Juncus effusus *
Juncus planifolius
Juncus prismatocarpus
Juncus tenuis *
Lepidosperma australe
Lepidosperma laterale
Luzula multiflora *
Machaerina juncea
Schoenus apogon
Schoenus maschalinus
Schoenus tendo
Tetraria capillaris

Monocots - other

Agapanthus orientalis *
Allium triquetrum *
Alstroemeria sp. *
Archontophoenix cunninghamiana *
Aristea ecklonii *
Arthropodium bifurcatum (cult.)
Asparagus scandens *
Cordyline australis
Crocosmia × crocosmiiflora *
Dianella latissima
Dianella nigra
Freesia refracta *
Gladiolus undulatus *
Hyacinthoides non-scripta * (cult.)
Phoenix canariensis * (seedlings)
Phormium cookianum (dwarf cultivar) (cult.)
Phormium tenax
Rhopalostylis sapida
Romulea rosea *
Sparaxis bulbifera *
Sparaxis tricolor *
Tradescantia fluminensis *
Zantedeschia aethiopica *

Dicot trees, shrubs and woody climbers

Acacia longissima * (M.D.Wilcox, 9 Mar 2018, AK 371028)
Acacia mearnsii * (cult. & wildings)
Acer negundo * (cult.)
Aesculus hippocastanum * (cult.)

Agonis flexuosa * (cult.)

Alectryon excelsus subsp. *grandis* (cult.)

Alectryon excelsus subsp. *excelsus*

Araujia hortorum *

Beilschmiedia tarairi (cult. and natural)

Beilschmiedia tawa

Callistachys lanceolata * (E.K.Cameron: 3 Nov 1996, AK 229810; 2 May 1998, AK 235586; 16 Nov 1998, AK 237588)

Camellia sasanqua * (cult.)

Carmichaelia australis (cult.)

Carpodetus serratus

Casuarina cunninghamiana * (cult.)

Casuarina glauca * (cult.)

Chrysanthemoides monilifera *

Clematis montana * (cult.)

Clematis paniculata

Coprosma arborea

Coprosma × *cunninghamii*

Coprosma grandifolia

Coprosma lucida

Coprosma macrocarpa

Coprosma repens (cult.)

Coprosma rhamnoides

Coprosma robusta

Corokia × *cheesemanii* (cult.)

Corynocarpus laevigatus

Cotoneaster glaucophyllus *

Dodonaea viscosa (cult.)

Dysoxylum spectabile

Elaeagnus × *reflexa* *

Eucalyptus cinerea * (cult.)

Euonymus japonica *

Euryops pectinatus * (cult., eastern margin)

Fagus sylvatica * (cult.)

Fatsia japonica *

Fraxinus angustifolia var. *oxycarpa* * (cult.)

Geniostoma ligustrifolia

Grevillea robusta *

Griselinia littoralis (cult.)

Hakea drupacea * (A.E.Esler, Oct 1973, AK 364775; E.K.Cameron, Feb 1986, AK 275898)

Hakea sericea *

Hedera helix *

Hedycarya arborea

Hoheria populnea (cult.)

Ipomoea cairica

Ipomoea indica * (margin)

Knightia excelsa

Kunzea robusta

Laurelia novae-zelandiae (cult.)

Leptospermum polygalifolium * (cult.)

Leptospermum scoparium (cult.)

Leucopogon fasciculatus

Ligustrum sinense *

Liriodendron tulipifera * (cult.)

Lophostemon confertus * (cult.)

Melaleuca armillaris * (cult.)

Melicope ternata

Melicytus macrophyllus

Melicytus micranthus

Melicytus ramiflorus

Metrosideros collina * (cult.)

Metrosideros excelsa (cult. and wild)

Metrosideros kermadecensis (cult.)

Metrosideros perforata

Metrosideros robusta (cult.)

Myrsine australis

Nestegis cunninghamii (cult.)

Nestegis lanceolatus (cult.)

Nestegis montana (cult.)

Olearia albida (cult.)

Olearia paniculata (cult.)

Parsonsia heterophylla

Piper excelsum

Pittosporum eugenioides

Pittosporum crassifolium

Pittosporum tenuifolium

Platanus × *acerifolia* * (cult.)

Plectranthus barbatus var. *grandis* *

Pomaderris kumeraho

Populus yunnanensis * (cult.)

Pseudopanax arboreus

Pseudopanax crassifolius

Pseudopanax crassifolius × *P. lessonii* 'Çyril Watson' (cult.)

Pseudopanax lessonii

Salix matsudana 'Tortuosa' * (cult.)

Schefflera digitata

Solanum laciniatum

Solanum mauritianum *

Solanum pseudocapsicum *

Sophora chathamica (cult.)

Sophora tetraptera (cult.)

Streblus banksii (cult.)

Syzygium australe * (cult.)

Syzygium maire (cult.)

Syzygium paniculatum *

Syzygium smithii * (cult.)

Trachelospermum jasminoides * (cult.)

Ulex europaeus *

Veronica stricta (cult.)

Vitex lucens (cult.)

Dicot herbs

Amaranthus lividus *

Apium nodiflorum *

Bellis perennis *

Bidens frondosa *

Callitriche muelleri

Callitriche stagnalis *

Calystegia sepium

Cardamine flexuosa *

Cardamine hirsuta *

Centaurium erythraea *

Centella uniflora

Cerastium glomeratum *

Chamaemelum nobile *

Cirsium vulgare *

Crepis capillaris *

Cymbalaria muralis *

Daucus carota *

Dichondra repens

Epilobium ciliatum *

Erigeron karvinskianus *

Erigeron sumatrensis *

Euphorbia peplus *

Fumaria muralis *

Galium aparine *

Galium divaricatum *

Gamochaeta coarctata *

Geranium homeanum

Geranium molle *

Geranium retrorsum

Geranium purpureum *

Geranium robertianum *

Gonocarpus incanus

Helminthotheca echioides *

Hydrocotyle moschata

Hydrocotyle tripartita *

Hypericum mutilum *

Hypochaeris radicata *

Jacobaea vulgaris *

Lapsana communis *

Leontodon saxatilis *

Lepidium didymum *

Leucanthemum vulgare *

Lotus angustissimus *

Lotus pedunculatus *

Lysimachia arvensis *

Lythrum hyssopifolia *

Mentha pulegium *

Modiola caroliniana *

Myosotis discolor *
Myosotis laxa *
Myosotis sylvatica *
Oenanthe pimpinelloides *
Oxalis exilis
Oxalis incarnata *
Oxalis pes-caprae *
Oxalis purpurea *
Persicaria decipiens
Phytolacca octandra *
Plantago lanceolata *
Plantago major *
Polycarpon tetraphyllum *
Portulaca oleracea *
Potentilla indica *
Prunella vulgaris *
Ranunculus muricatus *
Ranunculus parviflorus *
Ranunculus repens *
Ranunculus sardous *
Rumex obtusifolius *
Senecio bipinnatisectus
Senecio esleri
Sherardia arvensis *
Sison amomum *
Solanum lycopersicum *
Solanum nigrum *
Solenogyne gunnii *
Soliva sessilis *
Sonchus asper *
Sonchus oleraceus *
Stachys sylvatica *
Taraxacum officinale *
Trifolium repens *
Veronica arvensis *
Veronica persica *
Veronica plebeia
Veronica serpyllifolia *
Viola odorata *

Mt Eden/Maungawhau urban rock-forests revisited

Ewen K. Cameron

On the 19 July 2014 Auckland Botanical Society (ABS) repeated its Mt Eden / Maungawhau urban rock-forest field trip of 17 July 1999 (Cameron 1999a), only this time we started with a record number (?) of 66 people (see Appendix 1) at Government House and finished with 36 people at Almorah Road (compared with 38 and finishing with 22 in 1999). Although it was a cold winter's day the rain held off until the end of the trip.

The day's programme (19 July 2014):
10 am–noon: Government House grounds, via the Savannah Street entrance;
Noon–1 pm: Eden Gardens for lunch;
1.15 pm: Withiel Thomas Reserve off Withiel Drive (with talks from others);
Walk from Withiel Thomas to Almorah Road forest and finish there by 4 pm.

Introduction

For a background on these Mt Eden rock-forest areas of urban Auckland see Kirk (1871), Millener (1965), Cranwell (1981), Esler (1991: 193), Smale and Gardner (1999), Cameron (1999a), Esler (2004: 48-49), Bush (2006), Wilcox (2012), and a very full and readable account by Wilkins (2016). In the 19th century it was estimated to cover less than 50 ha (Smale & Gardner 1999) and today is only 3 ha (see Fig. 1). The forest is a mix of public and private land (1.7 vs 1.3 ha). There are also scattered rock-forest trees and shrubs in adjacent properties. It all has a certain level of protection under a Special Ecological Area (SEA) (Fig. 1) designation in the Unitary Plan, allowing only light tree-trimming; most other activities require a permit.

The remaining Mt Eden rock-forests lie on the north-eastern lower slopes of Mt Eden/Maungawhau on basaltic lava now estimated to be 28,000 years old (Hayward et al. 2011). Today the forests are centred around three small areas: Almorah Road (block A) (ex Goodfellow property), Government House grounds (block C) and Withiel Thomas Reserve (block B) (Fig. 1). Two of these face south and one faces north (Almorah) – this might explain the greater abundance of puriri (*Vitex lucens*) in the warmer Almorah forest. The best known, and the only one easily accessible to the public, is Withiel Thomas Reserve which was actually planted by Prof Thomas (see below); the other two appear to be genuine forest remnants. Lucy Cranwell (1981: 13) pointed out that one can also get a good view over the low rock wall into the Almorah rock-forest from Almorah Road.

Auckland Council recently classified its indigenous ecosystems (Singers et al. 2017) into the Department of Conservation's national ecosystem classification. The rock-forests fitted into their Puriri forest variant of WF7.2, which occurs on basaltic volcanoes in three main North Island areas: Pukekohe-Auckland, Whangarei and Kerikeri-Kaikohe. It has a threat status of Critically Endangered.