

Vegetation and flora of Totara Park and Auckland Botanic Gardens Bush, Manurewa

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Introduction

Totara Park (Fig. 1) is a 216 ha Auckland Council reserve offering adventure play, walks and bridle trails, riding for the disabled, tennis courts, a swimming pool, mountain bike tracks and the heritage building, Beaufords (Fig. 2), which is used for weddings, conferences and other private

functions. It is dog-friendly with both on-leash and off-leash areas. The park adjoins the Auckland Botanic Gardens and encompasses the upper reaches of the 12 km-long Puhinui Stream which flows through bush-clad banks and on through mostly industrial land to the Manukau Harbour at Wiri.

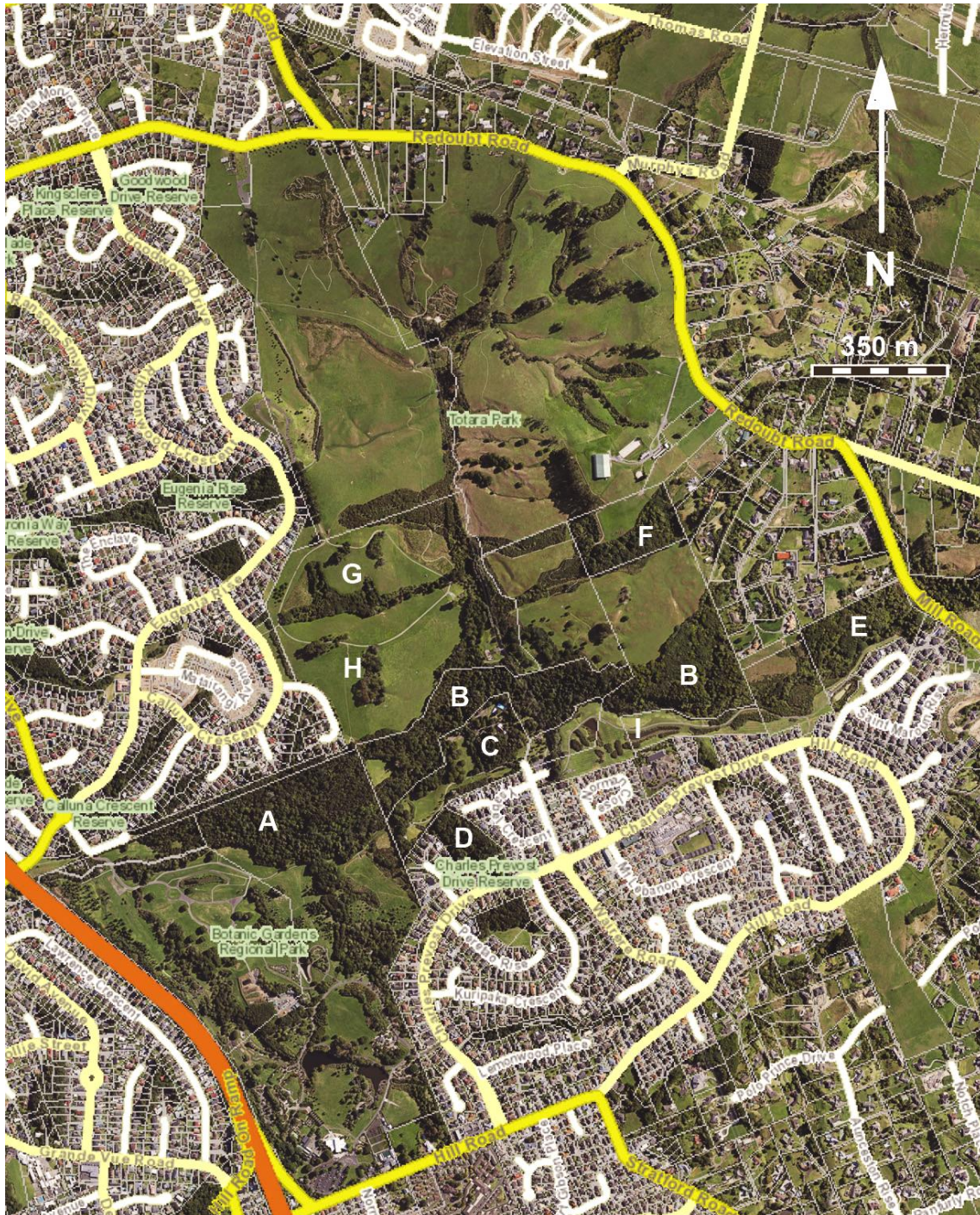


Fig. 1. Map of Totara Park and Auckland Botanic Gardens (Auckland Council). Blocks A-F native bush; Block G native revegetation enclosures; Block H exotic tree enclosure; Block I stormwater ponds.



Fig. 2. Beaufords, Totara Park, 26 May 2012. All photos by Mike Wilcox unless otherwise stated.



Fig. 3. *Clematis paniculata*, showy male flowers, bush margin of upper playground, Totara Park, 21 Sep 2019.



Fig. 4. Open-grown totara, Totara Park, 16 Dec 2019.



Fig. 5. *Earina mucronata*, hanging from a totara branch, Totara Park, G. Falla, Dec 2019.

The Puhinui Stream Forest Trail is an important local asset which traverses fine native bush in both the Botanic Gardens and Totara Park (Wenley 2016), and there is an ongoing project to restore the lower reaches of the stream and develop a walkway linking Totara Park and Puhinui Reserve.

Manukau City Council acquired Charles Prevost's Totara Park estate in 1966 after agreeing to protect the bush and preserve the park for public use and enjoyment (Ringer 2012). Since that time significant amounts of local funding have been used to develop facilities at Totara Park. A management plan was produced for the park in 2001, and development in line with this plan has progressed over time. Primary objectives outlined in the management plan are to provide for and encourage a range of outdoor recreation activities and uses throughout the park and to protect and enhance its ecological integrity and natural qualities.

Ringer (2012) provides a detailed history of the land from the original Clendon Crown land grant in 1842. Significant owners were the Cowleys (1878-1912) when it was "Springhill Farm", the Gunsons (1929-1947), and Charles Prevost (1947-1966). In the 1860s the whole area was in native bush.

The adjoining bush to the west is part of the Auckland Botanic Gardens (Cameron 1992) earlier owned by the Nathan family.

In 2017 the South Auckland Branch of Forest & Bird launched the South-east Wildlink Project to restore and enhance native biodiversity between Totara Park and Clevedon Scenic Reserve, where are located Forest & Bird's two bush reserves – Olive Davis (8 ha) at Alfriston and Ngaheretuku (15 ha) at Brookby. The Wildlink aims to create a corridor of native bush – which includes 50 ha of several small private blocks of bush (such as Nicky and Mark Auld's property at Brookby) – to provide safe habitat for native birds and other wildlife to feed, roost and breed (Forest & Bird 2019; Irace 2019). Control of rats and possums is the major activity.

Visit by Auckland Botanical Society, Forest & Bird, Kiwi Conservation Club (KCC), and Entomological Society on 21 September 2019

This scheduled field trip was part of Conservation Week 2019, and was attended by: Blair Balsom, Emma Bodley, Steve Cook, Victoria Cullington, Frances Duff, Katie Fowlds, Laura Francis, Ben Goodwin, Colleen Grayling, Brent Henry, Mark Hillary, Ann Kendall, Carol Kendall, Tim Kendall, Nicholas Martin, Peter McAndrew, John Millett, Helen Preston Jones, Jessica Reaburn, Conor Reid, Darion Rowan, Joshua Salter, Gabi Schmidt-Adam, Bryony Smart, Rebecca Stanley, Julie Steele, Margaret Steele, Julia Watson, Alison Wesley, Ian Whitehouse, Mike Wilcox,

Table 1. The six native bush blocks (areas in ha)

Botanic Gardens:	
A Botanic Gardens bush (west Puhinui Stream Forest Trail)	12.8
Totara Park:	
B Main Totara Park bush (east and part west Puhinui Stream Forest Trail)	13.5
C Beaufords	1.1
D Charles Prevost Drive Reserve	1.5
E Far south-east bush	4.3
F Pony Club bush	2.4
Subtotal	22.8
TOTAL	35.6

Pam Wilcox, Maureen Young, plus 10 children and 5 adults from KCC (Kiwi Conservation Club).

The KCC children and parents were coordinated by *Julia Watson* and *Katie Fowlds*, with *Mike Wilcox* and *Bryony Smart* assisting. The group visited the upper playground to view flowering *Clematis paniculata* (Fig. 3) and to study leaf types of native trees; part of the Puhinui Stream Forest trail to study patē (*Schefflera digitata*) and ferns such as hen and chickens fern (*Asplenium bulbiferum*), and the giant liverwort (*Monoclea forsteri*) (see Fig. 25); the Friends of Totara Park native plant nursery; an open-grown grove of tōtara trees (Fig. 4) with their epiphytes: the orchid *Earina mucronata* in flower (Fig. 5), abundant leather-leaf fern (*Pyrrosia elaeagnifolia*), and tank lily (*Astelia hastata*), and abundant lichens; and the Charles Prevost Drive Reserve (Fig. 1, Block D) tōtara forest with regeneration patches of pigeonwood (*Hedycarya arborea*), karaka (*Corynocarpus laevigata*) and taraire (*Beilschmiedia tarairi*), thanks to the spread of seeds by kereru from roost trees.

The rest of the gathering visited the Totara Park bush (Fig. 1, Block B) and Botanic Gardens bush (Fig. 1, Block A) (western Puhinui Stream Forest Trail) in the morning led by *Rebecca Stanley* and *Emma Bodley*, and the Totara Park bush (eastern Puhinui Stream Forest Trail) in the afternoon led by *Rebecca Stanley* and *Mike Wilcox*. Plants noted in flower were *Clematis paniculata*, *Earina mucronata*, *Geniostoma ligustrifolium*, *Pittosporum crassifolium* and *Vitex lucens*. Native plant records new for the area were the fern *Rumohra adiantiformis*, the sedge *Carex breviculmis*, and the herb *Cotula australis*.

Native bush

Native bush covers 22.8 ha in Totara Park, making it a very significant natural forest remnant in urban south Auckland (Cameron et al. 2008.; Wilcox 2012). It is lowland forest covering an altitude of 45–90 m asl. An additional 12.8 ha of bush adjoins to the

west in the Botanic Gardens. The Puhinui Stream Forest Trail was opened in 2009, planned and developed jointly by the Auckland Botanic Gardens and the Manukau City Council. When the Botanic Gardens bush is included there are six blocks of native bush, totalling 35.6 ha (Table 1).

The native bush block eastwards from Beaufords, and part of the Puhinui Stream Forest Trail, was reported on by Wilcox & Benham (1997) following a visit by the Auckland Botanical Society (Fig. 1, Block B). Lists of native plants in this bush were earlier prepared by Dakin (1977) and Gardner (1981). The present list (see Appendix) has been compiled from previous lists, herbarium records and numerous visits by the author. The main forest area occupies the valley of the Puhinui Stream and steep slopes of an escarpment and comprises two secondary forest types. On the drier slopes, there is an excellent variety of conifers, including mataī (*Prumnopitys taxifolia*) (Fig. 6), kahikatea (*Dacrycarpus dacrydioides*), rimu (*Dacrydium cupressinum*), tanekaha (*Phyllocladus trichomanoides*), tōtara (*Podocarpus totara*), and rarely, kauri (*Agathis australis*). Miro (*Pectinopitys ferruginea*) was mentioned by Wilcox & Benham (1997) and just one tree was seen in the 2019/2020 survey. The



Fig. 6. Mataī with the characteristic hammer-bark, Totara Park, 24 Dec 2019.

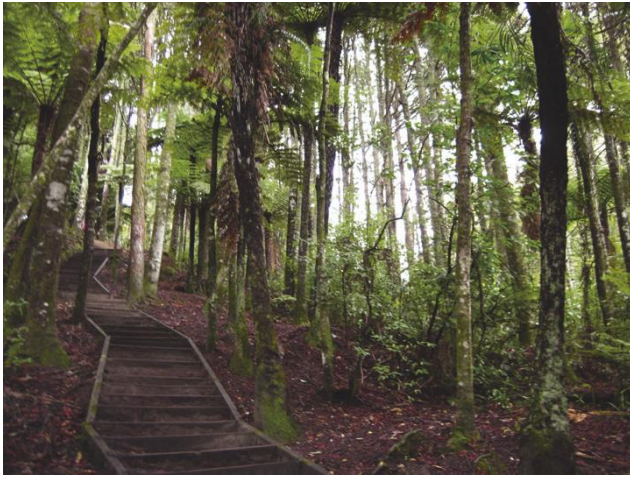


Fig. 7. Podocarp forest, Totara Park, 19 Mar 2019.



Fig. 8. Pūriri, Totara Park, 14 Mar 2019.



Fig. 9. Pole-tōtara forest, far east block, Totara Park, 16 Apr 2019.

podocarps are mainly pole-sized in dense stands (Fig. 7) but are also strongly present beside the Puhinui Stream. The second main type is a broadleaved forest with a dense canopy, dominated by taraire, with some large pūriri (*Vitex lucens*) (Fig. 8), scattered rewarewa (*Knightia excelsa*), karaka, kānuka (*Kunzea robusta*), and in the damper gullies, pukatea (*Laurelia novae-zelandiae*). The only northern rātā (*Metrosideros robusta*) seen (both in 1997 and 2019) was a dead one. The subcanopy trees are more diverse, with tawa (*Beilschmiedia tawa*), pigeonwood, titoki (*Alectryon excelsum*), kohekohe (*Dysoxylum spectabile*), māmāngi (*Coprosma arborea*), white maire (*Nestegis lanceolata*), māhoe (*Melicytus ramiflorus*), milk tree (*Streblus heterophyllus*), and lancewood (*Pseudopanax crassifolium*). Epiphytes are generally lacking, even on the very big pūriri trees, though Dakin (1977) observed *Astelia solandri* as “many” and *A. hastata* as “plentiful”. Below the canopy the forest is rather open, but with abundant regenerating nikau palms (*Rhopalostylis sapida*). Tree ferns are particularly abundant on the moist southern slopes, the dominant species being ponga or silver fern (*Cyathea dealbata*), with lesser numbers of mamaku (*Cyathea medullaris*), slender tree fern (*C. cunninghamii*) – a rarity in Auckland and first found here by Gardner (1981), and wheki (*Dicksonia squarrosa*).

Seedlings and saplings of the podocarp tree species are rarely seen in the understorey, though the light-demanding tōtara does regenerate on the bush margins. The shade-tolerant karaka regenerates freely beneath parent trees, pūriri saplings thrive after disturbance, and taraire seedlings and small saplings have become encouragingly plentiful.

Shrubs of the understorey and forest margins include *Melicope simplex*, *Melicytus micranthus*, *Carpodetus serratus*, *Coprosma spathulata*, *Pennantia corymbosa*, and *Streblus heterophyllus*, together with māpou (*Myrsine australis*), hangehange (*Geniostoma ligustrifolium*), karamū (*Coprosma robusta*), kanono (*Coprosma grandifolia*), kawakawa (*Piper excelsum*) and mingimingi (*Leucopogon fasciculatus*). Patē (*Schefflera digitata*), putaputāwētā (*Carpodetus serratus*) and tree fuchsia (*Fuchsia excorticata*) are mainly confined to stream banks or other damp places.

There is a further piece of bush (Far south-east bush, Fig. 1, Block E) alongside the Puhinui Stream east of the main block and extending to Mill Road. It has a notable stand of pole tōtara (Fig. 9), and an abundance of taraire. The fringes are weedy in places, with wandering Jew (*Tradescantia fluminensis*) and Chinese privet (*Ligustrum sinense*) prevalent.



Fig. 10. Māhoe trees, Totara Park, with ground cover of *Fissidens taxifolius*, 1 Mar 2019.

South of the pony club is an isolated fenced-off bush remnant (Fig. 1, Block F) predominantly of taraire, pūriri and nīkau, and near the Puhinui Stream further north is remnant open woodland of old māhoe trees (Fig. 10).

Charles Prevost Drive Reserve (Fig. 1, Block D), now part of Totara Park), has some good examples of dense local regeneration of pigeonwood, taraire and karaka from seed dropped by kereru from roosts in tōtara trees. Seedlings and saplings of kaikōmako (*Pennantia corymbosa*) are prevalent.

The bush adjoining Beaufords and the main picnic area (Fig. 1, Block C) is a fine piece of dense mixed podocarps, with mataī being particularly abundant.

The Botanic Gardens bush (Fig. 1, Block A) – visited by ABS on 20 June 1992 (Cameron 1992) and again on 21 Sep 2019 – is much like that in Totara Park, but with more plentiful pukatea, tītoki and tawa on the valley floor (narrow flood plain of the Puhinui Stream), and some sizeable kōwhai trees (*Sophora microphylla*). There is one large kaikōmako (*Pennantia corymbosa*) present (32 cm DBH in 1975, Cameron 1992) and several examples of milk tree (*Streblus heterophyllus*). During the prolonged summer drought (Dec 2019 to March 2020) tawa trees suffered wilting and die-off of foliage, particularly on trees growing on the hilly slopes.

The Ridge Track and lookout features pole stands of tōtara and tanekaha, abundance of shining karamū (*Coprosma lucida*), *Coprosma spathulata* and hangehange and kiekie (*Freycinetia banksii*), (Fig. 11), plentiful kohekohe, māmāngi, native broom (*Carmichaelia australis*), maire tāiki (*Mida salicifolia*), white maire (*Nestegis lanceolata*), poataniwha (*Melicope simplex*), the sedge *Gahnia pauciflora*, kauri grass (*Astelia trinervia*), blueberry (*Dianella nigra*), a terrestrial *Pittosporum cornifolium*, an extensive patch of the maidenhair fern *Adiantum*



Fig. 11. *Freycinetia banksii*, Ridge Track, Lookout, Botanic Gardens bush, 28 Aug 2019.

fulvum, and a mixed colony of the small ground orchids *Acianthus sinclairii* and *Corybas trilobus*.

An impressive feature of all the bush in the area is the abundance of native passion vine (*Passiflora tetrandra*) as a large, high-climbing tendril liane. Other woody climbers present are bush lawyer (*Rubus cissoides*), *Muehlenbeckia australis*, clematis (*Clematis paniculata*) – a male plant in full bloom beside the adventure playground, 21 Sep 2019 (Fig. 3), the rātā vines *Metrosideros diffusa*, *M. fulgens* and *M. perforata*, native jasmine (*Parsonsia heterophylla*), supplejack (*Ripogonum scandens*), and kiekie. *Pittosporum cornifolium* has been recorded as a perching epiphyte (as well as the terrestrial one on the Ridge Track), along with bamboo orchid (*Earina mucronata*) – in flower on 21 Sep 2019 and continuing through December (Fig. 5), and the asteliads, *Astelia hastata* and *A. solandri*.

Forest floor monocots are generally abundant, with the grasses *Microlaena avenacea*, *M. stipoides* and *Oplismenus hirtellus* frequent throughout. Four hook sedges (formerly *Uncinā*) are present: *Carex banksiana*, *C. subviridis*, *C. uncinata* and *C. zotovii*, while other *Carex* species to be found in the forest are *C. dissita*, *C. lambertiana*, *C. ochrosaccus* and *C. solandri*. *Carex lambertiana* is particularly abundant beside more open sections of bush tracks.

The forest has a great diversity of ferns, both terrestrial and epiphytic. On the damp and shaded banks of the Puhinui Stream the common ferns are *Asplenium bulbiferum*, *Austroblechnum lanceolatum*, *A. membranaceum*, *Leptopteris hymenophylloides*, *Pneumatopteris pennigera*, and in more open damp areas, *Deparia petersenii* (Fig. 12), *Diplazium australe* and *Parablechnum novaezelandiae*. *Parapolystichum glabellum* is common throughout while *P. microsorum* is less frequent. *Icarus filiformis* and *Microsorium scandens* are abundant forest climbers. *Asplenium flaccidum*, *A. polyodon* and *A.*

oblongifolium are common, and in the bush at Beaufords and nearby are some fine patches of *Asplenium lamprophyllum*. Leather-leaf fern is an especially prominent fern found creeping on the branches of trees in well-lit places such as forest edges, scattered podocarp trees around Beaufords, and on a wide range of planted trees, both native and exotic. Maidenhair ferns (*Adiantum*) are frequent in places, with the introduced *A. raddianum* abundant on open banks of Puhinui Stream, *A. hispidulum* on dry banks, and *A. cunninghamii* and *A. fulvum* in forest. Filmy ferns are not prominent, but there are some colonies of *Hymenophyllum demissum*, and *Trichomanes venosum* is frequent on tree fern trunks.



Fig. 12. *Deparia petersenii* on damp shaded banks, Totara Park, 19 Mar 2019.



Fig. 13. *Stachys sylvatica*, Bot Gardens bush, 9 Nov 2019.

The native bush does have some invasive weeds, the worst being African clubmoss (*Selaginella kraussiana*) – commonly seen on damp edges of forest tracks, and wandering Jew which occurs in several places in dense colonies on the banks of Puhinui Stream (where the volunteer Friends of Totara Park endeavour to control it). A common herbaceous weed is hedge woundwort (*Stachys sylvatica*), abounding on the disturbed margins of the bush (Fig. 13), sometimes accompanied by lesser herb Robert (*Geranium purpureum*) and garden forget-me-not (*Myosotis sylvatica*). Montbretia (*Crocsmia × crocosmiiflora*) grows densely on the banks of the Puhinui Stream in the Botanic Gardens. Open bush such as that in Charles Prevost Drive Reserve and bordering the Puhinui Stream in the Botanic Gardens is often infested with veldt grass (*Ehrharta erecta*) and grey sedge (*Carex divulsa*). Within the bush the only woody weeds of note are lilly pilly (*Syzygium smithii*) – occasional small saplings; bangalow palm (*Archontophoenix cunninghamii*) – as seedlings; tree privet (*Ligustrum lucidum*) and Chinese privet – both essentially just on bush margins though more pervasive in the fenced enclosures. Magenta lilly pilly (*Syzygium paniculatum*), loquat (*Eriobotrya japonica*) and hill cherry (*Prunus serrulata*) are other occasional woody weeds of disturbed margins. Overall, though, the interior of the bush is encouragingly weed-free.

Butterworth (1973) – as mentioned in Cranwell (1981) and Ringer (2012) – wrote about the bush that adjoins Totara Park to the west, and now part of the Botanic Gardens, noting the historic presence (from childhood memories) there of mangeao (*Litsaea calicaris*), hīnau (*Elaeocarpus dentatus*) and northern rātā in the forest, and with king fern (*Ptisana salicina*) and kidney fern. King fern is still very locally present there, augmented with plantings made in 2016 by Botanic Gardens staff and Kate Loman-Smith of Friends of Totara Park with propagules from Forest & Bird's Olive Davis Reserve, but the others are now absent and were so in 1992 (Cameron 1992). Five king ferns were also planted in the main (east) Totara Park bush but only one has survived (G. Falla pers. comm.).

So how does the Totara Park bush fit into the classification of Auckland's vegetation proposed by Singers et al. 2017? Their Ecosystem Unit AVs1 (Anthropogenic tōtara forest) is well represented and indeed is generally prevalent in south Auckland (Preston Jones et al. 2011). These more-or-less pure tōtara stands, 100–150 years old, have arisen from bird-dispersed seed into cleared bush that reverted to mānuka and kānuka and later was grazed by cattle. As to the bulk of the bush – which is secondary forest likely resulting from natural regeneration in the mid-late 19th Century following

fires and logging – there is no clear match with any of the 15 WF Ecosystem units recognised as occurring in Auckland. Along the Puhinui Stream the tall forest with kahikatea, pukatea, rimu, tītoki and tawa shares features of WF8 (kahikatea, pukatea forest), MF4 (kahikatea forest) and WF7.3 (kahikatea, pūriri forest). Forest on the lower slopes has features of WF9 (taraire, tawa and podocarp forest on rolling hill-slopes) and WF7.1 (pūriri, tōtara forest on alluvial terraces). However, the best match regarding species composition is WF7.2 (pūriri, taraire forest, with kohekohe, pukatea, rewarewa, karaka, tawa, tītoki and northern rātā, with rimu and mataī – an ecosystem type more typical of volcanic rock forest. The forest with abundant tanekaha, with tōtara, mataī, and rimu (but only rarely with kauri) is not recognised by Singers et al (2017). Regenerating forest with kānuka, māmāngi, māhoe, kōhūhū, hangehange, māpou and tree ferns can be classified as scrub forest (VS2, kānuka/scrub forest or VS5, broadleaved species scrub/forest) and is well represented at Totara Park as a successional phase that should develop in time into both podocarp forest and broadleaved forest. Groves of tall kānuka are a feature of much of the forest on the south-facing slopes, pointing to the relative youth of the podocarp/broadleaved forest and its transitional status.

Native revegetation enclosures

There has been extensive (and intensive) planting of native species in the park, mainly in fenced-off headwater gulleys occupied by streamlets feeding into the main Puhinui Stream, and adjoining cycleways. The more recent plantings were undertaken by Manukau City Council. Earlier, led by Graham Falla, the South Auckland Branch of Forest & Bird undertook annual plantings from 1975 to 1983 (Fig. 1 Block G) with volunteer labour and nursery seedlings supplied by Andrew Dakin from the then Auckland Regional Authority's (ARA) Hunua nursery.

Species used abundantly have been māhoe, mānuka, karamū, kānuka, kōhūhū (*Pittosporum tenuifolium*), cabbage tree (*Cordyline australis*), pūriri, rewarewa, tōtara, and some kahikatea and kauri. Predominantly mānuka thickets have plantings of toetoe (*Austroderia fulvida*) and flax (*Phormium tenax*) along stream courses. Other species recorded in these plantings are tītoki (*Alectryon excelsus*), five-finger (*Pseudopanax arboreus*), māpou (*Myrsine australis*) – commonly natural, koromiko (*Veronica stricta*), pōhutukawa (*Metrosideros excelsa*), hard beech (*Fuscopora truncata*), kōwhai (*Sophora microphylla*), karo (*Pittosporum crassifolium*) and lemonwood (*Pittosporum eugenoides*). Non-local *Coprosma crassifolia* × *C. repens* and *Olearia lineata* 'Dartonii' have also been planted. Plantings have mostly been carried out at high density (1 m × 1 m espacement), resulting in dense thickets. Potato vine



Fig. 14. Totara Park kauri plantings by Forest & Bird in 1979; G. Falla, May 2019.



Fig. 15. Pūriri, Charles Prevost Reserve, a rare good phenotype, Totara Park, 30 July 2019.

(*Solanum jasminoides*) has colonised native thickets adjoining Calluna Crescent.

The Friends of Totara Park have also been active with native tree planting, as have the Auckland Mountain Bike Club in 2012, with plantings alongside the cycleways. In 2018 as part of Matariki celebrations 20,000 native trees were planted by scores of volunteers, with seedlings raised and supplied by the Auckland Prison at Paremoremo.

Kauri has been successfully established in several small groves, the seed provenance of the most recent ones being the Forest & Bird Ngaheretuku Reserve at Brookby and the giant tree Tane Mahuta of Waipoua Forest. There is a particularly good grove of planted kauri (1978) in one of the native bush remnants in the open fields (Fig. 14).

Observation of the general plantings indicated that the consistently best survival and growth has been with kānuka, pūriri and tōtara. Planted pūriri usually develop into malformed trees with multiple forking, but a perfect specimen with a single straight stem and fine regular branching has been found in the former Charles Prevost Drive Reserve (Fig. 15).

Cultivated exotic trees

The numerous exotic trees at Totara Park are mainly plantings from when the property was a privately-owned farm. Conifers of note are several groves of Lawsons cypress (*Chamaecyparis lawsoniana*), an impressive belt of Monterey cypress or macrocarpa (*Cupressus macrocarpa*) on the western border by Eugenia Rise/Goodwood Drive and in several other groves, some woodlots and belts of Monterey pine (*Pinus radiata*), specimen trees of Aleppo pine (*Pinus halepensis*) and jack pine (*Pinus banksiana*), and two spirally-sculptured *Juniperus* × *pfitzeriana* at the front entrance to Beaufords function centre (Fig. 2). The jack pine tree was a fine mature specimen but suffered sudden severe die-back of the crown from mid-July 2019 and was dead by January 2020, possibly as a result of herbicide poisoning.

The Manurewa Rotary Club Garden features several ornamental flowering trees, two particularly colourful ones being glory tree (*Tibouchina granulosa*) and *Magnolia* 'Star Wars'.

There is a concentration of exotic broadleaved trees near the Wairere Road carpark, with fine specimens of tallowwood (*Eucalyptus microcorys*), plane (*Platanus × acerifolia*) and Algerian oak (*Quercus canariensis*). A large spotted gum (*Corymbia maculata*) grows near the old stockyards, and there is a huge messmate (*Eucalyptus obliqua*) on the western boundary. A group of large silver-top stringybark (*Eucalyptus laevopinea*) occurs near the pony club and is a eucalypt rarely recorded in New

Zealand. Two large sweet gums (*Liquidambar styraciflua*), a common lime (*Tilia × europaea*) and a hybrid poplar (*Populus × canadensis*) grow on the bush edge at Beaufords.

In 1972 the Manukau City Council started a planting programme of 1.8 ha on six blocks of fenced-off pasture with a mixture of evergreen and deciduous trees (Ringer 2012). A fenced enclosure in the fields near the Nyssa Place entrance (Fig. 1 Block H) is one of these blocks (Fig. 16). Exotic trees planted there are Norfolk Island pine (*Araucaria heterophylla*), Aleppo pine, eastern white pine (*Pinus strobus*), camphor laurel (*Cinnamomum camphora*), silky oak (*Grevillea robusta*), Yunnan poplar (*Populus yunnanensis*), pin oak (*Quercus palustris*), brush box (*Lophostemon confertus*), Western Australian peppermint (*Agonis flexuosa*), river she oak (*Casuarina cunninghamiana*), smooth-barked apple (*Angophora costata*), willow bottlebrush (*Melaleuca salicina*) and east Gippsland blue gum (*Eucalyptus pseudoglobulus*). The understorey comprises mainly a dense thicket of Chinese privet, with *Myrsine australis*, *Pittosporum crassifolium* and *Coprosma robusta* frequent. Other native trees that have colonised there are tōtara, kahikatea, pūriri, taraire, cabbage tree, nīkau, putaputāwētā and lemonwood. Other smaller enclosures feature *Eucalyptus obliqua*, *Populus × canadensis* and *P. yunnanensis*.

Stormwater ponds and wetlands

Plantings of the sedges *Machaerina articulata* and *Bolboschoenus fluviatilis* are the dominant tall emergent plants at the edges of the ponds (Fig. 17). The most abundant wetland plant around these ponds is a robust form ("long spike") of *Persicaria decipiens*. Fool's watercress or water celery (*Apium nodiflorum*) and watercress (*Nasturtium officinale*) are sometimes present, and some small ponds support water plantain (*Alisma plantago-aquatica*). Duckweed (*Lemna minor*) is present in most ponds.



Fig. 16. Exotic trees enclosure, Totara Park, 26 Mar 2019.



Fig. 17. *Bolboschoenus fluviatilis* on a pond margin, Totara Park, 9 Dec 2019.



Fig. 18. *Lythrum junceum*, damp area, Totara Park, 22 Jan 2020.



Fig. 19. *Arthropodium bifurcatum*, Friends building, Totara Park, 16 Nov 2019.

These stormwater detention ponds (Fig. 1 Block I) were constructed in the 1990s to remediate the flooding and bank erosion of the Puhinui Stream caused by stormwater runoff from housing developments on the southern boundary of Totara Park (Ringer 2012). These days the stream runs clear over the dry summer months but can become quite milky from silt at times after periods of heavy rain. An open ditch leading to one of the ponds has a diverse flora of plants with a liking for damp places, and includes American brooklime (*Veronica americana*), sea aster (*Symphytotrichum subulatus*), willow herbs (*Epilobium billardierianum* subsp. *cinereum*, *E. ciliatum*, *E. hirtigerum*), hyssop loosestrife (*Lythrum hyssopifolia*) – and more rarely, rose loosestrife (*Lythrum junceum*) (Fig. 18), creeping bent (*Agrostis stolonifera*), *Isolepis inundata*, *Juncus microcephalus*, and other wayside plants such as tarweed (*Parentucellia viscosa*), staggerweed (*Stachys arvensis*), *Veronica polita*, catchfly (*Silene gallica*), and wind grass (*Lachnagrostis filiformis*).

There are localised wetlands alongside small feeder creeks into Puhinui Stream. The ferns *Hypolepis ambigua*, kiokio (*Parablechnum novae-zelandiae*), water fern (*Histiopteris incisa*), and a lone *Dicksonia fibrosa*, the native grass *Isachne globosa*, freshwater paspalum (*Paspalum distichum*), the rushes *Juncus articulatus* and *J. effusus*, the sedges *Carex lessoniana* (forming extensive stands), *Cyperus ustulatus* and *Eleocharis acuta* occur in some of these, together with *Persicaria* "long spike", *P. hydropiper*, all often over-run by blackberry (*Rubus ulmifolius*) and native bindweed (*Calystegia sepium* subsp. *roseata*).

Fields and lawns

Grassland occupies a sizeable area of the park and much of it is managed by grazing lease as a farm park by Auckland Council, allowing access for recreational walking. Fenced-off open pasture is

dominated in late spring/early summer by perennial ryegrass (*Lolium perenne*), cocksfoot (*Dactylis glomerata*), rough-leaved meadow grass (*Poa trivialis*), red clover (*Trifolium perenne*), white clover (*T. repens*), creeping buttercup (*Ranunculus repens*), sweet vernal (*Anthoxanthum odoratum*), narrow-leaved plantain (*Plantago lanceolata*), soft brome (*Bromus hordeaceus*) and pale flax (*Linum bienne*). By mid- to late summer kikuyu grass (*Cenchrus clandestinus*), paspalum (*Paspalum dilatatum*) and white clover dominate, and centaury (*Centaurea erythraea*) becomes noticeable as a pink-flowered wildflower. Dried-off summer pastures have abundant browntop (*Agrostis capillaris*), crested dogtail (*Cynosurus cristatus*), rattail (*Sporobolus africanus*), annual ryegrass (*Lolium rigidum*) and perennial ryegrass, and abundant narrow-leaved plantain and creeping buttercup. These pastures are grazed by cattle.

Shaded damp lawns around the homestead have an assemblage of herbs and monocots. Common herbs are penny royal (*Mentha pulegium*), selfheal (*Prunella vulgaris*), creeping buttercup (*Ranunculus repens*), small-flowered buttercup (*Ranunculus parviflorus*), native starwort (*Callitriche muelleri*), thyme-leaved speedwell (*Veronica serpyllifolia*), broad-leaved plantain (*Plantago major*), lawn daisy (*Bellis perennis*) and Australian hydrocotyle (*Hydrocotyle tripartita*). In addition, a patch of the native creeping cudweed (*Euchiton japonicus*) occurs in 'moss gardens' and buttonweed (*Cotula australis*) becomes common in spring in the main picnic area. Lawn monocots include annual poa (*Poa annua*), carpet grass (*Axonopus fissifolius*) and *Isolepis reticularis*, and in the shadiest places, slender panic grass (*Oplismenus hirtellus*), *Carex inversa* and *C. divulsa*.

Gravel road edges – subject to periodic spraying with herbicides – have some characteristic plants, with the grasses, crowfoot (*Eleusine indica*), smooth



Fig. 20. The leafy liverwort *Plagiochila trispicata* collected from a māhoe trunk, Totara Park, 18 March 2019.

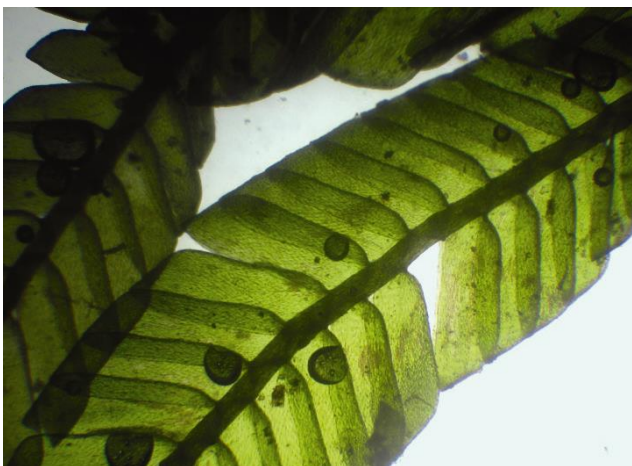


Fig. 21. Overlapping leaves of the moss *Orthorrhynchium elegans* collected from a *Coprosma arborea* trunk, Botanic Gardens bush, 22 Jan 2020. Each leaf approx. 1 mm long.



Fig. 22. The fruticose lichen *Ramalina vesuviana* on twigs of open-grown tōtara, Totara Park, 4 Apr 2019.

witch-grass (*Panicum dichotomiflorum*), and summer grass (*Digitaria sanguinalis*) being very prominent in late summer. Spotted spurge (*Euphorbia maculata*), red sand spurrey (*Spergularia rubra*), wireweed (*Polygonum arenastrum*) and twin cress (*Lepidium didymum*) are common dicot weeds. Bitter cress (*Cardamine hirsuta*) is a common winter herb in this habitat.

Native landscaping plants

The borders of the main carpark have native plantings of *Phormium cookianum*, *Ph. tenax*, *Carex virgata*, cabbage tree, karo and tōtara, with tōtara and pūriri also commonly planted by some of the paths through the open fields. At the main picnic / playground area there are cultivated oioi (*Apodasmia similis*), *Coprosma virescens* and *Sophora prostrata*. In the gardens at Beaufords grow several fine specimens of Norfolk Island/Three Kings cabbage tree (*Cordyline obtecta*), and extensive borders of *Asplenium lamprophyllum*. Near the Friends depot are two fine planted specimens of ribbonwood (*Plagianthus regius*), several large-leaved kōwhai (*Sophora tetraptera*), a weeping type of kānuka, and impressive clumps of rengarenga lily (*Arthropodium bifurcatum*) (Fig. 19).

Lower plants

This survey of Totara Park has paid some attention to the lower plants: liverworts, mosses and lichens. Each of these groups is represented by numerous species, the assemblages present being best described according to habitat: tree trunks and branches, forested banks of Puhinui Stream, on soil beside tracks, lawns, and a stone wall. Some fungi and algae have also been recorded.

Tree trunks and branches: This habitat is rich in epiphytic liverworts, mosses and lichens. Three conspicuous leafy liverworts found in native bush are *Porella elegantula* on *Griselinia littoralis*, *Plagiochila trispicata* (Fig. 20) on *Melicytus ramiflorus* and *Beilschmiedia tawa*, and *Spruceanthus olivaceus* on the bark of lemonwood and kahikatea. Renner (2004) notes that *Spruceanthus* looks superficially like *Porella* but can be recognised by its habit of growing sideways around the trunk, rather than downwards and pendulously away from it (as does *Porella*). In addition, *Bazzania tayloriana* occurs at the base of tree fern (*Dicksonia squarrosa*) trunks and *Radula strangulata* has been recorded from the trunk of a miro tree. The thallose liverwort *Metzgeria furcata* is commonly found on the trunks of trees, often in quite open situations. Epiphytic mosses recorded are *Cyrtopus setosus*, *Hypnum chrysogaster*, *Lembophyllum divulsum*, *Leptostomum inclinans*, *Lopidium concinnum*, *Orthorrhynchium elegans* (Fig. 21), *Papillaria crocata*, *Rhynchostegium*

tenuifolium, *Trachyloma diversinerve*, *Weymouthia cochlearifolia*, *W. mollis*, *Wijkia extenuata* and *Zygodon intermedius*.

Lichens on tree trunks and branches constitute a major part of the corticolous (bark-dwelling) flora. **Fruticose lichens** are particularly abundant and conspicuous on tōtara and other podocarps and are a feature of the well-lit open-grown trees at the main picnic area and the environs of Beaufords. *Ramalina peruviana* (Fig. 22) is much in evidence on small branches and twigs, and less abundantly on tree trunks. Other fruticose lichens present are *Ramalina celastri*, *Teloschistes chrysophthalmus*, *T. velifer*, *Usnea angulata*, *U. cornuta*, *U. pusilla* and *U. rubicunda*.

Totara Park abounds in epiphytic **foliose lichens**, a very common species being *Parmotrema reticulatum*. Other foliose species are *Leptogium cyanescens*, *Podostictina pickeringii*, *Pseudocyphellaria carpoloma*, *P. dissimilis*, *P. episticta*, *P. multifida*, *Sticta fuliginosa*, and *S. squamata*.

Crustose lichens on tree trunks are likewise numerous, and a particularly conspicuous one here is *Porina exocha* e.g. on tītoki, Beaufords Bush (Fig. 23). Others are the white paint-like *Phlyctis sordida* on the trunks of māhoe and māpou, *Brigantiaea chrysosticta* on the bark of matai (Fig. 24), *Lepra psoromica* on the bark of rimu, and *Phaeographis mucronata* on the bark of planted trees in the open.

The most conspicuous **Leprose (powdery) lichen** on tree trunks is the yellow *Chrysothrix xanthina* – commonly seen on rimu.

Damp, shaded stream banks in bush: The large thallose liverwort *Monoclea forsteri* (Fig. 25) is common along the Puhinui Stream, and with or near it the strap-shaped *Pallavicinia tenuinervis* and *Symphyogyna undulata*. The leafy liverwort *Heteroscyphus coalitus* is often abundant on soil (Fig. 26). The terrestrial mosses *Acrophyllum dentatum* (Fig. 27), *Hypnodendron arcuatum*, *Thamnobryum pandum* and *Thuidiopsis laeviusculum* are also a feature of this habitat. *Fissidens leptocladus* grows on rock in the stream itself.

Drier sites within forest: Two mosses, the milk moss (*Leucobryum javense*) and the pipe-cleaner moss (*Ptychomnion aciculare*), can be found on the ground in well-lit places in the denser podocarp forest. Milk moss also occurs on the bases of *Cyathea dealbata*. The introduced terrestrial moss *Fissidens taxifolius* is commonly found on ground at the edge of tracks, being particularly common in December 2019 along the track from



Fig. 23. The crustose lichen *Porina exocha* on tītoki trunk, Beaufords bush, Totara Park, 26 Mar 2019.



Fig. 24. The fertile crustose lichen *Brigantiaea chrysosticta* on matai, Totara Park, 21 Aug 2019.



Fig. 25. The large thalloid liverwort *Monoclea forsteri*, bank of Puhinui Stream, Totara Park, 4 Apr 2019.



Fig. 26. The leafy liverwort *Heteroscyphus coalitus* on soil, near stream, off Ridge Track, Botanic Gardens bush, 28 Aug 2019.



Fig. 27. The terrestrial moss *Achrophyllum dentatum*, bank of Puhinui Stream, east block, Totara Park, 16 Apr 2019.



Fig. 28. A moss in damp lawn, *Brachythecium albicans*, Totara Park, 28 Aug 2019.

the end of Everglade Drive, and found carpeting the ground beside the track through remnant māhoe forest on the eastern side of Totara Park (Fig. 10).

Damp lawns: The introduced feather moss *Eurhynchium praelongum* can be commonly found in the lawns around Beaufords, and *Brachythecium albicans* (Fig. 28) and *Calliergonella cuspidata* occur in damp grassy places on the bush edge, along with *Hypnodendron arcuatum* and *Breutelia pendula*, these species forming prominent 'moss gardens' in winter. The liverwort *Metzgeria furcata* can sometimes be found with these mosses, while crescent-cup liverwort (*Lunularia cruciata*) occurs in extensive colonies on the edges of roads and tracks, especially following herbicide spraying. The thallose liverwort *Marchantia berteroana* is often prominent in damp grassy places at the edge of ponds and the introduced *Marchantia polymorpha* is a common weed in plant pots at the Friends' nursery.

Stone wall and rock: There is a prominent stone wall constructed of basalt rock at the entrance on Eugenia Rise. On top of the wall grow the mosses *Didymodon torquatus*, *Grimmia pulvinata* and *Syntrichia antarctica*, the liverwort *Frullania*

pentapleura and the lichen *Cladonia darwinii*. On the side of the wall occur the moss *Racomitrium cuspidigerum* var. *convolutaceum* and the leprose lichen *Candelariella vitellina*. Other plants found on this wall are leather-leaf fern, ivy-leaved toadflax (*Cymbalaria muralis*) and vulpia hair grass (*Vulpia bromoides*).

Large placed rocks near Beaufords support the common drought-tolerant leafy liverwort *Chiloscyphus semiteres* var. *semiteres* and the crustose lichen *Poeltiaria turgescens*.

Sooty mould on the bark of matai trees

A notable feature of the matai trees here is that many of them have a black furry growth on the lower trunk generally below a fork or crotch (Fig. 29) and associated with ooze of heartwood sap ('matai beer'). The main organism (Fig. 30) in this growth is a sooty mould fungus, *Metacapnodium dingleyae* (Hughes 1981). It comprises pinkish-brown moniliform hyphae (moniliform: jointed or constricted at regular intervals resembling a string of beads). It is mostly found on matai, but there are some records from rimu and tanekaha, and from yew (*Taxus baccata*) in the UK (Hughes 1981). This fungus was named after Dr Joan M. Dingley OBE (1916–2008), a noted local mycologist, and much involved in setting up the Auckland Botanic Gardens.

Conclusion

The area described has a reasonably rich plant diversity for an urban location. Species recorded are: fungi (29), lichens (49), algae (6), mosses (32), liverworts (21), clubmosses (3), ferns (58), conifers (19), basal angiosperms and magnoliids (8), monocots (129), woody eudicots (169), herbaceous eudicots (179), totalling 702 species (525 wild, 177 cultivated), of which 310 are exotic and 392 native.

Feature species which we wish to highlight are:

- Peruvian fruticose lichen (*Ramalina peruviana*), abounding on twigs of tōtara and other trees in the open.
- Giant thallose liverwort (*Monoclea forsteri*) on the shady forested banks of the Puhinui Stream.
- Matai (*Prumnopitys taxifolia*) throughout the forest, and in greater abundance here than anywhere else in Auckland.
- Tōtara (*Podocarpus totara*), an iconic native tree of southern Auckland bush remnants, represented by well-formed trees in dense stands as well as picturesque open-grown trees.
- Kiekie (*Freycinetia banksii*), abundant in the forest understorey and as a climber on tree trunks.
- Native passion vine (*Passiflora tetrandra*), a very prominent large liane on the forest edge.
- Hedge woundwort (*Stachys sylvatica*), an introduced aromatic herb very common on disturbed, moist sites on the forest edge.



Fig. 29. Black mat of sooty mould fungus *Metacapnodium dingleyae* on matai trunk, Totara Park, 21 Aug 2019.



Fig. 30. 'String of beads' hyphae of the sooty mould fungus, *Metacapnodium dingleyae*, Totara Park, 16 Dec 2019. Scale bar 40 μ m.

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provided a list of vascular plants and Dan Blanchon a list of lichens recorded in the 2012 BioBlitz. Most of the fungal records are from the Landcare Research database.

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Appendix. Plant species list for Totara Park and adjoining Botanic Gardens Bush, Manurewa, Auckland – Compiled by Mike Wilcox

Source of records

1. Auckland Museum (AK), UNITEC (UNITEC), and Landcare Research Fungal Collection (PDD) herbaria.
Note – "*M.D. Wilcox*, DD MM YYYY (AK)" means that accessioning of a voucher specimen is pending at AK. "Observation" or "photo" means sight record but no herbarium specimen collected.
2. Dakin (1977)
3. Gardner (1981)
4. Field visits by MDW: 18 Oct 1997, 20 Jan 2001, 6 visits in Feb 2019, 4 in Mar 2019, 5 in Apr 2019, 2 in May 2019, 2 in June 2019, 3 in July 2019, 4 in Aug 2019, 3 in Sep 2019, incl. 21 Sep 2019 (ABS and F & B field trip), 3 in Nov 2019, 3 in Dec 2019, 22 Jan 2020, 28 Jan 2020 (MW and G. Falla), 5 Feb 2020 (MW & G. Falla), 26 Feb 2020 (MW and GF). In addition, GF has visited the area over a period of 55 years.
5. BioBlitz held 30–31 March 2012: lists compiled by Dan Blanchon (lichens) and Ewen Cameron (vascular plants)
6. Auckland Botanical Society field trips: 21 June 1975 (Beever 1975); 20 June 1992 (Cameron 1992) adding to Ewen Cameron's records of 3 June 1975; 18 Oct 1997 (Wilcox & Benham 1997); 21 September 2019

* = exotic species; cult. = cultivated; # = not seen by the authors MDW and RS

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Algae			
<i>Cephaleuros lagerheimii</i>	Leaf spot on leaves of <i>Melicytus ramiflorus</i>	<i>Spirogyra</i> sp.	Stormwater pond, on muddy bottom, abundant, <i>M. D. Wilcox</i> 6247, 17 Apr 2019 (AK)
<i>Cephaleuros virescens</i>	Leaf spot on leaves of <i>Camellia japonica</i> , Beaufords, <i>M.D. Wilcox</i> , 16 Aug 2019 (AK); algal fuzz on <i>Rhododendron</i> leaves, Beaufords, Totara Park, <i>M.D. Wilcox</i> , 16 Aug 2019 (AK)	<i>Trentepohlia jolithus</i>	On wooden fence, Redoubt Rd entrance, <i>M.D. Wilcox</i> , 27 Apr 2019, photo. (AK)
<i>Nitella hookeri</i>	Puhinui Stream at back of Botanic Gardens, <i>M. D. Wilcox</i> 6245, 9 Apr 2019 (AK); 17 Sep 2019	<i>Vaucheria</i> sp.	Ditch near stormwater pond, <i>M. D. Wilcox</i> 6246, 17 Apr 2019 (AK)
Fungi			
<i>Amanita australis</i>	Growing amongst pine needles. Conspicuous annulus, growing singularly or in small groups of 2-4, <i>H. Nessia</i> , 3 Apr 2009, UNITEC 3553	<i>Ganoderma</i> cf. <i>applanatum</i>	bracket fungus. On dead wood, 28 Aug 2019, M.D. Wilcox, photo
<i>Auricularia cornea</i>	wood ear. On dead wood, M.D. Wilcox, 30 July 2019, photo	<i>Gaeastrum triplex</i>	earth-star. <i>J.A. Beever</i> , 15 Jun 1979, PDD 100612
<i>Calvatia lilacina</i>	puffball, <i>J.D. Beever</i> , 15 Jun 1979, PDD 100773	<i>Gliophorus chromolimoneus</i>	yellow wax-gill mushroom. <i>C. Shirley</i> , 13 Jul 2019, PDD 117490
<i>Candida rongomai-pounamu</i>	budding yeast. On agaric mushroom, Rongomai Primary School students, 8 Mar 2016, PDD 105303 (a new species)	<i>Gliophorus lilacinoides</i>	wax-gill mushroom. <i>C. Shirley</i> , 22 Jun 2019, PDD 117487; <i>C. Shirley</i> , 10 Jul 2011, PDD 102228; <i>C. Shirley</i> , 13 Jul 2019, PDD 117834, 117835
<i>Coprinus disseminata</i>	Growing under broadleaf seedling in large clumps, younger mushrooms light brown, mature mushrooms grey, <i>H. Nessia</i> , 26 Oct 2008, UNITEC 3252	<i>Gliophorus lilacipes</i>	wax-gill mushroom. <i>C. Shirley</i> , 22 Jun 2019. PDD 117484; <i>C. Shirley</i> , 13 Jul 2019, PDD 117832
<i>Corynelia tropica</i>	parasitic leaf spot of tōtara. <i>J.H. Strickett</i> , 18 Aug 1983, PDD 44883	<i>Humidicutis multicolour</i>	wax-gill mushroom. <i>C. Shirley</i> , 13 Jul 2019, PDD 117489
<i>Cuphophyllus griseorufescens</i>	<i>C. Shirley</i> , 22 Jun 2019, PDD 117485	<i>Hygrocybe blanda</i>	wax-gill mushroom. <i>C. Shirley</i> , 22 Jun 2019, PDD 117486
<i>Cystroderma clastotrichum</i>	<i>P. Segedin</i> , 15 Jul 1978, PDD 70654; <i>C. Shirley</i> , 14 Jul 2007, PDD 93758	<i>Hygrocybe julietae</i>	<i>C. Shirley</i> , 13 Jul 2019, PDD 117833
<i>Favolaschia calocera</i> *	On fallen tōtara branch, M.D. Wilcox, 12 June 2019, photo	<i>Macrolepiota clelandii</i>	slender parasol. In May on ground in grassy area with scattered large tōtara trees, M.D. Wilcox, 5 May 2019, photo

<i>Metacapnodium dingleyae</i>	The major component of the back sooty mould, furry growth in the resinous seepage from crotches on matai trunks. <i>M.D. Wilcox</i> , 16 Dec 2019 (AK), 22 Jan 2020 (AK)
<i>Phaeoclavulina ochracea</i>	On wet rotten wood, <i>C. Shirley</i> , 2 Jun 2019, PDD 117437
<i>Pleurotus australis</i>	On nikau trunk, Rongomai School students, 8 Mar 2016, ICMO 21585 (culture)
<i>Psathyrella asperospora</i>	<i>C. Shirley</i> , 22 Jun 2019, PDD 117469
<i>Puccinia otagensis</i> (<i>Puccinia tiritea</i> , <i>Aecidium otagensis</i>)	Parasitic on <i>Muehlenbeckia australis</i> , <i>N.A. Martin</i> , 17 Mar 2018, PDD 111709

Lichens (Including species recorded in the March 2012 BioBlitz (Blanchon 2013))

<i>Brigantiaea chrysosticta</i>	On matai trunk, <i>M.D. Wilcox</i> , 21 Aug 2019 (AK)
<i>Byssoloma subdiscordans</i>	On tōtara leaves, <i>W.F. Kooperberg</i> , <i>I. Kularatne</i> & <i>D.J. Blanchon</i> , 31 Mar 2012, UNITEC 5211
<i>Calopadia subcoerulescens</i>	On tōtara leaves, <i>W.F. Kooperberg</i> , 30 Mar 2012, UNITEC 5212; on taraire leaves, <i>M.D. Wilcox</i> , 2 July 2019 (AK)
<i>Candelariella vitellina</i>	Yellow granular lichen. On basalt stone wall, vertical surface, Eugenia Rise entrance, <i>M.D. Wilcox</i> , 8 May 2019, photo
<i>Chrysothrix xanthina</i>	Yellow powder lichen on rimu bark near homestead, <i>M.D. Wilcox</i> , 22 Feb 2019, photo
<i>Cladonia darwinii</i>	On basalt stone wall, Eugenia Rise entrance, <i>M.D. Wilcox</i> , 8 May 2019 (AK)
<i>Coenogonium luteum</i>	On taraire trunk with <i>Parmotrema reticulatum</i> , <i>W.F. Kooperberg</i> , 31 Mar 2012, UNITEC 5217
<i>Collema kauaiense</i>	On cabbage tree trunk, <i>M.D. Wilcox</i> , 16 Dec 2019 (AK)
<i>Defourea ligulata</i>	On concrete curbing, <i>W.F. Kooperberg</i> , 30 Mar 2012, UNITEC 5119; on concrete curbing, Redoubt Rd entrance, <i>M.D. Wilcox</i> , 27 Apr 2019, photo
<i>Dirinaria applanata</i>	On bark of tōtara tree in forest, <i>M.D. Wilcox</i> , 26 Mar 2019 (AK)
<i>Enterographa bartlettii</i>	On <i>Dicksonia</i> trunk, <i>E. Bodley</i> , 25 Jul 2018, AK 371244, UNITEC 10604
<i>Heterodermia casarettiana</i>	On kānuka bark, <i>D.J. Blanchon</i> & <i>H. Nessia</i> , 30 Mar 2012, UNITEC 5219
<i>Heterodermia leucomela</i>	Windfall from tōtara, with <i>Ramalina peruviana</i> , <i>D.J. Blanchon</i> , <i>W.F. Kooperberg</i> & <i>I. Kularatne</i> , 31 Mar 2012, UNITEC 5122
<i>Heterodermia microphylla</i>	On kānuka, <i>W.F. Kooperberg</i> , 30 Mar 2012, UNITEC 5134
<i>Heterodermia speciosa</i>	On bark of planted tōtara trees, Redoubt Rd entrance, <i>M.D. Wilcox</i> , 28 Apr 2019 (AK)
<i>Hyperphyscia adglutinata</i>	On karamū and mānuka, <i>W.F. Kooperberg</i> & <i>H. Nessia</i> , 30 Mar 2012, UNITEC 5127

<i>Pycnoporus coccineus</i>	orange bracket. On dead wood, <i>M.D. Wilcox</i> , 28 Aug 2019, photo
<i>Ramariopsis ramarioides</i>	club fungus. <i>C. Shirley</i> , 13 Jul 2019, PDD 117836
<i>Rhagadolobium bakerianum</i>	On <i>Cyathea dealbata</i> , <i>J.M. Dingley</i> , 11 Jul 1969, PDD 26564
<i>Scleroderma flavidum</i>	earthball. <i>J.D. Beever</i> , 15 Jun 1979, PDD 100331
<i>Stachybotrys parvispora</i>	On <i>Freycinetia banksii</i> , <i>E.H.C. McKenzie</i> , 12 Oct 2012, PDD 102950
<i>Tricholomopsis scabra</i>	<i>C. Shirley</i> , 10 Jul 2011, PDD 102100 (see Cooper & Park 2016)
<i>Lepra psoromica</i> (<i>Pertusaria psoromica</i>)	On rimu bark, <i>M.D. Wilcox</i> , 25 Feb 2019 (AK)
<i>Lepraria finkii</i> (<i>L. lobificans</i>)	On trunks of <i>Cyathea dealbata</i> ; on tōtara bark in shade
<i>Lepraria incana</i>	On tōtara bark, Botanic Gardens, <i>J. Sparkes</i> & <i>D.J. Blanchon</i> , 30 Mar 2012, UNITEC 5129
<i>Leptogium cyanescens</i>	On tōtara, <i>I. Kularatne</i> & <i>W. F. Kooperberg</i> , 31 Mar 2012, UNITEC 5072; on fallen log by stream, <i>D.J. Blanchon</i> & <i>H. Nessia</i> , 30 Mar 2012, UNITEC 5131; on lemonwood trunk, <i>M.D. Wilcox</i> , 24 Dec 2019 (AK)
<i>Megalospora tuberculosa</i>	On matai trunk in shade, <i>D.J. Blanchon</i> & <i>H. Nessia</i> , UNITEC 5133
<i>Notoparmelia erumpens</i>	On bark of tōtara tree in forest, <i>M.D. Wilcox</i> , 26 Mar 2019 (AK)
<i>Parmotrema perlatum</i>	On twigs of tōtara, with <i>Ramalina peruviana</i> , <i>M.D. Wilcox</i> , 30 Jul 2019 (AK); branches of rimu, <i>M.D. Wilcox</i> , 16 Aug 2019 (AK); on bark of matai, <i>M.D. Wilcox</i> , 16 Aug 2019 (AK)
<i>Parmotrema reticulatum</i>	On tōtara, <i>W.F. Kooperberg</i> & <i>H. Nessia</i> , 30 Mar 2012, UNITEC 5137; on taraire trunk in shade, <i>W.F. Kooperberg</i> , <i>I. Kularatne</i> & <i>D.J. Blanchon</i> , 31 Mar 2012, UNITEC 5139; on bark of a large tōtara tree, Puhinui Stream Walkway, <i>M.D. Wilcox</i> , 14 Mar 2019 (AK); on bark of planted tōtara trees, Redoubt Rd entrance, <i>M.D. Wilcox</i> , 27 Apr 2019 (AK); on bark of large pine trees, <i>M.D. Wilcox</i> , 19 June 2019 (AK); on kahikatea tree, <i>M.D. Wilcox</i> , 22 Jan 2020 (AK)
<i>Phaeographis mucronata</i>	On maple tree, <i>W.F. Kooperberg</i> , 30 Mar 2012, UNITEC 5372; on bark of planted tōtara trees, Redoubt Rd entrance, <i>M.D. Wilcox</i> , 27 Apr 2019 (AK)
<i>Phlyctis sordida</i>	white paint lichen. On trunks of māhoe and māpou
<i>Physcia adscendens</i>	On maple tree, <i>W.F. Kooperberg</i> & <i>H. Nessia</i> , 30 Mar 2012, UNITEC 5222
<i>Physcia poncinsii</i>	On bark of large macrocarpa trees, Eugenia Rise entrance, <i>M.D. Wilcox</i> , 28 Apr 2019 (AK)

Lichens cont...

<i>Podostictina pickeringii</i>	On trunk of tanekaha, <i>M.D. Wilcox</i> , 21 Aug 2019 (AK)
<i>Poeltiaria turgescens</i>	Crustose lichen in large patches on placed rock near Beaufords entrance road, <i>M.D. Wilcox</i> , 12 June 2019, observation, photo
<i>Porina exocha</i>	On tītoki bark, Beaufords Bush, <i>M.D. Wilcox</i> , 26 Mar 2019 (AK); on kahikatea bark, Beaufords Bush, <i>M.D. Wilcox</i> , 4 Apr 2019 (AK); on bark of tawa tanekaha, mā māngi, karaka, Bot Gardens Bush, <i>M.D. Wilcox</i> , 24 Dec 2019 (AK)
<i>Pseudocyphellaria carpoloma</i>	Bot Gdns bush, on trunk of <i>Streblus heterophyllus</i> , <i>M.D. Wilcox</i> , 22 Jan 2020 (AK); Totara Park, on raised roots of a tawa tree, <i>M.D. Wilcox</i> , 22 Jan 2020 (AK); Totara Park, on fallen log, <i>M.D. Wilcox</i> , 28 Jan 2020 (AK)
<i>Pseudocyphellaria dissimilis</i>	On taraire trunk in shade, <i>W.F. Kooperberg & D.J. Blanchon</i> , 31 Mar 2012, UNITEC 5224; on māhoe overhanging stream, <i>M.D. Wilcox</i> , 12 June 2019 (AK); on trunk of nikau, by stream, <i>M.D. Wilcox</i> , 12 June 2019 (AK)
<i>Pseudocyphellaria episticta</i>	Windfall from tōtara, with <i>Heterodermia leucomela</i> , <i>D.J. Blanchon & W.F. Kooperberg</i> , 31 Mar 2012, UNITEC 5225; on trunk of miro, <i>M.D. Wilcox</i> , 28 Jan 2020 (AK)
<i>Pseudocyphellaria multifida</i>	On trunk of taraire, <i>D.J. Blanchon & W.F. Kooperberg</i> , 31 Mar 2012; on tanekaha bark, <i>M.D. Wilcox</i> , 12 June 2019 (AK)
<i>Ramalina celastri</i>	On dead twigs of <i>Coprosma repens</i> in planted thickets; on tōtara branchlets, Puhinui Forest Stream Forest Trail, <i>M.D. Wilcox</i> , 26 Mar 2019 (AK); on dead twigs of planted tōtara, Redoubt Rd entrance, <i>M.D. Wilcox</i> , 27 Apr 2019 (AK); on twigs of planted rimu, below Eugenia Drive entrance, <i>M.D. Wilcox</i> , 5 Feb 2020 (AK)
<i>Ramalina peruviana</i>	On tōtara twigs, <i>J.E. Braggins</i> , Apr 1994, AK 257249; on tōtara tree branchlets, <i>M.D. Wilcox</i> , 26 Mar 2019 (AK); on planted tōtara bark and twigs, Redoubt Rd entrance, <i>M.D. Wilcox</i> , 27 Apr 2019 (AK)

Liverworts

<i>Bazzania tayloriana</i>	Base of trunk (dead) of <i>Dicksonia squarrosa</i> , <i>M.D. Wilcox</i> , 22 Jan 2020 (AK)
<i>Chiloscyphus semiteres</i> var. <i>semiteres</i>	On large rock in open near road entrance to Beaufords, <i>M.D. Wilcox</i> , 12 June 2019 (AK)
<i>Frullania novaezelandiae</i>	On bark of <i>Pittosporum eugenioides</i> , walkway from Nyssa Cresc.; on bark of <i>Streblus heterophyllus</i> , Puhinui Stream Trail; on bark of tōtara tree in open, <i>M.D. Wilcox</i> , 12 June 2019 (AK)
<i>Frullania pentapleura</i> (<i>F. solanderiana</i>)	On top of basalt stone wall, Eugenia Rise entrance; on a large rock, Beaufords entrance road, <i>M.D. Wilcox</i> , 12 June 2019 (AK)

<i>Sticta fuliginosa</i>	On <i>Fuchsia excorticata</i> over stream, <i>D.J. Blanchon & W.F. Kooperberg</i> , 30 Mar 2012, UNITEC 5228
<i>Sticta squamata</i>	On <i>Fuchsia excorticata</i> over stream, <i>D.J. Blanchon & R. Kooperberg</i> , 30 Mar 2012, UNITEC 5229
<i>Strigula novae-zelandiae</i>	On fallen taraire leaves, <i>P.J. de Lange & G.M. Crowcroft</i> , 29 Sep 2013, UNITEC 5961
<i>Strigula orbicularis</i>	On upper surface of taraire leaves, <i>M.D. Wilcox</i> , 2 July 2019 (AK)
<i>Teloschistes chrysophthalmus</i>	On dead twigs of planted tōtara trees, Redoubt Rd entrance, <i>M.D. Wilcox</i> , 27 Apr 2019 (AK)
<i>Teloschistes velifer</i>	On dead twigs of planted tōtara trees, Redoubt Rd entrance, <i>M.D. Wilcox</i> , 27 Apr 2019 (AK)
<i>Usnea angulata</i>	On tōtara near Puhinui Stream, <i>C. Reynolds & O. Er</i> , 30 Mar 2012, UNITEC 5111; on tōtara tree in open, <i>M.D. Wilcox</i> , 28 Jan 2020 (AK)
<i>Usnea cornuta</i>	On bark of planted tōtara trees, Redoubt Rd entrance, <i>M.D. Wilcox</i> , 28 Apr 2019 (AK); bark of kahikatea, Charles Prevost Drive Reserve
<i>Usnea pusilla</i>	On twigs of old rimu tree by Beaufords, <i>M.D. Wilcox</i> , 18 Feb 2019 (AK); on planted tōtara bark and twigs, Redoubt Rd entrance, <i>M.D. Wilcox</i> , 27 Apr 2019 (AK)
<i>Usnea rubicunda</i>	On fence posts, <i>D. J. Blanchon & W. F. Kooperberg</i> , 31 Mar 2012, UNITEC 5068; on twigs of rimu tree by Beaufords 18 Feb 2019
<i>Xanthoparmelia scabrosa</i>	Tar seal road and rocks in open; on wooden fence rail top
<i>Xanthoria parietina</i>	On dead twigs of planted tōtara trees, Redoubt Rd entrance, <i>M.D. Wilcox</i> , 28 Apr 2019 (AK); on concrete base of a pylon, <i>M.D. Wilcox</i> , 13 July 2019 (AK)

<i>Heteroscyphus coalitus</i> var. <i>coalitus</i>	On damp soil on shaded bank of Puhinui Stream, in bush, <i>M.D. Wilcox</i> , 16 Apr 2019, 28 Aug 2019
<i>Lejeunea flava</i>	On bark of tōtara tree in bush, Charles Prevost Drive Reserve; on <i>Pittosporum tenuifolium</i> , <i>M.D. Wilcox</i> , 13 July 2019 (AK)
<i>Lunularia cruciata</i> *	crescent-cup liverwort. Bare ground on road edge. Nursery potted plants
<i>Marchantia berteriana</i>	On soil on edge of mānuka thickets; damp ground on edges of drains, <i>M.D. Wilcox</i> , 9 Dec 2019 (AK)
<i>Marchantia polymorpha</i> *	Abundant in plant pots, Friends nursery, <i>M.D. Wilcox</i> , 28 Jan 2020 (AK)

<i>Metzgeria furcata</i>	Bark of <i>Pittosporum tenuifolium</i> ; with mosses on damp lawn by bush; bark of <i>Cordyline australis</i> , with <i>Collema</i> , <i>M.D. Wilcox</i> , 16 Dec 2019 (AK); bark of <i>Pittosporum eugenioides</i> , mixed with <i>Frullania</i> , 24 Dec 2019, <i>M.D. Wilcox</i> , (AK)
<i>Monoclea forsteri</i>	giant thallose liverwort. Stream beds and banks in bush. Common
<i>Pallavicinia tenuinervis</i> (syn. <i>Symphyogyna prolifera</i> ; <i>S. tenuinervis</i>)	On damp shaded bank with <i>Monoclea forsteri</i>
<i>Plagiochila trispicata</i>	On tawa trunk. On māhoe trunk

Mosses

<i>Achrophyllum dentatum</i>	Near waterline of Puhinui Stream, on damp soil bank, bush, <i>M.D. Wilcox</i> , 16 Apr 2019 (AK)
<i>Brachythecium albicans</i>	In damp grassed area on southern boundary, <i>M.D. Wilcox</i> , 28 Aug 2019 (AK)
<i>Breutelia pendula</i>	Damp moss gardens near bush by swimming pool
<i>Bryum dichotomum</i>	On edge of gravel paths and roads in open; road edge, end of Wairere Rd, <i>M.D. Wilcox</i> , 12 June 2019 (AK)
<i>Calliergonella cuspidata</i> *	On damp grassy margin of bush. <i>M.D. Wilcox</i> , 28 Aug 2019 (AK)
<i>Cyrtopus setosus</i>	On bark of a tawa tree, <i>M.D. Wilcox</i> , 22 Jan 2020 (AK)
<i>Didymodon torquatus</i>	On top of stone wall, Eugenia Rise gate entrance
<i>Distichophyllum pulchellum</i>	Waterfall Track, damp base of a large kahikatea tree; damp ground near swimming pool
<i>Eurhynchium praelongum</i>	Abundant in lawns, especially on the margins of the surrounding bush; on exposed roots of an old pine tree, <i>M.D. Wilcox</i> , 5 Feb 2020 (AK)
<i>Fissidens leptocladus</i>	Carpeting rock in shaded, shallow stream
<i>Fissidens taxifolius</i> *	Extensive carpets on ground under mahoe trees, eastern side of park upper Puhinui Stream; Bot Gardens bush, beside track, abundant, <i>M.D. Wilcox</i> , 24 Dec 2019 (AK).
<i>Grimmia pulvinata</i>	On top of stone wall, Eugenia Rise gate entrance
<i>Hypnodendron arcuatum</i>	Damp lawn near edge of bush. At base of trees in shade on ground; on damp soil on shaded bank of Puhinui Stream, in bush, 16 Apr 2019.
<i>Hypnum chrysogaster</i>	On fallen branch of a tōtara tree in open, <i>M.D. Wilcox</i> , 12 June 2019 (AK)
<i>Hypopterygium tamarisci</i>	Damp ground in forest.
<i>Lembophyllum divulsum</i>	On trunk of miro tree, <i>M.D. Wilcox</i> , 28 Jan 2020 (AK)

<i>Porella elegantula</i>	On trunk of <i>Griselinia littoralis</i> , easternmost bridge across Puhinui Stream, <i>M.D. Wilcox</i> , 13 Jul 2019 (AK)
<i>Radula strangulata</i>	On trunk of miro tree, <i>M.D. Wilcox</i> , 28 Jan 2020 (AK)
<i>Siphonolejeunea nudipes</i>	On taraire leaves, <i>M.D. Wilcox</i> , 19 June 2019 (AK), 2 July 2019 (AK)
<i>Spruceanthus olivaceus</i> (syn. <i>Archilejeunea olivacea</i>)	On trunk of kahikatea in the bush; on trunk of lemonwood tree in bush
<i>Symphyogyna undulata</i>	On damp soil on shaded bank of Puhinui Stream, in bush, 16 Apr 2019
<i>Leptostomum inclinans</i>	On trunk of a mahoe tree on forest edge, <i>M.D. Wilcox</i> , 19 June 2019, 21 Sep 2019 (abundant capsules) (AK)
<i>Leucobryum javense</i>	milk moss. Base of <i>Cyathea dealbata</i> ; on ground, Ridge Track; on ground, Puhinui Stream Forest Trail eastern end, 21 Sep 2019
<i>Lopidium concinnum</i>	On a low branch in bush by Puhinui Stream, <i>M.D. Wilcox</i> , 12 June 2019 (AK)
<i>Orthorrhynchium elegans</i>	On bark of mamangi by Puhinui Stream, Botanic Gardens bush, <i>M.D. Wilcox</i> , 22 Jan 2020 (AK)
<i>Papillaria crocata</i>	On bark of māhoe in forest; on bark of macrocarpa in bush; on bark of lemonwood
<i>Ptychomnion aciculare</i>	pipe-cleaner moss. On ground at bush edge, Ridge track. On ground, end of Everglade Drive
<i>Racopilum cuspidigerum</i> var. <i>convolutaceum</i>	Base of a large pūriri tree, in forest; on bank beside track; on top of stone wall, Eugenia Rise gate entrance; on rotten tree fern trunk, Bot Gardens bush, <i>M.D. Wilcox</i> , 28 Aug 2019 (AK)
<i>Rhynchostegium tenuifolium</i>	At base of a <i>Cupressus macrocarpa</i> tree; exposed roots of large <i>Pinus radiata</i> , <i>M.D. Wilcox</i> , 5 Feb 2020 (AK)
<i>Syntrichia antarctica</i>	On top of stone wall, Eugenia Rise gate entrance
<i>Thamnobryum hispidum</i> (<i>Echinodium hispidum</i>)	On timber edging beside bush track; damp ground, Bot Gardens bush
<i>Thamnobryum pandum</i>	On damp soil on shaded bank of Puhinui Stream, in bush, 16 Apr 2019
<i>Thuidium laeviusculum</i>	On ground in dark, damp forest by stream
<i>Trachyloma diversinerve</i>	On bark of <i>Pittosporum eugenioides</i> , <i>M.D. Wilcox</i> , 24 Dec 2019 (AK)
<i>Weymouthia cochlearifolia</i>	On trunk of tanekaha, <i>M.D. Wilcox</i> , 21 Aug 2019 (AK)
<i>Weymouthia mollis</i>	Hanging from twigs of tōtara tree by Puhinui stream
<i>Wijkia extenuata</i>	Base of matai, <i>M.D. Wilcox</i> , 21 Aug 2019 (AK); base of tōtara tree, <i>M.D. Wilcox</i> , 15 Sep 2019 (AK), Charles Prevost Drive Reserve
<i>Zygodon intermedius</i>	On trunk of māhoe

Clubmosses

<i>Lycopodium deuterodensum</i> #	Gardner 1981, Cameron 1992
<i>Phlegmariurus billardierei</i> #	tassel fern, īwituna. Epiphyte on rewarewa. Dakin 1977
<i>Selaginella kraussiana</i> *	African clubmoss

Ferns

<i>Adiantum cunninghamii</i>	common maidenhair	<i>Diploblechnum fraseri</i> (syn. <i>Blechnum fraseri</i>) #	pygmy tree fern. Only record is Cameron 1992
<i>Adiantum fulvum</i>	Cameron 1992, BioBlitz 2012; Lookout, <i>M.D. Wilcox</i> , 28 Aug 2019, (AK). Lookout form with glabrous pinnae formerly known as <i>A. viridescens</i> (Brownsey et al. 2019)	<i>Doodia australis</i> (syn. <i>Blechnum parrisiae</i>)	rasp fern
<i>Adiantum hispidulum</i>	rosy maidenhair. M.D. Wilcox, 9 Apr 2019, photo	<i>Histiopteris incisa</i>	water fern, mātātā. Charles Prevost Drive Reserve, M.D. Wilcox, observation
<i>Adiantum raddianum</i> *	Delta maidenhair fern. Banks of Puhinui Stream, Botanic Gardens, M.D. Wilcox, 9 Nov 2019, photo	<i>Hymenophyllum demissum</i>	filmy fern
<i>Asplenium bulbiferum</i>	hen-and-chickens fern	<i>Hymenophyllum flabellatum</i>	on silver fern trunks
<i>Asplenium flaccidum</i>	hanging spleenwort	<i>Hypolepis ambigua</i>	Wetland, Puhinui Stream, <i>M.D. Wilcox</i> . 5 Feb 2020, (AK)
<i>Asplenium lamprophyllum</i>	Beaufords bush and cultivated at homestead	<i>Icarus filiformis</i> (syn. <i>Blechnum filiforme</i>)	climbing hard fern, thread fern. Commonly climbing up nikau stems
<i>Asplenium oblongifolium</i>	shining spleenwort (not listed by Gardner 1981)	<i>Lastreopsis hispida</i>	hairy fern
<i>Asplenium polyodon</i>	sickle spleenwort	<i>Lastreopsis velutina</i> #	Listed by Beever (1975) but not otherwise recorded. Probably <i>Parapolystichum microsorum</i> (syn. <i>Lastreopsis microsora</i>)
<i>Austroblechnum lanceolatum</i> (syn. <i>Blechnum chambersii</i>)	lance fern	<i>Leptopteris hymenophylloides</i>	crepe fern
<i>Austroblechnum membranaceum</i> (syn. <i>Blechnum membranaceum</i>)		<i>Lomaria discolor</i> (syn. <i>Blechnum discolor</i>) #	crown fern. Gardner 1981
<i>Cardiomanes reniforme</i> #	kidney fern. Recorded by Butterworth 1973	<i>Loxogramme dictyopteris</i>	
<i>Cranfillia fluviatilis</i> (syn. <i>Blechnum fluviatile</i>)	creek hard fern	<i>Lygodium articulatum</i> #	mangemange. Cameron 1992
<i>Cyathea cunninghamii</i>	slender tree fern, gully tree fern <i>R.O. Gardner</i> , 7 May 1981, AK 271102. BioBlitz 2012	<i>Microsorium pustulatum</i>	hound's tongue
<i>Cyathea dealbata</i>	ponga, silver tree fern	<i>Microsorium scandens</i>	fragrant fern. The commonest climbing fern here, on nikau, silver fern and tanekaha
<i>Cyathea medullaris</i>	mamaku	<i>Nephrolepis cordifolia</i> *	tuber sword fern
<i>Cyathea smithii</i> #	Listed by Beever 1975, but not otherwise recorded.	<i>Paesia scaberula</i>	pig fern, ring fern
<i>Deparia petersenii</i>	Charles Prevost Drive Reserve; Puhinui Stream banks	<i>Parablechnum novae-zelandiae</i> (syn. <i>Blechnum novae-zelandiae</i>)	kio kio
<i>Dicksonia fibrosa</i>	wheki-ponga. One plant in wetland, by Puhinui Stream, far eastern part of Totara Park, M.D. Wilcox & G. Falla, 5 Feb 2020	<i>Parapolystichum glabellum</i> (syn. <i>Lastreopsis glabella</i>)	
<i>Dicksonia squarrosa</i>	wheki	<i>Parapolystichum microsorum</i> (syn. <i>Lastreopsis microsora</i>)	Not listed by Gardner 1981. Wilcox & Benham 1997
<i>Diplazium australe</i>	Charles Prevost Drive Reserve; Botanic Gardens bush, by Puhinui Stream, M.D. Wilcox & E. Bodley, 16 Dec 2019	<i>Pellaea rotundifolia</i>	button fern

<i>Pneumatopteris pennigera</i>	gully fern
<i>Polystichum neozelandicum</i>	shield fern. Bot Gardens bush in open near Puhinui Stream, <i>M.D. Wilcox</i> , 9 Nov 2019 (AK)
<i>Pteridium esculentum</i>	bracken
<i>Pteris cretica</i> *	Cretan brake
<i>Pteris macilenta</i>	sweet fern
<i>Pteris tremula</i>	shaking brake
<i>Ptisana salicina</i>	king fern, para (recorded by Butterworth 1973). Planted in Bot Gardens bush 2016
<i>Pyrrosia elaeagnifolia</i>	leather-leaf fern. Common on tōtara branches in open; on stone wall, Eugenia Rise entrance gates; base of large macrocarpa trees, Eugenia Rise entrance

Conifers

<i>Afrocarpus falcatus</i> *	African yellowwood. Seedlings
<i>Agathis australis</i> (cult. & natural)	kauri
<i>Araucaria heterophylla</i> * (cult.)	Norfolk Island pine
<i>Chamaecyparis lawsoniana</i> * (cult.)	Lawsons cypress
<i>Cupressus macrocarpa</i> * (cult.)	Monterey cypress
<i>Dacrycarpus dacrydioides</i>	kahikatea
<i>Dacrydium cupressinum</i>	rimu
<i>Juniperus</i> × <i>pfitzeriana</i> 'Glauc' (<i>J. chinensis</i> × <i>J. sabina</i>) * (cult.)	Pair of spirally sculpted trees at entrance of Beaufords
<i>Libocedrus plumosa</i>	kawaka. A single seedling in Charles Prevost Drive Reserve, possibly planted

Basal angiosperms and magnoliids

<i>Beilschmiedia tarairi</i>	tarairi
<i>Beilschmiedia tawa</i>	tawa
<i>Cinnamomum camphora</i> * (cult.)	camphor laurel
<i>Hedycarya arborea</i>	pigeonwood

Monocots

<i>Acianthus sinclairii</i>	Near lookout. Cameron 1992, ABS 21 Sep 2019
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<i>Rumohra adiantiformis</i>	leathery shield fern. Epiphytic on a tree fern trunk, Puhinui Stream Forest Trail east, ABS (Maureen Young), 21 Sep 2019)
<i>Tmesipteris elongata</i>	fork fern
<i>Tmesipteris lanceolata</i>	fork fern
<i>Trichomanes elongatum</i>	bristle fern. Gardner 1981, Cameron 1992
<i>Trichomanes endlicherianum</i>	bristle fern. On rock beside Puhinui Stream, recorded by M.D. Wilcox
<i>Trichomanes venosum</i>	bristle fern. On silver fern trunks

<i>Pectinopitys ferruginea</i> (syn. <i>Prumnopitys ferruginea</i>) (wild & cult.)	miro. One sizeable tree, Puhinui Stream Forest Trail east, Totara Park. A recently-planted tree near the Friends depot. A small tree, Ridge Track.
<i>Phyllocladus trichomanoides</i>	tanekaha
<i>Pinus banksiana</i> * (cult.)	jack pine, died in late 2019
<i>Pinus halepensis</i> * (cult.)	Aleppo pine
<i>Pinus radiata</i> * (cult.)	Monterey pine
<i>Pinus strobus</i> * (cult.)	eastern white pine. Exotic tree enclosure, <i>M.D. Wilcox</i> , 26 Feb 2020, (AK)
<i>Podocarpus elatus</i> *	brown pine. Seedling
<i>Podocarpus laetus</i> (cult.)	Hall's tōtara
<i>Podocarpus totara</i> (wild and cult.)	tōtara
<i>Prumnopitys taxifolia</i>	matai

<i>Laurelia novae-zelandiae</i>	pukatea
<i>Litsea calicaris</i>	mangeao (recorded by Butterworth 1973)
<i>Magnolia</i> (<i>M. liliiflora</i> × <i>M. campbellii</i>) * (cult.)	Rotary garden. cv. 'Star Wars'
<i>Piper excelsum</i>	kawakawa. Not recorded by Gardner 1981

<i>Agapanthus orientalis</i> * (cult. & wild)	agapanthus
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Monocots cont...

<i>Agrostis capillaris</i> *	browntop
<i>Agrostis stolonifera</i> *	creeping bent. Edge of damp ditch, <i>M.D. Wilcox</i> , 9 Dec 2019 (AK)
<i>Alisma plantago-aquatica</i> *	water plantain. Pond margins
<i>Allium triquetrum</i> *	three-corned garlic, onion weed
<i>Alocasia brisbanensis</i> *	elephant's ear
<i>Aloe arborescens</i> *	torch aloe. Seedling in a native thicket
<i>Alopecurus geniculatus</i> *	marsh foxtail
<i>Anthoxanthum odoratum</i> *	sweet vernal
<i>Anthurium</i> * (cult.)	At Beaufords
<i>Apodasmia similis</i> (cult.)	oioi
<i>Archontophoenix cunninghamiana</i> *	seedlings
<i>Aristea ecklonii</i> *	blue iris
<i>Arrhenatherum elatius</i> *	tall oat grass
<i>Arthropodium bifurcatum</i> (cult.)	Matapouri Bay rengarenga lily
<i>Arthropodium cirratum</i> (cult.)	rengarenga lily
<i>Asparagus scandens</i> *	climbing asparagus
<i>Astelia grandis</i> #	swamp astelia. <i>R.O. Gardner</i> , 15 Jan 1981, AK 151857
<i>Astelia hastata</i>	tank lily, pūwharawhara
<i>Astelia solandri</i>	kōwharawhara, perching lily
<i>Astelia trinervia</i>	kauri grass. Ridge Track, near lookout
<i>Austroderia fulvida</i> (cult. & possibly natural)	toetoe
<i>Axonopus fissifolius</i> *	carpet grass
<i>Bolboschoenus fluviatilis</i>	Purua grass. Pond margins
<i>Bromus catharticus</i> subsp. <i>catharticus</i> (syn. <i>B. willdenowii</i>) *	praire grass
<i>Bromus hordeaceus</i> *	soft brome. Meadows, <i>M.D. Wilcox</i> , 7 Nov 2019, (AK)
<i>Canna</i> × <i>generalis</i> * (cult.)	canna lily. Rotary garden
<i>Carex banksiana</i> (syn. <i>Uncinia banksii</i>)	slender hook sedge
<i>Carex breviculmis</i>	grassland sedge. Ridge Track, ABS (Ben Goodwin), 21 Sep 2019, observation
<i>Carex dissita</i>	Damp areas near Puhinui Stream

<i>Carex divulsa</i> *	grey sedge
<i>Carex geminata</i>	
<i>Carex inversa</i>	
<i>Carex lambertiana</i>	
<i>Carex lessoniana</i>	cutty grass
<i>Carex ochrosaccus</i>	
<i>Carex solandri</i>	
<i>Carex subviridis</i> (syn. <i>Uncinia distans</i>)	
<i>Carex uncinata</i> (syn. <i>Uncinia uncinata</i>)	common hookgrass
<i>Carex virgata</i> (wild & cult.)	
<i>Carex zotovii</i> (syn. <i>Uncinia zotovii</i>)	
<i>Cenchrus clandestinus</i> *	kikuyu grass
<i>Clivia miniata</i> * (cult.)	At Beaufords
<i>Cordyline australis</i> (cult. & wild)	tī kouka, cabbage tree
<i>Cordyline banksii</i>	tī ngahere, Banks's cabbage tree
<i>Cordyline obtecta</i> (cult.)	Three Kings cabbage tree. At Beaufords
<i>Cordyline pumilio</i>	dwarf cabbage tree. Puhinui Stream Forest trail, east, <i>M.D. Wilcox</i> , 22 Jan 2020, observation
<i>Cortaderia selloana</i> subsp. <i>jubata</i> *	purple pampas
<i>Cortaderia selloana</i> subsp. <i>selloana</i> *	pampas
<i>Corybas trilobus</i> (<i>Nematoceras trilobum</i>)	spider orchid. Near lookout, with <i>Acianthus sinclairii</i>
<i>Crocasmia</i> × <i>crocosmiiflora</i> *	montbretia
<i>Ctenanthe lubbersiana</i> * (cult.)	At Beaufords
<i>Cynodon dactylon</i> *	Indian doab
<i>Cynosurus cristatus</i> *	crested dogstail
<i>Cyperus congestus</i> *	umbrella sedge
<i>Cyperus eragrostis</i> *	umbrella sedge
<i>Cyperus ustulatus</i> (wild & cult.)	umbrella sedge
<i>Dactylis glomerata</i> *	cocksfoot
<i>Dianella nigra</i>	blueberry, turutu
<i>Digitaria sanguinalis</i> *	summer grass

<i>Dracaena marginata</i> *	Madagascan dracaena. In Charles Prevost Drive Reserve.
<i>Drymoanthus adversus</i> #	green fleshy tree orchid. Cameron 1992, BioBlitz 2012
<i>Earina autumnalis</i>	scented orchid. On tōtara tree in open, G. Falla, 9 Dec 2019; G. Falla & M.D. Wilcox, 28 Jan 2020, photo
<i>Earina mucronata</i>	bamboo orchid
<i>Echinochloa crus-galli</i> *	barnyard grass
<i>Echinochloa crus-pavonis</i> *	Gulf barnyard grass
<i>Ehrharta erecta</i> *	veldt grass
<i>Eleocharis acuta</i>	spike sedge
<i>Eleusine indica</i> *	crowsfoot. Edge of gravel roads in summer
<i>Festuca rubra</i> subsp. <i>commutata</i> *	Chewing's fescue
<i>Freycinetia banksii</i>	kiekie
<i>Gahnia lacera</i>	bamboo cutty grass
<i>Gahnia pauciflora</i>	Near lookout
<i>Gahnia setifolia</i>	cutty grass
<i>Gahnia xanthocarpa</i>	cutty grass
<i>Glyceria declinata</i> *	floating sweet grass. In wet ditches and bordering storm water outlets, <i>M.D. Wilcox</i> , 9 Dec 2019 (AK)
<i>Holcus lanatus</i> *	Yorkshire fog
<i>Iris foetidissima</i> *	stinking iris
<i>Isachne globosa</i>	swamp millet
<i>Isolepis inundata</i>	Wet area at bush edge, <i>M.D. Wilcox</i> , 28 Jan 2020, (AK)
<i>Isolepis reticularis</i>	
<i>Isolepis sepulcralis</i> *	
<i>Juncus acuminatus</i> *	
<i>Juncus amabilis</i> *	
<i>Juncus articulatus</i> *	jointed rush
<i>Juncus australis</i>	
<i>Juncus bufonius</i> *	toad rush
<i>Juncus edgariae</i>	
<i>Juncus effusus</i> *	soft rush
<i>Juncus microcephalus</i> *	

<i>Juncus planifolius</i>	
<i>Juncus sarophorus</i>	
<i>Juncus tenuis</i> var. <i>tenuis</i> *	track rush
<i>Juncus usitatus</i>	
<i>Lachnagrostis filiformis</i>	NZ wind grass. Edge of a ditch, <i>M.D. Wilcox</i> , 9 Dec 2019 (AK)
<i>Lemna minor</i>	duckweed
<i>Lolium perenne</i> *	perennial ryegrass
<i>Lolium rigidum</i> *	annual ryegrass. Fields, <i>M.D. Wilcox</i> , 24 Dec 2019 (AK)
<i>Machaerina articulata</i> (cult.)	jointed twig rush
<i>Microlaena avenacea</i>	bush rice grass
<i>Microlaena stipoides</i>	meadow rice grass, pātiti
<i>Narcissus pseudonarcissus</i> * (cult.)	daffodil
<i>Narcissus tazetta</i> * (cult.)	polyanthus narcissus
<i>Neoregelia compacta</i> * (cult.)	Beaufords garden
<i>Ophiopogon japonicus</i> * (cult.)	green mondo grass. Rotary Garden. Main car park
<i>Oplismenus hirtellus</i> subsp. <i>imbecillis</i>	slender panic grass
<i>Panicum dichotomiflorum</i> *	smooth witchgrass
<i>Paspalum distichum</i> *	freshwater paspalum. Pond and wetland margins
<i>Paspalum dilatatum</i> *	paspalum
<i>Phormium cookianum</i> (cult.)	NZ flax, wharariki. Main car park
<i>Phormium tenax</i> (wild and cult.)	NZ flax, harakeke
<i>Poa anceps</i>	BioBlitz 2012
<i>Poa annua</i> *	annual poa
<i>Poa trivialis</i> *	rough-stalked meadow grass. Meadows, <i>M.D. Wilcox</i> , 7 Nov 2019 (AK)
<i>Pterostylis alobula</i>	Wilcox & Benham 1997
<i>Rhopalostylis sapida</i>	nikau
<i>Ripogonum scandens</i>	supplejack
<i>Rytidosperma racemosum</i> *	wallaby grass. Track to Lookout, Bot Gardens bush
<i>Schoenus tendo</i>	
<i>Secale cereale</i> *	rye

Monocots cont...

<i>Setaria pumila</i> *	yellow bristle grass. <i>M.D. Wilcox</i> , 5 Feb 2020, (AK)
<i>Sporobolus africanus</i> *	ratstail
<i>Thelymitra</i> sp. #	Gardner 1981
<i>Trachycarpus fortunei</i> *	Chinese windmill palm. Naturalised seedlings, ABS (Frances Duff), 21 Sep 2019

Woody eudicots: trees, shrubs & woody climbers

<i>Acacia verticillata</i> *	prickly Moses
<i>Acer palmatum</i> * (cult.)	Japanese maple
<i>Agonis flexuosa</i> * (cult.)	Western Australian peppermint
<i>Alectryon excelsus</i> (wild & cult.)	titoki
<i>Alnus glutinosa</i> *	alder
<i>Alseuosmia macrophylla</i>	toropapa, karapapa. Wilcox & Benham 1997, but not otherwise recorded
<i>Angophora costata</i> * (cult.)	Sydney red gum, smooth-barked apple
<i>Araujia hortorum</i> *	moth plant
<i>Aristotelia serrata</i> #	wineberry, makomako. Beever 1975, Dakin 1977
<i>Aucuba japonica</i> * (cult.)	At Beaufords
<i>Berberis glaucocarpa</i> * (cult. & naturalised)	barberry
<i>Brachyglottis repanda</i>	rangiora
<i>Calystegia sepium</i> subsp. <i>roseata</i>	native bindweed
<i>Calystegia silvatica</i> *	great bindweed
<i>Camellia</i> * (cult.)	At Beaufords. Pink flowers.
<i>Camellia japonica</i> cultivar * (cult.)	Rotary Garden. Pink flowers, August
<i>Camellia japonica</i> 'White Swan' * (cult.)	At Beaufords. Big single white flowers, August
<i>Carmichaelia australis</i>	native broom. Lookout.
<i>Carpodetus serratus</i>	putaputāwētā
<i>Casuarina cunninghamiana</i> * (cult.)	river sheoak
<i>Cestrum nocturnum</i> * (cult. & wild)	Queen of the night. Beaufords (cult.), Charles Prevost Drive Reserve (wild)
<i>Citrus limon</i> * (cult.)	lemon
<i>Clematis flammula</i> * (possibly cult.)	<i>D. Austin</i> , 9 Mar 2009, AK 304607

<i>Tradescantia fluminensis</i> *	tradescantia, wandering Jew
<i>Vulpia bromides</i> *	vulpia hair grass
<i>Yucca gigantea</i> (syn. <i>Y. guatemalensis</i>) * (cult.)	yucca
<i>Zantedeschia aethiopica</i> *	arum lily
<i>Clematis paniculata</i>	puawānanga
<i>Coprosma arborea</i>	mamangi
<i>Coprosma areolata</i>	
<i>Coprosma crassifolia</i> × <i>C. repens</i> (cult.)	
<i>Coprosma grandifolia</i>	konono
<i>Coprosma</i> × <i>kirkii</i> (cult.)	
<i>Coprosma lucida</i>	shining karamū
<i>Coprosma macrocarpa</i>	coastal karamū. Charles Prevost Drive Reserve
<i>Coprosma repens</i> (cult.)	taupata
<i>Coprosma robusta</i> (wild & cult.)	karamū
<i>Coprosma spathulata</i>	Common on Ridge Track
<i>Coprosma virescens</i> (cult.)	
<i>Corymbia maculata</i> * (cult.)	spotted gum
<i>Corynocarpus laevigatus</i>	karaka
<i>Corokia</i> × <i>cheesemania</i> (cult.)	hybrid corokia (<i>C. cotoneaster</i> × <i>C. buddleoides</i>)
<i>Crataegus monogyna</i> *	hawthorn
<i>Daphne odora</i> * (cult.)	daphne
<i>Dodonaea viscosa</i> (cult.)	akeake
<i>Dysoxylum spectabile</i>	kohekohe
<i>Elaeocarpus dentatus</i>	hīnau (recorded by Butterworth 1973)
<i>Entelea arborescens</i> (cult.)	whau
<i>Eriobotrya japonica</i> *	loquat
<i>Eucalyptus agglomerata</i> * (cult.)	blue stringybark
<i>Eucalyptus botryoides</i> * (cult.)	bangalay
<i>Eucalyptus globoides</i> * (cult.)	white stringybark

<i>Eucalyptus laevopinea</i> * (cult.)	silver-top stringybark
<i>Eucalyptus muelleriana</i> * (cult.)	yellow stringybark
<i>Eucalyptus microcorys</i> * (cult.)	tallowwood. large tree by main carpark
<i>Eucalyptus nicholii</i> * (cult.)	narrow-leaved black peppermint
<i>Eucalyptus obliqua</i> * (cult.)	messmate
<i>Eucalyptus pseudoglobulus</i> * (cult.)	East Gippsland blue gum
<i>Fatsia japonica</i> *	fatsia
<i>Ficus macrophylla</i> * (cult.)	Moreton Bay fig
<i>Fuchsia excorticata</i>	tree fuchsia, kōtukutuku
<i>Fuscospora truncata</i> (cult.)	hard beech. Planted by Forest & Bird c. 1978.
<i>Geniostoma ligustrifolium</i>	hangehange
<i>Gleditsia triacanthos</i> 'Emerald Castle' * (cult.)	weeping honey locust. Rotary Garden
<i>Gomphocarpus fruticosus</i> *	swan plant
<i>Grevillea lanigera</i> Mt Tamboritha' * (cult.)	Rotary Garden
<i>Grevillea robusta</i> * (cult.)	silky oak
<i>Griselinia littoralis</i> (cult.)	broadleaf, pāpāuma
<i>Griselinia lucida</i> #	puka
<i>Haloragis erecta</i>	shrubby haloragis
<i>Hedera helix</i> *	Ivy
<i>Hoheria populnea</i>	lacebark
<i>Hoheria sexstylosa</i> (cult.)	lacebark. In plantings by cycling centre
<i>Hydrangea macrophylla</i> * (cult.)	various cultivars at Beaufords
<i>Knightia excelsa</i>	rewarewa
<i>Kunzea robusta</i>	kānuka
<i>Kunzea</i> sp.	kānuka. Drooping trees planted by carpark, Friends depot
<i>Lagunaria patersonii</i> * (cult.)	Norfolk Island hibiscus
<i>Leptospermum scoparium</i> (cult.)	mānuka
<i>Leucopogon fasciculatus</i>	mingimingi
<i>Leycesteria formosa</i> *	Himalayan honeysuckle
<i>Ligustrum lucidum</i> *	tree privet

<i>Ligustrum sinense</i> *	Chinese privet
<i>Liquidambar styraciflua</i> * (cult.)	sweet gum
<i>Lophostemon confertus</i> * (cult.)	brush box
<i>Melaleuca salicina</i> (syn. <i>Callistemon salignus</i>) * (cult.)	willow bottlebrush
<i>Melicope</i> × <i>mantellii</i> (cult. & wild)	hybrid melicope. F & B 1978 plantings. Seedlings, Puhinui Stream Forest Trail west, ABS visit 21 Sep 2019
<i>Melicope simplex</i>	poataniwha. Ridge Track, M. Wilcox & G. Falla, 26 Feb 2020
<i>Melicope ternata</i> (cult.)	wharangi
<i>Melicytus micranthus</i>	small-leaved māhoe
<i>Melicytus ramiflorus</i>	māhoe
<i>Meryta sinclairii</i> (naturalised)	puka
<i>Metrosideros diffusa</i>	white rātā vine
<i>Metrosideros excelsa</i> (cult.)	pōhutukawa
<i>Metrosideros fulgens</i>	akakura
<i>Metrosideros perforata</i>	small white rātā vine, akatea
<i>Metrosideros robusta</i>	northern rātā. Dead tree, Puhinui Stream Forest Trail east, ABS, 21 Sep 2019
<i>Mida salicifolia</i>	mida, maire taiki. Ridge Track, 3 trees seen, M. Wilcox & G. Falla, 26 Feb 2020
<i>Muehlenbeckia australis</i>	pōhuehue
<i>Myoporum insulare</i> *	boobialla, Australian ngaio. Naturalised near entrance off southern end of Everglade Drive
<i>Myoporum laetum</i> (cult.)	ngaio
<i>Myrsine australis</i>	māpou
<i>Nandina domestica</i> * (cult.)	heavenly bamboo. Beaufords
<i>Nestegis cunninghamii</i> (cult.)	black maire (Cameron 1992)
<i>Nestegis lanceolata</i>	white maire
<i>Olea europaea</i> subsp. <i>europaea</i> *	olive. Numerous seedlings in mulch around kauri plantings, G. Falla, Jan 2020
<i>Olearia albida</i> (cult.)	F & B planting, 1978
<i>Olearia furfuracea</i>	akepiro
<i>Olearia lineata</i> 'Dartonii' (cult.)	twiggy tree daisy
<i>Olearia rani</i>	heketara

Woody eudicots cont...

<i>Paraserianthes lophantha</i> *	brush wattle
<i>Parsonsia heterophylla</i>	akakaikio, New Zealand jasmine
<i>Passiflora tetrandra</i>	native passionfruit, kōhia
<i>Pennantia corymbosa</i>	kaikōmako. Mostly juveniles but one large tree in Bot. Gdns. bush (Cameron 1992)
<i>Pittosporum colensoi</i> (cult.)	rautāwhiri
<i>Pittosporum cornifolium</i>	tāwhiri karo
<i>Pittosporum crassifolium</i> (cult. & wild ex plantings)	karo
<i>Pittosporum eugenioides</i> (cult. & wild ex plantings)	lemonwood, tarata
<i>Pittosporum tenuifolium</i> (cult. & natural)	kōhūhū
<i>Pittosporum umbellatum</i> (cult.)	haekaro
<i>Plagianthus regius</i> (cult.)	ribbonwood. Two cultivated trees near Rotary garden
<i>Platanus × acerifolia</i> * (cult.)	plane
<i>Pomaderris aspera</i> * (cult.)	hazel pomaderris. Beaufords
<i>Populus × canadensis</i> * (cult.)	hybrid poplar
<i>Populus nigra</i> 'Italica' * (cult.)	Lombardy poplar
<i>Populus yunnanensis</i> * (cult.)	Yunnan poplar
<i>Portulacaria afra</i> * (cult.)	jade plant
<i>Prunus serrulata</i> *	hill cherry
<i>Pseudopanax arboreus</i> (wild & cult.)	five-finger, whauwhaupaku
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pseudopanax crassifolius</i> × <i>P. lessonii</i> 'Cyril Watson' (cult.)	hybrid pseudopanax
<i>Pseudopanax lessonii</i> (cult.)	coastal five-finger, houpara
<i>Quercus canariensis</i> * (cult.)	Algerian oak. Main carpark
<i>Quercus palustris</i> * (cult.)	pin oak
<i>Quercus robur</i> * (cult.)	pedunculate oak
<i>Quercus rubra</i> *	red oak
<i>Raphiolepis umbellata</i> * (cult. & naturalised)	sexton's bride. Naturalised in Charles Prevost Drive Reserve
<i>Rhododendron</i> * (cult.)	Beaufords garden

<i>Rosa</i> * (cult.)	Rotary Garden
<i>Rosmarinus officinalis</i> * (cult.)	rosemary
<i>Rubus australis</i> #	bush lawyer
<i>Rubus cissoides</i>	tātārāmoa, bush lawyer
<i>Rubus ulmifolius</i> (<i>R. fruticosus</i> agg.) *	blackberry
<i>Salix cinerea</i> *	grey willow
<i>Schefflera arboricola</i> * (cult.)	At Beaufords
<i>Schefflera digitata</i>	pate
<i>Senna septemtrionalis</i> *	buttercup bush
<i>Solanum aviculare</i> #	poroporo. Gardner 1981
<i>Solanum jasminoides</i> *	potato vine
<i>Solanum laciniatum</i> (cult.)	poroporo
<i>Solanum mauritianum</i> *	woolly nightshade, tobacco weed
<i>Solanum pseudocapsicum</i> *	Jerusalem cherry
<i>Sophora chathamica</i>	kōwhai
<i>Sophora microphylla</i>	kōwhai
<i>Sophora prostrata</i> (cult.)	dwarf kōwhai
<i>Sophora tetraptera</i> (cult.)	large-leaved kōwhai
<i>Streblus banksii</i> (cult.)	large-leaved milk tree, ewekuri
<i>Streblus heterophyllus</i>	milk tree, tūrepo
<i>Syzygium paniculatum</i> *	magenta lilly pilli
<i>Syzygium smithii</i> *	lilly pilli, monkey apple
<i>Tibouchina granulosa</i> * (cult.)	glory tree. Rotary Garden.
<i>Tilia × europaea</i> * (cult.)	common lime, linden
<i>Toona sinensis</i> 'Fleming' *	Chinese toon tree
<i>Ulex europaeus</i> *	gorse
<i>Veronica diosmifolia</i> (cult.)	
<i>Veronica parviflora</i> (cult.)	
<i>Veronica speciosa</i> (cult.)	tītirangi
<i>Veronica stricta</i>	koromiko
<i>Viburnum tinus</i> * (cult.)	laurustinus. Rotary Garden
<i>Vitex lucens</i>	pūriri

Herbaceous eudicots

<i>Acaena</i> sp. #	bidi bidi, pipiripi. Cameron (1992) citing Gardner (1981)
<i>Acanthus mollis</i> *	bear's breeches
<i>Alternanthera nahui</i>	nahui
<i>Amaranthus lividus</i> *	purple amaranth
<i>Anthemis cotula</i> *	stinking mayweed. BioBlitz 2012
<i>Apium nodiflorum</i> *	fool's watercress, water celery
<i>Arctotheca calendula</i> *	Cape weed
<i>Artemisia verlotiorum</i> *	Chinese mugwort
<i>Bellis perennis</i> *	lawn daisy
<i>Bidens frondosa</i> *	beggar's ticks. BioBlitz 2012
<i>Brassica oleracea</i> * (cult.)	ornamental cabbage. Beaufords
<i>Callitriche muelleri</i>	native starwort
<i>Callitriche stagnalis</i> *	starwort
<i>Capsella bursa-pastoris</i> *	shepherd's purse
<i>Cardamine flexuosa</i> *	wavy bitter cress
<i>Cardamine hirsuta</i> *	bitter cress
<i>Carduus pycnocephalus</i> *	slender winged thistle. BioBlitz 2012
<i>Centaureum erythraea</i> *	centaury. Prevalent in fields and by stormwater ponds, M.D. Wilcox, 9 Dec 2019, observation
<i>Centella uniflora</i>	pennywort
<i>Cerastium glomeratum</i> *	mouse-eared chickweed
<i>Chenopodium album</i> *	fat hen
<i>Ciclospermum leptophyllum</i> *	slender celery
<i>Cirsium arvense</i> *	Californian thistle
<i>Cirsium vulgare</i> *	Scotch thistle
<i>Conium maculata</i> *	hemlock
<i>Cotula australis</i>	button weed. On shaded lawns under trees, main picnic area, ABS visit, 21 Sep 2019, M.D. Wilcox (AK)
<i>Crepis capillaris</i> *	hawksbeard
<i>Cyclamen persicum</i> * (cult.)	cyclamen. Beaufords
<i>Cymbalaria muralis</i> *	ivy-leaved toadflax
<i>Daucus carota</i> *	wild carrot, Queen Anne's lace

<i>Dichondra repens</i>	Mercury Bay weed
<i>Digitalis purpurea</i> *	foxglove
<i>Dysphania pumilio</i> * (syn. <i>Chenopodium pumilio</i>)	clammy goosefoot
<i>Epilobium billardieranum</i> subsp. <i>cinereum</i>	willow herb. Edge of ditch, M.D. Wilcox, 9 Dec 2019 (AK)
<i>Epilobium ciliatum</i> *	tall willow herb. Edge of ditch, M.D. Wilcox, 9 Dec 2019 (AK)
<i>Epilobium hirtigerum</i>	hairy willow herb. Edge of ditch, M.D. Wilcox, 9 Dec 2019 (AK)
<i>Erechtites hieracifolia</i> *	American fireweed. Weed in kauri plantations, M.D. Wilcox, 28 Jan 2020, observation
<i>Erechtites valerianifolia</i> *	Brazilian fireweed
<i>Erigeron bonariensis</i> *	wavy-leaved fleabane. BioBlitz 2012
<i>Erigeron karvinskianus</i> *	Mexican daisy. Redoubt Rd entrance, C. Cunneen, 20 Oct 2011, UNITEC 4984; bank of Puhinui Stream, Botanic Gardens, M.D. Wilcox, 22 Jan 2020, observation, photo
<i>Erigeron sumatrensis</i> *	broad-leaved fleabane. BioBlitz 2012
<i>Erodium cicutarium</i> *	storksbill
<i>Erodium moschatum</i> *	storksbill. BioBlitz 2012
<i>Euchiton japonicus</i> (<i>E. collinus</i> ; <i>E. gymnocephalus</i>)	creeping cudweed
<i>Euphorbia maculata</i> *	spotted spurge
<i>Euphorbia peplus</i> *	milkweed
<i>Foeniculum vulgare</i> *	fennel
<i>Fumaria capreolata</i> *	rampant fumitory. BioBlitz 2012
<i>Fumaria muralis</i> *	scrambling fumitory. BioBlitz 2012
<i>Galinsoga quadriradiata</i> *	galinsoga. BioBlitz 2012
<i>Galium aparine</i> *	cleavers
<i>Galium divaricatum</i> *	slender bedstraw
<i>Galium palustre</i> *	marsh bedstraw
<i>Gamochaeta calviceps</i> *	silky cudweed
<i>Gamochaeta coarctata</i> *	purple cudweed
<i>Gamochaeta simplicicaulis</i> *	simple-stemmed cudweed. BioBlitz 2012
<i>Geranium dissectum</i> *	cut-leaf geranium

Herbaceous eudicots cont...

<i>Geranium gardneri</i> *	Gardner's geranium
<i>Geranium homeanum</i> *	In kauri plantings, Friends of Totara Park
<i>Geranium molle</i> *	dove's foot
<i>Geranium purpureum</i> *	lesser herb Robert. Charles Prevost Drive Reserve, <i>M.D. Wilcox</i> , 9 Nov 2019, (AK)
<i>Geranium robertianum</i> *	herb Robert
<i>Geranium solandri</i>	Solander's geranium. BioBlitz 2012
<i>Gonocarpus incanus</i>	piripiri
<i>Helminthotheca echioides</i> *	ox tongue
<i>Hydrocotyle elongata</i> #	Gardner 1981
<i>Hydrocotyle dissecta</i> #	Dakin 1977
<i>Hydrocotyle moschata</i>	hydrocotyle
<i>Hydrocotyle tripartita</i> *	Australian hydrocotyle
<i>Hypericum mutilum</i> *	dwarf St John's wort, <i>M.D. Wilcox</i> (AK)
<i>Hypochaeris radicata</i> *	catsear
<i>Impatiens sodenii</i> *	shrub balsam
<i>Impatiens walleriana</i> *	bizzie lizzie. BioBlitz 2012
<i>Jacobaea vulgaris</i> *	ragwort
<i>Lactuca serriola</i> *	prickly lettuce
<i>Lamium purpureum</i> *	red dead nettle
<i>Lapsana communis</i> *	nipplewort
<i>Leontodon saxatilis</i> *	hawkbit. Abundant in summer, <i>M.D. Wilcox</i> , 9 Dec 2019, observation
<i>Lepidium didymum</i> *	twin cress
<i>Leucanthemum vulgare</i> *	oxeye daisy
<i>Linum bienne</i> *	pale flax
<i>Lobelia anceps</i> #	shore lobelia. Cameron 1992
<i>Lobelia angulata</i>	trailing pratia, panakenake. Gardner 1981
<i>Lobelia pedunculata</i> *	blue star creeper
<i>Lotus angustissimus</i> *	slender birdsfoot trefoil
<i>Lotus pedunculatus</i> *	lotus
<i>Lotus suaveolens</i> *	hairy birdsfoot trefoil

<i>Ludwigia palustris</i> *	water purslane
<i>Lysimachia</i> (formerly <i>Anagallis</i>) <i>arvensis</i> subsp. <i>arvensis</i> var. <i>arvensis</i> *	scarlet pimpernel
<i>Lythrum hyssopifolia</i> *	hyssop loosestrife
<i>Lythrum junceum</i> *	rose loosestrife. Wet area, <i>M.D. Wilcox</i> , 28 Jan 2020, (AK)
<i>Malva nicaeensis</i> *	French mallow. BioBlitz 2012; Charles Prevost Dr. Reserve, <i>M.D. Wilcox</i> , 9 Nov 2019, (AK); beside service road below Goodwood Drive, <i>M.D. Wilcox</i> , 5 Feb 2020, (AK)
<i>Matricaria discoidea</i> *	rayless chamomile. Edge of paths in open, Bot Gardens
<i>Medicago arabica</i> *	spotted burr medick. BioBlitz 2012
<i>Medicago lupulina</i> *	black medick
<i>Mentha pulegium</i> *	penny royal
<i>Mercurialis annua</i> *	annual mercury. BioBlitz 2012
<i>Modiola caroliniana</i> *	creeping mallow
<i>Mycelis muralis</i> *	wall lettuce. BioBlitz 2012
<i>Myosotis discolor</i> *	grassland forget-me-not. Charles Prevost Drive Reserve, <i>M.D. Wilcox</i> , 9 Nov 2010, (AK)
<i>Myosotis laxa</i> *	water forget-me-not
<i>Myosotis sylvatica</i> *	garden forget-me-not. <i>M.D. Wilcox</i> , 9 Nov 2019, (AK)
<i>Nasturtium officinale</i> *	water cress
<i>Nertera dichondrifolia</i> #	forest Nertera. Dakin 1977
<i>Oenanthe pimpinelloides</i> *	parsley dropwort
<i>Oxalis corniculata</i> *	creeping wood sorrel. BioBlitz 2012
<i>Oxalis corniculata</i> var. <i>atropurpurea</i> *	BioBlitz 2012
<i>Oxalis exilis</i>	creeping oxalis
<i>Papaver rhoeas</i> * (cult.)	field poppy. Beaufords, <i>M.D. Wilcox</i> , 16 Nov 2019, observation
<i>Parentucellia viscosa</i> *	tarweed. By stormwater filtration ponds, <i>M.D. Wilcox</i> , 9 Dec 2019, observation
<i>Persicaria decipiens</i>	swamp willow weed
<i>Persicaria</i> "long spike"	Presumed to be a robust form of swamp willow weed, <i>Persicaria decipiens</i> (see Esler 2004 p. 67)
<i>Persicaria hydropiper</i> *	water pepper
<i>Persicaria maculosa</i> *	willow weed. BioBlitz 2012

<i>Persicaria punctata</i> *	American willow weed, dotted smart weed. BioBlitz 2012
<i>Petunia</i> × <i>atkinsiana</i> (syn. <i>Petunia</i> × <i>hybrida</i>)	garden petunia, a pink cultivar. Beaufords
<i>Phytolacca octandra</i> *	inkweed. Along Puhinui Stream in open
<i>Plantago australis</i> *	swamp plantain. BioBlitz 2012
<i>Plantago lanceolata</i> *	narrow-leaved plantain
<i>Plantago major</i> *	broadleaved plantain
<i>Polycarpon tetraphyllum</i> *	allseed
<i>Polygonum arenastrum</i> *	wireweed
<i>Portulaca oleracea</i> *	purslane
<i>Potentilla indica</i> *	Indian strawberry
<i>Potentilla reptans</i> *	creeping cinquefoil
<i>Primula malacoides</i> * (cult.)	fairy primrose. Beaufords.
<i>Prunella vulgaris</i> *	selfheal
<i>Pseudognaphalium luteoalbum</i>	Jersey cudweed
<i>Ranunculus reflexus</i>	native bush buttercup
<i>Ranunculus parviflorus</i> *	small-flowered buttercup
<i>Ranunculus repens</i> *	creeping buttercup
<i>Raphanus raphanistrum</i> *	wild radish
<i>Rumex conglomeratus</i> *	clustered dock
<i>Rumex obtusifolius</i> *	broad-leaved dock
<i>Rumex pulcher</i> *	fiddle dock
<i>Rumex sagittatus</i> *	climbing dock. BioBlitz 2012
<i>Sagina procumbens</i> *	procumbent pearlwort
<i>Senecio bipinnatisectus</i>	fireweed
<i>Senecio esleri</i>	hairy legs
<i>Senecio minimus</i>	fireweed
<i>Senecio skirrhodon</i> *	gravel groundsel
<i>Senecio vulgaris</i> *	groundsel. BioBlitz 2012
<i>Sherardia arvensis</i> *	field madder
<i>Silene gallica</i> *	catchfly. Edge of open ditch, <i>M.D. Wilcox</i> . 9 Dec 2019 (AK)
<i>Sison amomum</i> *	stone parsley. BioBlitz 2012

<i>Sisymbrium officinale</i> *	hedge mustard. BioBlitz 2012
<i>Solanum americanum</i>	small-flowered nightshade
<i>Solanum lycopersicon</i> *	tomato
<i>Solanum nigrum</i> *	black nightshade
<i>Soliva sessilis</i> *	Onehunga weed. BioBlitz 2012
<i>Sonchus asper</i> *	prickly puha
<i>Sonchus oleraceus</i> *	puha
<i>Spergula arvensis</i> *	spurrey
<i>Spergularia rubra</i> *	red sand spurrey
<i>Stachys arvensis</i> *	staggerweed. Edge of ditch, <i>M.D. Wilcox</i> , 9 Dec 2019 (AK)
<i>Stachys byzantina</i> * (cult.)	lamb's ears. Rotary Garden
<i>Stachys sylvatica</i> *	hedge woundwort. Common on open bush edges, especially in damp, shaded places
<i>Stellaria media</i> *	chickweed. BioBlitz 2012
<i>Symphotrichum subulata</i> *	sea aster. Wet areas.
<i>Taraxacum officinale</i> *	dandelion
<i>Torilis arvensis</i> *	spreading hedge parsley
<i>Trifolium micranthum</i> *	lesser suckling clover. Grassy area at edge of storm water pond, <i>M.D. Wilcox</i> , 9 Dec 2019 (AK)
<i>Trifolium pratense</i> *	red clover
<i>Trifolium repens</i> *	white clover
<i>Tropaeolum majus</i> *	garden nasturtium
<i>Verbena bonariensis</i> *	Argentinian vervain. Botanic Gardens
<i>Verbena incompta</i> *	purple-top. BioBlitz 2012 (as <i>V. bonariensis</i>)
<i>Veronica americana</i> *	American brooklime. Open ditch, <i>M.D. Wilcox</i> , 9 Dec 2019, (AK); 22 Jan 2020, observation
<i>Veronica persica</i> *	scrambling speedwell
<i>Veronica plebeia</i>	trailing speedwell. Forest edge near Ridge Track.
<i>Veronica polita</i> *	grey speedwell. Edge of open ditch, <i>M.D. Wilcox</i> , 9 Dec 2019 (AK)
<i>Veronica serpyllifolia</i> *	thyme-leaved speedwell
<i>Viola tricolor</i> *	heartsease. BioBlitz 2012
<i>Wahlenbergia violacea</i> #	Gardner 1981 (as <i>W. gracilis</i>)