

Botany of Mangemangeroa Reserve, south-east Auckland

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Mangemangeroa Reserve is a 22ha narrow mostly steep coastal forest along the north-west edge of Mangemangeroa Creek and parallel to Somerville Road just south of Howick, south-east Auckland (Fig. 1). The Waitemata sediments are deeply cut down by several small streams flow down the escarpment. Manukau City Council bought the land in 1994 and the pleasant walkway along it was established in 1999. A south Auckland Forest & Bird stalwart, Betty Harris, played a key role in persuading the Mayor and Council to purchase the former private farm. The land on the south-east side of the creek was less steep, and contains less native vegetation. Middens and a fortified site indicate Maori occupation previous to European farming. Farm stock was finally excluded from the forest area in 1999 and some possum control has occurred more recently.

Attendees of the Auckland Botanical Society fieldtrip to Mangemangeroa on 20 May 2006: Sally Barclay (Royal Society Teacher Fellow researching the reserve), Ewen Cameron, Holly Cox (past ecological researcher of the catchment), Gail Donaghy, Graham Falla (Friends of Mangemangeroa Reserve), Colleen Frampton, Leslie Haines, Graeme Jane, Sandra Jones, Joan Kember, Helen Lyons, Elaine Marshall, Carol & Garry McSweeney, Cara and Ros Nicholson (trip leader), Juliet Richmond, Josh Slater and Tony Williams.

In 2000 local Rotary clubs and Forest and Bird, working separately, became involved in bush restoration planting, and the Friends of Mangemangeroa was formed 1-2 years after that (incorporated in 2002) with the aim of fostering the wellbeing of Mangemangeroa with emphasis on protecting the natural features. The Friends come under the umbrella of Manukau Parks and work in consultation with them. In October 2006 a revised draft Management Plan for the reserve was released for public comment.

The author of a recent MSc thesis of the Mangemangeroa catchment, Holly Cox (2000), joined us for the trip. Holly's thesis was written on the terrestrial ecology, with an emphasis on the large and small scale vegetation patterns, in the Mangemangeroa Catchment. This was undertaken as part of a larger study of how the catchment and protected estuary would be affected by lifestyle block development due to district plan change. She examined: land use and vegetation history and the relationship between the two; current vegetation of the catchment; conservation mechanisms of habitat on private property. The fieldwork undertaken included: permanent plots 15 x 15m; sampling of all vegetation-cover abundance; basal area and density; litter depth, soil compactness; bird counts. The data collected was analysed using classification and ordination. Analysed data was then separated into vegetation types and mapped.

Sally Barclay (2003) also joined us for part of the day. She completed a NZ Science Mathematics and Technology Teacher Fellowship in 2003. She documented the location of the larger trees in the reserve using a GPS and digital photography.

Thomas Cheeseman made notes of his visit 'Howick to Maungamaungaroa [Mangemangeroa]' in June 1873 (Stanley 1998) and recorded 'scanty' vegetation of *Metrosideros robusta*, akepiro (*Olearia furfuracea*), *Coprosma lucida*, *C. robusta*, *Leucopogon fasciculatus*, and *Ozothamnus leptophyllus*.

Two of these (akipiro, *Oz. leptophyllus*) are not currently recorded for the reserve. Cheeseman recorded at that time on the western side of the creek "...is distinguished with several patches of bush" and on the eastern bank opposite the most common trees were tawa (*Beilschmiedia tawa*), taraire (*B. tarairi*), puriri (*Vitex lucens*), toro (*Myrsine salicina*) (not currently listed for the reserve), mapou (*M. australis*), kohekohe (*Dysoxylum spectabile*) and with a few rimu (*Dacrydium cupressinum*), kahikatea (*Dacrycarpus dacyrdooides*) and kauri (*Agathis australis*).

Alan Esler and one of his sons, Wilson, in December 1984 surveyed the escarpment on the northwestern side of the Mangemangeroa Creek before the reserve was created (Esler & Esler 1985). They briefly described the habitat, vegetation, made several management considerations and provided a vascular plant list of 115 native species. They also interestingly pointed out: "This is the most species-rich forest bordering an estuary in the Waitemata or Manukau Harbours."

This reserve has some splendid remnants of mature coastal broadleaf forest. The area has been divided into seven vegetation communities: mature kohekohe, taraire forest, mahoe (*Melicytus ramiflorus*)/kawakawa (*Macropiper excelsum*)/mapou forest, regenerating totara (*Podocarpus totara*), taraire/kohekohe forest, mangroves (*Avicennia marina*), grassland (Fig. 2, Manukau City Council 2006). Although it is a narrow coastal strip of bush, the diversity is from saltmarsh (north end) species such as *Plagianthus divaricatus*, *Samolus repens*, *Selliera radicans* and oioi (*Apodasmia similis*), to cliff and gully species, with a small number of freshwater wetland (south end) species, including *Baumea rubiginosa* – others were difficult to distinguish at that time of the year. The mahoe/kawakawa/mapou forest is noticeably youngest and is located toward the narrow north-eastern end of the reserve and also adjacent to the grassed area along Somerville Road. The central bush patches of mature kohekohe forest and the taraire/kohekohe forest have some very large trees such as emergent *Metrosideros robusta*, and canopy species titoki (*Alectryon excelsus*), kohekohe, rewarewa (*Knigthea excelsa*), taraire, tawa, puriri, karaka (*Corynocarpus laevigatus*), kowhai (*Sophora microphylla* s.l) and pigeonwood (*Hedycarya arborea*). Towards the south-western end of the reserve is the taraire dominated forest with large kahikatea. *Clematis paniculata* is scattered through the forest. Undergrowth is healthy for the majority of the forest, e.g. mangeao (*Litsea calicaris*) seedlings, although the area of dense regenerating totara c.8m tall was sparse underneath.

How appropriate to visit an area named after a fern. The reserve and estuary name means 'valley of the mangemange' named after the climbing fern *Lygodium articulatum*, which is very local in the valley (Holly Cox pers. comm.). It may have been more common before the area was heavily disturbed. It was used by Maori for: rope, thatching (lashing the thatch), fish hooks, eel traps, cutting greenstone and coils to sleep on – the term "bushman's mattress" recalls how early Europeans also used it for rough bedding (Riley 1994).

Revegetation is occurring in the small patches within the fenced reserve. Over the last six years there has also been planting (evidently eco-sourced), of mostly *Coprosma robusta*, manuka (*Leptospermum scoparium*) and kawakawa, with some taraire, kahikatea, puriri and totara. Some of the planted kawakawa shrubs in the open suffered from a leaf curl – after showing photos and samples to various experts the cause was left unresolved.

Unfortunately there has been some vandalism to vines especially cutting off large rata vines, and it is thought to be possibly due to a misunderstanding of the value of these plants. However, along the

protected bush edge adjacent to the grazed pasture is a number of fine specimens of rata: *Metrosideros diffusa*, *M. fulgens*, *M. perforata* and the most special was carmine rata (*M. carminea*) which was locally common. Most carmine rata were in the open climbing up old ponga trunks intermixed with *M. perforata*.

Comments on selected native species

Asplenium hookerianum – both forms (*A. hookerianum* var. *hookerianum* & var. *colensoi*) were present at one locality growing together on a shaded trackside bank under the tall coastal broadleaf forest (Fig. 3). Leon Perrie (pers. comm.) says that it is not unusual for the two forms to grow together, although it does appear to be unusual for northern New Zealand (pers. ob.).

Blechnum ?norfolkianum – as noted by Brownsey & Smith-Dodsworth (2000) *B. norfolkianum* is a poorly defined species which is difficult to tell apart from large mainland forms of *B. chambersii* and that the two may hybridise. In one forested area on a stream bank by the walkway there were several of these large ferns with sterile fronds to 50cm long x 12.5cm across, with shorter fertile fronds 27 x 6cm (AK 296885).

Streblus heterophyllus hybrid? – occasional wild shrubs (c.1m tall) in the sparse understorey of a dense stand of 8m-tall totara. The lower leaves fiddle-shaped but too large for this species (leaf blade to 7.0cm long x 3.5cm across (Fig. 4, AK 296884)? Perhaps they are hybrids with *S. banksii*?

Weeds

Esler & Esler (1985) commented that the area contained many alien plants which impair the value of forest reserves and then listed: hawthorn (*Crataegus monogyna*), brush wattle (*Paraserianthes lophantha*), blackberry (*Rubus fruticosus* agg.), tree privet (*Ligustrum lucidum*), Chinese privet (*L. sinense*), wild ginger (*Hedychium gardnerianum*), Himalaya honeysuckle (*Leycesteria formosa*), moth plant (*Araujia sericifera*), gorse (*Ulex europaeus*), pampas (*Cortaderia selloana*) and woolly nightshade (*Solanum mauritianum*). These are all still present today, plus many more (see Species List). However, the Friends have made weeds a high profile in the reserve with photos of target species like wandering Jew (*Tradescantia fluminensis*), woolly nightshade, wattle, moth plant) and collection bags and bins for regular walkers to contribute – this has been partially successful. At the eastern end of the walkway by the estuary several weed species seemed to be localised in this area by what was possibly an old house site marked by two old Morton Bay fig trees (*Ficus macrophylla*). The weeds here included: *Plectranthus ciliatus*, Port St John creeper (*Podranea ricasoliana*) scrambling up through other vegetation to 6m high, a couple of shrubs of *Fuchsia boliviana*; and on patches of an exotic moss, *Fissidens taxifolius*, were seedlings of Queensland poplar (*Homalanthus populifolius*) and loquat (*Eriobotrya japonica*). If not managed the small patch of *Carex divisa* observed on the estuary margin has the potential to spread and form extensive swards.

Birds

Birds recorded during our visit: blackbird, Eastern rosella, fantail, grey warbler, harrier, Indian myna, kingfisher, NZ pigeon, silvereye, tui, pukeko, welcome swallow, pied shag, white-faced heron, and Caspian tern.

Conclusions

It was a delight to visit such a treasure hidden away on the side of the estuary. The local residents and Manukau City are to be congratulated in keeping development off this steep land and restoring the bush areas. The walkway is a wonderful asset which gives everyone easy access through the best forested parts and wonderful vistas.

Acknowledgements

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Vascular plant species list

- Key
EE = records from Esler & Esler (1985) – with names updated
W = addition from website www.aerolink.co.nz/mangemangeroa (2006)
ABS = seen by Auckland Botanical Society, May 2006 (* = appears to be a new record)
DC = additional records from a Landcare Research report (Stevens 1995) – a few unlikely records have been omitted
+ = was already listed on the fieldtrip handout Species List
AK = herbarium specimens (collected by: RO Gardner, Jan 1981; AE & WR Esler, Dec 1984; RG Falla, Sep 1997; EK Cameron, May 2006)

(A) Native vascular species

Ferns

<i>Adiantum aethiopicum</i>	DS
<i>A. cunninghamii</i>	EE, DS, ABS
<i>A. diaphanum</i>	ABS+
<i>A. fulvum</i>	EE, ABS
<i>A. hispidulum</i>	EE, DS, ABS
<i>Arthropteris tenella</i>	EE, ABS, AK
<i>Asplenium flaccidum</i>	EE, ABS
<i>A. gracillimum</i>	ABS*, AK (EE, DS as <i>A. bulbiferum</i> ?)
<i>A. hookerianum</i> var. <i>hookerianum</i>	EE, ABS, AK
<i>A. hookerianum</i> var. <i>colensoi</i>	ABS*, AK
<i>A. lamprophyllum</i>	EE, DS, ABS
<i>A. oblongifolium</i>	EE, DS, ABS
<i>A. polyodon</i>	EE, DS, ABS
<i>Blechnum blechnoides</i>	W
<i>B. chambersii</i>	EE, ABS
<i>B. filiforme</i>	EE, DS, ABS
<i>B. fluviatile</i>	W
<i>B. membranaceum</i>	DS, ABS
<i>B. ?norfolkianum</i>	ABS*, AK
<i>B. novae-zelandiae</i>	EE, DS, ABS
<i>Cyathea dealbata</i>	EE, DS, ABS
<i>C. medullaris</i>	EE, DS, ABS
<i>Deparia petersenii</i>	ABS+
<i>Dicksonia squarrosa</i>	DS
<i>Diplazium australe</i>	DS, ABS
<i>Doodia australis</i>	EE, DS, ABS
<i>Grammitis billardierei</i>	DS
<i>Histiopteris incisa</i>	DS
<i>Hymenophyllum demissum</i>	EE, DS, ABS
<i>Lastreopsis glabella</i>	EE, DS, ABS
<i>L. hispida</i>	DS
<i>L. microsora</i>	EE, DS, AK
<i>L. velutina</i>	EE, AK

<i>Leptopteris hymenophylloides</i>	W
<i>Lygodium articulatum</i>	W
<i>Microsorium pustulatum</i>	EE, DS, ABS
<i>M. scandens</i>	EE, DS, ABS
<i>Paesia scaberula</i>	DS, ABS
<i>Pellaea rotundifolia</i>	EE, DS, ABS
<i>Polystichum neozelandicum</i>	EE, DS, ABS, AK
<i>Pneumatopteris pennigera</i>	EE, DS, ABS
<i>Pteridium esculentum</i>	EE, DS, ABS
<i>Pteris macilenta</i>	EE, ABS
<i>P. tremula</i>	EE, ABS
<i>Pyrrosia eleagnifolia</i>	EE, DS, ABS
<i>Rumohra adiantiformis</i>	W
<i>Tmesipteris lanceolata</i>	ABS+

Conifers

<i>Dacrycarpus dacrydioides</i>	EE, DS, ABS
<i>Dacrydium cupressinum</i>	DS
<i>Phyllocladus trichomanoides</i>	DS
<i>Podocarpus totara</i>	EE, ABS (DS as <i>P. hallii</i> ?)

Dicotyledons

<i>Alectryon excelsus</i>	EE, DS, ABS
<i>Apium</i> "white denticles"	EE, DS, ABS*, AK
<i>Aristotelia serrata</i>	ABS+
<i>Avicennia marina</i>	EE, DS, ABS
<i>Beilschmeidia tarairi</i>	EE, DS, ABS
<i>B. tawa</i>	EE, DS, ABS
<i>Brachyglottis repanda</i>	EE, DS, ABS*
<i>Carmichaelia australis</i>	ABS
<i>Carpodetus serratus</i>	EE, DS, ABS
<i>Centella uniflora</i>	ABS*
<i>Clematis paniculata</i>	ABS*
<i>Coprosma arborea</i>	EE, DS, ABS
<i>C. lucida</i>	ABS*
<i>C. macrocarpa</i>	EE, DS, ABS, AK
<i>C. robusta</i>	EE, DS, ABS
<i>Corynocarpus laevigatus</i>	EE, DS, ABS
<i>Cotula coronopifolia</i>	DS, ABS
<i>Dysoxylum spectabile</i>	EE, DS, ABS
<i>Elaeocarpus dentatus</i>	EE, DS
<i>Euchiton gymnocephalus</i>	EE
<i>Fuschia excorticata</i>	EE, DS, ABS
<i>Geniostoma ligustrifolium</i>	EE, DS, ABS
<i>Haloragis erecta</i>	EE, ABS
<i>Hebe stricta</i>	EE

<i>Hedycarya arborea</i>	EE, DS, ABS
<i>Knightea excelsa</i>	EE, DS, ABS
<i>Kunzea ericoides</i>	EE, DS, ABS
<i>Laurelia novae-zelandiae</i>	ABS+
<i>Leptospermum scoparium</i>	DS, ABS
<i>Leucopogon fasciculatus</i>	EE, DS, ABS
<i>Lilaeopsis novae-zelandiae</i>	EE
<i>Litsea calicaris</i>	EE, DS, ABS
<i>Lobelia anceps</i>	DS, ABS
<i>Macropiper excelsum</i>	EE, DS, ABS
<i>Melicytus micranthus</i>	EE
<i>M. ramiflorus</i>	EE, DS, ABS
<i>Metrosideros carminea</i>	ABS+, AK
<i>Metrosideros diffusa</i>	ABS*
<i>M. excelsa</i>	EE, DS, ABS
<i>M. fulgens</i>	EE, DS, ABS
<i>M. perforata</i>	EE, DS, ABS
<i>M. robusta</i>	ABS+
<i>Muehlenbeckia australis</i>	DS, ABS
<i>M. complexa</i>	EE, DS, ABS
<i>Myrsine australis</i>	EE, DS, ABS
<i>Nestegis lanceolata</i>	ABS*
<i>Parsonsia heterophylla</i>	EE, DS, ABS
<i>Persicaria decipiens</i>	ABS*
<i>Pittosporum crassifolium</i>	ABS
<i>P. tenuifolium</i>	ABS*
<i>Plagianthus divaricatus</i>	EE, DS, ABS
<i>Pseudopanax crassifolius</i>	EE, DS, ABS
<i>P. lessonii</i>	EE, DS
<i>Ranunculus reflexus</i>	EE, DS
<i>Rubus cissioides</i>	EE, DS
<i>Samolus repens</i>	EE, DS, ABS
<i>Sarcocornia quinquefolia</i>	DS
<i>Schefflera digitata</i>	EE, DS, ABS
<i>Selliera radicans</i>	EE, DS, ABS
<i>Senecio glomeratus</i>	DS
<i>S. hispidulus</i>	DS, EE
<i>S. minimus</i>	EE, DS
<i>Solanum americanum</i>	EE, DS, ABS
<i>Sophora chathamica</i>	
<i>Sophora microphylla</i> s.lat.	EE, DS, ABS
<i>Streblus ?banksii</i> x <i>S. heterophyllus</i>	ABS*, AK
<i>S. heterophyllus</i>	EE, DS
<i>Vitex lucens</i>	EE, DS, ABS
<i>Wahlenbergia littoricola</i>	EE, ABS

Monocotyledons

<i>Apodasmia similis</i>	EE, DS, ABS
<i>Astelia banksii</i>	EE, DS, ABS
<i>Austrostipa stipoides</i>	DS
<i>Baumea rubiginosa</i>	ABS*
<i>Bolboschoenus fluviatilis</i>	EE, DS, ABS
<i>B. medianus</i>	DS
<i>Carex dissita</i>	EE, DS, ABS
<i>C. flagellifera</i>	EE, DS, ABS
<i>C. geminata</i> agg.	EE, DS, ABS
<i>C. lambertiana</i>	EE, DS, ABS
<i>C. ochrosaccus</i>	EE, DS, ABS
<i>C. spinirostris</i>	EE, ABS
<i>C. virgata</i>	EE, DS, ABS
<i>Collospermum hastatum</i>	EE, DS, ABS
<i>Cordyline australis</i>	EE, DS, ABS
<i>C. australis</i> x <i>C. banksii</i>	EE, DS
<i>Cyperus ustulatus</i>	EE, DS, ABS
<i>Dianella nigra</i>	EE, DS
<i>Drymoanthus adversus</i>	ABS*
<i>Earina mucronata</i>	ABS*
<i>Echinopogon ovatus</i>	EE
<i>Freycinetia banksii</i>	EE, DS, ABS
<i>Gahnia lacera</i>	EE, DS, ABS
<i>Isolepis cernua</i>	EE, DS, ABS
<i>Juncus edgariae</i>	EE, DS
<i>J. kraussii</i>	EE, DS, ABS
<i>J. pallidus</i>	DS
<i>J. planifolius</i>	EE, DS
<i>J. prismatocarpus</i>	DS
<i>Libertia ixioides</i>	EE, AK
<i>Luzula picta</i> var. <i>limosa</i>	DS
<i>Microlaena stipoides</i>	EE, DS, ABS
<i>Microtis unifolia</i>	EE
<i>Oplismenus hirtellus</i>	EE, ABS
<i>Phormium tenax</i>	EE, DS, ABS
<i>Poa anceps</i>	EE, DS, ABS
<i>Rhopalostylis sapida</i>	EE, DS, ABS
<i>Ripogonum scandens</i>	EE, DS, ABS
<i>Rytidosperma biannulare</i>	EE, DS
<i>Triglochin striata</i>	EE
<i>Uncinia uncinata</i>	EE, DS, ABS
<i>Zostera muelleri</i>	EE, ABS, AK

(B) Adventive vascular species

Conifers

Cupressus macrocarpa DS, ABS
Pinus radiata ABS*

Dicotyledons

Acacia mearnsii ABS*
Araujia sericifera EE, DS, ABS
Aster subulatus ABS*
Atriplex prostrata ABS*
Callitriche stagnalis ABS*
Calystegia sepium x *C. sylvaticum* EE, ABS*
Centaureum erythraea ABS*
Cestrum nocturnum ABS*
Cirsium vulgare ABS*
Crataegus monogyna EE, DS, ABS
Conyza sumatrensis ABS*
Duchesnea indica ABS*
Eriobotrya japonica ABS*, AK
Ficus macrophylla (cult.) ABS*
Fuchsia boliviana ABS*, AK
Galium aparine ABS*
Gamochaeta coarctata ABS*
Geranium homeanum ABS*, AK
Helminthotheca echioides ABS*
Homolanthus populifolius ABS*, AK
Jasminum polyanthum DS
Leycesteria formosa EE, DS, ABS
Ligustrum lucidum EE, DS, ABS
L. sinense EE, DS, ABS
Linum bienne DS
Lythrum hyssopifolia ABS*
Lotus pedunculatus DS
Lycopersicon esculentum ABS*
Mentha pulegium DS
Myosotis sylvatica ABS*
Nasturtium microphyllum EE, DS, AK
N. officinale DS, ABS
Paraserianthes lophantha EE, ABS
Pericallis x hybrida DS
Physalis peruvianum ABS*
Phytolacca octandra DS, ABS
Plantago australis DS
P. coronopus DS
Plectranthus ciliatus DS, ABS, AK
Podranea ricasoliana ABS*, AK
Prunella vulgaris ABS*
Ranunculus repens DS, ABS

<i>Rhus succedanea</i>	ABS*, AK
<i>Rubus fruticosus</i> agg.	EE, DS, ABS
<i>Rumex brownii</i>	DS
<i>R. crispus</i>	DS, ABS
<i>R. obtusifolius</i>	ABS*
<i>Senecio bipinnatisectus</i>	ABS*
<i>S. esleri</i>	ABS*
<i>S. mikanioides</i>	DS
<i>S. skirrhodon</i>	ABS*
<i>Silybum marianum</i>	DS
<i>Solanum mauritianum</i>	EE, DS, ABS
<i>S. nigrum</i>	ABS*
<i>Sonchus oleraceus</i>	DS, ABS
<i>Stachys sylvatica</i>	ABS*, AK
<i>Syzygium smithii</i>	ABS*
<i>Tropaeolum majus</i>	ABS*
<i>Ulex europaeus</i>	EE, DS, ABS
<i>Veronica serpyllifolia</i>	ABS*

Monocots

<i>Asparagus asparagoides</i>	ABS*
<i>A. scandens</i>	ABS*
<i>Carex divisa</i>	ABS*, AK
<i>Cortaderia selloana</i>	EE, DS, ABS
<i>Cyperus eragrostis</i>	DS, ABS
<i>Dactylis glomerata</i>	DS, ABS
<i>Gladiolus undulatus</i>	ABS*
<i>Hedychium gardnerianum</i>	EE, DS, ABS
<i>Holcus lanata</i>	DS, ABS
<i>Juncus acuminatus</i>	DS,
<i>J. articulatus</i>	DS, ABS
<i>J. effusus</i>	ABS*
<i>J. gerardii</i>	DS
<i>Paspalum vaginatum</i>	ABS*
<i>Pennisetum clandestinum</i>	ABS*
<i>Schedonorus phoenix</i>	DS, ABS
<i>Tradescantia fluminensis</i>	DS, ABS
<i>Zantedeschia aethiopicum</i>	ABS*

Fig. 1. Location of Mangemangeroa Reserve, near Howick.

Fig. 2. Seven vegetation zones of the Mangemangeroa Reserve – from the Restoration Plan (Manukau City 2006).

Fig. 3. Both forms of *Asplenium hookerianum*: *A. hookerianum* var. *hookerianum* & var. *colensoi*(more finely dissected) growing together on a shaded bank.

Fig. 4. *Streblus heterophyllus* hybrid? – leaves too large for this species?