Samolus repens
Solanum americanum
Solanum aviculare var. *albiflorum*
Solanum aviculare var. *aviculare*
Sophora chathamica
Streblus heterophyllus
Streblus heterophyllus x *S. banksii*
Vitex lucens

Monocotyledons

Acianthus sinclairii
Apodasmia similis
Astelia solandri
Baumea juncea
Baumea rubiginosa
Carex flagellifera
Carex lambertiana
Carex lessoniana
Carex solandri
Carex virgata
Collospermum hastatum
Cordyline australis
Cordyline banksii
Cyrtostylis oblonga
Dianella nigra
Eleocharis acuta
Ficinia nodosa
Freycinetia banksii
Gahnia lacera
Gahnia pauciflora
Gahnia xanthocarpa
Isolepis cernua
Juncus krausii
Libertia grandiflora
Microlaena stipoides
Nematoceras trilobum
Oplismenus hirtellus
Phormium tenax
Poa anceps
Pterostylis agathicola
Rhopalostylis sapida
Ripogonum scandens
Schoenoplectus tabernaemontani
Triglochin striata
Typha orientalis
Uncinia banksii
Uncinia uncinata
Uncinia zotovii

Botany of Mangemangeroa Reserve, south-east Auckland. 20/05/06

Ewen K Cameron & Leslie Haines

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 is 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.

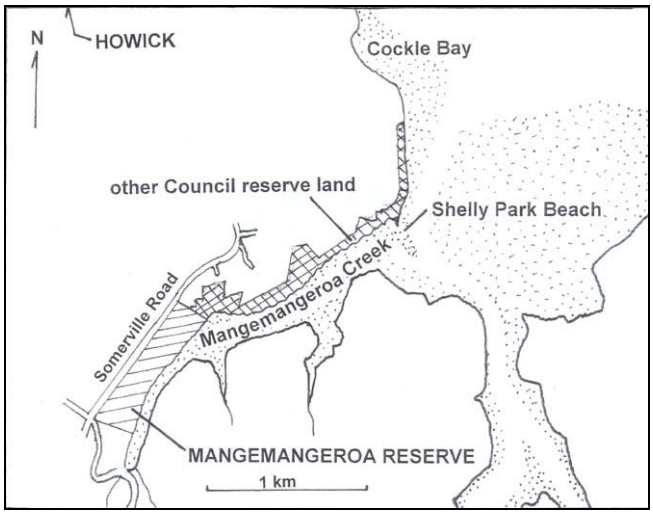

Fig. 1. Location of Mangemangeroa Reserve, near Howick.

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 (akepiro *O. 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 dacrydioides*) 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 (*Knightia 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*.

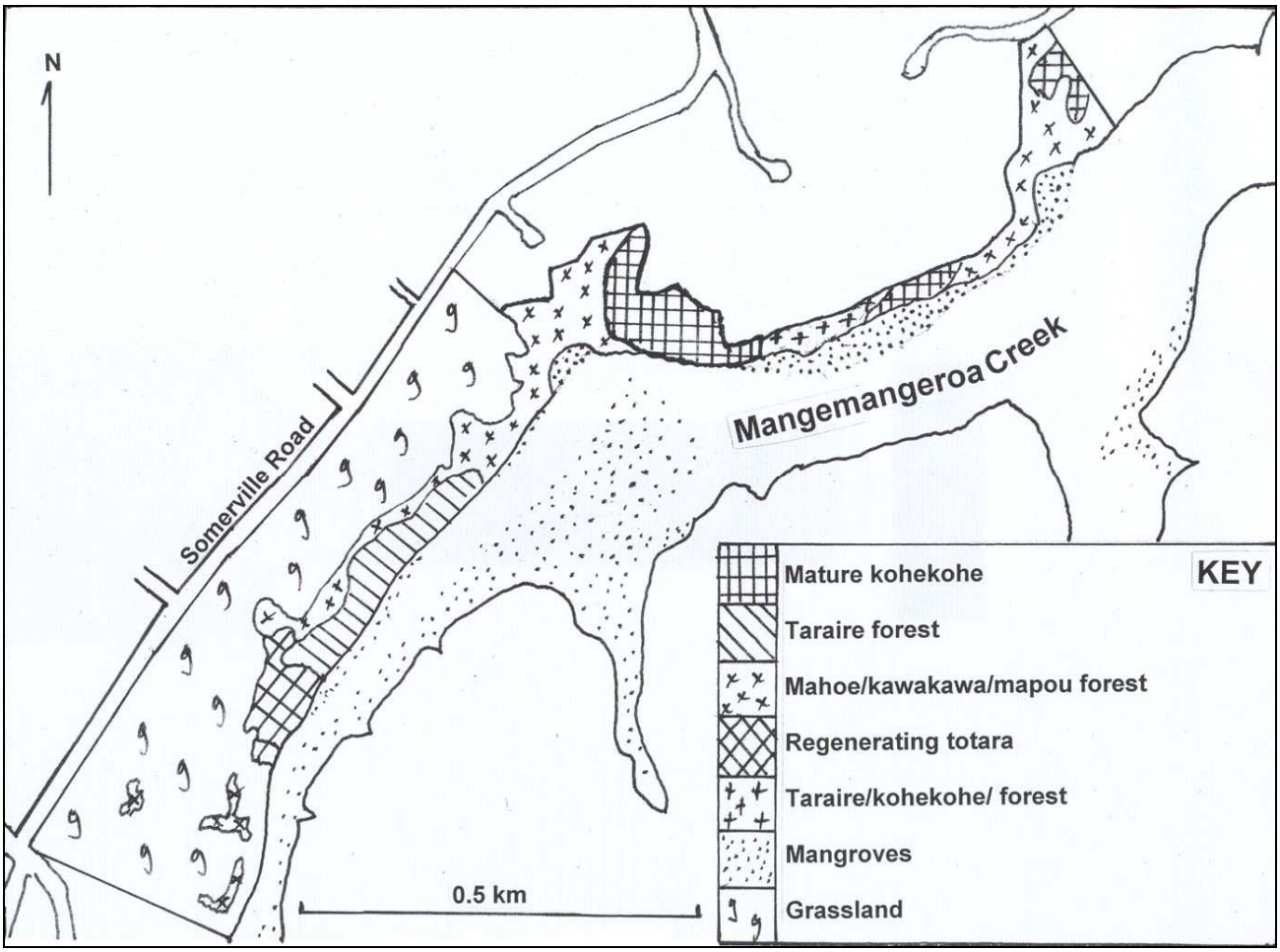

Fig. 2. Seven vegetation zones of the Mangemangeroa Reserve (and adjacent Council reserve land) – adapted from the Restoration Plan (Manukau City 2006: fig. 3).

Fig. 3. Both forms of *Asplenium hookerianum*: *A. hookerianum* var. *colensoi* (at left, more finely dissected AK 151875) & *A. hookerianum* var. *hookerianum* (right AK 151874) growing together on a shaded bank.

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 is unusual this far north (Ewen Cameron 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 (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 starting to restore the bush areas. The walkway is a wonderful asset which gives everyone easy access through the best forested parts and wonderful vistas.

Acknowledgements

Thanks to all on the trip for their comments; Graham Falla and Ros Nicholson for information about the area; and Alan Esler, Trudy McNie , Malcolm Page (Manukau City Council) and Bec Stanley for assistance in tracking down references.

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Vascular plant species list for Mangemangeroa Reserve and adjoining Council coastal reserve land to Shelly Park Beach (see Fig. 1).

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)
DS = additional records from a Landcare Research report (David Stevens 1995) – a few unlikely records have been omitted
\+ = was already listed on the fieldtrip handout Species List by Sally Barclay
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	
Adiantum aethiopicum	DS
A. cunninghamii	EE, DS, ABS
A. diaphanum	ABS+
A. fulvum	EE, ABS
A. hispidulum	EE, DS, ABS
Arthropteris tenella	EE, ABS, AK
Asplenium flaccidum	EE, ABS
A. gracillimum	ABS*, AK (EE, DS as *A. bulbiferum*?)
A. hookerianum var. *hookerianum*	EE, ABS, AK
A. hookerianum var. *colensoi*	ABS*, AK
A. lamprophyllum	EE, DS, ABS
A. oblongifolium	EE, DS, ABS
A. polyodon	EE, DS, ABS
Blechnum chambersii	EE, ABS
B. filiforme	EE, DS, ABS
B. fluviatile	W
B. membranaceum	DS, ABS
B. ?*norfolkianum*	ABS*, AK
B. novae-zelandiae	EE, DS, ABS
Cyathea dealbata	EE, DS, ABS
C. medullaris	EE, DS, ABS
Deparia petersenii	ABS+
Dicksonia squarrosa	DS
Diplazium australe	DS, ABS
Doodia australis	EE, DS, ABS
Grammitis billardierei	DS
Histiopteris incisa	DS
Hymenophyllum demissum	EE, DS, ABS
Lastreopsis glabella	EE, DS, ABS
L. hispida	DS
L. microsora	EE, DS, AK
L. velutina	EE, AK
Leptopteris hymenophylloides	W
Lygodium articulatum	W
Microsorum pustulatum	EE, DS, ABS
M. scandens	EE, DS, ABS
Paesia scaberula	DS, ABS
Pellaea rotundifolia	EE, DS, ABS
Polystichum neozelandicum	EE, DS, ABS, AK
Pneumatopteris pennigera	EE, DS, ABS
Pteridium esculentum	EE, DS, ABS
Pteris macilenta	EE, ABS
P. tremula	EE, ABS
Pyrrosia eleagnifolia	EE, DS, ABS
Rumohra adiantiformis	W
Tmesipteris lanceolata	ABS+
Conifers	
Dacrycarpus dacrydioides	EE, DS, ABS
Dacrydium cupressinum	DS
Phyllocladus trichomanoides	DS
Podocarpus totara	EE, ABS (DS as *P. hallii*?)
Dicotyledons	
Alectryon excelsus	EE, DS, ABS
Apium "white denticles"	EE, DS, ABS*, AK
Aristotelia serrata	ABS+
Avicennia marina	EE, DS, ABS
Beilschmeidia tarairi	EE, DS, ABS
B. tawa	EE, DS, ABS
Brachyglottis repanda	EE, DS, ABS*
Carmichaelia australis	ABS
Carpodetus serratus	EE, DS, ABS
Centella uniflora	ABS*
Clematis paniculata	ABS*
Coprosma arborea	EE, DS, ABS
C. lucida	ABS*
C. macrocarpa	EE, DS, ABS, AK
C. robusta	EE, DS, ABS
Corynocarpus laevigatus	EE, DS, ABS
Cotula coronopifolia	DS, ABS
Dysoxylum spectabile	EE, DS, ABS
Elaeocarpus dentatus	EE, DS
Euchiton gymnocephalus	EE
Fuschia excorticata	EE, DS, ABS
Geniostoma ligustrifolium	EE, DS, ABS
Haloragis erecta	EE, ABS
Hebe stricta	EE
Hedycarya arborea	EE, DS, ABS
Knightea excelsa	EE, DS, ABS
Kunzea ericoides	EE, DS, ABS
Laurelia novae-zelandiae	ABS+
Leptospermum scoparium	DS, ABS
Leucopogon fasciculatus	EE, DS, ABS
Lilaeopsis novae-zelandiae	EE
Litsea calicaris	EE, DS, ABS
Lobelia anceps	DS, ABS
Macropiper excelsum	EE, DS, ABS
Melicytus micranthus	EE

M. ramiflorus	EE, DS, ABS
Metrosideros carminea	ABS+, AK
Metrosideros diffusa	ABS*
M. excelsa	EE, DS, ABS
M. fulgens	EE, DS, ABS
M. perforata	EE, DS, ABS
M. robusta	ABS+
Muehlenbeckia australis	DS, ABS
M. complexa	EE, DS, ABS
Myrsine australis	EE, DS, ABS
Nestegis lanceolata	ABS*
Parsonsia heterophylla	EE, DS, ABS
Persicaria decipiens	ABS*
Pittosporum crassifolium	ABS
P. tenuifolium	ABS*
Plagianthus divaricatus	EE, DS, ABS
Pseudopanax crassifolius	EE, DS, ABS
P. lessonii	EE, DS
Ranunculus reflexus	EE, DS
Rubus cissioides	EE, DS
Samolus repens	EE, DS, ABS
Sarcocornia quinquefolia	DS
Schefflera digitata	EE, DS, ABS
Selliera radicans	EE, DS, ABS
Senecio glomeratus	DS
S. hispidulus	*DS, EE*
S. minimus	EE, DS
Solanum americanum	EE, DS, ABS
Sophora microphylla s.lat.	EE, DS, ABS
Streblus ?*banksii* x *S. heterophyllus*	ABS*, AK
S. heterophyllus	EE, DS
Vitex lucens	EE, DS, ABS
Wahlenbergia littoricola	EE, ABS

Monocotyledons

Apodasmia similis	EE, DS, ABS
Astelia banksii	EE, DS, ABS
Austrostipa stipoides	DS
Baumea rubiginosa	ABS*
Bolboschoenus fluviatilis	EE, DS, ABS
B. medianus	DS
Carex dissita	EE, DS, ABS
C. flagellifera	EE, DS, ABS
C. geminata agg.	EE, DS, ABS
C. lambertiana	EE, DS, ABS
C. ochrosaccus	EE, DS, ABS
C. spinirostris	EE, ABS
C. virgata	EE, DS, ABS
Collospermum hastatum	EE, DS, ABS
Cordyline australis	EE, DS, ABS
C. australis x *C. banksii*	EE, DS
Cyperus ustulatus	EE, DS, ABS
Dianella nigra	EE, DS
Drymoanthus adversus	ABS*
Earina mucronata	ABS*
Echinopogon ovatus	EE
Freycinetia banksii	EE, DS, ABS
Gahnia lacera	EE, DS, ABS
Isolepis cernua	EE, DS, ABS
Juncus edgariae	EE, DS
J. kraussii	EE, DS, ABS
J. pallidus	DS
J. planifolius	EE, DS
J. prismatocarpus	DS
Libertia ixioides	EE, AK
Luzula picta	DS
Microlaena stipoides	EE, DS, ABS
Microtis unifolia	EE
Oplismenus hirtellus	EE, ABS
Phormium tenax	EE, DS, ABS
Poa anceps	EE, DS, ABS
Rhopalostylis sapida	EE, DS, ABS
Ripogonum scandens	EE, DS, ABS
Rytidosperma biannulare	EE, DS
Triglochin striata	EE
Uncinia uncinata	EE, DS, ABS
Zostera muelleri	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*
Centaurium 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	
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
Rhus succedanea	ABS*, AK
Rubus fruticosus agg.	EE, DS, ABS
Rumex brownii	DS
R. crispus	DS, ABS
R. obtusifolius	ABS*
Senecio bipinnatisectus	ABS*
S. esleri	ABS*
S. mikanioides	DS
S. skirrhodon	ABS*
Silybum marianum	DS
Solanum mauritianum	EE, DS, ABS
S. nigrum	ABS*
Sonchus oleraceus	DS, ABS
Stachys sylvatica	ABS*, AK
Syzygium smithii	ABS*
Tropaeolum majus	ABS*
Ulex europaeus	EE, DS, ABS
Veronica serpyllifolia	ABS*

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

Update on the Auckland Botanic Gardens Threatened Native Plant Garden – August 2006

Steve Benham

The Threatened Native Plant Garden has proved to be one of our foremost attractions since its formal opening on that balmy, almost summer-like day on the 29 September 2001 by the Prime Minister, Helen Clark.

Accolades have been showering down upon this garden from a wide-ranging audience despite its 'unfinished' appearance. Our visitors from these islands and overseas have cherished the opportunity to become informed about our unique and treasured natural heritage.

The Threatened Native Plant Garden is probably unique in so far as threatened plants are being showcased together with naturally occurring associated non-threatened species in replicated habitats.

Replicating habitats, albeit a mere 'snapshot' of our wild environment, has meant that we have been able to show the natural diversity of our region from the mighty world of the Waitakere Ranges to the local lavafields of what is now industrial Penrose!

For the past five years we have been trying very hard to secure funding for the completion of the remaining coastal components i.e. salt meadow, dunes, including stabilised and foredunes, and shellbanks.

Finally news came through earlier this year that our application to the Lottery Environment and Heritage Fund had been successful to the sum of $33,100 with the Friends of the Gardens contributing a further $13,000.

Botanic Gardens staff prepared concept design sketches after a visit to the Puhinui Reserve on the Manukau Harbour. This reserve has regionally significant saline wetlands and provided much inspiration for this amazing project. Excavation work begun on the 22 May with the site being re-contoured and construction undertaken by Dave Johnson of Outdoor Images. Construction work was completed on schedule in September and planting began in October 2006.

Brief descriptions of the vegetation categories that we are emulating:

Salt meadow / marsh

A replicated sequence of vegetation zones within this saline wetland *viz.* below mid-tide, above mid-tide, reached only by spring tides, reached only by storm tides is planned. The last three are usually referred to as lower-, middle-, and upper-marsh respectively. Key species will be mangrove (Avicennia *marina*), glasswort (*Sarcocornia quinqueflora*), coastal rush (*Juncus krausii),* oioi (*Apodasmia similis*), *L. dioica* subsp*. dioica, Samolus repens*, *Selliera radicans,* and *Suaeda novae-zelandiae*.