

Waiheke Island : Labour Weekend, October 2008

Mike Wilcox and Graeme Jane

The Auckland Botanical Society held a botanical camp at Labour Weekend, 24-27 October 2008, based at Otakawhe Bay Lodge on the eastern side of Waiheke Island, near Orapiu. Bot Soc has had just three previous recorded visits to Waiheke Island, namely to Whakanewha Regional Park (Wilcox et al. 2002), to the Forest & Bird's Onetangi Reserve (White 2003), and to Te Matuku Bay in January 1994 (Beever 1995; Cameron 2009).



Fig. 1. Location map of Otakawhe Bay. Map: Auckland City Council.

Our group was Enid Asquith, Paul Asquith, Jan Butcher, Bev Davidson, Geoff Davidson, Gael Donaghy, Alan Foubister, Colleen Brewer, Warren Brewer, John Hobbs, Peter Hutton, Graeme Jane, John Millett, Helen Preston Jones, Sandra Jones, Rosslyn Prichard, Juliet Richmond, Alison Wesley, Diana Whimp, Mike Wilcox, Philip Wrigley, Maureen Young. On arrival at Matiatia on Friday afternoon we proceeded by hired minibuses to our base camp for the weekend at Otakawhe Bay, situated between Orapiu Wharf and Te Matuku Bay. Otakawhe Bay Lodge is an old 1917 farm mansion once owned by the Burt family, now under the care of the Auckland Outdoor Education Association. It has a street address, 73-75 Hunterville Road, but Hunterville Road is just a non-existent "paper road," so to get to the lodge you have to walk from the end of Nepean Avenue along a track. The land at the lodge and adjoining coastal headland is officially known as the Hunterville Reserve.

Coastal vegetation between Orapiu and Te Matuku Bay

There is a coastal walkway track from Orapiu to Otakawhe Bay and Pearl Bay (Anon. 2007). The shore is mostly steep cliffs down to greywacke rocks, with

large pohutukawa (*Metrosideros excelsa*) prominent, and beneath them karo (*Pittosporum crassifolium*), houpara (*Pseudopanax lessonii*), kawakawa (*Macropiper excelsum*), and coastal karamu (*Coprosma macrocarpa*). Other native shrubs commonly fringing the track were akepiro (*Olearia furfuracea*), mahoe (*Meliclytus ramiflorus*), coastal veronica (*Hebe macrocarpa*), mapou (*Myrsine australis*), karamu (*Coprosma robusta*), *Coprosma rhamnoides*, mingimingi (*Leucopogon fasciculatus*), coastal astelia (*Astelia banksii*) and manuka (*Leptospermum scoparium*).



Fig. 2. Otakawhe Bay Lodge and Hunterville Reserve, 22 Sep 2008. Photo: M.D.Wilcox.

The shore between Pearl Bay and Shelly Beach in Te Matuku Bay was of special botanical interest for here we found several shrubs of *Pomaderris rugosa* in flower, a fair amount of kowhai (*Sophora chathamica*) and several colonies of akeake (*Dodonaea viscosa*). *Pittosporum cornifolium* was recorded between Otakawhe Bay and Orapiu. Other native plants seen were coastal shield ferns (*Polystichum wawranum* and *P. neozelandicum*), common maidenhair fern (*Adiantum cunninghamii*), rasp fern (*Doodia australis*), coastal cuttygrass (*Gahnia lacera*), blueberry (*Dianella nigra*), toatoa (*Haloragis erecta*), bidibidi (*Acaena novaezealandiae*), sundew (*Drosera auriculata*), *Microlaena stipoides*, *Thelymitra longifolia*, *Senecio lautus*, *Veronica plebeia*, *Senecio hispidulus* and *Geranium homeanum*. So far, so good. Now to the weeds.

It has to be said that the native flora along this coast is heavily intermixed with exotic plants, many of which are notorious environmental weeds. Climbing asparagus (*Asparagus scandens*) was abundant, fully occupying the ground in places, and festooning the

lower trunks of native trees. Its relative, smilax (*Asparagus asparagoides*), was also present. We can then list the assemblage of other weeds: cotoneaster (*Cotoneaster glaucophyllus*), woolly nightshade



Fig. 3. *Pomaderris rugosa*, Pearl Bay, 25 Oct 2008. Photo: M.D.Wilcox.

(*Solanum mauritianum*), Chinese privet (*Ligustrum sinense*), gorse (*Ulex europaeus*), lilly pillly (*Syzygium smithii*), brush wattle (*Paraserianthes lophantha*), jasmine (*Jasminum polyanthum*), Cape ivy (*Senecio angulatus*), ox-tongue (*Helminthotheca echioides*), purple top (*Verbena bonariensis*), boneseed (*Chrysanthemoides monolifera*), moth plant (*Araujia sericifera*), honeysuckle (*Lonicera japonica*), Sexton's pride (*Rhaphiolepis umbellata*), Spanish heath (*Erica lusitanica*), pampas grass (*Cortaderia selloana*), kahili ginger (*Hedychium gardnerianum*), Mexican daisy (*Erigeron karvinskianus*), grey sedge (*Carex divulsa*) and ladder fern (*Nephrolepis cordata*). Rhamnus (*Rhamnus alaternus*) was absent!. Noteworthy planted trees were Moreton Bay fig (*Ficus macrophylla*) at the lodge, Monterey pine (*Pinus radiata*) and Monterey cypress (*Cupressus macrocarpa*), and salt cedar (*Tamarix ramoissima*) on the foreshore by the lodge.



Fig. 4. Te Matuku Bay and shell bank, 22 Sep 2008. Photo: M.D.Wilcox

There were also numerous introduced herbs and monocots, with particularly abundant ones being scarlet pimpernel (*Anagallis arvensis* var. *arvensis*), blue pimpernel (*Anagallis arvensis* var. *coerulea*), doves-foot cranesbill (*Geranium molle*), cut-leaf cranesbill (*Geranium dissectum*), grassland forget-me-not (*Myosotis discolor*), small-flowered buttercup (*Ranunculus parviflorus*) and yellow flax (*Linum trigynum*). Other exotics worth mentioning were caper spurge (*Euphorbia lathyris*) growing near the lodge, Himalayan honeysuckle (*Leycesteria formosa*), black wattle (*Acacia mearnsii*) and several grasses, notably wild oat (*Avena barbata*), sweet vernal (*Anthoxanthum odoratum*), rippgut brome (*Bromus diandrus*), red-leg grass (*Bothriochloa macra*) and short-hair plume grass (*Dichelachne rara*).



Fig. 5. *Austrostipa stipoides* and *Haloragis erecta* on the shell bank, Te Matuku Bay, 25 Oct 2008. Photo: M.D.Wilcox

The Te Matuku estuary and shell bank

The estuary is included in the 690 ha Te Matuku Marine Reserve which came into force on 4 August 2005 and features extensive mangroves (*Avicennia marina*) in the upper reaches and fringing thickets of shore ribbonwood (*Plagianthus divaricatus*) and salt marshes dominated by oi oi (*Apodasmia similis*), *Baumea juncea*, salt-marsh rush (*Juncus kraussii*) and *Bolboschoenus medianus*. Salt meadow plants in evidence were shore primrose (*Samolus repens*), *Selliera radicans*, *Apium prostratum*, *Cotula coronopifolia*, *Spergularia marina*, *Sarcocornia quinqueflora*, knobby sedge (*Ficinia nodosa*), *Isolepis cernua*, and the introduced orache (*Atriplex prostrata*) and salt-marsh sedge (*Carex divisa*). Results of a marine faunal survey were reported by Hayward et al. (1997).

The shell bank is a significant geographic feature, stretching six hundred metres, and made up of piles of bivalves shells, mainly pipi and cockles. Coastal needle grass (*Austrostipa stipoides*) was the dominant plant here, but apart from that and a few patches of toatoa (*Haloragis erecta*), pohuehue (*Muehlenbeckia complexa*), some stunted plants of flax (*Phormium*

tenax), *Cyperus ustulatus* and *Calystegia soldanella*, and scattered knobby sedge, weeds again were much in evidence. Rippgut brome, wild oat, hair grass (*Vulpia bromoides*), scarlet pimpernel, speedwell (*Veronica arvensis*), wild gladiolus (*Gladiolus undulatus*), wild onion (*Allium vineale*), Cretan mullein (*Verbascum creticum*), fumitory (*Fumaria muralis*), gravel groundsel (*Senecio skirrhodon*), sea rocket (*Cakile edentula*), *Calystegia sepium* and scotch thistle (*Cirsium vulgare*) were common. The only woody plants noticed were moth plant and sweet briar (*Rosa rubiginosa*). There was some excitement (and relief) when a native orchid, *Microtis unifolia*, was spotted, and we looked for and found the interesting moss, *Tortella rubripes*, reported from here by Jessica Beaver during the previous (1994) Bot Soc visit to this site (Beaver 1995).

Passage Rock (Takapu), which is included in the Marine Reserve, stands out to sea from Te Matuku Bay (Lee 1999), and gives its name to the nearby Passage Rock Vineyards.

Te Matuku Bay Scenic Reserve

This native bush reserve of 53 ha is the largest of the Department of Conservation's scenic reserves on Waiheke Island. It used to be owned by Cyril Wright, who has adjoining property, and occupies the steep southern slopes of a headland on the eastern side of Te Matuku Bay. We approached the site along the private Te Matuku Point Lane, from the property of Rosemary and Peter Thorne, and had Waiheke resident Rob Morton accompanying us. A spectacular *Clematis paniculata* with bunches of developing fruit was of interest during the walk along the road. The reserve had scattered kauri (*Agathis australis*) of moderate size, some stands of pole-sized tanekaha (*Phyllocladus trichomanoides*) and totara (*Podocarpus totara*), and the occasional kahikatea (*Dacrycarpus dacrydioides*), but the predominant forest types was mixed broadleaved forest and kanuka (*Kunzea ericoides*) forest.

The broadleaved forest was made up of scattered, very large multitrunked puriri (*Vitex lucens*), leaning outwards from the slope and bearing characteristic epiphytic loads of tank lily (*Collospermum hastatum*), kohekohe (*Dysoxylum spectabile*), taraire (*Beilschmiedia tarairi*), tawa (*B. tawa*), rewarewa (*Knightia excelsa*), karaka (*Corynocarpus laevigatus*) and hinau (*Elaeocarpus dentatus*). We found taraire to be the most abundant canopy tree and as well there were numerous seedlings, growing through the leaf litter. Nikau palm (*Rhopalostylis sapida*) grew in spectacular abundance in the deep, dark gullies, and pigeonwood (*Hedycarya arborea*) and supplejack (*Ripogonum scandens*) were common. Tree ferns present were *Cyathea dealbata*, *C. medullaris* and *Dicksonia squarrosa*, while common ground ferns here were *Adiantum cunninghamii*, *A. hispidulum*, *Asplenium oblongifolium*, *A. polyodon*, *Blechnum*

filiforme, *B. chambersii*, *B. novaezelandiae*, *Doodia australis*, *Polystichum wawranum* and *Pteris macilenta*.



Fig. 6. Taraire forest, Te Matuku Scenic Reserve, 25 Oct 2008. Photo: M.D.Wilcox.

Kanuka forest grew on the lower fringes and on some upper slopes that had reverted from former pasture. Kanuka trees were up to 14 m tall, with an understorey of hangehange (*Geniostoma ligustrifolium*), mahoe, shining karamu (*Coprosma lucida*), *Coprosma rhamnoides*, mapou, rangiora (*Brachyglottis repanda*) and *Gahnia lacera*. Behind the coastal fringe of shore ribbonwood there was a band of tall manuka (*Leptospermum scoparium*), at first with mostly *Baumea juncea* and *Carex virgata* beneath it on the damp ground, but further inland with a covering of the ferns *Lastreopsis glabella*, *Deparia petersenii* and *Diplazium australe*. *Carex ochrosaccus* and *C. flagellifera* were also found.

Te Haahi-Goodwin Reserve

Our visit to this bush was the botanical highlight of the weekend. The reserve is owned by the Forest & Bird Protection Society (White 2000; Anon 2008), covers 35 ha, and comprises the original Goodwin Block (Allotments 91 and 92) and the adjoining Te Haahi or Church Block (Allotment 95). Simon Griffiths and Russell St Paul of the Gulf Islands Branch of Forest & Bird lead us through the bush, as it has no formed tracks.

The tree cover was dominated on the gentler slopes by pole stands of tanekaha, with kanuka, and with pockets of kauri, some quite large. The damper, steep gully slopes had the typical coastal forest broadleaved species, namely taraire, puriri and kohekohe. Tanekaha grew mainly on impoverished gumland clay, with a wealth of understorey shrubs such as hangehange, akepiro, lancewood (*Pseudopanax crassifolius*), mapou, heketara (*Olearia rani*), mamangi (*Coprosma arborea*), *Alseuosmia quercifolia*, shining karamu, and the kauri associates – willow-leaved maire (*Mida salicifolia*), Kirk's tree daisy (*Brachyglottis kirkii* var. *angustior*), and kauri grass

(*Astelia trinervia*). There were a few trees and saplings of hard beech (*Nothofagus truncata*). Clubmosses covered the ground in spectacular abundance, dominated by *Lycopodium deuterodensum* with lesser amounts of *Lycopodiella cernua*, and there were some gumland ferns there too, namely *Gleichenia microphylla*, *Lindsaea linearis*, *Lindsaea trichomanoides* and *Schizaea fistulosa*. The common sundew (*Drosera auriculata*) was very plentiful, and *Gonocarpus incanus* was present. The main sedges seen were *Gahnia lacera*, *G. pauciflora*, *G. setifolia*, *Morelotia affinis* and *Schoenus tendo*. On the road edge we found several *Cordyline banksii* and *Carmichaelia australis* in flower.

Ground orchids were plentiful, and those identified by our "orchid group" (Gael Donaghy, Graeme Jane, Maureen Young) were: *Acianthus sinclairii*, *Corybas cheesemani*, *Cyrtostylis oblonga*, *Diplodium alobulum*, *Diplodium brumale*, *Diplodium trullifolia*, *Nematoceras trilobum*, *Orthoceras novae-zelandiae* (on roadside banks), *Petalochilus bartlettii*, *Petalochilus chlorostylus*, *Pterostylis agathicola*, *Pterostylis banksii*, *Pterostylis graminea*, *Simpliglottis cornuta*, *Singularybas oblongus*, *Thelymitra longifolia* and *Thelymitra pauciflora*. *Danhatchia australis* has also been recorded from this reserve but is not in evidence at this time of year. Epiphytic orchids seen were *Drymoanthus adversus*, *Earina mucronata*, *Ichthyostomum pygmaeum* and *Winika cunninghamii*.

We had a look at the vegetation at the Waiheke Pioneer Cemetery beside the Onetangi-Orapiu Road and found it to be similar to that in the Goodwin Reserve. There was a large Port Orford cedar (*Chamaecyparis lawsoniana*) beside the graves, with plentiful *Morelotia affinis*, *Drosera auriculata* and *Gonocarpus incanus*.



Fig. 7. Kauri forest, Waikopua Bay, 27 Oct 2008. Photo: M.D.Wilcox.

Waikopua Bay (also known as Waikopou Bay)

This is one of the secluded bays on the eastern side of Waiheke, between Orapiu and Man O'War Bay. Access is by a steep metalled road from the Cowes

Bay Road, and is an Auckland City Council Walkway. Adjoining the road is a 10 ha block of privately-owned native bush which we found to have a good diversity of tree species. The higher ridges had numerous kauri, with tanekaha and kanuka plentiful throughout, and unlike the other bush blocks we had visited, there was a sprinkling of rimu (*Dacrydium cupressinum*) and matai (*Prumnopitys taxifolia*). Kahikatea, mamangi, taraire, puriri, mangeao, white maire (*Nestegis lanceolata*), willow-leaved maire, toro (*Myrsine salicina*), lemonwood (*Pittosporum eugenioides*), kohuhu (*Pittosporum tenuifolium*), lancewood and five-finger (*Pseudopanax arboreus*) were the other trees identified. Nikau palms were abundant in the damp gullies. Several people saw a nice clump of *Earina autumnalis*.

The roadside banks had an interesting covering of plants including *Drosera auriculata*, *Coprosma rhamnoides*, *Pomaderris amoena*, *Lycopodium volubile*, *Paesia scaberula*, *Veronica plebeia*, *Euchiton collinus*, *Senecio hispidulus*, *Microtis unifolia*, *Thelymitra longifolia*, *Thelymitra pauciflora* and *Rytidosperma unarede*.

The beach at Waikopua Bay was stony. Several large pohutukawa trees adorned the shore, and there were several massive Monterey cypress and numerous old black wattle bordering the lower stretches of the access road. Of interest were three unusual exotic species – a patch of stinkweed (*Dittrichia suaveolens*), *Gladiolus nanus* in flower and seemingly wild beside the BBQ on the City Council Esplanade Reserve, and *Lonicera × americana* in a private garden.



Fig. 8. *Gladiolus nanus*, Waikopou Bay, Waiheke 27 Oct 2008. Photo: M. D. Wilcox.

Stony Batter

Our route then took us northwards, with views to the left of the magnificent kauri forest on the 2000 ha Man O'War Station. The Man O'War Forest has been identified as Waiheke's site of most outstanding ecological significance (Fitzgibbon & Slaven 1988). It has kauri/hard beech forest, taraire/kohekohe forest, and a small area of kahikatea/maire tawake forest.

After lunch on the beach at Man O'War Bay our convoy headed to Stony Batter. These curious rock formations are several million years old and are evidently geologically similar to the basalt of Ti Point, north of Omaha Bay. We viewed the military relics from above-ground only, but noted the valuable remnant patches of bush in the vicinity which had abundant taraire, rewarewa, puriri and kohekohe, and also a good deal of totara – much more plentiful here than at other sites we had visited.

The trip back to Matiatia featured the rural economy of Waiheke Island – based on cattle and sheep farming, vineyards, and olive orchards, and we briefly stopped to view the native forest plantings on Bruce Plested's Pie Melon Bay Station, where hillsides were clothed in mixed native tree plantings, including successful totara, puriri and karaka.

Seaweeds

Only brief forays were made to the rocky shores to record seaweeds. One of particular note was the

introduced Asian kelp *Undaria pinnatifida*, two plants of which were found freshly cast ashore in Pearl Bay. It is currently only known in Auckland from infestations at and near Westhaven in the Waitemata Harbour. The mid intertidal rocky shore on these eastern, sheltered "oyster" shores of Waiheke Island is dominated by *Hormosira banksii*. At Orapiu on upper intertidal rocks there was a community comprising the red algae *Caloglossa vieillardii*, *Bostrychia gracilis* and *Capreolia implexa*, together with the green alga *Ulva procera*, while at Man O'War Bay there was a conspicuous low intertidal assemblage of the green alga *Microdictyon mutabile* in amongst *Corallina* turf, the red alga *Laurencia thyrsoifera*, and abundantly above them in the oyster belt, *Gelidium caulacanthum*. The introduced green alga *Codium fragile* subsp. *tomentosoides* and the introduced brown alga *Hydroclathrus clathrata* were both recorded from the low intertidal cobble shore at Waikopua Bay, where too the brown alga *Enderachne binghamiae* was found attached to pontoons at the end of the wharf.

Acknowledgements

Our thanks to the Auckland Outdoor Education Association and caretaker Jack Hadden for the use of Otakawhe Bay Lodge, to Rob Morton of Awaararoa Bay for helping with organising the field programme, to Rosemary and Peter Thorne for access through their property, to Simon Griffiths and Russell St Paul for guiding us through the Te Haahi-Goodwin Reserve, to Petra White for the copy of the Te Haahi-Goodwin Reserve Management plan and species list, to Ewen Cameron for the species list from the 1994 camp at Te Matuku Bay, to Leslie Haines for arranging our transport, to Jan Butcher, Geoff Davidson and Paul Asquith for driving, and to Maureen Young for organising the provisions.

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List of vascular plants from south-eastern part of Waiheke Island

Te Haahi-Goodwin Reserve, Te Matuku Bay Cemetery, Te Matuku Bay shell bank, Orapiu to Te Matuku Bay coastal walkway, Te Matuku Scenic Reserve, Waikopua Bay, observed during the field trip (October 2008).

* = adventive species

Clubmosses

Huperzia varia
Lycopodiella cernua
Lycopodium deuterodensum
Lycopodium volubile

Ferns

Adiantum cunninghamii
Adiantum diaphanum
Adiantum fulvum
Adiantum hispidulum

Adiantum viridescens
Asplenium bulbiferum
Asplenium flaccidum
Asplenium gracillimum
Asplenium oblongifolium
Asplenium polyodon
Blechnum chambersii
Blechnum discolor
Blechnum filiforme
Blechnum fraseri
Blechnum membranaceum

Blechnum novae-zelandiae
Cardiomanes reniforme
Cyathea dealbata
Cyathea medullaris
Deparia petersenii
Dicksonia squarrosa
Diplazium australe
Doodia australis
Gleichenia microphylla
Grammitis ciliata
Histiopteris incisa
Hymenophyllum demissum
Hymenophyllum dilatatum
Hymenophyllum frankliniae (*H. ferrugineum*)
Hymenophyllum multifidum
Hymenophyllum rarum
Hymenophyllum sanguinolentum
Hymenophyllum scabrum
Lastreopsis glabella
Lastreopsis hispida
Lastreopsis microsora
Lastreopsis velutina
Leptopteris hymenophylloides
Lindsaea linearis
Lindsaea trichomanoides
Loxogramme dictyopteris
Lygodium articulatum
Microsorium pustulatum
Microsorium scandens
*Nephrolepis cordifolia**
Paesia scaberula
Pneumatopteris pennigera
Polystichum neozelandicum
Polystichum wawranum
Pteridium esculentum
Pteris macilenta
Pteris saxatilis
Pteris tremula
Pyrrhosia eleagnifolia
Schizaea bifida
Schizaea fistulosa
Tmesipteris elongata
Tmesipteris lanceolata
Tmesipteris tannensis
Trichomanes elongatum
Trichomanes endlicherianum
Trichomanes venosum

Conifers

Agathis australis
*Chamaecyparis lawsoniana**
*Cupressus macrocarpa**
Dacrydium dacrydioides
Dacrydium cupressinum
Phyllocladus trichomanoides
*Pinus pinaster**
*Pinus radiata**
Podocarpus hallii (*P. cunninghamii*)
Podocarpus totara
Prumnopitys ferruginea
Prumnopitys taxifolia

Dicot trees, shrubs and woody climbers

*Acacia mearnsii**
Acmena smithii (*Syzygium smithii*)*
Alectryon excelsus
Alseuosmia quercifolia
*Araujia sericifera**
Avicennia marina
Beilschmiedia tarairi
Beilschmiedia tawa
Brachyglottis kirkii var. *angustior*
Brachyglottis kirkii var. *kirkii*
Brachyglottis repanda
Carmichaelia australis
*Chrysanthemoides monolifera**
Clematis cunninghamii
Clematis paniculata
Coprosma arborea
Coprosma grandifolia
Coprosma lucida
Coprosma macrocarpa
Coprosma repens
Coprosma rhamnoides
Coprosma robusta
Coprosma spathulata
Coriaria arborea
Corynocarpus laevigatus
*Cotoneaster glaucophyllus**
Dodonaea viscosa
Dysoxylum spectabile
*Elaeagnus × reflexa**
Elaeocarpus dentatus
Entelea arborescens
*Erica lusitanica**
*Eriobotrya japonica**
*Ficus pumila**
Gaultheria antipoda
Geniostoma ligustrifolium
Griselinia lucida
Hebe macrocarpa
Hebe stricta var. *stricta*
*Hedera helix**
Hedycarya arborea
*Jasminum polyanthum**
Knightia excelsa
Kunzea ericoides
Laurelia novae-zelandiae
Leptecophylla juniperina
Leptospermum scoparium
Leucopogon fasciculatus
*Leycesteria formosa**
*Ligustrum lucidum**
*Ligustrum sinense**
Litsea calicaris
*Lonicera japonica**
Macropiper excelsum
Melicytus ramiflorus
Metrosideros diffusa
Metrosideros excelsa
Metrosideros fulgens
Metrosideros perforata

Metrosideros robusta
Mida salicifolia
Muehlenbeckia australis
Muehlenbeckia complexa
Myrsine australis
Myrsine salicina
Nestegis lanceolata
Nothofagus truncata
Olearia furfuracea
Olearia rani
*Paraserianthes lophantha**
Parsonia heterophylla
*Passiflora ? tarminiana**
Pimelea urvilliana subsp. *nesica*
Pittosporum cornifolium
Pittosporum crassifolium
Pittosporum eugenioides
Pittosporum tenuifolium
Plagianthus divaricatus
*Polygala myrtifolia**
Pomaderris amoena
Pomaderris rugosa
Pseudopanax arboreus
Pseudopanax crassifolius
Pseudopanax crassifolius × *P. lessonii*
Pseudopanax lessonii
*Rhaphiolepis umbellata**
*Roldana petasitis**
*Rosa rubiginosa**
Rubus australis
Rubus cissoides
*Salix cinerea**
Schefflera digitata
Solanum aviculare
*Solanum linnaeanum**
*Solanum mauritianum**
Sophora chathamica
*Ulex europaeus**
Vitex lucens
Weinmannia silvicola

Dicot herbs

Acaena anserinifolia
Acaena novae-zelandiae
*Acanthus mollis**
*Ageratina riparia**
Anagallis arvensis var. *arvensis**
Anagallis arvensis var. *coerulea**
Apium prostratum
*Aster subulatus**
*Atriplex prostrata**
*Bellis perennis**
Brassica rapa subsp. *sylvestris**
*Cakile edentula**
Callitriche muelleri
*Callitriche stagnalis**
Calystegia sepium subsp. *roseata*
Calystegia soldanella
Calystegia tuguriorum
*Carduus tenuiflorus**
*Centaurium erythraea**

Centella uniflora
Cerastium fontanum subsp. *vulgare**
*Cerastium glomeratum**
*Cirsium arvense**
*Cirsium vulgare**
*Conium maculatum**
*Conyza sumatrensis**
Cotula coronopifolia
*Crassula multicava**
Crassula sieberiana
*Crepis capillaris**
*Daucus carota**
Dichondra repens
*Digitalis purpurea**
Disphyma australe
*Dittrichia graveolens**
Drosera auriculata
*Duchesnea indica**
Epilobium cinereum
*Erigeron karvinskianus**
*Erodium moschatum**
Euchiton collinus
Euchiton involucratus
*Euphorbia lathyris**
*Euphorbia peplus**
*Foeniculum vulgare**
*Fumaria muralis**
*Galium aparine**
*Galium murale**
Galium perpusillum
Galium propinquum
*Gamochaeta coarctata**
*Gamochaeta simplicicaulis**
*Geranium dissectum**
*Geranium gardneri**
Geranium homeanum
*Geranium molle**
Gonocarpus incanus
Haloragis erecta
*Helminthotheca echioides**
Hypericum pusillum
*Hypochaeris radicata**
*Ipomoea indica**
*Lactuca serriola**
*Lapsana communis**
*Lathyrus latifolius**
*Leontodon taraxacoides**
*Leucanthemum vulgare**
*Linum bienne**
*Linum trigynum**
Lobelia anceps
*Lotus pedunculatus**
*Lotus suaveolens**
*Ludwigia palustris**
*Medicago arabica**
*Medicago nigra**
*Melilotus indica**
*Mentha pulegium**
*Modiola caroliniana**
*Myosotis discolor**
*Myosotis sylvatica**

Nertera dichondrifolia
Oxalis exilis
*Oxalis incarnata**
*Oxalis perennans**
Oxalis rubens
*Pericallis × hybrida**
*Physalis peruviana**
*Phytolacca octandra**
*Plantago lanceolata**
*Plantago major**
*Prunella vulgaris**
Pseudognaphalium luteoalbum
*Ranunculus parviflorus**
Ranunculus reflexus
*Rumex conglomeratus**
*Rumex obtusifolius**
*Sagina procumbens**
Samolus repens
Sarcocornia quinqueflora
Selliera radicans
*Senecio bipinnatisectus**
*Senecio esleri**
Senecio hispidulus
*Senecio jacobaea**
Senecio lautus
*Senecio mikanioides**
Senecio minimus
*Senecio skirrhodon**
Solanum americanum
*Sonchus asper**
*Sonchus oleraceus**
Spergularia marina
*Stellaria media**
*Taraxacum officinale**
*Trifolium repens**
*Tropaeolum majus**
*Verbascum creticum**
*Verbena bonariensis**
*Verbena litoralis**
*Veronica arvensis**
Veronica plebeia
*Vicia sativa**
*Vicia tetrasperma**

Monocots

Acianthus sinclairii
Agapanthus praecox subsp. *orientalis**
*Agrostis capillaris**
Aira caryophyllea subsp. *caryophyllea**
*Allium triquetrum**
Allium vineale subsp. *vineale**
*Anthoxanthum odoratum**
Apodasmia similis
*Asparagus asparagoides**
*Asparagus scandens**
Astelia banksii
Astelia solandri
Astelia trinervia
Austrostipa stipoides
*Avena barbata**
Baumea juncea

Baumea rubiginosa
Baumea tenax
Baumea teretifolia
Bolboschoenus medianus
*Bothriochloa macra**
*Briza minor**
*Bromus diandrus**
*Bromus hordeaceus**
*Bromus lithobius**
*Bromus willdenowii**
Carex breviculmis
Carex dissita
*Carex divisa**
*Carex divulsa**
Carex flagellifera
Carex inversa
Carex lambertiana
Carex lessoniana
*Carex longebrachiata**
Carex ochrosaccus
Carex solandri
Carex spinirostris
Carex testacea
Carex virgata
Carex geminata ("large")
Collospermum hastatum
Cordyline australis
Cordyline banksii
Cordyline pumilio
*Cortaderia jubata**
*Cortaderia selloana**
Corybas cheesemanii
*Crocasmia × crocosmiiflora**
*Cynosurus cristatus**
Cyperus ustulatus
Cyrtostylis oblonga
*Dactylis glomerata**
Deyeuxia avenoides
Dianella nigra
Dichelachne crinita
Dichelachne inaequiglumis
Dichelachne micrantha
*Dichelachne rara**
Diplodium alobulum
Diplodium brumale
Diplodium trullifolium
Drymoanthus adversus
Earina autumnalis
Earina mucronata
Echinopogon ovatus
*Elytrigia repens**
Ficinia nodosa
*Freesia refracta**
Freycinetia banksii
Gahnia lacera
Gahnia pauciflora
Gahnia setifolia
Gahnia xanthocarpa
*Gladiolus carneus**
*Gladiolus undulatus**
*Hedychium gardnerianum**

*Holcus lanatus**
Ichthyostomum pygmaeum
*Iris foetidissima**
Isachne globosa
Isolepis cernua
Isolepis distigmatosa
*Isolepis levynsiana**
Isolepis reticularis
*Isolepis sepulcralis**
Juncus australis
Juncus edgariae
*Juncus effusus**
Juncus kraussii
Juncus pallidus
Juncus planifolius
Juncus prismatocarpus
Juncus sarophorus
*Juncus tenuis**
Kniphofia uvaria var. *praecox**
Lachnagrostis billardierei
Lachnagrostis filiformis
*Lagurus ovatus**
Lepidosperma australe
Libertia grandiflora
*Lilium formosanum**
Microlaena stipoides
Microtis unifolia
Morelotia affinis
Nematoceras "pygmy"
Nematoceras macranthum
Nematoceras trilobum
Oplismenus hirtellus subsp. *imbecillis*
Orthoceras novae-zelandiae
*Parapholis incurva**
Paspalum dilatatum
*Pennisetum clandestinum**

Petalochilus bartlettii
Petalochilus chlorostylus
Phormium tenax
Phyllostachys nigra var. *henonis*
Poa anceps
*Poa annua**
*Poa pratensis**
*Polypogon fugax**
Pterostylis agathicola
Pterostylis banksii
Pterostylis graminea
Rhopalostylis sapida
Ripogonum scandens
Rytidosperma biannulare
Rytidosperma clavatum
Rytidosperma gracile
*Rytidosperma penicillatum**
*Rytidosperma racemosum**
*Schedonorus arundinaceus**
Schoenus maschalinus
Schoenus tendo
*Setaria palmifolia**
Simpliglottis cornuta
Singularybas oblongus
*Sporobolus africana**
*Stenotaphrum secundatum**
Thelymitra longifolia
Thelymitra pauciflora
Typha orientalis
Uncinia banksii
Uncinia uncinata
Uncinia zotovii
*Vulpia bromoides**
*Watsonia aletroides**
*Watsonia meriana**
Winika cunninghamii

Waiuku Forest, 15 November 2008

Tricia Aspin

Attendance (13): Tricia Aspin (leader), Jan Butcher, Colleen Crampton, Pam Dale, Jo Fillery, Leslie Haines, Shelley Heiss-Dunlop, Lati Moodie, Suman Pancha, Harold Waite, Alison Wesley, Mike Wilcox, Maureen Young.

The day began with confusion for some, due to the recent removal of some road signs and because Tricia chose to come via the back road she was unaware that some were taking an extra tour — her apologies. Our visit was split into three parts. We began at the dams near the site of the old Headquarters, then drove through restricted areas to the coastal dune area and finally to a remnant of native bush, before exiting the forest near the Maioro Sandmine.

The area which is now the Waiuku Forest at Maioro was described in 1859 as a "perfect sea of sand" (von Hochstetter 1867: chapter XIII) and in 1864 by Rev.

Vicemus Rush as "almost utterly bare of vegetation" (Drummond 1882). In July 1869 T. F. Cheeseman collected matagouri (*Discaria toumatou*) from the sandhills near Waiuku (AK 5152) and Harry Carse wrote in 1901 that "I understand from Mr Petrie that *Discaria toumatou* occurs among the sandhills near the Waikato Head." (No chocolate fish for the spotting of this — a chocolate whale it would have to be!) Sand drift encroached rapidly, engulfing settlers' farms and even dwellings. In 1932 the area was taken over by the Public Works Dept. First there was the planting of marram (*Ammophila arenaria*) to stabilise the sand followed by tree lupin (*Lupinus arboreus*) to provide nutrients and shelter for the pines that were first planted in 1935.

Monterey pine (*Pinus radiata*) was the main species used as a basis for rotational timber production. A small area of Bishop pine (*Pinus muricata*) on the first