

# Botanical features of Whakanewha Regional Park Waiheke Island

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## Summary

The main vegetation types of Whakanewha Regional Park (247 ha), Waiheke Island are coastal forest dominated by taraire (*Beilschmiedia tarairi*), regenerating *Leptospermum* and *Kunzea* scrub, wetlands and mangroves, and coastal beaches and shell banks. To date 445 species of higher plants have been recorded, comprising 265 native species (59%) and 180 introduced species (41%).

## History of Waiheke's vegetation

Waiheke Island covers an area of 9320 ha in the Hauraki Gulf, 20 km from Auckland. There is surprisingly little in the way of published accounts of the botany of Waiheke since the paper by Kirk (1878) which gives an idea of the original forest patterns. There is not a great deal of native bush left now on Waiheke following centuries of Maori occupation and cutting of the forests for timber and firewood, and clearing of the land for farming (White 2000; Chapple, Ebbett & Kitson 2001). Most of the remaining bush remnants were surveyed and reported on by Fitzgibbon & Slaven (1988).

Kauri (*Agathis australis*), tanekaha (*Phyllocladus trichomanoides*) and hard beech (*Nothofagus truncata*) were evidently present on upper valley walls, ridges and spurs; taraire (*Beilschmiedia tarairi*), tawa (*B. tawa*), and kohekohe (*Dysoxylum spectabile*) occurred in sheltered coastal and inland valleys, with some rimu (*Dacrydium cupressinum*) present also. Pohutukawa (*Metrosideros excelsa*) and occasional karo (*Pittosporum crassifolium*) occurred on coastal slopes and cliffs and the margins of forests by the sea. On less exposed coastal slopes kohekohe, puriri (*Vitex lucens*) and karaka (*Corynocarpus laevigata*) accompanied pohutukawa. In poorly drained areas pukatea (*Laurelia novae-zelandiae*), kahikatea (*Dacrycarpus dacrydioides*) and taraire were dominant. Flax (*Phormium tenax*) and various sedges occurred mainly in marshy places or on the borders of forests (Kirk, 1878; Fitzgibbon et al, 1988). On the coast the forests would have given way to saltmarsh and mangrove forest in tidal inlets, and to pingao-spinifex communities on mobile sand dunes. According to Kirk hard beech was common at sea level.

The early Maori occupants of the island lived largely off native fauna such as shellfish, moa, fur seals and the abundant fisheries of the Hauraki Gulf. Later on they developed more extensive gardening practices, burning forests for clearance and soil enrichment. This slash and burn type of agriculture occurred mainly in the western parts of the island on areas of flat land, while in the east reliance was more on kaimoana - seafood gathering. By the time of the European arrival, kanuka (*Kunzea ericoides*) - manuka (*Leptospermum scoparium*) forest predominated in western Waiheke and climax forest, including impressive stands of kauri, was limited to the area from Awaawaroa eastwards to the Orapiu/Man O' War Bay coast. Only tiny remnants of climax forest remained west of this point, and the

kauri forests of the western end of the island had disappeared.

In 1826 the European onslaught against kauri began when the barque St Patrick, with the assistance of local Maori (Ngati Paoa), loaded kauri spars at Man O' War Bay. Up until the 1850's Maori willingly cut and dragged out kauri logs and Europeans carted them away. Soil erosion, so evident today in western parts of the island, was begun by Maori with their cultivation practices and massive earthworks for pa sites, but was greatly accelerated by the European with their extensive forest clearance. Since the European arrival many of the wetland areas on the southern side of the island have increased considerably due to siltation after bare ground was exposed after the trees holding the soil together were felled. By about 1880 the hills had been stripped bare for sheep farming with only the small remnants of forests restricted mainly to gullies, the forests having been consumed consecutively by the needs of sailing ship technology, housing construction and the fires of Auckland.

During this early settler period kauri was transported to Sydney and Valparaiso, Chile, and sent to Auckland for house and furniture timber for the growing settlement there. It was also used for the building of Waiheke's early homes and farm buildings. Small pockets of kauri were still being cut out as late as 1908. Puriri was used for house foundations, fence posts and battens. Tanekaha bark was stripped for use in the tanning trade and the wood used as walking sticks and fishing rods. Kauri gum was used in the manufacture of paint and polishes, as kindling and polished for gifts. Pohutukawa was used for the knees of vessels and for framing (Monin 1992).

Manuka and kanuka was extensively cut down for firewood and was the chief source of Auckland's firewood. Kanuka was also used for fencing. Mamangi (*Coprosma arborea*) was quite numerous in several localities but was usually left standing as it gives off an unpleasant smell when burnt, though it was occasionally used for inlays due to its peculiar yellow colour (Kirk 1878). The unsuitability of this species as firewood may account for its dominance in various forest remnants in western Waiheke today. The steady decline in sheep farming on the island after 1945 has seen some areas slowly revert to kanuka/manuka regenerating forest and shrublands and has allowed

forest remnants to revive. Much of the regenerating forest has sprung up since then.

### Whakanewha Regional Park

Whakanewha Regional Park is contained within the Inner Gulf Islands Ecological District, which lies within the Auckland Ecological Region. It was purchased for recreation and conservation development in 1993 and added to the estate of some 22 parks administered by the Auckland Regional Council. Located on the western side of the island next to Rocky Bay and accessed via Gordons Road, the park covers some 247 hectares (Figure 1). The history of the area is well documented (Anon. 1996), and, as has aptly been put by Monin (1992), "... at Whakanewha the spirit of countless Maori generations pervades the calm of an undisturbed tidal beach".

The main vegetation types are coastal forest, regenerating scrub, wetlands, and coastal beaches and shell banks. Clunie (1992a, 1992b, 1992c), Cutting & Green (1992), and Gardner (1995) have previously reported on the vegetation and flora. Other publications on the Waiheke flora relevant to Whakanewha are the account of mosses by Jessica Beever (1995) and Mike Lee's (1999) paper on some

islets off Waiheke.

The Auckland Botanical Society held an excursion to the park on 17 November 2001, and were joined by several Waiheke residents.

Locals: Andy Spence, Don Chapple, Rainelia Wyld, Graham Hooper, Jaymz Hooper.

Bot Soc: Mike Wilcox, Maureen Young, Lisa Clapperton, Brian Cumber, Doug Shaw, Fawzi Karem, Morag McDonald, Pam Carmont, Pat Seyb, Harry Beecham, Carol McSweeney, Steve Cook, Shelley Heiss-Dunlop, Alistair McArthur, Fran Hinz, Alison Wesley, Juliet Richmond, Shirley Smith, Annette Lindsay, Sandra Jones, Leslie Haines, Sarah Flynn, Allan Flynn, Robin Gee.

Our route was along the Tarata Track to the Cascades, and then down to the beach via the Nikau Track, followed by exploration of the coastal wetlands. Further visits were made by the authors in December 2001, January 2002 (2), February 2002, and April 2002.

### Coastal forest and scrub

The dominant canopy trees in the remnant native bush at Whakanewha are taraire and tawa, frequently

accompanied by rewarewa (*Knightia excelsa*), kohekohe, puriri, and karaka. Typically, the canopy height is c. 16 m. There are also occasional northern rata (*Metrosideros robusta*), pohutukawa (*M. excelsa*), mangao (*Litsea calicaris*), matai (*Prumnopitys taxifolia*), rimu, common kowhai (*Sophora microphylla*) and coastal kowhai (*S. chathamica*). On the slopes downhill from Rocky Bay is a line of seven large puriri trees, known as "The Cathedral", said to have been planted by Maori residents in ancient times. One giant karaka tree is 22 m tall and 90 cm diameter. Kauri is scarce, but the few biggish trees recorded (we have counted only four) appear to be very vigorous.

The subcanopy and understory includes mamangi, wharangi (*Melicope ternata*), mahoe (*Melicactus ramiflorus*), hangehange (*Geniostoma rupestre* var. *ligustrifolium*), mapou (*Myrsine australis*), tarata (*Pittosporum eugenioides*), nikau (*Rhopalostylis sapida*), kawakawa (*Macropiper excelsum*), and lancewood (*Pseudopanax crassifolium*). The dominant tree ferns are silver fern (*Cyathea dealbata*) and mamaku

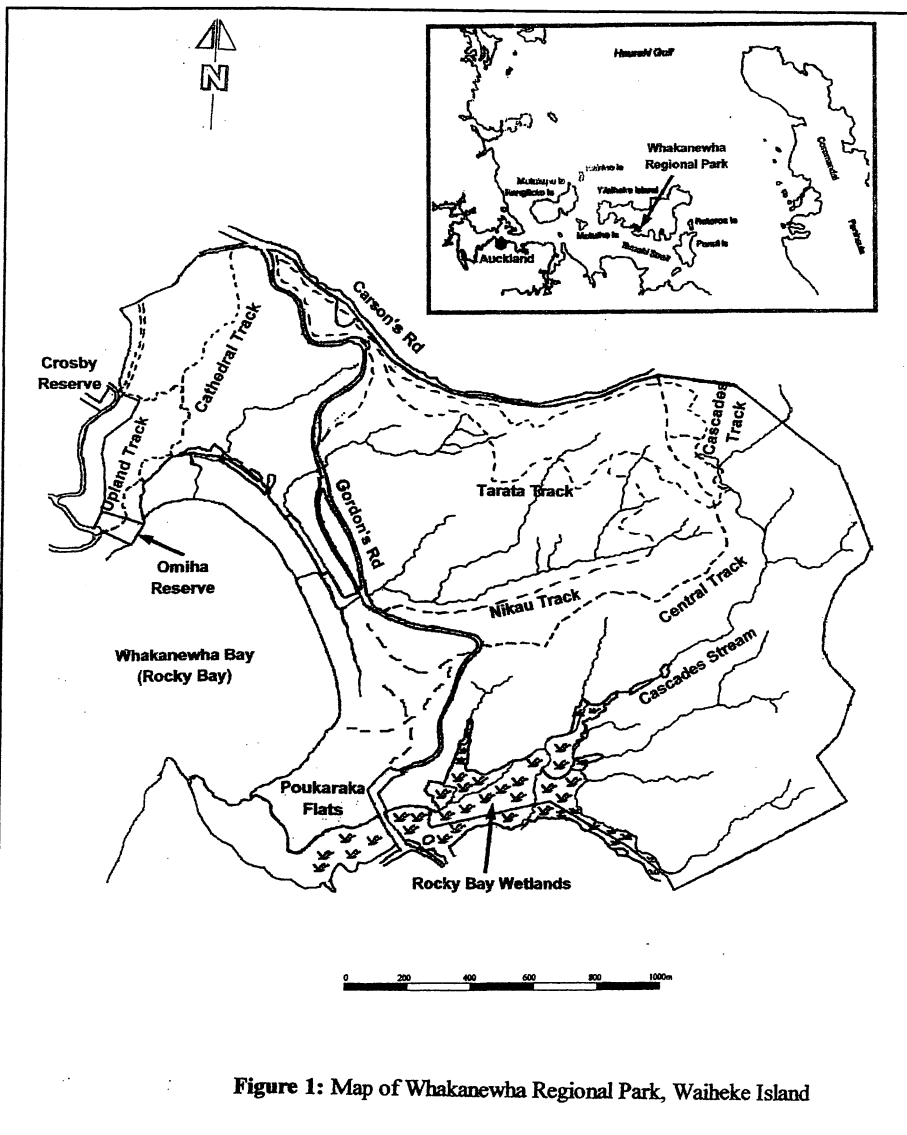


Figure 1: Map of Whakanewha Regional Park, Waiheke Island

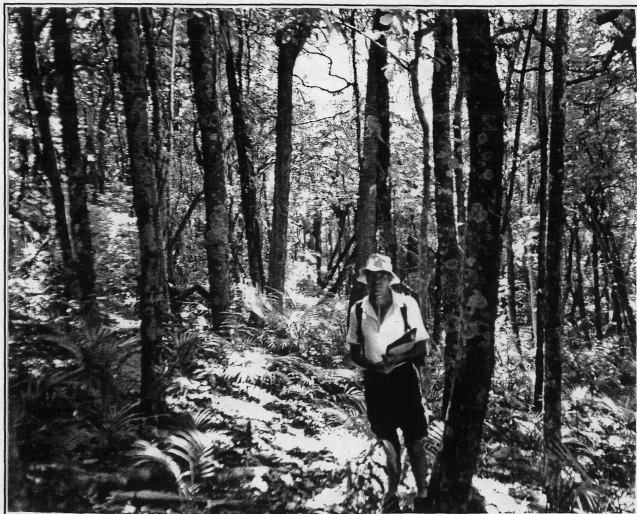


Fig.2: Coastal forest dominated by taraire (*Beilschmiedia tarairi*).

(*C. medullaris*), whilst wheki (*Dicksonia squarrosa*) occurs much more locally, on moister sites. *Coprosma rhamnoides* is a common twiggly shrub. Uncommon small trees are kaikomako (*Pennantia corymb-bosa*) and milk tree (*Streblus heterophyllus*). The shrubby epiphyte *Pittosporum cornifolium* is sometimes seen perching high up in puriri trees.

An interesting mixed pole hardwood forest occupies about one hectare in the upper part of the park. It is evidently a successional stage after manuka and now comprises c. 10-20 000 stems/ha of mainly mamangi and mapou 4-10 cm in diameter, and with a canopy height of c. 8 m. Seedlings and saplings of kohekohe and other tree species are sprinkled through the stand, indicating the likely composition of the eventual high forest.

There are abundant interspersed seral stands of kanuka and manuka, the kanuka commonly being 8-9 m in height, with regenerating mahoe, rangiora (*Brachyglottis repanda*), mapou, kawakawa, mamangi, and abundant silver tree fern beneath. These stands are generally festooned beneath with climbing asparagus (*Asparagus scandens*).

On shaded, damp banks around the Cascades stream and waterfall, or as epiphytes, conditions are suitable for filmy ferns, and *Trichomanes elongatum*, *T. endlicherianum*, *T. venosum*, *Hymenophyllum flexuosum*, *H. sanguinolentum*, *H. demissum*, and *H. flabellatum* were recorded. *Hymenophyllum rarum* has been found in the swamp forest area of the lower Cascades stream.

Outstanding features seen during the excursion were fine examples of five-finger (*Pseudopanax arboreus*) epiphytic on silver tree ferns, several exceptionally large trees of lancewood (*Pseudopanax crassifolius*), natural nursery patches of dense regenerating seedlings of wharangi, examples of the rare fern *Lastreopsis velutina*, a population of kiekie (*Freycinetia baueriana* subsp. *banksii*), which is generally uncommon on Waiheke, and regenerating kaikomako (*Pennantia corymbosa*).

The ground flora in the coastal forest is often quite sparse, but beside the tracks could be found some fine flowering patches of hooded orchid (*Pterostylis*

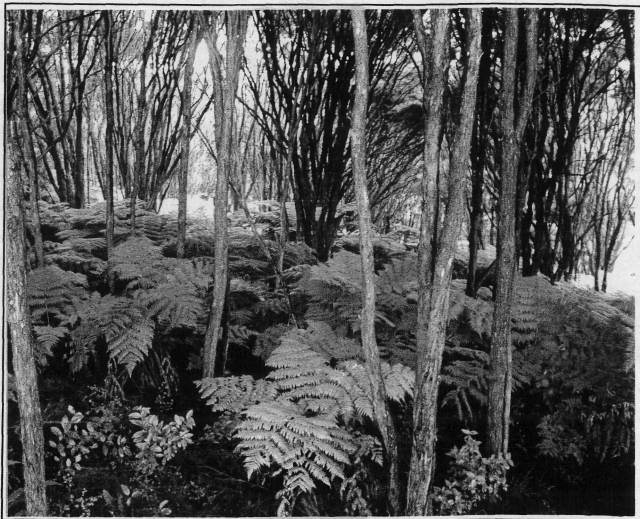


Fig.3: Open kanuka (*Kunzea ericoides*) forest with understory of silver fern (*Cyathea dealbata*)

*banksii*), *Acianthus sinclairii*, frequent *Gahnia lacera*, *Oplismenus hirtellus* subsp. *imbecillis*, *Uncinia uncinata*, *Carex breviculmis*, *Carex spinirostris*, *Dianella nigra* (in flower), *Veronica plebeia*, *Hydrocotyle dissecta*, *Ranunculus reflexus*, *Lobelia anceps*, *Hypericum humifusum*, *H. japonicum*, *Dichondra repens*, *Centella uniflora*, *Euchiton gymnocephalus*, and numerous ferns, including *Asplenium lamprophyllum*, *A. gracillimum*, *Pteris saxatilis*, *P. macilenta*, and *Doodia australis*. The Australian sedge (*Carex longebrachiata*) is frequent beside the bush tracks. It has persisted from the time it was a prominent pasture weed when the land was farmed. Nikau seedlings are abundant throughout.

Damp places within scrub or forest support a community of prostrate plants – commonly *Callitriche muelleri*, *Ranunculus amphitrichus*, *Juncus articulatus*, *Isolepis reticularis* and *Schoenus maschalinus*. True “gumland” conditions are not present in Whakanewha, but certain areas of shallower, more impoverished clay soils have some typical gumland species such as *Lepidosperma australe*, *Baumea tenax*, *Lindsaea linearis*, and *Gonocarpus incanus*.

The pa site above the beach is noteworthy for large old trees of puriri, ngaio (*Myoporum laetum*), kohekohe, tawa, taraire, matai, kowhai, an impressive hinau (*Elaeocarpus dentatus*), and populations of native passion vine (*Passiflora tetrandra*). A prominent weed there is herb Robert (*Geranium robertianum*). Moth plant (*Araujia sericifera*) still persists despite strenuous efforts by the local park workers to eliminate it.

#### Shell banks and beach

The sandy beach at Whakanewha is backed by shell banks which have been colonised to various degrees by plants. On the sand itself there are a few patches of spinifex (*Spinifex sericeus*), and some planted pingao (*Desmoschoenus spiralis*). There is also a fine clump of planted *Cortaderia splendens* at the main picnic area. The freshest shell banks have only a sparse vegetation, with plants such as native ice-plant (*Disphyma australe*), beach celery (*Apium prostratum*), sea rocket (*Cakile edentula*), knob-sedge (*Isolepis nodosa*), salt-marsh tussock (*Austrostipa stipoides*), shore bind-weed (*Calystegia soldanella*), beach orache (*Atriplex prostrata*), *Haloragis erecta*, and *Senecio lautus*. *Muehlenbeckia complexa* is an abundant scrambler in coastal sites throughout Whakanewha. Damper areas have abundant bachelors button (*Cotula coronopifolia*), glasswort (*Sarcocornia quinqueflora*), *Selliera radicans*, *Samolus repens*, and *Isolepis cernua*.

The older, more stable shell banks and beach have become colonised by numerous plants, mostly introduced, prominent among which are buffalo grass (*Stenotaphrum secundatum*), *Gladiolus undulatus*, wild onion (*Allium vineale*), rough clover (*Trifolium scabrum*), lesser suckling clover (*T. micranthum*), smooth tare (*Vicia tetrasperma*), hairy birdsfoot trefoil (*Lotus suaveolens*), hawkbit (*Leontodon taraxacoides*), *Avena barbata*, *Poa pratensis*, *Lagurus ovatus*, *Bromus diandrus*, *Briza maxima*, *Anagallis arvensis*, *Anagallis arvensis* var. *coerulea*, *Arctotheca calendula*, *Beta vulgaris*, *Cichorium intybus*, *Geranium molle*, *Geranium purpureum*, *Linum bienne*, *Medicago nigra*, *Meililotus*

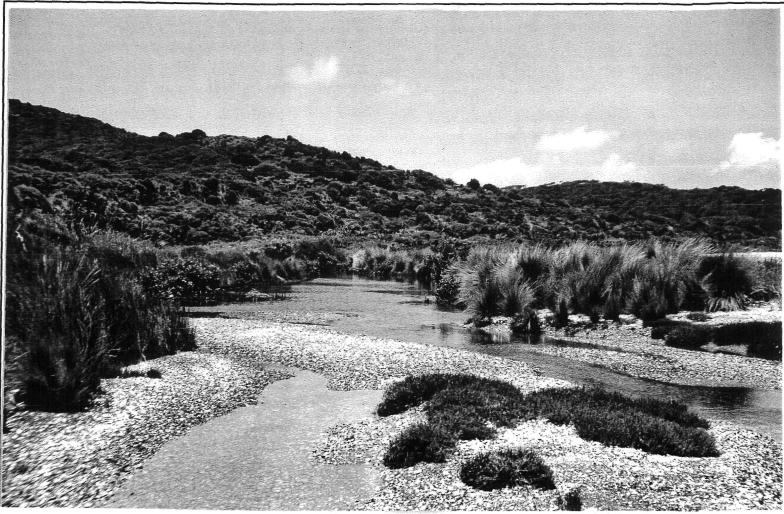


Fig.4: Shellbank and lagoon behind the beach, with clumps of glasswort (*Sarcocornia quinqueflora*) and tussocks of coastal needle grass (*Austrostipa stipoides*)

*indicus*, *Osteospermum barberiae*, *Polycarpon tetraphyllum*, *Ranunculus scleratus*, *Senecio bipinnatisectus*, *Senecio lautus*, *Silene gallica*, *Sonchus asper*, *Trifolium repens*, and *Verbascum creticum*. Damp open sites have native rushes - *Juncus sarophorus*, *J. australis*, and *J. edgariae*. Wind grass (*Lachnagrostis filiformis*) is common in places on stabilised shell banks, while sand wind grass (*L. billardierei*) can be found occasionally on the sandy beach.

### Wetlands

Sheltered coastal estuaries are fringed by mangroves (*Avicennia marina* var. *australasica*), and associated salt marshes, with shore ribbonwood (*Plagianthus divaricatus*), shore rush (*Juncus kraussii* var. *australiensis*), *Juncus pallidus*, *Baumea juncea*, *Samolus repens*, *Selliera radicans*, *Lilaeopsis novaezelandiae*, and *Apium prostratum* subsp. *prostratum* var. *filiforme*, *Triglochin striata*, *Parapholis strigosa*, and *Polypogon monspeliensis*. The introduced *Carex divisa*, as elsewhere in Auckland, has heavily invaded the margins of the salt marshes. Growing also on the fringe is clustered dock (*Rumex conglomeratus*) with reddish fruiting heads, and the more robust curled dock (*R. crispus*). Swamp bindweed (*Calystegia sepium*) abounds in wet areas. Where streams open out into the narrow lagoons behind the shell banks are beds of *Bolboschoenus medianus*, together with *Apodasmia similis*, and with *Cyperus ustulatus* prominent on drier land at the back. Sea aster (*Aster subulatus*) is abundant in places.

Further upstream from the coast, in the extensive 6 hectare Poukaraka Wetland, also known as the Rocky Bay Wetland, with increasingly freshwater conditions are prominent beds of raupo (*Typha orientalis*), adjoining extensive stands of freshwater club-rush (*Bolboschoenus fluviatilis*), and flax (*Phormium tenax*). There is swamp millet (*Isachne globosa*), bulrush (*Schoenoplectus tabernaemontani*), *Eleocharis acuta*, *Isolepis prolifera*, *Apodasmia similis*, *Baumea juncea*, *B. rubiginosa*, *Juncus effusus*, *Carex virgata*, *C. secta*, *C. solandri* where the forest joins the wetlands, and occasionally, *C. maorica*, and patches of *Paspalum vaginatum* where the water is brackish. Herbaceous dicot water plants in the freshwater upper reaches of the wetland include *Polygonum salicifolium*, *Ludwigia palustris*, *Rorippa nasturtium-aquaticum*, *Myosotis laxa* and *Callitriche stagnalis*. About a dozen clumps of toetoe (*Cortaderia fulvida*) occur scattered about in a sea of freshwater club-rush. We were unable to reach these plants and the possibility remains that it is *C. splendens*.

On the floodplain of the Cascade Stream, as it nears its outlet into the Poukaraka Wetland the ferns *Diplazium australe* and *Deparia petersenii* are commonly found. In this area a lone pukatea (*Laurelia novae-zelandiae*) stands tall above thickets of grey willow (*Salix cinerea*) and tobacco weed (*Solanum mauritianum*).

Within the forest are some sedge swamps, the dominant species being *Carex lesssoniana*, *C. geminata*, *Carex virgata*, and *Baumea tenax*.

There is a small bush-clad rocky island in the Poukaraka wetland on which is growing a thriving population of the locally rare shrub *Pomaderris rugosa*. Elsewhere on Waiheke this species is known from the eastern coastal margin of Te Matuku Bay, and it has recently been discovered on Rotoroa Island and a small unnamed islet between Rotoroa and Ponui Islands. On the island at Whakanewha some 23 plants were recorded on 31 December 2001, all healthy and vigorous. The island also has numerous small trees of wharangi and coastal kowhai, and a good deal of gorse, though it is seemingly not posing a threat to the *Pomaderris rugosa*.

Two swamp species – *Hydrocotyle pterocarpa* and *Ranunculus urvilleanus* - recorded by Gardner (1995) are considered to be uncommon in the Tamaki Ecological District

### Coastal cliffs

Pohutukawa trees cling to the greywacke cliffs, which also support colonies of *Poa anceps*, and extensive patches of *Peperomia urvilleana*, which is also locally plentiful at the base of trees above the Cascades Stream. Boneseed (*Chrysanthemoides monolifera*) is a cliff-face colonist, together with *Rytidosperma penicillatum*, *Aira caryophyllea*, *Dichelachne crinita*, *Senecio hispidulus*, and *Verbascum creticum*.

### Rarity of certain native species at Whakanewha

A noteworthy feature of the Whakanewha flora is that a number of native species there, which otherwise are fairly common around Auckland, were encountered by us in just single colonies or occurrences – and this was after comprehensive traverses over the whole park. These locally rare species include *Blechnum fraseri*, *Epilobium rotundifolium*, *Gleichenia microphylla*, *Hymenophyllum rarum*, *Hypolepis distans* (not known elsewhere on Waiheke Island), and *Laurelia novae-zelandiae*.

### Weeds

It has to be said that weeds are something of a feature at Whakanewha. The worst of them is climbing asparagus which is all too common in the kanuka stands and open bush areas, and has a strong grip. *Carex divisa* is common through the salt marsh fringes; *Carex longibrachiata* occurs abundantly throughout the park all along the track margins; tobacco weed (*Solanum mauritianum*), honeysuckle (*Lonicera japonica*), and moth plant (*Araujia sericifera*) rapidly invade disturbed bush sites; and infestations of smilax (*Asparagus asparagoides*) are particularly bad in the shell bank area, where gorse and buffalo grass also abound.

**Waiheke native species not recorded at Whakanewha**

Several native plants occurring elsewhere on Waiheke Island, but not yet recorded in Whakanewha are: *Aristolelia serrata*, *Arthropteris tenella*, *Blechnum discolor*, *Calystegia tuguriorum*, *Cardiomanes reniforme*, *Coprosma propinqua*, *Cordyline pumilio*,

*Coriaria arborea*, *Cyathea smithii*, *Drymoanthus adversus*, *Earina autumnalis*, *Grammitis billardierei*, *Hebe macrocarpa*, *Hymenophyllum dilatatum*, *Lindsaea trichomanoides*, *Nestegis montana*, *Nothofagus truncata*, *Pseudognaphalium luteoalbum*, *Pteris comans*, *Schizaea dichotoma*, *Streblus banksii*, *Syzygium maire*, and *Weinmannia silvicola*.



*Senecio lautus* on shellbank, Whakanewa Regional Park, Waiheke Island, 13 Oct 2001.



*Disphyma australe* subsp. *australe* on shellbank, Whakanewa Regional Park, Waiheke Island, 13 Oct 2001.

## Species list

Legend: \* adventive pl. planted.

Scientific name	Māori name	Common name
<b>Ferns</b>		
<i>Adiantum cunninghamii</i>	puhinu	common maidenhair
<i>Adiantum diaphanum</i>		small maidenhair
<i>Adiantum fulvum</i>		hairy maidenhair
<i>Adiantum hispidulum</i>		rosy maidenhair
<i>Adiantum raddianum</i> *		
<i>Adiantum viridescens</i>		a maidenhair fern
<i>Anarthropteris lanceolata</i>	whare-ngarara	lance fern
<i>Asplenium bulbiferum</i> subsp. <i>bulbiferum</i>	mouku, mouki, mauku, manamana	hen and chickens fern
<i>Asplenium bulbiferum</i> subsp. <i>gracillimum</i>	mouku	hen and chickens fern
<i>Asplenium flaccidum</i> subsp. <i>flaccidum</i>	makawe o, raukatauri, raukatauri	hanging spleenwort, drooping spleenwort
<i>Asplenium lamprophyllum</i>		
<i>Asplenium oblongifolium</i>	huruhuruhenua, parenako, paretao	shining spleenwort
<i>Asplenium polyodon</i>	petako	sickle spleenwort
<i>Blechnum chambersii</i>	rereti, nini	lance fern
<i>Blechnum filiforme</i>	panako	thread fern
<i>Blechnum fluviatile</i>	kiwakiwa	creek fern
<i>Blechnum fraseri</i>	maukurangi	miniature tree fern.
<i>Blechnum membranaceum</i>		
<i>Blechnum novae-zelandiae</i> (incl. <i>B. minus</i> )	kiokio & swamp kiokio	
<i>Cyathea dealbata</i>	ponga	silver tree fern
<i>Cyathea medullaris</i>	mamaku, korau, pitau	black tree fern
<i>Deparia petersenii</i>		
<i>Dicksonia squarrosa</i>	wheki, tirawa	rough or harsh tree fern
<i>Diplazium australe</i>		
<i>Doodia australis</i>	pukupuku	rasp fern
<i>Gleichenia microphylla</i>		umbrella fern
<i>Histiopteris incisa</i>		
<i>Hymenophyllum demissum</i>		filmy fern
<i>Hymenophyllum flabellatum</i>		filmy fern
<i>Hymenophyllum flexuosum</i>		filmy fern
<i>Hymenophyllum rarum</i>		filmy fern
<i>Hymenophyllum sanguinolentum</i>	pipiripi	filmy fern
<i>Hypolepis distans</i>		
<i>Lastreopsis glabella</i>		smooth shield fern
<i>Lastreopsis hispida</i>	tuakura	hairy fern
<i>Lastreopsis microsora</i>		
<i>Lastreopsis velutina</i>		velvet fern
<i>Lindsaea linearis</i>		
<i>Lygodium articulatum</i>	mangemange	bushman's mattress
<i>Marattia salicina</i>	para	king fern (pl.)
<i>Microsorium pustulatum</i>	kowaowao, paraharaha	hound's tongue
<i>Microsorium scandens</i>	mokimoki	fragrant fern
<i>Paesia scaberula</i>	matata	hard, scented, lace or ring fern
<i>Pneumatopteris pennigera</i>	pakauroharoha, piupiu	gully fern, feather fern
<i>Polystichum richardii</i>	pikopiko	common shield fern
<i>Pteridium esculentum</i>	rahurahu, rarauhe, rarahu	bracken, Austral bracken
<i>Pteris macilenta</i>	titipo	sweet brake, sweet fern
<i>Pteris saxatilis</i>		a brake fern
<i>Pteris tremula</i>	turawera	shaking brake
<i>Pyrosia eleagnifolia</i>	ngarara wehi	leather-leaf fern
<i>Trichomanes elongatum</i>		bristle fern
<i>Trichomanes endlicherianum</i>	(= <i>Crepidomanes endlicherianum</i> )	bristle fern
<i>Trichomanes venosum</i>	(= <i>Crepidomanes venosum</i> )	bristle fern

## Fern allies

<i>Lycopodium deuterodensum</i>	puakarimu	club moss
<i>Lycopodium varium</i> (= <i>Huperzia varia</i> )	iwituna	hanging clubmoss, tassel fern
<i>Selaginella kraussiana</i> *		African club-moss, selaginella
<i>Tmesipteris elongata</i>		a fork fern
<i>Tmesipteris lanceolata</i>		a fork fern
<i>Tmesipteris tannensis</i>		a fork fern
<b>Conifers</b>		
<i>Agathis australis</i>	kauri	
<i>Dacrycarpus dacrydioides</i>	kahikatea	white pine
<i>Dacrydium cupressinum</i>	rimu	red pine
<i>Libocedrus plumosa</i>	kawaka	pl.
<i>Phyllocladus trichomanoides</i>	tanekaha	celery pine
<i>Podocarpus totara</i>	totara	
<i>Prumnopitys ferruginea</i>	miro	brown pine
<i>Prumnopitys taxifolia</i>	matal	black pine
<b>Dicot trees and shrubs</b>		
<i>Alectryon excelsus</i>	titoki	
<i>Alseuosmia macrophylla</i>	toropapa	native honeysuckle
<i>Alseuosmia quercifolia</i>		
<i>Avicennia marina</i> var. <i>australasica</i>	manawa	mangrove
<i>Beilschmiedia tarairi</i>	taraire	
<i>Beilschmiedia tawa</i>	tawa	
<i>Brachyglottis repanda</i>	rangiora	
<i>Carmichaelia australis</i>	maukoro	native broom
<i>Carpodetus serratus</i>	putaputaweta	marble leaf
<i>Coprosma arborea</i>	mamangi	tree coprosma
<i>Coprosma areolata</i>		thin-leaved coprosma
<i>Coprosma grandifolia</i>	kanono	
<i>Coprosma lucida</i>	karamu	shiny karamu
<i>Coprosma macrocarpa</i>		
<i>Coprosma propinqua</i> x <i>robusta</i> or <i>macrocarpa</i>		
<i>Coprosma rhamnoides</i>		twiggy coprosma
<i>Coprosma robusta</i>	karamu	
<i>Coprosma robusta</i> x <i>C. rhamnoides</i>		
<i>Coprosma spathulata</i>		
<i>Corynocarpus laevigatus</i>	karaka	
<i>Cotoneaster glaucophyllus</i> *		cotoneaster
<i>Dodonaea viscosa</i>	akeake	
<i>Dysoxylum spectabile</i>	kohekohe	
<i>Elaeagnus x reflexa</i> *		elaeanus
<i>Elaeocarpus dentatus</i>	hinau	
<i>Entelea arborescens</i>	whau	cork-wood
<i>Eriobotrya japonica</i> *		loquat
<i>Eucalyptus botryoides</i> *		bangalay (pl.)
<i>Eucalyptus saligna</i> *		Sydney blue gum (pl.)
<i>Fuchsia excorticata</i>	kotukutuku	tree fuchsia
<i>Geniostoma rupestre</i> var. <i>ligustrifolium</i>	hangehange	Maori privet
<i>Griselinia lucida</i>	puka	
<i>Hebe stricta</i>	koromiko	
<i>Hedycarya arborea</i>	porokaiwhiri	pigeonwood
<i>Hoheria populnea</i>	houhere	lacebark
<i>Knightia excelsa</i>	rewarewa	NZ honeysuckle
<i>Kunzea ericoides</i>	kanuka	
<i>Laurelia novae-zelandiae</i>	pukatea	
<i>Leptospermum scoparium</i>	manuka	tea tree
<i>Leucopogon fasciculatus</i>	mingimingi	
<i>Leucopogon fraseri</i>	patotara	dwarf heath
<i>Leycesteria formosa</i> *		Himalayan honeysuckle
<i>Ligustrum lucidum</i> *		tree privet
<i>Ligustrum sinense</i> *		Chinese privet
<i>Litsea calicaris</i>	mangeao	
<i>Lophostemon confertus</i> *		brush box (pl.)
<i>Lycium ferocissimum</i> *		boxthorn (Koi Is.)

<i>Macropiper excelsum</i>	kawakawa			<i>Conyza albida</i> *	broad-leaved fleabane
<i>Melicope ternata</i>	wharangi			<i>Conyza bilbaoana</i> *	Canadian fleabane
<i>Melicytus micranthus</i>				<i>Cotula coronopifolia</i>	bachelor's button
<i>Melicytus ramiflorus</i>	mahoe	whiteywood		<i>Crepis capillaris</i> *	hawksbeard
<i>Metrosideros excelsa</i>	pohutukawa			<i>Erechtites valerianifolia</i> *	Brazilian fireweed
<i>Metrosideros robusta</i>	rata	northern rata		<i>Euchiton gymnocephalus</i>	creeping cudweed
<i>Mida salicifolia</i>				<i>Gamochaeta americana</i> *	cudweed
<i>Myoporum laetum</i>	ngaio			<i>Gamochaeta spicata</i> *	purple cudweed
<i>Myrsine australis</i>	mapou			<i>Gamochaeta simplicicaulis</i> *	tall cudweed
<i>Nestegis cunninghamii</i>	maire	black maire		<i>Helminthotheca echioides</i> *	oxtongue
<i>Nestegis lanceolata</i>	maire	white maire		<i>Hypochoeris radicata</i> *	catsear
<i>Olearia furfuracea</i>	akepiro, tanguru			<i>Lactuca serriola</i> *	prickly lettuce
<i>Olearia rani</i>	heketara			<i>Lapsana communis</i> *	nipplewort
<i>Paraserianthes lophantha</i> *		brush wattle		<i>Leontodon taraxacoides</i> *	hawkbit
<i>Pennantia corymbosa</i>	kaikomako			<i>Osteospermum barberiae</i> *	African daisy
<i>Pittosporum cornifolium</i>				<i>Senecio bipinnatisectus</i> *	smooth Australian fireweed
<i>Pittosporum crassifolium</i>	karo			<i>Senecio diaschides</i>	fireweed
<i>Pittosporum eugenioides</i>	tarata	lemonwood		<i>Senecio esleri</i> *	hairy Australian fireweed
<i>Pittosporum tenuifolium</i>	kohuhu			<i>Senecio glomeratus</i>	
<i>Plagianthus divaricatus</i>	makaka	swamp ribbonwood		<i>Senecio hispidulus</i>	
<i>Polygala myrtifolia</i> *		sweet pea shrub		<i>Senecio minimus</i>	gravel groundsel
<i>Pomaderris phycifolia</i> var. <i>ericifolia</i>	tauhinu			<i>Senecio lautus</i> *	shore groundsel
<i>Pomaderris rugosa</i>				<i>Silybum marianum</i> *	variegated thistle
<i>Pouteria costata</i>	tawapou	pl.		<i>Sonchus asper</i> *	prickly sow thistle, puha
<i>Prunus persica</i> *		peach		<i>Sonchus oleraceus</i> *	sow thistle
<i>Pseudopanax arboreus</i>	puahou, whau-whaupaku	five finger			
<i>Pseudopanax crassifolius</i>	horoeka	lancewood		<b>Other dicot herbs</b>	
<i>Pseudopanax crassifolius</i> x <i>P. lessonii</i>	horoeka	lancewood hybrid		<i>Acaena anserrinifolia</i>	bidibidi
<i>Pseudopanax lessonii</i>	houpara			<i>Alcea rosea</i> *	hollyhock
<i>Rosa rubiginosa</i> *		sweet brier		<i>Anagallis arvensis</i> *	scarlet pimpernel
<i>Rubus fruticosus</i> agg. *		blackberry		<i>Anagallis arvensis</i> var. <i>coerulea</i> *	blue pimpernel
<i>Salix cinerea</i> *		grey willow		<i>Apium prostratum</i>	tutae-koau large-leaved native celery (erect)
<i>Salix matsudana</i> 'Tortuosa' *		Peking corkscrew willow		<i>Apium prostratum</i> subsp. <i>prostratum</i> var. <i>filiforme</i>	small-leaved native celery (creeping)
<i>Schefflera digitata</i>	pate	sevenfinger		<i>Atriplex prostrata</i> *	beach orache
<i>Solanum aviculare</i>	poroporo			<i>Beta vulgaris</i> *	wild silver beet
<i>Solanum linnaeanum</i> *		apple of Sodom		<i>Cakile edentula</i> *	sea rocket
<i>Solanum mauritianum</i> *		tobacco weed, woolly nightshade		<i>Callitriche muelleri</i>	starwort
<i>Sophora chathamica</i>	coastal kowhai			<i>Callitriche stagnalis</i> *	starwort
<i>Sophora microphylla</i>	kowhai			<i>Centaureum erythraea</i> *	centaury
<i>Streblus heterophyllus</i>	turepo	small-leaved milk tree		<i>Centella uniflora</i>	pennywort
<i>Ulex europaeus</i> *		gorse		<i>Daucus carota</i> *	wild carrot
<i>Vitex lucens</i>	puriri			<i>Dichondra repens</i>	Mercury Bay weed
<b>Dicot lianes</b>				<i>Disphyma australe</i> subsp. <i>australe</i>	native ice plant
<i>Araujia sericifera</i> *		moth plant		<i>Duchesnea indica</i> *	Indian strawberry
<i>Calystegia sepium</i>	pohue	swamp bindweed		<i>Epilobium ciliatum</i> *	tall willow-herb
<i>Calystegia soldanella</i>	nihinihi	shore bindweed		<i>Epilobium rotundifolium</i>	
<i>Clematis paniculata</i>	puawananga	native clematis		<i>Erodium moschatum</i> *	musky storksbill
<i>Lonicera japonica</i> *		Japanese honeysuckle		<i>Euphorbia peplus</i> *	milk-weed
<i>Metrosideros diffusa</i>		white climbing rata		<i>Galium aparine</i> *	cleavers
<i>Metrosideros fulgens</i>	akatawhiwhi	orange rata vine		<i>Galium palustre</i> *	marsh bedstraw
<i>Metrosideros perforata</i>	aka	small white rata vine		<i>Geranium homeanum</i>	cranesbill
<i>Muehlenbeckia complexa</i>	pohuehue			<i>Geranium molle</i> *	dovesfoot cranesbill
<i>Parsonia heterophylla</i>	kaihua	NZ jasmine		<i>Geranium purpureum</i> *	
<i>Passiflora mollissima</i> *		banana passionfruit		<i>Geranium retrorsum</i>	cranesbill
<i>Passiflora tetrandra</i>	kohia	NZ passionfruit		<i>Geranium robertianum</i> *	herb Robert
<i>Rubus australis</i>	tataramoa	swamp lawyer		<i>Gonocarpus incanus</i>	
<i>Rubus cissoides</i>	tataramoa	bush lawyer		<i>Haloragis erecta</i>	toatoa
<b>Composite herbs</b>				<i>Hydrocotyle dissecta</i>	
<i>Ageratina adenophora</i> *		Mexican devil weed		<i>Hydrocotyle pterocarpa</i>	
<i>Ageratina riparia</i> *		mist flower		<i>Hypericum androsaemum</i> *	tutsan
<i>Arctotheca calendula</i> *		cape weed		<i>Hypericum humifusum</i> *	trailing St. John's wort
<i>Aster subulatus</i> *		sea aster		<i>Hypericum japonicum</i>	
<i>Bellis perennis</i> *		daisy		<i>Lilaeopsis novae-zelandiae</i>	
<i>Chrysanthemoides monolifera</i> *		boneseed		<i>Linum bienne</i> *	pale flax
<i>Cichorium intybus</i> *		chicory		<i>Linum trigynum</i> *	yellow flax
<i>Cirsium vulgare</i> *		Scotch thistle		<i>Lobelia anceps</i>	shore lobelia
				<i>Lotus pedunculatus</i> *	lotus major, birdsfoot trefoil
				<i>Lotus suaveolens</i> *	hairy birdsfoot trefoil



<i>Ludwigia palustris</i> *			
<i>Lycopersicon esculentum</i> *		tomato	
<i>Lythrum hyssopifolia</i> *		hyssop loosestrife	
<i>Medicago nigra</i> *		bur medick	
<i>Melilotus indicus</i> *		King Island mellilot	
<i>Mentha x piperita</i> *		peppermint	
<i>Mentha pulegium</i> *		pennyroyal	
<i>Modiola caroliniana</i> *		creeping mallow	
<i>Myosotis arvensis</i> *		field forget-me-not	
<i>Myosotis laxa</i> *		water forget-me-not	
<i>Oenanthe pimpinelloides</i> *		parsley dropwort	
<i>Orobanche minor</i> *		broomrape	
<i>Oxalis exilis</i>			
<i>Oxalis rubens</i>		coastal oxalis	
<i>Parentucellia viscosa</i> *		tarweed, yellow bartsia	
<i>Parochetus communis</i> *		shamrock pea	
<i>Peperomia urvilleana</i>			
<i>Physalis peruviana</i> *		Cape gooseberry	
<i>Phytolacca octandra</i> *		inkweed	
<i>Plantago australis</i> *		swamp plantain	
<i>Plantago lanceolata</i> *		narrow-leaved plantain	
<i>Plantago major</i> *		broad-leaved plantain	
<i>Polycarpon tetraphyllum</i> *		allseed	
<i>Polygonum salicifolium</i>	tutanawai	swamp willow weed	
<i>Prunella vulgaris</i> *		selfheal	
<i>Ranunculus amphitrichus</i>	waoriki	buttercup	
<i>Ranunculus reflexus</i> (= <i>R. hirtus</i> )	maruru	hairy buttercup	
<i>Ranunculus scleratus</i> *		celery-leaved buttercup	
<i>Ranunculus urvilleanus</i>		buttercup	
<i>Raphanus raphanistrum</i> *		wild radish	
<i>Rorippa nasturtium-aquaticum</i> *		watercress	
<i>Rumex acetosella</i> *		sheep's sorrel	
<i>Rumex conglomeratus</i> *		clustered dock	
<i>Rumex crispus</i> *		curled dock	
<i>Samolus repens</i>	maakoako	sea primrose, shore pimpernel	
<i>Sarcocornia quinqueflora</i> (= <i>Salicornia australis</i> )	ureure	glasswort	
<i>Selliera radicans</i>	remuremu, kohukohu	selliera	
<i>Sherardia arvensis</i> *		field madder	
<i>Silene gallica</i> *		catchfly	
<i>Solanum americanum</i>			
<i>Solanum nigrum</i> *		black nightshade	
<i>Spergularia rubra</i> *		sand spurrey	
<i>Stellaria media</i> *		common stitchwort	
<i>Stellaria parviflora</i>		native stitchwort	
<i>Tonilis arvensis</i> *		spreading hedge- parsley	
<i>Trifolium micranthum</i> *		lesser suckling clover	
<i>Trifolium pratense</i> *		red clover	
<i>Trifolium repens</i> *		white clover	
<i>Trifolium scabrum</i> *		rough clover	
<i>Verbascum creticum</i> *		Cretan mullein	
<i>Verbena bonariensis</i> *		purple top	
<i>Veronica persica</i> *		scrambling speedwell	
<i>Veronica plebeia</i> *		forest veronica	
<i>Vicia sativa</i> *		common vetch	
<i>Vicia tetrasperma</i> *		smooth tare	
<i>Vinca major</i> *		periwinkle	
<i>Wahlenbergia violacea</i>		native hare bell	
<b>Monocot trees and shrubs</b>			
<i>Cordyline australis</i>	ti kouka	cabbage tree	
<i>Cordyline banksii</i>	ti-ngahere	forest cabbage tree	
<i>Rhopalostylis sapida</i>	nikau		
<b>Monocot lianes</b>			
<i>Asparagus asparagoides</i> *		smilax	
<i>Asparagus scandens</i> *		climbing asparagus	
<i>Freycinetia baueriana</i> subsp. <i>banksii</i>		kiekie	
<i>Geitonoplesium cymosum</i> *			(eradicated)
<i>Ripogonum scandens</i>	kareao		supplejack
<b>Orchids</b>			
<i>Acianthus sinclairii</i>			pixie cap
<i>Corybas cheesemanii</i>			spider orchid
<i>Corybas macranthus</i>			spider orchid
<i>Earina mucronata</i>	peka-a-waka		bamboo orchid
<i>Microtis unifolia</i>			onion orchid
<i>Pterostylis banksii</i>	tutu-kiwi		elf's hood orchid
<i>Thelymitra longifolia</i>			sun orchid
<i>Thelymitra pauciflora</i>			sun orchid
<i>Winika</i> (= <i>Dendrobium</i> ) <i>cunninghamii</i>			lady's slipper orchid
<b>Sedges</b>			
<i>Baumea juncea</i>			
<i>Baumea rubiginosa</i>			
<i>Baumea tenax</i>			
<i>Bolboschoenus fluviatilis</i>	kukuraho		freshwater club-rush
<i>Bolboschoenus medianus</i>			marsh club-rush
<i>Carex breviculmis</i>			
<i>Carex divisa</i> *			salt marsh carex
<i>Carex dissita</i>			carex bush sedge
<i>Carex divulsa</i> *			grey sedge
<i>Carex geminata</i>	toetoe rautahi		cutty grass
<i>Carex inversa</i>			creeping lawn sedge
<i>Carex flagellifera</i>			tussock sedge
<i>Carex lambertiana</i>			
<i>Carex lesssoniana</i>			cutty grass
<i>Carex longibrachiata</i> *			Australian sedge
<i>Carex maorica</i>			
<i>Carex secta</i>	purei		niggerhead
<i>Carex solandri</i>			
<i>Carex spinirostris</i>			
<i>Carex virgata</i>			
<i>Cyperus brevifolius</i> *			green umbrella sedge
<i>Cyperus eragrostis</i> *			
<i>Cyperus ustulatus</i>	toetoe upoko- tangata		giant umbrella sedge
<i>Desmoschoenus spiralis</i>	pingao		golden sand sedge (pl.)
<i>Eleocharis acuta</i>			sharp spike-sedge
<i>Gahnia lacera</i>			coastal cutty grass
<i>Gahnia pauciflora</i>			cutty grass
<i>Gahnia setifolia</i>	mapere		cutty grass
<i>Gahnia xanthocarpa</i>	tupari maunga		cutty grass
<i>Isolepis cernua</i>			slender clubrush
<i>Isolepis nodosa</i>			knobby clubrush
<i>Isolepis prolifera</i>			
<i>Isolepis reticularis</i>			
<i>Isolepis sepulcralis</i> *			
<i>Lepidosperma australe</i>			square rush
<i>Morelotia affinis</i>			
<i>Schoenoplectus</i> <i>tabernaemontani</i>			bulrush
<i>Schoenus maschalinus</i>			
<i>Uncinia banksii</i>	watau		slender hook sedge
<i>Uncinia distans</i>			slender harsh hook sedge
<i>Uncinia uncinata</i>	kamu		hook sedge
<i>Uncinia zotovii</i>			hook sedge
<b>Rushes</b>			
<i>Juncus articulatus</i> *			jointed rush
<i>Juncus australis</i>			
<i>Juncus bufonius</i> *		toad rush	
<i>Juncus distegus</i>			
<i>Juncus edgariae</i> (formerly <i>J.</i> <i>gregifforus</i> )	wiwi		
<i>Juncus effusus</i> *			soft rush
<i>Juncus kraussii</i> var. <i>australiensis</i>	wiwi		sea rush
<i>Juncus microcephalus</i> *			

<i>Juncus pallidus</i>	
<i>Juncus planifolius</i>	
<i>Juncus prismatocarpus</i>	
<i>Juncus sarophorus</i>	
<i>Juncus tenuis</i> *	track rush
<b>Grasses</b>	
<i>Agrostis capillaris</i> *	browntop
<i>Agrostis stolonifera</i> *	creeping bent
<i>Aira caryophyllea</i> *	silvery hair grass
<i>Anthoxanthum odoratum</i> *	sweet vernal
<i>Arrhenatherum elatius</i> *	tall oat grass
<i>Austrostipa stipoides</i>	coastal needle grass
<i>Avena barbata</i> *	bearded oat
<i>Axonopus fissifolius</i> *	carpet grass
<i>Briza maxima</i> *	large quaking grass
<i>Briza minor</i> *	shivery grass
<i>Bromus diandrus</i> *	riggut brome
<i>Bromus hordeaceus</i> *	soft brome
<i>Bromus lithobius</i> *	Chilean brome
<i>Bromus willdenowii</i> *	prairie grass
<i>Cortaderia fulvida</i>	toetoe
<i>Cortaderia jubata</i> *	purple pampas grass
<i>Cortaderia selloana</i> *	pampas grass
<i>Cortaderia splendens</i>	toetoe
<i>Critesion murinum</i> *	barley grass
<i>Cynodon dactylon</i> *	Bermuda grass
<i>Dactylis glomerata</i> *	cocksfoot
<i>Deyeuxia avenoides</i>	
<i>Dichelachne crinita</i>	long-hair plume grass
<i>Digitaria sanguinalis</i> *	summer grass
<i>Ehrharta erecta</i> *	veld grass
<i>Eragrostis brownii</i> *	bay grass
<i>Gastridium ventricosum</i> *	nit grass
<i>Holcus lanatus</i> *	Yorkshire fog
<i>Isachne globosa</i>	swamp millet
<i>Lachnagrostis billardierei</i>	sand dune wind grass
<i>Lachnagrostis filiformis</i>	New Zealand wind grass
<i>Lagurus ovatus</i> *	hare's tail grass
<i>Lolium multiflorum</i> *	Italian ryegrass
<i>Lolium perenne</i> *	perennial ryegrass

<i>Lolium rigidum</i> *		annual ryegrass
<i>Microlaena avenacea</i>		bush rice-grass
<i>Microlaena stipoides</i>	patiti	meadow rice-grass
<i>Oplismenus hirtellus</i> subsp. <i>imbecillis</i>		slender panic grass
<i>Parapholis strigosa</i> *		slender barb grass
<i>Paspalum dilatatum</i> *		paspalum
<i>Paspalum vaginatum</i> *		saltwater paspalum
<i>Pennisetum clandestinum</i> *		kikuyu grass
<i>Phalaris aquatica</i> *		phalaris
<i>Phleum pratense</i> *		timothy grass
<i>Poa anceps</i>		
<i>Poa annua</i> *		annual poa
<i>Poa pratensis</i> *		Kentucky bluegrass
<i>Polypogon monspeliensis</i> *		annual beard grass
<i>Rytidosperma penicillatum</i> *		danthonia
<i>Rytidosperma racemosum</i> *		danthonia
<i>Schedonorus phoenix</i> *		tall fescue
<i>Setaria gracilis</i> *		knot-root bristle grass
<i>Spinifex sericeus</i>	kowhangatara	silvery sand grass
<i>Sporobolus africanus</i> *		ratstall
<i>Stenotaphrum secundatum</i> *		buffalo grass
<i>Vulpia bromoides</i> *		hair grass
<b>Other monocot herbs</b>		
<i>Agapanthus praecox</i> *		agapanthus
<i>Allium vineale</i> *		wild onion
<i>Apodasmia similis</i> (formerly <i>Leptocarpus simplex</i> )	oloi	coastal jointed rush
<i>Astelia solandri</i>	kowharawhara	perching lily
<i>Collospermum hastatum</i>	kahakaha	perching lily
<i>Dianella nigra</i>	turutu	NZ blueberry
<i>Gladiolus undulatus</i> *		wild gladiolus
<i>Hedychium gardnerianum</i> *		Kahill ginger
<i>Phormium tenax</i>	harakeke	NZ flax
<i>Triglochin striata</i>		arrow-grass
<i>Tradescantia fluminensis</i> *		wandering jew
<i>Typha orientalis</i>	raupo	bulrush
<i>Watsonia bulbifera</i> *		watsonia
<i>Zantedeschia aethiopica</i> *		arum lily

## Records of lower plants

**Mosses** (incorporating records from Peter Beveridge, 24-26 March 2002)

<i>Achrophyllum dentatum</i>	
<i>Calomnion complanatum</i>	
<i>Camptochaete angustata</i>	
<i>Camptochaete arbuscula</i>	
<i>Camptochaete pulvinata</i>	
<i>Campylopodium medium</i>	
<i>Campylopus clavatus</i>	Colonies in scrubland.
<i>Campylopus introflexus</i>	This moss occurs in patches on bare, shallow soil in manuka scrub.
<i>Catharomnion ciliatum</i>	
<i>Cryphaea chlorophyllosa</i>	
<i>Cyathophorum bulbosum</i>	
<i>Dicranoloma menziesii</i>	
<i>Ditrichum difficile</i>	
<i>Distichophyllum pulchellum</i>	
<i>Echinodium hispidum</i>	Growing in large colonies near streams, on the forest

	floor, mainly on exposed tree roots in dark taraire forest. Dark green colour.
<i>Fissidens curvatus</i> var. <i>curvatus</i>	
<i>Fissidens leptocladus</i>	
<i>Fissidens linearis</i> var. <i>angustifolius</i>	
<i>Fissidens taxifolius</i>	Form green tufted carpets on earth banks beside tracks.
<i>Fissidens tenellus</i> var. <i>australiensis</i>	
<i>Fissidens tenellus</i> var. <i>tenellus</i>	
<i>Hypnodendron arcuatum</i>	Beside streams in shady forest, forming extensive colonies.
<i>Hypnum chrysogaster</i>	
<i>Hypnum cupressiforme</i>	
<i>Hypopterygium rotulatum</i>	A small umbrella moss growing in conspicuous clumps on the forest floor. Lime green colour.
<i>Leptostomum macrocarpon</i>	"pin cushion moss". Forms large clumps on the stems of nikau palms, Cascade stream where it enters the Poukaraka Wetland.

<i>Leucobryum candidum</i>	"milk moss". Occasional patches on the ground in forest and scrub.
<i>Macrocoma tenue</i>	
<i>Macromitrium gracile</i>	
<i>Orthorrhynchium elegans</i>	
<i>Papillaria crocea</i>	
<i>Philonotis tenuis</i>	
<i>Ptychomnion aciculare</i>	Abundant colonies on the ground in manuka and kanuka areas.
<i>Racopilum convolutaceum</i>	On damp rocks above Cascades.
<i>Rhaphidorrhynchium amoenum</i>	
<i>Rhynchostegium tenuifolium</i>	
<i>Thamnobryum pandum</i>	Damp, shady stream banks
<i>Thuidium furfurosum</i>	Common in grassy open areas on the edge of tracks.
<i>Thuidium sparsum</i>	
<i>Wijkia extenuata</i>	
<i>Zygodon minutus</i>	

## Liverworts

<i>Aneura alterniloba</i>	Forming thick green, rather shapeless thalli on damp banks.
<i>Archilejeunea olivacea</i>	Taraire tree bark.
<i>Heteroscyphus coalitus</i>	Commonly forming mats on damp ground beside tracks in the taraire forest.
<i>Heteroscyphus furcistipulus</i>	Commonly forming mats on damp ground beside tracks in the taraire forest.
<i>Lepidolaena clavigera</i>	Epiphytic with lichens on taraire bark.

*Lepidolaena taylorii* Epiphytic in soft, light-green mats on trunks of taraire.  
*Pallavicinia xiphoides* In tufts at edge of stream, delta of Cascade Stream.  
*Plagiochila gregaria* Toothed leaves. Male and female plants look different. Male has reduced branches. On damp rocks at Cascades.  
*Porella elegantula* A beautiful, quite large liverwort, endemic to New Zealand. Generally epiphytic. It can occur in flat clumps several cm across. Individual stems are up to 10 cm long, pinnate. Olive green-brown. On damp banks near the Cascades, and on dead branches in the Cascades Stream delta.  
*Radula marginata* On bank along the Tarata Track.  
*Riccardia crassa* Damp stream bank in delta of the Cascade Stream.  
*Schistochila balfouriana* Clothing dark, shady stream bank in bush along the Tarata Track.  
*Symphogyna hymenophyllum* Damp, shady places on stream banks.  
*Symphogyna tenuinervis* Forms patches in damp, shaded places near stream banks, usually with the moss *Hypnodendron arcuatum*.  
*Trichocolea mollissima* On ground in scrubland, commonly with the moss *Thuidium furfursum*.

## Lichens

We have not yet studied the lichen flora in any detail, but have noted the following:

*Chrysothrix candelaris* A yellow, powdery, paint-like lichen common on kanuka trunks.  
*Cladina confusa* reindeer lichen. It occurs on the ground in open scrubland.  
*Cladonia ramulosa* Clay margins of Central track.  
*Parmotrema chinense* Coloniser of bark.

*Peltigera dolichorhiza* Blackish crusts on damp ground.  
*Pseudocyphellaria* sp. On a fallen taraire.  
*Ramalina celastri* Fruticose. Common on shore ribbonwood twigs.  
*Sticta latifrons* Foliose. On dead branches and the bark of trees.  
*Teloschistes chrysophthalmus* Fruticose. Golden or orange-yellow. Commonly epiphytic on mangroves and shore ribbonwood.  
*Usnea* sp. Fruticose. Epiphytic on trees.  
*Xanthoria parietina* Yellow crusts on twigs of trees near the sea.

## Eumycota (True Fungi)

Studies of fungi have not before been reported for Waiheke Island. During the course of preparing this article the authors made a start on identifying the many and diverse forms of fungi to be found at Whakanewha.

*Agaricus arvensis* horse or snowball mushroom. On Poukaraka Flats.  
*Agaricus campestris* var. field mushroom. Found in grassland on Poukaraka Flats in autumn.  
*Agrocybe parasitica* tawaka, poplar mushroom. A partial veil covers the gills of the young mushroom when young and breaks away as the cup expands to its full extent, leaving a dark brown pendulous ring. On the dead wood of tawa above the Tarata Track and at the base of a mangaeo above the Cathedral Track.  
*Amanita nothofagi* Edge of Cathedral Track.  
*Aseroe rubra* flower fungus. Member of the stinkhorn family. Upright white stem, pink to reddish coloured arms spreading horizontally at the top. Growing from the ground in the mamangi forest at the top of the Central Track and Poukaraka Flats.  
*Auricularia polytricha* hakeka, ear fungus, wood ears. Light to dark brown, leathery, ear-shaped fruiting bodies. Abundant on rotting wood throughout the Park.  
*Beauveria bassiana* sugar icing fungus, a species that parasitises insects, killing them by feeding on their internal organs. On cicadas in broadleaf forest above the Cathedral Track and bank of the Cascades Stream.  
*Biscogniauxia capnodes* var. *rumpens* (= *Hypoxylon nummularium*). A charcoal black crust or sheet on wood, black in section, having the appearance of charred wood. Common on dead hardwood branches.  
*Bovista* sp. A type of puffball. Found in open grassland/herbfield bottom of Central Track and the firebreak below Bella Vista Rd.  
*Calocera cornea* Yellow fingers growing from dead logs at the bottom of the

Upland Track and a small kauri stand above Cascades Stream.  
*Calvatia cyathiformis* lilac puffball. Campground.  
*Calvatia gigantea* giant puffball. Recorded growing in deep mulch on Poukaraka Flats in 2000.  
*Camarophyllus apricosus* An orange wax gill. A colony above the Cascades Stream. A yellow unidentified wax gill also seen.  
*Clavaria sulcata* fairy clubs or flame fungus. Bright salmon pink clubs irregular in shape up to 70mm height growing from the ground. Found in mapou-mamangi forest above the Tarata Track, broadleaf forest above Tarata Track and Cascades Stream and on the edge of the Upland Track (Omaha Reserve) at the entrance to the Park.  
*Conchomyces bursaeformis* White, flat, thin kidney-shaped fungus attached laterally to dead branches in broadleaf forests in the Park.  
*Cookeina colensoi* cup fungus. Small (10-15mm dia, 5-10mm height), shallow, cup-shaped fungi, deep pink when young becoming lighter pink with age, attached to wood by short pleated stem. On rotting wood in broadleaf forest above the Cathedral Track and Cascades Stream.  
*Coprinus micaceus* mica or glistening ink cap. A cluster found on a dead taraire in the south-eastern corner of the Park and one above the Cathedral Track.  
*Coprinus plicatilis* Japanese umbrella. Mushroom to 50mm high, cap folded like a fan. Growing from the ground in kanuka forest above Tarata Track.  
*Crepidotus* sp. A small white species with brown gills when old and brown spore. Found on nikau fronds in the Cascades Stream.  
*Crinipellis procera* horsehair. Stiff hair-like stem with tiny brown cap. Found growing on twigs and taraire leaves off the Tarata Track and Cathedral Track.  
*Crucibulum laeve* birdsnest fungus. Small cream coloured cup-shaped fungus with egg-like pore bodies inside the cup. In mixed forest above Cathedral Track and plantings outside the Park office.

*Cyclomyces tabacinus*. Bracket fungus with bands of brown turning black with age. On rotting wood throughout the Park.  
*Cyptotrama asprata* Orange yellow cup with shaggy spine-like surface, white gills, shaggy yellow stem, 20-30mm diameter and height. One seen on a twig in ground litter edge of Tarata Track.  
*Didymium squamulosum*. A small spherical fruiting body with or without a stalk 0.3 to 1 mm diam. When stalked to 1.5 mm high. Grey in colour.  
*Entoloma ?procerum* Several in Cascades area.  
*Favolaschia calocera* orange pore fungus. A small but conspicuous tropical species forming colonies on the dead and rotting wood of a wide range of native and exotic species throughout the Park, including the dead wood on living trees and leaves in ground litter.  
*Ganoderma* aff. *applanatum* Hoof- or shelf-like bracket. Scattered throughout the Park.  
*Ganoderma australe* perennial bracket fungus, artist's conk. Shelf-like bracket scattered throughout the Park. Some large old brackets bottom of Cascades Stream and on pa site.  
*Hericium coralloides* pekepeke kiore, fungus icicles. Much-branched, white coral-like fungus growing on dead wood. At base of Cascades Stream and fallen in ground litter above the Tarata Track.  
*Hypholoma fasciculare* sulphur tuft. A group on the bank of the Cascades Stream.  
*Ileodictyon abarium* white basket or lattice fungus. Found on the edges of tracks in autumn particularly in clay.  
*Isaria* (= *Cordyceps*) *sindairii* vegetable cicada fungus, a species that parasitises cicada larvae, growing from the ground beside the Upland Track.  
*Junghuhnia* (= *Flaviporus*) *brownii* A flat sheet with bright yellow pore surface, a distinctive species not commonly found. Growing on the underside of a rotting kanuka log at the bottom of the Upland Track.  
*Lycoperdon* sp. common puffball. Scattered throughout the Park.

*Macrolepiota delandii* parasol mushroom.

Margins of the northern wetland.

*Macrolepiota rachodes* shaggy parasol mushroom. On office planting mound.

*Notholepiota areolata*. A white pouch fungus. Stream bank of the upper reaches of the Cascades Stream.

*Orbillia delicatula* A small orange cup fungus. On fallen trees in broadleaf forest above Cathedral Track and bank of Cascades Stream.

*Oudemansiella australis* This mushroom is white all over and often its white spores can be seen coating the wood underneath. In broadleaf forest above Tarata Track.

*Paurocotylis pila* Small bright red potato-like fungus without a stem growing from the ground along tracks in the Park.

*Phellinus robustus* A woody, cinnamon brown, hoof-shaped bracket turning black at the lower part of the fruiting body. Two seen attached to fallen manuka wood at the south-eastern corner of the park.

*Physarum lateritium*. A small spherical fruiting body 0.3 to 0.7 mm diam. with no stalk. Orange to red in colour

*Pleurotus djamor* (= *P. oputinae*) oyster

mushroom. On fallen tree above the Cascades Stream. Other *Pleurotus* species seen but not identified.

*Podosphaera petalodes* wine glass fungus. Cap thin with different coloured bands of brown and ruffled margins, formed into a wine glass shape, stem short. On buried wood edge of Cathedral Track.

*Psathyrella* sp. A pair in ground litter above the Tarata Track.

*Pycnoporus coccineus* An orange bracket. On dead manuka at the south-eastern corner of the Park.

*Rosellinia* sp. Tiny black sphere topped by a nipple-like bump. A colony on dead wood in broadleaf forest above Cathedral Track.

*Russula acrolamellata* a yellow-brown russula. Common in kanuka forests.

*Russula griseoviridis* a green russula. Cap grey green with persistent filmy patches. A group of four in kanuka forest in the south-eastern corner.

*Russula macrocystidiata* purple russula. In kanuka forest at the top of the Central Track and in the south-eastern corner.

*Scutellinia badioberbis* an eyelash cup fungus. A colony on a fallen tree above Cascades Stream.

*Stereopsis hirscentis* Small white, erect,

branched fans. A colony growing from soil among moss on a shady, damp bank of the Cascades Stream.

*Stereum complicatum*. Small rosettes, attached in the centre with a ruffled margin. On fallen tree above Cascades Stream.

*Stereum fasciatum* Bracket fungus in shades of yellow and orange. A collection on a dead log at base of Cascades Stream.

*Trametes versicolor* rainbow bracket. Conspicuous bracket in many shades of brown on dead wood scattered throughout the Park.

*Tytopilus formosus* Edge of Cathedral Track.

*Weraroa virescens* blue pouch fungus. Edge of the Upper Cascades Track.

*Xeromphalina tenuipes* Cap orange-brown, stem yellow-brown, gills pale cream, no ring. On fallen hardwood trees south-eastern corner and bottom of Uphand Track.

*Xylaria hypoxylon* candlesnuff or stags horn fungus. 20-25mm high branched finger-like stalks, white tips grading to black at the base. Colonies found scattered throughout the Park on dead tree stumps.



***Hypopterygium rotulatum*, a small umbrella moss growing in conspicuous clumps on the forest floor. Whakanehua regional Park, Waiheke Island. 9 January 2002.**

#### **Myxomycetes (Slime Moulds)**

Myxomycetes are generally cosmopolitan in distribution, and the particular species found in an area depend on available moisture and habitat (Ing 1999). Specimens were collected on 10 April 2002 and later identification by Clive Shirley.

*Ceratiomyxa fruticulosa* Sporocarps effused up to 10 cm long, white, finger-like to 4 mm high, sparsely branched. A colony on decaying wood above Tarata Track.

*Hemitrichia calyculata* Stalked sporangia, found in small groups 1 – 3 mm high, 0.5 – 1 mm diam., yellow to ochraceous. On decaying wood, bank of the Cascades Stream.

*Hemitrichia serpula* Sporocarp to 15 mm long much branched and netted, to 0.6 mm wide, yellow. Capillitium elastic coiled yellow tubes. On nikau petiole, Cascades Stream.

*Lycogala epidendrum* Sporocarp aethalia clustered, cushion-shaped 4 – 7 mm diam., dark grey. On decaying wood, Cascades Stream.

- Hemitrichia serpula* Sporocarp to 15 mm long much branched and netted, to 0.6 mm wide, yellow. Capillitium elastic coiled yellow tubes. On nikau petiole, Cascades Stream.
- Lycogala epidendrum* Sporocarp aethalia clustered, cushion-shaped 4 – 7 mm diam., dark grey. On decaying wood, Cascades Stream.
- Perichaena depressa* Sessile sporangia, flattened, closely packed to adjacent sporangia becoming angular at point of contact. 1 – 1.5 mm across dark brown to black. Capillitium yellow released from edge of sporangia. On nikau petiole Cascades Stream.
- Physarum bogoriense* Forms elongate plasmodiocarps in small groups, dull yellow to brown, 0.3 – 0.6 mm wide. Splitting along a line of dehiscence to reveal inner idescent layer and spore mass with white lime crystals. On nikau petiole, Cascades Stream.
- Physarum globuliferum* Stalked sporangia accruing in large numbers, common, spherical, 0.4 – 0.7 mm diam, 0.8 – 1.5 mm tall. White to pale grey with white stalk. On nikau petiole, Cascades Stream.
- Physarum nutan.* Stalked sporangia accruing also in large numbers, common, nodding, lens-shaped, 0.4 – 0.7 mm diam., to 1.5 mm tall, white or pale grey with a dark stalk twice the diam. of the sporangium. On nikau petiole, Cascades Stream.
- Physarum* sp. (unidentified) On decaying wood, Cascades Stream.
- Physarum* sp. (unidentified) On nikau petiole, Cascades Stream.
- Stemonitis* sp. (unidentified) In leaf litter and soil, Cascades Stream.

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Coastal fringe of flax (*Phormium tenax*) and nikau palm (*Rhopalostylis sapida*).  
Whakanewha Regional Park, Waiheke Island. 5 Jan 2002.