

# KAUWAHAIA ISLAND - TE HENGA, WEST AUCKLAND

G.A. Taylor and E.K. Cameron

## INTRODUCTION

Kauwahaia Island (grid ref. NZMS 260 Q11 385785) is 100 m north of forested Erangi Point which separates Te Henga Beach and O'Neill Bay on Auckland's west coast (Fig. 1, and see also Hayward and Diamond 1977: Fig. 11). It is a small (0.7 ha) vertically cliffed island except for a flat-topped summit and a moderately steep landward slope covered in 2-6 m tall vegetation. The island area includes a storm platform >10 m wide on the north-west shore. The island is accessible on foot except at high tide. A small ladder is required to ascend the low cliffs on the landward side. Kauwahaia Island is owned by the Woodward family of Auckland.

This article is based on seven visits to the island by one of us (GAT) and a single visit by EKC; between July 1989 and April 1990.

## GEOLOGY AND HISTORY

Kauwahaia Island is made of hard volcanic conglomerate of early Miocene age (Waitakere group) capped with a few metres of soft Pleistocene sandstone (Kaihu group) (B.W. Hayward pers. comm.).

The island is a substantial pa with a flattened top, 12 man-made terraces down the landward side, several pits and abundant midden (Hayward and Diamond 1977) showing extensive use and complete clearance of vegetation by prehistoric Maori (B.W. Hayward pers. comm.). A radiocarbon date on some of the midden material was 1607  $\pm$ 48 AD (Hayward and Diamond 1980). This is not to say that the island may still have been used more recently but there is no record of use in historic (European) times (B.W. Hayward pers. comm.).

## FAUNA

Much of the island's surface under the vegetation is dominated by burrows of breeding petrels. The main species are grey-faced petrels (Pterodroma macroptera) and sooty shearwaters (Puffinus griseus) but flesh-footed shearwaters (P. carneipes) and diving petrels (Pelecanoides urinatrix) are also present.

Other than the petrels, the following birds have been observed on or around the island: Australasian gannet, pied shag, spotted shag, little shag, reef heron, pheasant, variable oystercatcher, pied stilt, red-billed gull, black-backed gull, caspian tern, white-fronted tern, feral pigeon, kingfisher, welcome swallow, NZ pipit, silvereye (breeding), tui, grey warbler, fantail, chaffinch, house sparrow, hedge sparrow, blackbird, starling and myna.

Ship rats (Rattus rattus) were abundant on the island, e.g., eight were seen on 13 December 1989. Some rats were high up in kawakawa (Macropiper excelsum) shrubs eating the ripe fruit. About 0.5 kg of Talon 20P poison was laid on 19 December. All the poison had gone when checked on 12 January 1990 and no rats were seen that night. Another 0.5 kg of Talon 20P was laid out and this remained untouched until it weathered away. No rats were seen on 11 April 1990.

No lizards have been reported from Kauwahaia Island.

## FLORA

The flora of Kawahaia Island is listed in Appendix 1. The vascular plant flora totals 82 species of which 62% are native, and these native species dominate the island's vegetation. All the adventive species are mainly insignificant as they all are herbaceous, some are very small and some are present in very low numbers.

The most interesting native plant on the island is Senecio rufigliandulosus. It was rare on the island, being found at a single locality on the forest margin on the upper south-facing cliff-tops amongst other herbaceous species. Its discovery appears to be the third most northern geographical collection of this New Zealand endemic daisy and only the second (first?) recent collection north of the western King Country. The most northern specimen is from Motuopao Island, off Cape Maria van Dieman, WELT 31720. It is undated and the collector is not stated. The handwriting is J. Buchanan's (P.J. Brownsey pers. comm.) and the most likely collection date is 1877 (N.M. Adams pers. comm.). The next most northern specimen is a seedling from Cuvier Island (from near the lighthouse), A.E. Wright, 1980, AK 153771 (because it is only a seedling, the identification has a degree of doubt). Next is Kawahaia Island (new record) and then nine old collections from the Hunua Ranges, 70 km south-east of Kawahaia Island: T. Kirk, undated, AK 11804, WELT 31702 and 31729; T.F. Cheeseman, 1879 (on 2 specimens), AK 10601-2, WELT 31696, 31722 and 31730-1. The next most northern specimens are from near Waitomo (ignoring the more northern East Cape specimens), e.g., E.K. Cameron 3170, 1984, AKU 17935; and P.J. de Lange, 1985, AK 170436. From these limestone areas in the western King Country, S. rufigliandulosus becomes more frequent further south.

An interesting weed record is little mouse-ear chickweed (Cerastium semidecandrum), which is a new northern limit for this species in New Zealand (cf. Webb et al. 1988). Searching similar habitats along the Northland coastline may reveal more northern localities for both the little mouse-ear chickweed and S. rufigliandulosus.

## VEGETATION

The summit ridge (runs north-south), some 30 m asl, is flattish for c. 20 x 8 m. Three to four metre tall houpara (Pseudopanax lessonii) and karo (Pittosporum crassifolium) are dominant around the summit and shining spleenwort (Asplenium oblongifolium) is an abundant ground cover. Other frequent shrub species include kawakawa, Coprosma crassifolia and hangehange (Geniostoma rupestre). Karamu (Coprosma robusta) is restricted to the summit.

The upper landward slope is only moderately steep and supports the island's tallest vegetation; a dense cover of karo up to 6 m tall. Houpara, kawakawa and hangehange are also common on the slopes below the summit. The ground is mainly bare underneath because of petrel activity and eroding sandstone. A few plants of shining spleenwort and seedlings of canopy species are present. A grove of 15 karaka (Corynocarpus laevigatus) trees, 0.5-5 m tall, are on the southern fringe of this karo forest. About 50 seedlings <30 cm tall were scattered under the largest tree. Mats of allseed (Polycarpon tetraphyllum) and Dichondra repens occur near the lower forest margin and lower down on the cliff-tops, glasswort (Sarcocornia quinqueflora) and ice plant (Disphyma australe) are locally dominant.

The island's north-east corner is open, gently sloping, and densely covered with sedges and grasses, e.g., Isolepis nodosa, Carex testacea, ripgut brome (Bromus diandrus), haretail (Lagurus ovatus), ratstail

(Sporobolus africanus), sand wind grass (Deyeuxia billardierei) and Elymus multiflorus. Dichondra repens is locally abundant. Less common plants present in this sward included; allseed, sow thistle (Sonchus oleraceus), NZ spinach (Tetragonia trigyna), native celery (Apium prostratum), soft brome (Bromus hordeaceus), shore groundsel (Senecio lautus), NZ wind grass (Lachnagrostis filiformis) and Lobelia anceps.

The upper vegetation of the western and northern sides is dominated by shrubby karo (<2 m tall) and below this are ledges of mainly herbaceous species where Lotus suaveolens, haretail, ice plant and clumps of coastal toetoe (Cortaderia splendens) and I. nodosa usually dominate. Other ledge species include tauhinu (Cassinia leptophylla), hawkbit (Leontodon taraxacoides), sand wind grass, sow thistle, NZ spinach, Paspalum dilatatum and karo. Flax (Phormium tenax) is common on the steep upper south face.

The most curious aspect of the island's vegetation is the complete absence of live pohutukawa (Metrosideros excelsa). There is one dead standing trunk on the summit ridge c. 2.5 m tall, which is presumably this species. Pohutukawa seed should frequently reach the island from the large trees on Erangi Point and behind O'Neill Bay. The geology of Erangi Point is essentially identical to Kauwahaia (Hayward 1983) and their differences in vegetation may relate to their differing histories of human interference. There is no evidence of any substantial use of Erangi Point high areas by humans apart from a small amount of midden (B.W. Hayward pers. comm.). The Erangi Point forest compared with Kauwahaia is much more extensive in area and species diversity, contains larger (older) individual trees and is over three times the height above sea level. Also burrowing sea birds are absent on Erangi Point but are common under the karo forest on Kauwahaia Island where they keep the ground virtually bare. We feel the reason that large pohutukawa trees are present on Erangi Point and yet absent on adjacent Kauwahaia must relate to: (a) the younger vegetation age which is a reflection of past disturbance, presumably by burning; (b) competition with shade tolerant species; and (c) the impact of burrowing petrels on the soils of Kauwahaia Island.

Judging from the size and species of the present vegetation, Kauwahaia must have been virtually barren around 1900. The usual early cover from bare ground on fired exposed northern New Zealand islands is pure flax. Clumps of flax occur throughout the southern and western slopes and a few are present in the central landward slopes. Cameron (1985) found on rat-free Rimariki Island (north-east New Zealand) that karo regenerated abundantly through dense flax and pohutukawa was only occasional even though large pohutukawa were frequent on nearby cliffs. Atkinson (1972) stated that kiore (Rattus exulans) eat karo seed and suggested that this may account for karo's poor regeneration on islands with kiore. Ship rats also eat karo seeds and have an effect on karo regeneration (pers. obs.). Kauwahaia Island earlier this century was probably too bare to support rats and possibly the present karo forest established before rats reached the island. On Kauwahaia, the eroding sandstone surface coupled with the petrel disturbance may give the larger karo seedlings an advantage over the tiny pohutukawa seedlings. Though with time pohutukawa should establish on the island, at least on the cliffs.

Tawapou (Planchonella costata) is present on Erangi Point and absent on Kauwahaia Island but unlike pohutukawa this is probably due to the lack of seed dispersal (New Zealand pigeon is the usual seed vector for this species), though karaka on Kauwahaia presumably arrived via the New Zealand pigeon. Two rather uncommon herbs to the Auckland area, Linum monogynum and Mentha cunninghamii, are also on Erangi Point and not on Kauwahaia Island.

## FUTURE MANAGEMENT

The small Kauwahaia Island with: vegetation dominated by native species; the only definitely known current Northland site for S. rufigliandulosus; four breeding species of petrels; now rat-free; the best preserved example of an island pa along the Waitakere coastline (Hayward and Diamond 1979); and being so close to Auckland City combine to give the island nationally significant conservation values. Such an island should be monitored every 2-3 years for appearance of exotic mammals and aggressive adventive plants. Rats especially should be searched for as they are likely to re-establish on the island. Possums (Trichosurus vulpecula) could feasibly also reach the island unaided.

Although 31 species of adventive higher plants were recorded on the island, all are herbaceous and only Kikuyu grass (Pennisetum clandestinum) has the potential to smother other species. Two patches of Kikuyu grass were seen and its eradication is desirable before it spreads.

The island's vertical cliffs protect it from most human disturbance, and also dogs and cats. Frequent human visits to such a vulnerable island should be discouraged. Legal protection of some kind is desirable for the long term security of the island's biota. The adjacent Erangi Point and Ihumoana Island (also both privately owned) contrast and complement Kauwahaia Island's biota and all three areas deserve legal protection, perhaps as Protected Private Land.

## ACKNOWLEDGEMENTS

To Dennis Woodward for permission to study the island's biota, to Shane Dalton for organising the initial trips to the island, to Bruce Hayward for geological and archaeological information, to the herbarium curators of AK, CHR, WAIK, and WELT for northern records and information of S. rufigliandulosus, to Tony Druce confirming the identification of S. rufigliandulosus, to Phil Garnock-Jones for the Cerastium identification, to Peter de Lange for assisting with herbarium information, to Jessica Beaver and John Braggins for the bryophyte identification.

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APPENDIX 1. Kauwahaia Island Flora.

a = abundant  
c = common  
o = occasional  
l = local  
r = rare, <5 plants

AKU = University of Auckland (Botany  
Dept.) herbarium voucher number  
\* = adventive species

Ferns (1)

*Asplenium oblongifolium* a AKU 22175

Dicotyledons (53)

*Anagallis arvensis* s.s. o  
*Apium prostratum* c  
*Calystegia sepium* x *C. soldanella*? lc AKU 22178  
*Cassinia leptophylla* o  
*Centaurium erythraea*\* o  
*Cerastium semidecandrum*\* o AKU 22188  
*Cirsium vulgare*\* o  
*Conyza albida*\* o  
*Coprosma crassifolia* o  
*C. macrocarpa* r  
*C. repens* o  
*C. rhamnoides* r  
*C. robusta* r  
*Corynocarpus laevigatus* lc  
*Crassula sieberiana* s.s. l AKU 22181  
*Dichondra repens* a  
*Disphyma australe* a  
*Geniostoma rupestre* c  
*Gnaphalium audax* r AKU 22256  
*G. coarctatum*\* l  
*Hypochoeris radicata*\* o  
*Leontodon taraxacoides*\* c  
*Leucopogon fasciculatus* r  
*Lobelia anceps* c  
*Lotus suaveolens*\* la AKU 22179  
*Macropiper excelsum* c  
*Melicytus ramiflorus* o  
*Muehlenbeckia complexa* r  
*Oxalis rubens* o  
*Parietaria debilis* c  
*Phytolacca octandra*\* r  
*Picris echioides*\* o  
*Pittosporum crassifolium* a  
*Plantago australis*\* o AKU 22174  
*Polycarpon tetraphyllum*\* c  
*Pseudognaphalium luteoalbum* o  
*Pseudopanax lessonii* a  
*Sagina apetala*\* l AKU 22182  
*S. procumbens*\* o

Samolus repens c  
Sarcocornia quinqueflora a  
Selliera radicans l AKU 22180  
Senecio bipinnatisectus\* o  
S. jacobaea\* r  
S. lautus s.s. c AKU 21721  
Senecio rufiglandulosus r AKU 21720 & 21806  
Solanum americanum c  
S. nigrum\* o  
Sonchus oleraceus\* o  
Spergularia media o  
Stellaria decipiens r  
S. media\* o  
Tetragonia trigyna o

#### Monocotyledons (28)

Arthropodium cirratum o  
Astelia banksii o  
Bromus diandrus\* o  
B. hordeaceus\* c  
B. willdenowii\* o  
Carex flagellifera o  
C. testacea lc  
Cordyline australis r  
Cortaderia splendens o  
Cyperus ustulatus o  
Dactylis glomerata\* o  
Deyeuxia billardierei o-c  
Dichelachne crinita o  
Elymus multiflorus o AKU 22177  
Holcus lanatus\* o  
Isolepis cernua o  
I. nodosa o  
Lachnagrostis filiformis  
var. littoralis o AKU 22183  
Lagurus ovatus\* c  
Oplismenus imbecillis l AKU 22176  
Paspalum dilatatum\* c  
Pennisetum clandestinum\* r  
Phormium tenax lc  
Poa anceps s.s. o  
P. annua\* o  
Sporobolus africanus\* c  
Stipa stipoides o  
Vulpia bromoides\* o

#### Bryophytes (3) (incomplete list)

Chiloscyphus semiteres AKU 72151  
Racopilum convolutaceum AKU 72149  
Trichostomiopsis (Barbula) australasiae AKU 72150

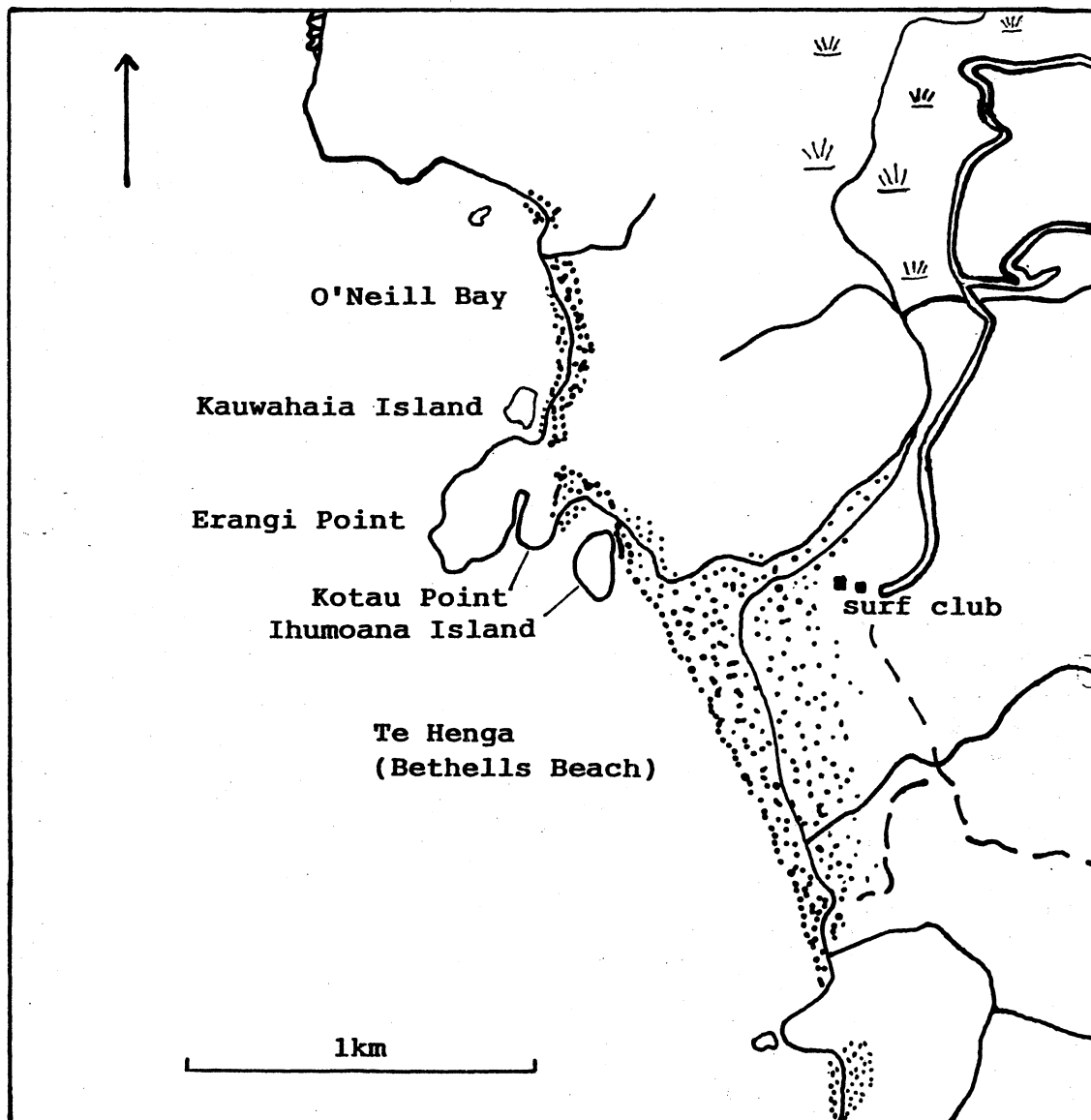


Fig. 1. Locality map for Kauwahaia Island

## LEAF STRUCTURE OF MERYTA\* SPECIES

R.O. Gardner

On a visit to Norfolk Island last year I made collections of Meryta angustifolia, a small subcanopy tree common in the Araucaria excelsa forest on the higher parts of Mt Pitt. The other species described from the island, M. latifolia, is rare; Mr Owen Evans kindly made a trip along the coast at Anson Bay to get me a specimen.

\* A generic name characteristic of the Forsters' learnedness, from a Greek word referring to the appearance of the male flowers, like furled sails. The pronunciation "màyríta" is preferable to our usual "mwriter".