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Vegetation of Motuarahi Island, Paihia, Bay of Islands

Ben Goodwin

Motuarahi is a 1.6 ha island, located a short distance off the Paihia foreshore, in the Bay of Islands. I visited the island on three occasions whilst on holiday in 2016 and 2017 and, on each excursion, explored and recorded its flora (see Appendix). Two trips occurred in winter (July 2016, July 2017) and one in summer (December 2016). Geologically, the island is formed of palaeozoic – mesozoic Waipapa terrane greywacke, with soils of Marua light-brown clay loam (Northland Regional Council 2014). Most of the coast is rocky and steep, with short, intertidal rock platforms (Fig.1). There is a small beach on the southern edge of the island, which permits comfortable landing. Motuarahi is administered as a 'Scenic Reserve' by the Department of Conservation.

Flora

The only beach area, formed of shell, pebble and sand, is situated at the southern edge of the island. Above the high tide mark, vegetation consists of scattered plants of fennel (*Foeniculum vulgare*), pohuehue (*Muehlenbeckia complexa*) and toatoa (*Haloragis erecta* subsp. *erecta*), with patches of Indian doab (*Cynodon dactylon*) and Bermuda buttercup (*Oxalis pes-caprae*). A rope barrier, used to reduce disturbance for breeding New Zealand dotterels (*Charadrius obscurus*), prohibited a thorough survey of this area on two of the three excursions. Shortly back from the beach, the island's three most significant invasive plants are evident, *Cotoneaster glaucophyllus*, sweet pea shrub (*Polygala myrtifolia*) and the African olive (*Olea europaea* subsp. *cuspidata*). These three shrubs,

particularly the latter, take up much of the space from the spring high tide mark, back to the foot of the steep slopes, which rise to the interior of the island. African olive is readily identified from the more familiar European or Mediterranean subspecies, *Olea europaea* subsp. *europaea*, by its leaves, which, in the African taxon, are typically larger, with pale green or yellowish undersides, as opposed to white or silver grey in *O. europaea* subsp. *europaea* (Cuneo & Leishman, 2006). These leaf characteristics were sufficient for field identification purposes. Other characteristics are discussed by Cameron (2017).

Heading northwards from the beach, the steep upward slope toward the interior of the island has a dense ground-cover of ferns. Rasp fern (*Doodia*



Fig 1. Eastern coastline, December 2016. All photos by author.

australis) and rosy maidenhair (*Adiantum hispidulum*) are abundant, with *Adiantum cunninghamii* and the sedge *Carex flagellifera* both occasional. The canopy here is primarily comprised of rawiri manuka (*Kunzea linearis*), pohutukawa (*Metrosideros excelsum*) and African olive, with single, larger specimens of totara (*Podocarpus totara*) and shining privet (*Ligustrum lucidum*). Small trees, saplings and shrubs in the understory include *Coprosma macrocarpa* subsp. *minor*, mapou (*Myrsine australis*), five finger (*Pseudopanax arboreus*), twiggly coprosma (*Coprosma rhamnoides*) and hangehange (*Geniostoma linguistifolium*), with some low ponga (*Cyathea dealbata*).

Higher on the slopes thread fern (*Icarus filiformis*) is locally common, with *Poa anceps* making an appearance only on the steepest sections. As the slope begins to plateau in the central part of the island (Fig.2), rawiri manuka becomes the exclusive canopy tree, with tall and particularly slender trees of mapou and dense shrubs of twiggly coprosma being abundant in the understory. Occasional are seedlings and low plants of totara, a native jasmine (*Parsonsia* sp.), akepiro (*Olearia furfuracea*), tanekaha (*Phyllocladus trichomanoides*) and the mingimingis *Leucopogon fasciculatus* and *Cyathodes juniperina* subsp. *juniperina*, the latter represented in both its larger- and smaller-leaved variants. Clumps of inkberry (*Dianella nigra*) and *Astelia banksii* are frequent, as are the ferns *Doodia australis*, hounds tongue (*Microsorium pustulatum*) and leather leaf (*Pyrrhosia eleagnifolia*), which grow thinly in small patches on the forest floor. On the northern headland, *Veronica ligustrifolia* (Fig.3) and haekaro (*Pittosporum umbellatum*) are locally common. Both of these species can also be found on coastal cliffs, especially on the northern half of the island. There is a significant amount of deadfall across the whole interior of the island indicating that it has, at times, been battered quite severely by storms.

FAUNA

Aside from New Zealand dotterels, other wildlife of note included a single, sub-adult shore skink (*Oligosoma smithii*), found amongst rocks on the eastern coastline. Habitat for this species is limited, the most suitable area being well and truly overshadowed by woody exotic trees and shrubs. The earwig (*Anosolabis littorea*) is very common on the beach, and webs of the large sheetweb spider (*Cambridgea foliata*) are frequent in the island's interior. Rats are present, as indicated by large husking stations consisting almost entirely of olive pits.

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Fig 2. Island interior, December 2016.

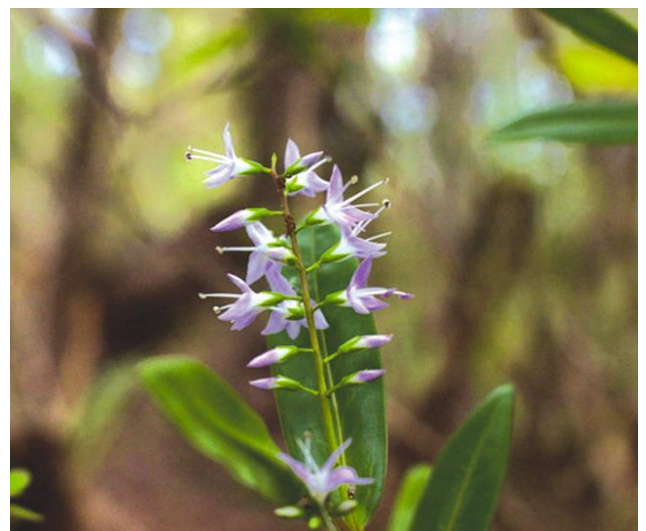


Fig 3. *Veronica ligustrifolia*, July 2017.

Appendix. Vascular plant species list for Motuarahi Island, Paihia, Bay of Islands

*Exotic species

Gymnosperms

<i>Phyllocladus trichomanoides</i>	tanekaha. Young plants, frequent, interior
<i>Podocarpus totara</i>	totara. One mature. Young plants, mainly seedlings, frequent, interior

Ferns

<i>Adiantum cunninghamii</i>	maidenhair. Frequent, shaded slopes. Sparse, interior
<i>Adiantum hispidulum</i>	rosy maidenhair. Abundant on shaded slopes, occasional on coastal cliffs
<i>Asplenium flaccidum</i>	hanging spleenwort. Common throughout, usually terrestrial, also epiphytic on pohutukawa
<i>Cyathea dealbata</i>	ponga. Young plants, occasional, shaded slopes
<i>Doodia australis</i>	rasp fern. Abundant, shaded habitats throughout
<i>Icarus filliformis</i> (syn. <i>Blechnum filliforme</i>)	thread fern. Locally common
<i>Microsorium pustulatum</i>	hounds tongue. Occasional in interior
<i>Pteris tremula</i>	Rare, single plant observed in December 2016
<i>Pyrrhosia elaeagnifolia</i>	leather leaf. Occasional, interior, terrestrial. Also epiphytic on pohutukawa.

Dicotyledons

<i>Anagallis arvensis</i> *	pimpernel. Rare, beach
<i>Asparagus scandens</i> *	climbing asparagus. Rare, single plant, interior
<i>Atriplex prostrata</i> *	orache. Locally common, beach
<i>Avicennia marina</i>	mangrove. Rare, coastal rocks
<i>Calystegia sepium</i> subsp. <i>roseata</i>	bindweed. Occasional, beach
<i>Chrysanthemoides monilifera</i> *	boneseed. Frequent, especially along northern coastline
<i>Coprosma macrocarpa</i> subsp. <i>minor</i>	Occasional, shaded slopes
<i>Coprosma rhamnoides</i>	twiggy coprosma. Common, interior and shaded slopes
<i>Coprosma robusta</i>	karamu. Occasional, shaded slopes
<i>Cotoneaster glaucophyllus</i> *	cotoneaster. Frequent coastal cliffs and beach
<i>Dichondra repens</i>	Mercury Bay weed. Occasional, interior
<i>Foeniculum vulgare</i> *	fennel. Locally common, beach
<i>Geniostoma ligustrifolium</i>	hangehange. Occasional, interior and shaded slopes
<i>Geranium robertianum</i> *	herb Robert. Rare, beach
<i>Kunzea linearis</i>	rawiri manuka. Abundant, cliffs and interior
<i>Leptocophylla juniperina</i> subsp. <i>juniperina</i>	mingimingi. Frequent in interior and coastal cliffs
<i>Leucopogon fasciculatus</i>	mingimingi. Occasional interior
<i>Ligustrum lucidum</i> *	shining privet. Sparse, shaded slopes, mainly young plants, one large tree.
<i>Metrosideros excelsum</i>	pohutukawa. Common, cliffs
<i>Muehlenbeckia complexa</i>	pohuehue. Locally common, beach and cliffs
<i>Myrsine australis</i>	mapou. Abundant interior and shaded slopes
<i>Olea europaea</i> subsp. <i>cuspidata</i> *	African olive. Frequent on coast, young plants occasional in interior and shaded slopes
<i>Olearia furfuracea</i>	akepiro. Frequent, interior
<i>Oxalis pes-caprae</i>	Bermuda buttercup. Local, beach.
<i>Parsonsia</i> sp.	native jasmine. Seedlings and young plants occasional, interior
<i>Peperomia urvilleana</i>	peperomia. Locally common on coastal cliffs
<i>Pittosporum umbellatum</i>	haekaro. Frequent on coastal cliffs and interior
<i>Plantago lanceolata</i> *	narrow leaf plantain. Rare, cliffs
<i>Polygala myrtifolia</i> *	sweet pea. Common, beach and cliffs
<i>Prunus ?avium</i> *	Rare, seedling noted in July 2016 (removed by author).
<i>Pseudopanax arboreus</i>	five finger. Occasional, shaded slopes, interior
<i>Sarcocornia quinqueflora</i>	glasswort. Locally common, coastal rocks

<i>Solanum nigrum</i> *	black nightshade. Rare, beach
<i>Sonchus oleraceus</i> *	sow thistle. Rare, beach
<i>Ulex europaeus</i> *	gorse. Occasional, interior and cliffs
<i>Veronica ligustrifolia</i> (syn. <i>Hebe ligustrifolium</i>)	Locally common, cliffs and interior
<i>Veronica plebeia</i>	creeping speedwell. Coast, rare

Monocotyledons

<i>Acianthus sinclairii</i>	pixie cap orchid. Locally common, interior
<i>Allium triquetrum</i> *	onion weed. Rare, beach
<i>Astelia banksii</i>	Frequent, throughout
<i>Austrostipa stipoides</i>	needlegrass. Rare, on coastal rocks
<i>Carex flagellifera</i>	Occasional, shaded slopes
<i>Cordyline australis</i>	cabbage tree. Rare, shaded slopes, two sizeable specimens
<i>Cynodon dactylon</i> *	Indian doab. Localised, beach
<i>Dianella nigra</i>	inkberry. Frequent, interior
<i>Oplismenus hirtellus</i>	panic grass. Occasional, interior
<i>Phormium tenax</i>	flax. Rare, low on coastal cliffs
<i>Poa anceps</i>	Localised, steep shaded slopes
<i>Rhynchospora</i> sp ?*	danthonia. Occasional, coastal cliffs

Mosses

<i>Leptostomum macrocarpum</i>	Uncommon, on coastal rocks and <i>Metrosideros</i>
<i>Ptychomnion aciculare</i>	Abundant, interior

Nukumea and Alice Eaves Scenic Reserves and environs – see p.45

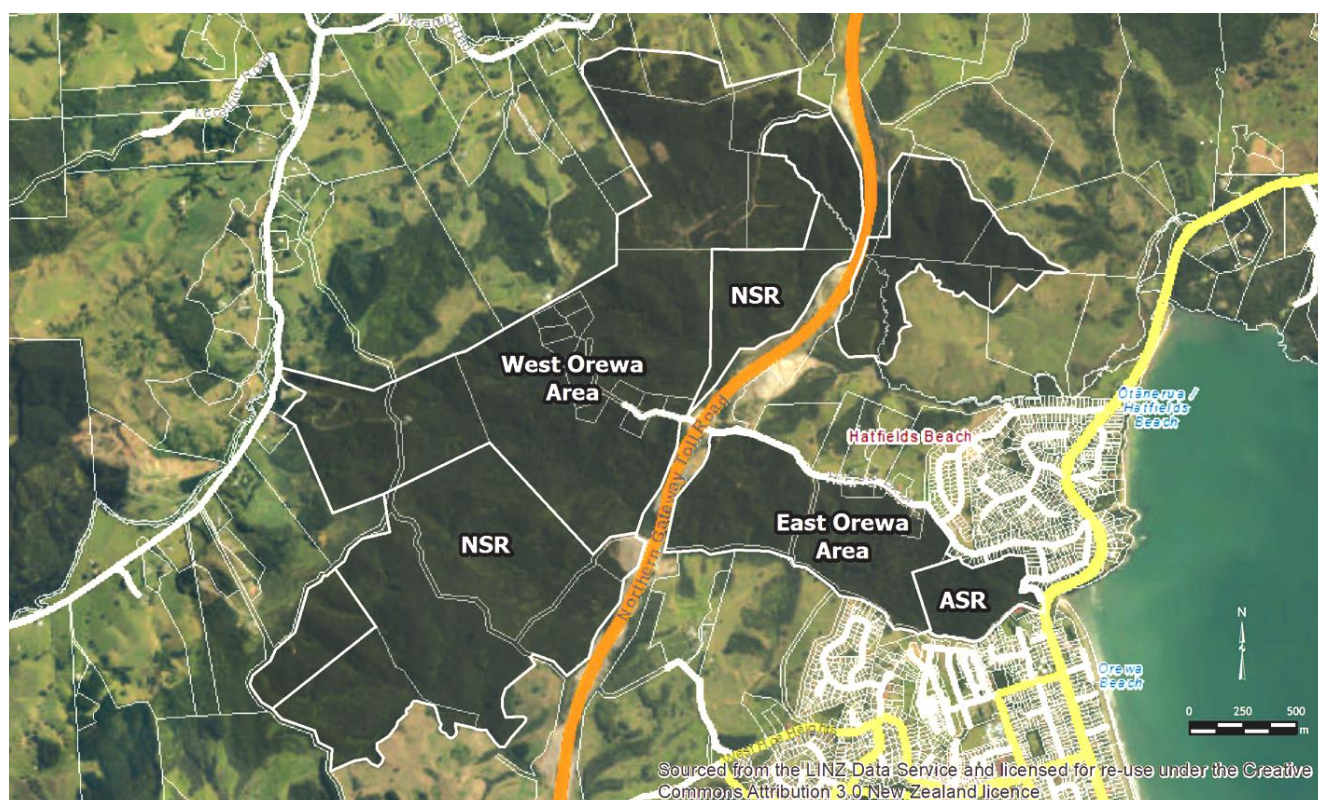


Fig. 1. Location of the study area (delineated by white line). NSR = Nukumea Scenic Reserve; ASR = Alice Eaves Scenic Reserve. Aerial photography sourced from LINZ Data Service, 8 May 2018. Modified by author.