

TABLE 2 - Schedule of vegetation types recorded at Hinehopu mire

Dominant species	Structural class	Location/topography
1. Potamogeton cheesemanii-Juncus articulatus-Lagarosiphon major	Water	Drain on northern margin
2. Baumea huttonii	Sedgeland	North-west at outlet
3. Raupo/B. huttonii	Reedland	North-west at outlet
4. B. teretifolia-B. huttonii	Sedgeland	Northern margin
5. B. rubiginosa	Sedgeland	South-west margin
6. Manuka-Coprosma tenuicaulis/tangle fern-B. rubiginosa	Shrubland	Northern margin
7. Gahnia xanthocarpa-manuka	Tussockland	Northern margin
8. Schoenus brevifolius-S. carset-Tetraria capillaris	Sedgeland	Central
9. Manuka/S. brevifolius-S. carset	Sedgeland	Central and southern quarter
10. Manuka/tangle fern-sphagnum	Fernland	Central and eastern quarter
11. Salix chinerea-S. fragilis	Scrub	Southern and western margin
12. Kahikatea	Forest	Southern and western margin
13. Kahikatea-rimu/pukatea + tawarewarewa + Kohuhu-lancewood	Forest and scrub	Northern margin in Lake Rototiti SR

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During July 1985, on request of a private consultant, I surveyed the coastal vegetation of Recreation Reserves between the Whakatane Golf Club and Otamarakau (excluding Matata and Thornton Wildlife Reserves) (Beadel, 1985) as part of a wider study of the coastal reserves in this area (Shaw, 1986). The vegetation and flora was inspected at a number of sites along the coast, and the following general descriptions of the vegetation and flora were compiled. A species list is appended. Vegetation type names and symbols follow Atkinson (1985) and Kelly (1972).

## 1. VEGETATION

The study area encompasses a narrow strip of sand dunes adjoining the coast and is made up of three zones:

1. frontal-dune zone
2. mid-dune zone
3. rear-dune zone

(Zone 1 being closest to the sea and zone 3 being the furthest away.)

There is no distinct boundary between the three zones as the vegetation forms a gradation across the dune system.

Frontal-Dune Zone

Silvery sandgrass - *Muehlenbeckia complexa* vine-grassland.

In the frontal dune zone the vegetation cover is dominated by silvery sandgrass (*Spinifex hirsutus*). Amongst this are occasional

*Muehlenbeckia complexa* and *Calystegia soldanella*, and scattered exotic grasses and herbs such as couch (*Agropyron repens* and *A. pungens*), inkweed (*Phytolacca octandra*), and sea rocket (*Cakile* sp.). There are scattered small areas of matram grass (*Ammophila arenaria*), especially north of Matata.

*Muehlenbeckia complexa* commonly forms dense entanglements, occurring down to the mean high tide mark, especially where the embankment is abrupt. Amongst the *Muehlenbeckia complexa* are scattered *Calystegia soldanella*, *Lachnagrostis* sp., *Scirpus nodosus* and exotic grasses and herbs, including puha (*Sonchus oleraceus*) and *Oxalis pes-caprae*.

#### Mid-dune Zone

##### Lupin shrubland

Lupin (*Lupinus arboreus*) shrubland dominates here with common occurrences of *Calystegia soldanella* and exotic grasses and herbs such as inkweed, scrambling fumitory (*Fumaria muralis*) and tall fescue (*Pestuca arundinacea*). *Muehlenbeckia complexa* is also common, occasionally forming dense mats. There are scattered African boxthorn (*Lyctum ferocissimum*), *Scirpus nodosus*, tauhinu (*Cassinia leptophylla*), kanuka (*Kunzea ericoides* var.) and taupata (*Coprosma repens*) (the latter only occurring west of Matata).

#### Rear-Dune Zone

The vegetation of the rear-dune zone varies over the survey area. It can be divided into four types.

#### African boxthorn scrub

This occurs throughout the length of the survey area being the dominant vegetation type between Golf Links Road and Matata with only small areas occurring north of Matata. African boxthorn forms dense thickets with profusions of *Muehlenbeckia complexa* and *M. australis* scrambling over it.

There are very few other canopy species with only rare lupin and cabbage tree (*Cordyline australis*). Beneath the African boxthorn are exotic grasses and herbs.

#### Kanuka forest

Kanuka forest covers a sizeable area in the rear-dune zone near the Walker access road. Kanuka (1.5-3.5 m in height) is the dominant canopy species here and in most places forms a tight windswept canopy. *Muehlenbeckia complexa* is common scrambling over the kanuka. There is occasional African boxthorn, lupin, tauhinu and bracken (*Pteridium esculentum*). The groundcover is sparse due to the effects of grazing and although meadow rice grass is locally abundant there is often only bare ground beneath the kanuka. There are occasional kanuka seedlings, moss, couch, inkweed and other exotic grasses and herbs. Lichens are common on the kanuka stems.

#### Eucalyptus forest

Eucalyptus (*Eucalyptus* sp. *botrydoides*) forest occurs west of Matata. The canopy is entirely composed of eucalyptus trees 15-25 metres in height. Beneath the eucalyptus, the vegetation is sparse and appears in places to have been recently cleared. However, there are scattered eucalyptus saplings, and native shrubs such as kawakawa (*Macropiper*

*excelsum*) and karamu (*Coprosma robusta*) with occasional bracken and *Pteris tremula*. Exotic herbs and grasses such as inkweed, purple groundsel (*Senecio elegans*) and ragwort (*Senecio dipinnatisectus*) are scattered throughout.

West of the Eucalyptus sp. forest there are a few scattered clumps of eucalyptus which generally occur in the rear-dune zone and occasionally occur in the mid-dune zone. Around these clumps there are native species such as karamu, tutu (*Coriaria arborea* var. *arborea*), taupata, coastal five-finger (*Pseudopanax lessoni*), bracken, *Scirpus nodosus* and *Muehlenbeckia complexa*. Lupin, fennel (*Foeniculum vulgare*), tall fescue and other exotic and herbs are also common here.

#### Raupo reedland $\rightarrow$ Purua grass sedge/land

West of Matata between the road and the mid-dune zone there is an intermittent 'wetland' zone replacing the rear-dune system. The vegetation here varies from raupo (*Typha orientalis*) reedland (refer below description of the vegetation surrounding the refuse tip), to purua grass (*Scirpus pungens*) sedge/land, or Baumea articulata - searush (*Juncus kraussii*) tussock reedland and including various permutations of the above. Other wetland species that occur here include spike-rush (*Eleocharis acuta*, *Juncus pallidus*, *J. gregiflorus*, *Scirpus lacustris*, *Baumea juncea*, flax (*Phormium tenax*), *Lemna minor* and *Polygonum declivens*. Around the edges of the small wetlands there are occasional marsh ribbonwood (*Plagiathanus divaricatus*) and kanuka with rare cabbage trees. Pampas grass (*Cortaderia sellowiana*) is common in these wetlands near Otamarakau.

The vegetation of the Matata refuse tip and environs.

Raupo reedland is the predominant vegetation type surrounding the lagoon. Raupo forms a thick sward 1-2 m high beneath which are occasional spike-rush and other rushes. Around the edges of the raupo reedland other wetland species occur such as *Juncus pallidus*, sea rush, *J. gregiflorus*, *Scirpus lacustris*, *S. nodosus*, *Carex* species and *Cyperus ustulatus*. Further back from the open water exotic grasses and herbs start to dominate such as creeping buttercup (*Ranunculus repens*), *Paspalum dilatatum*, tall fescue and couches, with scattered shrubs of lupin, African boxthorn and karamu. On well-drained sites lupin or boxthorn and occasional karamu form dense thickets over which *Muehlenbeckia complexa* scrambles.

On dunes adjacent to the coast the vegetation is dominated by silvery sand grass, lupin and *Muehlenbeckia complexa* associations.

## 2. THE FLORA

Forty-eight indigenous vascular taxa and seventy adventive taxa were recorded from the study area (listed in Appendix 1).

### Rare Plants

Pinago, (*Desmoshoenus spiralis*), which is classified as being of 'vulnerable' status (Given, 1981), was found at three sites, occurring just above the high tide mark.

1. Gold Links Road (3 small populations)

2. Walker Access Road (1 small population)

3. Approximately 5 km west of Matata (1 small population)
3. COMMENTS ON THE VEGETATION AND FLORA
1. Kanuka forest (present near Walker Access Road) occurs on a consolidated dune system in the rear-dune zone. This combination of vegetation and landform is now rare in New Zealand. The area should be fenced, stock excluded, and its status changed to a designation that recognises its biological values; e.g., Scenic Reserve. All of the kanuka forest area should be reclassified as Scenic Reserve and areas to the sides of the kanuka forest should also be protected to provide a representation of coastal vegetation in biological reserves in the Te Reko Ecological District. At present there is only one scenic reserve in the Te Reko Ecological District (Parimahana Scenic Reserve near Kawerau). No coastal vegetation within the ecological district is reserved. It is particularly important that the above areas be protected from grazing animals as they are causing considerable damage.
2. Sites where pingao occurs should be given special management consideration.
3. Several small pines occur near the Otamarakau end of the survey area. They should be removed before more pines establish and become a greater problem.
4. Control of the adventive pampas grass (*Cortaderia selloana*) present in the rear-dune zone near Otamarakau should be considered as it poses a threat to low-growing indigenous vegetation communities.

5. Within the Otawainuku Ecological District there are currently no reserves contiguous with the coastline, and those areas<sup>1</sup> between Matata and Otamarakau should be protected (e.g., under Scenic Reserve status) in order to maintain a representative example of this type of vegetation in the ecological district. Pingao is present in these areas.

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#### References

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<sup>1</sup> excluding the area of Eucalyptus forest and areas at present being utilised for camping activity.

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## APPENDIX 1

VASCULAR PLANT TAXA OF THE COASTAL RESERVES BETWEEN GOLF LINKS ROAD (RANGITAHI PLAINS) AND OPAHARAKAU (EXCLUDING MATARA AND THORNTON WILDLIFE RESERVES)

1.1 Indigenous Taxa	<i>Eleocharis acuta</i>
<i>Baumea articulata</i>	<i>Callium</i> sp.
<i>B. juncea</i>	<i>Geranium</i> sp.
<i>Calystegia soldanella</i>	<i>Gnaphalium spicatum</i>
<i>Carex pumila</i>	<i>Juncus gregiflorus</i>
<i>C. sp. (secta?)</i>	<i>J. kraussii</i>
<i>Cassinia leptophylla</i>	<i>J. pallidus</i>
<i>Coprosma lucida</i>	<i>Kunzea ericoides</i> var.
<i>C. repens</i>	
<i>C. robusta</i>	
<i>Cordyline australis</i>	<i>Lachnagrostis</i> sp.
<i>Coriaria arborea</i> var. <i>arborea</i>	<i>Lemna minor</i>
<i>Cortaderia toetoe</i>	<i>Leptospermum scoparium</i>
* <i>Cotula coronopifolia</i>	
<i>Cyathea medullaris</i>	<i>Macropiper excelsum</i> var.
<i>Cyperus ustulatus</i>	<i>excelsum</i>
	<i>Metrosideros excelsa</i>
<i>Desmoschoenus spiralis</i>	<i>Microlaena stipoides</i>
<i>Dicksonia squarrosa</i>	<i>Muehlenbeckia australis</i>
<i>Dodonea viscosa</i>	<i>H. complena</i>
	<i>Myoporum laetum</i>

\* probably adventive

<i>Phoridium tenax</i>	<i>Conyza canadensis</i>
<i>Plagiantchus divaricatus</i>	<i>C. floribunda</i>
<i>Polygonum decipiens</i>	<i>Cortaderia selloana</i>
<i>Pseudopanax lessonii</i>	<i>Crataegus monogyna</i>
<i>Pteridium esculentum</i>	<i>Crepis capillaris</i>
<i>Pteris tremula</i>	
<i>Pyrostia serpens</i>	<i>Dactylis glomerata</i>
	<i>Datura stramonium</i>
<i>Scirpus habrus</i>	<i>Digitaria sanguinalis</i>
<i>S. lacustris</i>	
<i>S. medianus</i>	<i>Eucalyptus</i> sp. ( <i>E. botryoides</i> ?)
<i>S. nodosus</i>	<i>Euphorbia pepilus</i>
<i>Spinifex hirsutus</i>	
	<i>Festuca arundinacea</i>
<i>Typha orientalis</i>	<i>Foeniculum vulgare</i>
	<i>Fumaria muralis</i>
1.2 <u>Adventive Species</u>	
<i>Agropyron pungens</i>	<i>Galium aparine</i>
<i>A. repens</i>	<i>Glyceria maxima</i>
<i>Albizia lophantha</i>	<i>Onopordium spicatum</i>
<i>Aloe</i> sp.	
<i>Agapanthus orientalis</i>	<i>Hedychium gardenianum</i>
	<i>Hoicus lanatus</i>
<i>Cakile</i> sp.	<i>Hypochaeris radicata</i>
<i>Cirsium arvense</i>	
<i>C. vulgare</i>	<i>Ipomoea Indica</i>

<i>Juncus articulatus</i>	<i>Rubus</i> sp. ( <i>R. fruticosus</i> agg.)
<i>J. effusus</i>	<i>Rumex acetosella</i>
<i>J. microcephalus</i>	<i>Salix</i> sp.
<i>Lactuca serriola</i>	<i>Senecio bipinnatisectus</i>
<i>Lepidium</i> sp.	<i>S. elegans</i>
<i>Lobularia maritima</i>	<i>S. jacobaea</i>
<i>Lotium perenne</i>	<i>S. mikanoides</i>
<i>Lotus pedunculatus</i>	<i>Silene gallica</i>
	<i>Solanum americanum</i>
<i>Lupinus arboreus</i>	<i>S. nigrum</i> var.
<i>Lycium ferocissimum</i>	<i>Sonchus oleraceus</i>
<i>Oxalis pes-caprae</i>	<i>Sporobolus africanus</i>
	<i>Stellaria media</i>
<i>Paspalum dilatatum</i>	<i>Trifolium dubium</i>
<i>Pastinaca sativa</i>	<i>T. pratense</i>
<i>Pennisetum clandestinum</i>	<i>T. repens</i>
<i>Phytolacca octandra</i>	
<i>Pinus</i> sp.	<i>Ulex europaeus</i>
<i>Plantago lanceolata</i>	
<i>Polycarpon tetraphyllum</i>	<i>Verbena bonariensis</i>
<i>Portulacca oleracea</i>	<i>Vicia</i> sp.
	<i>Yucca</i> sp.
<i>Ranunculus repens</i>	<i>Zantedeschia aethiopica</i>
<i>Raphanus raphanistrum</i>	
subsp. <i>maritimus</i>	

\* Garden escapes