VEGETATION AND FLORA OF KEEPA ROAD CONSERVATION AREA, WHAKATANE

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1. INTRODUCTION

Keepa Road Conservation Area (*c.*15 ha; grid reference NZMS260 W15 594532) is located adjacent to the western side of the Whakatane River, downstream of the State Highway 2 road bridge. The reserve is located between the river and the Kopeopeo Canal. It is flat land, underlain with undifferentiated alluvium (Healy *et al.* 1964). The Reserve is in the Te Teko Ecological District (see McEwen 1987). The reserve is part of a larger natural area which includes the estuarine wetlands and surrounds in the Whakatane River, extending out to the coastal sand dunes at the mouth of the Whakatane River and extending westward along the coast to Otamarakau (see also Beadel *et al.* 1996).

Wildland Consultants Ltd was contracted to survey the vegetation and flora of the reserve, and to identify related management requirements. The vegetation has been mapped and described, checklists compiled of indigenous and adventive plant species, botanical conservation significance evaluated, and the management requirements have been assessed. Maori names used in the text follow Beever (1991). Definition of technical terms and the symbols used in the vegetation type names are provided in Appendix 3.

2. OBJECTIVES

The project objectives are set out below:

- To describe and map the vegetation pattern.
- To compile a list of indigenous vascular plants and prominent adventive plants.
- To assess and identify any features of significance and assess botanical conservation values.
- To identify management requirements to maintain conservation values.

3. METHODS

Aerial photographs taken in 1944 and 1995 were obtained and assessed (refer to Figures 1 and 2 respectively). Field inspections of the reserve were made in November 1998 during which vegetation type boundaries were delineated onto a colour aerial photograph (scale 1:15,000; 1995; see Figure 2) and vegetation type descriptions and lists of vascular plants were compiled. Vegetation types and habitats were mapped and described.

4. VEGETATION HISTORY

Prior to Polynesian and European settlement on the Rangitaiki Plains, the vegetation in the reserve would have been a mixture of estuarine and freshwater wetland, comprising the species still present today, with marsh ribbonwood (*Plagianthus divaricatus*) and manuka (*Leptospermum scoparium*) common on higher ground. The site would have been flooded regularly. The reserve is now divided into two parts by a stopbank; the western side is adjacent to the Kopeopeo Canal and the eastern, larger part is adjacent to the Whakatane River. Both these waterways flood into the reserve at high levels.

Figure 1 shows a reproduction of a 1944 aerial photograph. The areas of raupo (*Typha orientalis*) and saltmarsh appear to have been present, however the area of pasture is much smaller and the vegetation appears taller; possibly a mixture of saltmarsh rushlands, sedgeland and shrublands.

5. VEGETATION AND HABITATS

Five vegetation/habitat types were mapped (refer to Figure 3) and these are described below:

1. Raupo reedland, arrow grass-*Juncus articulata-Isolepis cernua* herbfield and (sea rush) mudfield

   These areas comprise a mosaic of raupo reedland, and arrow grass-*Juncus articulatus-Isolepis cernua* herbfield and (sea rush) mudfield. These sub-types are described below. Raupo reedland is the dominant vegetation type. Around the margins of these areas creeping bent (*Agrostis stolonifera*) is often common in association with *Bolboschoenus*, *Isolepis distigimatosa*, *Schoenoplectus pungens* and sea rush (*Juncus maritimus* var. *australiensis*).

   Raupo reedland

   Raupo is dominant in association with locally abundant *Isolepis prolifer*, scattered and local clumps of sea rush, local *Bolboschenus caldwellii* and *B. fluviatilis*, and scattered tall fescue (*Festuca arundinacea*).

   Arrow grass-*Juncus articulatus-Isolepis cernua* herbfield

   Arrow grass (*Triglochin striata*), *Juncus articulatus* and *Isolepis cernua* form a dense herbfield.

   (Sea rush) mudfield

   Scattered sea rush occurs in a mainly unvegetated mudfield. Other species present in low numbers are bachelor's button (*Cotula cornopifolia*), *Isolepis prolifer* and *Juncus articulatus*.

3. Rank pasture

This type comprises rank pasture with a few local crack willow (*Salix fragilis*) and poplar (*Populus* sp.). Tall fescue is dominant in the rank pasture, with scattered browntop, and local raupo, *Bolboschoenus,* sea rush, bachelor's button, and water speedwell (*Veronica anagallis-aquatica*).

Scattered gorse is present along the river bank, and there is one area of pampas (*Cortaderia selloana*). There are a few areas of bare ground, with scattered water speedwell, bachelor's button and *Juncus bufonius*. *Schoenoplectus tabernaemontani* forms small reedlands locally in the drain flowing into the Kopeopeo Canal. There are also a few examples of sea rush in this drain. *Bolboschoenus fluviatilis* sedgeland and arrow grass herbfield are present locally in the drain flowing into the Whakatane River.

Bachelor's button and *Bolboschoenus* are locally common in the small shallow drains which are present elsewhere in the reserve.

There is a disused bark dump in the north-west part of the reserve, adjacent to the Kopeopeo Canal. This area is poorly drained and *Juncus effusus* and *Polygonum hydropiper* are common. Other species present include barnyard grass (*Echinochloa crus-galli*), paspalum (*Paspalum dilatatum*), and bachelor's button.

Muehlenbeckia complexa and *Calystegia sepium* form a vineland in one place.

Along the water margin on the west bank of the Kopeopeo canal there are areas of *Schoenoplectus tabernaemontani*, sea rush and *Bolboschoenus fluviatilis*. Towards the northern end of the section of canal in the reserve the banks become steeper and only scattered patches of *Bolboschoenus* occur.

Along the west bank above the dry land along the western margin of the canal rough pasture occurs, comprising predominantly kikuyu (*Pennisetum clandestinum*). Dock (*Rumex obtusifolius*) is common throughout, with local cocksfoot (*Dactylis glomerata*), fennel (*Foeniculum vulgare*), purpletop and emergent lupin. There is an area of canna lilies, a single ti kouka (*Cordyline australis*) and several ponga (*Cyathea dealbata*) and fruit trees. A small area of tradescantia (*Tradescantia fluminensis*) occurs in the kikuyu grassland and two Chinese privet shrubs approximately 1 m high occur at the northern end of the canal.

4. Poplar treeland

Poplars form a canopy over rank grass. Species present include browntop, tall fescue, dock (*Rumex obtusifolius*), creeping buttercup (*Ranunculus repens*), with local *Juncus gregiflorus,* and a few examples of *Polygonum hydropiper, Cyperus congestus,* and prickly puha (*Sonchus asper*).

5. Whakatane River Margins (outside of reserve)

Rough pasture generally occurs right to the river's edge, however there is one small area of *Schoenoplectus tabernaemontani* in the river.

6. FLORA

Seventeen indigenous vascular plant species and 58 adventive species were recorded from the reserve. Most are relatively common coastal and semi-coastal species and no threatened or local taxa were recorded (as per Cameron *et al.* 1995). *Bolboschoenus caldwellii* occurs in the reserve. Within Te Teko Ecological District this species is only known to occur in the Whakatane Estuary.

7. CONSERVATION EVALUATION

Standard criteria can be used for the assessment of relative conservation value of indigenous vegetation and habitats, such as representativeness, past vs present extent, diversity and pattern, rarity and special features, size and shape, ecological viability and sustainability, buffering and surrounding landscape, connectivity, and fragility and threat (cf. Whaley *et al.* 1995, Roper-Lindsay 1997, Shaw 1994).

Less than 1% of the once extensive wetlands of Te Teko Ecological District remain (Pike 1991) and the reserve contains some of the few remaining examples of wetland vegetation. The reserve is part of a large natural area extending to the coast and then along the coast to Otamarakau. The areas of adventive vegetation provides a protective buffer to these wetland areas. Vegetation in the reserve is of high botanical conservation value.

8. MANAGEMENT

8.1 Current Management

The reserve is currently leased out for grazing by Environment BOP but DOC is going to take over this lease shortly (D. Gosling pers. comm.). No other management of the reserve is currently undertaken.

8.2 Grazing

Stock are having an impact on the wetland vegetation and grazing animals should be removed from the part of the reserve to the east of the stopbank. Following stock removal, weed control will be necessary.

8.3 Fauna

The reserve contains habitat suitable for spotless crake, banded rail and fernbird, however no survey has been undertaken for these species and none were observed. Pukeko and pied stilt were recorded. It is recommended that a bird survey be undertaken of the reserve to ascertain the wildlife values and any related management requirements.

8.4 Environmental Pest Plants

No botanical values are currently being threatened by environmental pest plants and no weed control operations should be undertaken in the reserve until a rehabilitation/ restoration plan is developed (see below).

8.5 Wild animals

Rabbits were observed during the survey and it is likely that mustelids, rats and feral cats are present. Fauna values of the reserve need to be ascertained in order to determine priority for animal pest control.

8.6 Signs

There are no signs present which show the status of the reserve. Sign(s) should be erected.

8.7 Access

There is no public vehicle access to the reserve, however pedestrian access along the stopbank is available.

8.8 Whitebait Spawning Habitat

About two years ago DOC and Environment BOP reshaped a small portion of the Whakatane River margin out of the reserve on the true west side of the river just below the Landing Road bridge. Whilst the reserve is not immediately adjacent to the Whakatane River at any point, there may be further opportunities for creating whitebait spawning habitat adjacent to the reserve.

8.9 Restoration/Rehabilitation

The reserve has significant conservation value, however it is currently being grazed and is not being managed for its conservation values. Grazing should be removed and a simple rehabilitation/restoration plan prepared and put in place for the long term management and benefit of the reserve. A systematic low key management approach to the reserve could achieve some significant conservation gains. The reserve is in a prominent position and could have a higher public profile.

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LIST OF VASCULAR PLANTS

1.1 Indigenous Species

Monocot. trees and shrubs	
Cordyline australis	ti kouka, cabbage tree
Dicot. trees and shrubs	
Plagianthus divaricatus	marsh ribbonwood
Dicot. lianes	
Calystegia sepium	pohue
Muehlenbeckia complexa	pohuehue
Ferns	
Cyathea dealbata	ponga
Sedges	
Bolboschoenus fluviatilis	ririwaka
Isolepis cernua	
Isolepis prolifer	
Schoenoplectus pungens	
Schoenoplectus tabernaemontani	kapungawha
Rushes	
Juncus gregiflorus	wi
J. maritimus var. *australiensis*	wi, sea rush
Juncus sarophorus	wi
Monocot. herbs (other than orchids, grasses, sedges and rushes)	
Triglochin striata	arrow grass
Typha orientalis	raupo
Composite herbs	
Cotula coronopifolia	bachelors button
Pseudognaphalium luteoalbum	

1.2 Adventive Species

Dicot. trees and shrubs

Crataegus monogyna	hawthorn
Eucalyptus sp.	eucalypt
Ligustrum sinense	Chinese privet
Lupinus arboreus	lupin
Malus × *domestica*	apple tree
Populus sp.	poplar
Prunus persica	peach tree
Salix fragilis	crack willow
Ulex europaeus	gorse

Grasses

Agrostis capillaris	browntop
Agrostis stolonifera	creeping bent
Anthoxanthum odoratum	sweet vernal
Bromus sp.	ripgut brome
Cortaderia selloana	pampas
Cynodon dactylis	Indian doab
Dactylis glomerata	cooksfoot
Digitaria sanguinalis	summer grass
Echinochloa crus-galli	barnyard grass
Festuca arundinacea	tall fescue
Holcus lanatus	Yorkshire fog
Paspalum dilatatum	paspalum
Paspalum distichum	Mercer grass
Pennisetum clandestinum	kikuyu grass
Phleum pratense	timothy
Vulpia sp.	

Rushes

Juncus acuminatus	
Juncus articulatus	
Juncus bufonius	
Juncus effusus	rush

Monocot. herbs (other than orchids, grasses, sedges and rushes)

Canna indica	canna lily
Iris sp.	
Tradescantia fluminensis	tradescantia

Composite herbs

Aster subulatus	sea aster
Bidens frondosa	beggars ticks
Cirsium vulgare	Scotch thistle
Conyza albida	fleabane

Gamochaeta spicata	cudweed
Sonchus asper	prickly puha
Sonchus oleraceus	puha

Dicot. herbs (other than composites)

Atriplex sp.	
Callitriche stagnalis	starwort
Coronopus didymus	twin cress
Dipsacus fullonum	wild teasel
Foeniculum vulgare	fennel
Lotus pedunculatus	lotus
Lythrum hyssopifolia	loosestrife
Matricaria recutita	rayless chamomile
Oenothera stricta	evening primrose
Ornithopus perpusillus	
Pastinaca sativa	wild parsnip
Plantago coronopus	buck's-horn plantain
Plantago lanceolata	narrow-leaved plantain
Plantago major	broad-leaved plantain
Polygonum hydropiper	
Polygonum persicaria	willow weed
Polygonum prostratum	wire weed
Ranunculus repens	creeping buttercup
Ranunculus scleratus	celery-leaved buttercup
Rumex obtusifolius	dock
Sagina procumbens	
Trifolium dubium	suckling clover
Trifolium pratense	red clover
Trifolium repens	white clover
Verbena bonariensis	purpletop
Veronica anagallis-aquatica	water speedwell
Veronica arvensis	field speedwell

GLOSSARY

2.1 Technical Terms

Herbfield — Vegetation in which the cover of herbs in the canopy is 20-100% and in which the herb cover exceeds that of any other growth form or bare ground. Herbs include all herbaceous and low-growing semi-woody plants that are not separated as ferns, tussocks, grasses, sedges, rushes, reeds, cushion plants, mosses or lichens.

Reedland — Vegetation in which the cover of reeds in the canopy is 20-100% and in which the reed cover exceeds that of any other growth form or open water. Reeds are herbaceous plants growing in standing or slowly-running water that have tall, slender, erect, unbranched leaves or culms that are either hollow or have a very spongy pith. Examples include *Typha, Bolboschoenus, Schoenoplectus validus, Eleocharis sphacelata,* and *Baumea articulata.*

Treeland — Vegetation in which the cover of trees in the canopy is 20-80%, with tree cover exceeding that of any other growth form, and in which the trees form a discontinuous upper canopy above either a lower canopy of predominantly non-woody vegetation or bare ground, e.g. mahoe/rarahu treeland. (Note: Vegetation consisting of trees above shrubs is classified as either forest or scrub depending on the proportion of trees and shrubs in the canopy.)

2.3 Symbols and Abbreviations

dba	diameter breast height
ha	hectare
m	metre
/	separates various tiers of the vegetation in the type descriptions
-	links plants in the same tier
( )	less than 5% cover of the bracketed species
⇔	mosaic

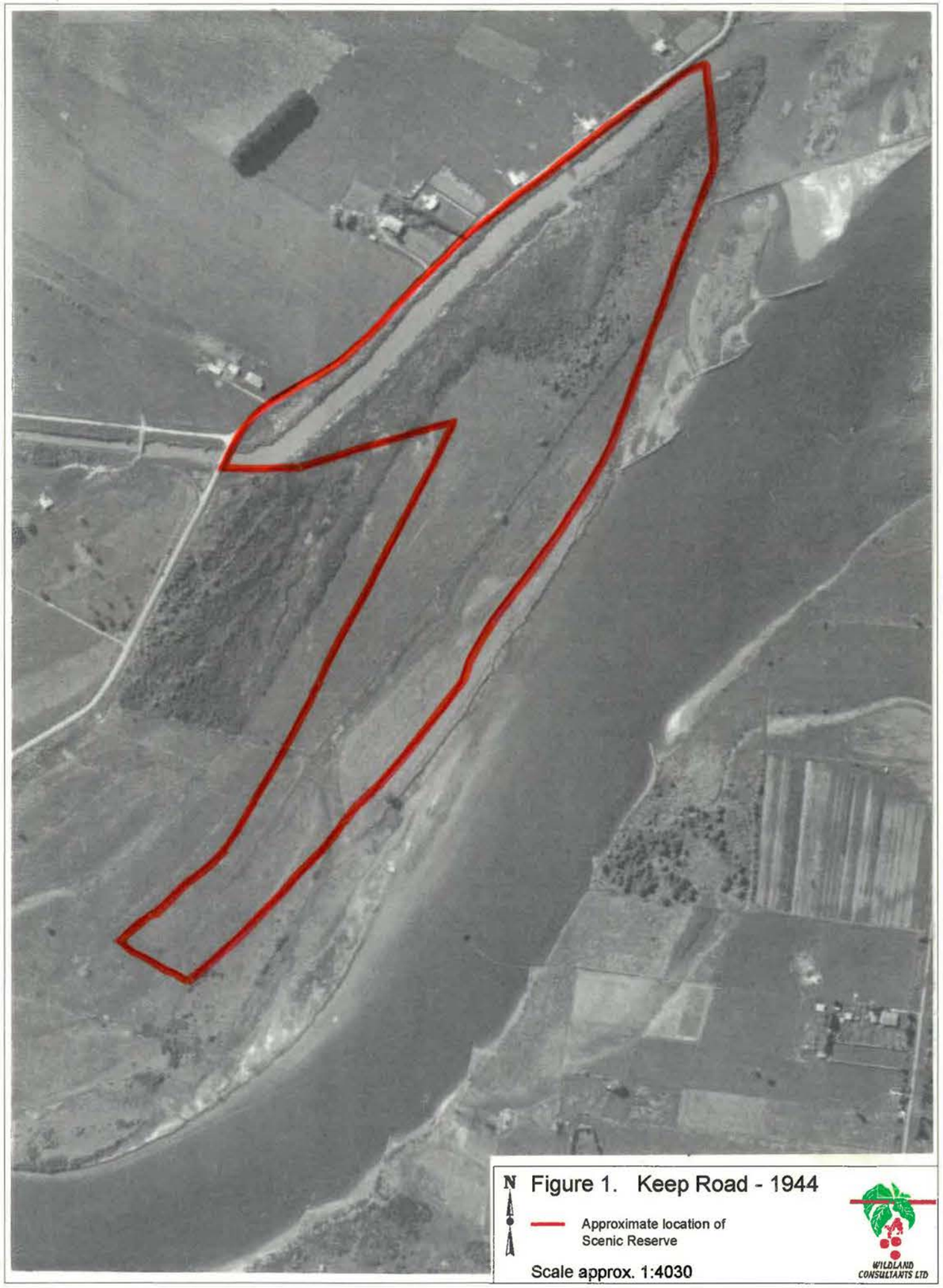

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Figure 1. Keep Road - 1944

Approximate location of Scenic Reserve

Scale approx. 1:4030

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Figure 2. Keepa Road Conservation Area - 1995

Scenic Reserve boundary

Scale approx. 1:5850

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Figure 3. Vegetation Map of Keepa Road Conservation Area

..... Vegetation type boundary

Scenic Reserve boundary

1 Raupo reedland and arrow grass-*Juncus articulata-Isolepis cernua* herbfield and (sea rush) mudfield

2 Raupo-marsh ribbonwood- sea rush shrub-reedland and mudflats

3 Rank pasture

4 Poplar treeland

Scale approx. 1:5850

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2. Raupo-marsh ribbonwood-sea rush shrub-reedland and mudflats

Raupo is dominant, in association with local marsh ribbonwood and locally common sea rush. *Bolboschoenus caldwellii* occurs locally. There is a small patch of *Bolboschoenus fluviatilis* sedgeland. Sea rush is common where this type adjoins vegetation type 3. This area also includes unvegetated mudflats.

Plate 1: Raupo reedland.

Plate 2: Foreground: raupo reedland; Background: rank pasture.

Plate 3: Foreground: raupo; Background: marsh ribbonwood