

## The Vegetation Map

### Method

The accompanying map (Fig. 1 ) was produced by

- (i) tracing boundaries around obvious textural differences in the vegetation, as shown in the multi-spectral aerial photograph of the Pauatahanui Reserve;
- (ii) ground inspection of each vegetation type so identified. An assessment was made of the percentage cover contributed by conspicuous plants, in the ranges <10%, 10-20%, 20-50%, > 50%, in each mapped unit. Units were mapped where one species (e.g. sea rush) or species group (e.g. grasses) occupied > 50% cover over a sufficient area to map at the scale of approx. 1:4000.

Where no single species or species group occupied > 50% cover over a large enough area, the plant associations were mapped as superimposed vegetation types. In such mixed vegetation, individual species were often in small 'pure' stands, which, however, could be mapped as a mosaic only.

This map does not show certain other variations in vegetation, particularly those minor associations of road and track fringes, on dumped landfill, along edges of watercourses, and adjacent to elevated farmland. Scattered trees and large shrubs are also omitted from the map.

Vegetation boundaries. Plants occur in zones in response to gradients of physical factors across the topography. In an estuarine ecosystem, these gradients are very gradual : saline to freshwater, mud to sand substrates, short to long periods of immersion in water, and so on. For vegetation mapping, the boundaries between adjacent vegetation types are therefore frequently indistinct, and the boundaries shown on the map are approximations in many cases.

### Rare species

The Reserve contains at least three indigenous plant species of local occurrence in the greater Wellington region, and one of these, Cotula dioica subsp. monoica was listed by Dr D. R. Given in his register of threatened plants of New Zealand (Given 1976). The locations of these three species are deliberately not shown on Fig. 1 , but the colonies are not in areas proposed for management. They have been marked on maps on file.

The three species are









- (i) Cotula dioica subsp. monoica : A saltmarsh daisy with creeping stems and fleshy leaves; locally common in certain types of indigenous vegetation within the Reserve. Easily cultivated, and could be transplanted into other sites, including certain 'managed' areas later. Apparently endemic to the south-west of the North Island : Lloyd (1972) lists

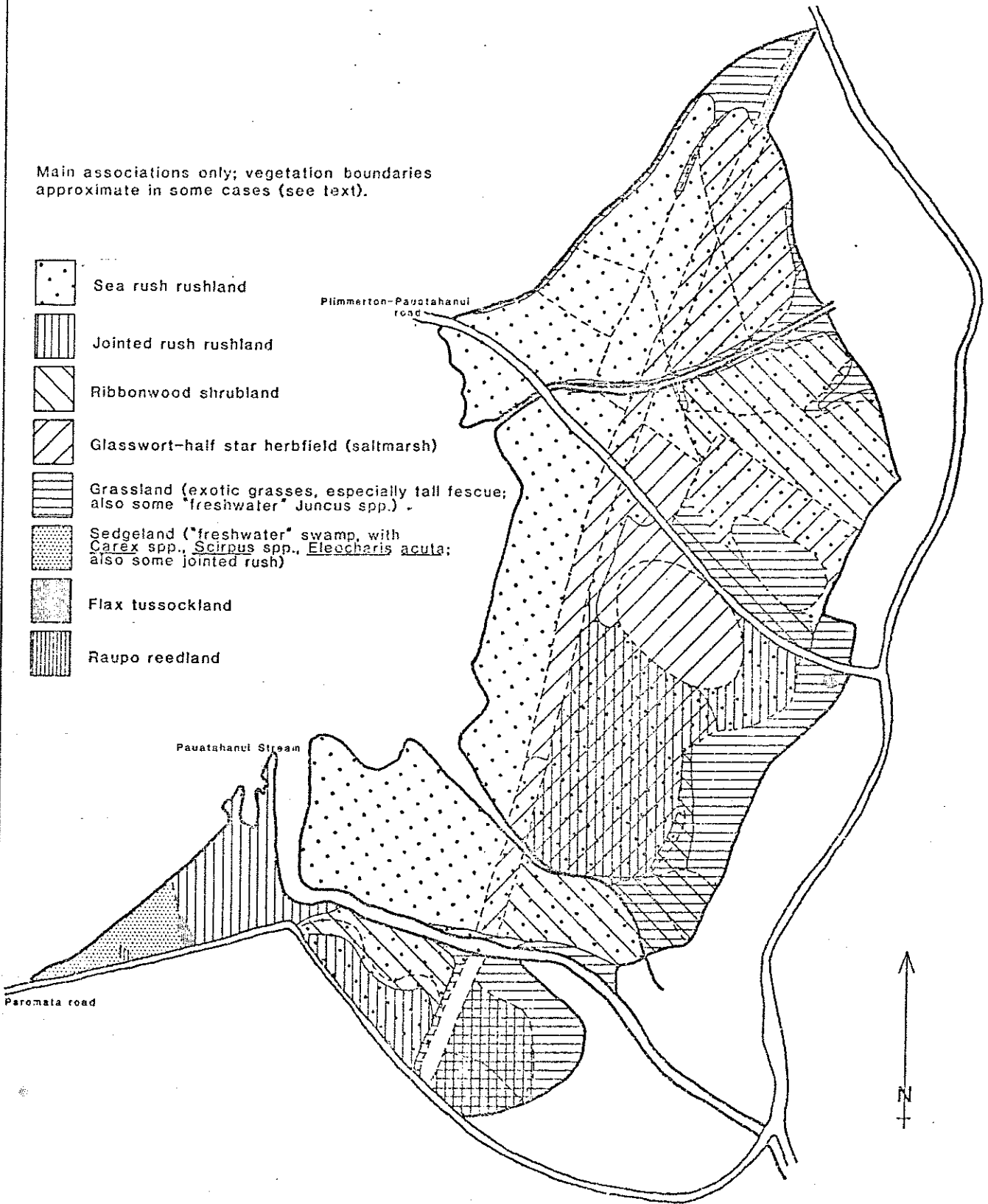
the other known colonies as being at Makara, Waikanae, and Hokio Beaches. It is also at Tangimoana.

- (ii) Mimulus repens (New Zealand musk) : a brackish-water plant rendered conspicuous by its relatively large snapdragon-type flowers which are mauve with a yellow centre. Only one small patch known in the Reserve. Elsewhere in the Wellington region it is known only in the same harbour near Ration Point, and at Makara, although it is locally common in some other coastal areas of New Zealand, e.g. L. Ellesmere. The species should be suited to habitats formed in certain managed areas of the Reserve, especially those which will hold brackish water for longer periods than they do currently. Propagation and transplanting are recommended once more suitable habitat exists.
- (iii) Schoenus nitens var. nitens : a rather inconspicuous sedge with fine leaves and stems up to 15 cm tall. The plant forms small clumps at several locations in the Reserve; it is not known elsewhere in the Wellington region. Widespread and occasionally common in some other districts; mostly coastal.

Fig. 1 Pauatahanui Reserve Vegetation Map.

Main associations only; vegetation boundaries approximate in some cases (see text).

-  Sea rush rushland
-  Jointed rush rushland
-  Ribbonwood shrubland
-  Glasswort-half star herbfield (saltmarsh)
-  Grassland (exotic grasses, especially tall fescue; also some "freshwater" *Juncus* spp.)
-  Sedgeland ("freshwater" swamp, with *Carex* spp., *Scirpus* spp., *Eleocharis acuta*; also some jointed rush)
-  Flax tussockland
-  Raupo reedland



Vascular plants of Pauatahanui saltmarshes, and on raised ground within the area shown on preliminary vegetation map.

C.C. Ogle, Jan-Feb 1982

**Abbreviations:**

- \* = exotic species
- s = saltmarsh species and/or in brackish swamp
- r = raised ground species (spoil dumps, road edges etc.)
- s/r = species of both habitats above
- (unc) = uncommon; only 1 or 2 specimens or a small patch seen
- (loc) = local; only in 1 or 2 small areas, but there common

<u>GYMNOSPERM</u>	<u>Habitat and abundance</u>	<u>Common names and notes</u>
* <u>Cupressus macrocarpa</u>	r	macrocarpa
<b>DICOTYLEDONS</b>		
<u>Apium filiforme</u>	s	sea celery
* <u>Aster subulatus</u>	s	sea aster
<u>Atriplex</u> sp. (native?)	s/r	orache
* <u>Bidens frondosa</u>	s(unc)	beggar's ticks
* <u>Callitriche stagnalis</u>	s(unc)	starwort
<u>Calystegia</u> sp. ( <u>C. sepium</u> agg.)	r(unc)	convolvulus (indigenous?)
<u>Cassinia leptophylla</u>	s(unc)/r(unc)	tauhinu
<u>Centella uniflora</u>	r(unc)	
* <u>Centaurium erythraea</u>	r(loc)	centaury
* <u>Chamaecytisus palmensis</u>	r(loc)	tree lucerne
<u>Chenopodium ambiquum</u>	s(unc)	NZ fathen
* <u>Chrysanthemum frutescens</u>	r(unc)	
<u>Cirsium arvense</u>	r(unc)	Californian thistle
<u>C. vulgare</u>	s(unc)/r	Scotch thistle
* <u>Clematis vitalba</u>	r(unc)	traveller's joy (=old man's beard)
* <u>Conium maculatum</u>	r(unc)	hemlock
* <u>Conyza floribunda</u>	r	fleabane
<u>Coprosma propinqua</u>	r(unc)	
<u>C. repens</u>	s(unc)/r	taupata
* <u>Cotula coronopifolia</u>	s/r	batchelor's button
<u>C. dioica</u> ssp. <u>monoica</u>	s(loc)	This sub-species is listed in "Threatened Plants of New Zealand": Given 1976
* <u>Crataegus</u> sp.	r(loc)	hawthorn
* <u>Cytisus scoparius</u>	r(unc)	broom
* <u>Foeniculum vulgare</u>	r	fennel
* <u>Galium aparine</u>	r	cleavers
* <u>Hypochoeris radicata</u>	r	cat's ear
* <u>Lathyrus latifolius</u>	r	wild sweet pea
* <u>Leontodon taraxacoides</u>	r	hawkbit
* <u>Lepidium bonariense</u>	r	
<u>Leptospermum ericoides</u>	r(unc)	kanuka
<u>L. scoparium</u>	s(unc)/r(loc)	manuka
<u>Lilaeopsis</u> sp. (unnamed?)	s(loc)	tape-measure plant
* <u>Linum bienne</u>	r(loc)	pale flax
<u>Lobelia anceps</u>	s/r	NZ lobelia
* <u>Lonicera japonica</u>	r	Japanese honeysuckle
* <u>Lotus pedunculatus</u>	s/r	lotus major
* <u>L. subbiflorus</u>	r	hairy lotus
* <u>Lupinus arboreus</u>	r	shrub lupin
* <u>Lythrum hyssopifolia</u>	s/r	loosestrife
* <u>Melilotus indica</u>	s/r	King Island melilot
* <u>Mentha pulegium</u>	r(unc)	penny royal
* <u>M. sp.</u>	r(unc)	mint
<u>Mimulus repens</u>	s(unc)	NZ musk (a rare plant of Wellington region - one other locality only)

DICOTYLEDONS (Con't)	Habitat and abundance	Common names and notes
<u>Muehlenbeckia complexa</u>	s/r	pohuehue
<u>Myoporum laetum</u>	r(unc)	ngaio
* <u>Myosotis laxa</u> var. <u>caespitosa</u>	s(unc)	water forget-me-not
<u>Olearia solandri</u>	s/r	shrub daisy
* <u>Parentucellia viscosa</u>	s/r	tarweed
* <u>Petasites fragrans</u>	r(unc)	winter heliotrope
* <u>Picris echioides</u>	r	ox-tongue
<u>Pittosporum tenuifolium</u>	r(unc)	kohuhu, matipo
<u>Plagianthus divaricatus</u>	s/r	saltmarsh ribbonwood
* <u>Plantago coronopus</u>	s/r	buck's horn plantain
* <u>P. lanceolata</u>	r	narrow-leaved plantain
* <u>P. major</u>	r	broad-leaved plantain
* <u>Polygonum aviculare</u>	r	wireweed
* <u>P. hydropiper</u>	s(unc)/r(unc)	water pepper
* <u>P. persicaria</u>	r(unc)	willow weed
<u>P. sp. (unnamed; P. decipiens of NZ authors)</u>	s(unc)	NZ willow weed
* <u>Prunella vulgaris</u>	r	self-heal
* <u>Prunus sp.</u>	r(unc)	plum
* <u>Ranunculus repens</u>	s/r	creeping buttercup
* <u>Raphanus raphanistrum</u>	r	wild radish
* <u>Rosa rubiginosa</u>	r(unc)	briar rose
* <u>Rumex conglomeratus</u>	r	clustered dock
* <u>R. crispus</u>	s/r	curled dock
* <u>R. obtusifolius</u>	r	broad-leaved dock
<u>Salicornia australis</u>	s	glasswort
<u>Samolus repens</u>	s/r	NZ primrose
<u>Selliera radicans</u>	s/r	half-star
<u>Senecio glomeratus</u>	s(unc)/r(unc)	
<u>S. hispidulus</u>	r(unc)	
* <u>S. jacobea</u>	r(unc)	ragwort
* <u>S. mikanioides</u>	r	German ivy
<u>S. minimus</u>	s(unc)/r(unc)	
* <u>Sonchus asper</u>	r(unc)	prickly sowthistle
* <u>S. oleraceus</u>	r	puwha, sowthistle
* <u>Tamarix sp.</u>	r	tamarix
* <u>Teline monspessulana</u>	r(unc)	Montpellier broom
* <u>Trifolium dubium</u>	s/r	suckling clover
* <u>T. fragiferum</u>	s/r	strawberry clover
* <u>T. pratense</u>	r	red clover
* <u>T. repens</u>	s/r	white clover
* <u>Ulex europaeus</u>	s/r	gorse
* <u>Vicia sativa</u>	r	vetch
* <u>V. tetrasperma</u>	s(unc)	four-seeded vetch
* <u>Vinca major</u>	r(unc)	periwinkle

MONOCOTYLEDONS

* <u>Agropyron repens</u>	r(loc)	couch (twitch)
* <u>Agrostis stolonifera</u>	s/r	creeping bent
* <u>A. tenuis</u>	r	browntop
* <u>Anthoxanthum odoratum</u>	r	sweet vernal
* <u>Bromus unioloides</u>	r	prairie grass
<u>Carex flagellifera</u>	s/r	
<u>C. lessoniana</u>	s(loc)	cutty-grass
<u>C. secta</u> var. <u>secta</u>	s(unc)	nigger head
<u>C. virgata</u>	s/r(loc)	
* <u>Cortaderia seloana</u>	r	pampas grass
<u>C. toetoe</u>	s/r	toetoe
* <u>Cynosurus cristatus</u>	r	crested dog's tail
* <u>Cyperus eragrostis</u>	r	
<u>C. ustulatus</u>	s/r	
* <u>Dactylis glomerata</u>	r	cock's foot
<u>Eleocharis acuta</u>	s	spike sedge
* <u>Festuca arundinacea</u>	s/r	tail fescue
* <u>Glyceria declinata</u>	s(unc)	floating sweet-grass
* <u>Holcus lanatus</u>	r	Yorkshire fog
* <u>Juncus articulatus</u>	s/r	jointed-leaved rush
<u>J. australis</u>	s/r	

MONOCOTYLEDONS (Con't)	<u>Habitat and abundance</u>	<u>Common names and notes</u>
* <u>J. bufonius</u>	s/r	toad rush
<u>J. caespiticius</u>	s(unc)	
* <u>J. effusus</u>	s(unc)	
* <u>J. gerardii</u>	s	
<u>J. gregiflorus</u>	r	
<u>J. maritimus</u> var. <u>australiensis</u>	s/r	sea rush
<u>J. pallidus</u>	s/r	
<u>J. sarophorus</u>	r	
<u>Lemna minor</u>	s(unc)	duckweed
<u>Leptocarpus similis</u>	s/r	jointed rush
* <u>Lolium multiflorum</u>	s(unc)	Italian rye grass
* <u>L. perenne</u>	r	perennial rye grass
<u>Microtis unifolia</u>	s(unc)/r	onion-leaved orchid
* <u>Parapholis incurva</u>	s(loc)	sickle grass
* <u>Paspalum dilatatum</u>	r(unc)	paspalum
<u>Phormium tenax</u>	s(loc)/r(unc)	NZ flax
* <u>Polypogon monspeliensis</u>	r	beard grass
<u>Puccinellia stricta</u>	s	
<u>Schoenus nitens</u>	s(unc)	A rare plant of Wellington region - possibly this is the only site.
<u>Scirpus caldwellii</u>	s(loc)	Purua grass
<u>S. cernuus</u>	s	
<u>S. nodosus</u>	s/r	
<u>S. platycarpus</u> (?)	s(loc)	
<u>S. prolifer</u>	s/r(unc)	
<u>S. pungens</u>	s(loc)	three-square sedge
<u>Triglochin striatum</u>	s	
<u>Typha orientalis</u>	s(loc)	raupo
<u>Zostera muelleri</u>	s	eel-grass