

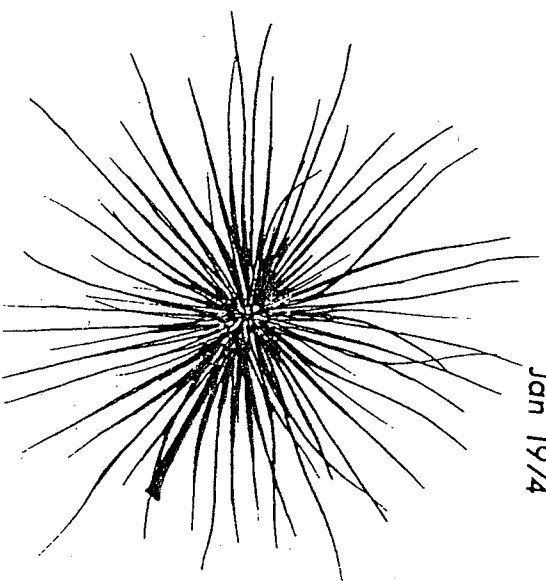
# Sand country vegetation of the PAKIRI COAST and BREAM BAY

*Sand country is subject to quite rapid change. Most of the change has been adverse to the native plants which for centuries have been the major factors in shaping the landscape. No piece of landscape is typical of the scene before exotic plants arrived in New Zealand — but the immediate foreshore of the Pakiri coast and Bream Bay retains many of its native plant species.*

*This report gives a brief account of the sandy coastline at the present time.*

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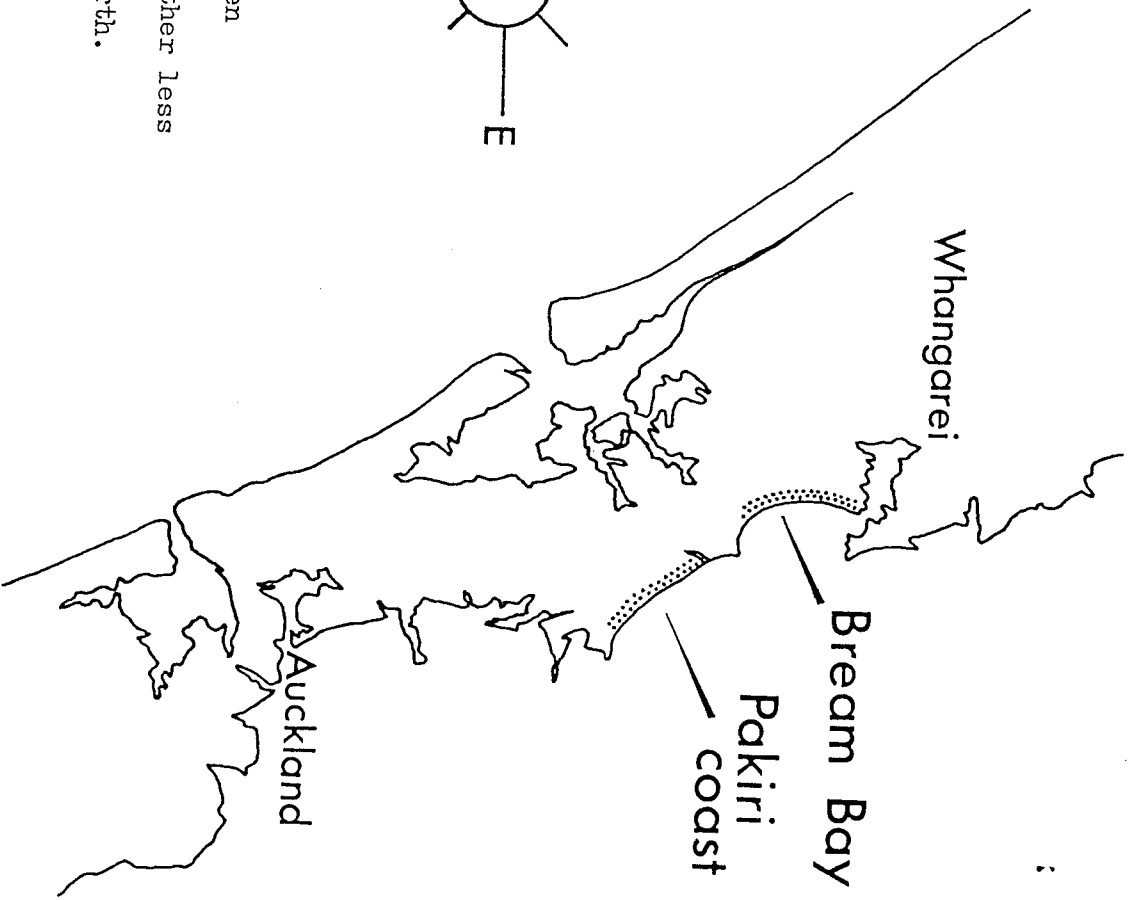
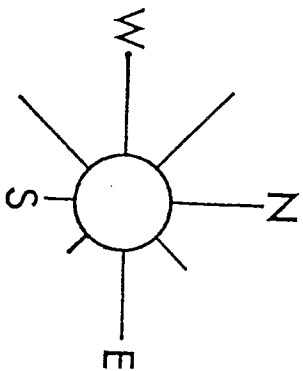


SOME FEATURES OF THE ENVIRONMENT

RAINFALL is about 50 inches (1270mm) per annum. The winter months are the wettest.

WINDS are not strong or persistent. Lowest frequencies are from the NE (directly onshore), S and SE. From other directions frequencies are about equal.

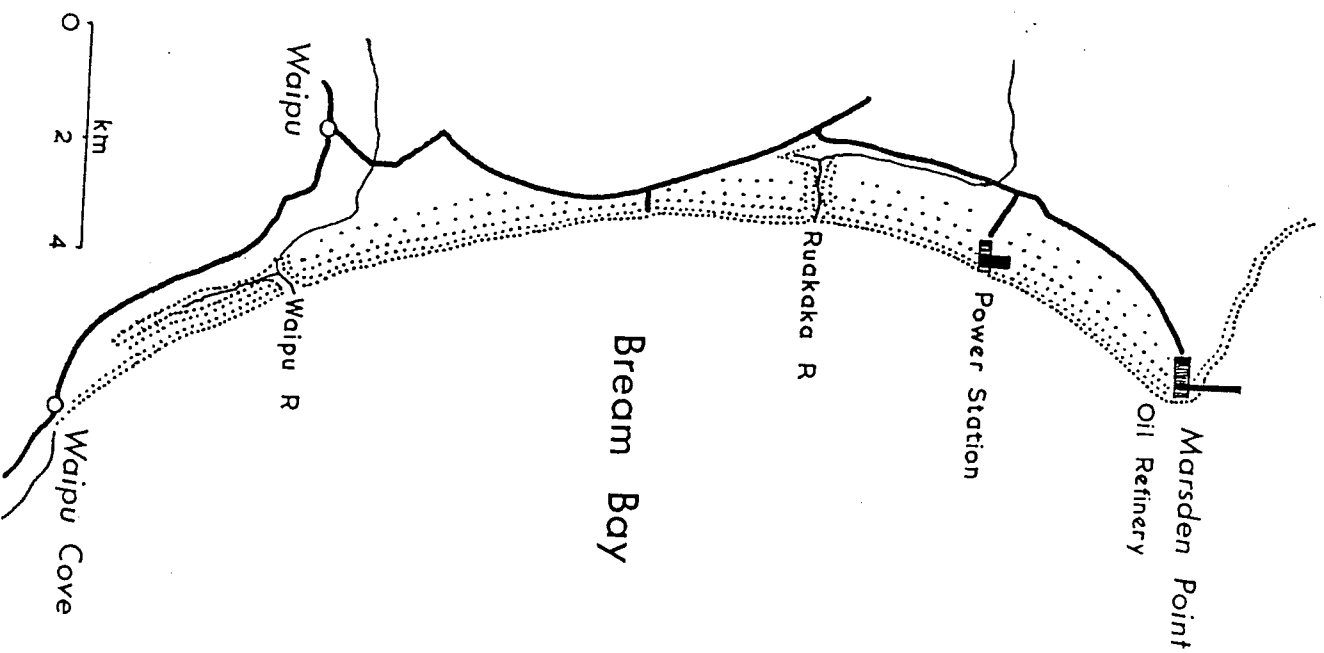
DEPOSITION OF SAND is in moderate amounts but has been sufficient to give smoothly curved coastlines. Rather less is deposited in the south of each bay than in the north.



## SAND COUNTRY OF BREAM BAY

The beaches of Bream Bay stretch for 28 km in a long curve from Waipu Cove to Marsden Point and are broken only by the Waipu and Ruakaka rivers. In the south the sand country is mostly confined to a spit about 6 km long and not more than  $\frac{1}{2}$  km wide at the maximum width. On the inland side it is bordered by an inlet which meets the Waipu River at its mouth. From the Waipu River northwards sand extends inland for more than 1 km. Inland the sand is weathered and was obviously deposited some centuries ago. Except at the mouths of the rivers the sand is fairly well fixed on the foreshore by native plants and inland by exotics.

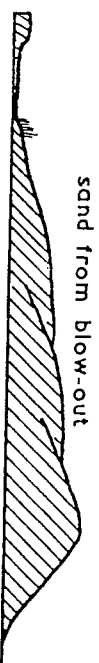
The history has not been investigated but I have been told that there was a period when large amounts of sand were on the move and fixed about 1922 or 1923 by planting marram from the Waipu River to Marsden Point.



The Waipn Cove Beach (6 km) is quite distinct from other Bream Bay beaches because

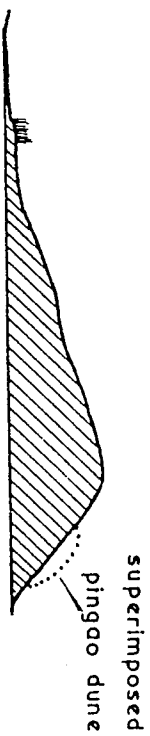
1. the sand country consists solely of fore dune,
2. just about the whole area is dominated by native plants,
3. marram is absent,
4. the lee of the fore dune is sparsely vegetated,
5. the flora is very restricted.

The dune has simple form. In the south it is narrow, falling on the lee side fairly sharply to a flat at the head of the estuary. The northern half of the spit has blow-outs of limited extent. These form concave channels on the face of the fore dune and a series of irregular mounds on the lee. These lose height towards the estuary. At the extreme tip sand is moving much more freely, some of it unfixed by vegetation. This is normal topography for river outlets on beaches. The seaward face of the fore dune throughout is rather steeper than is usual for a spinifex dune. It is clear that undercutting by the sea has moved sand from the lower slope.



Some minor modification to the topography occurs where foot tracks from across the upper estuary cross the fore dune. Trampling has destroyed spinifex on the seaward face of the fore dune causing sand to be blown out of a channel and to be deposited on the lee. This transfer of sand reduces the angle of the seaward and lee slopes while lowering the height of the crest. Because this path makes access to the beach easier the foot traffic is confined to the disturbed area and the remainder of the dune remains intact. In a more windy climate this concentration of trampling could initiate a blow-out.

The vegetation is nearly all of the pioneering class. In the south spinifex dominates the fore dune. There are smaller quantities of pingao and sand convolvulus. Pingao is fairly patchy. Where clumps occur the smooth regular slope of the spinifex dune has an inverted-saucer pingao mound superimposed upon it. On the lee there is mainly spinifex with some harestalk and sand convolvulus running down to the communities containing Stipa, Juncus maritimus,



Salicornia, Samolus and Leptocarpus on the margin of the inlet.

A little further north the lee is most unusual because of the stability of the sand in spite of the sparseness of the vegetation. The sand is covered in a crust, apparently of filamentous algae, which cause it to shed water. Perhaps this is one of the factors giving the region such an infertile appearance. Stunting of plants (lupin and gorse in particular) and the tardiness in colonising bare sand are very noticeable. In many places not more than half the sand surface is vegetated. Moribund spinifex covers about 25%, and hare-tail a similar amount. Erechtites scaberula, Senecio elegans and moss are of some local importance. There are small quantities of cat-sear, hawkbit and Deyouzia billardieri.

Plants are more vigorous in the blow-out areas. Only in these places does pingao occur away from the seaward face. Muehlenbeckia and Scirpus nodosus are more abundant where they receive sand on the margins of blow-outs.

On the northern tip where much sand is on the move there are only three species of significance - spinifex, pingao and sand

convolvulus. The mounds isolated from the narrow dune are mostly covered with pingao.

Ruakaka Beach ( 6 km) has a relatively simple fore dune. The seaward face is fairly steep because of erosion of the lower slope and is mostly about 5 m high. The crest is either level (N of the river) or has a longitudinal depression (S of the river). The lee slope falls away to lower undulating land which does not rise above the altitude of the fore dune.

In the south near the Presbyterian camp there is a fairly typical fore dune with spinifex, pingao and sand convolvulus. A depression along the crest is wide enough to accommodate a vehicle track. The lee of the dune with plentiful lupin and marram falls away irregularly to a plantation and gorse-infested farmland.

Nearer the river the fore dune crest community contains spinifex, marram, haretail Deyouxia, Muehlenbeckia, Scirpus nodosus, ice plant (Carpobrotus edulis), and some large patches of Coprosma acerosa, a species now quite uncommon in Bream Bay. Two species of Cakile which normally grow on



the upper beach extend onto the dune here. The northern toe toe and Cassinia retorta are uncommon.

North of the river mouth the fore dune is wider, having a well defined platform up to 20 m wide along most of its length. This has spinifex and Scirpus nodosus on the platform together with sand convolvulus, Senecio elegans, harextail, catsear and hawkbit. The only Zoysia planifolia seen in Bream Bay grows here. The lee slope has a fairly dense cover of lupin, marram, Muehlenbeckia and an abundance of ice plant.

In some places the seaward slope has two faces. The upper gentler slope appears to be the relic of a spinifex dune and a lower steeper slope the result of fairly recent marine erosion. The species of the platform cover the upper slope and spinifex trails down over the lower slope.

A continuous depression behind the fore dune is wet enough to maintain Baumea articulata, B. juncea, Leptocarpus mariscus sedge and N.Z. flax. Drier parts have Scirpus nodosus and Muehlenbeckia. The inland slope rising from the depression has marram, Scirpus nodosus, sheep's sorrel, N.Z. flax and gorse.





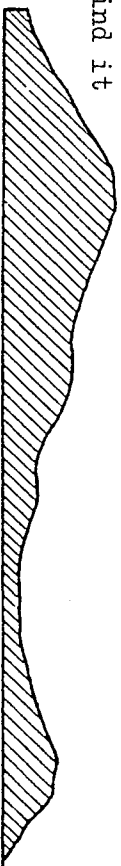
At the river mouth the fore dune, both north and south, gives way to a series of mounds, most with a covering of pingao. Some have spinifex. A small colony of about a dozen plants of Festuca littoralis is probably the only occurrence of the species in Bream Bay.

A small estuarine plain has Samolus, Carex pumila, Scirpus cernuus, Paspalum vaginatum, Deyeuxia billardieri, Triglochin, Lobelia anceps, Apium filliforme and Leptocarpus.

Marsden Point Beach (3 km) differs from other beaches in its form and its flora. South of the car park the fore dune is up to 5 m high in parts and is fairly well covered with spinifex, pingao and sand convolvulus. In the rear it falls to a longitudinal depression moist enough in some places to support Leptocarpus

Baumea juncea. Scirpus nodosus is plentiful. Behind it is a dune with a bench along its length which has been used for laying the pipeline between the Marsden Point oil

ery and the Ruakaka power station. This dune, with an height of 30 m, has mainly marram with abundant sheep's and some Scirpus nodosus. The undulating land beyond it

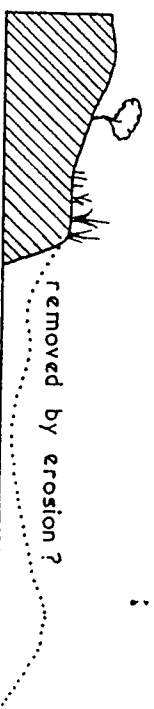


to the west is dominated by gorse, lupin and Muehlenbeckia.

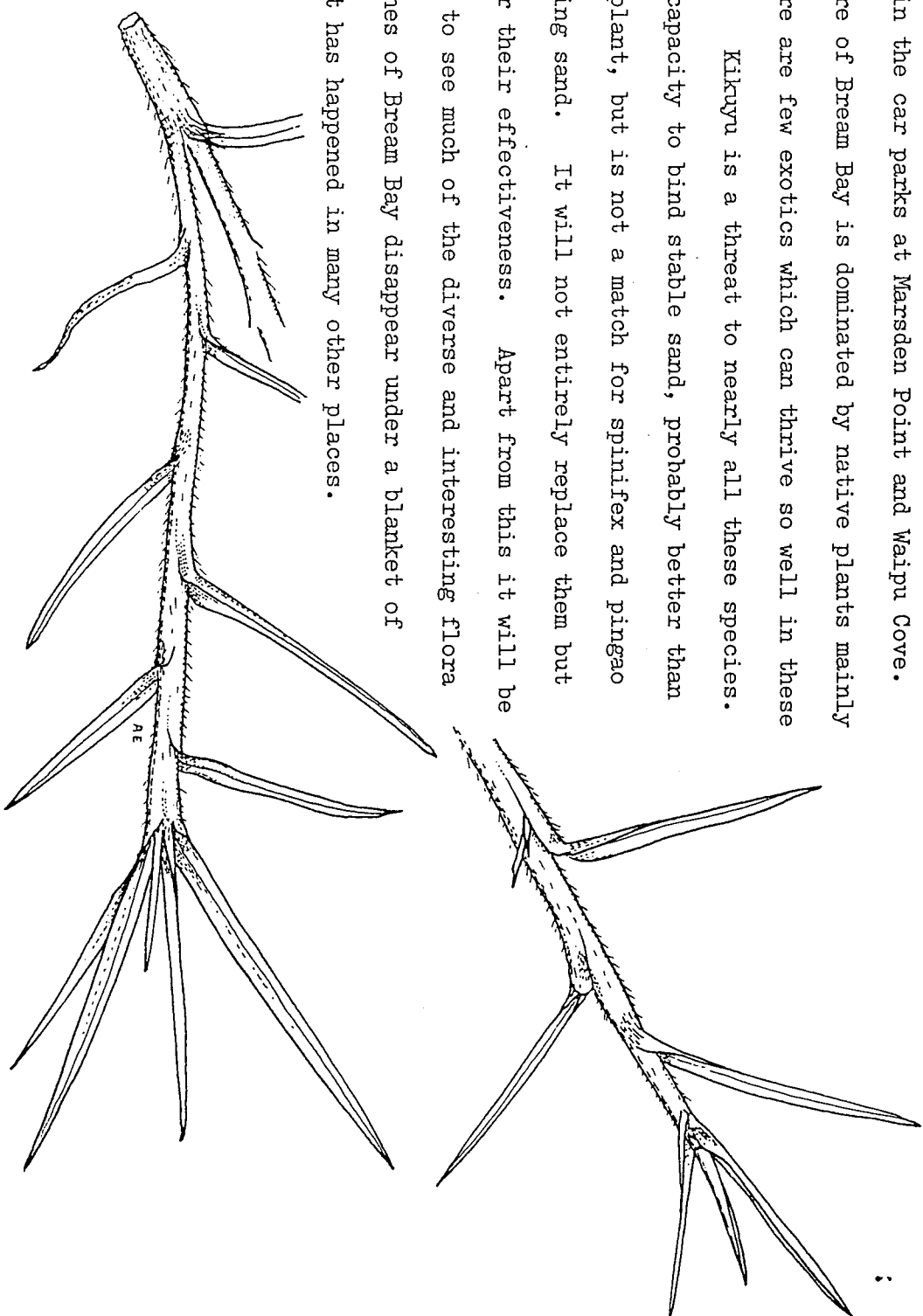
North of the car park the shore seems to have been truncated by erosion. It appears that erosion has taken away the fore dune and the depression, and is now eating into the first backing dune. The steep face of the eroding dune is about 10 m high and is capped by dense vegetation consisting of N.Z. flax, northern toetoe, Muehlenbeckia and bracken. A few adult pohutukawa grow here and seedlings are establishing in open parts of the community.

A feature of Marsden Point is the prominence of some plants not significant on other beaches. Among them are bracken, northern toetoe, Senecio sylvaticus, hawkbeard, apple of Sodom, Poa pratensis, sheep's sorrel, Yorkshire fog, Lotus major and sweet vernal.

If the car park area is included the list becomes very much larger. This car park, like many others on fore dunes throughout the country, has been formed by bringing in clay and other fill. This has brought in plants and seeds not previously in the region and has created a local habitat for



these non-sand plants. Some thrive but do not spread beyond the car park. Many such as kikuyu can grow quite freely on the sand. Apart from a few colonies along the pipe line kikuyu was noted only in the car parks at Marsden Point and Waipu Cove. The foreshore of Bream Bay is dominated by native plants mainly because there are few exotics which can thrive so well in these conditions. Kikuyu is a threat to nearly all these species. It has the capacity to bind stable sand, probably better than any native plant, but is not a match for spinifex and pingao among drifting sand. It will not entirely replace them but could impair their effectiveness. Apart from this it will be regrettable to see much of the diverse and interesting flora of the beaches of Bream Bay disappear under a blanket of kikuyu. It has happened in many other places.



NATIVE PLANTS OF THE DUNES

Calystegia soldanella	sand convolvulus	Marsden Pt	Ruakaka	Waipu	Pakiri				
Carex flagellifera		o	o		o				
Cassinia retorta			o	o					
Collospermum hastatum					o				
Coprosma acerosa	sand coprosma		o						
Cordyline australis	cabbage tree	o							
Cortaderia spendens	northern toetoe	m	o						
Corynocarpus laevigatus	karakara				o				
Cyathodes fasciculata	mingimingi				o				
Cyperus ustulatus	mariscus sedge	o	o		o				
Desmoschoenus spiralis	pingao	p	p	p	p				
Deyouxia billardieri	wind bent	o	m	m	o				
Erechtites scaberula	fireweed	m	o	m	m				
Festuca littoralis			o						
Gnaphalium gymnocephalum	cudweed		o						
G. luteo-album	cudweed		o	o	o				
Haloragis erecta		o			o				
Leptospermum scoparium	manuka		o		o				
Metrosideros excelsa	pohutukawa	o		o	o				

	Marsden Pt	Ruakaka	Waipu	Pakirri
Muehlenbeckia complexa	p	m	p	p
Myrsine divaricata				r
Oxalis corniculata (sand var.)	m	m	o	m
Phormium tenax	o	m	o	
Pteridium aquilinum	bracken			o
Scirpus nodosus	p	p	p	m
Solanum nodiflorum				o
Spinifex hirsutus	spinifex	p	p	p
Tetragonia triegyna	N.Z. spinach	o		o
Thelymitra longifolia	orchid	o		
Zoysia planifolia		o		

WESTLAND NATIVES

Baumea articulata		o		
B. juncea	m	o		
Carex pumila		o		
Juncus pallidus	o			
Leptocarpus simplex	o	o		

EXOTICS (other than grasses and sedges)

	Marsden Pt	Ruakaka	Waipu	Pakiri
Anagallis arvensis		o		
scarlet pimpernel				
Aster subulatus		o		
sea rocket				
Cakile maritima & C. edentula		o	o	o
Calystegia sylvestris				
convolvulus				
Carpobrotus edulis	m		p	
ice plant				
Centaurium erythraea		o		
centaury				
Cerastium glomeratum				
mouse-ear chickweed		o		
Orepis capillaris	p		m	
hawk_sbeard				
Erigeron floribundus		o	o	o
fleabane				
Galium aparine				
cleavers				
Hypochaeris radicata	o	o	p	m
catsear				
Leontodon taraxacoides		m	p	
hawkbit				
Lotus pedunculatus	p	o		o
(Lotus major)				
Lupinus arboreus	m	m	o	p
lupin				
Lycium ferocissimum				
boxthorn				
Ornithopus perpusillus	o	o		
serradella				
Physalis peruviana	o			o
Cape gooseberry				
Phytolacca octandra	o			
inkweed				
Plantago lanceolata				
narrow-leaved plantain				o

Ranunculus repens	creeping buttercup	o	Marsden Pt	o	Ruakaka	o	Waipu	o	Pakiri
Rumex acetosella	sheep's sorrel	p		o				o	
Senecio elegans	Purple groundsel	p					p		
S. sylvaticus	wood groundsel	m		o					
Silene gallica	catchfly	p						o	
Solanum sodomaeum	apple of sodom	m							
Sonchus asper	prickly sow thistle	o							
S. oleraceus	sow thistle	m		o				o	
Stellaria media	chickweed	o						o	
Trifolium repens	white clover							o	
Ulex europaeus	gorse	p		o				o	
Watsonia bulbilifera		o		o				o	
Zantedeschia aethiopica	arum lily	o							

EXOTIC GRASSES & SEDGES

Aira caryophylla & A. multiculmis	hair grass	o		m					
Ammophila arenaria	marram	p		p				o	
Anthoxanthum odoratum	sweet vernal	o		o				o	
Avena barbata	wild oat							o	
Bromus diandrus		m		o				o	p
B. unioloides	prairie grass	o		o				o	

		Marsden Pt	Ruakaka	Waipu	Pakirri
<i>Carex divulsa</i>	sedge	o			
<i>Cortaderia selloana</i>		o			
<i>Dactylis glomerata</i>	cocksfoot			o	
<i>Festuca arundinacea</i>	tall fescue			o	
<i>Holcus lanatus</i>	Yorkshire fog	p	o		o
<i>Lagurus ovatus</i>	haretail	m	p	p	m
<i>Lolium perenne</i>	perennial ryegrass				o
<i>Paspalum dilatatum</i>	paspalum	o			
<i>Pennisetum clandestinum</i>	kikuyu				m
<i>Poa annua</i>					o
<i>P. pratensis</i>		p	o		
<i>P. trivialis</i>					o
<i>Stenotaphrum secundatum</i>	buffalo grass				m

This report was compiled from field notes made 28-30 Oct 1973 and 10 Jan 1974