



CONSERVATION  
TE PAPA ATAWHAI

## CONSERVATION ADVISORY SCIENCE NOTES

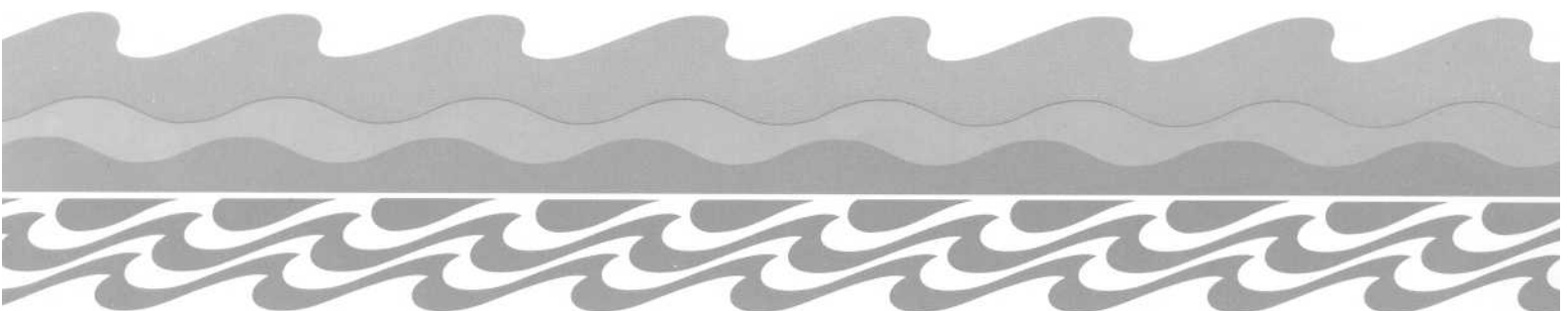
No. 63

### TAIERI ISLAND VEGETATION

(Short Answers in Conservation Science)

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#### TAIERI ISLAND: UNPROGRAMMED ADVICE

I visited Taieri Island (Moturata) for about 2 hours with Dave Wilkins and Bruce McInlay on 9 February.

In answer to your specific questions:

1. Has vegetation cover at gross level expanded or receded since 1976?

Vegetation has retreated by up to 10m from its former seaward boundary along much of the coastline (see map appended), and particularly at the northern and southern extremities of the island. Most of the retreat has been caused by death of *Hebe elliptica* shrubs resulting from undermining by seabird burrows. However, an area of bare substrate shown extending about halfway across the island north of the summit in 1976 is now covered with *Phormium tenax* and *Pteridium esculentum*.

2. Are elements (species) of the vegetation missing or new elements present?

Yes. The appended species list shows species recorded in 1976 and 1994 with estimates of their abundance on the scale used in Scenic Reserves of Otago (Allen 1978). Present in 1976 but not recorded in 1994 are the native species *Acaena novae-zelandiae*, *Haloragis erecta*, *Leptospermum scoparium* (recorded only in an experimental plot in 1994), and *Parsonsia heterophylla*, and the exotics *Cerastium holosteoides*, *Euphorbia peplus*, *Lupinus arboreus*, *Marrubium vulgare*, and *Ulex europaeus*. Recorded only in 1994 are the native species *Carex trifida*, *Chenopodium glaucum* subsp. *ambiguum*, *Histiopteris incisa*, *Hydrocotyle heteromeria*, *Lilaeopsis novae-zelandiae*, *Meliccytus ramiflorus*, *Puccinellia stricta*, *Senecio glomeratus*, and *Spergularia media*.

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Exotics in this category are *Atriplex prostrata*, *Bromus catharticus*, *Callitriche stagnalis*, *Carduus tenuiflorus*, *Coprosma repens* (a native species outside its natural range), *Leycesteria formosa*, *Poa annua*, *Puccinellia distans*, *Sambucus nigra*, *Senecio elegans*, *Solanum dulcamara*, and *Sonchus asper*.

### 3. Is a trend in vegetation dynamics discernible?

Yes. Erosion of sandy soil, particularly along the western side of the island, through burrowing and wind has resulted in the disappearance of the majority of mature *Hebe elliptica* plants, along with most *Poa cita* (formerly *Poa laevis*) and many *Isolepis nodosa* (*Scirpus nodosus*) tussocks, the remainder of which are perched on soil pedestals. A consequence is the movement of sand eastwards, where it is partly burying *Phonidium tenax* and *Pteridium esculentum* plants as far up as the summit of the island.

Sandy soil bared by the death of *Hebe elliptica* is maintained in that state by the activities of black-backed gulls, and continues to be eroded from its coastal scarp by burrowing, leaving an exposed regolith largely of cemented pebbles and stones in the west, or a schist surface at the eastern edge of the island.

There appears to have been an increase in the extent of turf communities on the east coast, particularly in small seepage areas.

### General comments

Floristic diversity, both in native and exotic species, has increased since 1976. Most new species were recorded in relatively moist sheltered areas such as the small coves on the western shore. Two potentially important weeds now appear to be absent (*Ulex europaeus* and *Lupinus arboreus*) and are unlikely to re-establish without accidental transport of seed by people. The appearance of one plant of *Leycesteria formosa*, an aggressive shrub weed in the nearby Taieri River gorge, is cause for concern that this bird-dispersed species could become established on the island.

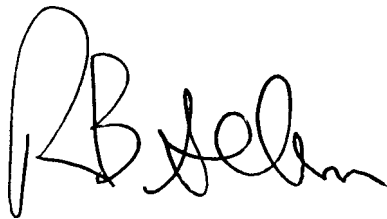
Browsing and droppings on the turf communities mainly on the eastern side of the island indicate that rabbits are present, but no burrows were observed that could be attributed solely to rabbits, so they are probably having little major effect on the vegetation. The increase in extent of turf communities and in herbaceous species since 1976 also suggests that rabbit influence is small.

The retreat of *Hebe elliptica* and accompanying erosion and redeposition of the sandy soils of the western coast are natural processes that reflect the inherently dynamic ecosystem of an exposed coastal site such as this. *Hebe* seedlings are abundant, and the species will survive by continually shifting habitat as soils go through cycles of buildup and erosion.

There is substantial scope for re-introduction of plant species that were probably on the island before human occupation. Any of the shrub and tree species that grow on the

exposed adjacent mainland coast are likely subjects, and plants propagated from local sources could be planted into environments on the island that most closely match those in which they are found on the mainland. The present experiments with *Leptospermum scoparium* establishment from brush matting, and natural regeneration (although mainly of exotic species) in an enclosure, indicate the potential for success. However, there will inevitably be catastrophic climatic and biological events that will result in the loss of both naturally occurring and artificially established plants in this extreme environment.

Clear definition of long-term aims is the most important consideration for management of the island's vegetation. For example, is it desired to prevent further erosion, despite its natural causes? Is the goal establishment of low forest, for example of *Metrosideros umbellata* and *Melicactus ramiflorus*? Is protection of cultural sites, both Polynesian and European, an over-riding consideration? Vegetation management planning must take into account all of these questions and more, so that the most economical and practicable management system can be put into place.

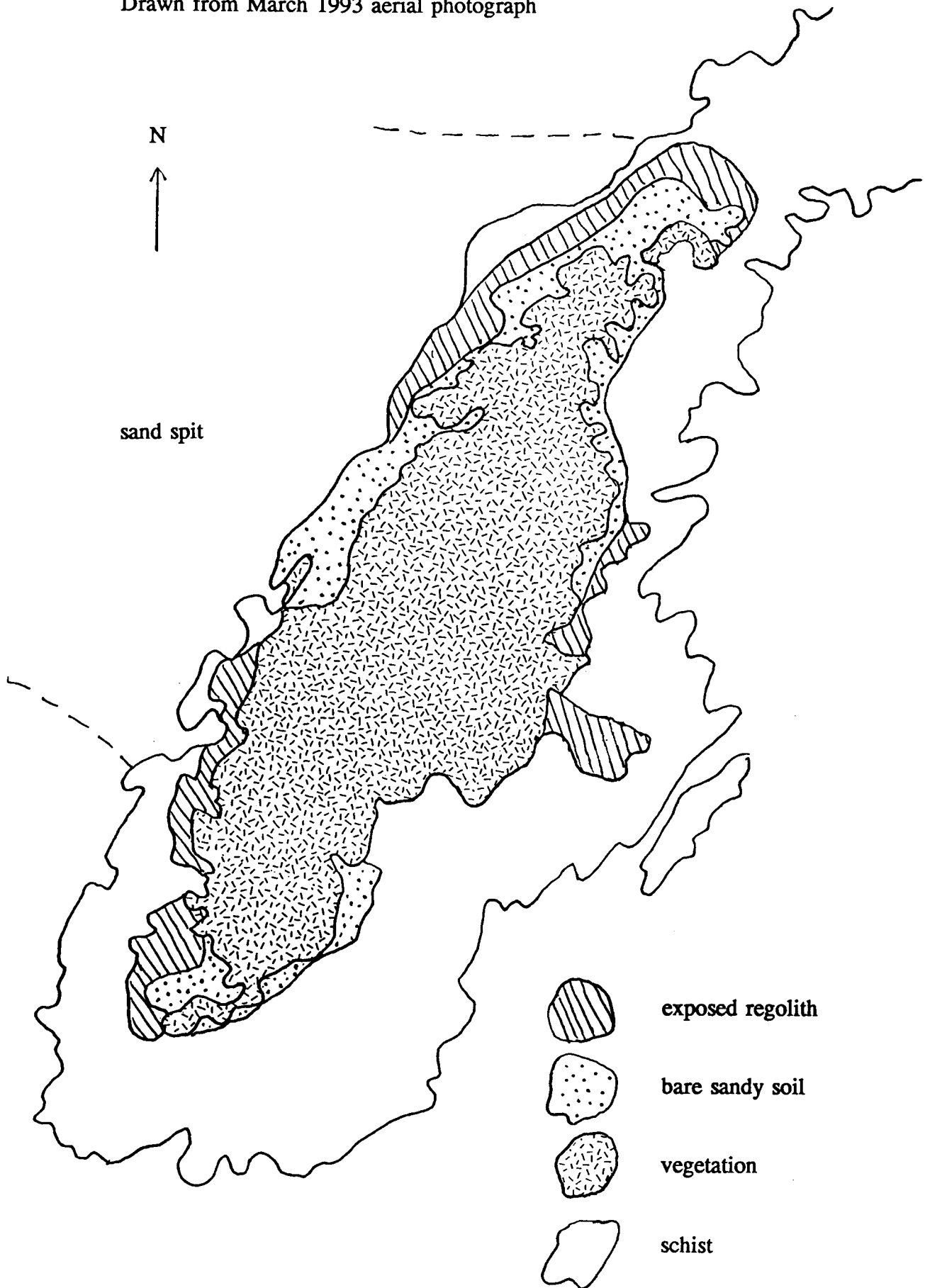
A handwritten signature in black ink, appearing to read 'R.B. Allen'. The signature is fluid and cursive, with the first letters of the first and last names being significantly larger and more prominent.

R.B. Allen  
Scientist

Reference: Allen, R.B. 1978: Scenic Reserves of Otago Land District. Biological Survey of Reserves Report 4. Department of Lands and Survey, Wellington.

# TAIERI ISLAND (MOTURATA)

Drawn from March 1993 aerial photograph



## SPECIES LIST

species	common name	abundance	
		1976	1994
<i>Acaena novae-zelandiae</i>	bidibidi	r	-
<i>Anagallis arvensis</i> *	scarlet pimpernel	f	r
<i>Apium australe</i>	shore celery	o	o
<i>Asplenium obtusatum</i>		a	f
<i>Atriplex prostrata</i> *	orache	-	o
<i>Blechnum banksii</i>		o	o
<i>Bromus catharticus</i> *	prairie grass	-	r
<i>Callitriche stagnalis</i> *	starwort	-	l
<i>Carduus tenuiflorus</i> *	winged thistle	-	r
<i>Carex trifida</i>		-	r
<i>Cerastium holosteoides</i> *	mouse-ear chickweed	o	-
<i>Chenopodium glaucum</i>			
subsp. <i>ambiguum</i>	glaucous goosefoot	-	o
<i>Cirsium arvense</i> *	Californian thistle	o	r
<i>Cirsium vulgare</i> *	Scotch thistle	f	r
<i>Colobanthus muelleri</i>		o	l
<i>Coprosma repens</i> *	taupata	-	r
<i>Cordyline australis</i>	cabbage tree	r	r
<i>Crassula moschata</i>		o	o
<i>Disphyma australe</i>	ice plant	a	f
<i>Euphorbia peplus</i> *	milkweed	r	-
<i>Haloragis erecta</i>		o	-
<i>Hebe elliptica</i>		a	f
<i>Histiopteris incisa</i>	water fern	-	l
<i>Holcus lanatus</i> *	Yorkshire fog	f	l
<i>Hydrocotyle heteromeria</i>	waxweed	-	r
<i>Isolepis cernua</i>		o	o
<i>Isolepis nodosa</i>	club rush	af	
<i>Lavatera arborea</i> *	tree mallow	o	r
<i>Leptinella dioica</i>		o	l
<i>Leptospermum scoparium</i>	manuka	r	-
<i>Leycesteria formosa</i> *	Himalayan honeysuckle	-	r
<i>Lilaeopsis novae-zelandiae</i>		-	r
<i>Lupinus arboreus</i> *	tree lupin	o	-
<i>Marrubium vulgare</i> *	horehound	o	-
<i>Melicytus ramiflorus</i>	mahoe	-	r
<i>Olearia avicenniaefolia</i>		o	o
<i>Parsonsia heterophylla</i>	native jasmine	r	-
<i>Phormium tenax</i>	flax	v	v
<i>Poa annua</i> *	annual meadow grass	-	l
<i>Poa cita</i>	silver tussock	a	o
<i>Pteridium esculentum</i>	bracken	a	a
<i>Puccinellia distans</i> *		-	o
<i>Puccinellia stricta</i>		-	o
<i>Sambucus nigra</i> *	elder	-	o

Samolus repens		o	r
Senecio minimus	fireweed	o	o
Senecio elegans*		-	o
Senecio glomeratus	fireweed	-	o
Solanum dulcamara*	bittersweet	-	
Solanum laciniatum	poroporo	a	r
Sonchus asper*	prickly sow thistle	-	r
Spergularia media		-	r
Tetragonia trigyna	shore spinach	o	o
Ulex europaeus*	gorse	o	-
Urtica urens*	nettle	r	l

\* = exotic species