

Vegetation of the Government Purpose Reserve,
Kaitorete Spit, Ellesmere, Canterbury

T.R. Partridge

Botany Division, DSIR

Private Bag

Christchurch

SUMMARY AND RECOMMENDATIONS

This reserve contains a series of parallel gravel depressions with dryland shrubs dominant, and between, a grassland of mostly native species. The seaward margin includes some back sand dunes. The reserve should be extended to include the sand dune sequence and perhaps west to include more of this peculiar and rare vegetation.

Keywords

Dry coastal shrubland, Dry coastal grassland, Sand dune.

Introduction

Kaitorete Spit is a harsh dry environment characterised by thin soils, sand and gravels. It is exposed to strong north-west and southerly winds, the former being the more important in imposing stress through drought, the latter usually bringing relief with rain but introducing salt spray as well.

The area surveyed was gazetted in 1979 as a Government Purpose Reserve for the carrying out of research into the ionosphere. Buildings and equipment used for this purpose are the dominant feature of the reserve. Although created for this purpose, the area is nevertheless botanically interesting as well.

Across the reserve are a series of long parallel shallow gravel depressions with wider areas of thin sandy soils between. The system runs more or less parallel to the present beachfront, having had a gravel beach and sand dune origin. The seaward edge of the reserve is partly active low sand dune, the pattern of rows of gravel and active dune being repeated to the final gravel at the shoreline. The whole reserve is grazed by sheep, but provides little feed of only low quality.

Vegetation

The parallel structures are distinctive, with different vegetation on the gravels and soils. The gravel areas have mostly shrubs while between them on the soils are mainly grasses. To the east of the reserve this contrast is particularly distinct with no shrubs at all on the raised areas, although land development may have emphasised this difference. Westward through the reserve and beyond, the distinction becomes less obvious.

The main shrubs in the hollows are all native being wire weed (*Muehlenbeckia complexa*), *Coprosma propinqua* and porcupine shrub (*Hymenanthera alpina*), with lesser amounts of *Coprosma crassifolia* and matagouri (*Discaria toumatou*). The distinctive leafless lawyer (*Rubus squarrosus*) is conspicuous but not abundant, and bracken (*Pteridium esculentum*) sometimes grows up through shrubs where grazing animals cannot reach. Sweet brier (*Rosa rubiginosa*) is scattered and has been spot sprayed. The grassland on the ridges is mostly of native grasses with the danthonias (*Rytidosperma caespitosum*, *R. clavatum*, *R. pilosum*), blue wheat grass (*Phylmus retisectus*), and silver tussock (*Poa laevis*) dominant along with the adventives, needle grass (*Stipa variabilis*), soft brome (*Bromus mollis*) and silvery hair grass (*Aira caryophyllea*). Another adventive grass, haretail (*Lagurus ovatus*) is more common seaward. A few plants of nassella tussock (*Stipa trichotoma*) are outliers of a larger population to the north. Shrubs of wire weed also occur on the raised areas. Having the taller plants on the gravels actually creates a false impression of topography, the taller species probably being able to reach down to the ground water aquifer only in the hollows.

The seaward margin of the reserve is at the inner edge of the coastal sand dune system, on top of the innermost essentially stable dune. This has plants of *Carmichaelia appressa*, scabweed (*Raoulia australis*), haretail, shore bindweed (*Calystegia soldanella*) and the small grass *Zoysia minima*, with remnants of those of more active dunes such as pingao (*Desmoschoenus spiralis*) or of gravels (*Muehlenbeckia ephedroides*). Seaward of this boundary, the plants of active dunes and gravels become more important and are joined by others (e.g. *Asperula* sp. *H. melea urvilleana*). The low dune system has been partly invaded by marram

(*Amphiphila arenaria*) but the natives persist, the most important being the dune builder, pingao. Although low, these dunes still have the structure of those on the rest of the spit. The binders pingao and marram are on the active dunes, but are replaced by *Carmichaelia appressa* and scabweed when stabilised as at the present reserve boundary. In the dune hollows, the youngest have scabweed, *H. melea urvilleana* and sand sedge (*Carex pumila*), and the older silver tussock and *Zoysia minima*. These bands extend parallel to the shoreline to produce very distinct zones. To the west, near the sand/gravel pits, diversity is even greater, the dunes become taller, and marram disappears except for some small clumps. The stabilised inner dune is dominated by a dense covering of extremely prostrate plants of the Kaitorete Spit endemic, *Carmichaelia appressa*, with taller species absent, to produce a very peculiar landscape. This feature only occurs again at the extreme western end of the spit.

The observatory installations have had virtually no impact on the vegetation except where buildings have been erected, while the sheep help to maintain native species in the grassland by preferentially grazing the adventive agricultural grasses. Within the enclosed observatory grounds, such vigorous agricultural grasses such as perennial ryegrass (*Lolium perenne*), cocksfoot (*Dactylis glomerata*), Yorkshire fog (*Holcus lanatus*) and the palatable weeds broom (*Cytisus scoparius*) and sow thistle (*Sonchus oleraceus*) thrive in the absence of grazing at the expense of native grasses. This grazing however, probably does restrict establishment, especially of the native shrubs, which are therefore probably not being replaced as they die. As far as the native species are concerned, the effects of grazing animals on the reserve needs to be carefully considered.

Conclusions

As well as the small dune on its margin, the reserve contains interesting dry coastal shrubland and grassland still dominated by native species. Such habitats, especially in conjunction with the geographical features found there, are poorly developed in New Zealand. Elsewhere, they have never been extensive and most have been lost to farming and clearing. Most of the species within this reserve are also found in the Scientific Reserve further down Kaitorete Spit, but the ridge and depression system described does not. Seaward extension of the reserve boundary to include the sand dunes on 'Section 58' would add considerable habitat diversity, making the reserve even more multi-purpose. To the west of the reserve is similar vegetation although the dunes become higher and more diverse. Any extension in this direction would enhance the coverage of the vegetation types and increase diversity in the sand dunes.

Considering the origin of this reserve, it is remarkable that it contains such interesting vegetation. Recognition of the value of this vegetation needs to be made in any reserve management plan.

Species list

Inside the Reserve

* <i>Acaena agnipila</i> (= <i>A. ovina</i>)	Australian sheeps burr	o
1. <i>novae-Zelandiae</i>	piripiri	r
* <i>Aira caryophylla</i>	silvery hair grass	a
* <i>Anthoxanthum odoratum</i>	sweet vernal	r
* <i>Bromus mollis</i>	soft brome	f
<i>Calystegia soldanella</i>	shore bindweed	o
<i>Carex pumila</i>	sand sedge	r
<i>Carmichaelia appressa</i>		
<i>Cirsium vulgare</i>	Scotch thistle	o
<i>Convolvulus verecundus</i>	tussock bindweed	f
<i>Coprosma crassifolia</i>		o
<i>C. propinqua</i>		a
* <i>Cytisus scoparius</i> (= <i>Sarothamnus scoparius</i>)	broom	r
* <i>Dactylis glomerata</i>	cocksfoot	r
<i>Desmoschoenus spiralis</i>	pingao	r
<i>Dichelachne crinita</i>	long-hair plume grass	r
<i>Discaria toumatou</i>	matagouri	o
<i>Elymus retisectus</i> (= <i>Agropyron scabrum</i>)	blue wheat grass	f
* <i>Holcus lanatus</i>	Yorkshire fog	o
<i>Hymenanthera alpina</i>	porcupine shrub	f
* <i>Hypochoeris radicata</i>	catsear	a
* <i>Lagurus ovatus</i>	harestail	f
* <i>Lolium perenne</i>	perennial ryegrass	r
* <i>Marrubium vulgare</i>	horehound	r

<i>Muehlenbeckia complexa</i>	wire weed	d
<i>M. ephedroides</i>		o
<i>Poa laevis</i> (= <i>P. caespitosa</i>)	silver tussock	f
<i>P. eridium esculentum</i> (= <i>P. aquilinum</i> var. <i>esculentum</i>)	bracken	o
<i>Raoulia australis</i>	scabweed	o
* <i>Rosa rubiginosa</i>	sweet brier	o
<i>Rubus squarrosus</i>	leafless lawyer	o
* <i>umex acetosella</i>	sheeps sorrel	f
<i>Rytidosperma caespitosum</i> (= <i>N. todanthonia</i> <i>caespitosa</i>)	danthonia	d
<i>R. clavatum</i> (= <i>N. clavata</i>)	danthonia	f
<i>R. maculatum</i> (= <i>N. maculata</i>)	danthonia	r
<i>R. pilosum</i> (= <i>N. pilosa</i>)	danthonia	a
<i>Scirpoides nodosa</i> (= <i>Scirpus nodosus</i>)	knobbly club-rush	r
<i>Scleranthus uniflorus</i>		r
* <i>silene gallica</i>	catchfly	o
* <i>onchus oleraceus</i>	sow thistle	r
* <i>pergularia rubra</i>	sand spurry	r
* <i>tipa trichotoma</i> (= <i>Nassella trichotoma</i>)	nassella tussock	r
* <i>. variabilis</i>	needle grass	d
* <i>rifolium arvense</i>	haresfoot trefoil	f
* <i>. fragiferum</i>	strawberry clover	r
* <i>. glomeratum</i>	clustered clover	r
* <i>Vrbascum thapsus</i>	wolly mullein	r
* <i>V. virgatum</i>	moth mullein	r
* <i>Vattadinia gracilis</i> (= <i>V. triloba</i>)	purple fuzzweed	r
<i>Zoysia minima</i>		r

On sand dunes outside the reserve
(additional)

<i>*Anmophila arenaria</i>	marram
<i>Asperula sp.</i> (unnamed)	
<i>* Bromus diandrus</i>	ripgut brome
<i>*E rodium cicutarium</i>	storksbill
<i>*G caucium flavum</i>	horned poppy
<i>Pi melea urvilleana</i>	
* adventive species	

KEY

d = dominant

a = abundant

f = frequent

o = occasional

r = rare