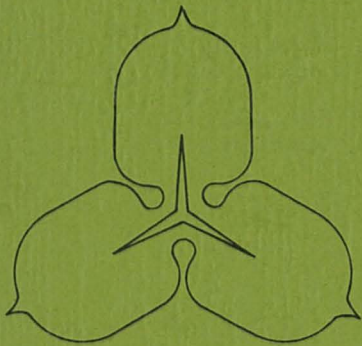


BOTANY DIVISION DSIR



REPORT

FORTROSE SPIT : BOTANICAL REPORT

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MAY 1984

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SUMMARY AND CONCLUSIONS

1. Fortrose Spit, at the Mataura River Mouth, Southland, is a 6 km long sandspit which retains a large flora of native dune plants.
2. Major plant communities are:
 - (a) Pingao and *Poa triodioides* on foredunes
 - (b) *Pimelea lyallii* and other sand-binders on dune crests
 - (c) Sand flats with *Raoulia hookeri*, and herbs such as *Myosotis*, *Geranium*.
 - (d) Marram grass plus tree lupin scrub
 - (e) Damp sand with *Carex pumila*
 - (f) Silver tussock and *Scirpus nodosus* in dune hollows
 - (g) Salt marsh turf near river
3. This dune system is botanically one of two most highly rated in Southland.
4. Introduced plants, especially marram grass, tree lupin and gorse are a threat to the native plants.
5. Recommendation: That grazing of this sandpit should cease.
6. Recommendation: That the area be declared a reserve, fenced preferably at the base of the spit, and that weed control and vegetation monitoring be commenced.

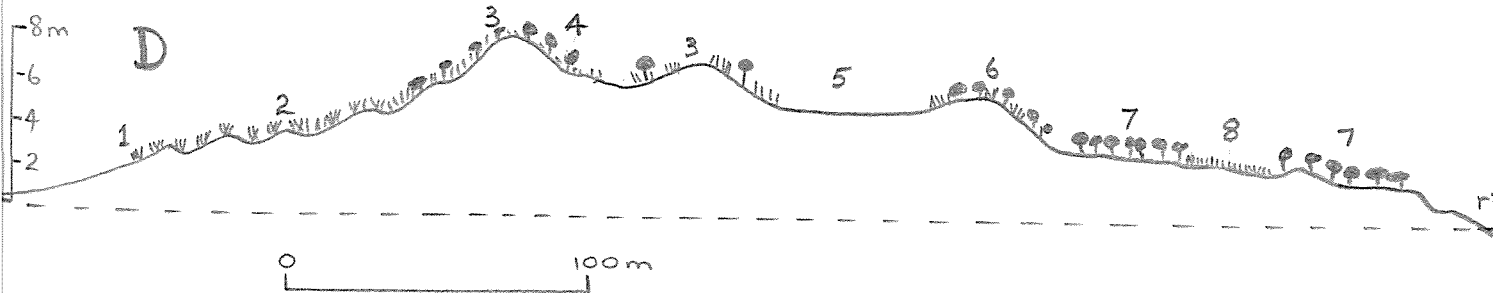
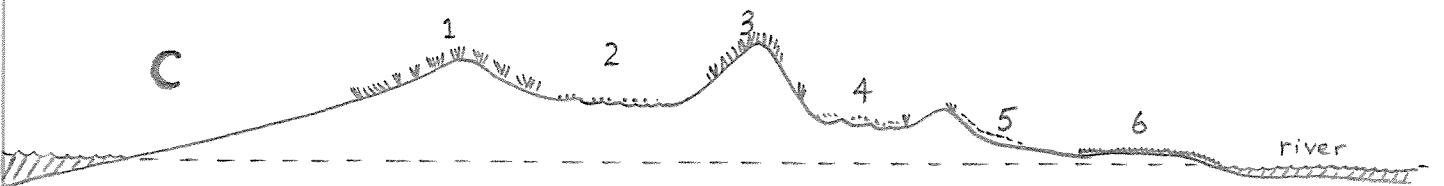
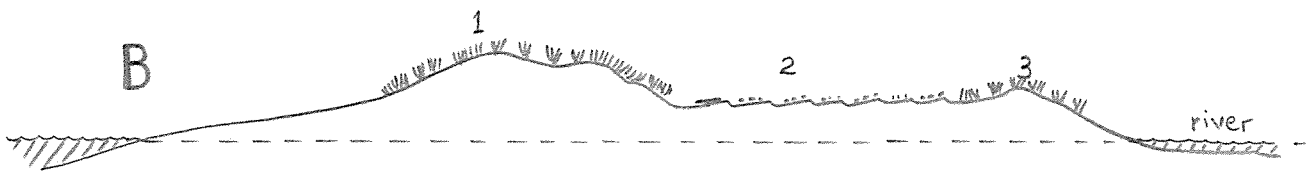
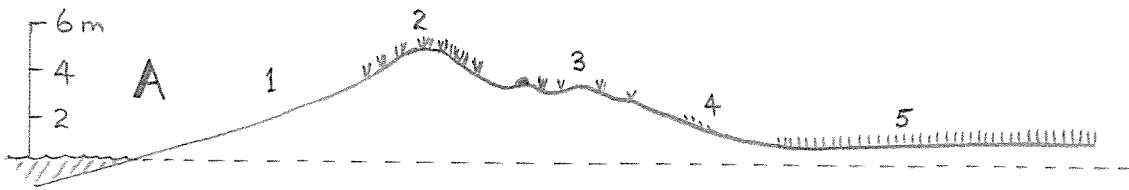
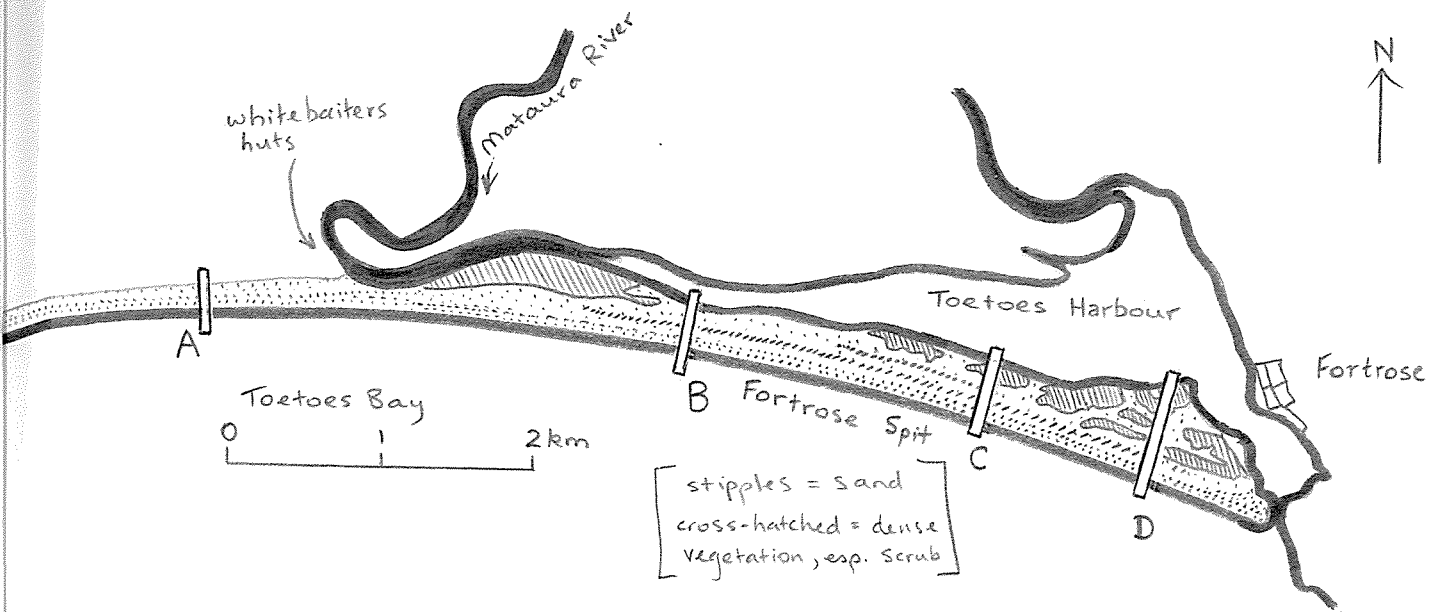
INTRODUCTION

Information on the botany of Fortrose Spit on the Southland coast was sought by Lands & Survey Department, Invercargill in May 1984. An inventory survey by DSIR botanists of dune vegetation throughout the South Island (almost completed but not yet published), identified Fortrose Spit, enclosing Toetoes Harbour at the mouth of the Mataura River, as one of the most important examples of dune vegetation remaining in Southland. The dune was rated 4 out of 5 for its range of habitats, 5 for representation of native plants, 3 for lack of modification and 4 indicating relatively low degree of weed infestation, giving a total rating of 16 out of 20. The only other Southland Beach with a rating as high as 16 is Long Beach - Shades Beach. In the context of a coastal survey of Southland County, this sandspit is being assessed for its reserve potential. The spit has been grazed by cattle, under a Crown lease, but termination of the lease, over all or part of the spit, is under consideration.

This report is based on field work on 23 and 24 September 1981.

FLORA

A list of all plant species recorded is attached. It contains 34 native and 24 naturalised species, altogether 58. There is a very good representation of native plants typical of sand dunes, most of them common here. Yet these are the very same ones that have disappeared from most Southland beaches. They are, in particular, pingao (*Desmoschoenus spiralis*), shore convolvulus (*Calystegia soldanella*), sand tussock (*Poa triodioides*), sand carex (*C. pumila*), shore gentian (*Gentiana saxosa*), sand geranium (*G. sessiliflorum* var. *arenarium*), *Myosotis pygmaea*, the Southland sand daphne (*Pimelea lyallii*), a tiny buttercup (*Ranunculus repens*), the form of the scabweed (*Raoulia hookeri*) typical of the Southland coast, and *Scleranthus biflorus*.



FORTROSE SPIT, PROFILES ACROSS DUNES.

To accompany botanical report by P.N. Johnson, DSIR

VEGETATION

Refer to attached map, showing location and profile of the following transects.

- A
1. Steep beach of coarse sand.
 2. Low dunes, 40% vegetated with pingao, *Poa triodioides*, and occasionally marram grass which forms its own dunes, c. 2 x 2m.
 3. Scattered tufts of pingao (grazed and uprooted by cattle) and silver tussock, plus shrub-cushions, partly buried, of *Pimelea lyallii*, and rosettes of *Geranium*, *Myosotis*, catsear and hawkbit.
 4. Gentle back slope, heavily grazed and only 8% covered with pingao, *Pimelea*, *Raoulia* and grasses.
 5. Boggy ground, with *Leptocarpus*, red tussock and gorse, being grazed. Some 200-300 m inland across damp low ground are young pines and pasture.
- B
1. Dune crest about half vegetated with an equal mixture of pingao, sand tussock (*Poa triodioides*) and marram grass, all plants rather small (30-40 cm tall) and lax.
 2. Gritty sand flat, 40% covered with scabweed, *Raoulia hookeri*, growing on the lee sides of a multitude of low, tilted terraces.
 3. Dune with pingao and sand tussock; also *Hydrocotyle 'montana'*, *pimelea*, *Ranunculus acaulis*, and stonecrop, but 80% bare sand. Some gorse was seen on rear side of dune.
- C
1. Foredune with marram grass (30% cover), pingao 10%, and herbs 10% (e.g. hawkbit, shore gentian, shore convolvulus).
 2. Hollow with scabweed and sand herbs (as 4).
 3. Marram on crest.
 4. Sand flat, 30% scabweed mats, 5% *Pimelea* cushions, occasional pingao and small sand herbs: gentian, *Ranunculus recens*, cudweed and allseed.
 5. Moist sand on slight slope with low marram (30%), bare ground 30%, much sand carex, *Colobanthus muelleri* and stonecrop.

6. Low turfy hollow by river, with *Selliera*, *Samolus*, *Scirpus cernuus*, and *Tillaea moschata* dominant. Turf plants of lesser importance are native celery, *Cotula dioica*, glasswort, *Lilaeopsis*, creeping bent and *Puccinellia*.

D 1. Beach of coarse sand.

2. Low foredunes covered with marram (70%) and pingao (just 1%).
3. Highest dunes rising to 8 m, with 1 m tall vegetation of marram (75%) and tree lupin 30%. Ground plants, covering 40% of the ground are catsear, hawkbit, mouse-ear chickweed, white clover, cocksfoot, Yorkshire fog, and Cardamine.
4. On rear slope of dune: lupin scrub 10%, marram 10%, grasses and clovers 8%, all heavily grazed.
5. Bare sand hollow.
6. Lupin scrub 40%, marram 40% and pingao 20% are the main cover, but gorse is also present, perhaps 1% total cover as patches 2-5 m across. Occasional clumps of flax are also present.
7. Tree lupin scrub is dominant (90% cover) over grasses.
8. Silver tussock and clubrush (*Scirpus nodosus*) cover some hollows, to 20 m wide, with a turf of lotus, hawkbit, grasses and clovers.

DISCUSSION

Fortrose Spit is botanically diverse and interesting such that it is well worth reserving, and managing to preserve these values. As noted above, it still has a rich flora of native sand plants, which form various plant communities on different sorts of habitats - foredunes with pingao and sand tussock, more stable older surfaces with *Pimelea*, extensive eroded hollows with scabweed and sand herbs, and various damp sand communities towards the river. Its large size gives it a biological resilience which small dune systems lack. There is nothing comparable in size and botanical diversity on any of the big beaches between Te Waewae Bay and Oreti Beach, on the southern Southland coast. Nor is there anything quite the same along the Tiwai Point to Waituna Lagoon coast, which is essentially a gravel coast. In the great sweep of Toetoes Bay, it is to the eastern, Fortrose end that the finest sand has drifted and accumulated.

Even within the 6 km length of Fortrose Spit, a gradation is obvious from low dunes of coarse sand in the west to taller dunes of fine sand in the east. And it is in the east that introduced plants - marram grass and tree lupin in particular, have been most successful in replacing the native sand binders. Here too, pasture plants have established best, offering more grazing and opportunity than the central part of the spit.

Grazing would seem to be of no benefit whatever to the native dune vegetation. Heavy grazing by cattle along the narrow dune between Waituna Lagoon and the base of Fortrose Spit is obvious on individual plants, and is presumably reflected also in the sparse vegetative cover.

Topographically, the most workable reserve boundary, and line beyond which grazing should be disallowed is across the base of Fortrose Spit. It may be, however, that there could be some case for continued grazing of the densely vegetated area, west of profile B, (cross hatched on sketch map). This area was not studied during my visit. From the air photos it appears to be partly in scrub and pasture. Any assessment of whether this bit of land should go to reserve or to continued grazing must take into account:

1. whether it has vegetation types worth reserving;
2. the need to protect dune vegetation on the seaward side of the grass-scrub area;
3. whether it is practicable to erect a workable reserve boundary fence at its eastern edge, i.e. somewhere near profile B on the sketch map.

Management and monitoring of the dune vegetation are a necessity. The main aim should be to prevent further replacement of native dune communities by naturalised plants. Control could start immediately on the scattered gorse patches, and on any isolated marram grass patches that threaten native sand-binders. Larger scale eradication of marram and lupin should not be initiated until the spit has been more intensively surveyed, and the plant communities mapped. It may be that in the long term, the marram-lupin vegetation at the east end

of the spit must be accepted as there to stay, while reserve management concentrates on the central part of the spit.

In conclusion, reservation of this botanically important area, is recommended.

o = occasional

r = rare

didid

drooping bent

grass

relay

convulvus

grass

chickweed

thistle

thistle

grass

grass

grass

grass

grass

grass

grass

grass

grass

grass

grass

grass

grass

grass

grass

grass

grass

grass

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grass

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grass

FORTROSE SPIT: LIST OF PLANT SPECIES

* = naturalised
 v = very abundant
 a = abundant

f = frequent
 o = occasional
 r = rare

| | | |
|---|---|---------------------|
| Acaena anserinifolia | o | bidibid |
| A. novae-zelandiae | o | " |
| * Agrostis stolonifera | f | creeping bent |
| * Ammophila arenaria | v | marram grass |
| Apium australe | o | native celery |
| Calystegia soldanella | o | shore convolvulus |
| Cardamine debilis | f | |
| Carex litorosa | r | |
| C. pumila | f | sand carex |
| * Cerastium fontanum | a | mouse-ear chickweed |
| * Cirsium arvense | o | Californian thistle |
| * C. vulgare | o | Scotch thistle |
| Colobanthus muelleri | o | |
| * Conium maculatum | r | hemlock |
| Cotula dioica | o | |
| * Dactylis glomerata | f | cocksfoot |
| Desmoschoenus spiralis | v | pingao |
| * Festuca arundinacea | f | tall fescue |
| Gentiana saxosa | o | shore gentian |
| Geranium sessiliflorum var. arenarium | f | sand geranium |
| Gnaphalium luteo-album | r | cudweed |
| * Holcus lanatus | f | Yorkshire fog |
| Hydrocotyle novae-zelandiae var. montana | f | |
| * Hypochoeris radicata | f | catsear |
| * Juncus articulatus | o | jointed rush |
| * Leontodon taraxacoides | v | hawkbit |
| * Lotus pedunculatus | f | lotus |
| Lilaeopsis novae-zelandiae | o | |
| * Lupinus arboreus | v | tree lupin |
| Luzula rufa | o | woodrush |
| Myosotis pygmaea var. drucei | o | |
| Phormium tenax | o | flax |
| Pimelea lyallii | f | |
| Poa laevis | f | silver tussock |
| P. triodioides | v | |
| * Polycarpon tetraphyllum | r | allseed |
| * Prunella vulgaris | o | selfheal |
| Puccinellia sp. | o | |
| Ranunculus acaulis | f | |
| R. recens | o | |
| Raoulia hookeri | f | scabweed |

| | | |
|----------------------|---|-----------------|
| * Sagina procumbens | o | pearlwort |
| Salicornia australis | r | glasswort |
| * Sambucus nigra | r | elder |
| Samolus repens | o | |
| Schoenus nitens | o | |
| Scirpus cernuus | o | |
| S. nodosus | o | clubrush |
| Scleranthus biflorus | r | |
| * Sedum acre | f | stonecrop |
| Selliera radicans | o | |
| Senecio biserratus | o | fireweed |
| * Solanum dulcamara | o | bittersweet |
| * Sonchus oleraceus | o | sow thistle |
| Tillaea moschata | o | |
| * Trifolium dubium | o | suckling clover |
| * T. repens | f | white clover |
| * Ulex europaeus | o | gorse |