

Waipapa Beach Conservation Area – Vegetation report

Introduction

The Waipapa Point Conservation Area (CA) is a conservation unit that has had only limited previous ecological description. This report is the result of two inspections, the first undertaken on 29th September 2005 by Bill Lee (Landcare Research, Dunedin), Peter Johnson (Landcare Research, Dunedin), and Brian Rance (TSO Biodiversity-flora/terrestrial ecosystems, Southland Conservancy). The second undertaken on 21st October 2005 by Lynne Sheldon-Sayer (Ranger – Biodiversity – weeds, Murihiku Area), Phil Knightbridge (TSO – Biodiversity -flora/terrestrial ecosystems, West Coast Conservancy) and Brian Rance. This report serves to describe the known ecological values of the area.

Ecological Setting

Waipapa Beach is a 7.5 km long beach located in the western portion of the Takahopa Ecological District. The Takahopa ED is a large Ecological District that extends from Kaka Point in the northeast to Fortrose in the southwest, and so spans both Otago and Southland Conservancies. The major ecosystems have been listed in the Southland Protection Strategy (Harding, 1999). The coastal vegetation (including sand dune systems) is a distinctive feature of the Takahopa ED. There are several long sandy beaches within the ecological district, however several have a narrow dune system.

A feature of the Waipapa Beach is the size of the dune system and diversity of dune habitat. The Waipapa Point CA being c.242ha in size (in two parts) with another 11ha of marginal strip on the adjacent shore along Waipapa Beach. It is one of few sand dune systems along the Foveaux Strait/southern Southland area (within Southland Conservancy) that is administered by the Department of Conservation. Others include Haldane Beach, Fortrose Spit, and Kawakaputa Beach.

The only previous known ecological survey undertaken was undertaken as part of the Sand Dune and Beach vegetation inventory of New Zealand (Johnson, 1992). This survey examined 333 coastal sites, including 78 in Southland. Of the 30 sites identified as nationally important, 19 are found in Southland. However these sites are largely confined to the Fiordland/Waitutu coast (9 sites) and Stewart Island coast (9 sites), with only one (Fortrose Spit) on the southern Southland coast.

In the Sand Dune and Beach vegetation inventory Johnson lists six dune communities found at Waipapa Beach. The beach was given a rating score of 14, a score of 15 or more was considered to be a nationally priority for conservation. The extensive dune wetland communities and forest within the hind dune was not described and so assumed not to have been surveyed. These communities represent some of the most significant features of the Waipapa Beach CA.

Vegetation

Fore dune

The fore dune is dominated by marram grass (*Ammophila arenaria*) with relatively few other species associated. The dune morphology has been modified by marram grass. The pingao (*Desmoschoenus spiralis*), sand tussock (*Austrofestuca littoralis*) and *Sonchus kirkii*, recorded by P. N. Johnson from this community have either declined or disappeared.

Mid dune

This area is dominated by a wetland area containing a variety of turf communities, oioi rushland, ponds and dryer hummocks. The community present at a site is determined by the water table, soils, drainage, fertility and other site factors. This area is relatively recent in its origin, with it having been sand dune as late as c. 1970.

Ponds: These are elongate, shallow lagoons. The water level fluctuates through the year. Some ponds or parts of ponds are ephemeral. There are very few aquatic plants associated with them.

Oioi rushland: This community varies considerably in the cover of oioi (*Leptocarpus similis*) and other species. Some sites consist of a relatively dense cover of oioi while other sites are semi open. One site of semi-open oioi examined consisted of bryophytes (60% cover), oioi (20%), *Nertera balfouriana* (5%), *Schoenus concinnus* (1-5%), hairy plantain (*Plantago australis*, 2%), *Hydrocotyle novae-zelandiae* var. *montana* (1%), *Selliera radicans* (1%), *Pratia angulata* (1%), *Schoenus maschalinus* (1%), birdsfoot trefoil (*Lotus pedunculare*, 1%), hawksbit (*Leontodon taraxacoides*, 1%) and other species. Also present are scattered lowland flax (*Phormium tenax*), toetoe (*Cortaderia richardii*) and mingimingi (*Coprosma propinqua*). Four square sedge (*Lepidosperme australe*) may be locally common. In some sites the oioi appears young and may be vigorously expanding.

Wet turf communities: These wet turf communities are dominated by *Myriophyllum votschii* (c. 90%), with oioi <10%), bryophytes (2%), *Hydrocotyle hydrophila* (2%), *Pratia angulata* (1%), arrow grass (*Triglochin striatum*), bladderwort (*Utricularia monanthos*).

Intermediate moisture turf communities: The composition of turfs is quite variable. Only some of the variation is described. One area of turf examined consisted of *Nertera balfouriana* (35% cover), *Schoenus concinnus* (25%), *Centella uniflora* (18%), bryophytes (10%), *Selliera radicans* (5%), *Myriophyllum votschii* (5%), *Lagenifera petiolata*?, *Euphrasia repens*, hawksbit, jointed rush (*Juncus articulatus*) and sweet vernal (*Anthoxanthum odoratum*). Another turf community consisted of bryophyte (75% cover), *Nertera balfouriana* (35%), hairy plantain (3%), *Pratia angulata* (1%), *Hydrocotyle hydrophila* (1%), hawksbit (1%), jointed rush (1%), *Juncus planifolius*, *Myriophyllum votschii*, *Lagenifera petiolata*? birdsfoot trefoil, sweet vernal, lawn daisy (*Bellis perennis*) and other species.

Damp turf communities: This community contained *Schoenus concinnus* (60% cover), bare ground (10%), bryophytes (8%), hawksbit (6%), *Mazus arenarius* (4%), *Myriophyllum votschii* (3%), *Euphrasia repens* (2%), jointed rush (1%), *Juncus planifolius* (1%), liverwort (1%), *Carex flaviformis*, *Euchiton polylepis*, *Samolus repens*, *Selliera radicans*, selfheal (*Prunella vulgaris*) and other species.

Sandy hummocks: There are sandy hummocks scattered throughout the wetland area. The toe of the hummock remains damp. This area contains bryophytes, *Nertera balfouriana*, *Centella uniflora*, *Hydrocotyle novae-zelandiae* var. *montana*, *Lagenifera petiolata*, *Schoenus concinnus*, shore gentian (*Gentiana saxosa*), club rush (*Isolepis nodosa*), sweet vernal, Yorkshire fog (*Holcus lanatus*), selfheal, catsear

(*Hypochaeris radicata*), birdsfoot trefoil and other species. Higher hummock areas contain marram grass, with some Yorkshire fog, birdsfoot trefoil, tree lupin (*Lupinus arboreus*) and club rush, with occasional mingimingi, lowland flax, gorse.

Mingimingi shrubland: There are localised fragmented patches of mingimingi shrubland. These are dominated by mingimingi, with occasional *Coprosma rigida*, lowland flax and gorse (*Ulex europaeus*). The shrubland has few species on the ground and is surrounded by exotic grassland.

Hind dune

The hind dune system is of variable width. While some of it is included in the Waipapa Beach Conservation Area it does extend into the more extensive privately owned farmland behind. The dune system also extends inland, up a hill slope to the north-east, almost 1 km beyond the Conservation Area boundary.

The hind dune is generally dominated by marram grass and/or exotic grasses, with some tree lupin, gorse and mingimingi.

Totara forest: There are only small, fragmented remnants of Hall's totara (*Podocarpus hallii*) forest remaining. Larger Hall's totara forest remnants are found outside the Conservation Land. There is little understorey or ground cover. The ground cover consists mainly of bare sand, with some hemlock (*Conium maculatum*), chickweed (*Stellaria media*) and cocksfoot (*Dactylis glomerata*). Few other trees were associated, though individuals of kohuhu (*Pittosporum tenuifolium*) and red mapou (*Myrsine australis*) were recorded. This forest would once have been the major cover upon the hind dune system.

Mingimingi shrubland: Areas of dense mingimingi shrubland were found on flat ground on both sides of the northern boundary of the Conservation Land. Other species associated included occasional Hall's totara, kahikatea (*Dacrydium dacrydioides*), manuka (*Leptospermum scoparium*), cabbage tree (*Cordyline australis*) and *Coprosma rigida*. Understorey species included the pennyworts *Hydrocotyle heteromera* and *H. novae-zelandiae* var. *montana*, biddibid (*Acaena novae-zelandiae*), hook grass (*Uncinia uncinata*), little hard fern (*Blechnum pennamarina*), swamp kiokio (*B. minus*) and *Hyolepis ambiguum*. This community is important as it is the successional stage to forest.

Wetland: This community was localised occurring in a dune hollow. The community was characterised by *Juncus gregiflorus*, *Carex appressa*, *C. virgata*, mingimingi, *Coprosma rigida* and manuka, however the major cover consisted of Yorkshire fog, creeping buttercup (*Ranunculus repens*), birdsfoot trefoil and cocksfoot.

Flora

A flora of 102 native species has been recorded. This flora is considered very rich for a sand dune system on the Southland coast. The majority of these species occurred in the mid dune wetland communities. Of particular note is the presence of four species of national interest (de Lange, 2004). These are:

Mazus arenarius (National status – Gradual Decline) This species is locally common within the turf/wetland area. It is only one of two records from the Takahopa ED.

Gunnera arenaria (National status – Gradual Decline) This species was uncommon within the turf/wetland area. It is thought to be the only record from the Takahopa ED.

Libertia peregrinans (National status – Gradual Decline) This species was uncommon within the turf/wetland area. It is thought to be the only record from the Takahopa ED.

Gnaphalium polylepis (National status – Data Deficient) This species was locally common within within the turf/wetland area. It is thought to be the only record from the Takahopa ED.

The rare plants pingao (*Desmoschoenus spiralis*, National Status - Gradual Decline), sand tussock (*Austrofestuca littoralis*, National Status - Gradual Decline) and *Sonchus littoralis* (National Status - Gradual Decline), recorded by P. N. Johnson both appear to have at least declined but probably disappeared.

Weeds

Despite the abundance of exotic species recorded within the dune system (at least 41 species), there are few plants of conservation concern.

Marram grass (*Ammophila arenaria*): Marram grass dominates the fore dune and is common in parts of the hind dune. It is confined to sandy hummocks within the mid-dune area containing the turf/wetland communities. It has stabilised and changed the form the dune system.

Gorse (*Ulex europaeus*): Gorse is scattered through the hind dune and turf/wetland communities. Gorse has potential to increase to dominate the hind dune. It also could increase to change the character of the turf/wetland communities.

Broom (*Cytisus scoparius*): Broom is uncommon within the dune system, with only a few plants observed on the hind dune.

Elderberry (*Sambucus nigra*): Scattered plants of elderberry are found on the hind dune.

Blackberry (*Rubus fruticosus*): A localised infestation of blackberry was found in a swampy area on the hind dune.

Tree lupin (*Lupinus arboreus*): It is found on suitable sites with the fore, mid and hind dune systems.

Giant gunnera (*Gunnera tinctora*): A single plant of this species was reported from the beach by Arne Ericson. It was not able to be found during the survey.

A number of other exotic species have potential to increase and reduce the naturalness of the turf/wetland communities. These species will be difficult to control. Those of greatest concern include *Carex ovalis*, jointed rush (*Juncus articulatus*), soft rush (J.

effuses), creeping bent (*Agrostis stolonifera*), white clover (*Trifolium repens*), birdsfoot trefoil (*Lotus pedunculare*) and hairy plantain (*Plantago australis*).

Fauna

The larger lagoon areas provide habitat for a range of waterfowl and wading birds. The presence of fernbird is notable. It is likely that skink are present. The area also forms an important habitat for invertebrates.

Historical values

The site was subject to gold mining. The remains of the last dredge constitute an important historical site.

Discussion

Grazing: There has been grazing across the back dune area, however it is not thought that any grazing concession exists. Generally this grazing appears to be low impact, probably being limited stock numbers for a short period. However there is permanent electric fencing established within the north-eastern portion of the Conservation Unit. This area appears to be more heavily stocked with cattle.

It is likely that even low levels of stock may restrict shrub regeneration on the hind dune.

Weed control: Weed control is the major management requirement for the area. Gorse is the most common species and although still only at low – moderate levels and somewhat localised. However it will increase rapidly over the next few years. Of particular concern is its spread across the wetland areas, however it also has potential to cover much of the hind dune.

This survey only looked at a small area of the dune system a further more in depth weed survey is planned for the summer of 2006. Of concern is a report of *Gunnera tinctora* on the foredunes. *Gunnera tinctora* is a highly invasive species particularly in coastal situations.

Restoration: Active restoration would be required to re-establish pingao and other native species onto the foredune. Likewise planting would be need to speed up expansion of the Halls totara forest. However the size of the dune system and therefore the work involved means that restoration would be a very expensive exercise that would require national funding.

The merits of restoration at this dune system over other dune systems and other restoration projects needs to be evaluated. Dune system restoration is already underway in a limited way are Fortose Spit and Three Sisters dune. Other dune systems of high value that should be considered for restoration include Waipapa Beach, Haldane Beach and Kawakaputa Beach. Each has slightly different ecological values associated.

Significance: Dune slacks and other dune wetlands are a characteristic feature of dune systems. These dune wetlands are generally small scale and localised. The Waipapa Beach dune system contains the largest and best wetland turf community known in Southland and likely to be one of the larger expanses and better examples nationally.

The presence of four nationally listed plant species adds importance to these turf communities. Hall's totara forest on sand dunes is another nationally much diminished community.

The protected area contains the fore dune, mid dune and hind dune. Therefore the area includes much of the dune system, extending for 4.25 km along the eastern end of beach and up to c. 500 m inland. The reserve design could be improved by extending the system inland (2 km) to include larger stands of Hall's totara forest and the transition from Hall's totara forest into coastal podocarp hardwood forest.

Summary

Waipapa Point Conservation Area is a little appreciated, under valued area of the Southland coast. It contains values that have not previously been recognised, that warrant its recognition as being nationally important.

Recommendations

- 1 To develop a management statement for the area which incorporates the full spectrum of values (i.e. ecological, recreation, historic and cultural).
- 2 To evaluate the weed control requirements, to develop costings and to initiate weed control on priority weeds/parts of the system.
- 3 To evaluate the impact of grazing on the dune system and seek to preferably prevent future grazing or formalise this through a grazing concession.
- 4 To evaluate the ecological values on adjacent private land in order to improve reserve design and better incorporate ecological sequences of remaining natural vegetation.

References

De Lange P. J., Norton D. A., Heenan P. B., Courtney S. P., Molloy B. P. J., Ogle C. C., Rance B. D., Johnson P. N. and Hitchough R. 2004. Threatened and uncommon plants of New Zealand. *New Zealand Journal of Botany*, Volume 42: 45-76.

Johnson P. N 1992. The sand dune and beach vegetation inventory of New Zealand. II South Island and Stewart Island. DSIR Land Resources, Scientific Report No. 16, Christchurch.

Brian Rance
15 February 2006

Waipapa Beach turfs, east end Waipapa Beach – Plant species list

- 1 Recorded by B. D. Rance on 11 March 2000
- 2 Recorded by B. D. Rance and P. N. Johnson on 29 September 2005
- 3 Additional species recorded by B. D. Rance, Phil Knightsbridge and Lynne Sheldon-Sayer on 21 October 2005

t turf
 fd fore dune
 bd back dune
 p private land adjacent (i.e. hind dune)

Ferns

<i>Asplenium flaccidum</i>	hanging spleenwort		3	p	o
<i>Blechnum minus</i>	swamp kiokio		2	t,p	o
<i>Blechnum penna-marina</i>	little hard fern		3	bd,p	o
<i>Hypolepis ambiguum</i>	a fern		3	p	o
<i>Ophioglossum coriaceum?</i>	Adders tongue fern	1		t	o
<i>Phymatosorus diversifolius</i>	hounds tongue fern		3	p	
<i>Polystichum vestitum</i>	prickly shield fern		3	bd,p	o
<i>Pteridium esculentum</i>	bracken		2	bd	lc

Trees & shrubs

<i>Coprosma acerosa</i>	sand coprosma		2	t, fd	o
<i>Coprosma propinqua</i>	mingimingi	1	2	t,bd,p	lc
<i>Coprosma rigida</i>	a coprosma		2	bd,p	o
* <i>Cytasus scoparius</i>	broom		2	bd,p	lo
<i>Dacrycarpus dacrydioides</i>	kahikatea		3	p	o
<i>Discaria toumatou</i>	matagouri		2	p	u
<i>Leptospermum scoparium</i>	manuka		3	p	lc
* <i>Lupinus arboreus</i>	tree lupin	1	2	t,p	c
<i>Myrsine australis</i>	red mapou		3	p	o
<i>Ozothamnus vauvilliersii</i>	cottonwood		3	p	o
<i>Pittosporum tenuifolium</i>	kohuhu		3	p	u
<i>Podocarpus hallii</i>	Halls totara		3	p	lc
<i>Pseudowintera colorata</i>	pepper tree		3	p	u
* <i>Sambucus nigra</i>	elderberry		2	bd	o
* <i>Ulex europaeus</i>	gorse	1	2	t,bd	c

Climbers & vines

<i>Clematis paniculata</i>	white flowered clematis		3	p	u
<i>Fuchsia perscandens</i>	climbing fuchsia		3	p	lc
<i>Muehlenbeckia australis</i>	pohuehue	1	2	bd,p	lc
<i>Muehlenbeckia complexa</i>	a vine		3	p	lc
<i>Rubus australis</i>	a lawyer vine		3	p	lo
<i>Rubus cissoides</i>	a lawyer vine		3	p	o
* <i>Rubus fruticosus</i>	blackberry		3	bd	lo
<i>Rubus schmidlioides</i>	a lawyer vine		3	p	o

Composite herbs

*Bellis perennis	lawn daisy	1	2	t	c
Celmisia gracilentia	a daisy		3	p	o
*Cirsium arvense	Californian thistle	1	2	t, bd	o
*Cirsium vulgare	Scotch thistle		3	p	o
Gnaphalium polylepis?	a herb	1	2	t	lc
Helichrysum filicaule	a herb	1		bd	lc
*Hypochaeris radicata	catsear		2	t	c
Lagenifera petiolata/pumila	a daisy	1	2	t	c
*Mycelus muralis	wall lettuce		3	p	o
*Leotodon taraxacoides	hawkbit	1	2	t	f
Leptinella mediana var. squalida	a button daisy		2	t	o
Raoulia aff. hookerii	a mat daisy		3	t	o
Senecio glomeratus	a native groundsel		2	t	u
Senecio minimus	fireweed		3	p	o
Senecio wairauensis	a native groundsel		3	bd, p	u

Non-composite herbs

Acaena anserinifolia	a biddibid		3	p	o
*Callitriche stagnalis	water starwort		2	t, p	o
Centella uniflora	a herb		2	t, p	lc
*Cerastium fontanum	mouse-ear chickweed		2	t, p	o
Dichondra brevifolia	a creeping herb		3	p	lc
Epilobium billardierianum	a willowherb		2	t	u
Euphrasia repens	a herb	1	2	t	o
*Galium aparine	cleaver		3	p	o
Gonocarpus aggregatus	a slender herb		3	p	lc
Gunnera arenaria	a creeping herb		3	t	lo
Gunnera prorepens	a creeping herb		3	p	lo
Hydrocotyle heteromera	a pennywort		3	p	o
Hydrocotyle hydrophila	a pennywort	1	2	t	f
Hydrocotyle novae-zelandiae var. montana	a pennywort	1	2	t	f
Hydrocotyle novae-zelandiae var. ?	a pennywort		3	p	o
Hydrocotyle salcata	a pennywort		3	p	lc
Lilaeopsis novae-zelandiae	a herb	1	2	t	o
Limosella lineata	a creeping herb		2	t	lo
*Linum catharticum	purging flax	1	2	t, fd	c
*Lotus pedunculatus	birdsfoot trefoil	1	2	t, p	c
Mazus arenarius	a creeping herb		3	t	lc
*Mimulus guttatus	musk		2	t	lo
*Mimulus moschatus	monkey musk		3	p	lo
Montia fontana	a herb		2	t	lo
Myosotis laxa ssp. caespitosa	water forget-me-not	1	2	t	o
Myriophyllum pedunculatum var. novae-zelandiae	a milfoil		2	t	o
Myriophyllum votschii	a milfoil	1	2	t	c
Nertera balfouriana	a creeping herb	1	2	t	f
Nertera setulosa	a slender herb		3	p	lc
*Parentucella viscosa	tarweed	1		t	o
*Plantago australis	hairy plantain	1	2	t	c
Plantago triandra	a native plantain		2	t	o

Potentilla anserinifolia	silverweed	1	2	t	lc
Pratia angulata	a creeping herb	1	2	t	c
*Prunella vulgaris	selfheal	1	2	t	c
Ranunculus acaulis	a creeping buttercup		2	t	o
Ranunculus foliosus	a buttercup		3	p	o
Ranunculus glabrifolius	a wetland buttercup		3	p	o
*Ranunculus repens	creeping buttercup	1	2	t,p	o
*Sagina procumbens	pearlwort	1	2	t	o
Samolus repens	a creeping herb	1	2	t	o
Sellieria radicans	a creeping herb	1	2	t	c
*Stellaria alsine	bog stichwort		3	p	o
*Stellaria media	chickweed		3	p	c
Stellaria parviflora	a native chickweed		3	p	o
*Trifolium dubium	suckling clover	1	2	t	o
*Trifolium pratense	red clover	1		bd	o
*Trifolium repens	white clover		2	t	c
Utricularia monanthus	bladderwort	1	2	t	lc
Viola cunninghamii	a native violet		3	p	o

Monocots

Grasses

*Agrostis capillaris	browntop	1		bd	o
*Agrostis stolonifera	creeping bent		2	t,p	o
*Alopecurus geniculatus	marsh foxtail		2	t	lo
*Ammophila arenaria	marram grass		2	fd,t,p	a
*Anthoxanthum odoratum	sweet vernal	1	2	bd	o
Chionochloa rubra	red tussock		2	bd,p	o
Cortaderia richardii	toetoe	1	2	t	o
*Cynosorus cristatus	crested dogs tail	1		bd	o
*Dactylis glomeratus	cocksfoot	1		bd,p	o
*Holcus lanatus	Yorkshire fog	1	2	t,bd,p	c
Poa cita	silver tussock	1	2	t,bd	o

Sedges

Carex appressa	a sedge		3	p	lc
Carex comans?	a sedge		2	t	o
Carex coriacea	cutty grass	1	2	t,p	o
Carex flaviformis	a sedge	1	2	t	c
*Carex ovalis?	a sedge		2	t	lc
Carex pumila	a sedge	1	2	t	lc
Carex secta	pedicelled sedge		3	p	u
Carex testacea	a sedge	1	2	t	o
Carex virgata	a sedge	1	2	t	o
Eleocharis acuta	a spike rush	1	2	t,p	lc
Eleocharis gracile	a spike rush	1	3	t	lc
Isolepis aucklandicus/cernus	a dwarf sedge	1		t	o
Isolepis habra	a dwarf sedge		3	p	o
Isolepis nodosus	clubrush	1	2	t, bd	f
Lepidosperme australe	square sedge	1	2	t	lc
Schoenus concinnus	a dwarf sedge	1	2	t	a

<i>Schoenus maschalinus</i>	a dwarf sedge	1	2	t	o
<i>Uncinia uncinata</i>	a hook grass		3	p	o
Orchids					
<i>Corybas iridescens?</i>	a spider orchid		2	t,p	lo
<i>Microtis oligantha</i>	an orchid	1	2	t	o
<i>Prasophyllum colensoi</i>	leek orchid	1		t	o
<i>Thelymitra longifolia?</i>	a sun orchid		2	t	o
Rushes					
<i>Centrolepis pallida</i>	a dwarf rush		2	t	lc
* <i>Juncus articulatus</i>	jointed rush	1	2	t,p	f
* <i>Juncus bufonius</i>	toad rush	1	2	t	c
* <i>Juncus effusus</i>	soft rush		3	p	o
<i>Juncus gregiflorus</i>	a native rush		2	t,p	o
<i>Juncus pallidus</i>	a native rush		3	t	o
<i>Juncus planifolius</i>	flat-leaved rush	1	2	t	c
<i>Leptocarpus similis</i>	jointed rush	1	2	t	f
* <i>Luzula congesta</i>	a woodrush		2	t	o
Other monocots					
<i>Cordyline australis</i>	cabbage tree		2	bd,p	u
<i>Libertia peregrinans</i>	creeping iris		2	t	lo
<i>Phormium tenax</i>	lowland flax		2	bd	o
<i>Potamogeton cheesemani/orchreatus</i>	a pondweed		2	t	o
<i>Triglochin striatum</i>	arrow-grass	1	2	t	o