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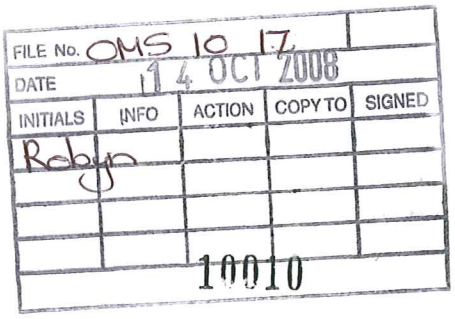
13 October 2008



Horizons Regional Council
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Attention: Robyn Harrison

Dear Robyn

REPORT ON VEGETATION & THREATENED PLANTS

As you may be aware Dr Christine Cheyne, member of the Taranaki/Whanganui Conservation Board recently presented to the Proposed One Plan Coastal Hearing on behalf of the Board. Upon a request from the Commissioners, Christine has asked me to trace a report on rare/endangered coastal plants.

Accordingly, please find attached a copy of a report prepared by Mr Colin Ogle entitled *"Vegetation and threatened and adventive plants of the Wanganui sand country"*. Could you please distribute to the Commissioners as required.

Regards

Louise Davies
Community Relations Officer – Board Support
Department of Conservation

Vegetation and threatened and adventive plants of the Wanganui sand country

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Introduction

In papers at two previous conferences Coastal Dune Vegetation Network (CDVN) (Ogle 2001, 2002) I used the term 'sand country' to include all land derived from moving sand, including elevated dunes and the land of low relief between the dunes – sand plains, swamps, and lakes. Although exotic plants predominate throughout the sand country, indigenous species occur, mostly as minor components, in grasslands, sedgelands, rushlands, herbfields, shrublands and fragments of dune forest. Sand country from Paekakariki in the south to Manutahi, west of Patea, in the north to has been defined as Foxton Ecological District (FED) (McEwen 1987; Ravine 1992). It is the largest continuous extent of sand country in New Zealand. At its inland limits, sand abuts elevated marine terraces (Manawatu Plains ED) where it often impedes drainage. Wetlands are common along this boundary.

Wanganui lies in the northern half of FED, about midway between the Manawatu River and Manutahi. The Manawatu River is also the boundary between the Wellington and Wanganui Conservancies of the Department of Conservation, and I have used it as a convenient southern limit for my studies of dune plants. This paper deals with this northern half of FED only, henceforth called the study area.

Threatened plants of Foxton Ecological District (FED)

In the study area, 31 indigenous plant species have been recorded that have a national conservation status of Threatened, Uncommon or Data Deficient. Many of the species are confined to sand habitats, here and elsewhere in New Zealand. Some have become extinct within the past several decades from some places (Table 1). This is an increase of seven species since last reported by me (Ogle 2002), although this is largely the result of more species being recognised as under threat nationally and the use of a modified scale of threat by de Lange et al. (2004). Some have become even rarer since I reported on them in 2002 (Ogle 2001, 2002), most obviously *Sebaea ovata*, the subject of a separate paper by Jim Campbell in this workshop.

Table 1 shows that two, or perhaps as many as four, species have probably become extinct across the study area since records and collections have been made. Presumed to have been extinct for some decades, sand fescue and a dwarf buttercup would have inhabited dry dunes and damp dune slacks, respectively. Dwarf mistletoe was known until the 1990s in just one site, where it grew on kanuka (*Kunzea* sp. aff. *K. ericoides*) trees that were felled to plant pines. An inconspicuous aquatic herb, *Lepilaena bilocularis*, has not been recorded in the past two decades (e.g. it was not found by Champion and Wells 2003). Several other threatened and uncommon species are known now from just one or two sites, having been recorded more widely in the past (Ogle 2001).

National ratings & Species	Common name	Present?[1]
ACUTELY THREATENED		
Nationally Critical		
Limosella 'Manutahi'	a semi-succulent mat-forming herb of wet sand	p
Pimelea "Turakina"	a native daphne of dune slacks	p
Pterosylis micromega	swamp hood orchid	p
Sebaea ovata	a gentian of dune slacks	p
CHRONICALLY THREATENED		
Serious Decline		
Carex litorosa	a small tussock of brackish mud	p
Isolepis basilaris	a minute sedge of dune slacks	p
Mazus novaezeelandiae subsp. *impolitus*	dwarf musk (of dune slacks)	p
Pimelea arenaria "southern"	sand daphne	p
DECLINING		
Austrofestuca littoralis	sand fescue	e
rassula manaia	a minute succulent of coastal turf	p
Desmoschoenus spiralis	pingao	p
Eleocharis neozelandica	a dune wetland sedge	p
Epilobium chionanthum	a dune swamp willow-herb	p
Gunnera arenaria	sand gunnera	p
Leptinella dioica subsp. *monoica*	a button-daisy	p
Libertia peregrinans	sand iris	p
Potamogeton pectinatus	a submerged aquatic herb	p?
Ranunculus macropus	an aquatic buttercup	p
Ranunculus recens	a dwarf buttercup	e
Selliera rotundifolia	a half-star	p
Sonchus kirkii	native sowthistle	p
Urtica linearifolia	swamp nettle	p
AT RISK		
Sparse		
Crassula ruamahanga	a small semi-aquatic herb	p
Korthalsella salicornioides	dwarf mistletoe	(e)
Leptinella dispersa ssp. *dispersa*	a creeping button-daisy of dune lake edges	p
Leptinella tenella	A creeping button daisy of wet sand	
Range restricted		
Coprosma sp. aff. *acerosa*	Prostrate shrub of shallow sand on hard surfaces	
Leptinella dispersa ssp. *rupestris*	a creeping button-daisy of damp sand	p
DATA DEFICIENT		
Carex raoulii s.s.	a robust tussock of shady scrub	p
Centipeda aotearoana	a creeping daisy of lake edge mud	p
Euchiton polylepis	a tufted/cushion daisy of wet cliffs	p
Lepilaena bilocularis	a minute aquatic herb	(e)

[1] Recent and historic records indicate the species is regionally e = extinct; (e) = probably extinct; p= present

Table 1. Threatened and uncommon indigenous vascular plants of Foxton Ecological District, north of the Manawatu River.

Adventive plants (weeds) of FED

A discussion of the weeds and their impacts in FED was given in Ogle (2002). Topics covered included the origins, spread and control of the four grasses in the genus *Ehrharta*; the invasion of aquatic weeds and their possible impacts on native plants of dune lakes; the variety and spread of garden plants from planting and dumping at Patea and Castlecliff; weeds and the decline of the endangered native species, especially *Sebaea ovata* and attempts to manage it *in situ*.

My unpublished database of adventive plant species, including casual records (Heenan et al. 1998), from a range of places in the study area now contains 758 species, an increase of 178 species (23%) from my last reporting of this total to CDVN (Ogle 2002). Many of the adventive species are very common and widely distributed, but others are known from one site only. Both the number of species and presence of individual species vary through the length of the district (Tables 2, 3) and some have increased their ranges since 2002 (Table 3).

Some of the plants added to the database over the past 6 years are probably new to the study area as adventive species, since they were found in places that had been well-surveyed before 2002. Examples are *Paronychia brasiliensis*, *Eleusine tristachya*, *Chasmanthe floribunda*, *Eragrostis cilianensis*, *Ixia paniculata*, *Silene ulgaris* ssp. *vulgaris* and *Avena sativa*. Others result from surveys of areas not explored closely before. Some additions result from newly discarded plant material, especially in formal or informal garden weed dumps such as those at Patea and Koitiata. Other additions have resulted from an improved ability to recognise some species, such as *Oxalis chnoodes* and *Glyceria fluitans*, or the realisation that well-known species were actually escaping from cultivation, like Moreton Bay fig (*Ficus macrophylla*) and Norway spruce (*Picea sitchensis*).

Beach (north to south order)	Number of adventive species						
	Trees, shrubs, lianes	Grasses	Other monocots	Dicot herbs	Ferns & fern allies	Totals	% increase of totals
Patea	36 (21)	29 (18)	39 (25)	162 (118)	1 (1)	267 (183)	31
Waipipi	7 (3)	30 (11)	7 (6)	66 (34)		110 (54)	51
Waitotara R (right bank)	6 (5)	27 (24)	8 (7)	67 (58)		108 (89)	17
Castlecliff (west of town)	15 (12)	17 (16)	23 (20)	71 (53)		126 (101)	20
Castlecliff (town to river)	34 (29)	27 (24)	24 (21)	94 (80		169 (154)	9
Whitiau (Whangaehu R)	17 (13)	33 (31)	11 (9)	89 (88)	2 (2)	152 (143)	6
Koitiata (Turakina R)	32 (17)	29 (20)	32 (8)	106 (54)		199 (99)	50
Tangimoana	14 (10)	24 (17)	14 (7)	79 (50)	1 (1)	132 (85)	36

Table 2. Numbers of adventive species in coastal dunes in parts of Foxton Ecological District. Data presented in Ogle (2002) are shown in parentheses.

Two statements that I made previously (Ogle 2002) bear repetition here. It is a matter of simple observation to see that some indigenous species of sand country are more resilient than others in the face of human induced changes, including weeds. Spinifex, club sedge (*Isolepis nodosa*), sand convolvulus (*Calystegia soldanella*) and cabbage tree (*Cordyline australis*) are examples. While some such as kanuka have been targeted for firewood and matagouri (*Discaria toumatou*) was all but eliminated as a 'weed', it seems that many other indigenous species have declined with a rise in weed species diversity and weed abundance.

Beach (north to south order)	Locations of selected adventive species						
	Acacia sophorae Sand wattle	*Anredera cordifolia* Madeira vine	*Chrysanthe-moides monilifera* Boneseed	*Cyperus congestus* Purple umbrella sedge	*Juncus acutus* Sharp rush	*Lobularia maritima* Sweet alyssum	*Senecio glastifolius* Pink ragwort
Patea		x				x	
Waipipi				x			
Waitotara R (right bank)				x			X
Castlecliff (west of town)	x					x	x
Castlecliff (town to river)	x	x	x	X		x	x
Whitiau (Whangaehu R)	x			1 on 1/00		x	x
Koitiata (Turakina R)	x		x			x	x
Tangimoana	x			1 on 3/96	x	x	x
Himatangi	x		X		x	x	?
Foxton Beach	x		x		x	x	?

Table 3. Distribution of selected adventive plants along the northern half of Foxton Ecological District (upper case 'X' indicates an addition since Ogle (2002)).

References

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More studies are needed to determine the impacts of certain weeds on indigenous plant species, particular on threatened species. Many authors have stated that weeds smother indigenous vegetation, suppress regeneration and cause a loss of indigenous species, but there are remarkably few studies in New Zealand which have examined precise interactions between weeds and indigenous flora in dune country, or other ecosystems for that matter.

WANGANUI PLANT LIST 6 - Vascular Plants of Coast from Castlecliff to Hawera.

0. Ototoka 12.9.89, 27.1.91
1. Castlecliff 5.10.88, 29.5.93, 6.12.94, 21.10.97, 10/98, 10/99, 3/00, 7/00, 4/01, 5/03 **(List 4)**
2. Mowhanau 24.10.88, 12.9.89, 1.12.89, 8.10.90
3. Waitotara River Mouth (left bank) to Snapper Rock, east of Waiinu 11.5.77, 12.9.89, 4.6.90, 27.01.91, 5.11.92; 11.2.03
4. Waverley 28.5.88, 29.11.89, 17.1.92, 4.10.92
5. Waitotara River Mouth (right bank) 10.4.89, 13.8.89, 2.11.89, 2.12.89, 22.1.90, 8-9/2000 (J Campbell)
6. Whenuakura River Mouth and east to Waipipi 24.12.78 (+ D Ravine pers. comm. 11/90); 29.9.91 (Wanganui Botanical Group); 14.12.94; (with J Campbell, G La Cock, M Bayfield) 26.10.00
7. Patea River Mouth and estuary 12.9.89 and many trips after **(List 119)**
8. Patea-Kakaramea-Manutahi (Waikaikai Stream) sea cliffs 11/90 (D Ravine), 23.10.91; 18.1.95
9. Manawapou-Tangahoe River mouths 26.12.74
10. Waihi Beach, Hawera 27.12.90, 29.01.91
11. Okehu Stream 8.10.90; 11.5.04
12.

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