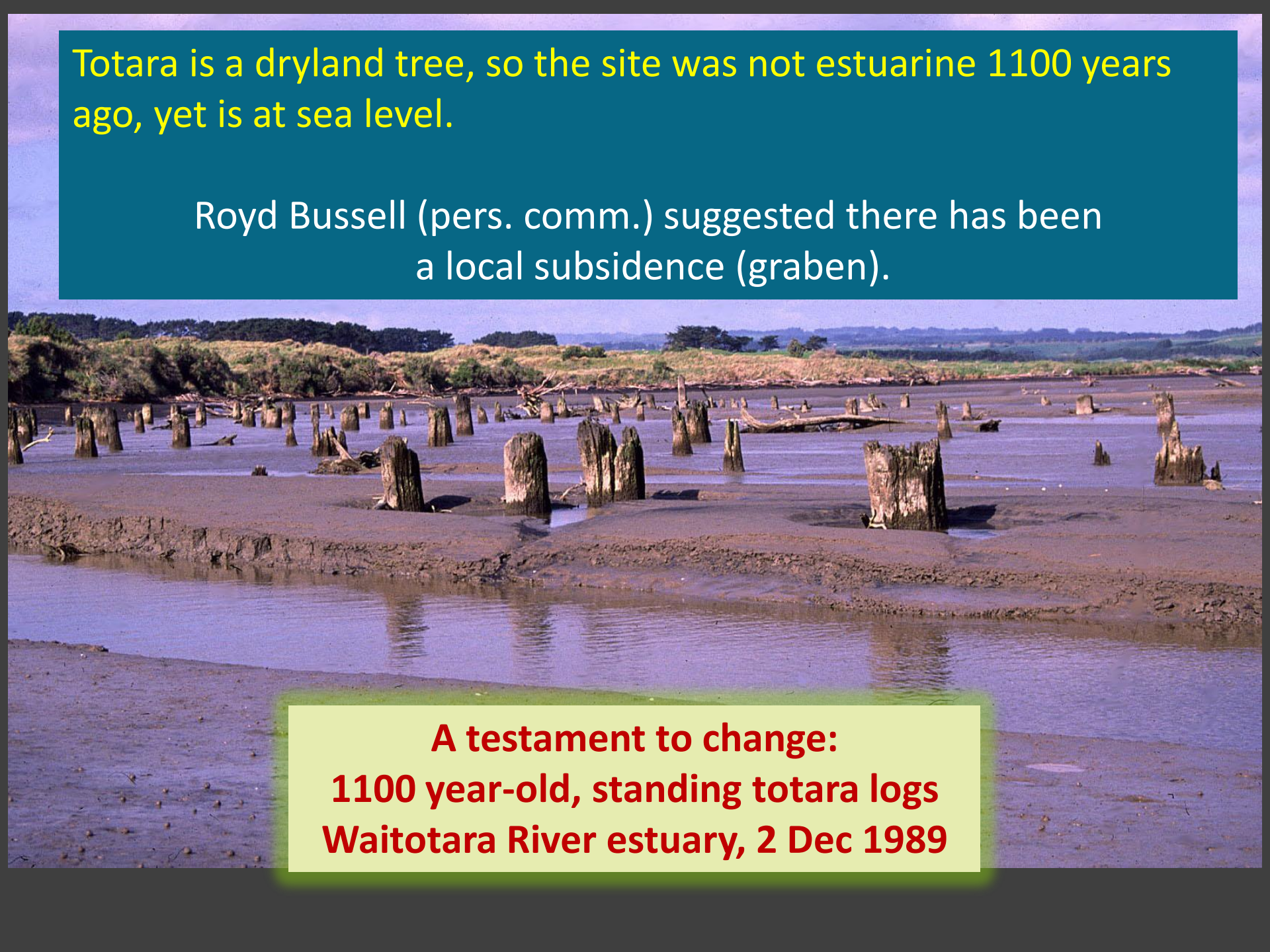


Totara is a dryland tree, so the site was not estuarine 1100 years ago, yet is at sea level.

Royd Bussell (pers. comm.) suggested there has been a local subsidence (graben).

A photograph of the Waitotara River estuary. The scene shows a wide expanse of water and mudflats. Numerous standing totara logs are scattered throughout the area, some partially submerged in the water and others on the mudflats. The logs are weathered and appear to be remnants of ancient trees. In the background, there is a line of trees and a clear sky.

**A testament to change:  
1100 year-old, standing totara logs  
Waitotara River estuary, 2 Dec 1989**

**We have now seen that totara forest grew on this coast before human settlement.**

**However, there is a notable lack of formal papers, written anecdotes, plant lists, herbarium collections, etc., that tell us what grew in the coastal land between South Taranaki and the Rangitikei.**

**Existing native vegetation gives some clues, but it consists of fragments and these are almost all highly modified.**

**Shortly, dune forest will provide an example:**

# Whanganui's CBD is on dunes

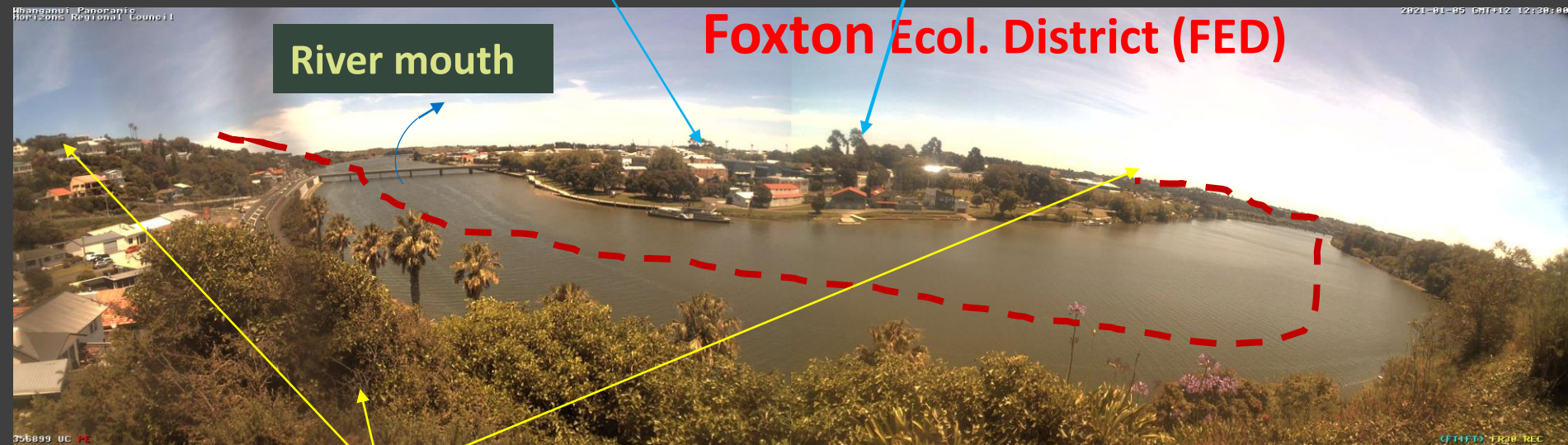
Cooks Gardens

Pukenamu/Queen's Park

River mouth

Foxton Ecol. District (FED)

Manawatu Plains Ecol. District (MPED) -  
uplifted marine terraces



MPED

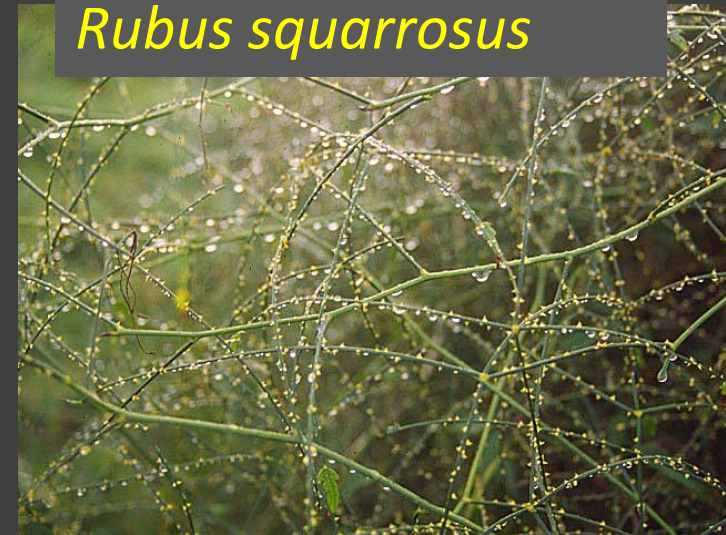
Lake Alice

FED

The 2nd-best  
coastal dune forest  
of the southern  
North Island



*Corokia cotoneaster*  
*Coprosma crassifolia*  
*Rubus squarrosus*

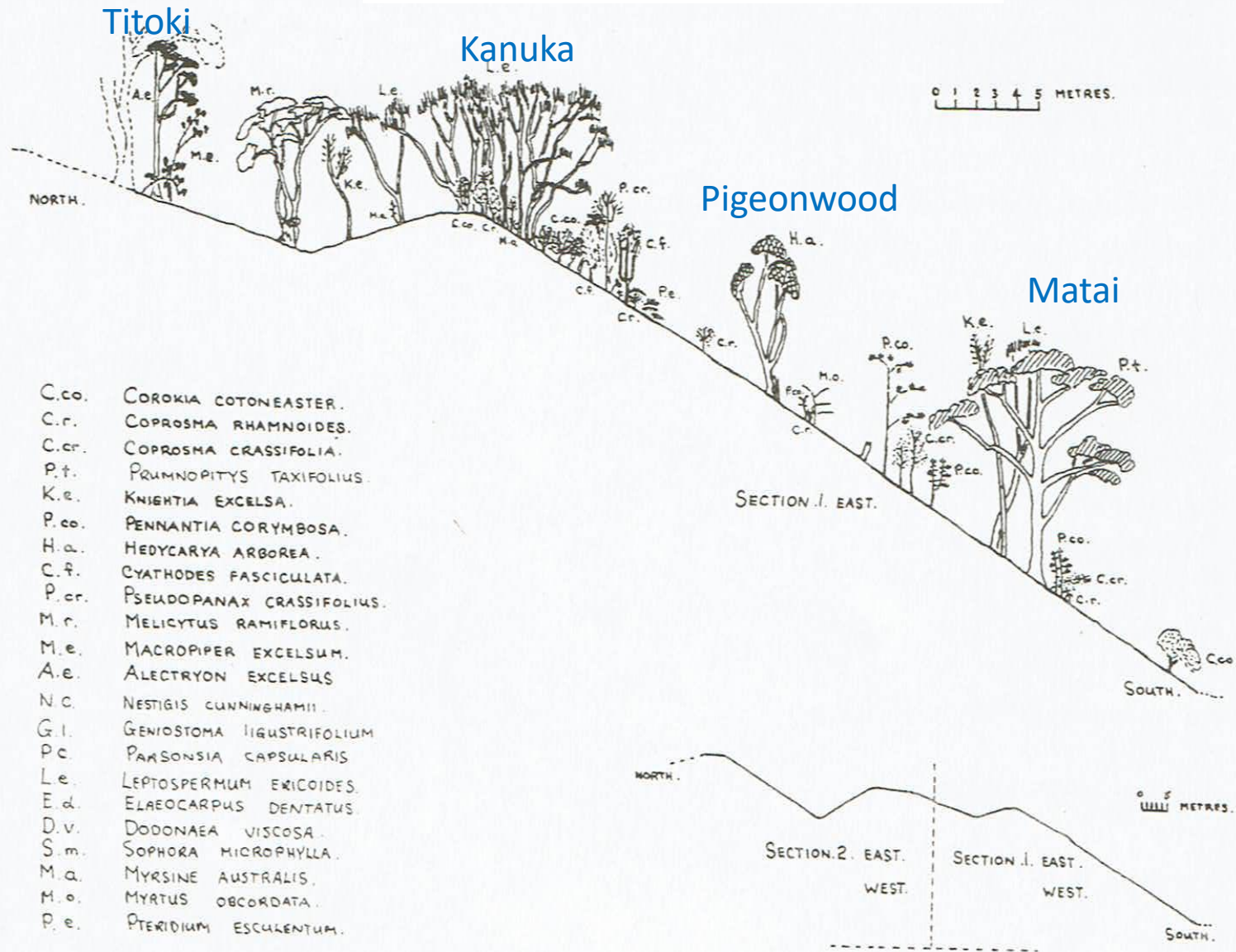




**Pakipaki forest near Levin** -  
the largest, most intact and  
floristically rich dune forest in  
the southern North Island

# One of 4 forest profiles in Cooksley & Townsend (1992)

## Transect of Pakipaki Dune Forest



**Dynamic coast.** Waipipi dunes with vigorous spinifex and pingao – eroding marram on steeper dune to the left

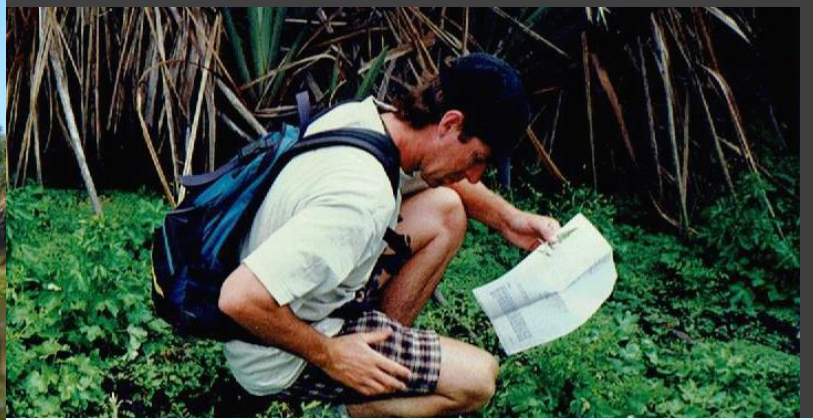


## Spinifex's gains and losses at Whitiau



Nov. 2020





**Lake Waikato**  
10 March 2013

**View over coastal part of Castlecliff urban area**



Whanganui River mouth  
Duncan Pavilion

(Jim Campbell, DOC, photo, ca 2000)



Jan 2013



Jan  
2016



10 Sept 2008

**Waverley Beach**  
– progressive  
coastal erosion.

## Waverley Beach

Native vegetation extends only few metres back from sea cliff rim.

What grew here in pre-human times?



Rough pasture with marram



Wind erosion allows establishment of native shore groundsel (*Senecio lautus*)



**Waverley Beach is the furthest east that zoysia turf grows on the cliff tops**



***Zoysia minima* – a tough native turf grass**



***Crassula manaia***

Cape Egmont to  
Waverley

**Two other South Taranaki species  
that extend to just east of Waverley**



**An unnamed *Coprosma*,  
related to *C. acerosa*.**

Cape Egmont to Waitotara  
River.

Limestone rocks near Waiinu Beach, just east of Waitotara estuary  
*Unnamed Coprosma sp.*





Major weeds are invading the coastal cliffs. here, near Manaia, is 'Chilean rhubarb' (*Gunnera tinctoria*), but it has been seen wild east of the Waitotara River mouth.



*Gunnera*

*Gunnera*






**Losses of sea cliff habitats for native plants by**

- i) Erosion (accelerating with climate change, sea level rise?);**
- ii) Weed invasion (e.g., pasture grasses, pampas)**



A button-daisy,  
*Leptinella dispersa*  
ssp. *rupestris*



This daisy sets no seed,  
as each known site has  
just one gender



Status: Nationally Critical



## *Pimelea actea*

- Erect shrubs to 0.2 m, all hermaphrodite.
- In past, it was in dune slacks from Turakina to near Foxton.
- In 2003, 3 patches were on wet mudstone cliffs just west of Castlecliff, now all gone, as cliffs eroded

Status: Nationally Critical

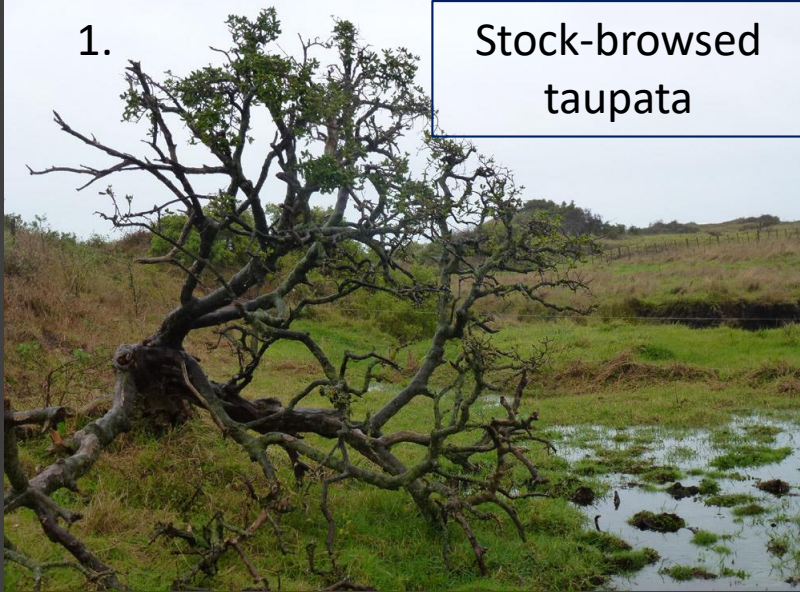
Previous habitat of *Pimelea acuta*,  
just south of Himatangi (view northwards), 1993  
Dune slacks planted in pines, invaded by pampas grass, sand wattle ...



## Waipipi

1.

Stock-browsed  
taupata



2.



3.



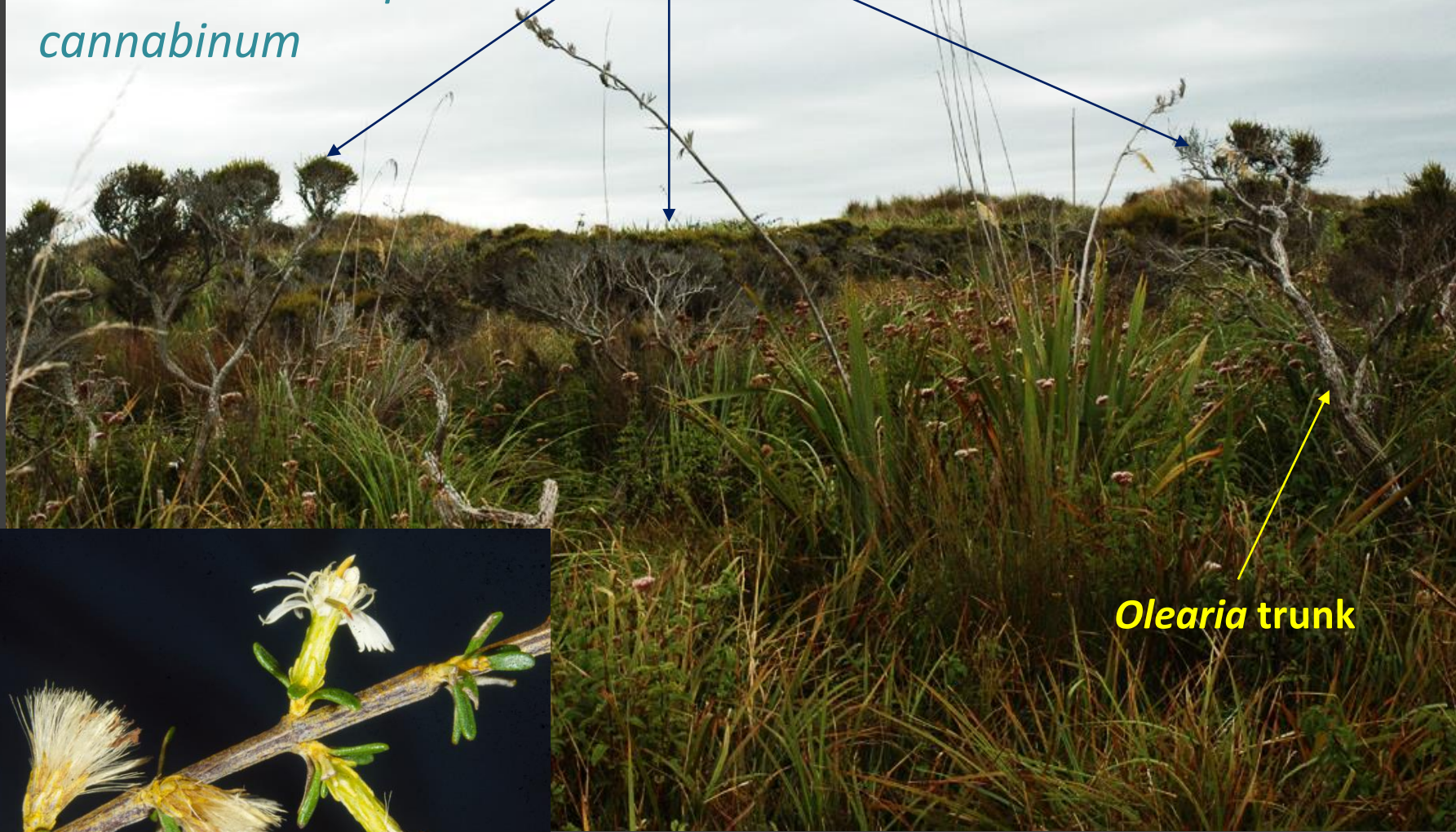
**Some effects of uncontrolled cattle  
in the past.**

1 & 2: Waipipi Stream,  
3: a significant swamp towards  
Waverley Beach that has now been  
fenced.

Shrub daisy (*Olearia solandri*)

With invasive *Eupatorium cannabinum*

Waipipi dune swamp



*Olearia* trunk





2 Nov 1996

12 shrubs at L Alice –  
now under pines



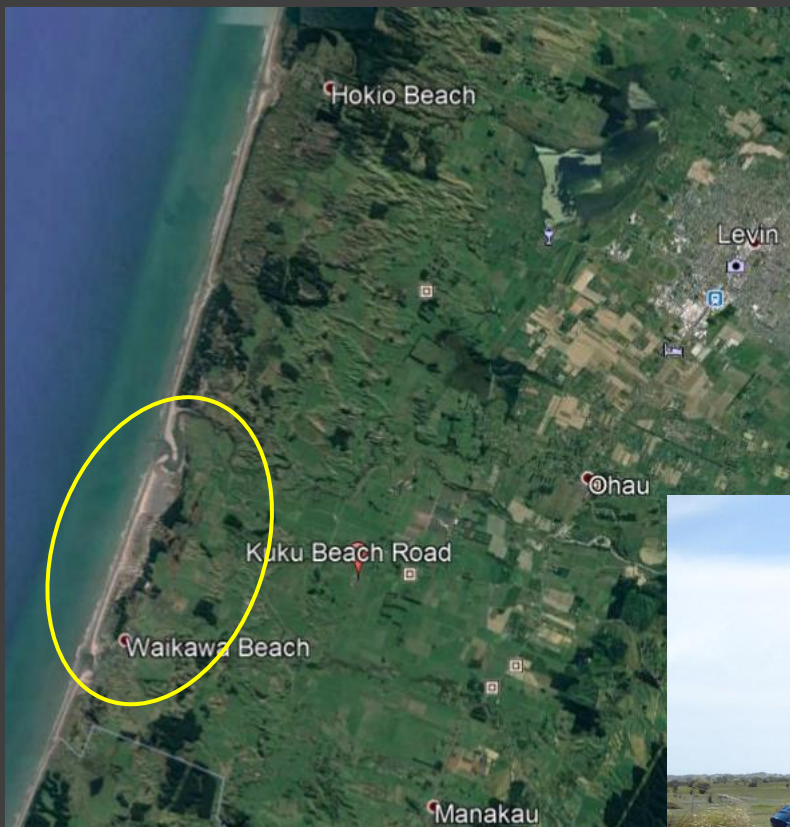
April 2018



Has every matagouri  
between Wellington  
and Taranaki gone?

## A little-modified dune slack, south of Levin

Reserves at mouths of Whangaehu (Whitiau Scientific Reserve, Waitotara [Tapuarau] and Turakina [Koitiata Domain] used to have turf communities like this .



Sand buttercup

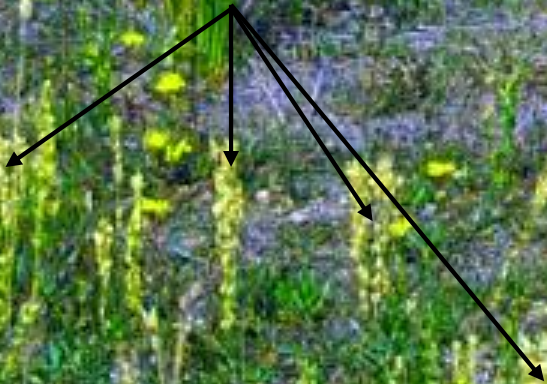




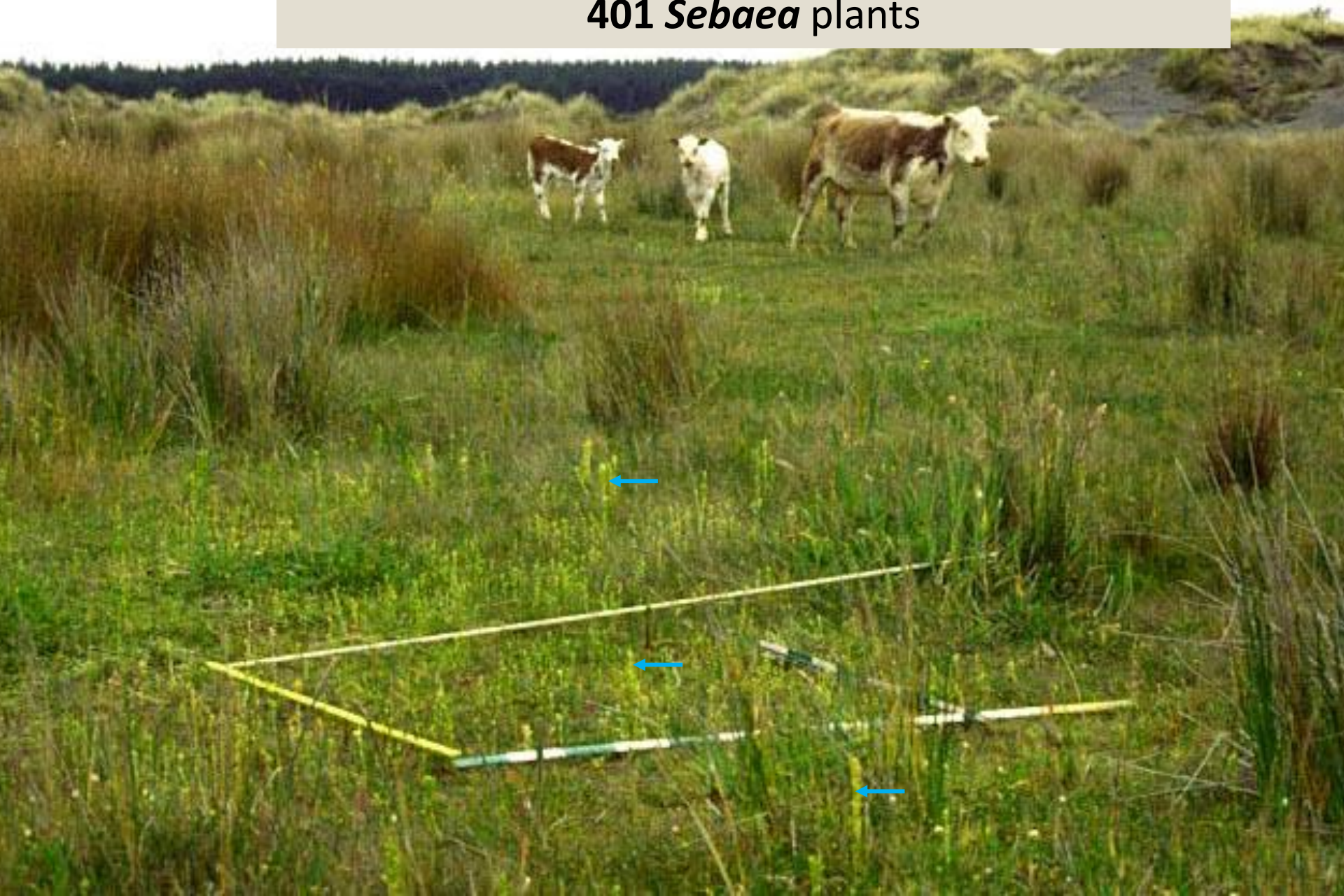
**Mouth of Whangaehu River and  
Whitiau Scientific Reserve –  
250 ha - - - - -**



A native gentian-relative,  
*Sebaea ovata* at Whitiau;  
21.2.1989



Whitiau, Dec 1992 – one-metre square plot with  
**401 *Sebaea*** plants



*Spiranthes novae-zelandiae*



*Mazus nz*  
subsp.  
*impolitus*

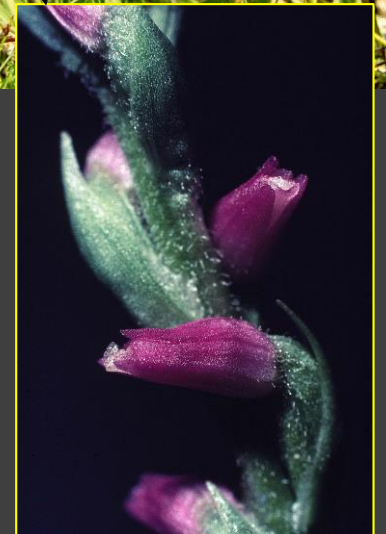


Andrew Townsend

Whanganui Botanical  
Group, 12 Feb 1998



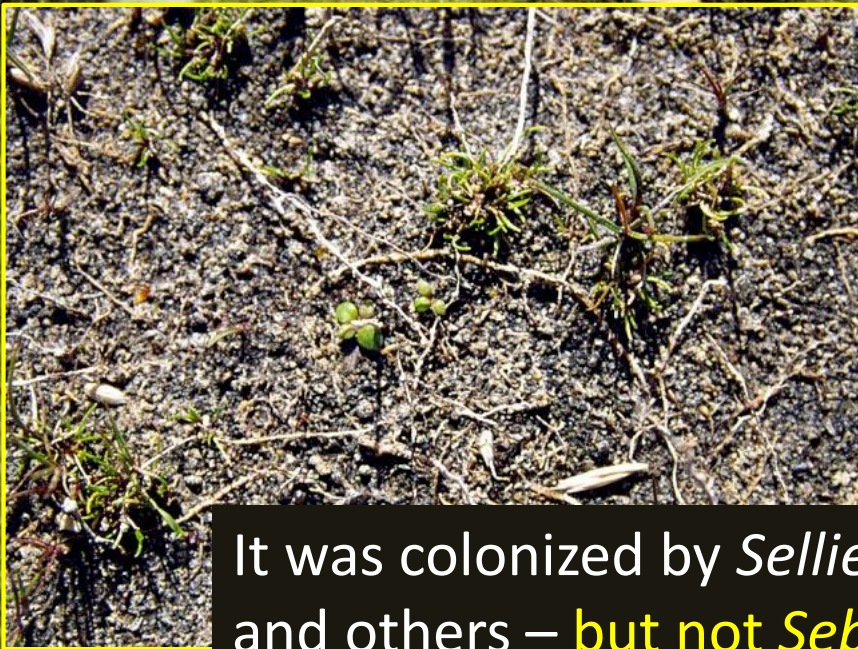
*Selliera rotundifolia*



Many dune slacks at Whitiau are dominated by dense beds of oioi (*Apodasmia similis*) – and increasingly so



A created scrape for colonisation  
by native turf species



It was colonized by *Selliera rotundifolia*, *Isolepis basilaris*  
and others – **but not *Sebaea***

The created scrape filled with water, seasonally



Whitiau Scientific Reserve is 250 ha.

The sand moves inland but **new dune slacks are not being formed.**

Peaty sand hollows: oioi dominant, with ti kouka & swamp shrubs





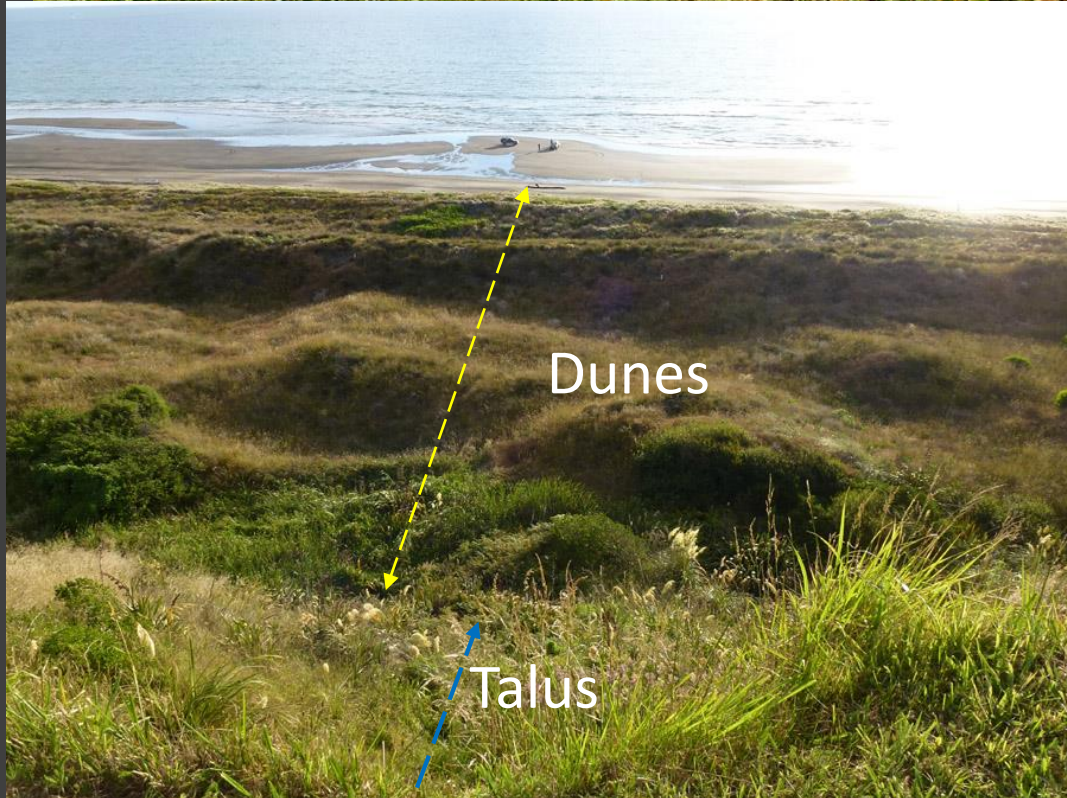
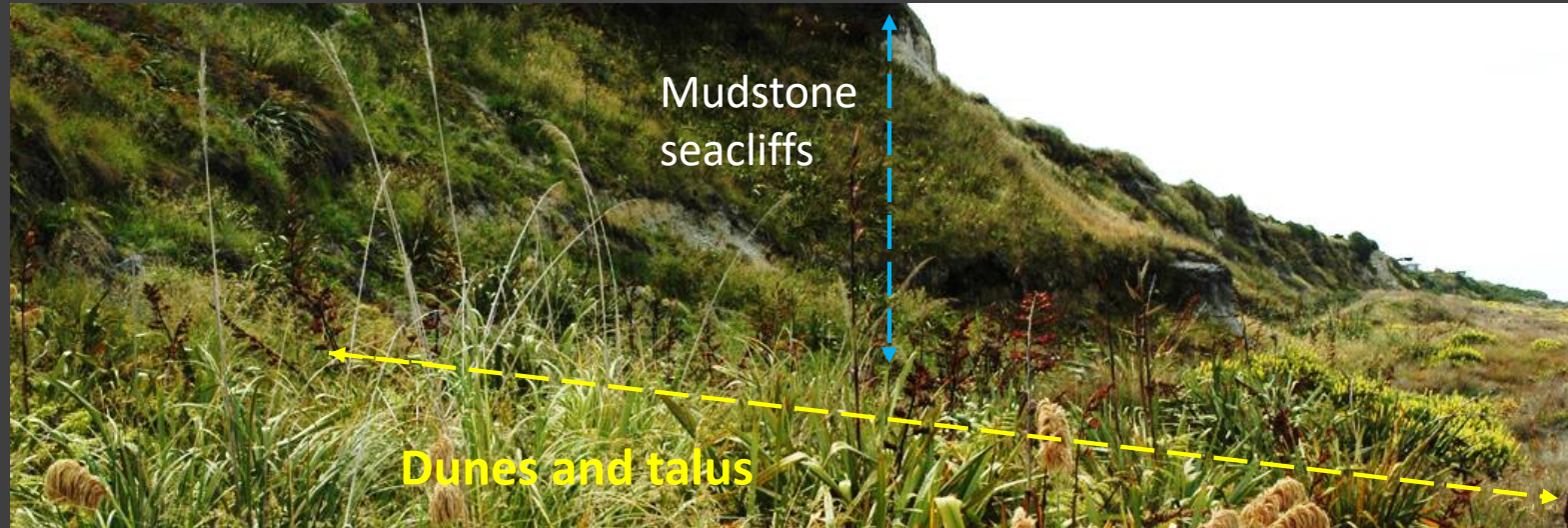
An aerial photograph showing a coastal area with significant erosion. The top half of the image shows green agricultural fields. A dark, narrow channel of water or a gully runs diagonally from the top left towards the center. Below this, a large, dark, eroded cliff face descends to a sandy beach. The beach is dark and appears to be composed of sand and silt. The ocean is visible at the bottom of the frame, with white surf breaking on the shore. The overall scene illustrates the impact of farm runoff on coastal erosion.

Coastal erosion exacerbated by farm runoff.

Manawatu Plains ED is right to the coast, west of Castlecliff.

The sand country!





# Pink ragwort at Koitiata – and also pampas grass, lupins

Where are the 'turf-plant habitats'?

dense native oioi

22 Nov 1996



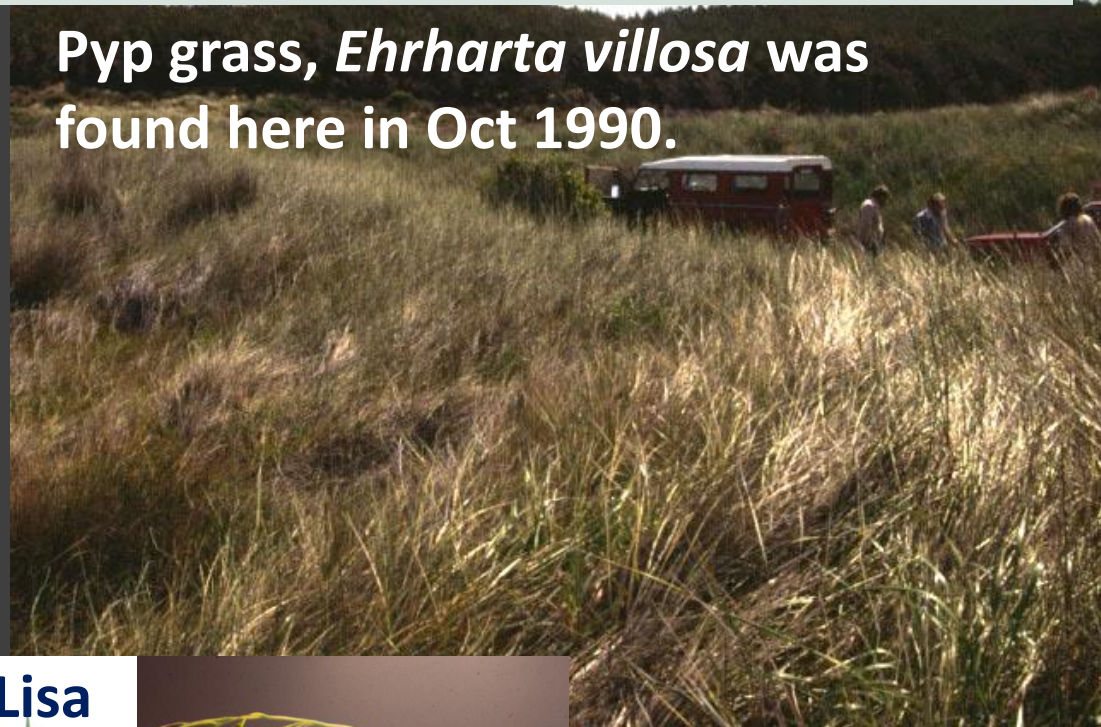


Only in seasonally flooded  
vehicle tracks ...  
Here, it's *Isolepis basilaris*



## Koitiata – near Turakina River mouth

Pyp grass, *Ehrharta villosa* was found here in Oct 1990.



10 March 2019: **Lisa Clapcott** showed us a fragment, still growing



Sand wattle  
(*Acacia sophorae*)





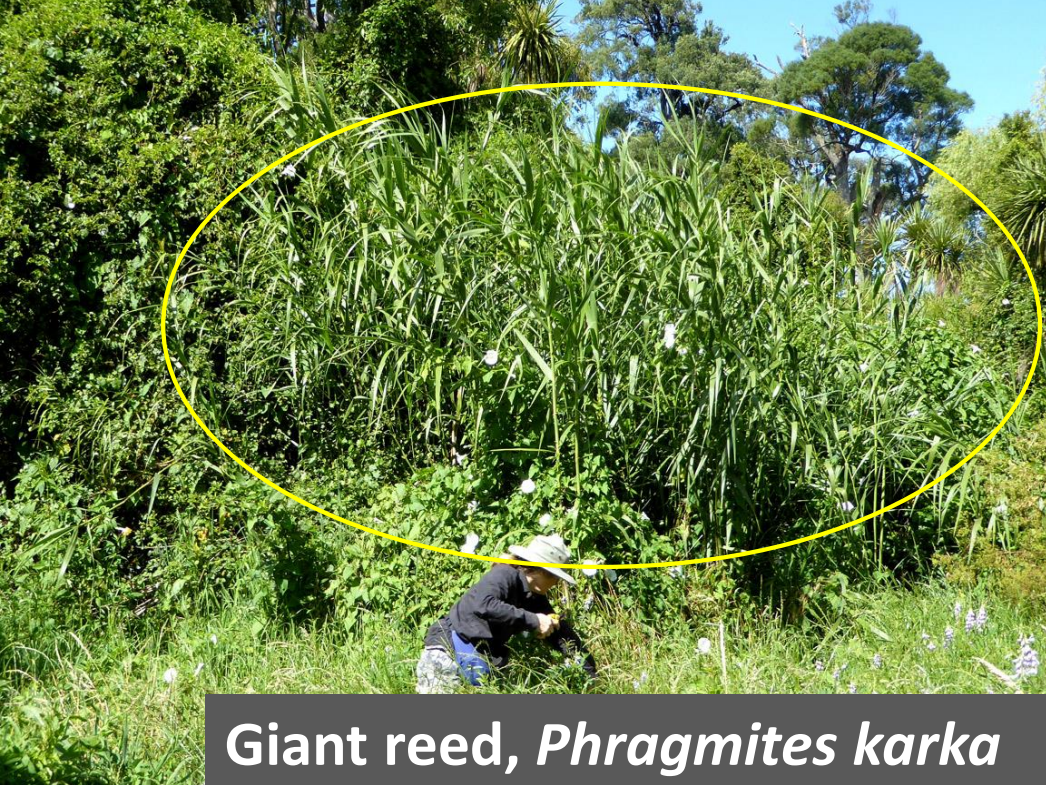
Natural seedling establishment

Castlecliff 1941 showing *Acacia* plantings. (Roger Shand collection)

# Whitiau Scientific Reserve and Whangaehu River







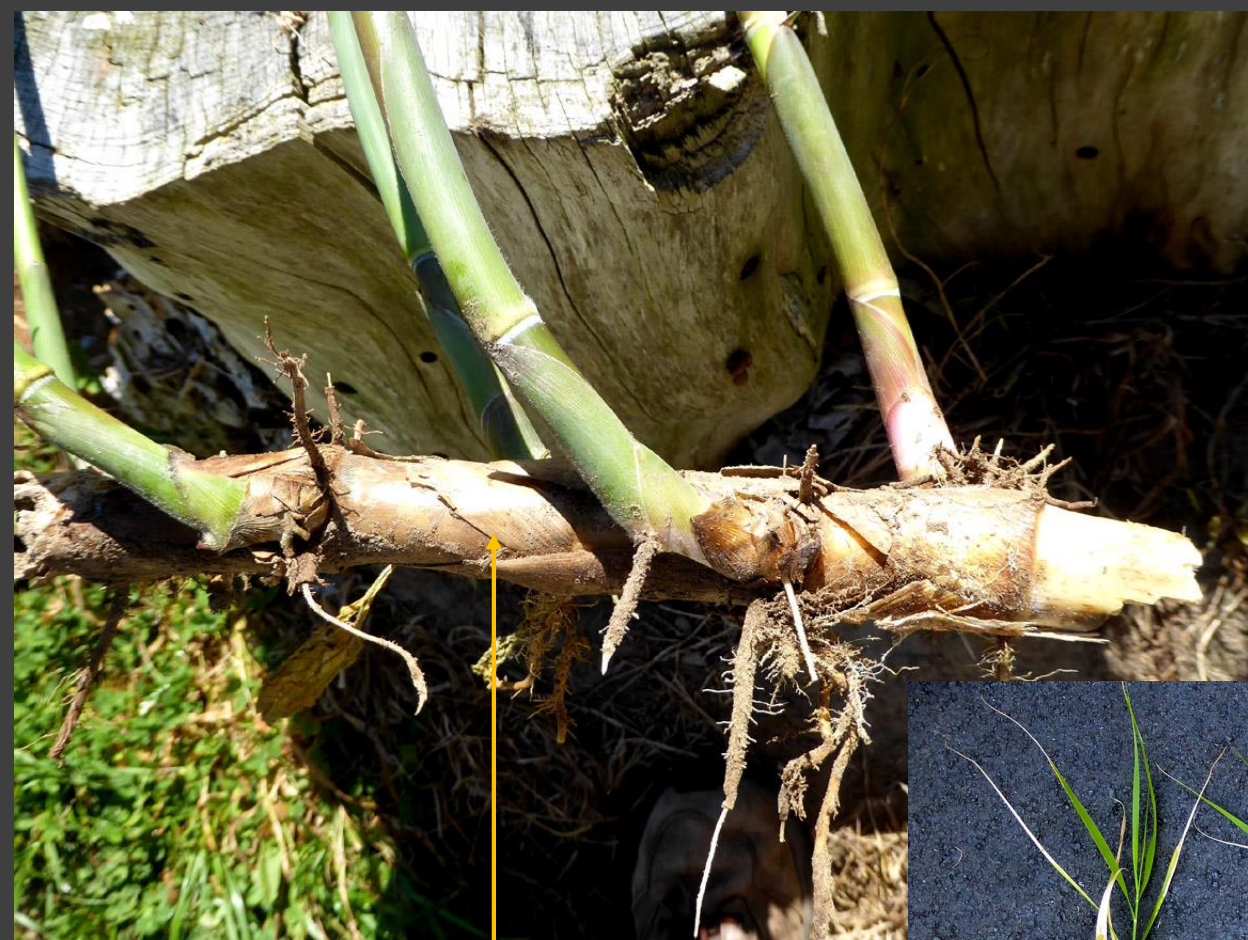
**Giant reed, *Phragmites karka***



**Up to 8 m tall!**



**Makino Stream in Kitchener  
Park Reserve, Feilding**



Spreads by rhizomes and stolons

Giant reed, *Phragmites karka*



## Restoration of natural areas

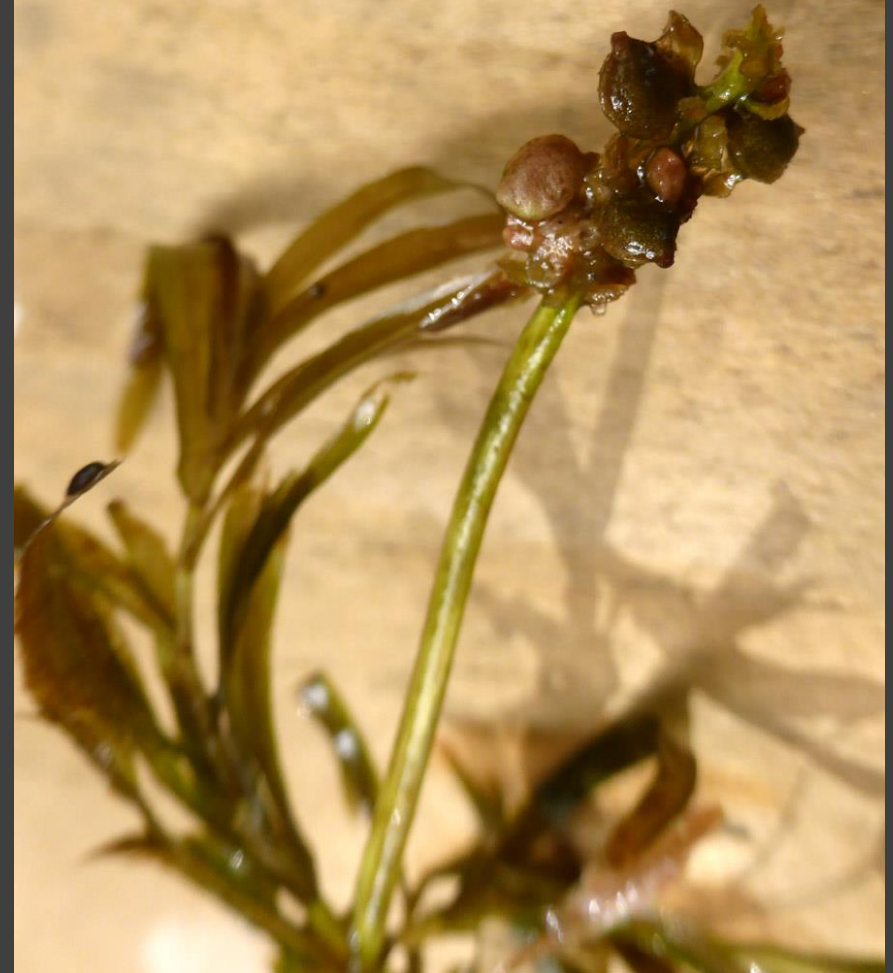
Here's a rare example of planting to enhance a species on this coast



Photo: Dec 2020

**Revegetation just west of Patea River mouth, using pingao.  
Planted early 1990s**

**Restoration of natural areas**  
**Transplanting rare species**

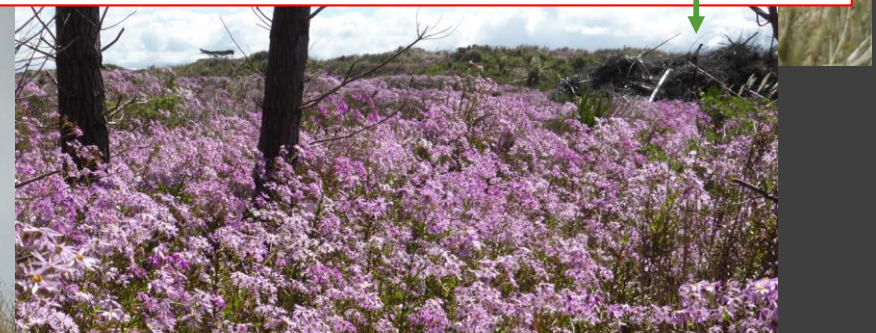


*Potamogeton ochreatus* and *Stuckenia pectinata*  
were transferred to existing ponds at Waipipi, from ponds  
drained for the wind farm

**Restoration of natural areas commonly comprises weed control**



**Further infestation following milling of pines on the reserve's edge**



**Annual pulling of 'pink ragwort' (*Senecio glastifolius*) by volunteers and DOC staff since ca 1989**



## Restoration of natural areas



Lake Pauri fenced and planted,  
2006-08



Lake Alice's edge, fenced  
2006



Much 'restoration' has been for improving water quality

## So what's left to restore and is there time?

Note the lack of good past records for our region.

Do 'we' value these sites and species?

What are the threats?

If so, where are the critical places?

**Whanganui has the most-modified estuary in the region**  
—  
**little of its assumed native plant biodiversity remains.**



Planted 1 Aug 2003;  
photo 2 Mar 2021

Oioi (*Apodasmia similis*) in  
Whanganui Estuary

The last record of oioi in the  
Whanganui estuary was:

“By town bridge, Whanganui R.”

I.W. Davey. 3 Jan 1943 CHR 51202