

The Flora of Taranaki

Bruce Clarkson



Environmental
Research Institute

Te Pūtahi Rangahau Taiao

THE UNIVERSITY OF WAIKATO

Nga Mihi

B. Clarkson



B. Clarkson



B. Clarkson



C. Bryan



Garden experiments beginnings 1961-1973



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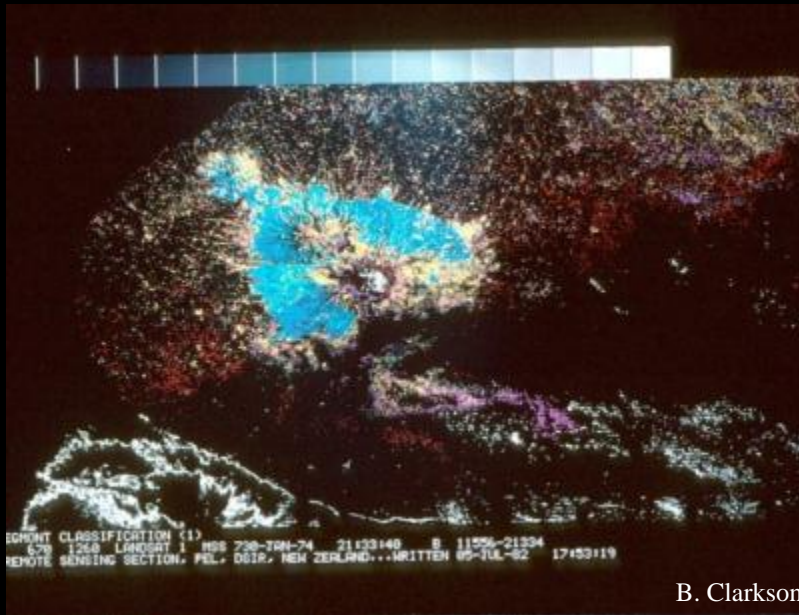


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Taranaki Volcanic Succession



EDMONT CLASSIFICATION (1)
678 1268 LARGEST 1 HPS 728-TON-74 2153148 B 11526-21234
NEWOTE MAPPING SECTION, FEL. DSIR, NEW ZEALAND...WRITTEN 05-JUL-82 17:53:19

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Kaitake : 575,000 yrs



Pouakai: 250,000 yrs

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Taranaki: 70,000 yrs

C. Bryan

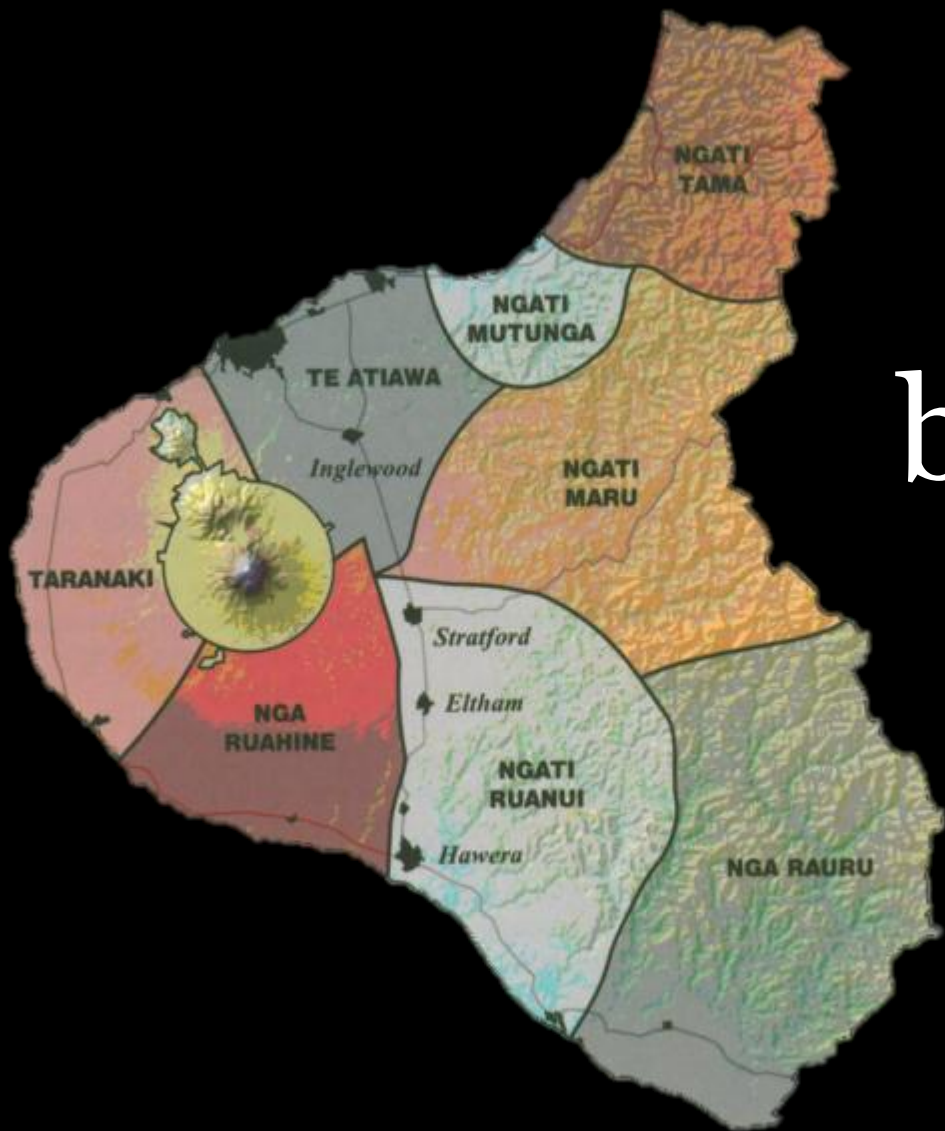


Aotearoa/New Zealand 1000 AD





Iwi boundaries



12 January 1770



Sir Joseph Banks

(1743- 1820)



knarf.english.upenn.edu/People/banks.html



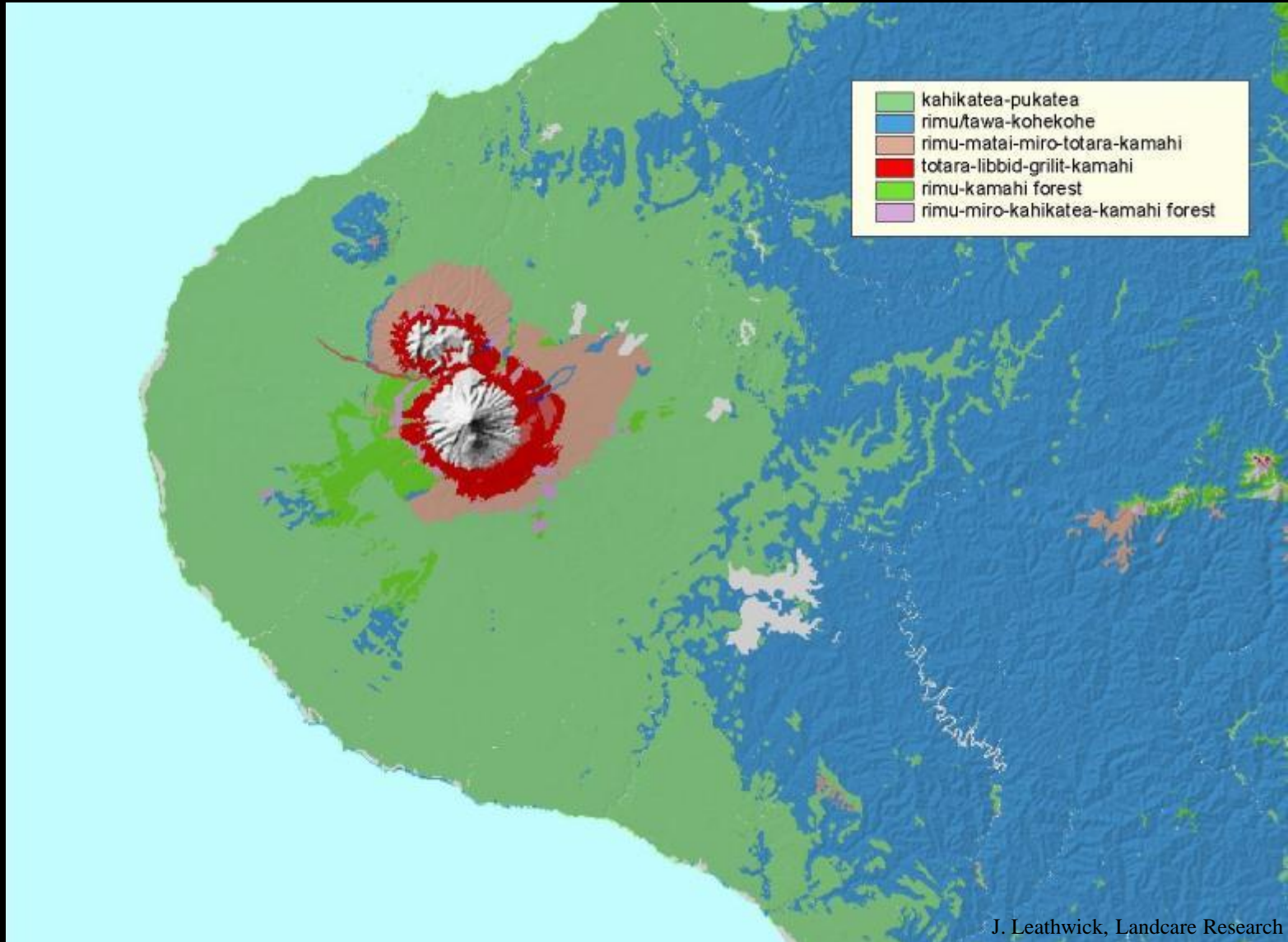
www.anbg.gov.au/biography/banks.biography.html

The Endeavour Journal

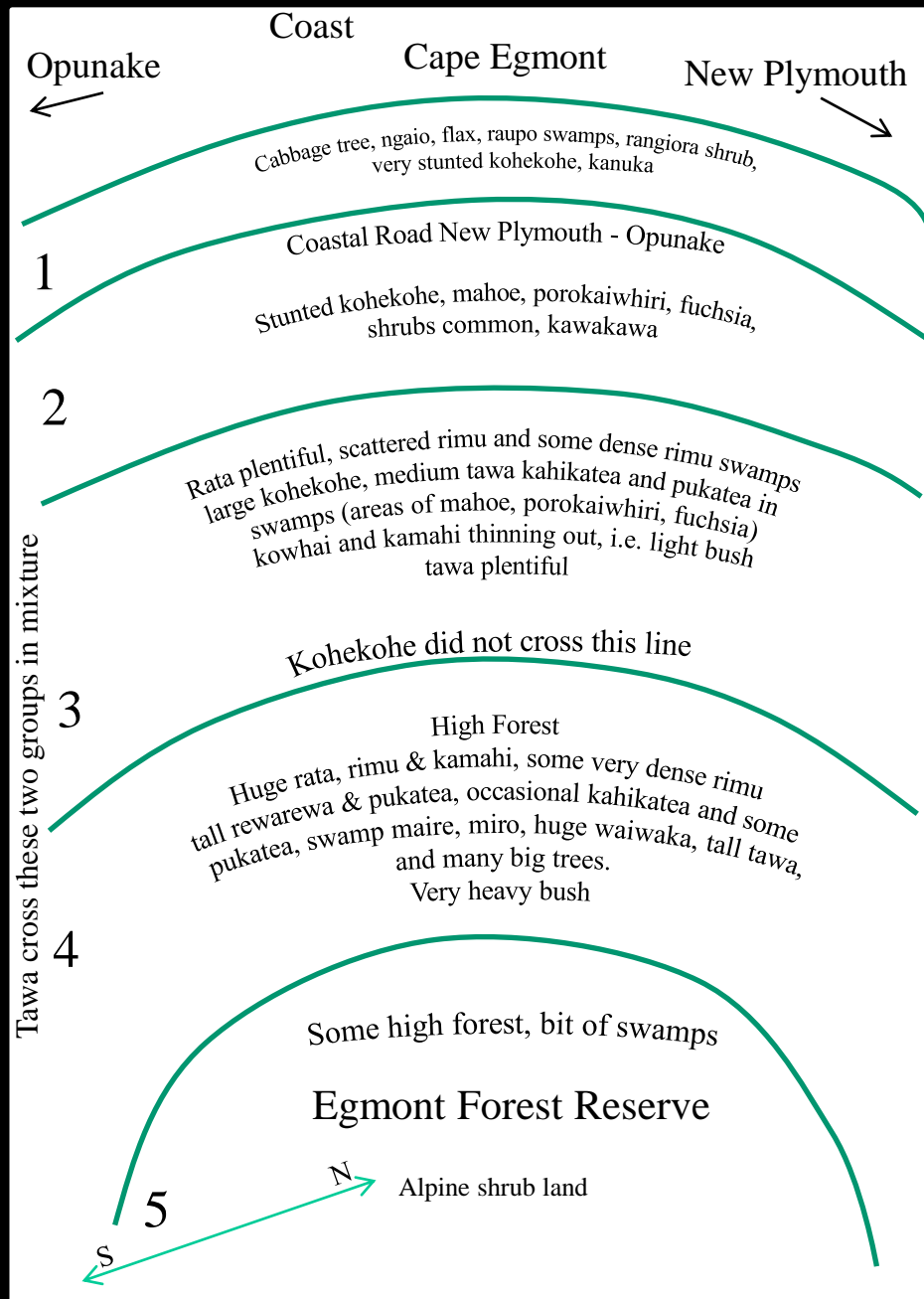
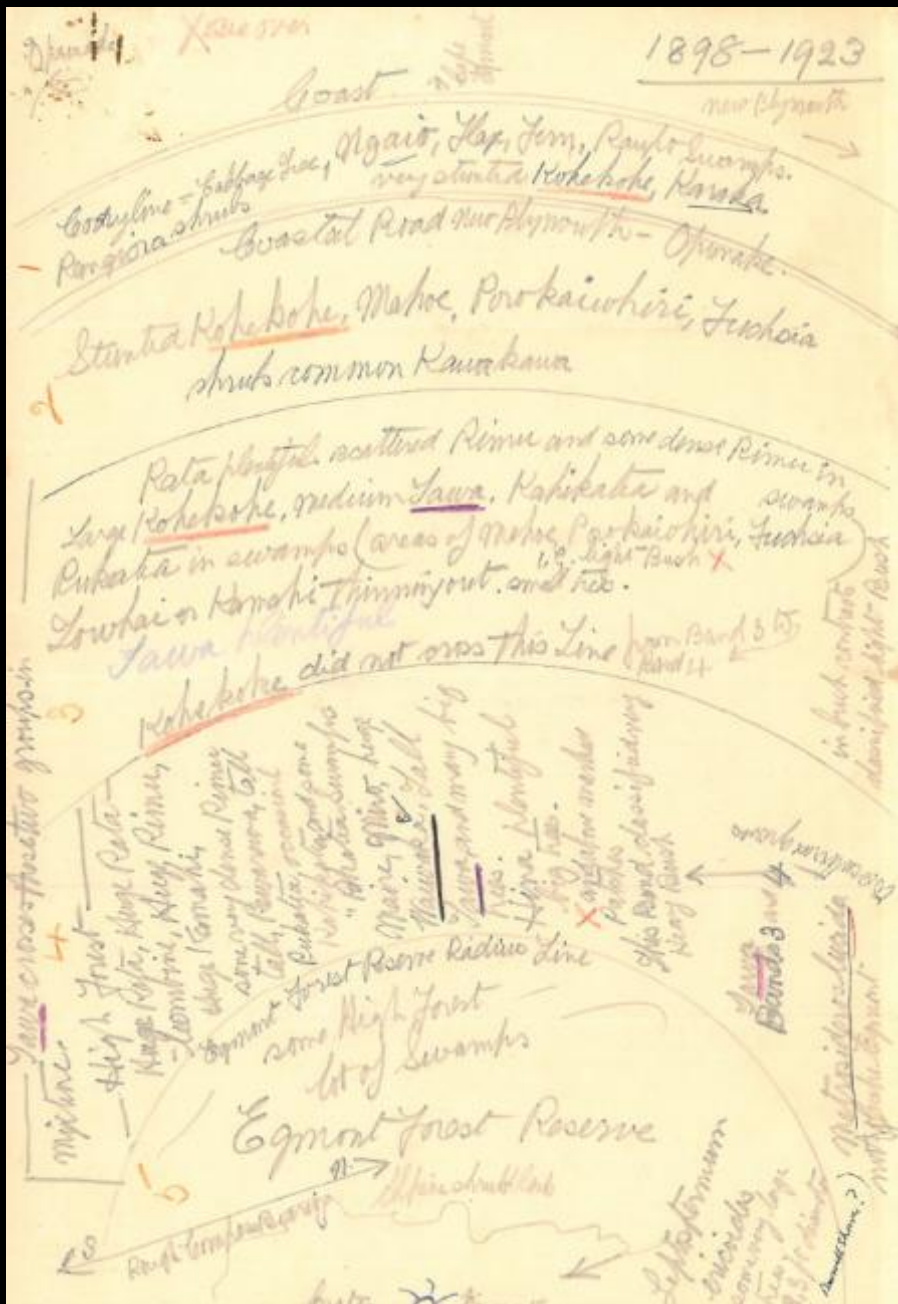
“Many white lumps in companies of fifty or sixty together, which probably were stones or tufts of grass, but bore much resemblance to flocks of sheep”



Pre-human vegetation?



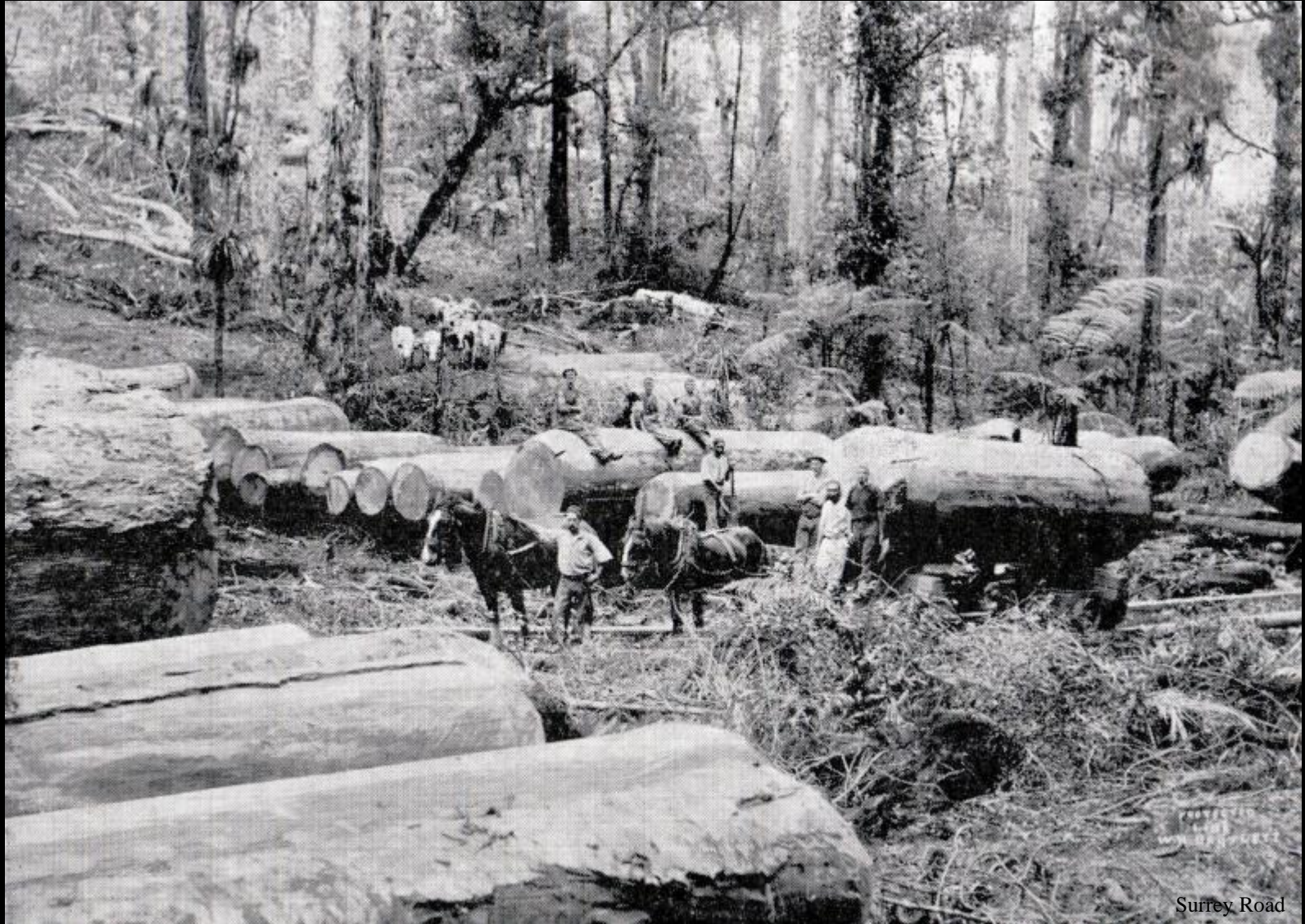
H. N. Kitchingman (1955)



Forest clearance



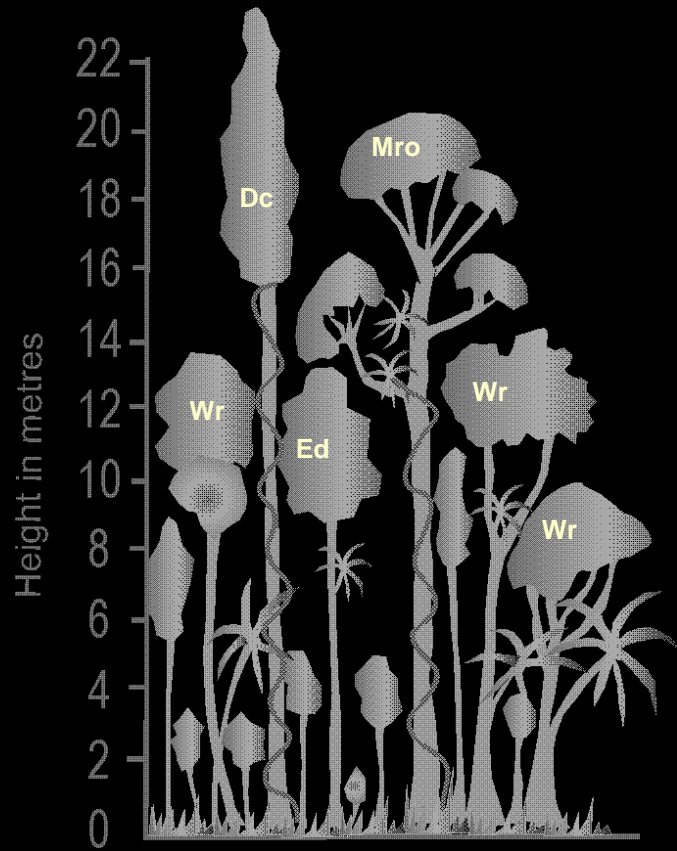
Forest logging



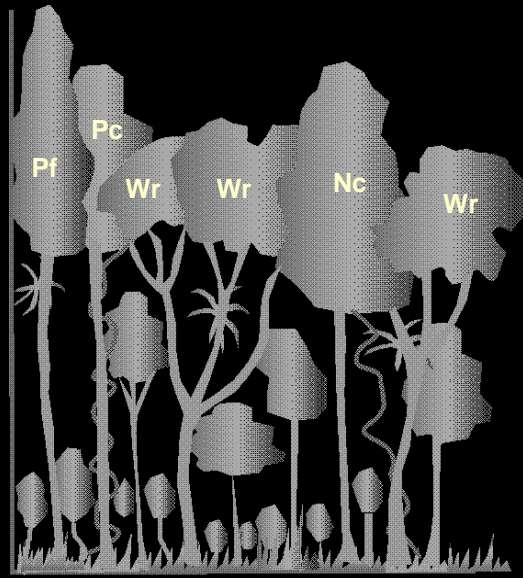
“Burning the bush, Taranaki” from an 1867 watercolour



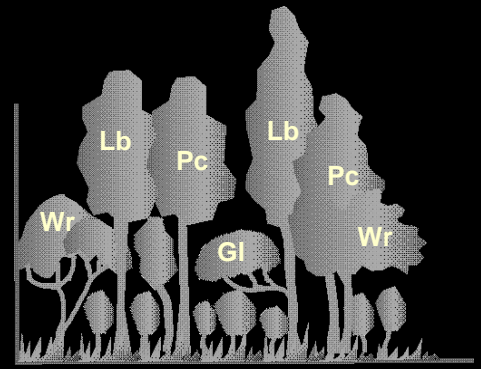




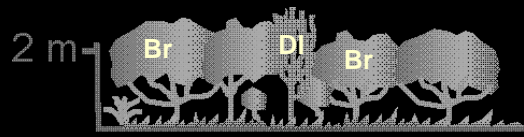
548 m (1800 ft)



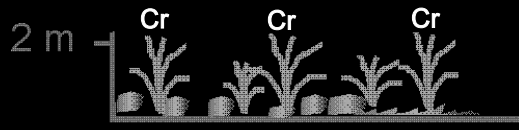
823 m (2700 ft)



1066 m (3500 ft)



1310 m (4300 ft)

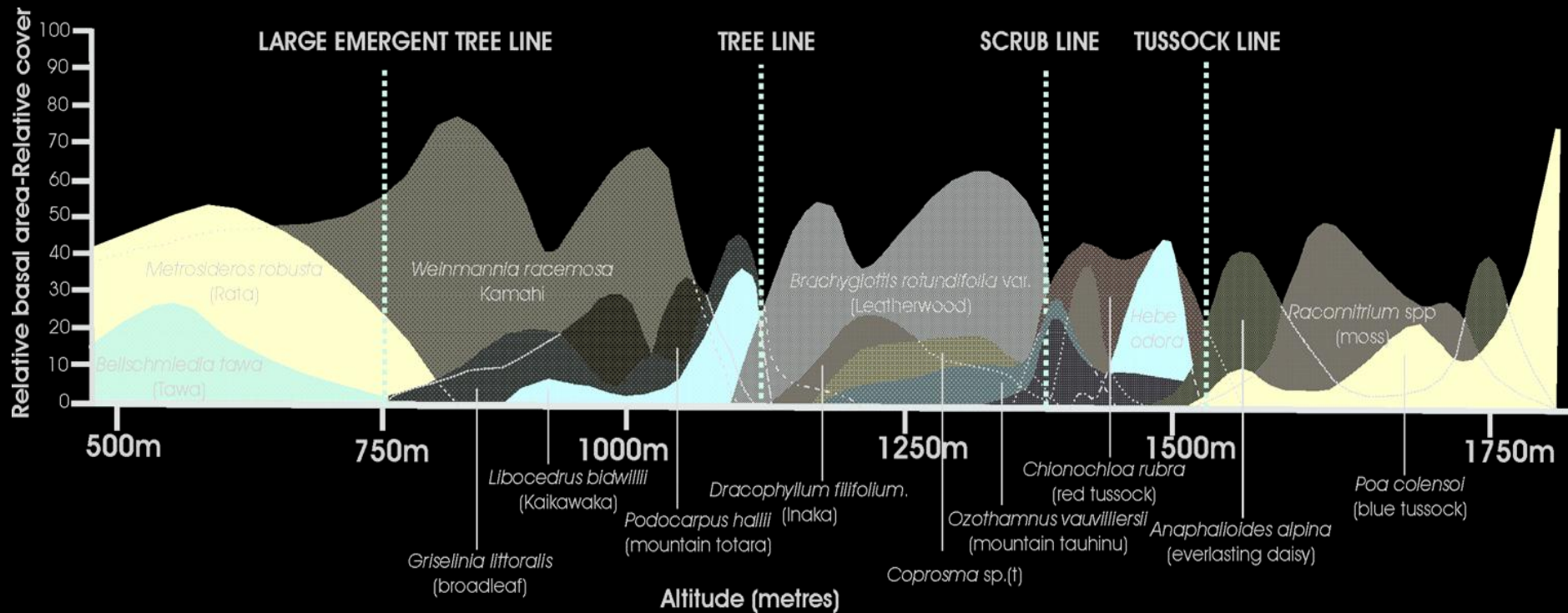


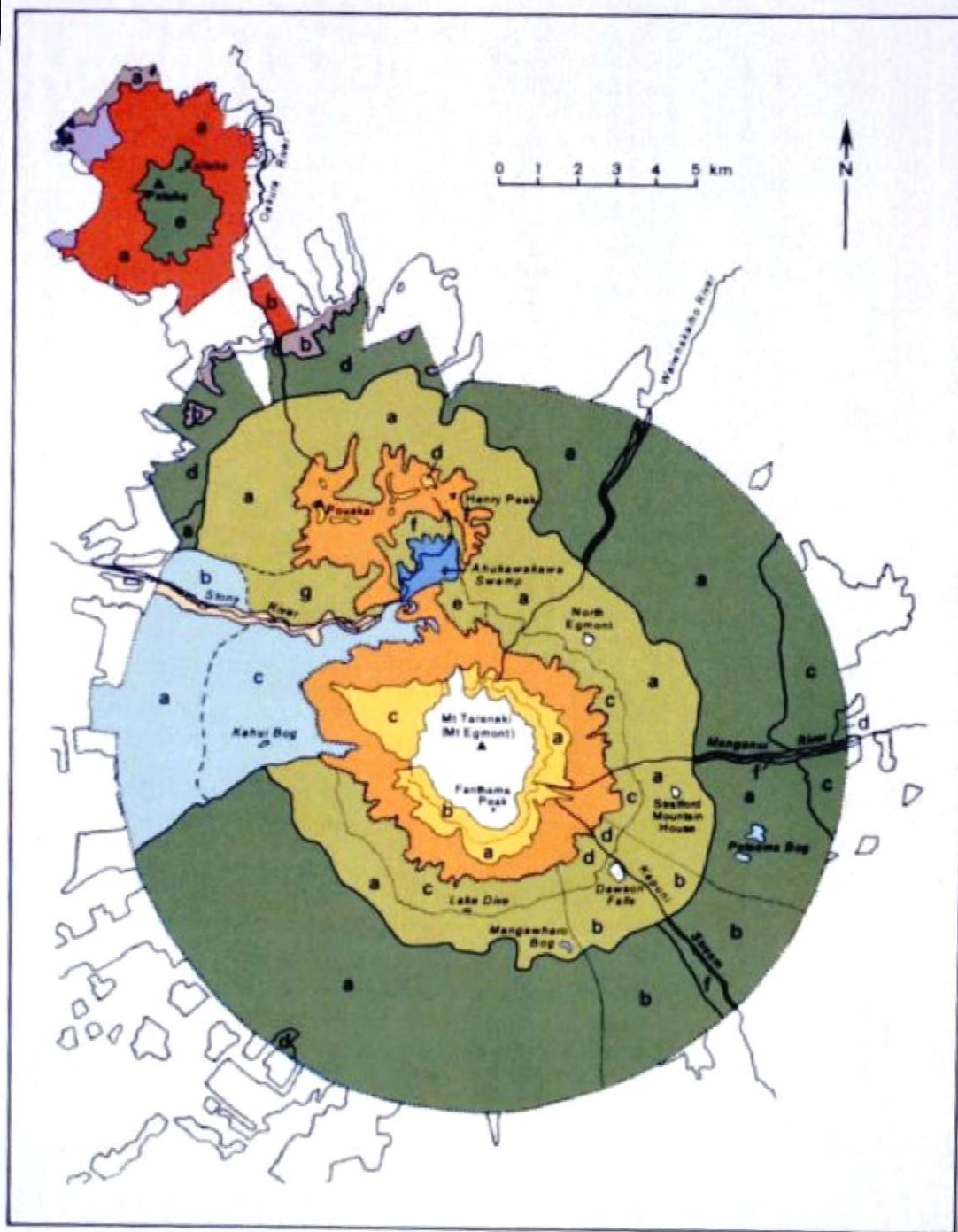
1523 m (5000 ft)



1828 m (6000 ft)

Change in composition



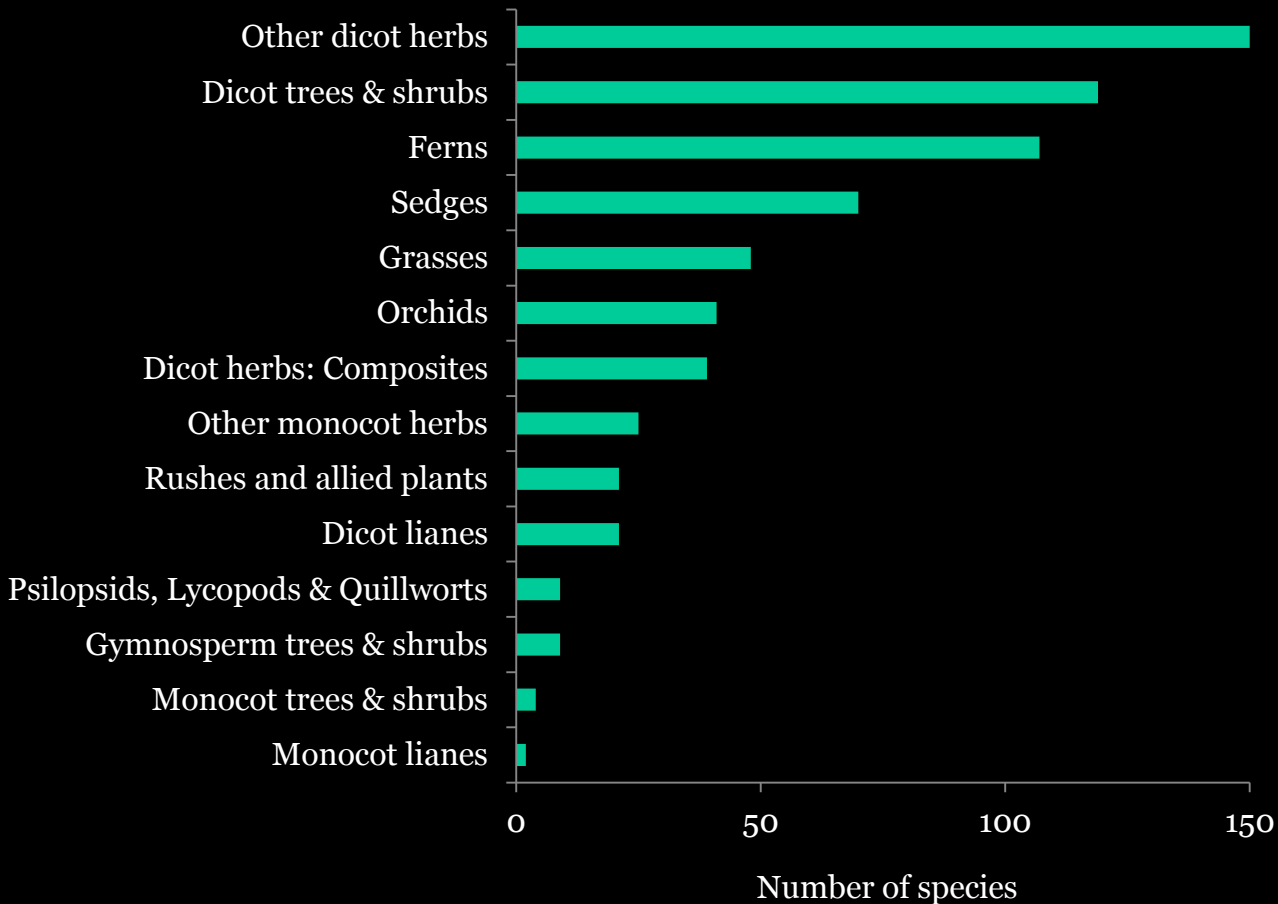


Vegetation Map

Figure 4: Vegetation and substrate class map of Egmont National Park.

Flora statistics

665 indigenous vascular plants in the Ecological District (550 on ENP)



Flora statistics

- 4 or 5 endemics? Only one species fully resolved
- 460 missing plants; *Nothofagus* plus
- South Island connections?
- Local distributions of many species
- Only 4 new records since 1980



Missing Plants:

Silver beech & tawheowheo



South Island connections



Hoheria glabrata &
Polystichum cystostegia



New records: *Myriophyllum robustum*



Local distributions



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Plants for which Mt Taranaki is the type locality

Name	Authority	Year	Revised name
<i>Drapetes dieffenbachii</i>	W. Hooker	1843	<i>Kelleria dieffenbachii</i>
<i>Ourisia macrophylla</i> subsp. <i>macrophylla</i>	W. Hooker	1843	
<i>Ranunculus nivicola</i>	J. Hooker	1844	
<i>Claytonia australasica</i> var. <i>biflora</i>	J. Buchanan	1871	<i>Montia calycina</i>
<i>Polystichum cystostegia</i>	(W. Hooker) J.B. Armstrong	1881	
<i>Myosotis pygmaea</i>	W. Colenso	1883	
<i>Coprosma tenuifolia</i>	T. Cheeseman	1885	

Plants for which Mt Taranaki is the type locality

Name	Authority	Year	Revised name
<i>Poa caespitosa</i> var. <i>leioclada</i>	E. Hackel	1906	<i>Poa cita</i>
<i>Forstera bidwillii</i> var. <i>densifolia</i>	J. Mildbraed	1908	<i>Forstera tenella</i>
<i>Celmisia glandulosa</i> var. <i>latifolia</i>	L. Cockayne	1917	
<i>Luzula migrata</i>	C. Ostenfeld	1921	<i>Luzula banksiana</i> var. <i>migrata</i>
<i>Plantago masoniae</i>	T. Cheeseman	1921	<i>Plantago triandra</i>
<i>Carmichaelia australis</i> var. <i>egmontiana</i>	L. Cockayne & H. Allan	1926	<i>Carmichaelia</i> <i>australis</i>
<i>Pterostylis irsoniana</i>	E. Hatch	1950	

Plants for which Mt Taranaki is the type locality

Name	Authority	Year	Revised name
<i>Uncinia egmontiana</i>	B. Hamlin	1959	
<i>Uncinia involuta</i>	B. Hamlin	1959	
<i>Celmisia major</i> var. <i>brevis</i>	H. Allan	1961	
<i>Hebe stricta</i> var. <i>egmontiana</i>	L. Moore	1961	
<i>Scirpus habrus</i>	E. Edgar	1966	<i>Isolepis habra</i>
<i>Crassula manaia</i>	A. Druce & W. Sykes	1988	
<i>Chionochloa rubra</i> subsp. <i>rubra</i> var. <i>inermis</i>	H. Connor	1991	
<i>Melicytus drucei</i>	B. Molloy & B.D. Clarkson	1996	
<i>Anaphalioides alpina</i>	D. Glenney	1997	
<i>Myosotis brevis</i>	P. de Lange & J. Barkla	2010	



Ourisia macrophylla
subsp. *macrophylla*
no longer endemic



Pouakai margins: *Meliccytus* habitat



Melicytus drucei (Molloy et Clarkson) 1996



Melicytus flexuosus

diploid $2n = 32$



Melicytus aff. *alpinus*

tetraploid $2n = 64$



Melicytus drucei

permanent odd polyploid

$2n = 48$ (triploid?; $16 + 32$) or (hexaploid
if palaeodiploid with $x=8$ ancestor)



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Breeding system uncertain

Recent taxonomic findings



Coastal herbfield



Myosotis brevis

de Lange et al. 2010



J. Bythell

Myosotis pygmaea var. *minutiflora* = *Myosotis brevis*

Myosotis brevis



Myosotis pygmaea

de Lange et al. 2010



J. Barkla



J. Barkla

Myosotis pygmaea var. *pygmaea* = *Myosotis pygmaea*

Plantago masoniae

Meudt 2012



J. Barkla



W. Clarkson

Plantago masoniae



Plantago triandra

Pimelea

Pimelea cf. urvilleana = *Pimelea carnososa*

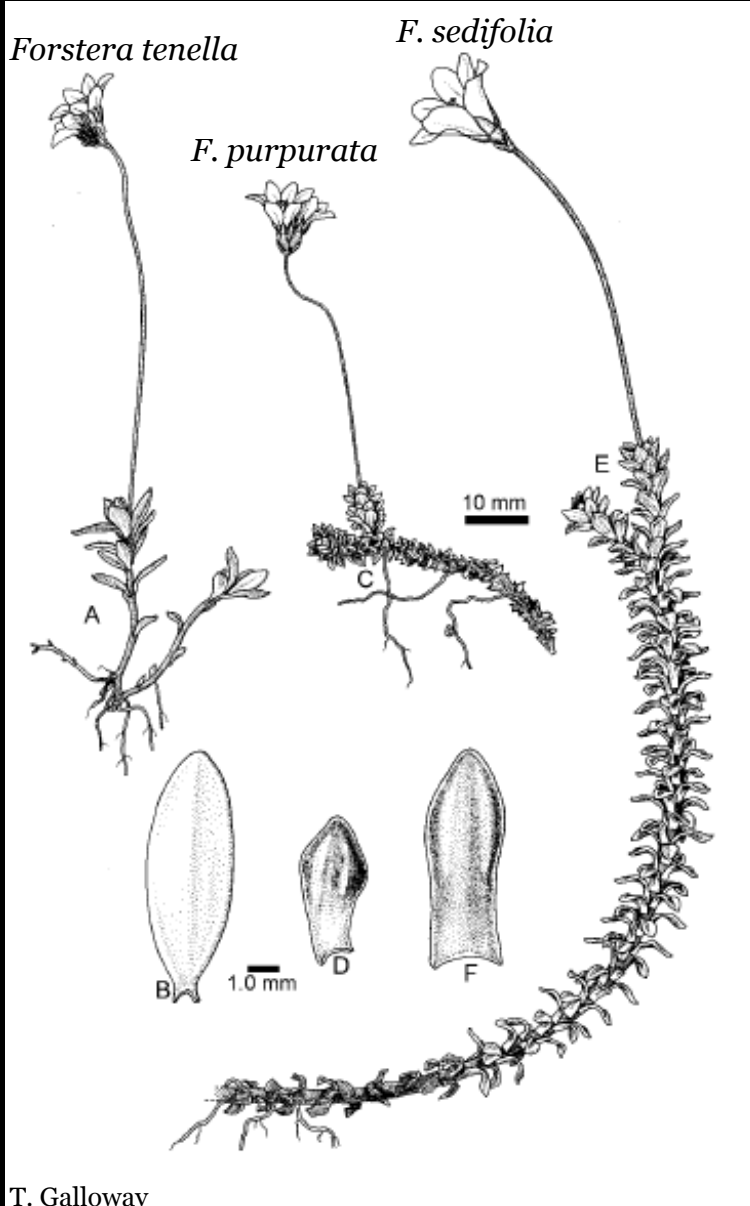
Pimelea arenaria = *Pimelea villosa* subsp. *arenaria*

Burrows 2009



Forstera

Glenny 2009

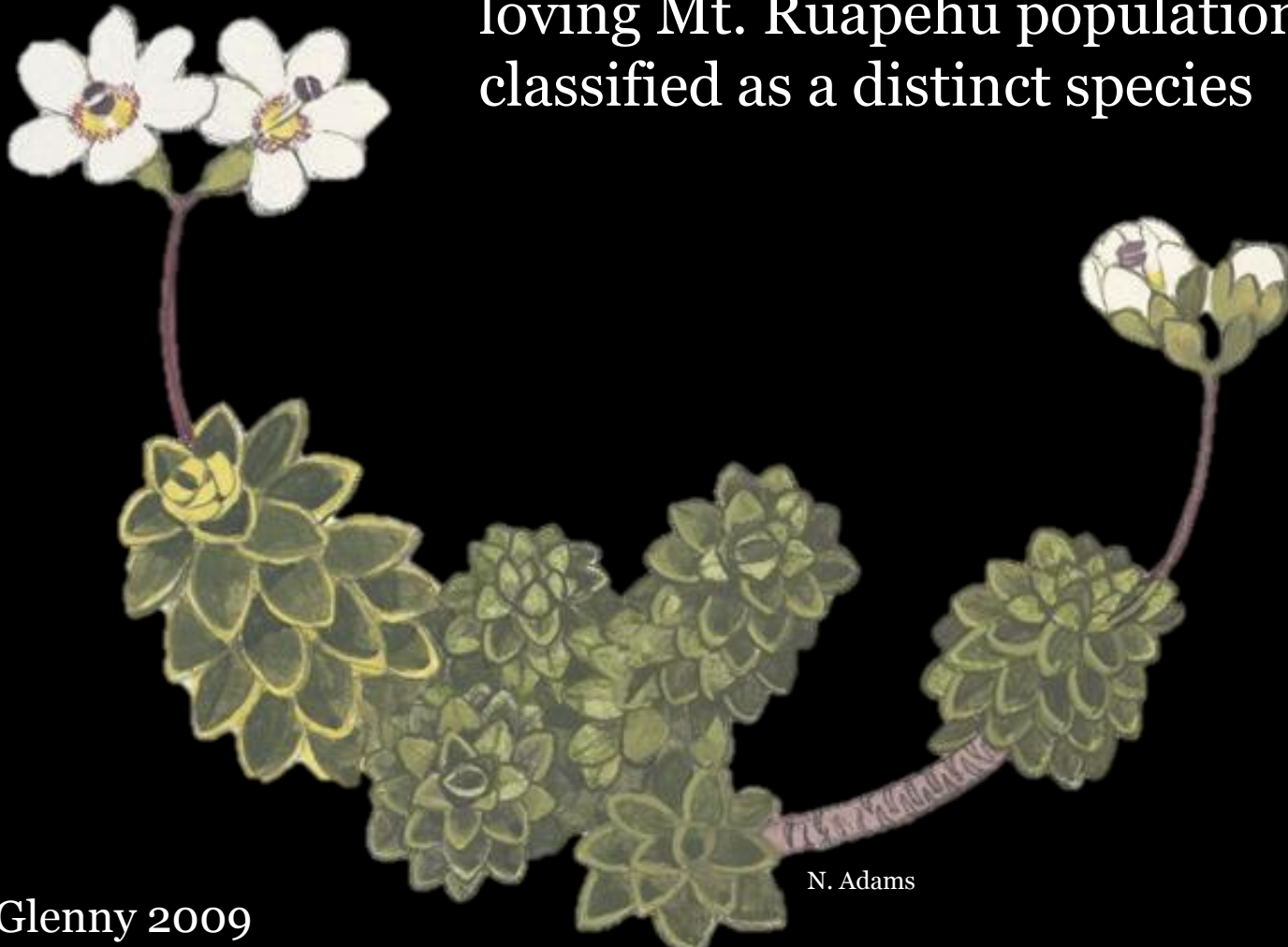


Mt. Taranaki
Forstera bidwillii var. *densifolia*



Forstera tenella

- Mt. Taranaki *Forstera* population has unique features
- But is not different enough from shade-loving Mt. Ruapehu populations to be classified as a distinct species



Forstera tenella distribution



Coprosma

- Jane (2005) revised:
 - *C. parviflora*
 - *C. pseudociliata*
 - *C. ciliata*
 - *C. tayloriae*
 - *C. dumosa*
- Glenny & Cruickshank (2011):

Coprosma tayloriae

=

Coprosma dumosa



Anaphalioides alpina and *A. bellidioides*



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Current taxonomic unknowns



Celmisia problems?

- *Celmisia major* variety *brevis* or *Celmisia gracilentata* variety?
- *Celmisia gracilentata* & *Celmisia graminifolia*?
- *Celmisia setacea*?
- *Celmisia coriacea*?



Celmisia gracilenta/ *graminifolia* complex



Celmisia coriacea natural?



Hebe problems?

- *Hebe stricta* variety *egmontiana* or *Hebe* sp. unnamed?
- *Hebe subsimilis* variety *astonii* or *Hebe tetragona* variety?
- *Hebe odora* complex?



Hebe sp. unnamed
H. “egmontiana” $2n = 80$



Hebe tetragona unnamed variety



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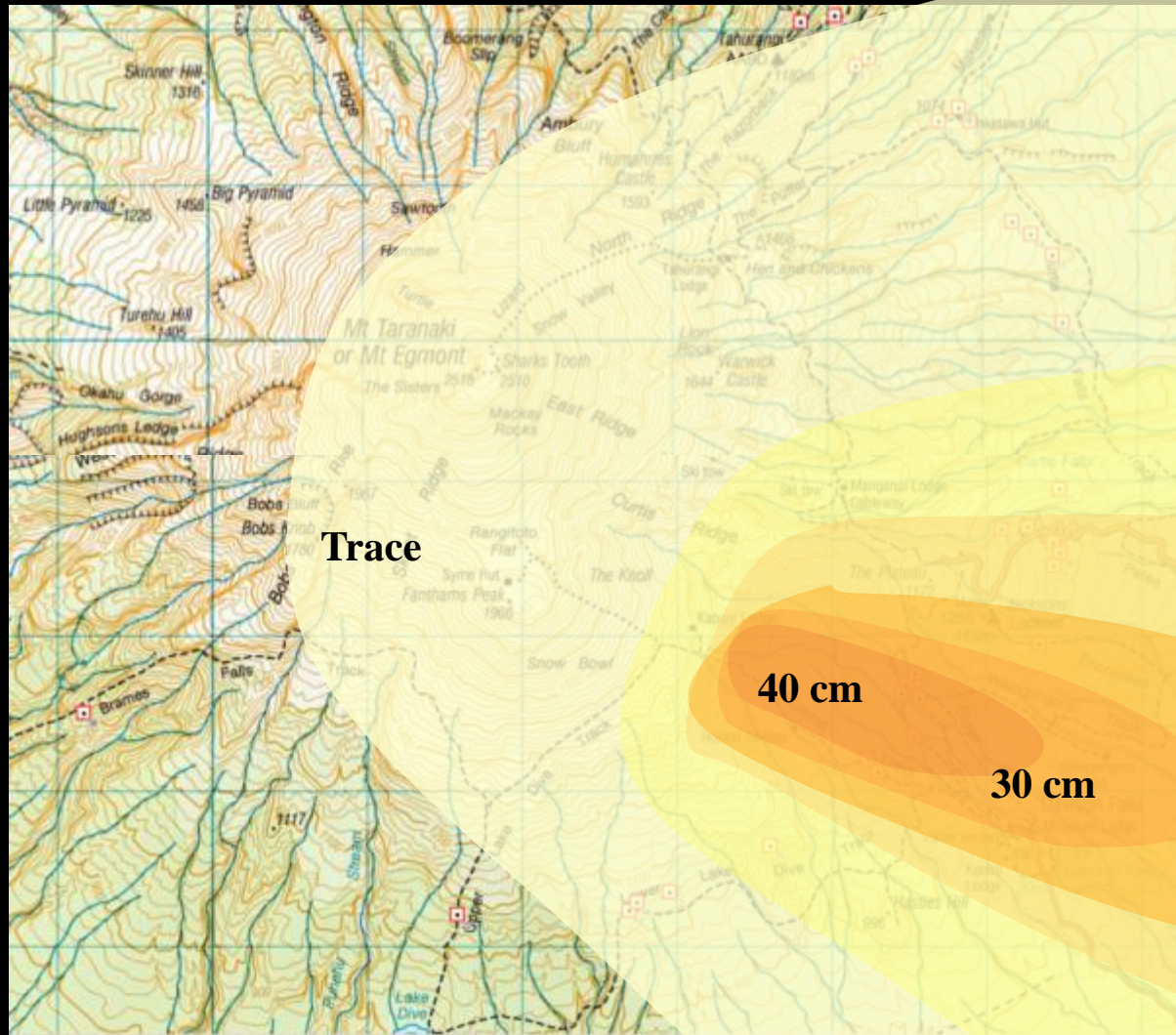
Hebe odora complex



Recent ecological findings



Treeline vegetation map



Trace

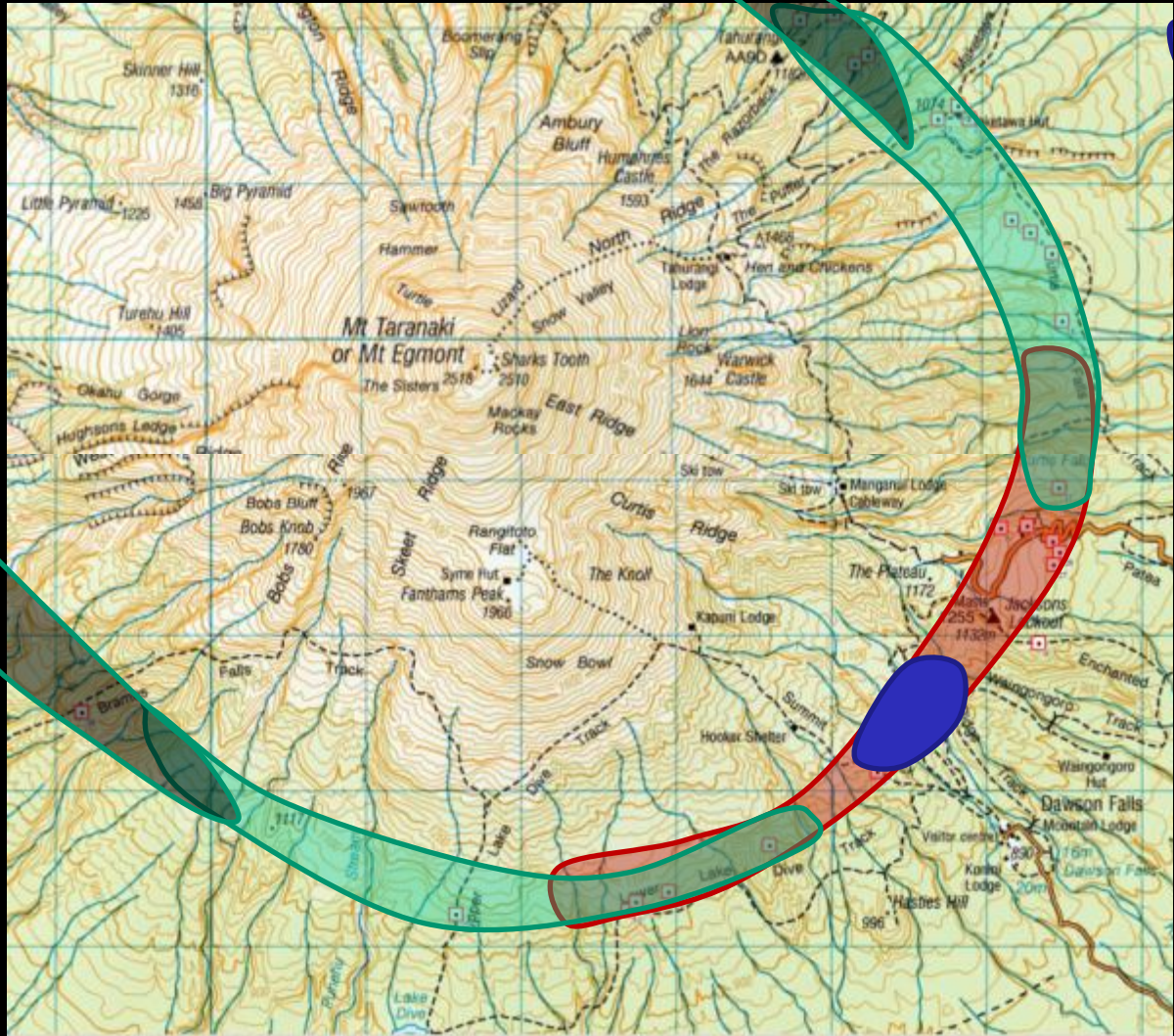
40 cm

30 cm

20 cm

15 cm

Treeline vegetation map



SEVERE

= Hall's totara –
Broadleaf *with*
Fuchsia & wine berry

= Hall's totara -
Broadleaf

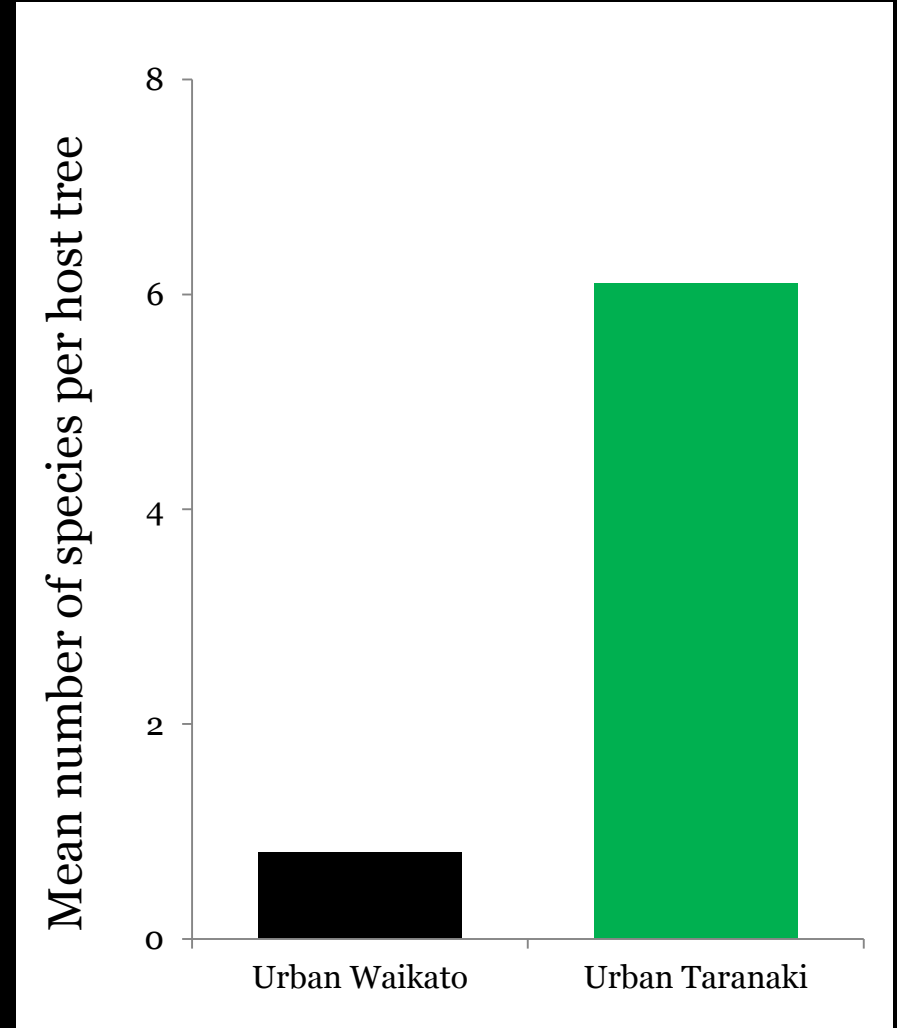
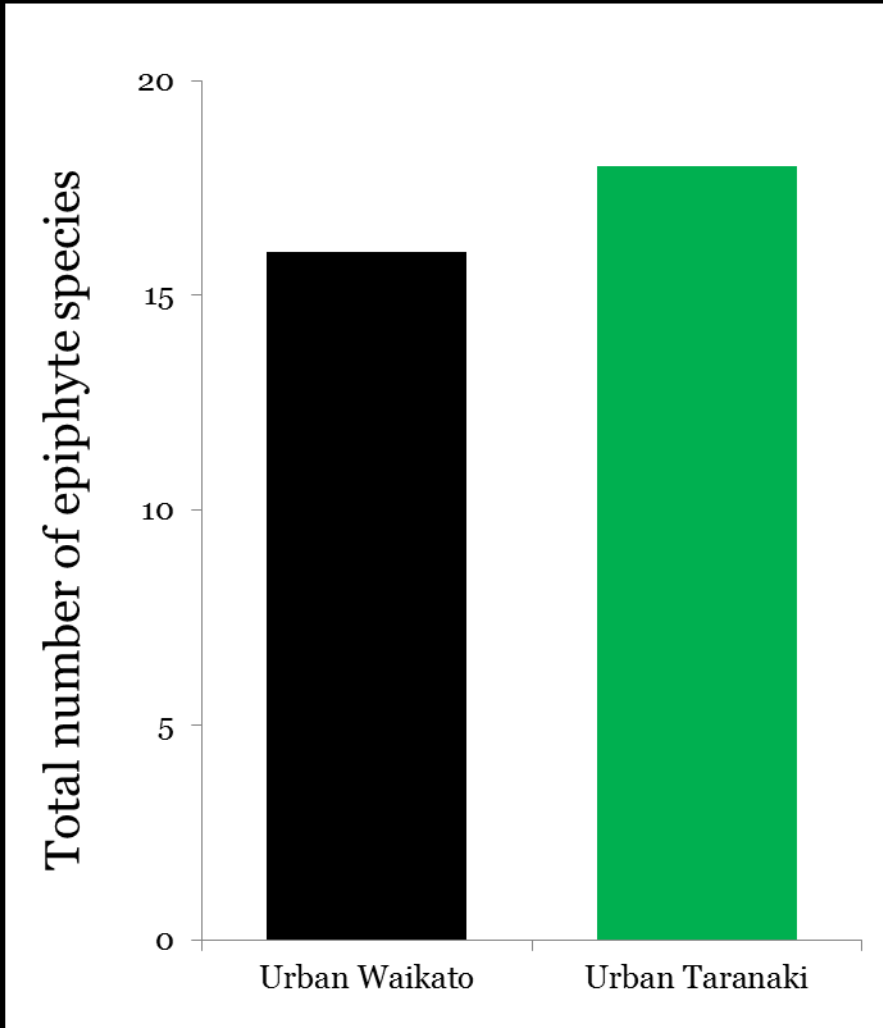
MINOR

= Kaikawaka -
Hall's totara
Broadleaf

OUTSIDE

= Kaikawaka -
Hall's totara
Broadleaf
kamahi

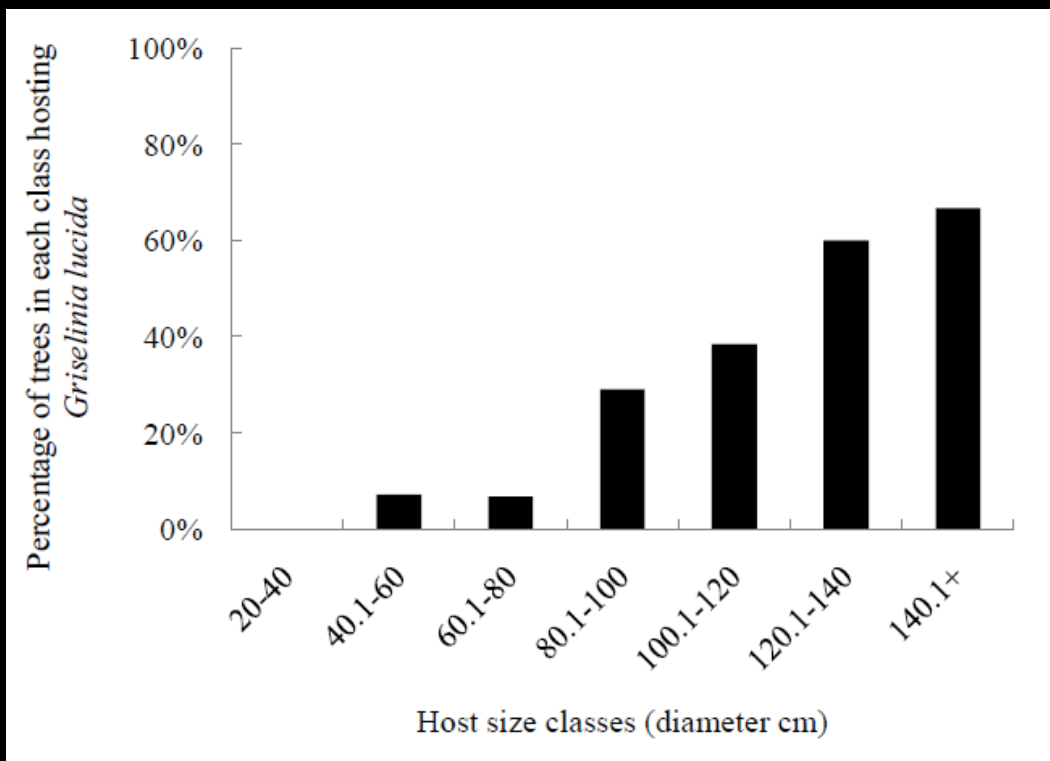
Epiphytes in Urban Taranaki forests



Criteria for diverse, abundant populations:



- Large forest area
- Mod-high humidity
- Large host trees
- Nest epiphytes
- Small dispersal distances



Pittosporum cornifolium & *P. kirkii*



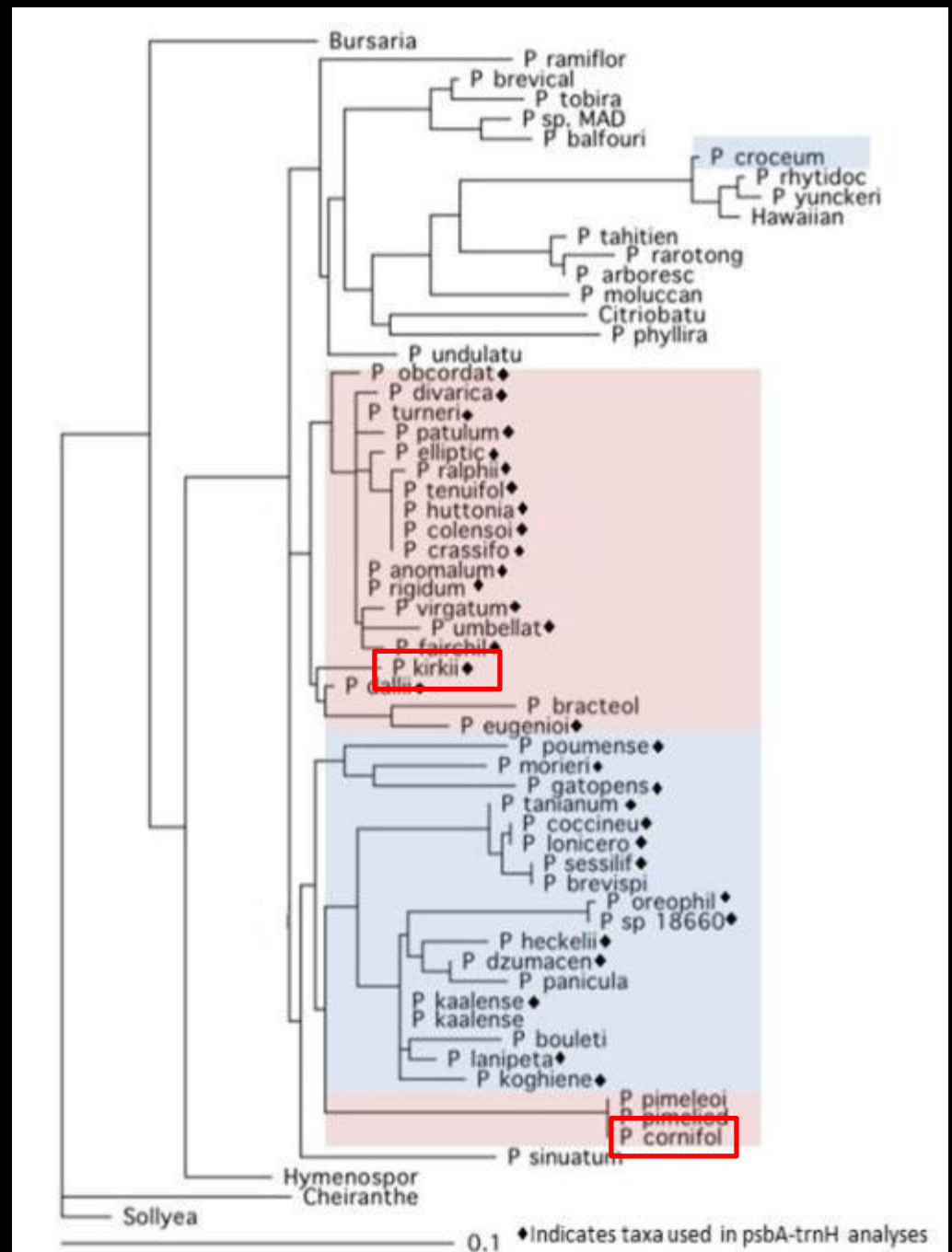
Pittosporum cornifolium & *P. kirkii*



Pittosporum phylogenetic relationships

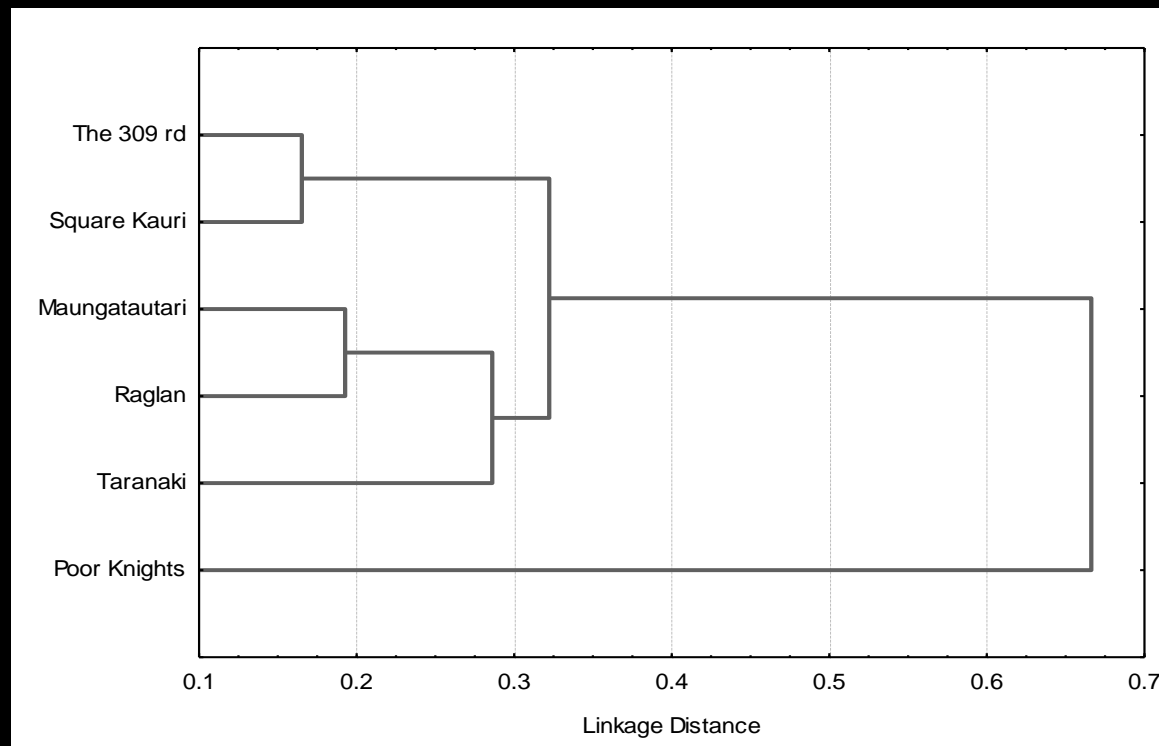
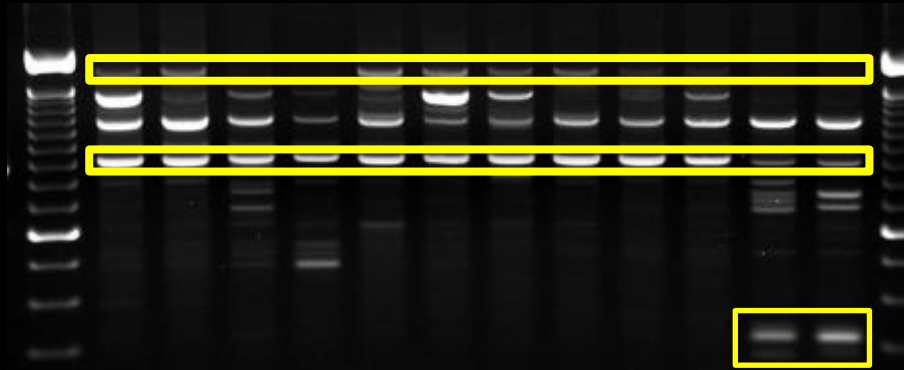


New Zealand
 New Caledonia



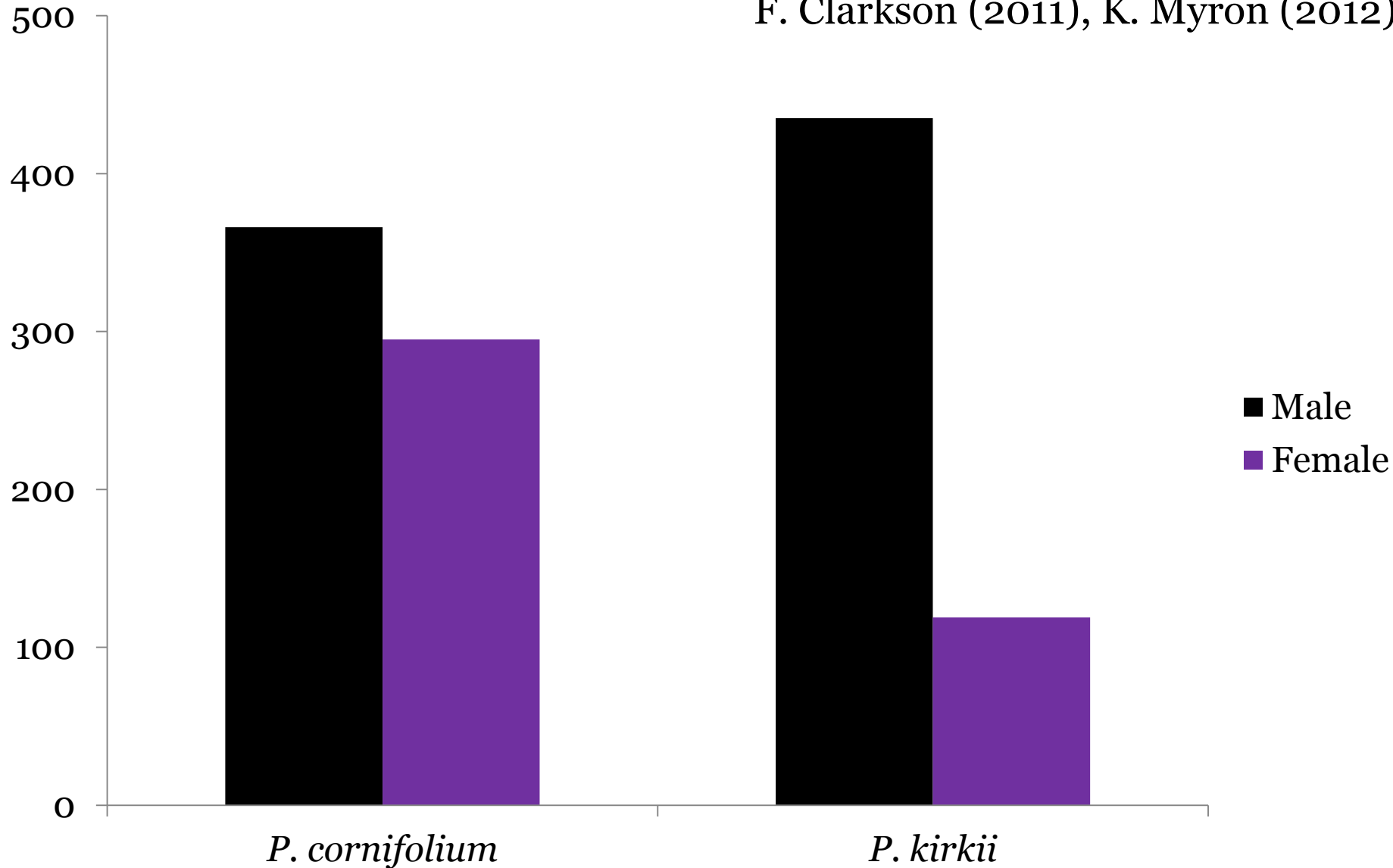
Population Genetics

F.M. Clarkson 2011



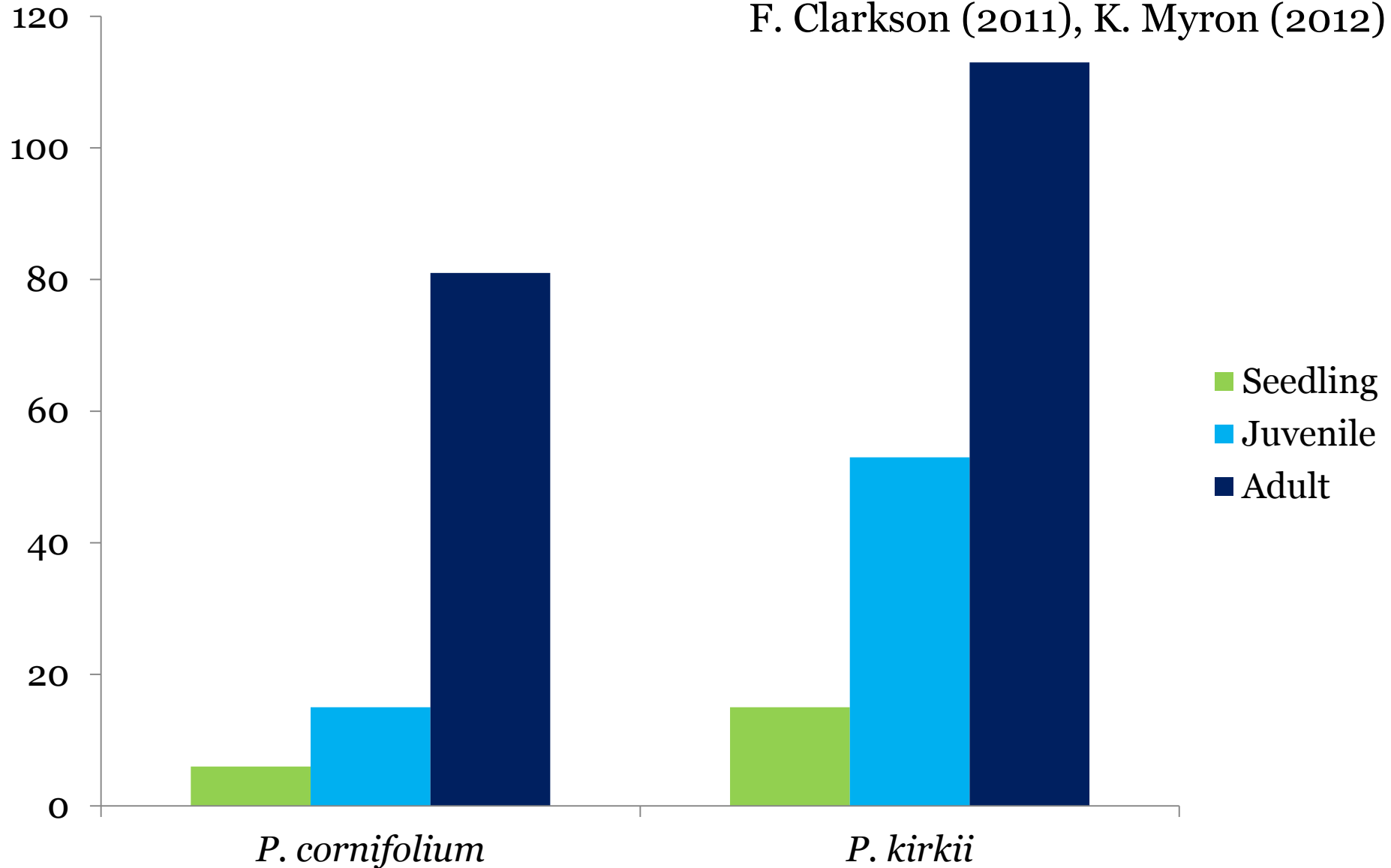
Sex ratios

F. Clarkson (2011), K. Myron (2012)

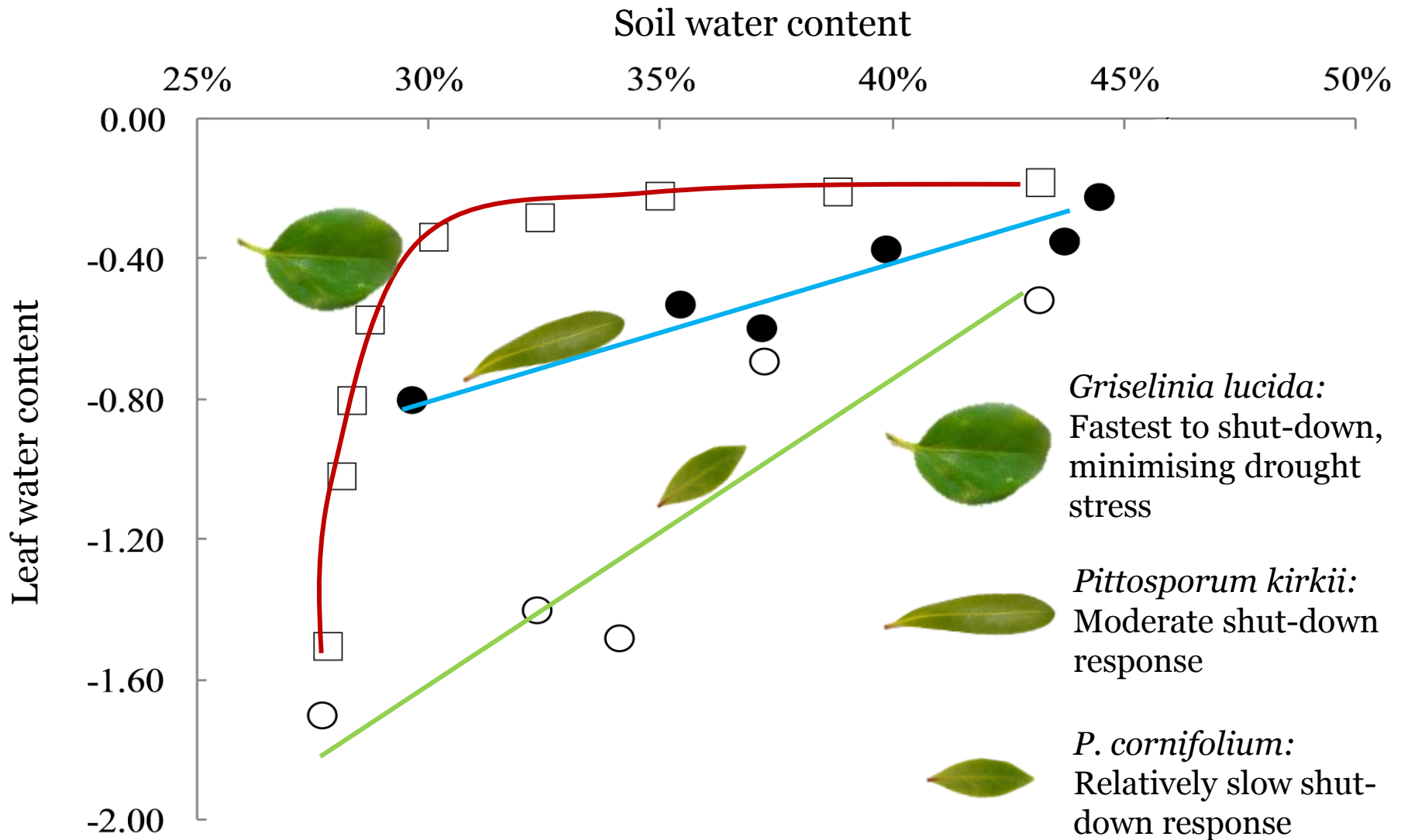


Population structure

F. Clarkson (2011), K. Myron (2012)



Drought tolerance



The future



C. Bryan

Restoration and Reconstruction

Pests



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B. Clarkson

Weeds



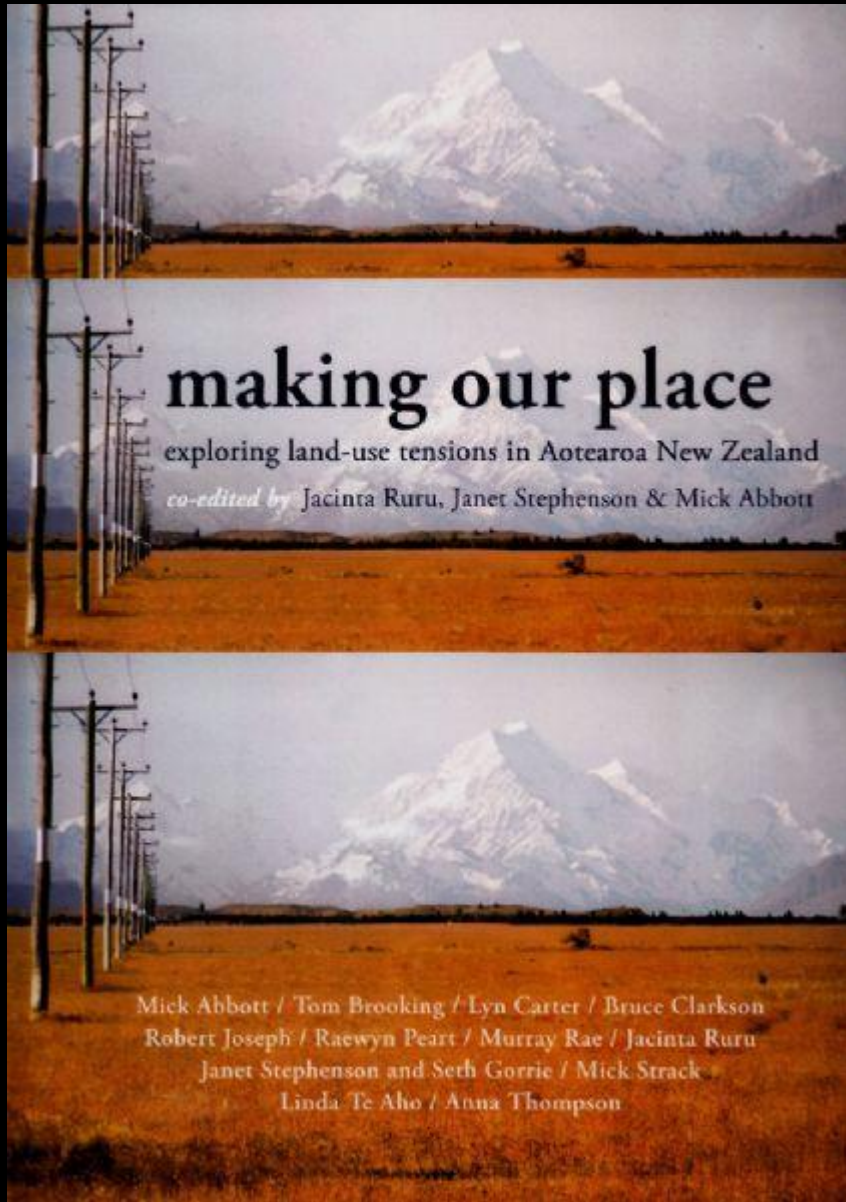
K. Thomas



new-horse.blogspot.co.nz/2011/08/ragwort-faq.html



www.worldofstock.com/stock-photos/gorse--flowers-and-thorns-against-blue/NPF2965



making our place

exploring land-use tensions in Aotearoa New Zealand

co-edited by Jacinta Ruru, Janet Stephenson & Mick Abbott

Mick Abbott / Tom Brooking / Lyn Carter / Bruce Clarkson
Robert Joseph / Raewyn Peart / Murray Rae / Jacinta Ruru
Janet Stephenson and Seth Gorrie / Mick Strack
Linda Te Aho / Anna Thompson

For more
information

Current health and condition

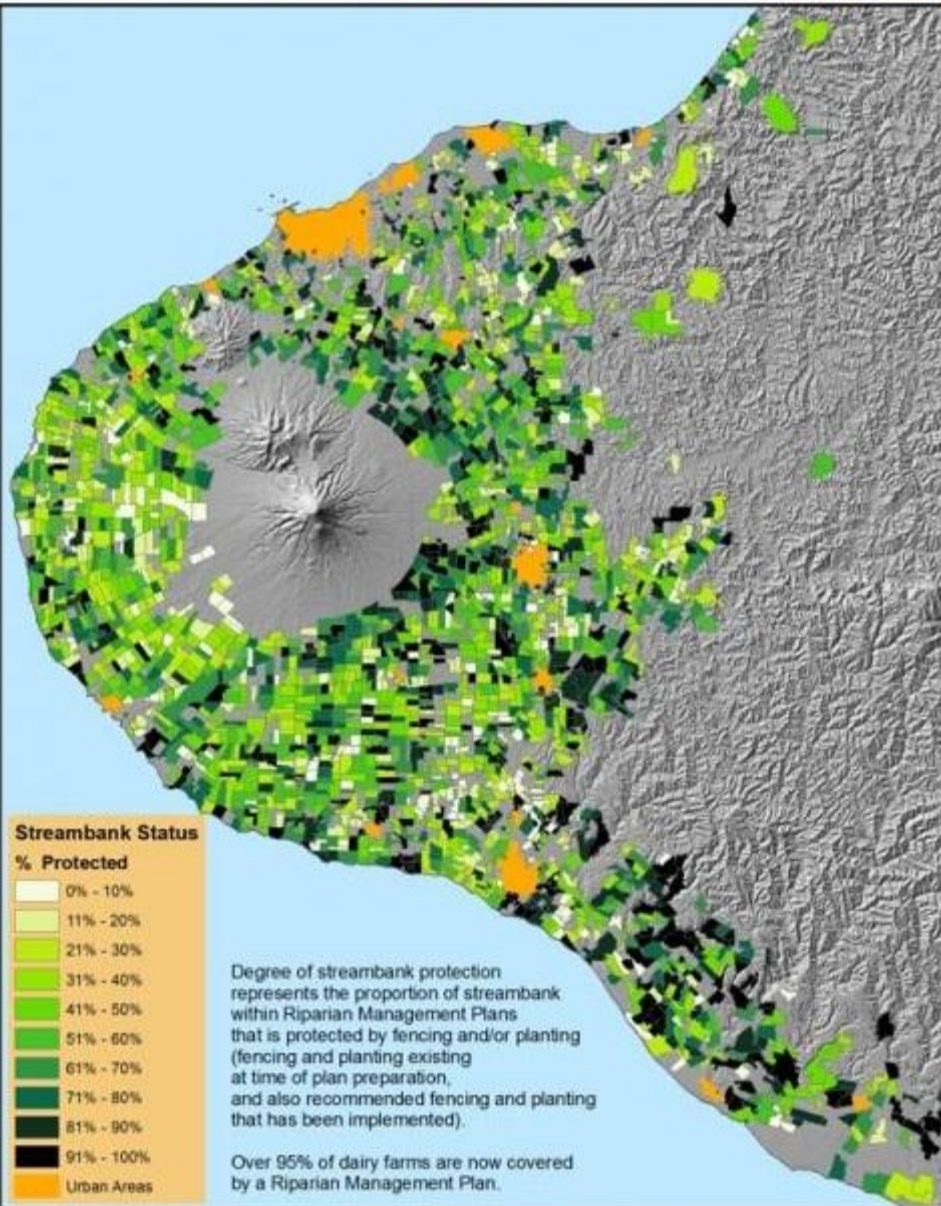


safe.org.nz/Campaigns/Goat-welfare/



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Status of Streambank Protection on Riparian Management Plans in Taranaki



SCALE 1:420,000
 0 5 10 20 km
 DATE 25 November 2010



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TRC



TRC

> 95% of dairy farms have Riparian Management plans

> 2500 km waterways planted

Rotokare Scenic Reserve



8.4 km fence

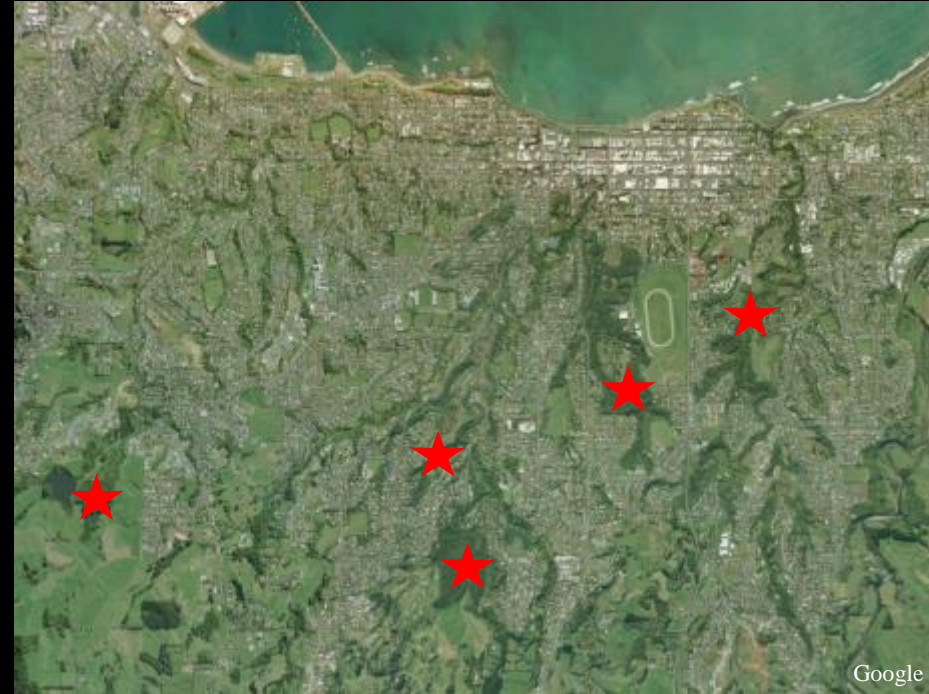
Kiwi reintroduced



Urban restoration



C. Bryan



Google



C. Bryan

Coastal Walkway

11 km of multi-use paths

Restoration of coastal vegetation: *Spinifex* sandfields
flax-taupata shrubland



A bolder bioregional approach?



Taranaki Biodiversity Forum Accord

