

Northern rata: prospects for restoration of a once-common strangling epiphyte

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The lost species...

- Northern rata is one of a range of species that were once common in the lowland forest ecosystems of the North Island but are much depleted.
- Examples:
 - kohekohe (*Dysoxylum spectabile*)
 - hinau (*Elaeocarpus dentatus*)
 - rimu (*Dacrydium cupressinum*) and other conifers
 - king fern (*Marattia salicina*)
 - haumakaroa (*Pseudopanax simplex*)
 - kotukutuku (*Fuchsia excorticata*)
- Our perception of their importance in native forests is shaped by the fact that our generation has never experienced these species as common.

Metrosideros robusta

- Northern rata
- Distribution – North Island forests, northwest Nelson, North Westland
- Hemiepiphytic and terrestrial growth forms
- Canopy emergent and forest dominant
- Important nectar source
- High epiphyte loads itself



Early impressions



The Rata Valley – Karori tree myrtle
William Fox 1850



Rata Tree, Wellington
Charles Gold 1850

Was it common?

Cheeseman (1906)

M. robusta – “abundant in forests from North Cape southwards to Marlborough, Nelson and Westland”

Cockayne (1928) recognised “northern rata forest” as one of the major broad-leaved tree communities.

Zotov et al. (1938)

Tararuas – “..rata found in abundance in the wet western area.” Dominant canopy tree is northern rata or rimu.

McKelvey and Nicholls (1957):

Recognised 73 forest types in North Island. 25 (34%) of these had *M. robusta* as a major “physiognomic prominent”

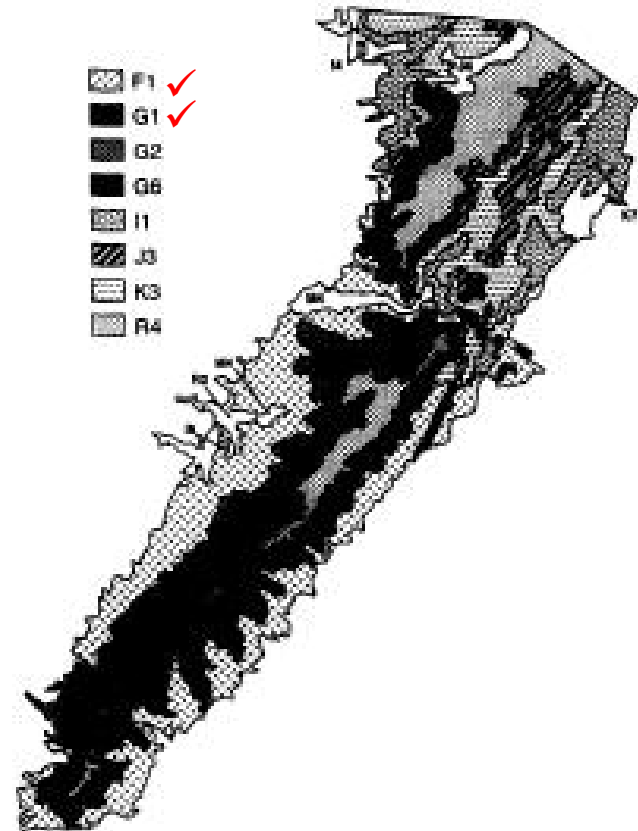


Fig. 2. Distribution of forest types (see Table 1) in 1946 in the southern Ruahine Range (after McKelvey & Nicholls, 1957; Nicholls, 1976; J. L. Nicholls, personal communication).

(Rogers and Leathwick 1997)

Decline

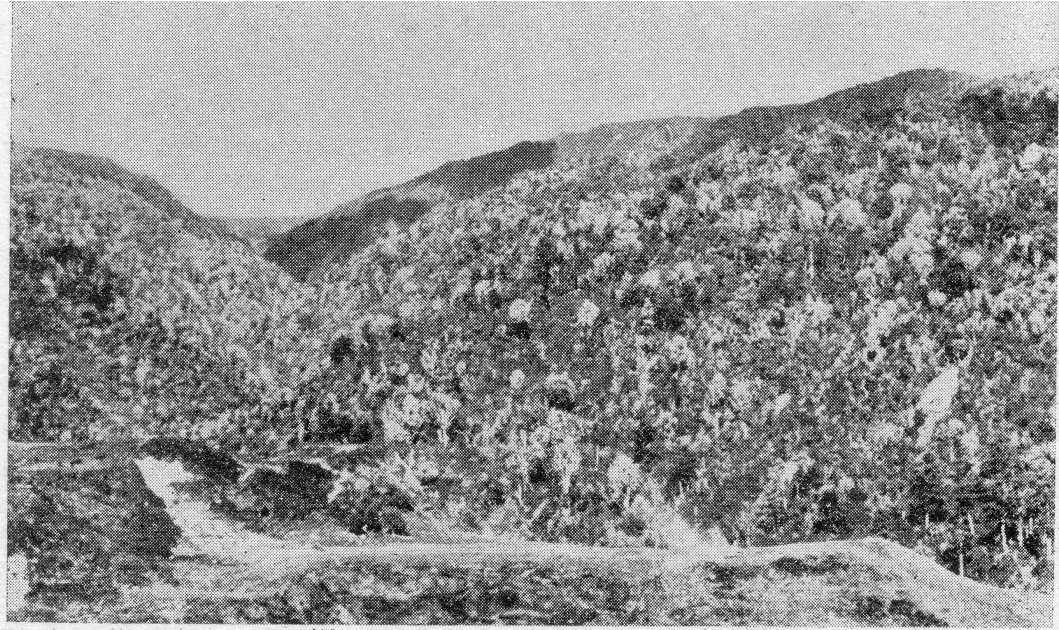


FIG. 4.—Dead trees on northerly faces above junction of Pohangina River and Piripiri Stream, western Ruahines.

Ruahines 1958

Orongorongo Valley
Trees died 1930-1950

Elimination of northern rata

- Wardle J. 1967 – “The presence of logs shows that northern rata ...was once fairly common in the Aorangi Range, but it is now **nearly extinct**.”
- Esler 1978 – “If a floral emblem had been chosen for the Manawatu in the early days, northern rata would have been considered as a subject because of its abundance...The last northern rata in the Manawatu District **died about 1950**.”
- Wardle P. 1991 – forests of volcanic plateau – “Type D1 has an even lower density of podocarps, these being large trees that are frequently host to large northern rata trees, many or most of which have **died in recent decades**”
- Rogers and Leathwick 1997 – “..previously dominant *Metrosideros robusta* in the southern Ruahine Range is **extinct** in many catchments, and reduced to isolated individuals in others..”

Orongorongo and possums

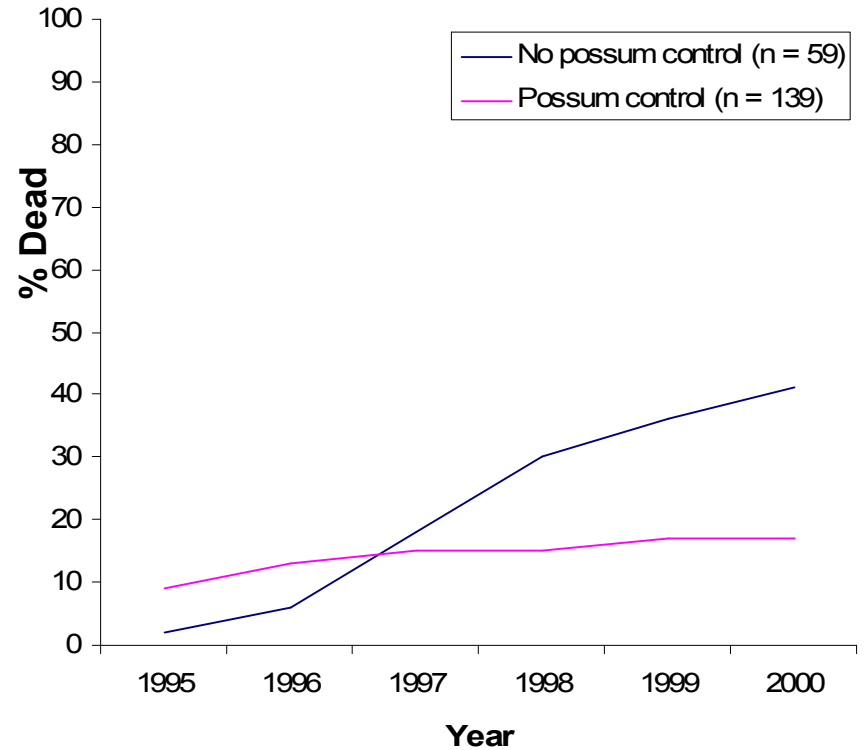
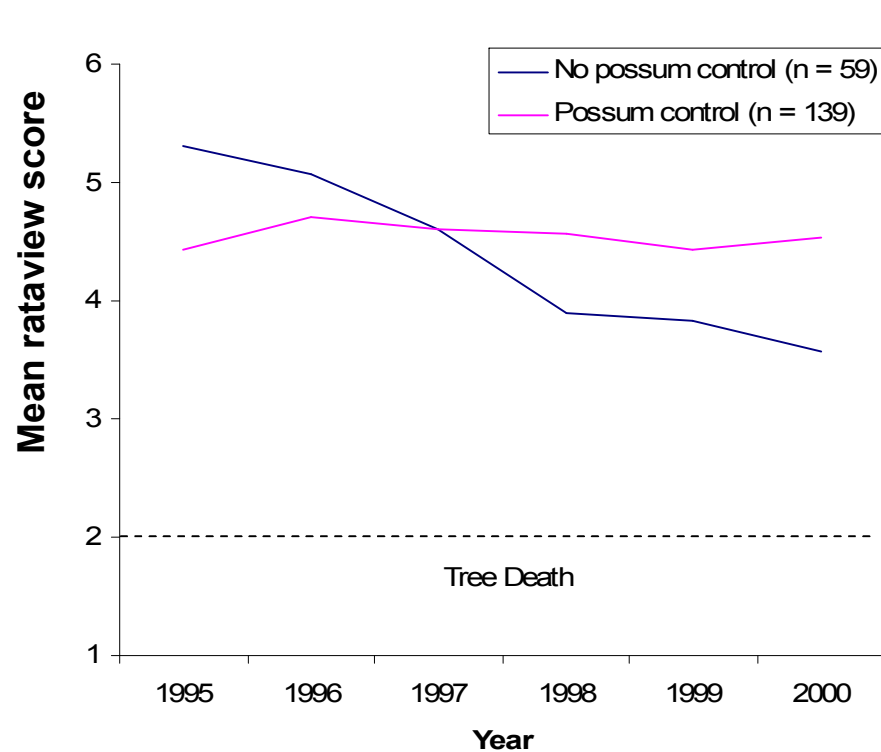
- Changes in 2.25 ha of forest followed from 1969 – 1985 (Campbell 1990)
- Northern rata:
 - 1969 – 28 stems
 - 1978 – 18 stems
 - 1985 – 17 stems
- Diet of possums – 29% *M. robusta* leaves

Possums as the cause

- Northern rata foliage highly palatable to possums
- Possums severely browse trees
- Dieback events have broadly followed spread of possums through New Zealand
- Trees that are protected from possums recover



Rataview Coromandel



Data from de Monchy, Broome and Ogle 2000; Overdyck 2001

Restoration?

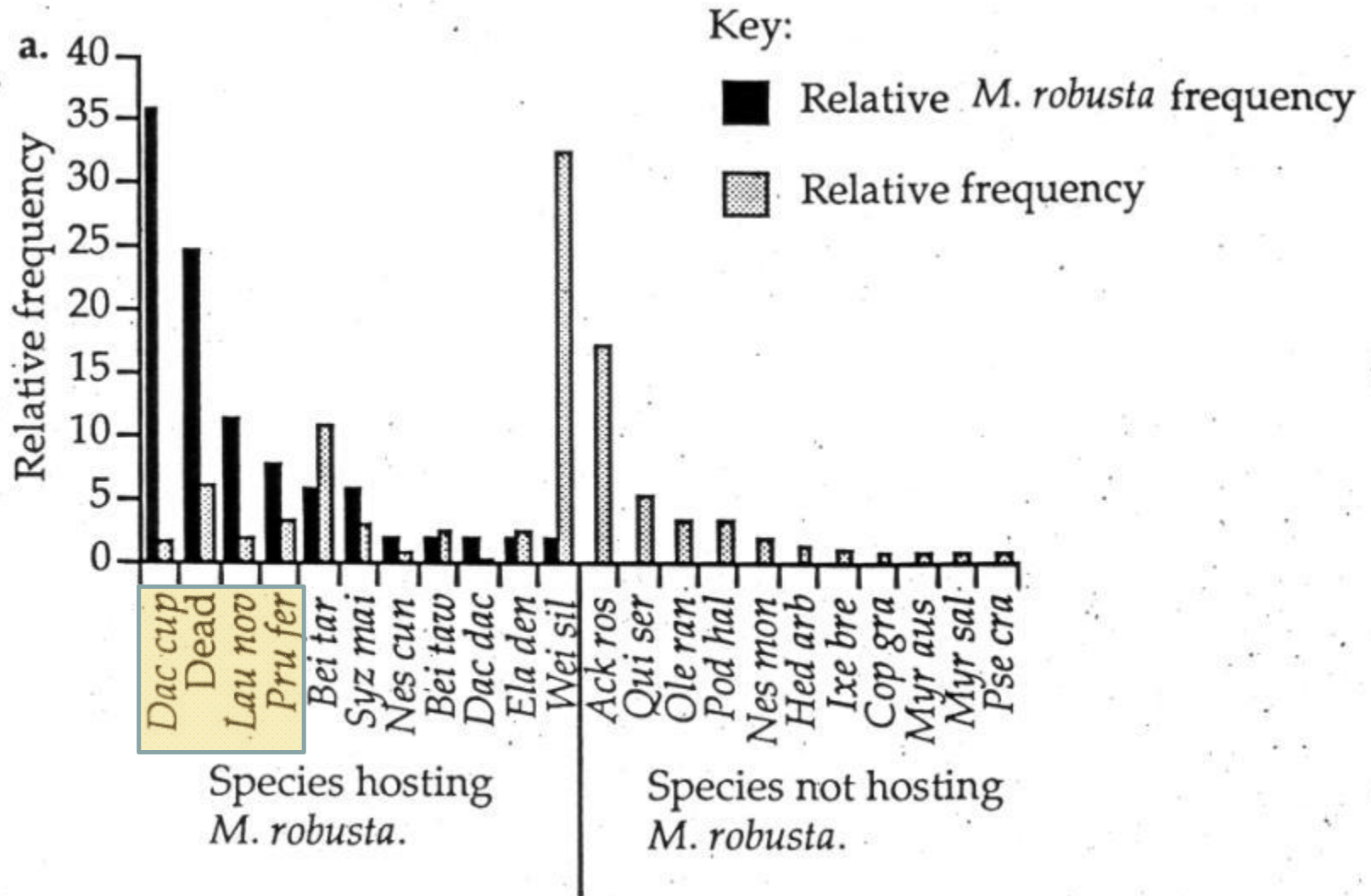
- Attempt only where possums absent or under sustained control (e.g., sanctuaries)
- Terrestrial or epiphytic?
- If epiphytic:
 - on what hosts and establishment sites?
 - how to get roots into the ground?
 - how to accelerate growth?

Host species and establishment sites

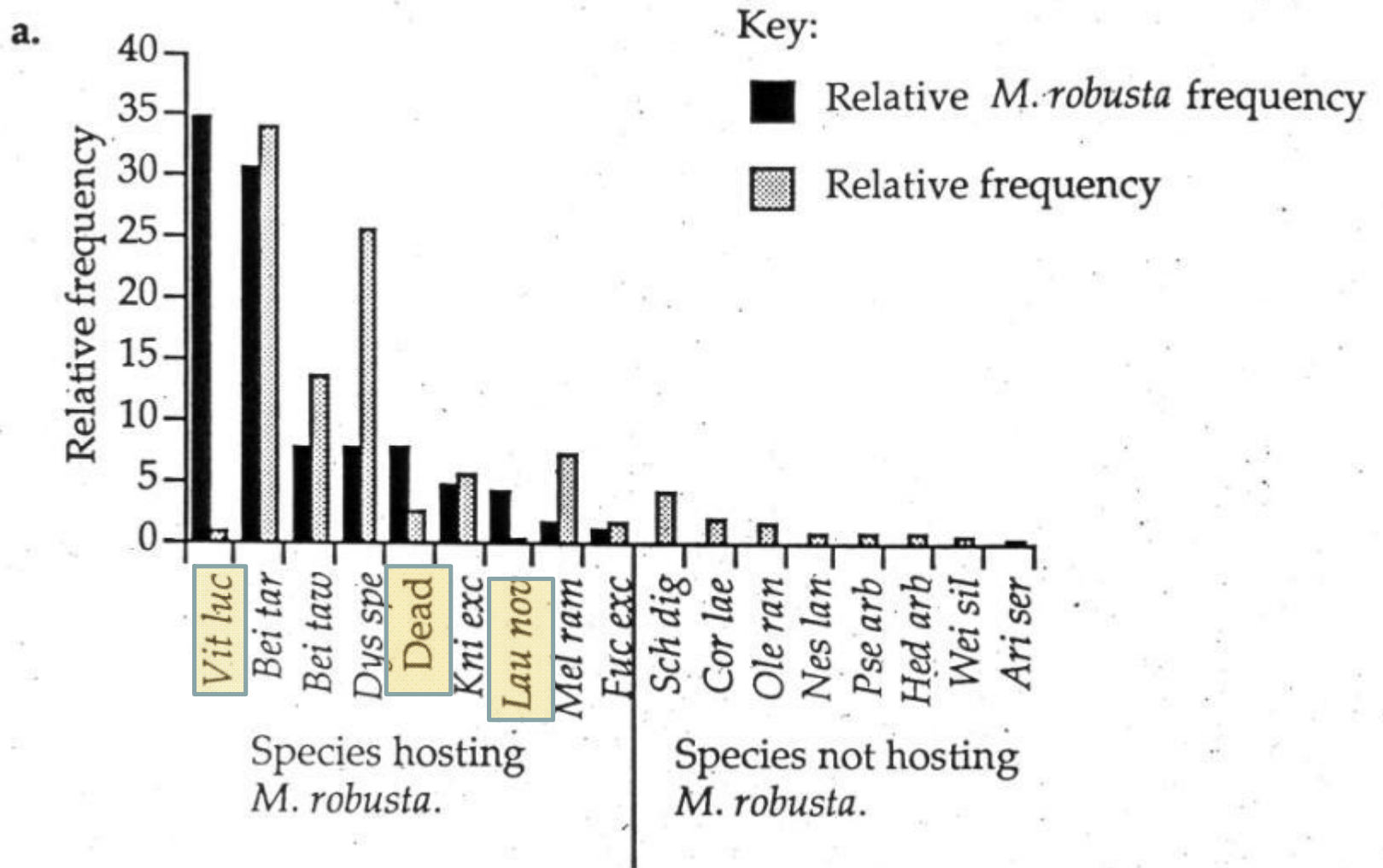
Knightbridge and Ogden 1998

- surveyed 58 ha over 7 sites for northern rata
- occurred more commonly on large host trees (>50 cm diameter) than expected
- 21 tree species acted as hosts (podocarps, puriri, pukatea, and dead trees preferred)
- Establishment sites
 - Horizontal branches 44%
 - Primary branch forks 31%
 - Sides of trunks 27%

Host preference Waipoua



Host preference Hauturu



Restoration trial at Karori Wildlife Sanctuary

Now possum free

Previously northern rata a forest dominant

How to establish northern rata epiphytically?

Key environmental factors – water, light, bark type?

200 seedlings planted in July 2007

- factors:
1. host (pine versus hinau)
 2. rooting volume (PB2 versus root trainers)
 3. aspect (north versus south)





Survivorship of northern rata seedlings at Karori 2007-2008

	Hinau	Pine	Total
Rooting volume - large	56%	26%	41%
Rooting volume - small	32%	2%	17%
Aspect – north	42%	6%	24%
Aspect - south	46%	22%	34%
Total	44%	14%	29%



Next step...

Another 200 northern rata seedlings established in 2008

- hosts – rewarewa, pine
- establishment sites – branch axil
versus side of trunk
- aspect – north versus south



Conclusions

- Northern rata was abundant in North Island forests
- Acute and chronic decline through decades of 20th century and ongoing
- Decline largely attributable to possums
- Restoration may be possible in possum-free areas
- Northern rata shows preference for particular host species and for large trees
- Water availability is a major factor in epiphytic establishment

Acknowledgements

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