



Ex situ conservation

New Zealand Perspective

Marion MacKay



New Zealand Research Team

- Marion MacKay, Massey University
- Graham Smith, Pukeiti Rhododendron Trust
- Ahmed Fayaz, Massey University
- Sue Gardiner/Davies, The New Zealand Institute of Plant & Food Research Ltd
- Claudia Wiedow, The New Zealand Institute of Plant & Food Research Ltd



New Zealand Perspective

1. *Rhododendron* in New Zealand
2. Vireya research
3. Conservation issues
4. Conservation principles and actions



R. excellens - VU

New Zealand Perspective

Rhododendron in New Zealand



Rhododendron in New Zealand

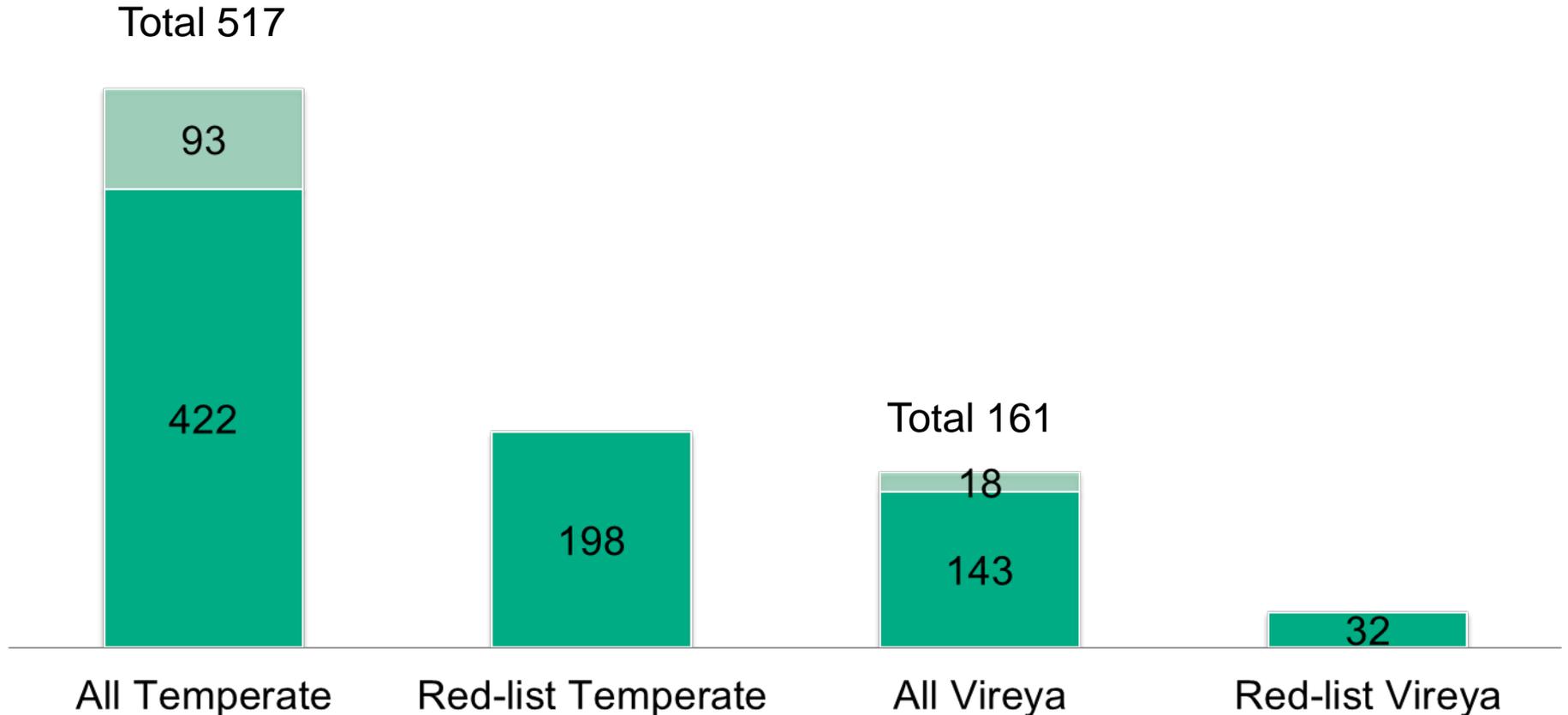
Method: collections data set

- Base data from previous work
- Collections survey
- Commercial trade
- Ministry of Primary Industries database
- International data from BGCI, RBGE, Kew
- Red-list details from Gibbs et al.

Results: Taxa in New Zealand

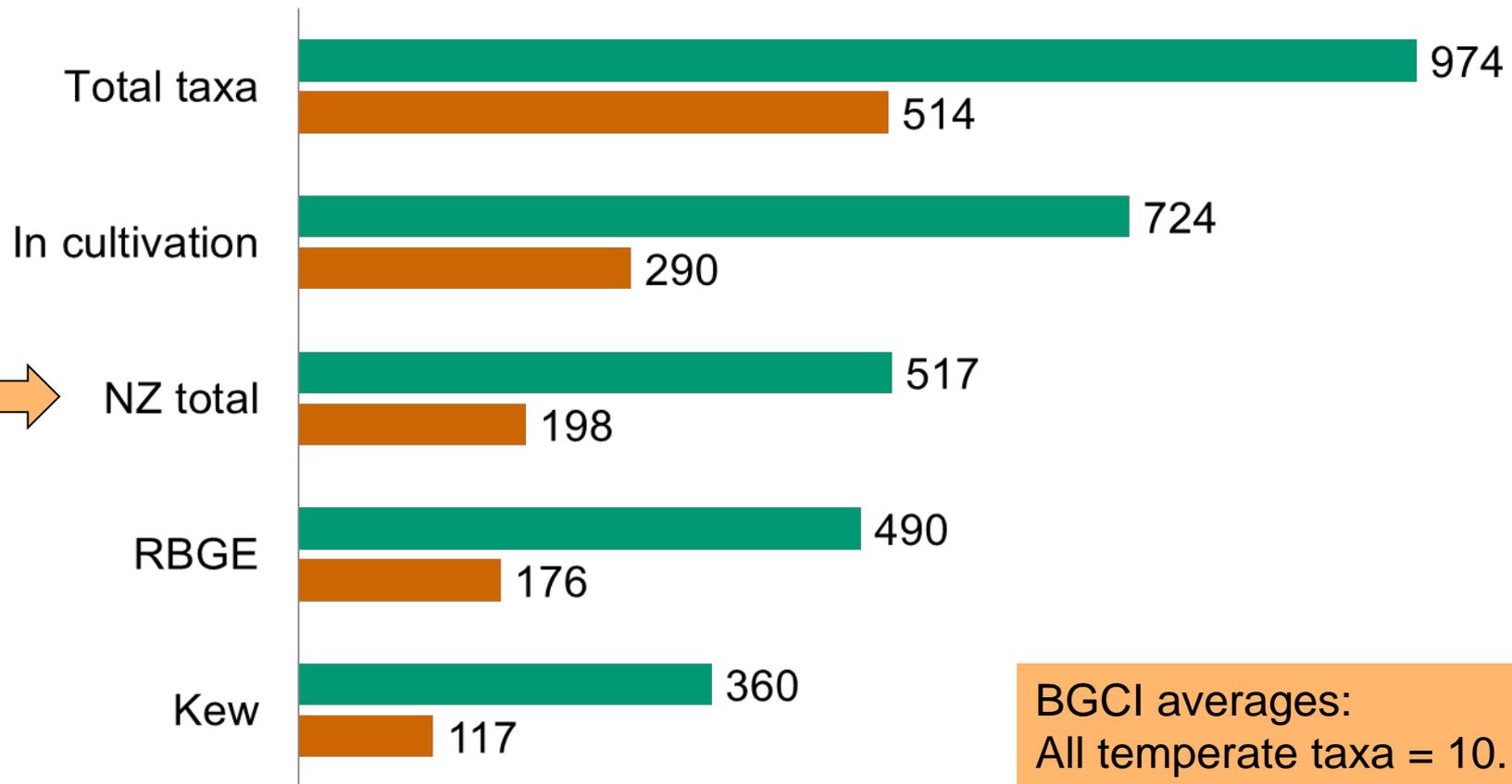
Rhododendron Taxa in New Zealand

- In New Zealand and additional to Gibbs et al.
- In New Zealand and in Gibbs et al.



Results: Temperate Taxa Comparison

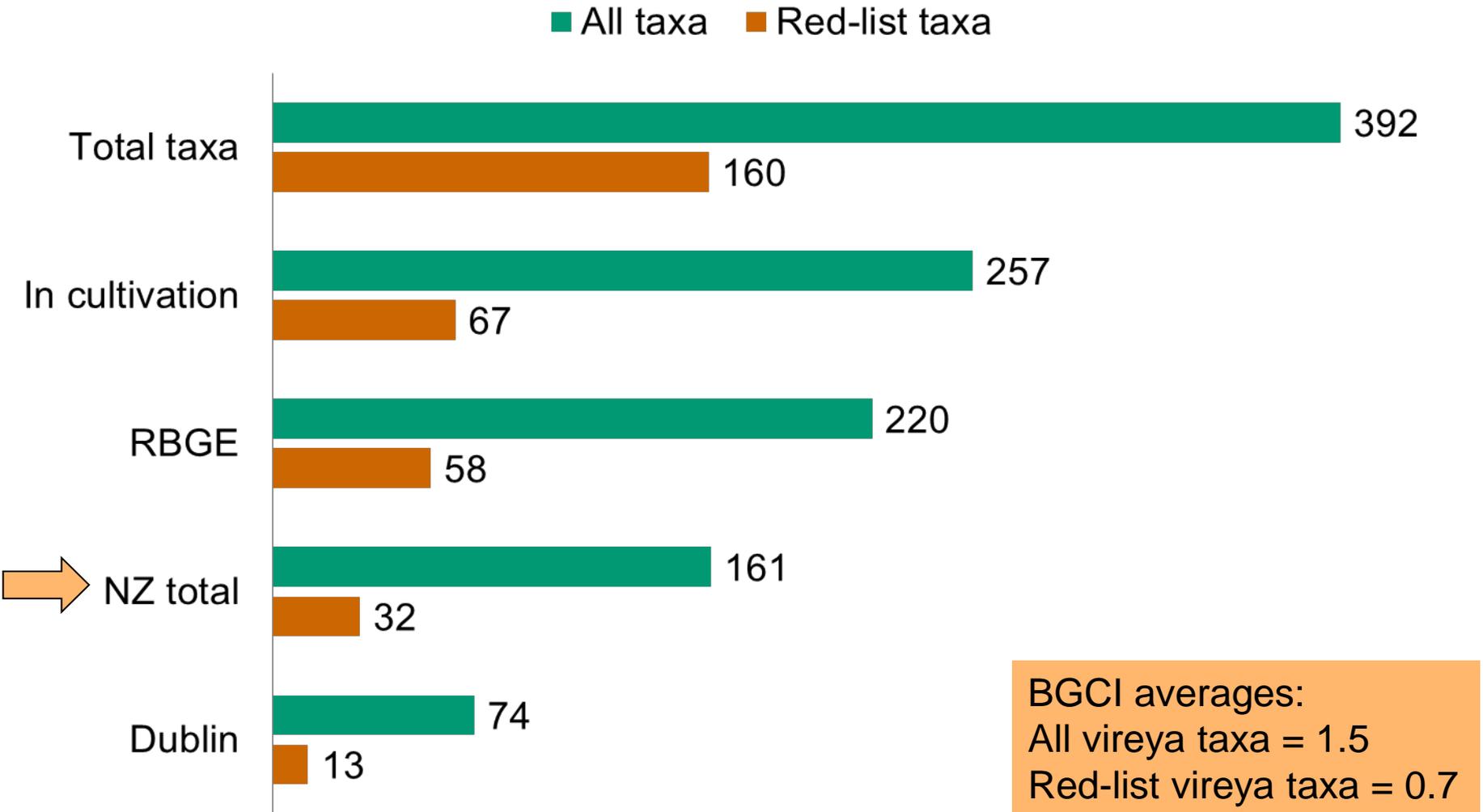
■ All taxa ■ Red-list taxa



BGCI averages:
All temperate taxa = 10.1
Red-list temperate taxa = 5.3

'In cultivation' = those taxa recorded at either BGCI, RBGE, Kew, or NZ.

Results: Vireya Taxa Comparison



'In cultivation' = those taxa recorded at either BGCI, RBGE, Kew, or NZ.

Results: Wild-Source Taxa in NZ

262 in total

88 red-list taxa

Different sources

Unclear documentation



R. macabeanum – EN
Wild source



Results: Taxa in NZ

- Limited numbers of accessions
- Variable representation of different groups
- Horticultural collections (private)
- Collections concentrated on few sites
- Documentation often limited

New Zealand Perspective

Vireya Study

Rhododendron in NZ: Vireya Study

Taxonomic uncertainty and conservation



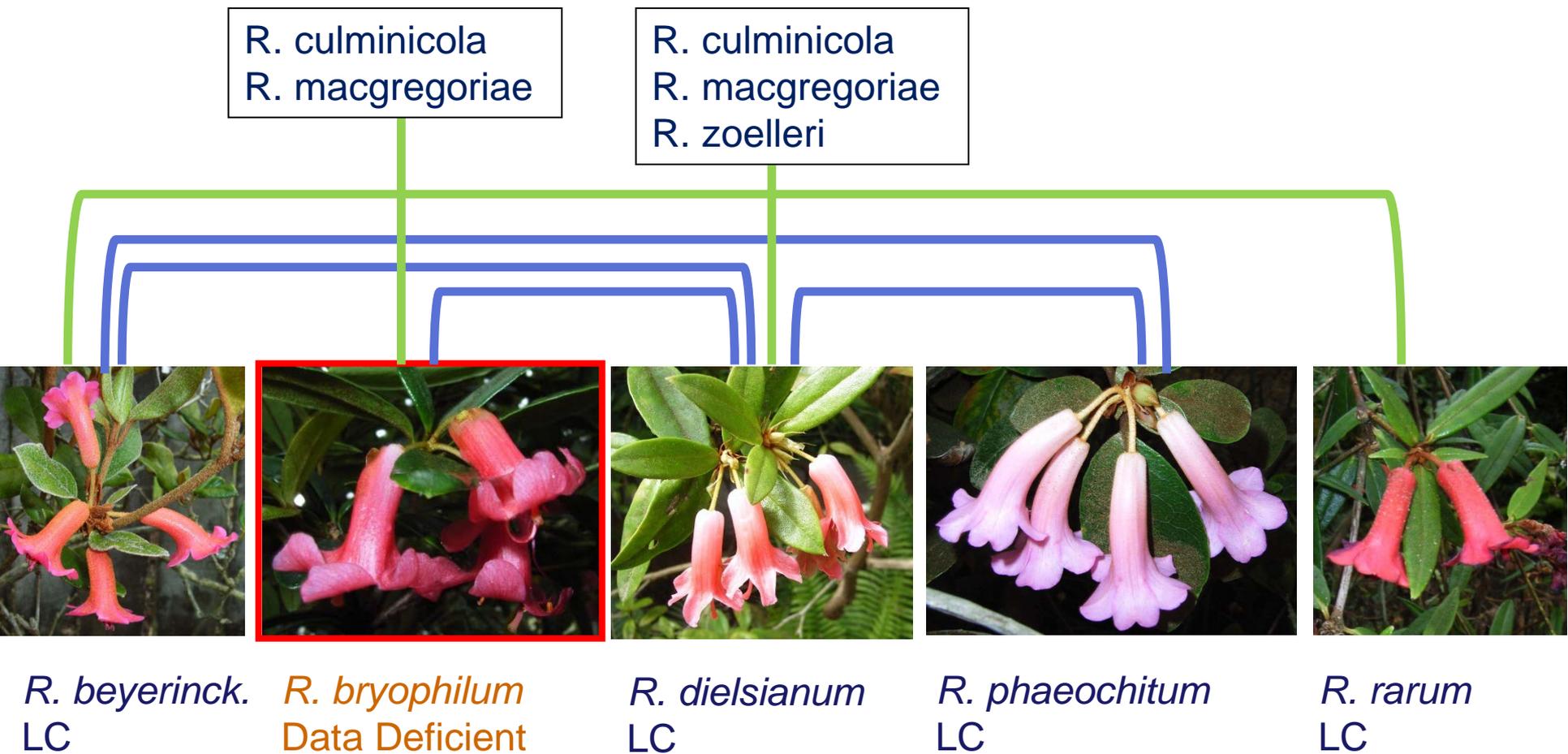
R. bryophilum – Data Deficient



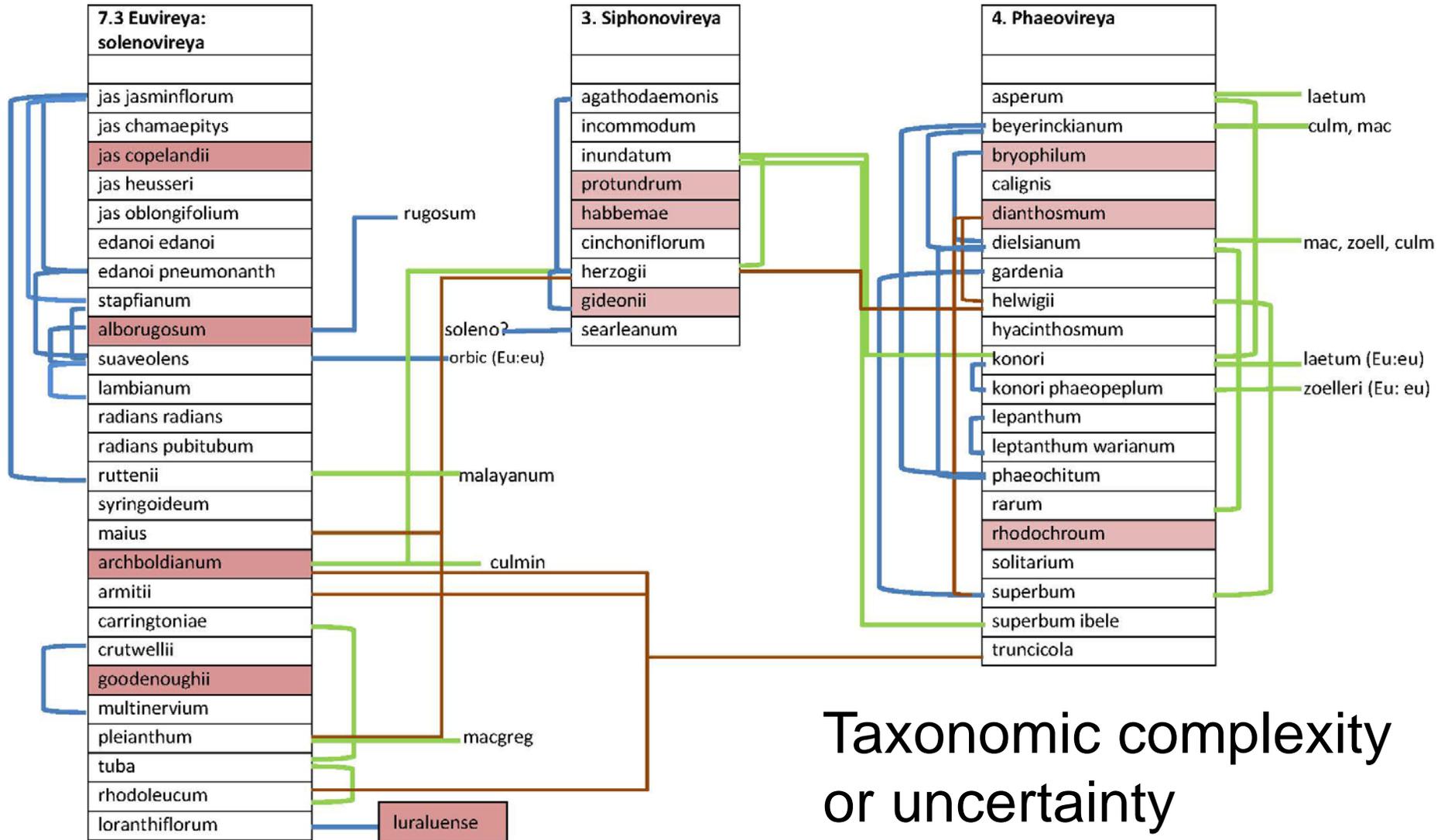
R. dielsianum- Least Concern

Rhododendron in NZ: Vireya Study

Taxonomic uncertainty and conservation



Rhododendron in NZ: Vireya Study



Rhododendron in NZ: Vireya Study

Taxonomic uncertainty/complexity

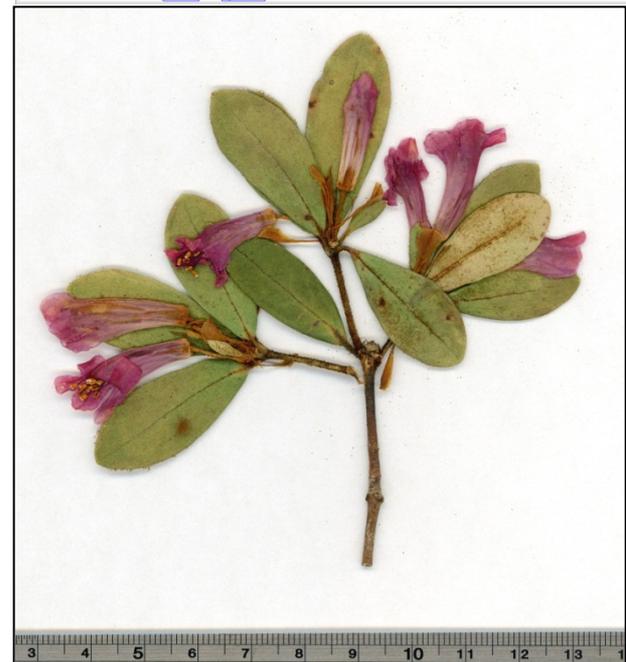
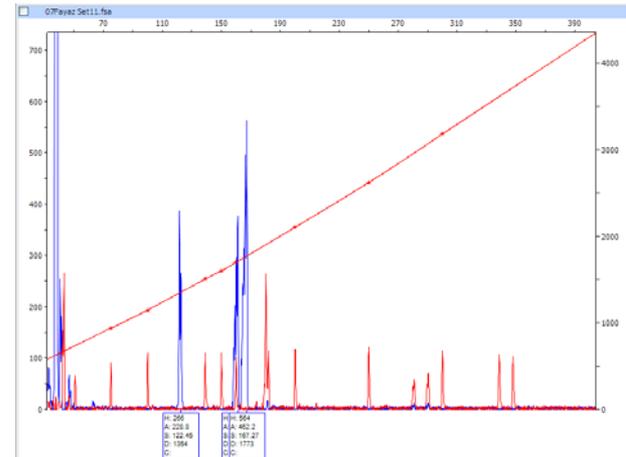
- Are red-list species distinct enough to warrant conservation?
- Are accessions diverse enough to be useful for conservation?



Rhododendron in NZ: *Vireya* Study

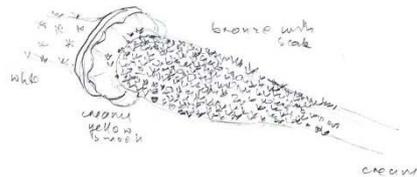
Method: *vireya* study

- Molecular screening of red-list taxa and relatives
 - RAPD
 - Microsatellite
 - Sequencing
- Morphological study

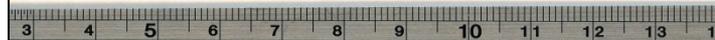




- tube outer. Some scales but sparse
- tube inner quite smooth
- stamens not equal
- anthers short & stumpy, gold
- filaments bright pink, smooth at top quite smooth all way down.
- stigma yellow green, round, 5 lobes
- style yellowish. Some scales at base
- ovary densely covered with scales, No hairs. Scales arms could be mistaken for hairs, but there only scales here
- disc smooth yellow with few scales at junction with ovary

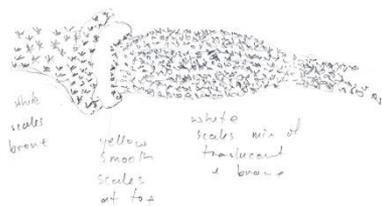


R. bryophilum EK649



EK502

- tube outer, some scales but not very number
- anthers short & stumpy, gold
- filaments pink & smooth, seem to be smooth all way to base, except for a few short stumpy hairs towards to base
- ovary white. Base plate yellow



checked later - glabrous style ✓
for diels. except for few hairs at base x

1 Dec 2010 sample only partly shows scales on calyx, some calyxes appear quite smooth. Guessing the scales fall off?

HF023

R. dielsianum HF023



Results: Vireya Study

R. luraluense - Vulnerable

Results indicate diversity among accessions

➤ Useful for conservation



Results: Vireya Study

R. archboldianum - Data Deficient

The two accessions appear identical

➤ More accessions needed for conservation



Results: Vireya Study

R. arenicola - Data Deficient

Groups with *R. lagunculicarpum* – LC

➤ Lower priority for conservation



Results: Vireya Study

R. perakense – Least Concern

Distinct separation from other *Discovireya*

- Conservation?
- *R. buxoides*: VU



R. perakense

Results: Vireya Study

R. bryophilum - Data Deficient

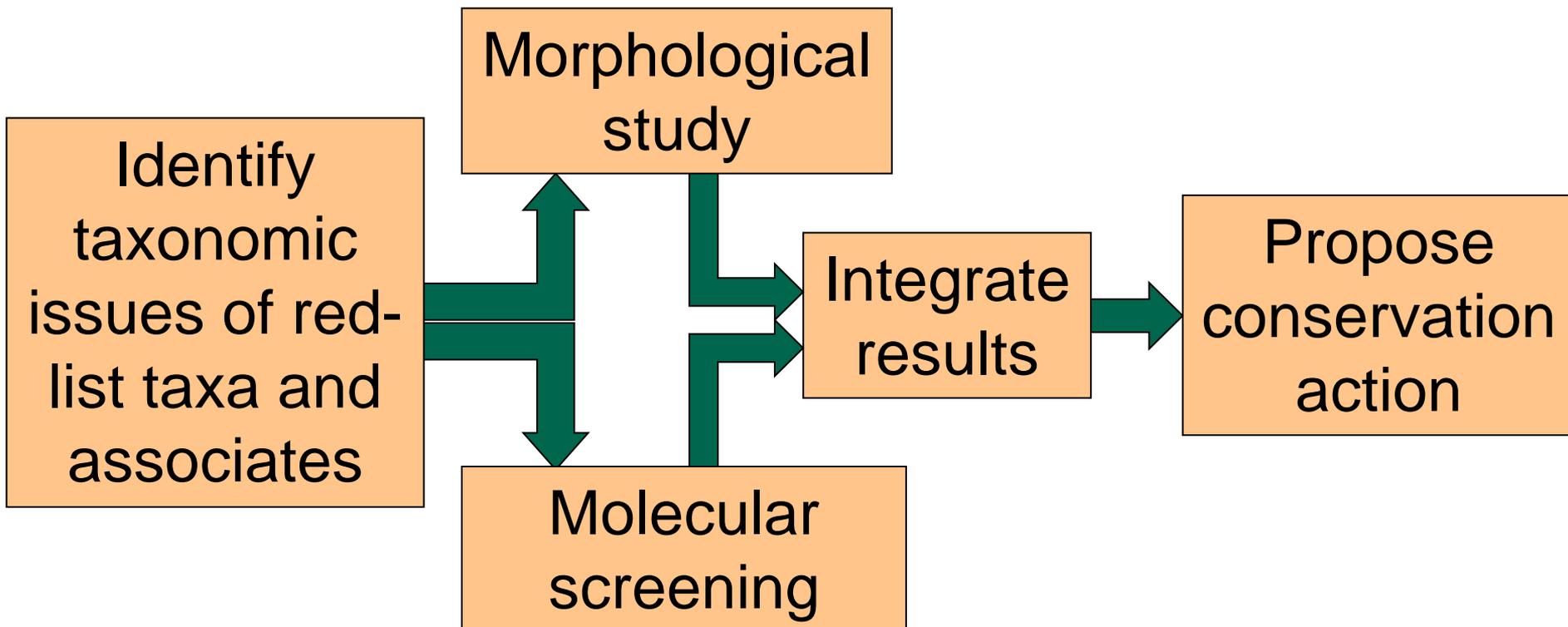
Molecular results suggest diversity, but all samples identify as *R. dielsianum*

- Not useful for conservation



Results: Vireya Study

Method: integrating taxonomic issues and conservation





New Zealand Perspective

Conservation Issues

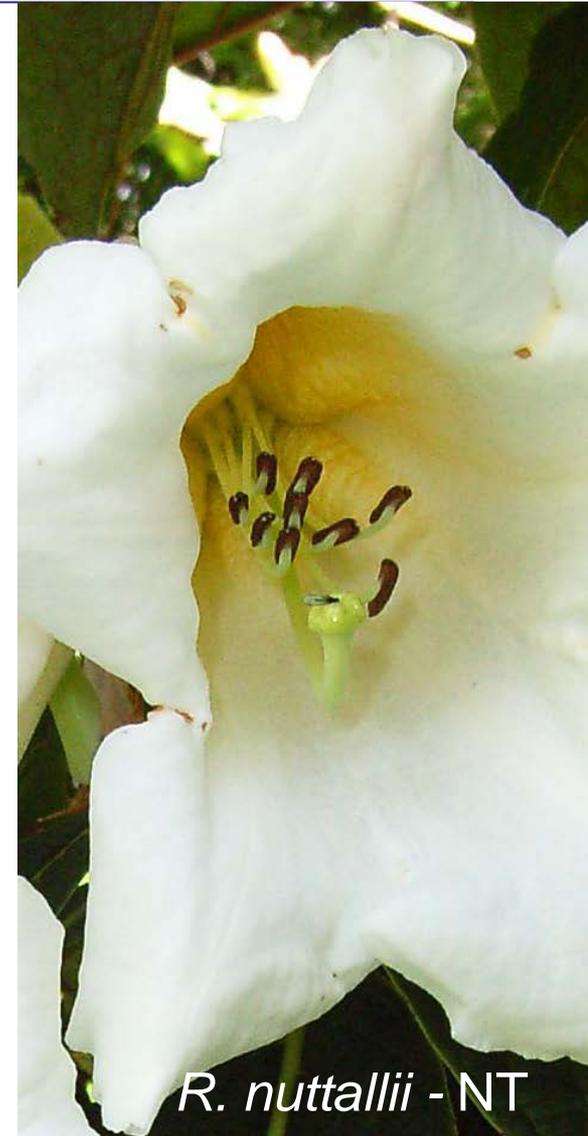
Conservation Issues

Weaknesses: NZ

- Limited numbers of accessions
- Identity and verification
- Uneven representation of groups

- Wild-source not evenly spread
- Unclear or limited documentation

- Incomplete collections data
- Limited international comparison



R. nuttallii - NT

Conservation Issues

Strengths: NZ

- Many taxa
- Diversity: some accessions
- Wild source material
- Different wild source material
- Integrated method to relate taxonomy and conservation



New Zealand Perspective

Conservation Action



Conservation Action: Principles

Develop conservation plan

Deeper understanding of the resource

Collective international action

Address known barriers





Conservation Action

Develop a network of collections world-wide

- Vireya, temperate, other groups
- Process and criteria to select sites
- Development plan for each collection
- Priorities





Conservation Action

Address the information problem

- Extend the international database
 - More collections
 - Different data categories
- Information gaps and priorities
- Taxonomic uncertainty and conservation
- Form research projects



Conservation Action

Address the information problem

- Better links between 'collection' and 'database'
 - Plant, no record
 - Record, no plant
 - Record, wrong plant
- Field work: identification
- Resources to facilitate identification
- Molecular and morphological research





Conservation Action

Address the issue of low accession numbers and diversity:

- Further analysis of existing collections
- Horticultural collections: molecular screening
- Exchange existing material

- Priority: vireya?
- Taxa 'not in cultivation'





Conservation Action

Use international connections

- Overall strategy
- Divided into projects
- Collaborate with research partners



Conclusion

- *Rhododendron* resource in New Zealand
- *Vireya* research on-going



R. acrophilum - CR



Acknowledgements

- Sibbald Trust, UK
- Pukeiti Rhododendron Trust
- Botanic Gardens Conservation International, UK
- American Rhododendron Society
- Rhododendron Species Botanical Garden, USA
- Species Conservation Group, UK
- Peter Skellerup Plant Conservation Award
- Sir Victor Davies Research Foundation
- George Mason Charitable Trust
- New Zealand Rhododendron Association
- Ben Hall, Washington
- Frank Dunneman, Dresden
- Kay Sinclair, Massey University
- Collection owners in New Zealand
- The New Zealand Institute of Plant & Food Research Ltd
- Massey University

