

IN THE MATTER

of the Resource Management Act 1991

AND

IN THE MATTER

of an application to amend the Water Conservation
(Kawarau) Order 1997 pursuant to section 216 of the
Act

BY

the New Zealand and Otago Fish and Game Councils

**Statement of Further Evidence of John Worrell Barkla
On Behalf of Director-General of Conservation**

Dated 27th April 2010

Department of Conservation

Otago Conservancy

Conservation House

Lower Stuart Street

P O Box 5244

DUNEDIN

Phone: (03) 477 0677

Fax: (03) 477 8626

Solicitor: P D Williams

DDI (03) 474 6902

Email: pwilliams@doc.govt.nz

1. Introduction – Qualifications and Experience

- 1.1 My full name is John Worrell Barkla. I am currently employed by the Department of Conservation, Otago Conservancy, as a botanist within the Technical Support Unit
- 1.2 My qualifications and experience are set out in my primary brief of evidence dated 12 February 2010.

2. Scope of Evidence

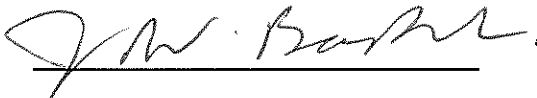
- 2.1 This evidence covers the status of various *Myosotis* species including some plants found in the Nevis Valley, and which were discussed in questions to Mr Neill Simpson from the Special Tribunal at the hearing on 19 April 2010.

3. Taxonomic status of Myosotis Plant Species

- 3.1 Plants are classified on a taxonomic basis into family, genus, species, subspecies, variety and forma. The basic taxonomic unit is a species. A plant species is one which has been described and formally published in accordance with the requirements of the International Code of Botanical Nomenclature and is generally accepted as a distinct species.
- 3.2 The very recently published book *Threatened Plants of New Zealand* sets out to provide a comprehensive and current account of New Zealand's most severely threatened indigenous vascular plants. This book contains as an appendix a paper I and one of the authors, Dr Peter de Lange, prepared formally describing the following species:
 - a) *Myosotis glauca* – previously known as *Myosotis pygmaea* var. *glauca* as described by Simpson and Thomson in 1943;
 - b) *Myosotis drucei* – previously known as *Myosotis pygmaea* var. *drucei* as described by Moore in 1961; and
 - c) *Myosotis brevis* – previously known as *Myosotis pygmaea* var. *minutiflora* as described by Simpson and Thompson in 1943. This species was unable to be named "*Myosotis minutiflora*" as there is already an overseas species with that name.
- 3.3 This publication of these formal species descriptions meets the requirements of the International Code of Botanical Nomenclature. These

plants may now be fairly considered as plant species in their own right rather than being subspecies of *Myosotis pygmaea*.

3.4 This Appendix is attached to this evidence at "A".

A handwritten signature in black ink, appearing to read 'J W Barkla', is written over a horizontal line.

John Worrell Barkla

Dated 27th April 2010

References

de Lange, P. J.; Heenan, P. B.; Norton, D. A.; Rolfe J; Sawyer J 2010: *Threatened Plants of New Zealand*. Canterbury University Press

"A"

Appendix

New Combinations

With the exception of the new combination proposed here for *Myosotis pygmaea* var. *drucei* L.B.Moore, the combinations made below are for taxa whose conservation management is of concern, and which are treated in this book.

Asteraceae

Pseudognaphalium ephemerum de Lange nom. nov.

≡ *Gnaphalium luteoalbum* var. *compactum* Kirk *Stud. Fl. N. Z.* 298 (1899)

LECTOTYPE (Designated here): 'Drybed of Lake Lyndon, T. Kirk', WELT SP58012!

COMMENTS: *Gnaphalium luteoalbum* var. *compactum* was not transferred to *Pseudognaphalium* by Hilliard and Burtt (1981) or Anderberg (1991). Nevertheless *Gnaphalium luteoalbum* var. *compactum* shares the following key characters with *Pseudognaphalium*: involucre bracts with a divided stereome, short involucre bracts, female florets outnumbering the hermaphrodite, and usually filiform pappus hairs that are scabrid with bases cohering by patent cilia. For these reasons this plant has been widely known in New Zealand by the informal tag name *Pseudognaphalium* 'compactum' and illegitimate combination *P. compactum*. However, as that combination has never legally been made, *Gnaphalium luteoalbum* var. *compactum* to *Pseudognaphalium* is here effectively transferred. It is also recognised that this combination is effectively interim, as the generic status of *Pseudognaphalium*, let alone its satellite genus *Laphangium* into which *P. luteoalbum* has sometimes been placed (see Greuter 2003), is questionable and recent research suggests that both genera might be better merged with *Helichrysum* (A. Anderberg and I. Breitwieser pers. comm.). Nevertheless it would seem that even that merger is unlikely to be effected in the short term, and in the meantime transferral to species rank within a genus that is still widely used in New Zealand seems preferable to leaving *P. ephemerum* within the wrong genus altogether and there at a rank where its conservation management would seem unlikely.

Pseudognaphalium ephemerum is distinctive, both morphologically and ecologically, and is on occasion sympatric with others of the New Zealand *P. luteoalbum* agg. Kirk (1899) described this plant from specimens he gathered with John Enys from Lake Lyndon, and his protologue includes both authors. However, there are no specimens available that match the protologue as to both collectors. As noted by de Lange (2007), for Kirk's preparation toward the publication of his *Students' Flora*, he routinely rewrote labels of new taxa he was describing in that publication and in the process normally discarded associated collectors. Further, because that book was published posthumously from Kirk's unfinished manuscripts, many of the protologues appear in a draft or unfinished state. Therefore matching specimens to the exact wording of the protologues published in that book is not always possible, and some latitude for interpretation is called for in many typifications of Kirk taxa named within that publication. The specimen selected here is regarded as lectotype because in common

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with other taxa named in that publication (see de Lange 2007) Kirk has labelled the sheet 'Stud. Fl. N.Z.', evidence of his final decision as to name and rank, while the gathering matches the protologue as to location and the author of the name. Two further sheets at WELT (SP44760 & SP44761) appear to be part of the same gathering but are excluded from the syntypes because they are labelled 'Gnaphalium luteoalbum var. nanum', an unpublished manuscript name Kirk never adopted.

The epithet '*epherum*' alludes to the ephemeral wetland habit of the species. The name is taken in preference to Kirk's epithet '*compactum*' because of the past frequent and illegitimate publication of '*Pseudognaphalium compactum*' by New Zealand botanists.

Senecio lautus subsp. *esperensis* (Sykes) de Lange comb. et stat nov.

≡ *S. lautus* subsp. *lautus* var. *esperensis* Sykes *N. Z. J. Bot.* 9: 533–538 (1971)

HOLOTYPE: 'Kermadec Islands, L'Esperance; scoria pockets inside crater, W. R. Sykes, 19 Jul 1969', CHR 193800!

COMMENTS: As the current rank of variety is considered inconsistent with the application of that rank elsewhere within the genus, or indeed within modern usage of the term in the New Zealand flora (see for example de Lange and Murray 1998; de Lange et al. 2005), a new combination at the more appropriate rank of subspecies is here made for this allopatric endemic.

Boraginaceae

Myosotis brevis de Lange et Barkla nom. nov., stat nov.

≡ *M. pygmaea* var. *minutiflora* G.Simpson et J.S.Thomson *T. R. S. N. Z.* 73: 155–171 (p. 161), (1943)

HOLOTYPE: 'Lake Lyndon, Canterbury, moist gravel at lake shores, G.Simpson & J.S.Thomson', CHR 75725!

COMMENTS: *M. brevis* is morphologically closest to *M. pygmaea* s.str., with which it has been found growing sympatrically. From that species, it differs by its usually strict annual habit, dull brown-green to dull olive-green rather than dull pale grey-green leaves, obliquely sessile rather than attenuate to cuneate bracts, and much smaller cream, pale blue or cream striped with blue rather than white flowers; (0.5–1mm in *M. brevis*, 1.5–3.0mm in *M. pygmaea*). The seeds of *M. brevis* are notably smaller 0.9–1.1 × 0.6–0.8mm, and with the ventral surface more prominently keeled than in the other members of *M. pygmaea* complex (fide Webb and Simpson 2001) In non-flowering material it can be reliably distinguished from the other species in the *M. pygmaea* complex, *M. drucei* (L.B.Moore) de Lange et Barkla and *M. glauca* (G.Simpson et J.S.Thomson) de Lange et Barkla, by non-strigose to weakly strigose, stiff, somewhat spreading leaf hairs. It has been observed that occasional intermediates are found between this species and *M. pygmaea* s.str. or *M. glauca* s.str. However, such occurrences are infrequent and are taken here as putative evidence of occasional hybridism between these normally selfing species. Further study is required to resolve their exact status. The epithet '*minutiflora*' could not be used at species rank for this taxon because it is preoccupied by *M. minutiflora* Boiss. et Reut. The epithet '*brevis*' alludes to the brief life span of this usually annual to short-lived perennial species.

Myosotis drucei (L.B.Moore) de Lange et Barkla comb. et stat nov.

≡ *M. pygmaea* var. *drucei* L.B.Moore *Fl. N. Z. Vol. I*: 816, 973, (1961)

HOLOTYPE: 'Whanahua Range, Ruahine Mountains, Mt Maungamahoe [sic] (Maungamahue), Rock at summit, 5450 feet, J. A. Hay, 21 Jan 1952', CHR 76820!

COMMENTS: *Myosotis drucei* is part of a complex of taxa allied to *M. pygmaea* Colenso. From *M. pygmaea* s.str. it differs consistently by its cream to lemon-coloured flowers; pilose, tapering leaf hairs with finely flexuous tips; generally longer calyx furnished with two types of hairs, longer strigose antrorse and short non-strigose retrorse; and particularly by the nutlets, which are deeply immersed within the calyx, never protruding. Both species show ecological partitioning and are very rarely sympatric. *M. drucei* is primarily a species of mountains, where it grows on damp semi-stable scree, boulders, cliff faces and fell-field. However, it has also been found growing on compacted soil on gritty ground and in leaf litter within *Chionochloa rubra* Zotov subsp. *rubra* tussock grassland, where it occasionally overlaps with the distribution of *M. pygmaea*, and another as yet unnamed entity allied to it and apparently endemic to the Volcanic Plateau of the North Island. *Myosotis pygmaea* occupies a wider range of habitats than *M. drucei*, growing in coastal, lowland and mountainous areas. In places of sympatry, such as the Volcanic Plateau, Kaimanawa and Ruahine Ranges, both species maintain their distinctiveness.

Myosotis glauca (G.Simpson et J.S.Thomson) de Lange et Barkla comb. et stat nov.

≡ *M. pygmaea* var. *glauca* G.Simpson et J.S.Thomson, *T. P. R. S. N. Z.* 72: 21-40 (p. 26), (1942)

HOLOTYPE: 'Base of Mount Ida at 500 m. altitude, Simpson & Thomson', CHR 75722!

COMMENTS: Ecologically and morphologically distinct from *M. pygmaea* Colenso, *M. glauca* is a species of montane to alpine areas where it inhabits rather open dry sandy gravelly ground (often near rivers) and clay pans, often in sites kept open by wind ablation. It has been found occasionally growing sympatrically with *M. brevis* de Lange et Barkla and *M. pygmaea* Colenso. From the rest of the *M. pygmaea* complex it is clearly distinguished by the sparsely leaved rosettes; glaucous green to grey leaves whose upper surface is furnished with sparse, antrorse, closely appressed, stiff strigose hairs while the undersides are virtually glabrous; and by the narrow, spreading calyx lobes whose outer surface is sparsely clad in stiff, rather coarse, antrorse hairs and whose inner surface is glabrous except for the midline, which is furnished with 4-5 sparse, erect, stiff and short hairs. Webb and Simpson (2001) further note that the seeds of this species can be distinguished from the rest of the *M. pygmaea* complex by their usually more broadly-ovate shape (1.2-1.5 × 0.8-1.2mm). On rare occasions intermediates have been found between this species and *M. pygmaea* or *M. brevis*. These occurrences are taken here as putative evidence of occasional hybridism between these normally selfing species. Further study is required to resolve their exact status.

Myosotis lytteltonensis (Laing et A.Wall) de Lange comb et stat nov.

≡ *M. australis* var. *lytteltonensis* Laing et A.Wall, *T. P. R. S. N. Z.* 51: 438-444 (p. 442) (1924)

HOLOTYPE: 'Mt Pleasant, Lyttelton', Robt. M. Laing, Nov. 1917, CHR 17637!

ISOTYPE: CHR 17636!

COMMENTS: *M. lytteltonensis* is not closely allied to the *M. australis* R.Br. complex. It is perhaps closest to *M. forsteri* Lehm., from which it differs by the absence of orange glands from the undersurfaces of the rosette leaves, and the overall general absence, or

paucity if present, of retrorse hairs on the leaves. The calyces of *M. lytteltonensis* also differ from *M. forsteri* in that they are larger and copiously covered in long hairs, and the lobes are more deeply cut. It is also ecologically distinct from that species. From the New Zealand members of the *M. australis* complex, *M. lytteltonensis* differs by its much larger size, by the weakly spreading, decumbent to weakly erect lateral branches (which often root on contact with the soil), larger funnellform flowers, with longer filaments, longer style and paler nutlets. It has no obvious relationship to *M. australis* s.str., which is here regarded as an Australian endemic.

Plantaginaceae

Parabebe jovellanooides (Garn.-Jones et de Lange) de Lange comb. nov.

≡ *Veronica jovellanooides* Garn.-Jones et de Lange N.Z.J.Bot. 47: 271–279 (2009)

HOLOTYPE: 'New Zealand, North Island, Auckland Ecological Region, Rodney Ecological District, Waimauku, behind 215 Ararimu Valley Road (Westbrook Winery), Ernest Morgan Reserve. P. J. de Lange 7534, G. R. Davidson, R. O. Gardner, & M. E. Young, 9 Nov 2008', AK 304567!

COMMENTS: The short-tubed corolla with broad spreading white lobes, yellowish green throat and magenta eye and nectar guides of *Veronica jovellanooides* are all characteristic of the majority of the species traditionally placed within the segregate genus *Parabebe*, while DNA sequence data firmly places *Veronica jovellanooides* within *Parabebe* (see discussion by Davidson et al. 2009). Because the widened circumscription of *Veronica* advocated by mostly northern hemisphere botanists – which includes the merger of the hitherto distinctive southern hemisphere genera *Chionohebe*, *Detzneria*, *Derwintea*, *Hebe*, *Hebejeebie*, *Heliohebe*, *Leonhebe* and *Parabebe* into *Veronica* – has not met with universal acceptance in New Zealand (see comments by de Lange & Rolfe 2008 and Norton & Molloy 2009), a combination for *V. jovellanooides* in *Parabebe* is here provided.



THREATENED PLANTS OF NEW ZEALAND

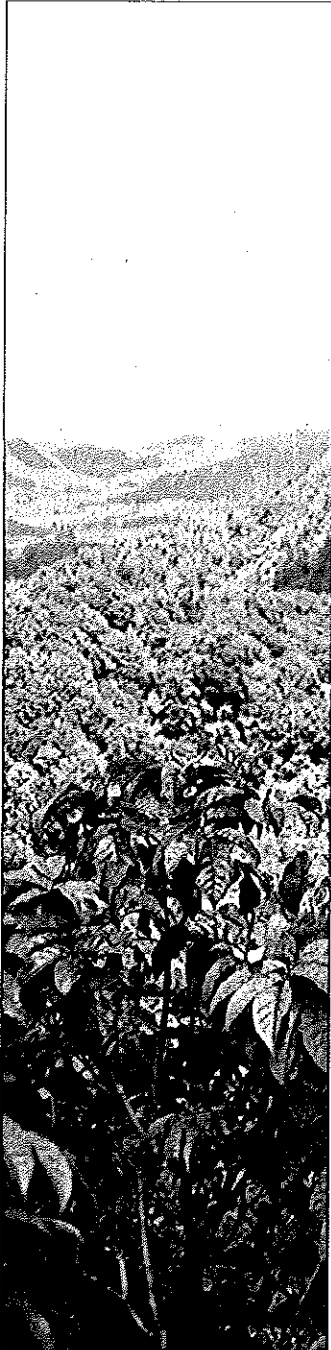
PETER DE LANGE

PETER HEENAN

DAVID NORTON

JEREMY ROLFE

JOHN SAWYER



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Clinathus puniceus
Peter Heenan

Back cover images:
(Top to bottom)

Hypericum minutiflorum
Jeremy Rolfe

Drosera pygmaea
Nick Singers

Gentianella scopulorum
Phil Knightbridge

Alectryon excelsus subsp. *grandis*
Jeremy Rolfe

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