

THE WIGGY-WIG BUSH – ORPHAN OR GERIATRIC? *MUEHLENBECKIA ASTONII* (POLYGONACEAE) IN NORTH CANTERBURY AND MARLBOROUGH.

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One of the very conspicuous elements of the family Polygonaceae in New Zealand is the genus *Muehlenbeckia*. Most are non-descript scramblers or even weeds, the exception being *M. astonii*, or shrubby tororaro which is a medium to large-sized shrub found in four discrete areas: coastal Wellington, northeastern Marlborough, north Canterbury and Kaitorete Spit just south of Christchurch. It is the only stiffly shrubby member of the genus in New Zealand, readily recognized by its orange, interlaced zig-zag wiry stems, small limegreen and somewhat heart-shaped leaves, very small but numerous flowers, and its compact and dense habit that, in older plants has been likened to a gigantic natural mattress. As plants age cane-like new stems are formed in the interior of the bushes.

It is curious that such a distinct plant should not be recognised until the early part of this century when Donald Petrie (1911) described it from plants collected by B.C. Aston from the Wellington coast. It was first noted from Marlborough by Petrie, but most of the North Canterbury sites were not known until nassella tussock surveys by Arthur Healy in the 1950s and 1960s. In total, c. 2600 plants have been found, of which over 90% are known from Kaitorete Spit in mid Canterbury. Shrubby tororaro was not included on threatened plant lists until the late 1980s, a reflection of both its wide distribution and (until recently) the few people who had encountered it in the wild. That has dramatically changed with recognition of its status as nationally Endangered and publication of a national recovery plan (de Lange and Jones 2000).

In Marlborough, the species occurs at a number of separate sites from the north side of the Wither Hills, immediately south of Blenheim, to the Ward area and Blind Stream. Within this region it tends to occur (or has occurred in the past) in several discrete areas: the Wither Hills, lower Awatere Valley, Blind River and Clifford Bay to Cape Campbell, Ward area. There is also an isolated and older record from the Inland Kaikoura Range.

In North Canterbury, it is currently known from near Waiua, at Balmoral overlooking the south end of the Culverden Plain where there are several discrete sites, near Weka Pass, Waikari Stream, and at four sites along the Waipara River. Records, which have yet to be reconfirmed, are known from near Scargill.

In North Canterbury and Marlborough it has a particularly fragmentary range that reflects profound land use modification and loss of habitat. In fact, one of the remarkable features of this species is that virtually no site preserves anything likely to approach its original habitat. One of the immediate research problems for ensuring the long term security of this species is to reconstruct its likely past habitat including characteristic associated species.

Muehlenbeckia astonii is a valuable horticultural plant and preservation of an adequate gene-pool is desirable. The species has value as a shrub for hedges and has potential as a shelter plant in drier parts of the South Island. It was noticeable during the severe droughts of the 2000/2001 summer that *M. astonii* generally showed no signs of obvious drought stress, when many exotic species and even some indigenous species showed considerable drought stress. This provides a potential selling point for its reestablishment on both private and public land.

What sort of habitat does this species occupy? Sufficient field information is now available to be able to offer some ecological characterisation of *Muehlenbeckia astonii*. Sixty-nine plants have been examined in the field in North Canterbury and Marlborough. Parameters measured are not sophisticated, but include, a brief description of surrounding vegetation (usually highly modified and largely exotic), slope, aspect, soil pH and plant dimensions as a measure of health and vigour.

With regard to aspect, plants tend to be located on warmer and sunnier slopes generally ranging from north to southeast (Fig. 1). Where there is a choice there appears to be a tendency for individuals to face into major rivers or coastal beaches rather than occur on slopes that face away from these.

Muehlenbeckia astonii has a strong tendency to grow on slopes; it has a preference for relatively gentle slopes but can be found on slopes in excess of 30° (Fig. 1). One feature noted in the field is that in North Canterbury and Marlborough it often occurs on terrace faces where there is a break in slope especially the upper slope break at the top of a terrace face. In North Canterbury and Marlborough, the species usually occurs in free-draining, colluvial or reworked soils, generally with a matrix of clay or sand and sometimes with significant loess content. The pH mean for plants sampled is slightly above 6, but ranges from 3 to 7. Although often close to limestone it consistently avoids direct contact with limestone and soils directly overlying limestone and calcareous sandstones, although sometimes found less than 100 m away from limestone. Similarly the species appears to avoid direct contact with volcanic underlying rock, e.g., at Haldon Hills, Marlborough, where it occurs, as in Canterbury on reworked soils.

At virtually all sites the original vegetation has been very highly modified or even destroyed, so that many plants now grow in highly modified, grazed grasslands. Only at Balmoral on the south side of the Hurunui River, the upper part of the Waipara Gorge, and possibly at Cape Campbell is it possible to gain an impression of the original associated vegetation. At Cape Campbell it is likely that the current vegetation inside a fenced area under covenant is highly modified. There is need to reconstruct likely vegetation associates before attempting restoration and this has been recognized by the Species Recovery Team. Analysis of both structure and species make-up of shrubland and grass/sedgeland mosaics (including small-leaved *Coprosma* and *Olearia*, and *Sophora* and *Cassinia*) adjacent to existing sites should be part of that research. *Muehlenbeckia astonii* does not appear to grow in association with medium or broad-leaved trees and shrubs, or in direct association with manuka or kanuka.

An important consideration is that the existing spatial configuration of individual plants of *Muehlenbeckia astonii* probably closely reflects the original disposition of

the species in vegetation. It is significant that nineteenth century botanists did not recognize a shrub that can form a bush several metres across and up three metres high, especially as several large plants currently occur very close to roads that have been major travelling routes since the 1850s. This suggests that the species has never been particularly abundant at any one site. Restoration or enhancement of the habitat, including replanting of the species, should attempt to approximate this spatial pattern. Field observation at the Hurunui (Balmoral) site, Cape Campbell and Mussel Point, also points to a high degree of aggregation of individuals within populations.

A concern regarding the future of this species is that reproduction is practically unknown. Flowers are either females or ‘inconstant males’ and seed are produced where there is opportunity for cross-pollination (de Lange and Jones 2000). These authors also briefly summarise what we know of dispersal of seeds, including the role of small animals. However, there is still considerable scope for study of the biology of this species, and especially for the reasons for reproductive failure in the wild. It is assumed at the present time that existing wild plants largely represent an aging cohort of currently unknown longevity. This species is both an orphan (of its former dry scrub associations) and a geriatric.

Undoubtedly, further plants of this fascinating species will be discovered. Once one gets ones eye in for the species it can be readily distinguished, even from a distance, using binoculars. However, much of the countryside where it occurs is rugged and dissected hill country where there are many areas of possibly suitable habitat tucked away in obscure gullies. Being a very localised and threatened species, records should be confirmed by close examination and herbarium specimens or photographs. Suspected new records and further information on the species can be forwarded either to Department of Conservation area offices or to the Isaac Centre for Nature Conservation at Lincoln University.

And why ‘wiggly-wig bush’? This delightfully descriptive name derives from a newspaper article by Ted Reynolds, who at the time had retired to a property on the north side of the Awatere River close to Seddon. In an edition of his regular feature article (*Out in the Country*) in the Marlborough Express of 18 June 1996 he talked about the large igloo-like plant of *M. astonii* that had been discovered on his property and suggested that, “*And all there was to view was the world’s biggest wiggly-wig bush*”. And – so the name has stuck!

REFERENCES

- de Lange, P.; Jones, C. 2000: Shrubby tororaro (*Muehlenbeckia astonii* Petrie) recovery plan 2000–2010. *DoC Threatened Species Recovery Plan 31*.
- Petrie, D. 1911: Description of new native phanerogams. *Transactions of the New Zealand Institute 43*: 254–257.

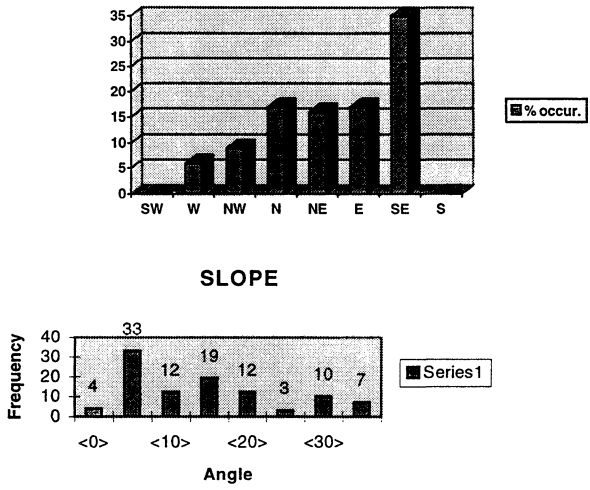
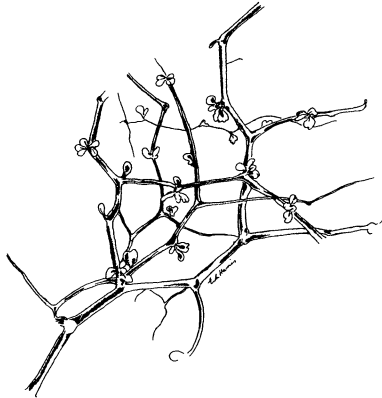


Fig. 1. The occurrence of *Muehlenbeckia astonii* in relation to aspect and slope.



Wiggy-Wig twigs. *Muehlenbeckia astonii*. (del. Emily S. Harris).