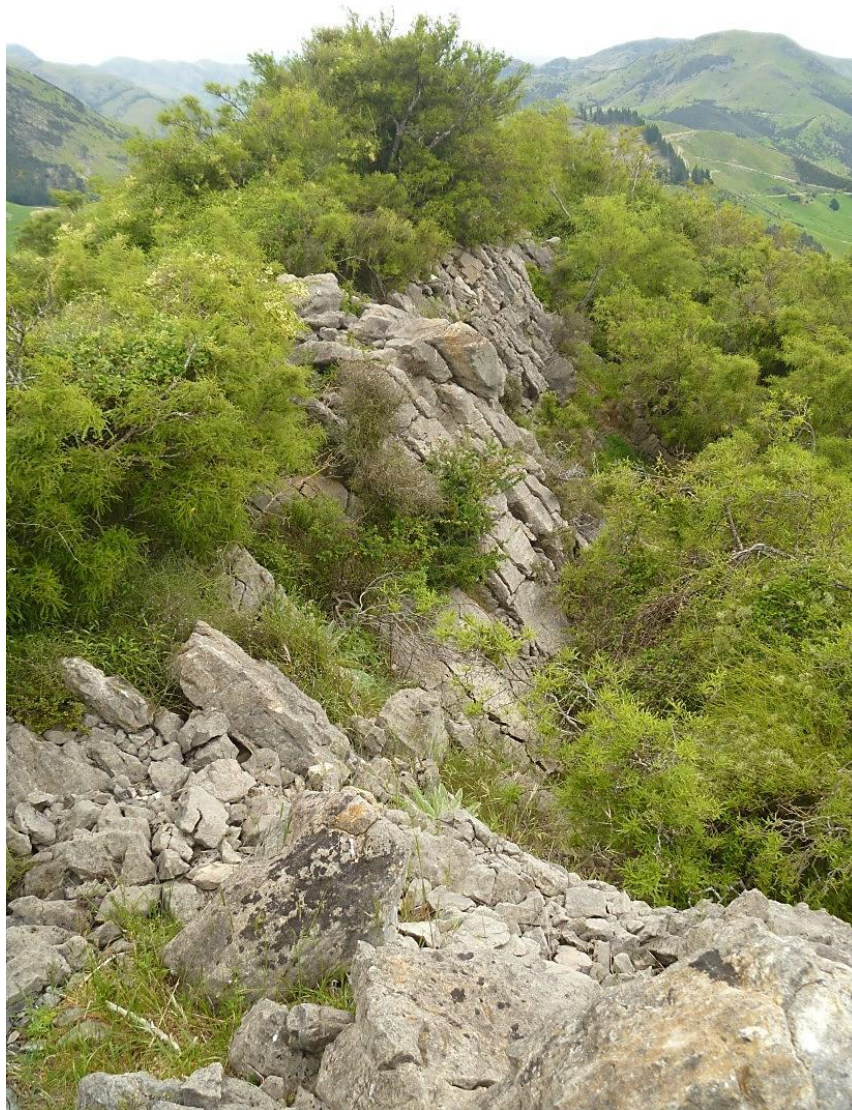


## ***SOPHORA LONGICARINATA* - A NEW KOWHAI RECORD FOR CANTERBURY**

**Miles Giller**

The Canterbury Botanical Society's 2013 spring camp was based at Island Hills Station, on the northern side of the Hurunui River, 23 km west of Culverden. Two fairly full days were spent fossicking along sections of the Hurunui High Country Track, looking at a range of montane habitats beside the Mandamus River. Several participants needed to leave somewhat early, so a short outing was arranged on the Sunday for the remaining contingent to botanise a prominent limestone outcrop on neighbouring Glens of Tekoa Station (Fig. 1). This outcrop is clearly visible across the Dove River from the Island Hills accommodation, so we assumed that it would have been visited and botanised at some stage in the past.



**Figure 1** Glens of Tekoa limestone kowhai habitat.

The landform is apparently well known and regularly visited by geology students, described as a syncline of hard, semi-crystalline Weka Pass shell-limestone. This limestone overlies fine-grained red-brown calcareous tuffs derived from a sub-marine basaltic eruption, in turn overlying glauconitic marine sandstone and mudstone. The main part of the limestone is white to cream coloured, but towards the base small amounts of tuffaceous material imparts a pink to red tint, similar to that found at Marble Point (Mason 1949).

An overcast but clearing morning saw Trevor Blogg, Gillian and Miles Giller, Graeme Jane, Alastair Macdonald and Alice Shanks climbing from the Dove River valley floor, heading for a low ridge capped by a canopy of light green coloured forest. Shrubland vegetation on the way up was familiar enough to us, scattered *Coprosma propinqua*, kanuka and *Melicytus* aff. *alpinus* over silver tussock and a pasture sward, growing mainly on loessial soils. Nearing the crest we encountered darker rendzina soils, with a few small kowhai trees and more *Coprosma propinqua*, plus a few *Coprosma crassifolia* and a lone *C. virescens* (Declining), apparently associated with a few limestone exposures. On the crest itself the hard limestone rocks become far more prominent and the woody vegetation suddenly became far thicker, dominated by extensive kowhai tree-land and forest, albeit of rather shorter stature than most of us were familiar with. We all ticked off the ubiquitous *Sophora microphylla* in our brains, and began eagerly searching for other species, anticipating perhaps finding some unusual little shrub or herb associated with the limestone geology.

After a few minutes, Graeme commented that many of the kowhai looked just like *Sophora longicarinata* – limestone kowhai, a species he was familiar with from north-west Nelson (Fig. 2, p.7). Participants looked back and forth at one another and at the kowhais, and agreed that indeed the kowhais were certainly not typical of other North Canterbury populations. However the expectation of seeing *Sophora longicarinata* had seemed so remote to us that none of us had initially entertained it as a possibility. The nearest record that any of us could recall (the Leatham River) was far away - as it turns out, 110 km to the northeast. We were instead familiar with the ubiquitous *Sophora microphylla*, found throughout the South and North Islands, and with *Sophora prostrata*, endemic to the eastern South Island. We understood that limestone kowhai had not been recorded outside Nelson and Marlborough, and almost convinced ourselves that we were just looking at a particularly fine-leaved form of *S. microphylla*. However specimens of leaves, twigs, flowers and fruit were collected and subsequently taken to the Allan Herbarium, where they were indeed confirmed as *Sophora longicarinata*.





**Figure 2** Glens of Tekoa limestone kowhai foliage.

The first reference to what we now know as *Sophora longicarinata* was by Thomas Cheeseman in 1925, where he wrote of a garden plant, collected from limestone rocks near Takaka, "cultivated in Mr Treadwell's garden at Wellington". Cheeseman briefly described the plant, and noted that "If specimens from the original locality conform to the above characters, I think this plant is at least worthy of varietal distinction, in which case it should bear the name of *S. Treadwellii*" (Cheeseman 1925, Heenan 1998). Seventeen years later the plant was described as a new species *Sophora longicarinata* by George Simpson & John S Thomson (Simpson & Thomson 1942). The epithet *longicarinata* alludes to the length of the flower keel, which was initially thought to be longer than that of typical *S. microphylla*, though subsequent comparisons indicate that the two species are not reliably distinguishable in this respect. *Sophora longicarinata* was subsequently relegated, without any explanation, to varietal rank (*Sophora microphylla* var. *longicarinata*) in Flora of New Zealand volume 1 by Harry Allan (Allan 1961), but was later elevated back to species level by Peter Heenan (Heenan 1998). Possibly as a legacy of these changes, the plant has sometimes been promoted by the nursery trade under the early name *Sophora* 'Treadwellii' (Metcalf 1972).

Early records indicated that limestone kowhai was confined to north-west Nelson, its known distribution later expanding to include Marlborough. Herbarium records have been collected from the Takaka Hill, side creeks of the Takaka River, Pohara, and in the catchments of the

Graham River, Pearce River, Ellis River, Wairoa River, Leatham River, and more recently the Waima (Ure) River. These populations are generally small, isolated and widely separated. The species is restricted to sites characterised by unstable and rapidly eroding base-rich marble and limestone outcrops. It typically grows on ledges and in crevices on limestone and marble outcrops, among boulders, rock debris and rubble surrounding these outcrops, in gullies with deeper soils, and on alluvium over-lying marble rock. It appears to be absent from large areas of apparently suitable habitat, possibly indicating a preference for a very specific niche. The most recent threat listing for New Zealand plants classified *S. longicarinata* as Naturally Uncommon.

*Sophora longicarinata* lacks the divaricating yellow-stemmed growth characteristic of *Sophora prostrata* and juvenile *S. microphylla*. Its growth habit is not as tree-like as *S. microphylla*, sometimes suckering to become multi-stemmed and appearing shrub-like, but without the tangling twigs of *S. prostrata*. The leaflets of *Sophora longicarinata* are small, numerous, and usually spaced well apart compared with those of *S. microphylla* which has relatively larger and closer spaced leaflets, or *S. prostrata* which has small but much less numerous leaflets (Heenan et al. 2001). The pedicels of *Sophora longicarinata* flowers are typically twisted, unlike those of *S. microphylla*, which are typically straight (Heenan 1998).

The Glens of Tekoa site is strongly dominated by *Sophora longicarinata*. Indeed there are few other tree genera present on the limestone, albeit that kanuka (both *Kunzea robusta* and *K. serotina*) are locally abundant close-by on volcanic and loessial soils. Identifying the parentage of all the kowhai trees at the Glens of Tekoa site is somewhat daunting, as *Sophora prostrata* and (rarely) *S. microphylla* are also present, plus an extensive range of hybrids. Plant morphology indicates that most hybrids are likely to be based around *Sophora longicarinata* x *prostrata* (or possibly back crosses to one or other parent). One swarm of hybrid shrubs in particular exhibits a wide range of leaf, twig and branch combinations. Occasional plants with larger leaflets indicate that *S. microphylla* parentage might also be involved. Hybrid plants appear to be especially prominent on the fringes of near-pure *Sophora longicarinata* stands, especially when close to more prominent limestone outcrops where apparently pure *S. prostrata* occasionally occurs. Intriguingly, one group of *Sophora microphylla* trees growing over 5 km distant was recently noted as having an unusually weakly expressed yellow-stemmed juvenile phase, begging the question as to whether *S. longicarinata* genes are perhaps spread further into some local *S. microphylla* populations.

Lower tiers at the Glens of Tekoa site are dominated by exotic herbs and grasses, though creepers (especially *Parsonsia capsularis* var. *capsularis*, *P. capsularis* var. *rosea*, *Clematis afoliata* and *Scandia geniculata*) are well

represented along edges and in canopy gaps. Native herbs are generally suppressed by the exotic grasses, but a few species of interest remain, including a couple of *Cardamine* taxa possibly associated with limestone. The pygmy mistletoe (*Korthalsella lindsayi*) is very abundant on one patch of limestone kowhai, whilst *K. clavata* is similarly common alongside on *Coprosma crassifolia* and *C. propinqua* shrubs.

The population of limestone kowhai at Glens of Tekoa appears to be among the largest currently known, and seems to be every bit as robust and healthy as any of the of Nelson and Marlborough populations. It supports a full range of limestone kowhai size classes, from seedlings and saplings through to mature trees. The abundance of pods on trees and of bright yellow seeds on the ground indicates strong reproductive potential. Being in a farmed landscape, there are inevitably some management issues present, including a nasty incidence of hawthorn (*Crataegus monogyna*), an escapee from the early Glens of Tekoa homestead garden, which needs to be controlled to ensure the site's long term sustainability. The owners of Glens of Tekoa have expressed a clear wish to see the area managed in accordance with its new-found ecological significance.

As one of the finders of this limestone kowhai population later noted, one of the greatest joys of field botany is to stumble across the completely unexpected.

### **Acknowledgements**

Thanks to the owners of Glens of Tekoa station, Beau and Georgie McRae, for allowing access to the site and for permitting further scrutiny of its flora. Thanks also to Peter Heenan, Brian Molloy, Shannel Courtney, Nick Head, Kari Bassett and Kevin Platt for information on *Sophora longicarinata* and advice regarding this article.

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## A WEE STORY TO WHET YOUR APPETITE FOR AN ADVENTURE IN THE DEEP SOUTH

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On the afternoon of the 6 March 1987 when flying into Invercargill airport from Stewart Island following three wonderful days camped upon Mount Anglem with my lepidopterist colleague Neville Hudson – at that time doing field work for his PhD in geology – I saw from the aircraft what looked like large purplish patches of *Gunnera hamiltonii* standing out on a rocky sand dune system below the Three Sisters, facing Stewart Island. The species, although described from southern Southland, was at that time thought to be locally extinct, although a few plants were known from sand dunes on Stewart Island.

Needless to say we wasted no time and hopped in our car that was waiting at the airport and drove around towards Bluff. Venturing off a side-road we then used the Three Sisters high point (173 m) as a beacon as we bashed our way through thick manuka to find this wonderful site. And there it was at last, a sprawling rocky slope stretching down to the rocky shore, interspersed with tongues of sand that have been blown a hundred metres up-slope. Along with the sand, the wind has transported salt high up the slope so that the rocky areas contain saline communities in which *Gunnera hamiltonii* lives along with a myriad of other herbs, grasses and mosses (Fig. 1, p. 11).