

THE VEGETATION OF SMOTHERING GULLY, OMIHI HILLS, NORTH CANTERBURY

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Smothering Gully has been legally protected by way of an 18 ha QEII covenant and physically protected by way of new fencing since August 2011. Canterbury Botanical Society members visited in April 2011, and added several new finds to the existing QEII species list (Table 1, page 45). Certainly the outlier population of southern rata (*Metrosideros umbellata*) was regarded as the botanical highlight of the flora, although several other species of interest appear to have found a safe home at Smothering Gully (see also Geoff Walls' article in this issue of the *Canterbury Botanical Society Journal* (pages 33-41)).

Like Mount Ararat, the geology of Smothering Gully is dominated by quartz sandstone. However, the exposures of this material at Smothering Gully come about largely as a result of a deeply incised canyon rather than the dome-shaped massif of Mount Ararat (Walls 2011). This canyon drops about 40 vertical meters over a 500 m length, much of that being in a slot-like gorge with near-vertical cliffs occasionally up to 50 m high. Unlike the very exposed faces of Mount Ararat, the landform of Smothering Gully gives rise to some very protected habitats, thus there are both similarities and opportunities for differences in their flora.

Prior to 2011 farm livestock had relatively uninterrupted access to the easier slopes, resulting in a vegetation mix that was generally skewed in favour of unpalatable species, with palatable species being largely confined to steep bluffs and inaccessible refuges. Kanuka (*Kunzea ericoides*) had established almost total dominance of the canopy over the easier, soil-mantled upper slopes, with occasional wilding pines (*Pinus radiata* and *P. nigra*) occurring as scattered emergents. The less accessible, steep mid-slopes and the rocky bluffs below provided safer habitat for palatable species, such as mahoe (*Melicytus ramiflorus*), broadleaf (*Griselinia littoralis*) and five-finger (*Pseudopanax arboreus*), both in the canopy and sub-canopy. Numerous seedlings of these had been volunteering under the nearby kanuka, but development was being arrested by browsing livestock. Palatable understorey species such as karamu (*Coprosma lucida*) were similarly restricted in their distribution and recruitment. Many of the fern species were also restricted to steeper inaccessible refuges near the gully bottom. Correspondingly, the relatively unpalatable species *Leptecophylla juniperina* and *Coprosma rhamnoides* were locally common to abundant in the understorey throughout.

Virtually all the larger specimens of southern rata at Smothering Gully are found growing in clefts on the steep exposed upper cliffs of the canyon. However, a significant number of small plants were located close-by growing

in sandy soils under a sparse kanuka canopy. Most of these are still of understorey stature, although a few are beginning to emerge above the kanuka canopy and appear to have the potential to grow significantly larger than the cliff dwellers. Being light-demanding, it would be interesting to know whether these rata volunteers established prior to the kanuka, at the same time as the kanuka, or if they established under the kanuka at a later date.

A hint of what might occur on the forest floor after destocking is provided by a small area that by chance had been ring-fenced from livestock when earlier boundary fences were constructed. Whilst only a few square meters in area, this unintentional enclosure has assumed a continuous cover of *Blechnum* and *Asplenium* ferns plus various *Carex* species - in stark contrast to the almost bare ground nearby where livestock had until recently had free access.

A few species only occur in very restricted numbers. A single *Celmisia monroi* plant has been found on one face of the ravine, close to a small patch of the undescribed woolly-button *Craspedia* cf. *minor*. Isolated on one of the cliffs a single lowland totara (*Podocarpus totara*) clings on, its nearest companions probably being on the southern slopes of the Mount Cass limestone ridge some 1.5 km to the south. It is intriguing to find a lone *Olearia arborescens* growing at the base of the cliffs, perhaps finding the higher humidity of the canyon bottom to its liking. A single specimen of climbing rata *Metrosideros diffusa* has been recorded, though it seems to be likely there is scope for more. A rambling patch of leather-leaf fern (*Pyrrosia eleagnifolia*) occurs on one very exposed cliff top, and already appears to be expanding since the end of trampling by livestock.

The formerly sparse groundcover under the hilltop kanuka forest has revealed some surprises, which like southern rata are probably related to the moisture retention of the underlying rocks and soils. The two small filmy ferns *Hymenophyllum cupressiforme* and *H. minimum* occur as numerous scattered clumps and mats, some of them several square meters in extent. Both occur on shallow sandy soils close to the underlying sandstone, and *H. minimum* also occurs as several extensive patches on steeper south-facing sandstone banks. Both tend to shrivel when desiccating north-westerly winds are persistent, but have the ability to quickly recover after a shower of rain. *Hymenophyllum cupressiforme* reaches its recorded southern distributional limit in South Canterbury, and neither it nor *H. minimum* is often encountered elsewhere in coastal North Canterbury. Nearby Cranky Tom Reserve lies partially over Tertiary sandstone, again deeply incised into canyons, with the strap fern (*Notogrammitis patagonica*) (formerly *Grammitis patagonica*), plus *H. revolutum* and *H. minimum* recorded on the damp gorge walls (Steven 2000). Yet another small filmy fern *H. peltatum* has been recorded not far away, once again growing on Tertiary sandstone banks.

Blechnum vulcanicum occurs in relative abundance on lower slopes of Smothering Gully under a tall kanuka and five-finger canopy, reputedly more prevalent in Smothering Gully than elsewhere in the Ecological District. On

one sandstone bank the small autumn-flowering orchid *Diplodium alobulum* has established small colonies within the *H. minimum* mats, much admired by camera-wielding Bot Soc members when they visited the area. Other orchids recorded include a *Gastrodia* species (yet to be determined), *Corybas macranthus* and *C. trilobus*, *Pterostylis areolata*, *Thelymitra pauciflora* and a small *Caladenia* (species yet to be determined).

The cryptic pygmy mistletoe *Korthalsella salicornioides* (Naturally Uncommon) has been recorded from the Smothering Gully locality in the past. Given that most North Canterbury populations appear to occur on kanuka this potential host species was closely searched. However, *K. salicornioides* finally revealed itself on nearby manuka (*Leptospermum scoparium*), the customary kanuka host option seemingly unoccupied.

Turutu (*Dianella nigra*) is generally regarded as relatively uncommon in coastal North Canterbury. However, it is well represented in and around Smothering Gully, with several particularly strong patches occurring on small ledges in the ravine, as well as scattered plants under the kanuka forest and on sandstone outcrops. On the drier ridges the native hedgehog grass *Echinopogon ovatus* can be found, easily identified in late summer by the distinctive hedgehog-like seed heads.

The wilding pine trees have now been controlled by drilling and poisoning, and will hopefully decay and fall bit-by-bit, thus causing minimal damage to nearby native vegetation. The steep topography required contractors to use safety ropes and harnesses during this operation. Unfortunately, the bare surfaces of the cliffs will, like those of nearby Mount Ararat Reserve, require the on-going control of further pine volunteers. Future monitoring should hopefully help to identify and limit the establishment of these and other ecologically threatening weeds. Photopoints have recently been established, and will hopefully show southern rata recovering to its best potential in this near-unique site.

Acknowledgements

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References

- Walls G 2001. Southern rata (*Metrosideros umbellata*) in the Omihi hills. A report for Project Crimson and the Department of Conservation.
- Steven J 2000. Motunau and Cheviot Ecological Districts – Survey Report for the Protected Natural Areas Programme. Department of Conservation.

Table 1: Native plant species recorded at Smothering Gully¹ (S) and/or Mount Ararat² (A).**GYMNOSPERMS**

<i>Podocarpus totara</i>	S
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ANGIOSPERMS**Dicotyledons**

<i>Acaena novae-zelandiae</i>	S	<i>Euchiton audax</i>	S, A
<i>Anaphalioides bellidioides</i>	A	<i>Fuchsia excorticata</i>	S
<i>Aristotelia serrata</i>	S	<i>Fuchsia perscandens</i>	S
<i>Cardamine debilis agg.</i>	S	<i>Fuchsia x colensoi</i>	S
<i>Carmichaelia australis</i>	S, A	<i>Galium propinquum</i>	S
<i>Carpodetus serratus</i>	S	<i>Gaultheria antipoda</i>	S, A
<i>Celmisia monroi</i>	S, A	<i>Geranium microphyllum</i>	S
<i>Centella uniflora</i>	S	<i>Gnaphalium ruahinicum</i>	S
<i>Clematis foetida</i>	S	<i>Griselinia littoralis</i>	S, A
<i>Clematis paniculata</i>	S	<i>Haloragis erecta</i>	S
<i>Coprosma acerosa</i>	A	<i>Hebe salicifolia</i>	S, A
<i>Coprosma crassifolia</i>	S	<i>Helichrysum filicaule</i>	A
<i>Coprosma dumosa</i>	S, A	<i>Hydrocotyle heteromeria</i>	S
<i>Coprosma lucida</i>	S, A	<i>Hydrocotyle moschata</i>	S, A
<i>Coprosma microcarpa</i>	S, A	<i>Ileostylus micranthus</i>	S
<i>Coprosma propinqua</i>	S, A	<i>Korthalsella salicornioides (on Leptospermum scoparium)</i>	S
<i>Coprosma rhamnoides</i>	S	<i>Kunzea ericoides</i>	S, A
<i>Coprosma robusta</i>	S	<i>Lagenifera petiolata</i>	S
<i>Coprosma x cunninghamii</i>	S, A	<i>Lagenifera strangulata</i>	S
<i>Craspedia cf. minor</i>	S	<i>Leptecophylla juniperina</i>	S, A
<i>Dichondra repens</i>	S	<i>Leptinella pusilla</i>	S
<i>Discaria toumatou</i>	S	<i>Leptinella squalida</i>	S
<i>Epilobium rotundifolium</i>	S	<i>Leptospermum scoparium</i>	S, A
<i>Epilobium sp.</i>	S	<i>Leucopogon fasciculatus</i>	S, A

Dicotyledons continued

<i>Leucopogon fraseri</i>	S, A	<i>Pseudopanax crassifolius</i>	S
<i>Melicytus ramiflorus</i>	S	<i>Ranunculus reflexus</i>	S
<i>Metrosideros diffusa</i>	S	<i>Ranunculus glabrifolius</i>	S
<i>Metrosideros umbellata</i>	S, A	<i>Rubus schmidelioides</i>	S
<i>Muehlenbeckia australis</i>	S	<i>Rubus squarrosus</i>	S
<i>Muehlenbeckia axillaris</i>	A	<i>Schefflera digitata</i>	S
<i>Muehlenbeckia complexa</i>	S	<i>Senecio glomeratus</i>	S
<i>Myrsine australis</i>	S	<i>Senecio minimus</i>	S
<i>Nertera villosa</i>	S	<i>Senecio quadridentatus</i>	S, A
<i>Olearia arborescens</i>	S, A	<i>Solanum laciniatum</i>	S
<i>Olearia avicenniifolia</i>	S, A	<i>Sophora microphylla</i>	S
<i>Ozothamnus vauvilliersii</i>	S, A	<i>Stellaria parviflora</i>	S
<i>Pelargonium inodorum</i>	S	<i>Urtica ferox</i>	S
<i>Pittosporum tenuifolium</i>	S	<i>Urtica incisa</i>	S
<i>Pseudognaphalium luteo- album</i>	S	<i>Wahlenbergia albomarginata</i>	A
<i>Pseudopanax arboreus</i>	S, A		

Monocotyledons			
<i>Arthropodium candidum</i>	S	<i>Lachnagrostis filiformis</i>	A
<i>Astelia fragrans</i>	S	<i>Libertia ixioides</i>	S
<i>Carex breviculmis</i>	S	<i>Luzula banksiana var. orina</i>	S
<i>Carex dissita</i>	S	<i>Luzula rufa</i>	A
<i>Carex forsteri</i>	S	<i>Microlaena stipoides</i>	S
<i>Carex goyenii</i>	S	<i>Phormium tenax</i>	S, A
<i>Carex secta</i>	S	<i>Poa breviglumis</i>	S
<i>Carex solandri</i>	S	<i>Poa cita</i>	S, A
<i>Carex sp.</i>	S	<i>Poa imbecilla</i>	S
<i>Carex virgata</i>	S	<i>Rytidosperma clavatum</i>	S
<i>Cordyline australis</i>	S, A	<i>Rytidosperma gracile</i>	S, A
<i>Cortaderia richardii</i>	S, A	<i>Rytidosperma merum</i>	A
<i>Deyeuxia avenoides</i>	S, A	<i>Rytidosperma unarede</i>	S, A
<i>Dianella nigra</i>	S, A	<i>Uncinia rupestris</i>	S
<i>Dichelachne crinita</i>	S	<i>Uncinia uncinata</i>	S
<i>Echinopogon ovatus</i>	S		

ORCHIDS			
<i>Caladenia sp.</i>	S	<i>Gastrodia sp.</i>	S
<i>Corybas macranthus</i>	S	<i>Pterostylis areolata</i>	S
<i>Corybas trilobus</i>	S	<i>Thelymitra pauciflora</i>	S, A
<i>Diplodium alobulum</i>	S		

FERNS & FERN ALLIES			
<i>Adiantum cunninghamii</i>	S	<i>Notogrammitis billardierei</i>	A
<i>Asplenium appendiculatum</i>	S, A	<i>Notogrammitis ciliata</i>	S
<i>Asplenium flabellifolium</i>	S, A	<i>Histiopteris incisa</i>	S, A
<i>Asplenium flaccidum</i>	S, A	<i>Huperzia varia</i>	A
<i>Asplenium gracillimum</i>	S	<i>Hymenophyllum cupressiforme</i>	S, A
<i>Asplenium hookerianum</i>	S	<i>Hymenophyllum minimum</i>	S, A
<i>Asplenium lyallii</i>	S, A	<i>Hypolepis ambigua</i>	S
<i>Blechnum chambersii</i>	S	<i>Hypolepis rufobarbata</i>	S
<i>Blechnum discolor</i>	A	<i>Lycopodium volubile</i>	S, A
<i>Blechnum fluviatile</i>	S	<i>Microsorium pustulatum</i>	S, A
<i>Blechnum minus</i>	S, A	<i>Pellaea rotundifolia</i>	S
<i>Blechnum novae-zelandiae</i>	S	<i>Pneumatopteris pennigera</i>	S
<i>Blechnum penna-marina</i>	S, A	<i>Polystichum neozelandicum</i>	S
		spp. <i>zerophyllum</i>	
<i>Blechnum procerum</i>	S	<i>Polystichum vestitum</i>	S, A
<i>Blechnum vulcanicum</i>	S, A	<i>Pteridium esculentum</i>	S, A
<i>Ctenopteris heterophylla</i>	S	<i>Pyrrosia eleagnifolia</i>	S
<i>Cyathea smithii</i>	A		

¹ The Smothering Gully species list was recorded and updated by QEII (August 2010 to present), with additions by Canterbury Botanical Society (April 2011). This list covers the rata-clad rock outcrops plus the extensive areas of surrounding scrub and forest.

² The Mount Ararat species list was recorded by BPJ Molloy (January 1985) and updated by Canterbury Botanical Society (November 1997). This list covers the rata-clad rock outcrop with only limited coverage of the surrounding scrub and forest.