

THE IMPORTANCE OF THE INDIGENOUS FLORA AND VEGETATION COVER OF MOUNT CASS RIDGE, NORTH CANTERBURY

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Introduction

The Mount Cass ridge looms above the Canterbury coastline north of the Waipara River mouth. Mounts Cass, 525 m and Totara, 557 m are the highest points on this more than 6 km long, ENE-trending, limestone ridge. The bedrock is a layer of massive, brownish Weka Pass limestone over white Amberley limestone. A cliffed scarp lies along the north side of the ridge. Atop the ridge is a plateau-like feature 300-600 m wide. The slope to the south gradually steepens downhill and some stream-cut deep gullies occur on the lower slopes.

On the plateau, at right angles to the ridge's trend-line, are low rough-surfaced limestone ridgelets alternating with smooth-floored shallow valleys or swales. The swales extend downslope into the deeper gullies on the south aspect. The limestone ridgelets are deeply-fissured, with numerous crevices, wide and narrow, shallow and deep. Exposed limestone bosses are rounded by weathering, and some shallow crevices have weathered floors but most of the deep crevices seem to be related to the joint patterns in the rocks, possibly opened by earthquake shaking. This limestone area, with its very complex surface pattern, is an outstanding geomorphic feature, unique in Canterbury and of a kind scarce in New Zealand.

The Flora

A comprehensive indigenous floristic list was compiled for the location by Goulder Associates (2008). In it are 14 fern species, 80 small and 3 large herb species, 29 shrubs, 3 parasites, 15 vines and 24 tree species. The numbers of species and the floristic composition resemble those for the largest forest patches on Banks Peninsula. The woody vegetation, covering about 200 ha in all, contains a high proportion of the species found in lower-level, mixed angiosperm-podocarp forests in Canterbury. I shall not list the entire flora but note features that make the Mount Cass ridge a botanically extremely important location.

- There are 4 undescribed taxa present, in genera *Craspedia*, *Melicytus* and *Senecio* (2).

- Two species are at their known recorded southern limit: *Brachyglottis monroi*, *Festuca multinodis*.
- Seven taxa that are rare, or generally in decline, are present: *Aciphylla subflabellata*, *Australopyrum calcis* subsp *optatum*, *Carmichaelia kirkii*, *Einadia allanii*, *Heliohebe raoulii* subsp *maccaskillii*, *Pseudopanax ferox*, *Tupeia antarctica*.
- The herbaceous flora is unusually rich and varied for such a limited area and easterly location in Canterbury. Noteworthy species are: *Acaena anserinifolia*, *Aciphylla* cf *colensoi*, *Anaphalioides bellidioides*, *Australina pusilla**, *Brachyscome sinclairii*, *Celmisia gracilentia*, *Gingidia montana**, *Chiloglottis* sp, *Colobanthus acicularis*, *C. apetala*, *C. muelleri*, *Galium propinquum*, *G. trilobum*, *Helichrysum filicaule*, *Hierochloe redolens*, *Hydrocotyle novaezelandiae*, *Linum monogynum*, *Mentha cunninghamii*, *Oreomyrrhis ramosa*, *O. rigida*, *Parietaria debilis**, *Plantago spathulata*, *Poa colensoi*, *Phormium cookianum*, *Pterostylis areolata*, *P. banksii*, *Ranunculus multiscapus*, *R reflexus*, *Scandia geniculata**, *Schizeilema trifoliolatum*, *Stellaria gracilentia*, *S. parviflora*, *Stenostachys gracilis*, *Tetragonia trigyna**, *Urtica incisa*, *Viola cunninghamii*, *Wahlenbergia albomarginata*. Those marked * are scarce in eastern Canterbury, through grazing. Most of the remainder are usually found in moister environments to the west.
- Important vine and shrub occurrences are: 5 species of *Clematis*; 9 species of *Coprosma*; *Aristotelia fruticosa*+, *Fuchsia perscandens*, *Macropiper excelsum*, *Melicope simplex*, *Myrsine divaricata*, *Olearia avicenniifolia* (abundant)+, *O. bullata*, *Passiflora tetrandra*, *Raukaua anomalus* (very abundant)+, *Ripogonum scandens*, *Sophora prostrata*, *Urtica ferox* (very abundant) (+ usually found in moister environments to the west).
- The trees include healthy populations of: *Alectryon excelsus*, *Aristotelia serrata*, *Carpodetus serratus*, *Dacrycarpus dacrydioides*, *Fuchsia excorticata*, *Hoheria angustifolia*, *Melicytus ramiflorus*, *Myoporum laetum*, *Myrsine australis*, *Pennantia corymbosa*, *Plagianthus regius*, *Podocarpus totara*, *Prumnopitys taxifolia*, *Pseudopanax crassifolius*, *P. ferox*, *Schefflera digitata*, *Streblus heterophyllus*, as well as hardier species that are generally common in woodland and forest. Overall the flora is exceptionally rich and varied.

The Vegetation

The limestone scarp cliffs and some exposed northern edges of limestone outcrops are sparsely vegetated. Some locally scarce plants such as *Aciphylla* cf. *colensoi*, *Craspedia* sp., *Heliohebe* spp., *Haloragis erecta* and *Pimelea prostrata* occur in these sites. Generally the denser woody cover on the upper part of the Mount Cass ridge occurs south of the scarp crest but in a few places it spills down on the north side among heaps of fallen

limestone debris. Along the plateau, woody vegetation (scrub at the northern edges, woodland, with plants up to 6 m tall and occasional emergent trees and forest, composed of plants higher than 6 m) is confined to the limestone outcrops while the swales are clad in grassland, that includes some *Poa cita*, but mainly introduced grasses, sometimes with hardy shrubs such as *Coprosma propinqua* or *C. crassifolia*. Intuitively, it might be expected that the limestone sites would be unfavourably dry as habitat for trees and shrubs. However the woody plants are closely associated with the limestone outcrops. This appears to be because moisture condenses on the rock surfaces and plant foliage during periods of cloud cover (which are frequent). The crevices accumulate leaf and other plant litter, providing substrates that are moist and nutrient rich. Thus, there are feedback systems making the broken limestone surfaces suitable habitat for woody plants. The swales (filled with fine limestone particles, probably wind-blown from the scarp) seem to be drier and unfavourable for tree establishment. Grazing by stock may accentuate these contrasts.

Old logs on parts of the plateau area indicate that totara trees once grew near the crest of the Mount Cass ridge, but podocarps (and some angiosperm species) are now confined to lower slopes, especially in gullies. The best forest stands are on the area near Mount Totara.

A variety of shrubs and the trees *Cordyline australis*, *Griselinia littoralis*, *Hoheria augustifolia*, *Melicytus ramiflorus*, *Myrsine australis*, *Pittosporum eugenioides*, *P. tenuifolium*, *Podocarpus totara*, *Pseudopanax arboreus*, *P. crassifolius* and *Sophora microphylla* are the main forest forming species, but there is a wide assortment of patches with varied composition. Most tree species, including the podocarps, appear to be regenerating.

Why is Mount Cass Ridge Important?

From a Canterbury-wide, if not a national perspective, the native vegetation and natural landforms of Mount Cass are highly significant. The location contains outstanding landscape and the largest area of species rich, low altitude forest that survives between Conway Flat and Banks Peninsula. In terms of Canterbury biodiversity, it is of great ecological value because of its rich flora and varied vegetation composition and its potential for sustaining a diverse fauna. The Mount Cass forested area and its limestone habitat is a precious environmental treasure.

Historic Considerations, Present Threats and Conclusions

We know (Molloy et al 1963; Molloy 1969) that before humans reached our region the province was well forested, from the sea to the mountain timberline. The Plains and downlands that the 1850 settlers found

covered in grassland were well wooded 700 years earlier. Limestone areas throughout the province were also tree covered at the time. Most of these forests were ravaged by fires on a truly holocaust scale. Study after study has confirmed this unfortunate demise of the forests (Molloy 1994; Moar 2008; Burrows and Wilson 2008). Continued attrition of the native vegetation since 1850 is also well documented (Wilson 2008; Meurk 2008). Only small forest patches survive near the Canterbury coast.

The Mount Cass forests have come through the pre and post 1850 traumas mauled by fire and grazing but resilient. Here at Mount Cass is one of the last good areas of mixed angiosperm - podocarp forest in the northern part of our province. Better still, it is on limestone. In this sense, it is the very best surviving example of its kind in Canterbury. I know of only one other forest area on limestone in Canterbury, at Kakahu in South Canterbury, where the floristic diversity is less than 50 percent of that at Mount Cass.

We should do our very best to preserve the Mount Cass ridge from devastation. The new threat there is the plan by Mainpower to site 83 wind turbines along the ridge. Gross disturbance to the landscape and ecosystem would result because the plans require a bulldozed road line along the ridge, cutting across many wooded limestone outcrops. The turbines would be sited in the grassy swales, but each would require a separate road. The roads would be surfaced with crushed limestone from the ridge. There would also be a large substation area on the ridge and a line of pylons to lead the power away, causing more forest destruction. The Mount Cass ridge would become a major industrial site. The plans mention "mitigation", but how could such destructive works be mitigated?

Other potential windfarm sites without the intrinsic natural values of Mount Cass ridge are available in North Canterbury. It is to be hoped that the development can be diverted away from Mount Cass. Windfarms elsewhere in the country have not been placed in locations with such excellent natural qualities.

References

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* Chapters in Winterbourn, M., Knox, G., Burrows, C., Marsden, I. (eds). *The Natural History of Canterbury*. Canterbury University Press, Christchurch.

Plagianthus regius
(mānatu) in winter.
Inset: summer
fruiting branch.
Drawings by Hugh
Wilson

