

not on Mt Taranaki include the prostrate tree fern *Cyathea colensoi*, and two shrubs, *Hebe venustula* (Plate 18) and *Coprosma* sp. (p).

Shrubland gives way to shrub-tussockland and ultimately to tussockland with increasing altitude or poor drainage. At first, a few spindly plants of red tussock project through the shrub-dominated canopy but gradually or abruptly, depending on the steepness of slope, red tussock assumes dominance (Appendix 5d).

Subalpine and alpine tussockland

Tussockland (Appendix 6) occurs as a narrow c. 500 m-wide belt between 1400 m and 1600 m a.s.l. on Mt Taranaki. It also covers the high peaks and poorly drained tops of the Pouakai Range and is predominant in the Ahukawakawa Swamp (see Mire vegetation).

In the common type, red tussock (Plate 13), between 75 cm and 120 cm tall, dominates the canopy, and silver tussock is an important associate. Mt Taranaki is the only area above tree-line in the North Island where silver tussock is so important (Druce 1961). At the lower limits of the belt and where drainage is not too poor, shrubs are scattered amongst the tussock. The most common is *Hebe odora* (Plate 13) followed by mountain tauhinu (Plate 13), inaka, leatherwood, and the much smaller semi-prostrate shrub *Coprosma depressa*. Where conditions are most favourable for the tussocks they are crowded together and little space remains for smaller plants. But at the upper levels of the belt or on poorly drained sites, the tussocks are more widely spaced, and there is a well-developed herb layer. This type of vegetation is named tussock-herbfield (Appendix 7c).

The most spectacular flowering plants in the park, a golden-flowered buttercup, *Ranunculus nivicola* and the large-leaved ourisia (*Ourisia macrophylla* subsp. *macrophylla*), are common in the tussockland. *Ranunculus nivicola* (Plate 14) flowers between November and February and, as its specific name suggests, it also grows in the often snow-covered upper herbfield zone. The large-leaved ourisia (Plate 14), which flowers over a similar period, has long flower stalks (up to 40 cm) with many whorls of white flowers. As the lower-most whorls of flowers die back, those on the whorls above open, giving a flowering display lasting many weeks. Although most prominent in the tussockland, the large-leaved ourisia also clothes many of the stream banks in the goblin forest and occurs well up into the herbfield zone.

A green-hooded orchid, *Pterostylis banksii* var. *patens*, distinguished from other species of the genus found in the park by its strongly reflexed lateral sepals, is occasionally found at the lower limits of subalpine tussockland (Plate 14). Like all its close relatives, it has a labellum (Plate 14) which is sensitive to insect visitors, suddenly flicking them upwards and into the bottom of the flower. If an insect is trapped it has only one possible route to follow to get out. In doing so it deposits and receives pollen thus ensuring cross-fertilisation of the flower.

The poorly drained tussockland of the Pouakai tops (Appendix 6a) is floristically quite different from the type already outlined.

Plate 12 Subalpine scrub and shrubland

1 *Brachyglottis rotundifolia* var. [*Senecio elaeagnifolius*].

(Leatherwood)

a branch habit, leaves, and old flower stalk × 0.6.

b remnant bracts "wood flowers" from previous flower season × 4.0.

2 *Coprosma pseudocuneata*.

a branch × 0.6.

b apical shoot showing leaf arrangement × 2.5.

3 *Dracophyllum longifolium* var. [*D. filifolium*].

(Inaka)

a branch × 0.6.

b old capsule in calyx × 12.0.

c needle-leaf × 4.0.



Plants not found on Mt Taranaki, such as *Schoenus pauciflorus*, *Bulbinella hookeri* (Plate 10) and *Coprosma* sp. (p), are locally common. Also present is a prostrate form of *Hebe odora* (Plate 13) which shows a marked tendency to spread by vegetative layering.

Several distinctive "smaller-scale" plant communities are present in the Pouakai tussockland zone. These also contain plants unknown elsewhere in the park. One such type is on an exposed ridge crest to the north of the old Pouakai Hut. Here a small whipcord hebe, *Hebe tetragona* var. [*H. subsimilis* var. *astonii*] (Plate 18) creeps over a turf composed mainly of mosses (*Racomitrium* spp.), comb sedge, and a miniature fleshy-leaved daisy *Abrotanella caespitosa*.

The common tussockland type is absent from the debris fans on the north-western slopes of Mt Taranaki. In its place is a moss-herbfield and mossfield with scattered circular patches of red tussock surrounded by mountain tutu (*Coriaria plumosa*) (see Alpine herbfield).

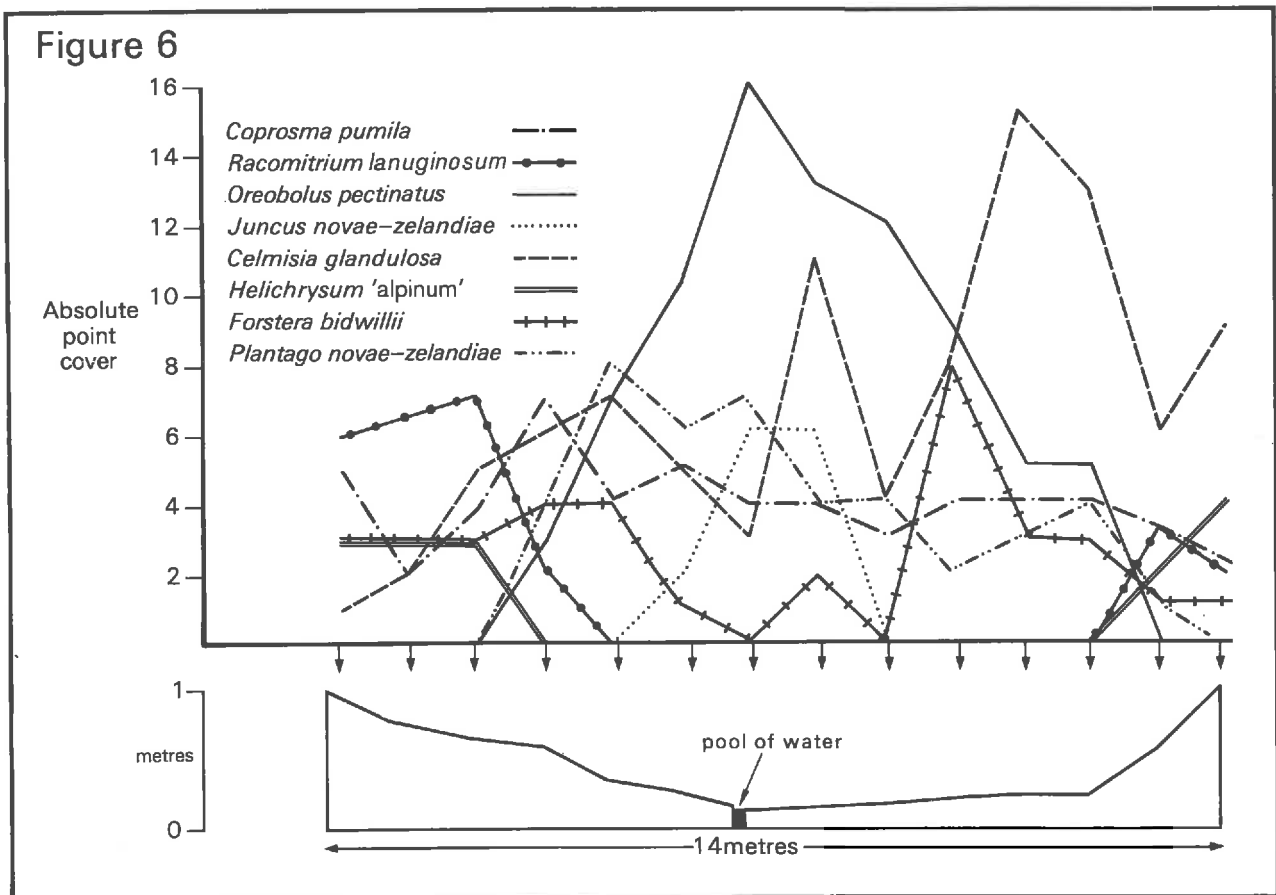
Alpine herbfield

On the northern, southern, and eastern slopes of Mt Taranaki, above the upper limit of red tussock (approximately 1600 m) and up to about 1675 m a.s.l. in places, the ground is completely carpeted by small plants less than 15 cm high. This class of vegetation (Appendix 7a-7c) includes true herbfield (the type in which herbs are the predominant growth form) as well as mossfield and moss-herbfield, (types in which mosses, e.g., *Racomitrium* spp., are dominant) and cushion-plant field (types dominated by cushion plants, e.g., comb sedge).

In the true herbfield, the most common plants are the mountain daisies, *Celmisia gracilentia* var. and *C. glandulosa* var. *latifolia*, everlasting daisy (*Helichrysum* sp. unnamed, "*H. alpinum*" of Cockayne, 1928), anisotome (*Anisotome aromatica*), and forstera (*Forstera bidwillii* var. *densifolia*). These are the plants which contribute most to the renowned massed flowering displays of mid to late January. The mountain daisies, everlasting daisy, and forstera are taxonomically somewhat of a problem. *Celmisia gracilentia* var. [*Celmisia major* var. *brevis*] (Plate 16) is a variety of mountain daisy endemic to Egmont National Park although other varieties are found throughout New Zealand. *Celmisia glandulosa* var. *latifolia* (Plate 15) is a broadleaved, doubtfully endemic variety of a mountain daisy found throughout New Zealand and characterised by glandular hair-covered leaves. The everlasting daisy (Plate 16) has not been formally named but is a species with close affinities to *Helichrysum bellidioides*. It differs markedly from that species in possessing much larger leaves and capitula. *H. bellidioides* is present in the park but is restricted to parts of Pouakai and Ahukawakawa Swamp. Forstera (Plate 16), a succulent-leaved member of Stylidaceae, is a doubtfully endemic variety of a widespread species. Anisotome (Plate 15), a member of the carrot family, has distinctive dissected leaves which give off a characteristic odour when crushed. Other common species are two

Plate 13 Subalpine and alpine tussockland

- 1 *Chionochloa rubra*.
(Red tussock)
a spikelet × 4.0.
b leaves and spikelets
× 0.6.
c habit of plant × 0.03.
- 2 *Cassinia vauvilliersii*.
(Mountain tauhinu)
a apical shoot × 3.0.
b flowering branchlet
× 0.6.
c branch × 0.6.
d capitulum; also cut
vertically to show florets
× 3.0.
e floret cut vertically × 6.0.
- 3 *Hebe odora*.
a flowering shoot × 3.0.
b branch of typical erect
form × 0.6.
c apical shoot showing
leaf arrangement × 3.0.
d branch of prostrate form
× 0.6.



Herbfield composition near Mangahume Hut (1322 m a.s.l.).

dwarf shrubs, creeping coprosma (*Coprosma pumila*) (Plate 15), and *Gaultheria* sp. unnamed [*Gaultheria depressa* var. *novae-zelandiae*] (Plate 16), comb sedge, blue tussock (*Poa colensoi*), a club moss, *Lycopodium fastigiatum* and a moss, *Racomitrium lanuginosum* var. *pruinatum*.

Much of the variation in herbfield composition relates to microtopography and drainage. An example of the pattern, near Mangahume Hut, from Clarkson (1981), is reproduced above (Fig. 6). A miniature rush, *Juncus novae-zelandiae* inhabits the small pools; comb sedge and a native plantain, *Plantago novae-zelandiae*, dominate the hollows. *Celmisia glandulosa* var. *latifolia* and creeping coprosma are most prominent at intermediate sites, and *Racomitrium lanuginosum* var. *pruinatum* and everlasting daisy grow on higher ground.

On the western side of Mt Taranaki, moss-herbfield and mossfield extend down to virtually 1000 m a.s.l., marking the courses of former debris flows. The main mosses are *Racomitrium lanuginosum* var. *pruinatum* (Plate 15), *R. ptycophyllum*, and *R. crispulum*; the first mentioned forming distinctive grey-green hummocks. It was probably moss hummocks like these which, in 1770, caught the attention of the naturalist Joseph Banks as he scanned the mountain with an eyeglass from the deck of Cook's Endeavour. He recorded "many white lumps in companies of fifty or sixty together, which probably were stones or tufts of grass, but