CHIONOCHLOA FRIGIDA GRASSLANDS IN KOSCIUSKO NATIONAL PARK: AFFINITIES TO NEW ZEALAND ALPINE FLORA; A PRELIMINARY REPORT.

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C. frigida exists only in Kosciusko National Park, the centre of the alpine (above treeline) flora of mainland Australia. It dominates well-established tussocklands on the western slopes of the Kosciusko Plateau. *C. frigida* was once common on eastern slopes of Mt. Kosciusko, but was reduced almost to extinction there by the 1930's (Costin 1958). Since grazing ceased in 1944, *C. frigida* has been on the increase (Thompson 1981, Wimbush and Costin 1979, Costin *et al.* 1979). In the last few years, *C. frigida* is reported by local botanists to have greatly accelerated its rate of spread along with large palatable herbs such as *Ranunculus anemoneus*, *Aciphylla glacialis* and *Craspedia leucantha* (A.B. Costin, J. Thompson and A.R.H. Martin, pers. comm.). I have been granted permission by the National Parks and Wildlife Service of New South Wales to study the regeneration of these *Chionochloa frigida* tussock grasslands. Here I report preliminary observations on affinities of these grasslands to the New Zealand alpine flora.

Species of a lower section of a well-established *C. frigida* grassland (1890-2057m) near Blue Lake are listed in Table 1. This grassland area is arranged in mosaics of closed (75-100% cover) tall (longest measured frond, 1.2m) tussock and open areas which are *Poa fawcettiae* dominant and relatively species-rich (Table 1).

A New Zealand element is important in the *Chionochloa frigida* grassland flora, compared to the Kosciusko flora in general. All of the listed *Chionochloa frigida* grassland genera are shared with the alpine flora of New Zealand (and occur in *Chionochloa spp.* grasslands there), compared to 86 of 104 genera (83%) in the Kosciusko alpine flora. Fewer Australasian genera (10%) are present than in the Kosciusko alpine flora in general (28%; Smith, 1986). Other Kosciusko alpine associations appear to share fewer genera with the New Zealand alpine flora, or with the corresponding New Zealand alpine community. For example, alpine heathland adjacent to the Blue Lake *Chionochloa frigida* grassland is dominated by *Phebalium ovatifolium* (75%), with *Podocarpus lawrencei* common (25%), and *Prostanthera cuneata, Orites lancifolia* and *Grevillea australis* also present. Except for

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Podocarpus , these genera do not occur in New Zealand. I have found 3 of the 4 principally New Zealand genera which occur at Kosciusko (*Chionochloa, Aciphylla, Schizeilema and Gingidia*) in the Blue Lake grassland.

A number of the plants found in this *C. frigida* tussockland appear to be closely related to New Zealand alpine species. *Ranunculus anemoneus* is similar to the New Zealand *Ranunculus buchananii* (Fisher 1965). *Craspedia leucantha* resembles the New Zealand *Craspedia uniflora*; although the relationships between these taxa have yet to be worked out (Costin *et al.* 1979, Allan 1982). The *Acaena* species is related to the New Zealand *A. anserinifolia* complex (Thompson 1981). Australian and New Zealand forms of *Trisetum spicatum* have been described as *ssp. australiense* Hulten (Costin *et al.* 1979). Six of the 25 *Chionochloa frigida* grassland species listed (24%) also occur in New Zealand (Table 1), a somewhat greater percentage than for the Kosciusko alpine flora in general (15%). No conclusion can be drawn from these data as to whether the present-day occurrence of closely related species in *Chionochloa spp.* alpine tussocklands in Australia and New Zealand is due to a common Gondwanan origin or to dispersal events.

Table 1: Species of *Chionochloa frigida* tussocklands

Found under *Chionochloa frigida*
Acetosella vulgaris Fourr. *sens. lat.* (*Rumex acetosella* L.)*
Brachythecium sp. (a moss)
Geranium potentilloides L Hérit. ex DC. var. *potentilloides**
Viola betonicifolia Sm. ssp. *betonicifolia*

Found in open areas within tussockland
Acaena sp. (aff. *anserinifolia* (Forst. et Forst. f.) Druce)
Acetosella vulgaris Fourr. *sens. lat.* (*Rumex acetosella* L.)*
Aciphylla glacialis (F. Muell.)Benth.
Blechnum penna-marina (Poir.) Kuhn*
Cardamine sp.(lg fls)
Carex gaudichaudiana Kunth*
Carex hebes Nelmes
Craspedia leucantha F. Muell.
Epilobium sarmentaceum Hausskn.
Epilobium tasmanicum Hausskn.*
Geranium potentilloides L. Hérit. ex DC. var. *potentilloides**
Gnaphalium argentifolium N. A. Wakefield
Luzula sp.
Olearia phlogopappa (Labill.) DC.var. *subrepanda* (DC.) J.H. Willis
Plantago euryphylla Briggs, Carolyn et Pulley
Plantago spp. hybrid swarm
Poa fawcettiae Vickery**
Polystichum proliferum (R.Br.) Presl
Ranunculus anemoneus F. Muell.

Ranunculus niphophilus B.G. Briggs
Schizeilema fragoseum (F. Meull.) Domin
Senecio gunni (Hook. f.) Belcher
Senecio lautus Forst. f. ex Willd. ssp. *alpinus* Ali
Trisetum spicatum (L.) Richt*
Viola betonicifolia Sm. ssp. *betonicifolia*

Seedlings
Cardamine sp.
Geranium potentilloides L. Hérit. ex DC. var. *potentilloides**
Senecio gunnii (Hook. f.) Belcher
Viola betonicifolia Sm. ssp. *betonicifolia*

*shared with New Zealand alpine flora (see notes, accompanying paper)
**dominant intertussock species

Acknowlegements.

I am grateful to J. Thompson for critically reading the manuscript, and S.W.L. Jacobs (grasses), A.R.H. Martin and J. Thompson for identification of plant species.

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