

Whilst a limited alpine fauna occurs on Pinelheugh (1124m), on Long Valley/South Rough Ridges (1176m) a lepidopterous fauna typical of other block mountains of Central Otago exists associated with the diverse cushionfields and grassland/herbfields (see fig. 4). As usual the majority of such species are diurnal and gaily coloured. Additionally most are members of the families Crambidae, Geometridae, Noctuidae and Tortricidae.

The moth fauna of the Manorburn Ecological District exhibits a phenomenon that is widespread in the eastern South Island although poorly understood. That is the continued emergence of different species throughout the year, including when winter snow covers the valley floors both *Theoxena scissaris* (see Hudson 1928) and *Atomotricha lewisi* emerge during winter and apparently at no other time of the year.

The late autumn emerging fauna, characteristic of the eastern subalpine South Island, is better developed on South Rough Ridge than further inland and includes such species as *Eurythecta leucothrinca* and undescribed species of Hepialidae, Tortricidae and Crambidae, often emerging into early June in between snow storms. The late autumn fauna of South Rough Ridge is identical with that of the Lammermoor Range to the east.

Saline soils with salt-pans are a feature of the district and also occur to the west, north and east of the district. The moth fauna has been documented (Patrick 1989) and found to be small but distinctive with at least four species (*Paranotoreas fulva*, *Loxostege* sp., *Scythris triatma*, *Kiwaia thyraula*) either confined to these sites, breeding on the sites or common on such saline sites. All four species occur in this district with *K. thyraula* not so far found on saline sites outside this district. *Loxostege* sp. reaches its eastern distributional limit on saline sites at Galloway in the west of the district. Conversely *S. triatma* reaches its western distributional limit in the eastern part of the district. The saline sites at Galloway and in the surrounding hills are among the most extensive and faunistically important surviving in New Zealand and two were selected as representative stand alone reserves (Patrick 1989).

Another feature of the Manorburn Ecological District is the abundance of tors (see fig. 5) in both the montane and alpine zones. A rich attendant moth fauna with larvae feeding on lichens and algae is present as is characteristic of central and eastern Otago. The colourful genus *Dichromodes* with four mainly diurnal species and the genera *Helastia*, *Eudonia*, *Scoparia*, *Phaeosaces*, *Tingena*, *Izatha*, *Hierodoris*, *Kiwaia* and various genera of Psychidae have in total about nineteen species with larvae on mosses, lichens and algae on rock surfaces in the district.

Shrublands are scattered throughout the district and contain an interesting although mainly widespread moth fauna. Both *Meliccytus alpinus* and *Coprosma* species are important hosts for moth species but by far the most important in Central Otago is *Olearia odorata*, which is host to twelve moth species. Five of these have been recorded from the Manorburn Ecological District. The species on *Olearia* in *Meterana* and *Pasiphila* are rarely collected and until recently their host was unknown.

The grasshopper fauna is very interesting because it contains a combination of species different from any other area in New Zealand. Three montane species are found on rocky, dry hillsides and one of these (*Sigaus australis*) joins *Paprides dugdali* in the alpine cushionfield and grassland (see fig. 1). For *P. dugdali*, this is its north-western distributional limit. The rare *Sigaus minutus* is fairly widespread in montane areas of the MacKenzie Country (B Patrick unpub. data) and only found in Central Otago between Alexandra and Galloway area, where it is locally abundant. The tiny, slim males and small females are here distributed over barely vegetated rocky hillsides amongst a mosaic of saline patches and schist tors.

Only one species of cicada was collected, the grassland *Kikihia angusta*. It was common in red tussock areas which are widespread in the district (see fig. 6). No specimens of shrubland *Kikihia* were found, nor of *Maoricicada*. The latter are characteristic of high altitude cushion field.



**Figure 5:** Eastern montane areas of the Manorbum district with the characteristic landscape of rock tors and predominately silver tussock grassland.



**Figure 6:** Red tussock is a feature of the uplands of the Manorbum District. Here pictured east of the Greenland Reservoir.

In summary, the fauna of the Manorburn Ecological District listed in this survey is highly interesting in that it contains a relatively rich moth fauna associated with tors, a small distinctive moth fauna on saline soils, a moderately rich alpine moth fauna and a combination of grasshopper species unlike that of any other Ecological District in New Zealand. Compared to adjacent districts such as Old Man, Rock mid Pillar, and Waipori, the fauna is numerically poorer yet many nationally rare moth species are present that are absent from the adjacent districts. Biogeographically the fauna has closest affinities with that of the Rock and Pillar and Lammermoor Ranges with some lesser ties to the Mt Benger - Old Man Range areas.

Key Sites for Lepidoptera, Acrididae, Cicadidae Conservation in the Manorburn Ecological District

- 1 Galloway Saline Areas No 1 and 2 (Patrick 1989)
- 2 South Rough Ridge summit grassland/herbfield to cushionfield near Serpentine Road.
- 3 Long Valley Ridge herbfield/cushionfield/grasslands.
- 4 Greenland Reservoir wetlands.
- 5 Pinelheugh grassland/wetlands (Matangi Station).
- 6 Moa Creek saline site on Crawford Hills Road (Patrick 1989).
- 7 Substantial areas of for landscape, eg, above Alexandra, Whiterocks, Raggedy Range.
- 8 Substantial shrubland gorges with *Olearia odorata* component.

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