

Figure 6. Distributions of *Hemiandrus "vicinus"*, *Hemiandrus "promontorius"*, *Hemiandrus "onokis"*, *Hemiandrus "horomaka"*, *Hemiandrus bilobatus*.

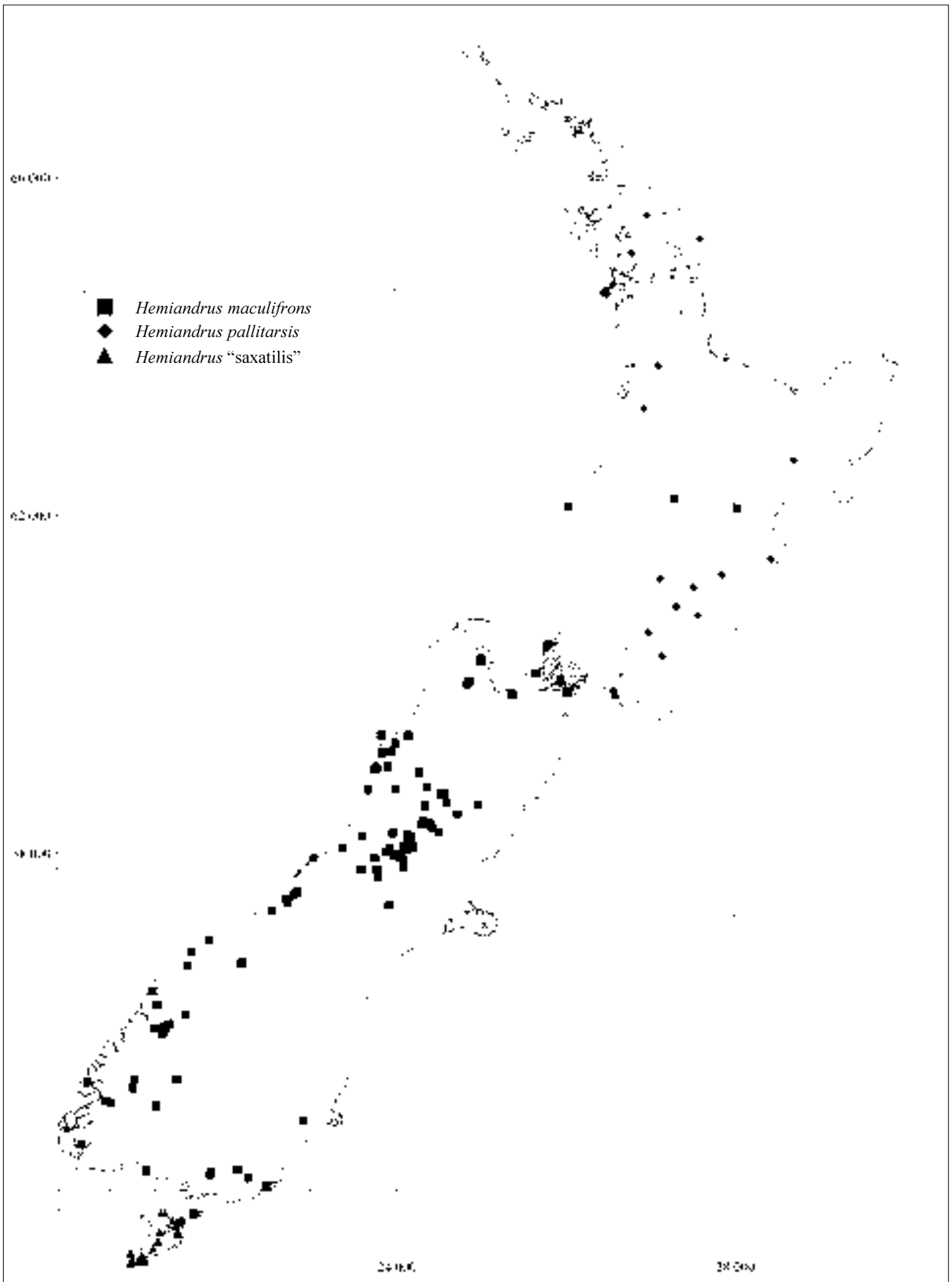


Figure 7. Distributions of *Hemiandrus maculifrons*, *Hemiandrus pallitarsis*, *Hemiandrus* "saxatilis".

4.3 SPECIES THAT ARE PROBABLY VERY RESTRICTED AND ARE KNOWN FROM FEWER THAN FIVE SPECIMENS (MOSTLY ONLY ONE)

Hemiandrus lanceolatus (Walker, 1869)

Known from its very immature holotype and cannot be recognised in present collections. Collected from 'cave, Collingwood'.

Hemiandrus "dodsons"

Known from Dodsons Valley, Nelson.

Hemiandrus "elegans"

Known only from Mt Moehau, Coromandel.

Hemiandrus "hapuku"

Known from relatively high altitude in Seaward Kaikoura Range—2 specimens from nearby sites.

Hemiandrus "mtgeorge"

Mt George, Mt Cook National Park (though possibly mislabelled).

Hemiandrus "nokomai"

Known from the Nokomai Range, Southland. Taken in subalpine herbfield.

Hemiandrus "otautau"

A single female from Otautau, Southland.

Hemiandrus "pureora1"

Hemiandrus "pureora2"

Two species known from single specimens in Pureora Forest.

Hemiandrus "redhills"

A single specimen from Red Hills, Nelson.

Hemiandrus "staveley"

A single specimen presumably from Mt Alford Forest, Staveley, mid-Canterbury.

Hemiandrus "waimakariri"

A single specimen from Aeroplane Flat, Poulter Valley, Arthurs Pass National Park. This species is close to *H. "turgidulus"* or *H. "furovianus"* and its habitat is also very similar.

5. Discussion: diversity and conservation

Practical conservation strategies are usually based around two very different approaches. One involves protecting areas of high diversity and the argument is that by protecting such areas many species are helped. The aim is to protect the whole ecology of certain areas. Good examples of this approach are 'mainland islands'. The other strategy concentrates on single species that are often in a special habitat for which 'uniqueness' and isolation are strong bases for

support. Examples of this approach are strategies to protect the tusked weta, particular bird species, the tuatara and other lizards. Examples and support for both strategies can readily be found among the *Hemiandrus* species.

5.1 'MAINLAND ISLANDS'

Without doubt the present 'mainland island' projects at Mt Moehau (Coromandel) and Nelson Lakes National Park would help preserve the interesting weta fauna. Mt Moehau has *H.* "elegans", still only known from two specimens even after intense searching. It has some elements of 'uniqueness' for it may well be intermediate between Australian and New Zealand species. It is apparently confined to the upper levels of the mountain. Should it be a soil or moss burrower then it may well be subject to depredations by pigs. Their rooting destroys soft ground habitats, and when this occurs during the weta egg laying and long development period, the population could be greatly affected. There are three species within or near the Nelson Lakes 'mainland island': *H. maculifrons*, *H.* "okiwi", *H.* "richmond". The last two are very poorly known and their relatives are found at each end of the country, respectively *H.* "evansae" near Dunedin and *H.* "otekauri" in Northland. This, from an evolutionary point of view, is fascinating and may provide corroborative evidence of large-scale land movements associated with the alpine fault and maintenance of a relatively warm climate in the area, even during the Pleistocene.

5.2 UNIQUE 'ISOLATES'

There are three such species, *Hemiandrus* "promontorius", *H.* "furoviarius" and *H.* "turgidulus" for which sufficient data are available to make some comment. The first is at Cape Campbell and nearby Marfells Beach (Fig. 6). It was readily pit-trapped in the low sparse shrub vegetation comprising at least ngaio (*Myoporum laetum*), *Cassinia* sp., flax (*Phormium* sp.) and tussock with exotic grasses and herbs. Its closest relative is probably *H. bilobatus* of coastal Wellington and the Brothers Islands, immediately opposite over Cook Strait. It seems less closely related to the Marlborough Sounds species *H.* "vicinus", or its parapatric species *H.* "onokis". Although only known from two very close sites, *H.* "promontorius" seems very restricted, as there are specimens which seem to be *H.* "onokis" from the Puhipuhi Valley and nearby, north of Kaikoura and at the Clarence River. To the north, *H.* "vicinus" is not known south of the Wairau River, and one specimen (not noted in the list above) from near Blenheim seems not to belong to any of this group of species. If there is yet another species in the coastal hills between Blenheim and Cape Campbell, a complex similar to that in the coastal and riverine native brooms could be present. All these species and *H.* "horomaka" would be good subjects for genetic analysis to determine their relationships.

Hemiandrus "furoviarius" is endemic to the river margins of the Tekapo and nearby rivers of the Mackenzie basin. Although it favours the terraces, usually above the level of normal flow and short floods, its habitat is very susceptible to severe flooding such as that during the week of 19 December 1995. Then, the insects' burrows were covered with at least a metre of water for a week and

much silt was deposited but the populations recovered. However, although the habitat is one which has been much modified by the presence of exotic grasses, weeds and trees, the population can survive provided there is no extensive disturbance of the silty soil. Disturbance by off-road vehicles was suggested by Wyngaarden (1985) as being detrimental.

Hemiandrus “turgidulus” is one species which could be seen as a ‘success story’ for intense conservation on a miniature ‘mainland island’. Its habitat in the Cromwell river sand dunes was set aside as a reserve for the Cromwell chafer beetle (*Prodontria lewisii*). The reserve was established for that beetle and intense management by fencing and removal of vertebrate predators has allowed the beetle to maintain itself. The endemic weta, unknown at the time of the reserve’s establishment, is also present in good numbers.

5.3 DISJUNCT POPULATIONS

Two species show very disjunct populations: *Hemiandrus fiordensis* (Fig. 4) and *H. focalis* (Fig. 5). The first is in Fiordland and the second is widespread at high altitudes in the Central Otago and Southland mountains. Both are present at sites on isolated mountain-tops in and north of Arthurs Pass National Park eastwards to the Inland Kaikoura Range, and the northern populations do have slight differences. *Hemiandrus* “hapuku”, on the Seaward Kaikoura Range, is similar to *H. focalis*. *Hemiandrus focalis* is also present on Codfish Island but not on Stewart Island. A similar situation is seen in *H. maculifrons*, as it is present on Jacky Lees Island close to the north coast of Stewart Island. Stewart Island has only its endemic *H. “saxatilis”*.

The populations of *H. pallitarsis* on the islands close to Northland and the Coromandel Peninsula also have slight differences.

All these isolates are scientifically interesting and are of high conservation value. As they are very isolated and their sites are already mostly within public conservation lands there is little likelihood of them becoming endangered.

6. Recommendations

The author recommends that in Waikato Conservancy:

- Pigs should be more intensely controlled on Mt Moehau.
- Further weta samples should be collected from Pureora Forest.

In Nelson-Marlborough Conservancy:

- The eastern portions of Marfell’s Beach Recreation Reserve should be transferred to at least Scenic Reserve status and further areas of nearby cliff, cliff-top and upper beach vegetation should be aquired. Planting of natives and reduction of the introduced vegetation may enhance the habitat.
- There should be further surveys for weta within coastal vegetation from Blenheim south to Kaikoura, and the Nelson lowlands and ranges immediately east of Nelson.

In Otago Conservancy:

- Weta should be included in the monitoring of the Cromwell chafer beetle Reserve.

In Southland Conservancy:

- Remnant forests and shrublands in the Southland plains should be surveyed for weta.

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