Family: Noctuidae

Common name: **Armyworms, cutworms, noctuid moths, owl moths, owlet moths**

Order: Lepidoptera

Family: Noctuidae

Taxonomic Name: *Meterana* "Foveaux Strait"

Common Names: -

Synonyms: -

M&D Category: I High Priority

Conservancy Office: OT, SL

Area Office: Coastal Otago, Murihiku, Southern Islands

Wingspan: 35 mm

Description: A large moth with dark green forewings and pinkish-grey hindwings (B. Patrick pers. comm. 1999). The wingspan is about 35 mm (B. Patrick pers. comm. 1999). The larvae are green, white and red (Patrick 1997b).

Type Locality: Not described.

Specimen Holdings: -

Distribution: Mason Bay, Stewart Island; Sealers Bay, Codfish Island; Three Sisters sand-dune, near Bluff (Patrick 1997b; Patrick & Dugdale 2000); Tautuku Beach; Tahakopa; Foveaux; Mt Allen (Patrick 1994d; Patrick & Dugdale 2000).

Habitat: Confined to coastal areas (E. Edwards pers. comm. 1999), occurring on sand-dunes. Host is sand daphne (*Pimelea lyallii*) (Patrick 1997b; Patrick & Dugdale 2000).

Top: Adult.
Bottom: Caterpillar.
Photos: Brian Patrick.

Threats: Host communities are at risk from erosion, or development in sites not legally protected (Patrick & Dugdale 2000).

Work Undertaken to Date: Survey of Otago and Southland coasts and Stewart Island. Captive rearing undertaken (B. Patrick pers. comm. 1999).

Priority Research, Survey, and Monitoring: 1) Taxonomy required to confirm the species status (B. Patrick pers. comm. 1999).

Management Needs: 1) Undertake habitat restoration by planting the host (*Pimelea lyallii*) at selected sites.

2) Maintain habitat at selected sites.

3) Look at options for introducing the moth to Fortrose Spit sand-dune (B. Patrick pers. comm. 1999).

Contacts: Brian Patrick.

See Plate 1, No. 9, No. 10.

Order: Lepidoptera

Family: Noctuidae

Taxonomic Name: *Meterana pictula* (White in Taylor, 1855)

Common Names: Northern pimelea cutworm moth

Synonyms: *Melanchra rhodopleura* (Dugdale 1988), *Mamestra rhodopleura* (Hudson 1928)

M&D Category: I High Priority

Conservancy Office: BP, TT, EC/HB, WL, NM, WC, SL

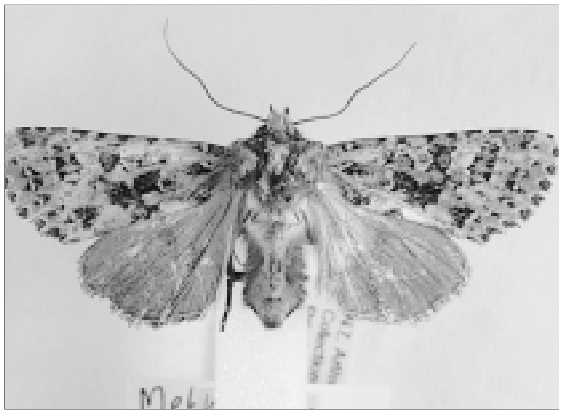
Area Office: Rangataiki, Ruapehu, Hawke's Bay, Poneke, Golden Bay, Buller, Te Anau

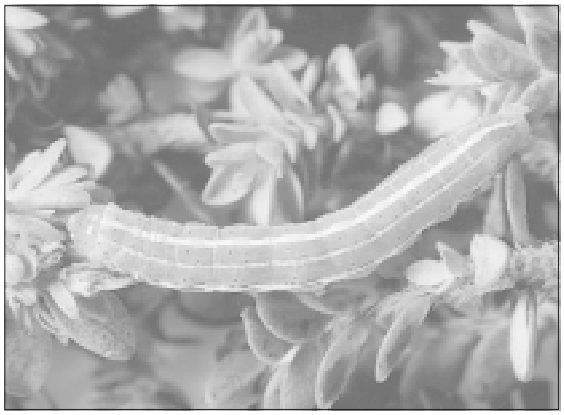
Description: A moth with greenish-grey forewings, carrying yellow marks edged in black (Foord 1990). The hindwings are pink-grey. The wings are about 38 mm wide, and the sides of the abdomen are crimson (Hudson 1928). The larvae are colourful, with white, red, and yellow lines (B. Patrick pers. comm. 1999), and measure about 38 mm long. Their general ground colour is a rich velvety green, but this is variable (Hudson 1928). This species' forewings lack the prominent white reniform characteristic of South Island *M. meyricci* (Dugdale 1988).

Wingspan: 38 mm

Type Locality: North Island - specimen not located (Patrick & Dugdale 2000).

Specimen Holdings: CMNZ, MONZ, NZAC, OMNZ.





Top: Adult. Photo: Andrew Townsend.
Bottom: Caterpillar. Photo: Brian Patrick.

Distribution: Coastal to alpine open habitats in the central and eastern North Island and the western South Island. Locally extinct at many coastal sites in the North Island, still relatively common in north-west Nelson and the North Island Central Plateau, and probably locally common in coastal Fiordland (B.Patrick pers. comm. 1999). It has been collected from coastal north-west Nelson (B.Patrick pers. comm. 1999); Mt Ruapehu 1978; Hawkes Bay, Little Bush 1964[5]; Napier[1, 5]; Wellington[1, 5]; Tokaanu[1, 3, 4, 5]; Titahi[3, 4]; Titahi Bay[2]; Waitomo[4]; Auckland; Claremonty, North Canterbury[1]; Amberley[2]; Makara, Wellington[3]; Hawkes Bay farm[3]. The western disjunct distribution in the South Island is an important biogeographical feature (Patrick & Dugdale 2000). The Claremonty and Amberley records should be checked because these are outside of the species known range (J. Dugdale pers. comm. 2000).

[1]Hudson 1928; [2]Hudson 1939; [3]CMNZ; [4]MONZ, [5]NZAC.

Habitat: Found in coastal, montane, and alpine shrublands in the North Island, but only coastal shrublands in the South Island (information from J. Dugdale pers. comm. 2000; B. Patrick pers. comm. 1999). The larva feeds on sub and sub-shrub *Pimelea* species (Thymeleacae) (Patrick & Dugdale 2000).

Threats: Lowland sites in the Bay of Plenty and possibly Nelson, Fiordland and elsewhere (Patrick & Dugdale 2000) are at risk from erosion, or development in sites not legally protected. Locally extinct at many coastal sites in the North Island (B. Patrick pers. comm. 1999).

Work Undertaken to Date: Survey and biology work done (*B. Patrick* pers. comm. 1999). *Meterana pictula* sensu Butler 1877 was synonymised with *M. meyricci*. However, *M. pictula* White in Taylor 1855 stands. *M. pictula* lacks the characteristic white reniform of the South Island *M. meyricci* (Dugdale 1988). There is legal protection for a few frost flat sites in the Taupo area (Patrick & Dugdale 2000).

Priority Research, Survey, and Monitoring: 1) Investigate whether this species is present at frost flats with *Pimelea* present along the Napier/Taupo Rd, and also at Pureora Forest and Whirinaki Forest where suitable habitat is present (K. Owen pers. comm. 2000).

2) Check the Canterbury records of Claremonty and Amberley, because these are outside the species known range (J. Dugdale pers. comm. 2000).

Management Needs: 1) Maintain habitat at some key coastal populations.

Contacts: John Dugdale, Brian Patrick.

See Plate 1, No. 11, No. 12.

Order: Lepidoptera

Family: Unknown

Taxonomic Name: *Titanomis sisyrota* Meyrick, 1888

Common Names: -

Synonyms: -

M&D Category: X

Conservancy Office: WK, TT, WL, NM, WC, SL

Area Office: Maniapoto, Ruapehu, Kapiti, Nelson, South Marlborough, Greymouth, Murihiku

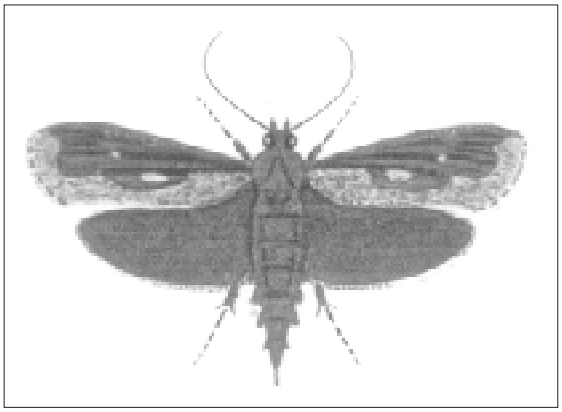
Description: A large, greyish-black moth, with a very broad, wavy, speckled whitish band along the back and sides of the forewings. The female wing span is 63 mm (Hudson 1928), and c. 55 mm in the male (R. Hoare pers. comm. 2000).

Wingspan: 63 mm

Type Locality: Nelson (Hudson 1928; Dugdale 1988).

Specimen Holdings: NHML.

Distribution: Has been found at, Wakapuaka, Nelson[1]; Greymouth[2]; Haldane, Southland[1, 2]; Nelson[1, 2]; Blenheim[2]; Otaki[1, 2] (all 1900 or prior); Rangataua, near the base of Mt Ruapehu (1921)[1, 2]; Waipapa, Waikato (1959) (specimen lost) (Patrick & Dugdale 2000).



[1]Hamilton 1921; [2]Hudson 1928;

Habitat: Biology unknown. The most recent specimen was collected from a site dominated by tall *Kunzea* forest (Patrick & Dugdale 2000). All other specimens came from regions which had beech forest and/or *Kunzea* in their localities (Hamilton 1921; J. Dugdale pers. comm. 2000).

Threats: Not known.

Work Undertaken to Date: Last seen in 1959 (Waipapa, Waikato), possibly extinct (Patrick & Dugdale 2000).

Priority Research, Survey, and Monitoring: 1) Keep an eye out for this species if doing any light trapping or fieldwork.

Contacts: John Dugdale, Robert Hoare.

See Plate 1, No. 19.

Adult female.
Top: Permission: G. Gibbs. Hudson 1928, Plate 25, Fig. 28.
Bottom: Photo: Permission Landcare Research (NZ) Ltd.

Order: Orthoptera (Gr. *orthos*, straight + *pteron*, wing)

Common name: **Crickets, katydids, grasshoppers, locusts, & weta**

Family: Acrididae

Common name: **Short-horned grasshoppers, kowhitiwhiti**

Order: Orthoptera

Family: Acrididae

Taxonomic Name: *Brachaspis robustus* Bigelow, 1967

Common Names: Robust grasshopper (Scott & Emberson 1999)

Synonyms: -

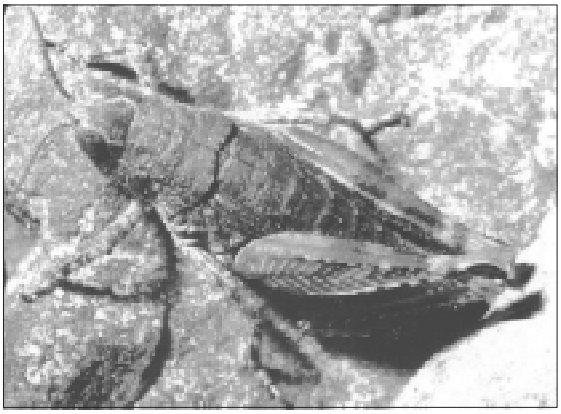
M&D Category: A

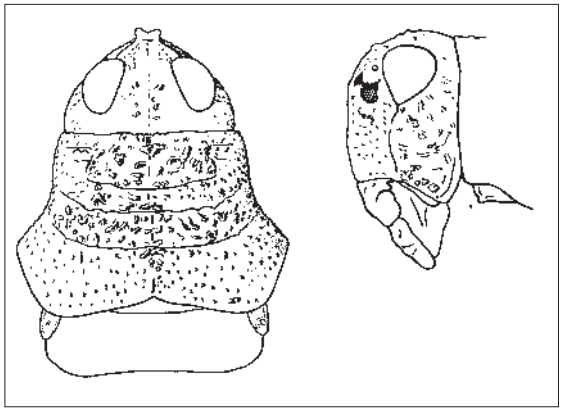
Conservancy Office: CA

Area Office: Twizel

Description: A slate-grey grasshopper, with some individuals having light yellowish, and occasionally orange, patterns on the thorax. The ground colour is variable, especially between habitats of different background colours, with earthen-brown colours more prominent in some areas, and richly patterned black and grey individuals in prominent lichen areas. The inner side of the hind legs has red and indigo-violet flash displays. The antennae are of a similar length to the face. This species can be distinguished from all other grasshoppers by the shape and surface of the pronotum (the body covering immediately behind the head), which is broader than long, and rounded towards the sides. The surface is rough, not smooth, and its hind margin is more or less straight, not wavy (White 1994).

Type Locality: Ahuriri River, North Otago (Bigelow 1967).





Top: Permission: Manaaki Whenua Press. Meads 1990a, p 29.
Bottom: Left: Dorsal view of head and pronotum.
Right: Lateral view of head and pronotum.
Permission: Canterbury University Press. Bigelow 1967, Plate 26, Figs. 26.1, 26.2.

Specimen Holdings: CMNZ.

Distribution: Known from the Mackenzie Basin, Canterbury. It has been found at Kurow, on the Waitaki River (White 1994); Ahuriri River (Bigelow 1967), at the southern limits of the basin; Ohau River delta; Pukaki River; Tekapo River channel; Fork Stream, Balmoral Station; by the Tekapo A Powerhouse; Grays Hills; Snow River; Sawdon Stream (White 1994).

Habitat: This species' microhabitat preferences vary depending on the site, and include diverse loose-stone aggregates as in braided river beds (Ohau River delta, Pukaki River, Snow River, Sawdon Stream), lichen covered embedded stone pavements as in stable terraces and fans (Sawdon Stream young flood terraces, Grays Hill old river terraces, Snow River fan old outwash), fractured non-fluvial stones of recent downcutting flood disturbances (Mackenzie River, Snow River), degrading embankments of loose stone as in gullies on high terrace risers (Tekapo Canal monitoring site). The only obvious common feature is stoniness, and the presence of fine stone pavements (White 1994). Maloney (1992) noted that most sightings of the grasshopper were within 1 m of some form of vegetation, with stone crop (*Sedum acre*) (Ohau River area), and willowherb (*Epilobium* spp.) (Pukaki River), having a relatively high association rate.

Threats: Predation from hedgehogs, cats, skinks and birds (especially banded dotterel) is thought to occur, based on

fragments found in faeces. Spiders may also contribute to losses. Prey switching due to decline in rabbit populations is also a factor which may introduce seasonal predators. Populations in river channels face periodic losses from natural flood events or large hydroelectric river releases (White 1994; G. White pers. comm. 1999). An apparent decline in the Pukaki riverbed population may be due to large flood events in the summer of 1996 (Fraser 1999).

Work Undertaken to Date: Research, survey and monitoring of the populations in the Mackenzie Basin has been undertaken. Patrick & Chisholm (1989) did not find this species near Kurow, but it was still locally common in the Mackenzie Country. White (1994) mentioned that a recent survey of the Kurow and Ahuriri River areas failed to locate either any specimens, or promising habitat. However, searches in some of the other areas were successful. Transects were undertaken at the Pukaki River, Ohau Spit and the lower Ohau riverbed in the summer of 1998/99. Grasshoppers were found at all three sites, but only after extensive searching at the Pukaki River site, and then only 2 specimens (Fraser 1999).

Priority Research, Survey, and Monitoring: 1) Monitor the population in the lower Pukaki River, approximately 6 km above the junction of the Pukaki and Tekapo Rivers, to determine if the reduced numbers found in the last survey are due to a decline in the population or just a fluctuation.

2) Undertake genetic research on southern grasshopper specimens presumed to be *Brachaspis nivalis* to determine whether they are in fact *B. nivalis, B. robustus*, or a new species altogether. Preliminary examination has shown that these grasshoppers are genetically very close to *B. robustus* (Trewick & Wallis pers. comm. 1999). This needs to be resolved because it could alter the conservation status of *B. robustus*.

3) Re-assess grasshopper abundance at Mackenzie River, Sawdon Stream, or Snow River outwash fan. If there is an adequate abundance to statistically demonstrate the effects of predator control, then undertake a 2 year trial of feral cat control at one of three sites (Mackenzie River, Sawdon Stream, or Snow River outwash fan), just before and following the December - January recruitment of new *B. robustus* adults in each of the 2 years. This will allow comparison of adult female survival between the three sites, and test the possibility of enhanced breeding success for the species (White 1994). Remain mindful of cohort effects between years. A 'low' year may follow or precede a year of higher densities due to life-stage cohorts associated with the 2-3 year life-cycle (G. White pers. comm. 2000).

Management Needs: 1) Maintain habitat at the Snow River outwash fan site.

2) Maintain habitat at the Pukaki River site.

3) Liaison between the Department of Conservation and the Electricity Corporation of New Zealand to optimise the cautions and timing of hydroelectric river releases (White 1994). When the Twizel River is running high during a Gate 22 spill into Ohau River, cusecs are additive below Twizel River junction with Ohau River. Hence Ohau delta populations may not be protected by Gate 22 spills that fail to account for high waters in Twizel River e.g. as ocurred in November 1999 (G. Whiter pers. comm. 2000).

4) Maintain sightings database, and train field staff in the identification of this grasshopper (Fraser 1999).

Contacts: Graeme White, Steve Trewick, Simon Morris.

See Plate 2, No. 17.

Order: Orthoptera

Family: Acrididae

Taxonomic Name: *Sigaus piliferus* Hutton, 1898

Common Names: -

Synonyms: -

M&D Category: I High Priority

Conservancy Office: EC/HB

Area Office: Gisborne

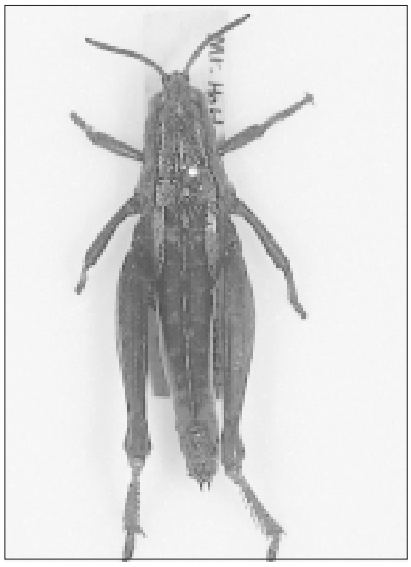
Description: A large brown grasshopper, paler on the upper surface. Most of the body is coarsely pitted or reticulate with many wrinkles. The body is 15 - 22 mm long in the male, 25 - 40 mm long in the female (Bigelow 1967). The hind tibia (lower leg) is very hairy (Hutton 1898).

Type Locality: Auckland (Hutton 1898).

Body length: 40 mm

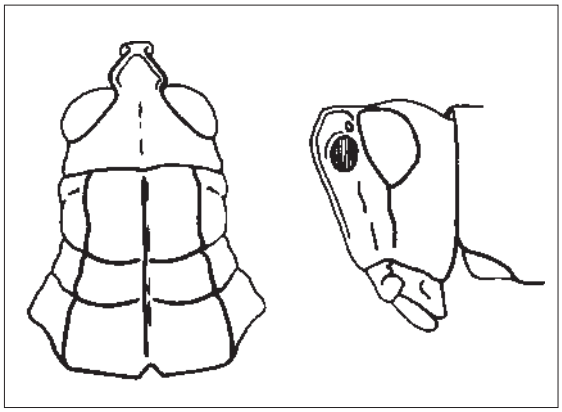
Specimen Holdings: CMNZ, MONZ.

Distribution: Bigelow (1967) stated that it 'probably occurs in all alpine areas of the North Island except for Mt Egmont', however it now appears to be restricted to East Cape (P. Johns pers. comm. 1999). Specimens have been collected from Pohangina Saddle, Eastern Ruahine Ranges 1402 m; Kauaeranga Valley, Coromandel Peninsula; Maungatautari, Cambridge; Rotorua area; Mt Hikurangi, East Cape Peninsula; Waihaha River, Lake Taupo; Tauhara Summit, Lake Taupo; Tongariro National Park District; Kaimanawa Range; Kaweka Range; Waiouru; Taihape-Napier Road; Ruahine Range; Wellington (Bigelow 1967); Scoria Flat, Mt Ruapehu, National Park District; Conical Hill, Upper Waihaha River; Mt Holdsworth 1219 - 1371 m; Mt Hector; Slopes of Tabletop, Tararua Ranges (MONZ).



Habitat: Occurs in lowland to high country open grasslands, scrub, and roadsides (P. Johns pers. comm. 1999). It has been collected from tussock, stream banks, and scree & swamp (CMNZ). It is most common at altitudes above 914 m (Bigelow 1967).

Threats: Predated by mynah birds (*Acridotheres tristis*) (P. Johns pers. comm. 1999).



Top: Photo: Andrew Townsend.
Bottom: Left: Dorsal view of head and pronotum.
Right: Lateral view of head and pronotum.
Permission: Canterbury University Press. Bigelow 1967, Plate 4, Figs. 4.1, 4.2.

Work Undertaken to Date: -

Priority Research, Survey, and Monitoring: 1) Survey suitable sites in the East Cape region to obtain an estimate of the distribution and abundance of this species.

Contacts: Peter Johns, Simon Morris.

Family: Anostostomatidae

Common name: **Bush weta, ground weta, tree weta**

Genus: *Anisoura*

Order: Orthoptera

Family: Anostostomatidae

Taxonomic Name: *Anisoura nicobarica* Ander, 1938

Common Names: Northland tusked weta (Scott & Emberson 1999), Reinga weta, Hokianga weta, Hokianga tusked weta (Ramsay 1979)

Synonyms: *Hemiandrus monstrosus* (Johns 1997)

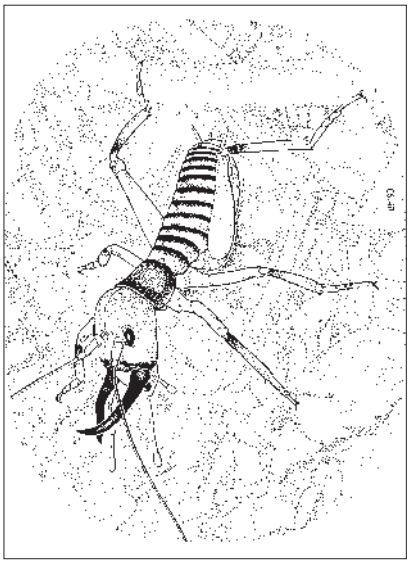
M&D Category: C

Conservancy Office: NL

Area Office: Kaitaia, Kerikeri, Whangarei.

Description: A small bodied, glossy orange-brown weta, with the abdomen strongly banded with yellow. The males are 17 - 23 mm long (Gibbs 1998a), and have protruding tusks at the base of their mandibles, which extend forward and cross each other (Sherley 1998a). The females are up to 33 mm long (R.Parrish pers. comm. 2000).

Body length: 33 mm



Top: Male.
Photo: Andrew Townsend.
Bottom: Drawing: Des Helmore.
Permission: Landcare Research (NZ) Ltd.

Type Locality: Reinga, North Auckland, under log (Palma et al. 1989).

Specimen Holdings: MONZ.

Distribution: Only known from north of a line between Waipoua and Whananaki. Has been found at Orokawa Bay in the Bay of Islands, 1948; Cape Reinga, 1950; Pakanae Valley; Opononi; Kohukohu; Maungapika (Te Paki); Whareana (Te Paki); Whananaki; Kaitaia; Puketi Forest (Sherley 1998a); Herekino; Okaihau; Pakanae (near Opononi); Omahuta Forest; Ahipara (Bellingham 1991); Herekino Gorge area (Messenger 1992); Taranga Bay (S. Trewick & M. Morgan-Richards pers. comm. 1999); Waipoua Kauri Forest (Laidlaw 1956); Maungataniwha Forest, near Pokaka (south Kerikeri); Omapere (A. Booth pers. comm. 2000). Most of the recent sightings have come from the Hokianga region, and most records are of single animals, which has given little indication of their abundance (Sherley 1998a).

Habitat: Most specimens have been located inside manuka (*Leptospermum scoparium*) and kanuka (*Kunzea ericoides*) holes, but specimens have also been found under a log; in the stem of a *Muehlenbeckia* vine growing on totara (*Podocarpus totara*) (Sherley 1998a); in mixed manuka and broad-leaved shrubland; in buildings (Bellingham 1991); on a ponga (*Cyathea dealbata*) frond in forest (Messenger 1991); several specimens in a short rotten tutu (*Coriaria* sp.) branch. The tunnel in the tutu branch was 8 mm in diameter and 92 mm long, with a clean and bright surface, it went straight into the branch for a short distance and then curved sharply and followed the pith (Messenger 1992). Mainly arboreal, they also spend some time on the ground, as evidenced by specimens being collected under logs (Bellingham 1991). They may also use holes in the soil. These weta often plug their holes with a mixture of saliva and wood chips, and they always face the entrance of the hole (Gibbs 1998a).

Threats: Not known. There is no evidence of a decline, and little information on past or present abundance and distribution. Loss of habitat through forest clearance, and the introduction of exotic predators, has probably reduced both the distribution and abundance of the species (Sherley 1998a).

Work Undertaken to Date: 1997: *Hemiandrus monstrosus* made a synonym of *Anisoura nicobarica* (Johns 1997). Recent discoveries have been recorded and informal surveys have been conducted. Attempts to breed the species by Jackie Davidson, Graeme Ramsay and Chris Winks have been unsuccessful (Sherley 1998a).

Priority Research, Survey, and Monitoring: 1) Determine the distribution and abundance.

2) Research the habitat requirements and biology of the species through captive and field studies (Sherley 1998a).

Management Needs: 1) Avoid aerial sowing of grain based 1080 pellets in areas where these weta occur (Hutcheson 1989).

Contacts: George Gibbs, Richard Parrish, Andrea Booth, Mark Bellingham, Paul Barrett, Peter Johns.

See Plate 2, No. 11.

Genus: *Deinacrida*

Common name: **Giant weta**

Order: Orthoptera

Family: Anostostomatidae

Taxonomic Name: *Deinacrida carinata* Salmon, 1950

Common Names: Herekopare weta (Scott & Emberson 1999), Herekopare Island weta, Foveaux Strait giant weta, Herekopare giant weta (Foord 1990).

Synonyms: -

M&D Category: C

Conservancy Office: SL

Area Office: Southern Islands

Description: A small, dull brown-black weta, with no dark pigment spots along the posterior margin of the pronotum (the 'shield' just behind the head). There is a conspicuous crest on abdominal segments 4 - 7 (G. Gibbs pers. comm. 2000).

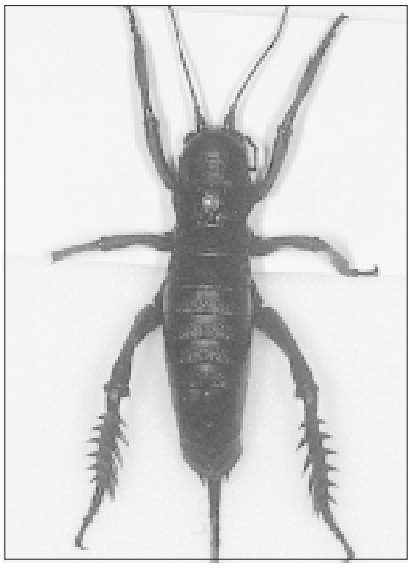
Type Locality: Herekopare Island, Foveaux Strait (Salmon 1950).

Specimen Holdings: MONZ.

Distribution: Found on Pig Island, off Colac Bay, Foveaux Strait; Herekopare Island, off Halfmoon Bay, Stewart Island; and Kundy Island, south-west of Stewart Island. Present in low numbers on Kundy Island (Cooper et al. 1999), and the population size on Herekopare Island is not known. The Pig Island population appears to be large and viable (Sherley 1998a). Presence on all three islands has been noted since 1997 (Edwards 1999).

Habitat: The vegetation of Herekopare Island is quite different from that of Pig Island. The former is comprised of shrub species, and the latter is dominated by *Carex*, sedge, and some woody shrubs (Sherley 1998a). On Pig Island, specimens have been found on cocksfoot (*Dactylis glomerata*), Californian thistle (*Cirsium arvense*), and southern nettle (*Urtica australis*), along pathways near a flaxy slope (Cooper et al. 1999).

Sign of Presence: Faecal pellets are small and not characteristic of other giant weta species (Meads & Notman 1995a).



Female.
Photo: Andrew Townsend.

Threats: Introductions or invasions of rodents are a threat to the long term survival of this species. The former range of this species is not known, but it is assumed that cats and weka have had an impact on their distribution (Sherley 1998a).

Work Undertaken to Date: Surveys of Herekopare and Pig Islands have been completed. Two adult pairs and a pair of nymphs were collected by Mike Meads in March 1993, for observation and captive breeding. The adult females laid eggs before dying in captivity. The eggs failed to hatch (Sherley 1998a). Currently, there are management plans being worked on to capture and relocate weka (Cooper et al. 1999), and to prevent rodent invasion on Pig Island (Edwards 1999).

Priority Research, Survey, and Monitoring: 1) Survey rodent-free islands in the Foveaux Strait/Stewart Island region, including Omaui, Dog, and Rarotoka Islands (Cooper et al. 1999), as well as the known locations of Kundy,

Herekopare and Pig Island, to determine the distribution and abundance of this species.

2) Investigate the potential introduction of *D. carinata* to Codfish Island.

Management Needs: -

Contacts: Andy Roberts, Pete McClelland, George Gibbs.

See Plate 2, No. 1.

Order: Orthoptera

Family: Anostostomatidae

Taxonomic Name: *Deinacrida elegans* Gibbs, 1999

Common Names: Bluff weta, Kaikoura Ranges weta, Mid-Canterbury weta, Kahutara weta (Gibbs 1999a), Mt Somers weta.

Synonyms: *Deinacrida* "maungakoura" (Meads & Notman 1992b), *Deinacrida* species A (from Kaikoura Range), *Deinacrida* species C (from Mt Somers) (Field 1993).

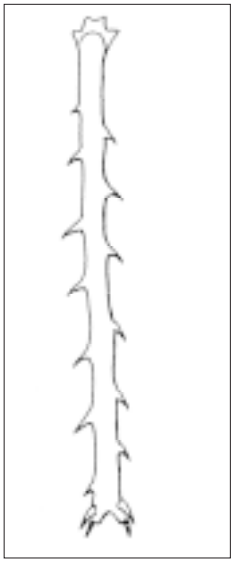
M&D Category: B

Conservancy Office: NM, CA

Area Office: South Marlborough, St Arnaud, (Waimakariri?)

Body length: 55 mm

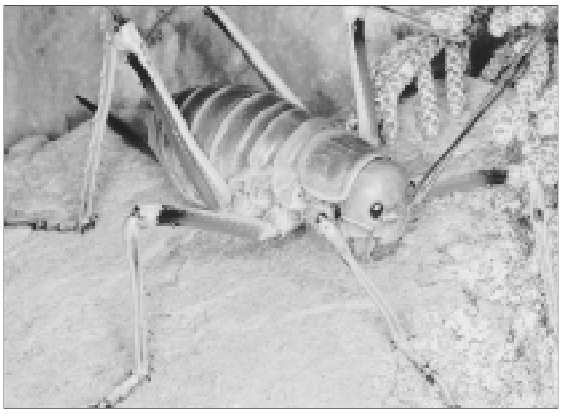
Description: A moderately large, steel-grey, long legged weta, with distinctive red, black, and white banded femora (the long part of the leg closest to the body) (Gibbs 1999a). The rear of each body segment is edged with white or pale grey which becomes grey and orange on the sides. The thoracic shield is greyish and is tinged with orange (Sherley 1998a). The tibiae (the long part of the leg just above the feet), have 7 or 8 fixed spines plus a single articulated distal spine in the inner row (Gibbs 1999a). Small juveniles are mainly black, with white spines and leg joints. Males weigh 8.0 g, females 11.4 - 16.5 g (Gibbs 1999a). Females can reach a length of 55 mm (excluding ovipositor) (Gibbs & Richards 1994).



Type Locality: Junction Woolshed & Morgan Streams, Mt Somers, 800 m (Gibbs 1999a).

Specimen Holdings: NZAC, MONZ, VUNZ.

Distribution: The species is known from between 42° 00' S and 43° 35' S at sites in the Marlborough and Mid Canterbury Ranges (Gibbs 1999a) including Kahutara Saddle 1310 m; Staircase Stream, upper Hodder River 1600 m; Shearwater Stream c 1300 m; Red Hills, upper Hodder River 1600 m; north branch of the Hapuku River 1250 m & 1225 m (Meads & Notman 1992b); north branch upper Hapuku River, 900 m & 1140 m; junction Woolshed & Morgan Streams, Mt Somers, 800 m; Middlehurst Station, Tone Block, Inland Kaikoura Ranges, 1725 m; Team Stream, Saxton River, Molesworth Station; upper Hapuku Valley, 900 m; tributary Woolshed Creek, Mt Somers, 620 m; Waterfall Cliffs, above Pinnacles Hut, Mt Somers, 1100-1200 m (Gibbs 1999a); Judges Creek, Wairau Valley, Raglan Range (information from Gibbs 1999a; P. McArthur pers. comm. 2000). Their distribution is likely to be limited by the availability of suitable habitats, therefore some populations may be quite small and isolated (Sherley 1990a).



Top: Right hind tibia.
Permission: SIR Publishing. Gibbs 1999a, p 314, Fig. 6.
Bottom: Female.
Permission: Manaaki Whenua Press. Meads & Notman 1991, p 10, Fig. 1.

Habitat: Occurs on rocky bluffs in lower rainfall ranges. Lives in narrow crevices and fissures on solid, near vertical rock bluffs. The crevices are clean and dry, usually close to horizontal with extensive deep cavities. Small immatures occupy crevices only a few mm wide, whilst adults live in spaces about 10-15 mm wide. Occasionally adults may be found under dense overhanging plants (e.g. *Helichrysum*) on cliffs. Found between 620-1725 m (Gibbs 1999a).

Sign of Presence: Droppings in rock crevices (G. Gibbs pers. comm. 2000).

Threats: Not considered to be at risk or under threat.

Work Undertaken to Date: Genetic research has shown that the Mt Somers (or 'Mid Canterbury giant weta') and the 'Bluff' weta of the Seaward and Inland Kaikoura Ranges are the same species. A male and female weta were taken into captivity by Mike Meads in 1991, to form the nucleus of a breeding colony. Offspring have been produced from this colony (Mike Meads, pers. comm. cited in Sherley 1998a). Formally described in 1999 (Gibbs 1999a).

Priority Research, Survey, and Monitoring: 1) Incidental survey only, and record extensions to the known range.

Management Needs: -

Contacts: Ian Millar; George Gibbs.

See Plate 2, No. 8.

Order: Orthoptera

Family: Anostostomatidae

Taxonomic Name: *Deinacrida fallai* Salmon, 1950

Common Names: Poor Knights giant weta (Scott & Emberson 1999), Poor Knights Island weta, Poor Knights weta (Foord 1990)

Synonyms: -

M&D Category: C

Conservancy Office: NL

Area Office: Whangarei

Description: A large, light brown weta, with a line of black markings on the back, and black stripes along the flanks. The lower hind legs are dark brown. The females are up to 73 mm long (Sherley 1998a) and weigh between 24 and 48 g (P. Barrett pers. comm. 2000).

Body length: 73 mm

Type Locality: Poor Knights Island (Watt 1982b; Palma et al. 1989).

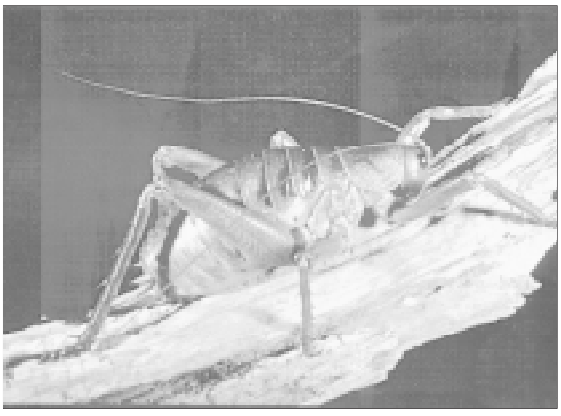
Specimen Holdings: MONZ, AMNZ.

Distribution: Restricted to the Poor Knights Islands group, where it is common on Tawhiti Rahi and Aorangi Island (Richards 1973, Watt 1982b). A faecal pellet found on Archway Island was confirmed to be from a giant weta (R. Parrish pers. comm.) (Sherley 1998a) and may relate to this species.

Habitat: Almost ubiquitous on Aorangi and Tawhiti Rahi Islands, from the top most branches of trees down through shrubs to renga lillies (*Arthropodium cirratum*), and frequently on the ground (R. Parrish pers. comm. 2000). Have been found on old gnarled trees, which have an abundance of holes and loose bark, in particular pohutukawa (*Metrosideros excelsa*) (Parrish 1992). When on the ground, they can be found during the day sheltering under stones and sedges (Brook 1999b).

Sign of Presence: Faecal pellets present under foliage where the weta feed.

Threats: None known at present. The accidental introduction of rodents could seriously reduce or eliminate Poor Knights weta from one or both islands, and would endanger the entire species. They are preyed upon by a range of indigenous species (e.g. tuatara, lizards and birds), but these do not appear to threaten the viability of the weta population. Any future introduction of other insectivorous animals like saddleback could have a deleterious effect, although there are presently no plans to reintroduce such species (Sherley 1998a).



Female.
Photo: George Gibbs.

Work Undertaken to Date: Pigs eradicated from Aorangi in 1936 (Powell 1938 cited in Penniket 1981). Surveys of the Archway Islands in the Poor Knights group found signs of weta presence in 1996. This species has been successfully bred in captivity at Wellington Zoo. Richards (1973) kept this species in captivity during her study on their biology. Mike Meads and Paul Barrett have also successfully bred *Deinacrida fallai* in captivity (Sherley 1998a), with Barrett having reared through three generations (P. Barrett pers. comm. 2000). Behavioural study undertaken at Wellington Zoo by John Brown in 1995 (G. Gibbs pers. comm. 2000).

Priority Research, Survey, and Monitoring: 1) Survey Aorangi, Archway and other small islands in the Poor Knights Islands group (Brook 1999b), to see if this species is present outside the current known distribution.

Management Needs: 1) Maintain island security at the Poor Knights Islands.

2) If no additional populations are found on other islands, then investigate the potential for, and feasibility of, increasing the number of populations to four or five by introducing the species to other locations (Sherley 1998a).

Contacts: Richard Parrish, Andrea Booth, Paul Barrett, George Gibbs.

See Plate 2, No. 2.

Order: Orthoptera

Family: Anostostomatidae

Taxonomic Name: *Deinacrida heteracantha* White, 1842

Common Names: Little Barrier giant weta (weta punga) (Scott & Emberson 1999), giant weta-punga, forest weta (Foord 1990)

Synonyms: *Hemideina gigantea, Deinacrida gigantea* (Wise 1977)

M&D Category: B

Conservancy Office: AU

Area Office: Warkworth

Description: A large mottled brown weta. Females are up to 82 mm long and usually weigh over 40 g. The heaviest recorded weight for a captive female was 71.3 grams (Richards 1973), and the heaviest adult male kept in captivity was 18 g (Paul Barrett pers. comm. in Sherley 1998a).

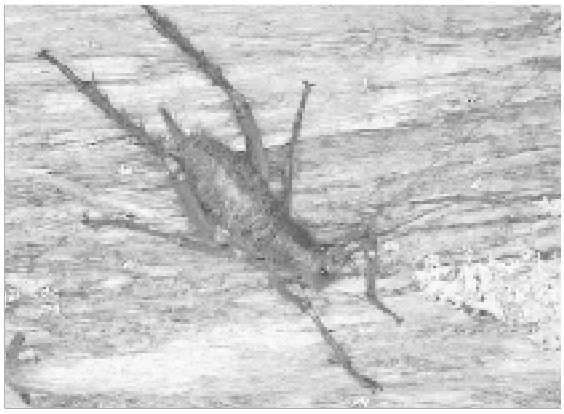
Type Locality: The neotype of Salmon from Little Barrier Island is invalid and has no type status (Palma et al. 1989).

Specimen Holdings: NHML (Type), AMNZ.

Distribution: Historically present in the forests north of Auckland (Buller 1871), Great Barrier Island, and Little Barrier Island (Sherley 1998a). Old records have specimens from Pahia; Waiheke Island; Tangiteroria; near Whangarei; near the Kaipara River; near the Wairoa River; and from a small wooded island in the Hauraki Gulf (Richards 1973). Now restricted to Little Barrier Island, where it has been found at Te Toki Point; Tirikakawa Track; and Hamilton Track (Meads & Ballance 1990). There has been a definite decline in numbers since the late 1950s, and there has not been any sign of recovery since 1992. It is likely that the population is still in decline (Gibbs & McIntyre 1997).

Body length: 82 mm

Habitat: This weta is arboreal, and large convoluted trees, which provide retreats, cover, and crevices appear to be important (Meads & Notman 1995b). They can be found during the day under lose bark, amongst the dense 'skirts' of dead leaves found under some tree fern crowns, under epiphytes, or in the hanging foliage of rimu (*Dacrydium cupressinum*) or nikau palms (*Rhopalostylis sapida*). Specimens have also been collected from mahoe (*Melicytus ramiflorus*), poroporo (*Solanum* spp.), kohekohe (*Dysoxylum spectabile*), pohutukawa (*Metrosideros excelsa*), towai (*Weinmannia silvicola*) (Meads & Ballance 1990), and kanuka (*Kunzea ericoides*) (J. Pickard pers. comm. to P. Barrett).



Female.
Permission: Manaaki Whenua Press. Meads 1990a, p 17.

Sign of Presence: Look for faecal pellets. These are most commonly found at the base of old convoluted tree trunks, inside refuge crevices in tree trunks, and in areas directly below epiphytes on overhanging branches (Meads & Notman 1995b).

Threats: Predation by rats and saddlebacks is a possible threat, although there is no direct evidence of this occurring (Gibbs & McIntyre 1997). The increase in kiore numbers after cat eradication, the damage cyclone Bola caused to mature kanuka (*Kunzea ericoides*) trees, and the fact that saddlebacks are

efficient foragers of habitat associated with juvenile weta (Meads & Ballance 1990), is likely to have increased the pressure on this weta. The accidental introduction of additional mammalian pests to Little Barrier Island poses a potential threat (Sherley 1998a).

Work Undertaken to Date: 1970s: Cats were eradicated from Little Barrier Island.

1984: Saddlebacks reintroduced to Little Barrier Island after a 100 year absence (Meads & Ballance 1990).

1994: Poison control of kiore around the rangers house ceased (C. Smuts-Kennedy pers. comm. 2000).

1997: Survey to assess conservation status of wetapunga was completed. A radiotracking study indicated that adult females lead a nomadic lifestyle (Gibbs & McIntyre 1997).

1998: Recovery plan published (Sherley 1998a).

Mike Meads and Paul Barrett have kept *Deinacrida heteracantha* for conservation and research purposes, and Richards (1973) kept *D. heteracantha* in captivity during a study of their biology (Sherley 1998a).

Priority Research, Survey, and Monitoring: 1) Determine the range and abundance of wetapunga on Little Barrier Island (Sherley 1998a).

Management Needs: 1) Advocate kiore control or removal from Little Barrier Island.

2) Establish a captive population to provide individuals for transfer and also to act as a back-up population.

3) Establish a population on another island with suitable habitat which is predator free, to ensure continued survival of this species (Gibbs & McIntyre 1997).

4) Investigate the use of artificial refuges where kiore control or removal is not practical. Ensure these refuges offer security from saddleback.

Contacts: Chris Green, Paul Barrett, George Gibbs, Mary McIntyre.

See Plate 2, No. 3.

Order: Orthoptera

Family: Anostostomatidae

Taxonomic Name: *Deinacrida mahoenui* Gibbs, 1999

Common Names: Mahoenui giant weta (Foord 1990), gorse weta, King Country weta (Foord 1990)

Synonyms: -

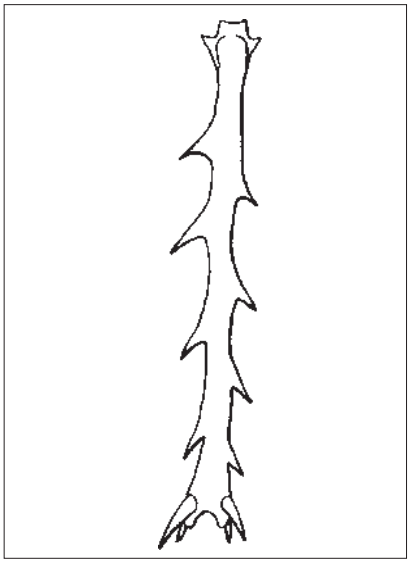
M&D Category: C

Conservancy Office: WK

Area Office: Maniapoto, Hauraki

Description: A large dark brown, or occasionally yellowish, long-legged weta. The hind tibiae (the long part of the leg just above the feet), have four fixed spines plus a single articulated distal spine in each row (Gibbs 1999a). Adult females are 65 - 74 mm long, and adult males 45 - 49 mm long (Sherley 1998a). Males weigh 5.9 - 9.6 g and females 9.8 - 17.7 g (Gibbs 1999a).

Body length: 74 mm

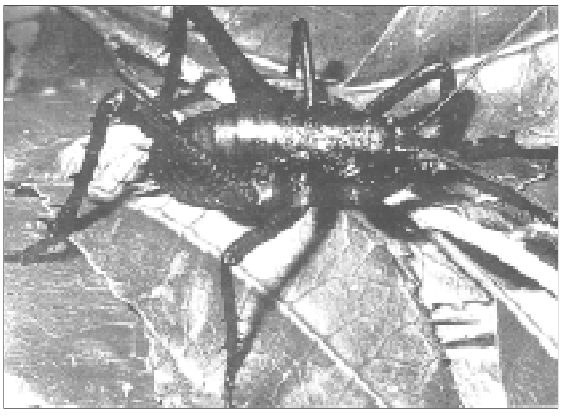


Type Locality: Mahoenui, Te Kuiti.

Specimen Holdings: Specimens held in MONZ, AMNZ (Gibbs 1999a).

Distribution: Naturally found in two King Country sites, Mahoenui (230 ha) and Otangiwai (Sherley 1998a). Translocated to Arthur Cowan's land at Rewarewa; Mangaokewa Gorge Scenic Reserve (twice); Ruakuri Reserve; Mahurangi Island; and Motutapere Island. It is not known how the Cowan release and original Mangaokewa release are establishing, and it is too early to determine how the other translocations are establishing. Some weta are also present at Waotu near Putaruru as escapees from a captive breeding programme (J. Roxburgh pers. comm. 1999).

Habitat: Mahoenui weta are thought to have lived in tawa forest during pre-European times (in epiphytes such as *Collospermum*) but they are now found primarily in gorse (*Ulex europaeus*) bushes (Sherley 1998a), which constitutes most of their diet (LaPorta 1988). On Mahurangi Island they are in a coastal broadleaf, gorse and manuka habitat (J. Roxburgh pers. comm. 1999; C. Smuts-Kennedy pers. comm. 2000). At Mahoenui it tends to favour north to east facing steep slopes (Sherley & Hayes 1993), and large gorse bushes with little or no goat browsing, over small, isolated, and heavily browsed gorse (Richards 1994). They have also been found in tree ferns (*Dicksonia fibrosa*), mainly under overhanging dead fronds (Meads 1987a), as well as in gaps between broken off fronds on the fern trunk, and in gaps between the live fronds at the frond base (Jowett 1996); in epiphytic *Astelia* sp. growing on tawa; and in holes and hollows in gorse and tree ferns (Jowett & Plant 1989). This weta seldom ventures to the ground (Meads 1990; Richards 1994), but will cross open pasture (up to 40 m) to new gorse habitat, especially in late summer (Richards 1994). They are generalist feeders consuming plant and insect matter, including aphids, dead crickets, and larvae of the willow sawfly. Weta reared on gorse



Top: Right hind tibia.
Permission: SIR Publishing. Gibbs 1999a, p 314, Fig 7.
Bottom: Male.
Permission: Manaaki Whenua Press. Meads 1990a, p 25.

and pasture plants had a lower mortality and gained weight more steadily than weta reared on native vegetation. They feed on fresh and dead gorse foliage, green and mature gorse pods, and gorse flowers, as well as dandelion (*Taraxacum officinale*), plantain and various grasses at the reserve (Richards 1994). A diet study showed a preference for broadleaf (*Griselinia littorialis*), karo (*Pittosporum crassifolium*), and mountain holly (*Olearia ilicifolia*) and the exotics, gorse, willow (*Salix matsudana* and *S. tangoio*), broadleaf plantain (*Plantago major*), and dandelion. These plants were preferred over other plants offered including tawa, although each was never the only food eaten (see Richards 1994 table 8.1). Occurs over an altitudinal range of 50 - 300 m (Gibbs 1999a).

Sign of Presence: Faecal pellets present under foliage where the weta feed.

Threats: The population has probably declined after loss or modification of habitat, and the introduction of predators. Approximately 100 ha of weta habitat was lost to forestry conversion on private land in November and December 1993. There is a risk of further loss through destruction or modification of its limited habitat by either deliberate or accidental means. The Otangiwai population is not currently protected (Sherley 1998a). Hedgehogs prey on these weta, while the ship rat and possum are possible predators (Jowett 1996). The weta are more vulnerable to predation in summer because they are more active and spend longer periods in the upper more exposed regions of gorse, as well as spending time on the ground and moving between bushes (Richards 1994).

Work Undertaken to Date: Initial monitoring of the main population and mainland founder populations. Research has been completed on habitat use, life history, dispersal and reproductive biology. Captive rearing techniques have been developed and captive reared weta have been used for establishing founder populations. Mahoenui weta have been bred in captivity for successive generations by Mike Meads and Chris Winks (Sherley 1998a). Translocated to Mangaokewa Gorge Scenic Reserve (February 1989 and December 1989), Arthur Cowans land at Rewarewa (February 1989, December 1989, January 1991, September 1992) (Sherley 1994b), and Mahurangi Island (November 1993). Weta released onto Motutapere Island in 1998 (J. Roxburgh pers. comm. 1999). In March 1999, 68 weta were transferred to Ruakuri and Mangaokewa Gorge Scenic Reserves (Martin 1999). The initial Mangaokewa and Cowan releases are believed to have been unsuccessful. A survey of Mahurangi Island in 1996 found one juvenile female after a brief search (P. Thomson pers. comm. 1996), but a subsequent survey found nothing (P. Bradfield pers. comm. 2000). A community-based possum control operation is about to get underway at Mahoenui, with DOC setting up about 200 bait stations to control possums and rats in the reserve (*Rare Bits* No. 31 December 1998). Formally described in 1999 (Gibbs 1999a).

Priority Research, Survey, and Monitoring: 1) Monitor all populations using a standardised methodology (Sherley 1998a), including the translocated populations, to gain a measure of their success.

2) Determine the optimal level of gorse grazing (R. Scrimgeour pers. comm. 1999).

3) Monitor the effects of biological control agents for gorse (e.g. gorse thrip) which may affect weta habitat (Sherley 1998a).

Management Needs: 1) Manage the risk of fire to existing habitats, and prevent the revegetation of existing firebreaks.

2) Re-establish forest habitat in covenanted areas which border the reserve, prevent the entry of feral and domestic stock, and implement and maintain predator control for rodents, mustelids etc.

3) Salvage weta where land development, or habitat deterioration is a threat (Sherley 1998a).

4) Maintain goats and other grazers (e.g. hares) within the reserve at optimal numbers, as determined by the recommended study.

Contacts: Ray Scrimgeour, Paul Barrett, Mike Meads, Greg Sherley.

See Plate 2, No. 10.

Order: Orthoptera

Family: Anostostomatidae

Taxonomic Name: *Deinacrida parva* Buller, 1895

Common Names: Kaikoura giant weta (Scott & Emberson 1999), Kaikoura weta

Synonyms: *Hemdeina parva* (Salmon 1950)

M&D Category: C

Conservancy Office: NM, CA

Area Office: South Marlborough, North Canterbury

Description: A small to medium size weta which is difficult to differentiate from *Deinacrida rugosa* at the species level (Gibbs & Richards 1994). *D. parva* can be identified by the six spines on the rear tibia, and the pink or red edging on the thoracic shield (Meads 1990b), although these characters are somewhat variable even within the species. Taxonomically *D. parva* is best regarded as a sister species to *D. rugosa. D. parva* is quite distinct morphologically from *D. rugosa* (in size, colour, tibial spines) and in habitat. It should be treated as distinct, not only for conservation purposes, but taxonomically as well (G. Gibbs pers. comm. 2000).

Type Locality: Type does not exist (G. Gibbs pers. comm. 2000).

Specimen Holdings: -

Distribution: Reported from 150 m to 1500 m above sea-level, in scattered locations ranging from south Marlborough to Hanmer Springs, including parts of the Hapuku and Kowhai catchments near Kaikoura (Sherley 1998a); along the borders of the Mt Fyffe State Forest, Kaikoura, in the vicinity of Luke Stream (Meads 1987b); Puhi Puhi Valley; Waimangarara Stream; western arm of the Hapuku River; north Hapuku; Kowhai; Kowhai River; Whakiri Stream (Meads 1989a). Populations appear to have declined in some areas to a few individuals (Sherley 1998a).

Habitat: Most commonly seen on river flats and scrub margins along forest edges. It is also known to occur on bluffs, in screes, and on stony ground under forest cover (Sherley 1998a). Meads & Notman (1991) noted that they shelter under boulders on open alpine rock, on the ridge above Barrets Hut. Some remnant populations survive under large logs after their forest cover has been felled or burned (Sherley 1998a). Low altitude sites (150 m) seem temporary, but stable populations occur at around 1000 m. This suggests that the weta gets washed down river from time to time (G. Gibbs pers. comm. 2000).

Male.
Permission: Manaaki Whenua Press. Meads 1990a, p 19.

Sign of Presence: Faecal pellets and chewed foliage.

Threats: Massive die-offs have occurred in larger populations adjacent to rivers (e.g. in the Kowhai and Hapuku catchments). The die-offs may be associated with a gordian worm parasite (*Gordius* sp.) (Meads & Notman 1991). Habitat clearance and predation is likely to be significant, especially in lowland areas. It is probable that its range has reduced following human occupation. Predation by rats and other predators is thought to have a significant impact on weta at lower altitudes (Sherley 1998a), and the weta are not capable of sustained existence

on lowland sites (G. Gibbs pers. comm. 2000).The species appears to be secure in at least the Kowhai and Hapuka catchments, provided that no major irruptions of predators occur. A number of the populations recorded in earlier times are unlikely to survive in the long-term because of habitat modification. Other weta populations may also be threatened by predators (Sherley 1998a).

Work Undertaken to Date: Surveys of the Main Divide and Seaward Kaikoura Ranges have been completed. *Deinacrida parva* has been successfully bred in captivity (Mike Meads pers. comm. 2000). A study on the taxonomic status of *D. rugosa* and *D. parva* has been done (Cameron 1996).

Priority Research, Survey, and Monitoring: 1) Determine an effective monitoring method and survey the distribution and abundance of Kaikoura weta, concentrating on areas away from known populations, and on populations for which data are scarce.

2) Establish a monitoring programme to examine the effect of rats on populations in the north branch of the Hapuka River and Kowhai River (upper catchment).

3) Investigate the impact of the gordian worm parasite on *D. parva* populations (Sherley 1998a).

Management Needs: 1) Avoid aerial sowing of grain based 1080 pellets in areas where these weta occur (Hutcheson 1989).

Contacts: Mike Meads, Ian Millar, George Gibbs.

See Plate 2, No. 4.

Order: Orthoptera

Family: Anostostomatidae

Taxonomic Name: *Deinacrida pluvialis* Gibbs, 1999

Common Names: Alpine weta, Mt Cook weta (Gibbs 1999b)

Synonyms: *Deinacrida* "occidentalis" (Meads & Notman 1995c), *Deinacrida* species B (Field 1993), *Deinacrida* "Whitcombe/ Matukituki"

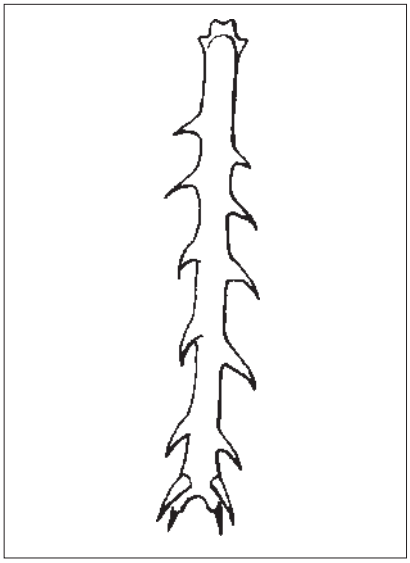
M&D Category: I

Conservancy Office: WC, CA, OT, SL

Area Office: Greymouth, Hokitika, Franz Josef, South Westland, North Canterbury, Waimakariri, Raukapuka, Aoraki, Twizel, Wanaka

Description: A moderate sized, uniformly brown or yellow-brown weta, with smooth body plates on the top of the abdomen. Ground colour can vary slightly between populations, being a warm mid-brown at Price's Basin, and distinctly yellowish-brown at West Matukituki Basin. The legs are pale brownish-white, and have five fixed spines plus a single articulated distal spine in each row on the hind tibiae (the long part of the leg just above the feet). Males weigh 4.7 - 6.5 g, females 8.7 - 11.7 g (Gibbs 1999a). Females reach a length of 52 mm (excluding ovipositor) (Gibbs & Richards 1994).

Body length: 52 mm



Top: Right hind tibia.
Permission: SIR Publishing. Gibbs 1999a, p 314, Fig. 4.
Bottom: Male.
Photo: Andrew Townsend.

Type Locality: Price's Basin, Whitcombe Valley, 1350 m (Gibbs 1999a).

Specimen Holdings: LUNZ, MONZ, NZAC, UCNZ, VUNZ.

Distribution: Occurs on the crest of the Southern Alps and ranges to the west of the main divide between Mt Alexander (42° 43' S) and Cleddau Cirque (45° 46' S) including Price's Basin, Whitcombe Valley, 1350 m; Sealy Pass, Scone Creek, Perth River, 1725 m; near Karanga Saddle, Upper Landsborough River; Sawyer Stream, Mt Cook National Park, 800 m; Head Basin, west Matukituki River, 890-920 m; Mt Alexander, Kaimata Range; Hut Stream, Mathias River; Adams Range, 1230 m; between Castle Rock hut and Tower Saddle, 1460 m; Whymper hut, Whataroa River, 1700 m; Scone Creek headwaters, Perth River, 1630 m; below Douglas Saddle, Karangarua River, 1360 m; Isobel Glacier Stream, upper Dart Valley, 974 m; head basin, Cameron's Creek, Young Range, 900 m; Rob Roy Glacier, west Matukituki River, 700 m; Cleddau Cirque, Milford Sound Rd, 800 m; Snow White Glacier, head Arawata River, 1850 m (photo only); Tornado Valley, Olivine Range, 1020 m (photo only); south face Mt Bevan, west Matukituki River, 1600-1700 m (photos only) (Gibbs 1999a).

Habitat: Normally lives on subalpine to alpine (700-1400 m) slopes and basins in extremely high rainfall areas (up to 7 m annually) which support well developed vegetation, with a community of snow tussock (*Chionochloa* spp.) and woody shrubs or pure snow tussock. A few individuals have been found at exposed rocky sites up to 1850 m. This weta can be found in cavities under rocks during the day (Gibbs 1999a).

Threats: An inaccessible rather than rare species, which can be relatively common in some favoured sites such as the head basins of West Matukituki

River (Gibbs 1999a). It is considered that there are currently no conservation issues with this species.

Work Undertaken to Date: Two pairs have been held in captivity (M. Meads pers. comm.) and eggs been produced from these animals (Sherley 1998a). Formally described in 1999 (Gibbs 1999a).

Priority Research, Survey, and Monitoring: -

Management Needs: -

Contacts: George Gibbs, Peter Johns.

See Plate 2, No. 7.

Order: Orthoptera

Family: Anostostomatidae

Taxonomic Name: *Deinacrida rugosa* Buller, 1871

Common Names: Cook Strait giant weta (Scott & Emberson 1999), Stephens Island weta (IUCN), Stephens Island giant weta, rugose weta, wrinkled weta (Foord 1990)

Synonyms: -

M&D Category: C

Conservancy Office: WL, NM

Area Office: Kapiti, Poneke, Sounds

Description: A light-tan to medium-brown weta, with some black markings on the thorax. It generally has five large spines on the rear of its hind tibia (the long part of the leg just above the feet), but some have six spines as in *Deinacrida parva*. Adult females can reach 70 mm in length, and weigh up to 27 g. Males may reach about 14 g (information from Gibbs 1998b; Sherley 1998a; M. McIntyre pers. comm. 2000; G. Gibbs pers. comm. 2000).

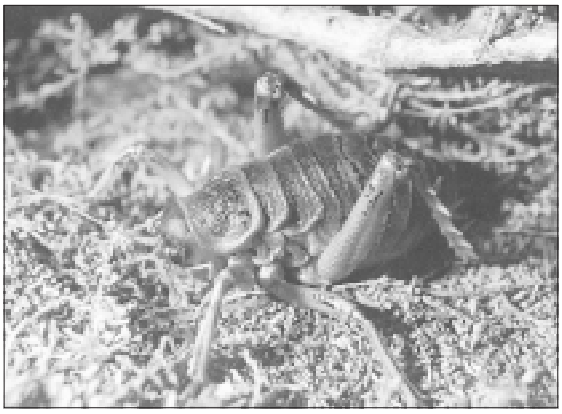
Body length: 70 mm

Type Locality: Wanganui in an underground burrow (Hamilton 1913).

Specimen Holdings: MONZ, CMNZ. Holotype has been lost, the incorrect labelling and designation of a female as the original type by Salmon must be disregarded, the validity of the neotype (held in the Canterbury Museum) designated by Hamilton should be considered in any future systematic studies (Palma et al. 1989).

Distribution: Found on five rodent-free islands and two islets in the Cook Strait vicinity; North, South, and Middle Trio Islands, Stephens Island, Maud Island, Matiu/Somes Island, and Mana Island. They are abundant on Mana Island (Sherley 1998a), and in lower numbers, though not assessed, on Stephens Island and Middle Trio Island. Historically occurred at Wanganui (disappeared around the turn of the century - 1900) (Meads & Notman 1992a), and Kapiti Island (1930s) (Sherley 1998a) .

Habitat: Spends most of its time on the ground in open grassland or shrubland/grassland habitats. It is solitary and nomadic, adults climb low bushes or feed on the ground at night, crawling into long grass to shelter in a temporary 'nest' made at the soil surface by day (Gibbs 1998a). They have been found in three distinct habitats: rank grass, *Muehlenbeckia* vines along forest margins, and on flax (*Phormium* spp.) (Gibbs & Allen 1990). On Mana Island, they occur in rank grass and shrubland including tauhinu (*Ozothamnus leptophylla*) (Sherley 1998a). *Deinacrida rugosa* has a clear preference for tauhinu as a food source, and has been seen eating the flowers of this plant (McIntyre 1992a).



Male.
Permission: Manaaki Whenua Press. Meads 1990a, p 15.

Sign of Presence: Faecal pellets and chewed foliage.

Threats: Now confined to offshore island habitats owing to the introduction of predators and loss of habitat (Sherley 1998a). Accidental introductions of mammalian predators to an island pose a continual threat to the Cook Strait weta

populations. Future vertebrate introductions to Mana Island need to consider the possible impacts on giant weta. Other island restoration activities may also affect weta numbers including reforestation (assuming the weta is a shrubland/grassland species) (Sherley 1998a).

Work Undertaken to Date: 1976:Weta transferred from Maude Island to Mana Island. This population is increasing (Meads & Notman 1992a).

1986: Cattle removed from Mana Island (Newman 1994).

1989: Mice eradicated from Mana Island (Newman 1994).Capture rates increased significantly on Mana Island after mice were eradicated. Counts of 19+ weta per person hour were obtained in 1991 (McIntyre 1992a), and these contrast with pre-eradication rates of 0.7 weta per hour and up to 4 on 'good' nights (M. Meads pers. comm. cited in McIntyre 1992a).

1996: Two transfers of a total of 62 weta, from Mana Island to Matiu/Somes Island initiated (McIntyre 1998). A thesis study on the taxonomic status of *D. rugosa* and *D. parva* submitted (Cameron 1996).

1999: First island bred adults were seen on Matiu/Somes Island (M. McIntyre pers. comm. 1999). Captive breeding techniques have been developed. Field research on dispersal behaviour and habitat use has been undertaken (McIntyre 1992a). This species has been successfully bred in captivity by Paul Barrett and Mike Meads (Sherley 1998a).

Priority Research, Survey, and Monitoring: 1) Monitor distribution and abundance of weta populations on offshore islands, in particular Stephens Island. At present there is no baseline information for *D. rugosa* on this island (M. McIntyre pers. comm. 2000).

2) Continue to use this species for developing giant weta survey and monitoring techniques (e.g. use of radio-tagging) (Sherley 1998a).

3) Assess the feasibility of a reintroduction of these weta to Kapiti Island.

Management Needs: 1) Maintain island security through the implementation of pest contingency plans (especially rodents) (Sherley 1998a).

2) Continue to introduce to new island habitats in the Cook Strait vicinity, as part of restoration projects (M. Aviss pers. comm. 2000).

3) Avoid aerial sowing of grain based 1080 pellets in areas where these weta occur (Hutcheson 1989).

Contacts: Colin Miskelly, Ian Millar, Mike Aviss, Brian Paton, Mary McIntyre, George Gibbs.

See Plate 2, No. 5.

Order: Orthoptera

Family: Anostostomatidae

Taxonomic Name: *Deinacrida talpa* Gibbs, 1999

Common Names: Giant mole weta, Mt Faraday weta (Foord 1990)

Synonyms: -

M&D Category: B

Conservancy Office: WC

Area Office: Buller

Body length: 49 mm

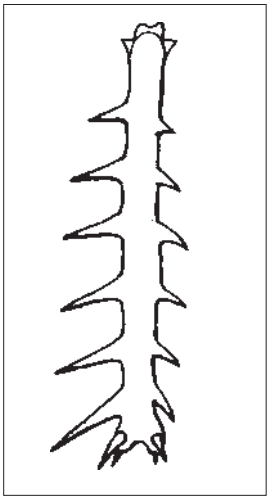
Description: A moderate sized, dark smoky-brown, short legged weta, with smooth body plates on the top of the abdomen. The hind tibiae (the long part of the leg just above the feet), have six long fixed spines plus a single articulated distal spine in each row. The males weigh 5.9 - 7.5 g, the females 11.1 - 11.9 g (Gibbs 1999b). Females are around 49 mm long excluding ovipositor (G. Gibbs pers. comm. 2000).

Type Locality: Mt Faraday, Paparoa Range, 1280 m (Gibbs 1999b).

Specimen Holdings: MONZ.

Distribution: Known only from the central region of the Paparoa Range, Mt Faraday to Mt Ramsay (Gibbs 1999b).

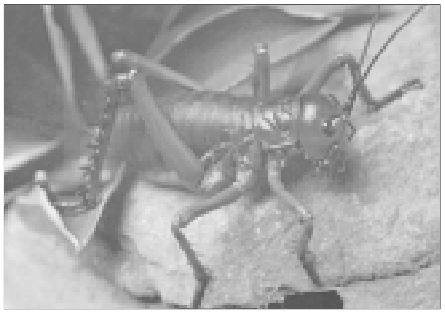
Habitat: These weta spend the day in tunnels concealed under fringes of carpet grass (*Chionochloa australis*). The tunnels are made in the less waterlogged soils of north-western facing slopes above 1200 m, they are clustered in groups of three or four, each about 200 mm apart. They are about 200-300 mm long and 25-30 mm wide, with smooth sides, and run more or less horizontally under the roots of the plants for two thirds of their length, and then dip down. The tunnels are moist with smooth sides, and the end is always more than 250 mm below the ground. This weta has been found between 1250-1300 m (information from Meads & Notman 1995c, Gibbs 1999b).



Sign of Presence: Smooth-walled tunnels, 25-30 mm in diameter, under carpet grass (G. Gibbs pers. comm. 2000).

Threats: Probable predators of this weta include kiwi and weka. Possums and mice are possible predators (Meads & Notman 1995c).

Work Undertaken to Date: Survey conducted in 1994 by Mike Meads. Additional surveys undertaken in 1999. Weta found on Mt Faraday, Mt Euclid, Buckland Peaks, just north of Mt Pecksniff, Mt Lodge, and on outlying peaks to the north-west of the Nile River headwaters. Not found on Mt Johnson, Mt Marshall, Mt Micawber, Mt McHardy, Mt Wise, Mt Epping, Mt Stevenson, or the Nile River headwaters (J. Lyall pers. comm. 2000). Formally described in 1999 (Gibbs 1999b).



Top: Right hind tibia.
Permission: SIR Publishing. Gibbs 1999a, p 314, Fig. 5.
Bottom: Male.
Photo: B. Robertson, VUW photo.

Priority Research, Survey, and Monitoring: 1) Monitor the population to evaluate the effect of any change in the management of the area (i.e. goat and possum control).

2) Survey sites near and similar to Mt Faraday to determine whether *D. talpa* exists at other sites (Meads & Notman 1995c), including Mt Bovis. Concentrate on the northern faces above 1200 m (J. Lyall pers. comm. 1998).

Contacts: John Lyall, Mike Meads, George Gibbs.

See Plate 2, No. 6.

Order: Orthoptera

Family: Anostostomatidae

Taxonomic Name: *Deinacrida tibiospina* Salmon, 1950

Common Names: Mt Arthur giant weta (Scott & Emberson 1999), Nelson alpine weta (Foord 1990).

Synonyms: -

M&D Category: C

Conservancy Office: NM, WC

Area Office: Golden Bay, Motueka, Buller

Description: The smallest known species of *Deinacrida*. Adults are uniform pale or dark brown, and have a squat, compressed appearance (Sherley 1998a). Juveniles are black and shiny, with bright orange marks and spines on the rear legs (Meads 1990a). The hind femurs have very spiny upper surfaces, this being a characteristic of the species. They weigh about 7 g, and females measure up to 40 mm in length (Sherley 1998a).

Body length: 40 mm

Type Locality: Main Spur, Mt Arthur, under stone, 1219 m (Salmon 1950).

Specimen Holdings: MONZ, NZAC (Salmon 1956).

Distribution: Occurs in very low densities within the eastern and central areas of north-west Nelson Forest Park (Sherley 1998a). It is known from the Mt Arthur main spur 1219 m; Mt Arthur, north-eastern spur; Mt Arthur, ridge behind hut; Mt Arthur tableland; Peel Range, west of Mt Peel, 1540 m; Peel Range near junction of Kakapo Spur, 1400 m; north of Lake Sylvester, Cobb Valley, 1371 m; Mt Goul, at trig, south of Heaphy Track, 1409 m; Grindley/Morgan Range; Morgan Range; Marshall Range, 1524 m; The Twins; Anatoki Range, 1390 m (Meads 1989b); lower slopes of Iron Hill, 914 m, Cobb Valley, Nelson (Salmon 1956).

Habitat: Inhabits sub-alpine tussock and herbfields. During the day it hides in or under the bases of tussock, thick clumps of *Astelia*, or other plant species (Sherley 1998a). Generally found between 1300-1500 m (Meads 1990a). It has been found amongst decaying leaf masses under a bog pine (*Halocarpus bidwillii*) (Salmon 1956), in tussock, and under stones above the bushline (Meads 1989b).

Threats: This species may have always been in small numbers throughout their range. Population size may be limited by predators, but there is no direct evidence of this at present, and rats are relatively rare at these elevations. There is potential for this weta to be preyed on by introduced mammals, should these predators penetrate above the bushline. If the weta naturally occurs at low densities, increased predation from introduced species may place the population at risk (Sherley 1998a).

Female.
Photo: Mike Meads.

Work Undertaken to Date: A single generation has been successfully bred in captivity by Mike Meads (Sherley 1998a). Found near Mt Arthur's hut during a survey in the summer of 1998/99. Trial monitoring of the populations will be undertaken (I. Millar pers. comm. 1999).

Priority Research, Survey, and Monitoring: 1) Determine an effective monitoring method and undertake surveys of the distribution and abundance of *Deinacrida tibiospina* to clarify its conservation status.

2) Monitor several population for effects of predation.

3) Undertake research into habitat use and the life cycle of *D. tibiospina* (Sherley 1998a).

Contacts: Mike Meads, Ian Millar, George Gibbs.

See Plate 2, No. 9.

Genus: *Hemiandrus*

Common name: **Ground weta**

Order: Orthoptera

Family: Anostostomatidae

Taxonomic Name: *Hemiandrus* "Cape Campbell"

Common Names: -

Synonyms: -

M&D Category: I

Conservancy Office: NM

Area Office: South Marlborough

Description: A ground weta, about 12 mm in length (P. Johns pers. comm. 1992).

Type Locality: Not described.

Specimen Holdings: NZAC (P. Johns pers. comm. 1992).

Distribution: Cape Campbell, Marlborough.

Body length: 12 mm

Habitat: On farmland.

Threats: Not known.

Work Undertaken to Date: Peter Johns is currently working on a revision of *Hemiandrus* ground weta.

Priority Research, Survey, and Monitoring: 1) Survey the Cape Campbell area to determine the distribution and abundance of this species, and whether it is in need of conservation action.

Management Needs: 1) Avoid aerial sowing of grain based 1080 pellets in areas where these weta occur (Hutcheson 1989).

Contacts: Peter Johns.

See Plate 2, No. 13.

Photo: Peter Johns.

Order: Orthoptera

Family: Anostostomatidae

Taxonomic Name: *Hemiandrus* "Cromwell"

Common Names: -

Synonyms: -

M&D Category: I High Priority

Conservancy Office: OT

Area Office: Central Otago

Description: A ground weta.

Type Locality: Not described.

Specimen Holdings: -

Distribution: Remnant populations may be widespread in Central Otago. It is common on the Cromwell Chafer Beetle Nature Reserve, and extant populations occur as far away as Alexandra, including one at the Flat Top Hill Conservation Area (Van Wyngaarden 1995).

Habitat: Inhabits stable sand-dunes which it burrows into (P. Johns pers. comm. 1992).

Threats: Not known. There is anecdotal evidence that weta numbers are decreasing, based on evidence from pitfall traps at Cromwell (B. McKinlay pers. comm. 1999). Current distribution is thought to be much reduced due to habitat loss from land development. Hedgehogs are probably the most significant predator (Van Wyngaarden 1995).

Work Undertaken to Date: Rabbits have been removed from the reserve and ground cover is increasing (B. McKinlay pers. comm. 1999). Peter Johns is currently working on a revision of *Hemiandrus* ground weta.

Priority Research, Survey, and Monitoring: 1) Clarify the taxonomy of this species. Is it a distinct species to the *Hemiandrus* sp. found at Tekapo, as believed?

2) Survey areas outside of the Cromwell Chafer Beetle Nature Reserve to determine the distribution and abundance of this species, and whether it is in need of conservation action.

Management Needs: 1) Maintain control of mammals within the Cromwell Chafer Beetle Nature Reserve, especially hedgehogs and rodents.

2) Avoid aerial sowing of grain based 1080 pellets in areas where these weta occur (Hutcheson 1989).

Contacts: Peter Johns.

Order: Orthoptera

Family: Anostostomatidae

Taxonomic Name: *Hemiandrus* "Longwood Range"

Common Names: -

Synonyms: -

M&D Category: I

Conservancy Office: SL

Area Office: Murihiku

Description: A large bodied ground weta (P. Johns pers. comm. 1992).

Type Locality: Not described.

Specimen Holdings: NZAC (P. Johns pers. comm. 1992).

Distribution: Longwood Range (P. Johns pers. comm. 1992).

Habitat: Not known. Soil burrowing (P. Johns pers. comm. 1992).

Threats: Not known.

Work Undertaken to Date: Longwood Range is listed in the Southland Conservation Management Strategy to become a Conservation Park (E. Edwards pers. comm. 1999). Peter Johns is currently working on a revision of *Hemiandrus* ground weta.

Priority Research, Survey, and Monitoring: 1) Survey the Longwood Range area to determine the distribution and abundance of this species, and whether it is in need of conservation action.

Management Needs: 1) Avoid aerial sowing of grain based 1080 pellets in areas where these weta occur (Hutcheson 1989).

Contacts: Peter Johns.

Order: Orthoptera

Family: Anostostomatidae

Taxonomic Name: *Hemiandrus* "Moehau"

Common Names: Moehau weta

Synonyms: -

M&D Category: I

Conservancy Office: WK

Area Office: Hauraki

Description: A large ground weta, 37 - 44 mm long (P. Johns pers. comm. 1992).

Type Locality: Not described.

Specimen Holdings: NZAC (P. Johns pers. comm. 1992).

Distribution: Mt Moehau, Coromandel (P. Johns pers. comm. 1992); Pahi (J. Roxburgh pers. comm. 1999).

Body length: 44 mm

Habitat: Mid-altitude bush comprising towai (*Weinmannia silvicola*), quintinia and rice grass (J. Roxburgh pers. comm. 1999).

Threats: Not known.

Work Undertaken to Date: Peter Johns is currently working on a revision of *Hemiandrus* ground weta.

Priority Research, Survey, and Monitoring: 1) Survey Mt Moehau area to obtain an estimate of the distribution and abundance of this species, and whether it is in need of conservation action.

Management Needs: 1) Avoid aerial sowing of grain based 1080 pellets in areas where these weta occur (Hutcheson 1989).

Contacts: Peter Johns, Jason Roxburgh.

Order: Orthoptera

Family: Anostostomatidae

Taxonomic Name: *Hemiandrus* "Rocklands"

Common Names: -

Synonyms: -

M&D Category: I

Conservancy Office: OT

Area Office: Coastal Otago

Description: A small ground weta.

Type Locality: Not described.

Specimen Holdings: -

Distribution: Behind Dunedin (P. Johns pers. comm. 1992).

Habitat: Not known.

Threats: Not known.

Work Undertaken to Date: Peter Johns is currently working on a revision of *Hemiandrus* ground weta.

Priority Research, Survey, and Monitoring: 1) Survey the Dunedin area to determine the distribution and abundance of this species, and whether it is in need of conservation action.

Management Needs: 1) Avoid aerial sowing of grain based 1080 pellets in areas where these weta occur (Hutcheson 1989).

Contacts: Peter Johns.

Order: Orthoptera

Family: Anostostomatidae

Taxonomic Name: Hemiandrus "Tapuaenuku"

Common Names: -

Synonyms: -

M&D Category: I

Conservancy Office: NM

Area Office: South Marlborough

Description: A ground weta.

Type Locality: Not described.

Specimen Holdings: -

Distribution: Tapuae-O-Uenuku.

Habitat: Alpine.

Threats: Not known.

Work Undertaken to Date: Peter Johns is currently working on a revision of *Hemiandrus* ground weta.

Priority Research, Survey, and Monitoring: 1) Survey the Tapuae-O-Uenuku area to determine the distribution and abundance of this species, and whether it is in need of conservation action.

Management Needs: 1) Avoid aerial sowing of grain based 1080 pellets in areas where these weta occur (Hutcheson 1989).

Contacts: Peter Johns.

Order: Orthoptera

Family: Anostostomatidae

Taxonomic Name: *Hemiandrus* "Timaru"

Common Names: -

Synonyms: -

M&D Category: I

Conservancy Office: CA

Area Office: Raukapuka

Body length: 25 mm

Description: A large bodied ground weta, 25 mm long (P. Johns pers. comm. 1992).

Type Locality: Not described.

Specimen Holdings: -

Distribution: Timaru township (P. Johns pers. comm.1999).

Habitat: Gardens and scrubland (P. Johns pers. comm.1999).

Threats: Not under any known threat. It is present in household gardens, and should be taken off the list (P. Johns pers. comm.1999).

Work Undertaken to Date: Peter Johns is currently working on a revision of *Hemiandrus* ground weta.

Priority Research, Survey, and Monitoring: -

Management Needs: 1) Recommend that this species is removed from the list based on current available information.

Contacts: Peter Johns.

Genus: *Hemideina*

Common name: **Tree weta**

Order: Orthoptera

Family: Anostostomatidae

Taxonomic Name: *Hemideina ricta* (Hutton, 1897)

Common Names: Banks Peninsula tree weta (Scott & Emberson 1999), Banks Peninsula weta, putangatanga (Ramsay 1979)

Synonyms: *Hemideina tibiata* (Salmon 1950)

M&D Category: B

Conservancy Office: CA

Area Office: North Canterbury

Description: A weta, which is morphologically similar to *Hemideina femorata*, but genetically distinct. There are two colour morphs, a uniform mahogany one, and one with coloured transverse stripes on the top of the abdomen. *Hemideina ricta* is usually a more uniform colour than *H. femorata*, and has a pronotum that is not pale in contrast to the head and body (Morgan-Richards & Townsend 1995). Also, *H. ricta* does not have retrolateral apical spines on the hind femora, which are sometimes present in *H. femorata*, and the femur markings are pale light-brown in *H. ricta*, but black in *H. femorata* (Morgan-Richards & Townsend 1995; J.A. Townsend pers. comm. 1999).

Type Locality: Banks Peninsula, Canterbury (Salmon 1950).

Specimen Holdings: -

Distribution: Restricted to an area of c. 200 km^2 on Banks Peninsula (Morgan-Richards & Townsend 1995), occurring east and north of Akaroa Harbour (Brown & Townsend 1994). It has been found off Long Bay Rd; Ellangowan Stream, Hickory Bay; roadside below Stony Bay Saddle; Narbey's Long Bay Rd; Lighthouse Rd; Paua Bay Rd; Le Bons Peak; Dalglishes Road Le Bons; Hinewai; Mt Pearce; Little Akaloa Rd; Summit Rd/Pigeon Bay Rd (edge of species' distribution); Starvation Gully Rd; Nikau Palm Gully; Takamatua Valey; Pigeon Bay; farmland below Brasenose Peak (Townsend, J.A. 1995); Mt Pearce north of translator on ridgeline; Repeater Rd opposite Piper Rd stock route; Ellangowan Reserve (J.A. Townsend pers. comm. 1999); Goughs Bay; Okains Peak (Morgan-Richards & Townsend 1995).

Habitat: During the day, these weta are usually found in gallery type crevices, or in splits, under bark, in rotten wood (Brown & Townsend 1994). Occasionally found under rocks and in rock crevices (J.A. Townsend pers. comm. 1999). At night they spend much of their time on the ground and low shrubs (L. Field pers. comm. 2000). Kanuka trees (*Kunzea ericoides*) and totara (*Podocarpus totara*)/broadleaf logs are important habitats. These trees were found to house the most weta, but this reflects the large number of galleries present in those tree types, and therefore the higher search rate of them. (Brown & Townsend 1994). Quite a few have been found in exposed splits in fence posts (Townsend, J.A. 1995). They occur between 40-806 m altitude, but only in low numbers between 200-400 m (Townsend, J.A. 1995).

Female.
Photo: George Gibbs.

Threats: The distribution of *Hemideina ricta* probably diminished after the clearance of forest and shrubland for

farming. Predation by rodents may also have been a significant factor in their decline. Current threats include loss of habitat through fire and land clearance, and rodent predation (Sherley 1998a). Feral cats are also a problem (L. Field pers. comm. 2000). There is a possibility that hybridisation with *H. femorata* may be a problem in small localised areas (Morgan-Richards & Townsend 1995).

Work Undertaken to Date: A survey of Banks Peninsula has been completed and the conservation status and biosystematics of the species has been clarified. Research on habitat use has been completed. Three adults (1 male and 2 females) have been held at Wellington Zoo and weta have also been held at Massey University Department of Ecology. No breeding has been reported from either location (Sherley 1998a). There are no longer any of those weta at Wellington Zoo or Massey University.

Priority Research, Survey, and Monitoring: 1) Assess the significance of hybridisation between *H. femorata* and *H. ricta*. Determine where it is occurring, whether it is a problem, and whether anything can be done about it (P. Barrett pers. comm. 2000).

Management Needs: 1) Determine whether habitat management or predator control is required to improve existing populations of *H. ricta* (based on Brown and Townsend 1994).

2) Locate suitable protected habitat for the long-term maintenance of new populations (Sherley 1998a).

3) Avoid aerial sowing of grain based 1080 pellets in areas where these weta occur (Hutcheson 1989).

Contacts: Barbara Brown, Euan Kennedy, Peter Johns, Paul Barrett, Ian Stringer, Jackie Townsend, Larry Field.

See Plate 2, No. 14.

Genus: *Motuweta*

Order: Orthoptera

Family: Anostostomatidae

Taxonomic Name: *Motuweta isolata* Johns, 1997

Common Names: Mercury Island tusked weta (Scott & Emberson 1999), Middle Island tusked weta, elephant weta, Middle Island monster (Foord 1990).

Synonyms: -

M&D Category: A

Conservancy Office: WK

Area Office: Hauraki

Description: A large-bodied red-brown weta, with a pale underside, and dark brown patches on the back. The juveniles are darker in colour than the adults. Males have an enlarged head with prominent ridged tusks projecting forward from the base of the mandible. The female lacks both the tusks and the large head of the male (Sherley 1998a). They weigh up to 26 g in the field (both sexes) and 28 g in captivity, and are 80 - 100 mm long (McIntyre pers. comm. in Sherley 1998a).

Body length: 100 mm

Type Locality: Middle Island, Mercury Island Group.

Specimen Holdings: MONZ (Johns 1997).

Distribution: Restricted to Middle Island (10 ha) in the Mercury Islands group (Sherley 1998a).

Habitat: These weta are mainly carnivorous (Winks & Ramsay 1998). They are nocturnal sheltering in underground burrows during the day. The burrows are sometimes located near the entrance of bird or tuatara burrows (Sherley 1998a). They appear to prefer to come out on dark moonless nights when conditions are moist and humid.

Threats: It is though that this weta was present on all of the larger islands of the Mercury Islands group prior to human arrival in New Zealand. Middle Island is rodent free, and the introduction of rodents and other predators poses the greatest potential threat to this species (Sherley 1998a). Of native predators, lizards, tuatara, and giant centipedes (*Cormocephalus rubriceps*) prey upon them (McIntyre 1992b).

Work Undertaken to Date: Field research on their life history and behavioural ecology has been undertaken (M. McIntyre trip reports; April 1991, Jan. 1992, April 1992, Nov. 1992, April 1994 & 1995). Further work is currently underway looking into their ecology and possible translocation (I. Stringer pers. comm. 1999). Aldermen Island was searched for these weta around 1997 (8 person, 10 days) without locating this species (C. Smuts-Kennedy pers. comm. 2000). An investigation into aspects of the biology of this weta is being carried out by Landcare Research, Mt Albert, for the Department of Conservation, in order to develop a reliable captive rearing method. Initially proved difficult to rear in captivity. However several factors have been recognised causing poor breeding success and mortality of eggs, juveniles and adults. Modifications have been made to the rearing

Male.
Photo: B. Robertson, VUW photo.

method and these are now showing signs of success. During 1999, 180 weta hatchlings were produced. During May 2000, 94 juvenile (4th and 5th instar) captive reared Middle Island tusked weta were released on Double Island and Red Mercury Island, in the Mercury Islands group. A further 80 weta are still in captivity, at Landcare Mt Albert, the Auckland Zoo and Massey University. The majority of these weta will also eventually be released on the two islands, but some will be kept in captivity for breeding. The long term aim is to establish the weta on all of the larger islands of the Mercury Island group (C. Winks pers. comm. 2000).

Priority Research, Survey, and Monitoring: 1) Continue working towards establishing at least one other population of tusked weta on a kiore-free island in the Mercury Island group (Red Mercury or Double Island) and maintain the Middle Island population (Sherley 1998a).This would involve continued development of the captive breeding and re-introduction programme. This should include determination of the timing of female sexual receptivity after the final moult, time needed with a male for successful mating, and identification of preferred oviposition substrates (Winks & Ramsay 1998).

2) Confirm the absence of tusked weta on Green Island.

3) Investigate the feasibility of harvesting nymphs from Middle Island for translocation to other sites (approximately 30 per year for 4 years).

Management Needs: 1) Maintain island security.

Contacts: Mary McIntyre, George Gibbs, Chris Winks, Ian Stringer, Chris Smuts-Kennedy, Rob Chappell.

See Plate 2, No. 12.

Family: Rhaphidophoridae

Common name: **Cave weta, tokoriro (Ramsay 1979)**

Order: Orthoptera

Family: Rhaphidophoridae

Taxonomic Name: *Gymnoplectron giganteum* Richards, 1962

Common Names: Poor Knights cave weta (Ramsay 1979), giant cave weta (Foord 1990)

Synonyms: -

M&D Category: B

Conservancy Office: NL

Area Office: Whangarei

Description: A large cave weta, 450 mm in length from the tip of its antenna to the end of its rear legs, although the body is only about 50 mm long (Sherley 1998a). It has a mid-brown colouring with ochreous (yellow with a slight tinge of brown) borders on the body plates (Richards 1962). There are two large ochreous marks on the pronotum. The abdomen is irregularly mottled with light brown (Richards 1962).

Type Locality: In cave, Tawhiti Rahi Island, Poor Knights Islands (Richards 1962).

Specimen Holdings: NZAC, AMNZ, MONZ.

Distribution: Occurs on Tawhiti Rahi Island (Richards 1962; Watt 1982b); western side of Puweto Valley, Aorangi Island (Parrish 1998), in the Poor Knights Islands group. Watt (1982) stated that it was not uncommon near the rockfall area on Tawhiti Rahi. More than 100 were seen over 11 days at Aorangi in 1998 (Parrish 1998 unpub.).

Body length: 50 mm

Habitat: These weta shelter in caves and rock piles during day, at night they are active on the ground and tree trunks (Brook 1999b). They have been found in deep crevices, a cave, on tree trunks at night (Watt 1982b), including pohutukawa (*Metrosideros excelsa*), ngaio (*Myoporum laetum*) (P. Barrett pers. comm. 2000), and in a hollow mahoe (*Melicytus ramiflorus*). A specimen has been seen feeding on a pohutukawa flower stamen (P. Barrett pers. comm. 2000), and they may also feed on lichens (Anon 1991).

Threats: None known at present. Introduced mammals could pose a threat if they established on the islands.

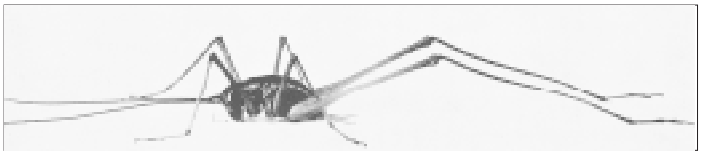
Work Undertaken to Date: Pigs eradicated from Aorangi in 1936 (Powell 1938 cited in Penniket 1981).

Priority Research, Survey, and Monitoring: 1) Survey to confirm the presence and abundance of this species on other islands in the Poor Knights Islands group (Sherley 1998a).

Management Needs: 1) Maintain island security.

Contacts: Richard Parrish, Andrea Booth, Paul Barrett, Mike Meads.

See Plate 2, No. 15.



Top: Photo: Richard Parrish.
Bottom: Male.
Permission: SIR Publishing. Richards 1962, Plate 1, Fig. 1.

Order: Orthoptera

Family: Rhaphidophoridae

Taxonomic Name: *Novoplectron serratum* (Hutton, 1904)

Common Names: -

Synonyms: *Pleioplectron serratum* (Richards 1958)

M&D Category: I

Conservancy Office: WL

Area Office: Chatham Islands

Body length: 26 mm

Description: A medium to dark, blackish weta, paler on the sides and head. The legs are yellow with a slight tinge of brown, and banded. The ovipositor is reddish-brown. The body is up to 26 mm long, 24 mm on average. The antennae are three times as long as the body (Richards 1958).

Type Locality: Pitt Island (Hutton 1904).

Specimen Holdings: CMNZ.

Distribution: Has been found on Pitt Island, Mangere Island, and South East Island, in the Chatham Islands group; The Sisters Islands (Richards 1958); Star Keys (Emberson 1998a).

Habitat: A diurnal weta (Craw 1986) found in petrel burrows and under stones (Richards 1958).

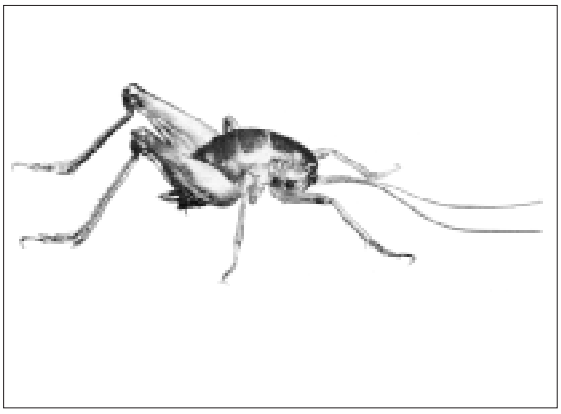
Threats: Disturbances to, and reduction in, the number of petrel burrows will affect population numbers (Meads 1990c).

Work Undertaken to Date: -

Priority Research, Survey, and Monitoring: 1) Maintain rodent quarantine procedures on islands.

Management Needs: -

Contacts: -



Male.
Permission: SIR Publishing. Richards 1958, Plate 24, fig. 3.

Order: Orthoptera

Family: Rhaphidophoridae

Taxonomic Name: *Talitropsis crassicruris* Hutton, 1897

Common Names: -

Synonyms: *Gammaroparnops crassicruris* (Richards 1958).

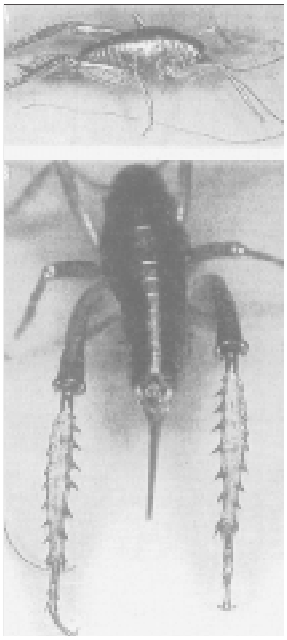
M&D Category: I

Conservancy Office: WL, CA

Area Office: Chatham Islands, North Canterbury

Body length: 23 mm

Description: A mid-brown weta, marbled with deep ochrous (yellow with a slight tinge of brown). The abdominal segments have a deeper brown band at the hind margin. The front two pairs of legs are pale ochrous, with transverse bands of deep ochrous. The hind femora are ochrous with narrow bands of brown, the rest of the hind legs are a deep reddish brown, as is the ovipositor. The hind tibiae are dilated and flattened above. The body is 23 mm long, and the antennae are 3.5 times as long as the body (Richards 1958).



Type Locality: Banks Peninsula (Richards 1958). Hutton's holotype apparently originated from Banks Peninsula, but has not been found there since. The holotype is severely damaged, and a neotype male has been designated from The Sisters (Trewick 1999b).

Specimen Holdings: CMNZ.

Distribution: Historically found at Banks Peninsula (Hutton 1897); The Sisters; Waitangi, Chatham Island; Kaingaroa (Richards 1958). Now only known from; Whangamarino, Taiko Camp, Henga Scenic Reserve on Chatham Island; The Sisters (neotype, only record of *Talitropsis* from The Sisters) (Trewick 1999a). NB records from South East Island (Rangatira) near Glory Bay, Pitt Island; Ouwenga, Mangere Island (Richards 1958), are now attributed to *Talitropsis megatibia*. The record from Banks Peninsula is dubious, the specimen is in such a bad state that it cannot be distinguished from the widespread New Zealand species *Talitropsis sedilloti*. No specimens of *T. crassicruris* have been collected from Banks Peninsula since, but *T. sedilloti* does occur in the region (S. Trewick pers. comm. 1999).

Habitat: Occurs on trees and shrubs at night. Have been extracted from narrow holes in living and dead wood by day (Trewick 1999a).

Threats: Habitat reduction due to burning, clearing, and general farming practices is suspected (Meads 1990c).

Top: Female, lateral view.
Middle: Female, rear view.
Permission: SIR Publishing. Trewick 1999a, p 169, Figs. 3A, B.
Bottom: Male.
Photo: Steve Trewick.

Work Undertaken to Date: *Talitropsis crassicruris* has been split into two species, *T. crassicruris* and *T. megatibia* (Trewick 1999a), since its inclusion and ranking in Molloy & Davis (1994).

Priority Research, Survey, and Monitoring: 1) Determine distribution and abundance of this species.

Management Needs: -

Contacts: Steve Trewick.

See Plate 2, No. 16.

Order: Ephemeroptera (Gr. *ephemerous*, short-lived + *pteron*, wing)

Common name: **Mayflies**

Characteristics: Triangular, membranous forewings with many cross-veins. Wings unfolded at rest.

Family: Leptophlebiidae

Order: Ephemeroptera

Family: Leptophlebiidae

Taxonomic Name: *Isothraulus abditus* Towns & Peters, 1979

Common Names: Possible common name is fringed-gill mayfly (D. Towns pers. comm. 2000)

Synonyms: Has been listed as *Zephlebia* sp. A in Towns 1978 (Towns and Peters 1979)

M&D Category: I

Conservancy Office: AU

Area Office: Auckland, Great Barrier, Warkworth

Body length: 7.9 mm

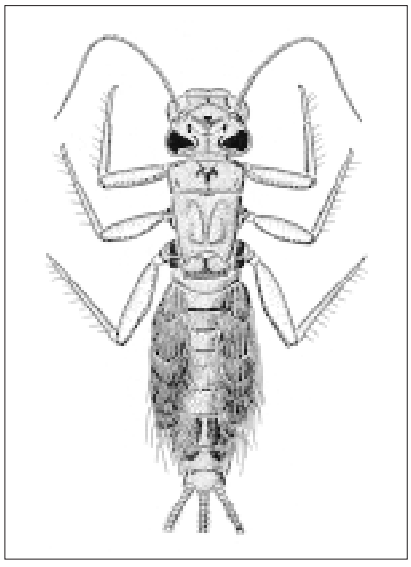
Description: A yellowish-brown mayfly, 6.7 - 7.9 mm long. The forewings are 7.8 - 8.8 mm long, transparent and glassy. They have purplish-brown clouds near the front edge, and are washed with pale brown at the base (Towns & Peters 1996). The veins are pale to dark brown (Towns & Peters 1979). The males have the upper portion of their eyes pale brownish-orange, the lower portion is black. In females the entire eye is black. The male abdomen is transparent and glassy at the front, brown at the end. The female abdomen is uniformly pale-brownish (Towns & Peters 1996). Gill morphology is the main diagnostic feature for nymphs (D. Towns pers. comm. 1999).

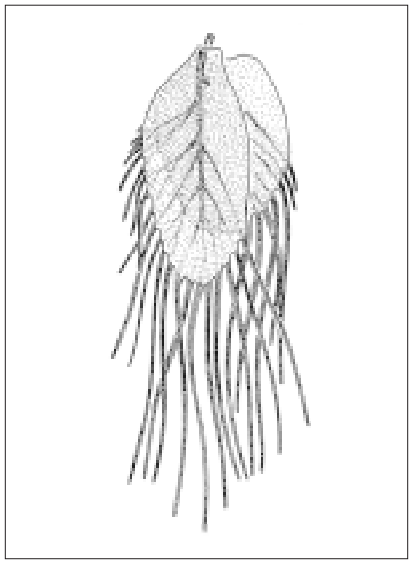
Type Locality: Tributary of Waitakere River near Anderson's Track.

Specimen Holdings: NZAC, FAMU (Towns & Peters 1996).

Distribution: Has been collected from streams in the Waitakere Ranges, near Auckland; Little Barrier Island; Waterfalls Stream and Kokako Stream (informal names), Great Barrier Island (information from Towns & Peters 1979, 1996; Towns 1987; Collier 1992b).

Habitat: Associated with gravel-bed native forest streams (K. Collier pers. comm. 1999). Nymphs collected have been either on vegetation at pool margins, or under stones partly buried in algal detritus in pools and slow flowing parts of streams (Towns & Peters 1979, 1996; Collier 1992b).





Threats: Possible threats include introduced predators such as trout. Pigs muddying the waters would also pose a threat (D. Towns pers. comm. 1999).

Left: Nymph.
Right: Abdominal gill 4.
Permission: SIR Publishing. Towns & Peters 1979, p 444, Fig. 24, p 443, Fig. 23.

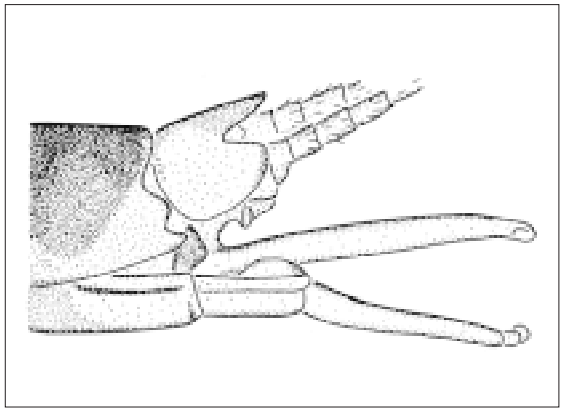
Work Undertaken to Date: -

Priority Research, Survey, and Monitoring: 1) Survey Waitakere Ranges and Great Barrier Island to obtain an estimate of the distribution and abundance of this species, and whether it is in need of conservation action.

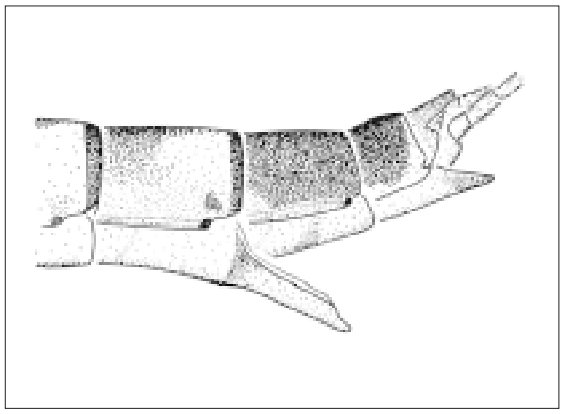
2) Possibly examine the effects of excluding trout (D.Towns pers. comm. 1999).

Management Needs: 1) Maintain habitat at selected sites.

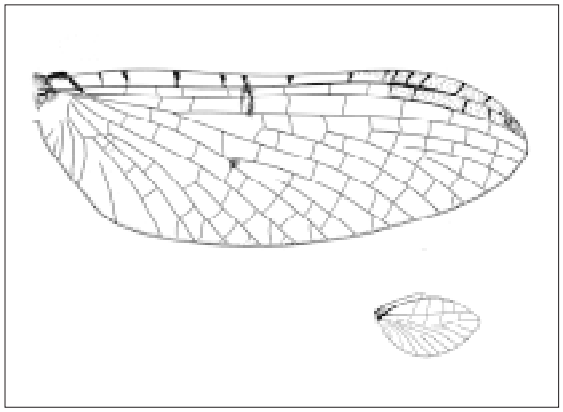
Contacts: Dave Towns, Kevin Collier.



Male genitalia, lateral view.



Female abdominal segments 7-10, lateral view.



Adult male forewing and hindwing.
Permission: SIR Publishing. Towns & Peters 1979, p 441, Figs. 1, 2, 6, 10.

Order: Trichoptera (Gr. *tricos*, hair + *pteron*, wing)

Common name: **Caddisflies**

Characteristics: Membranous wings with few cross-veins.

Order: Trichoptera

Family: Conoesucidae

Taxonomic Name: *Olinga fumosa* Wise, 1958

Common Names: -

Synonyms: -

M&D Category: I

Conservancy Office: CA, OT

Area Office: Raukapuka, Coastal Otago

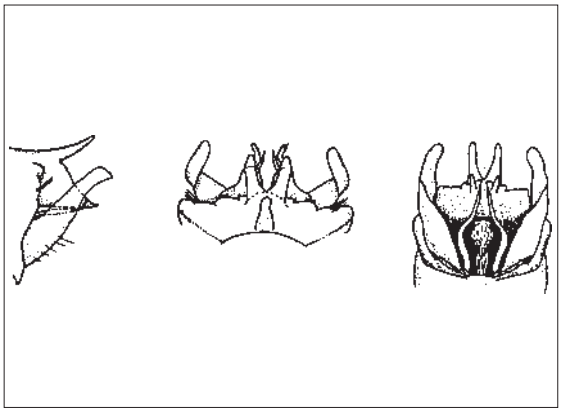
Description: A caddisfly with an orange stripe just below and following the contour of the leading edge of the otherwise uniformly black forewings. The males have a wingspan of 18.5 mm, the females 22 mm (Patrick 1994a). This species is similar to *O. feredayi* but smaller and darker (Wise 1958).

Forewing length: 11 mm

Type Locality: Waitati near Dunedin (Wise 1958).

Specimen Holdings: -

Distribution: Has been found at Gunns Bush Stream, Waimate, South Canterbury; Kelseys Bush, Waimate Creek and tributary[2]; McQuilkans Creek below Swampy Summit, Dunedin[1]; Waitati River[1], Dunedin, (1917)[2]. All are recent records, apart from Waitati (J. Ward pers. comm. 1999).



[1]Patrick 1994a; [2]Ward & McKenzie 1997.

Habitat: Has been found in small bouldery streams at c. 300 m, open or in forest (Ward 1997).

Threats: Not known.

Work Undertaken to Date: Surveys have been undertaken, as has taxonomic work, and research on life history (B. Patrick pers. comm. 2000).

Priority Research, Survey, and Monitoring: 1) Survey suitable sites adjacent to known locations, in an attempt to determine the distribution of this species.

Management Needs: -

Contacts: Brian Patrick, Brian Smith, John Ward.

See Plate 1, No. 20.

Top: Left: Male genitalia, lateral view.
Center: Male genitalia, dorsal view.
Right: Male genitalia, ventral view.
Permission: Auckland Museum. Wise 1958, p 61, Figs. 6a, b, c.
Bottom: Photo: Brian Patrick.

Order: Trichoptera

Family: Ecnomidae

Taxonomic Name: *Ecnomina zealandica* Wise, 1958

Common Names: -

Synonyms: -

M&D Category: I

Conservancy Office: AU, WK, possibly WL

Area Office: Auckland, Hauraki, Poneke

Description: A dark brown, almost black caddisfly, with the antennae and legs being yellow with a slight tinge of brown. The forewing is 3.5 mm long, light black, with the fringe being darker (Wise 1958). The larvae are 4.8 mm long (Cowley 1978), and can not be distinguished as yet from those of *Zelandoptila* (Psychomyiidae) (M.Winterbourn pers. comm. 2000). Only one male has been collected and attributed to this species, however, there is no proof that this male is of the same species as the female specimens (Ward 1999).

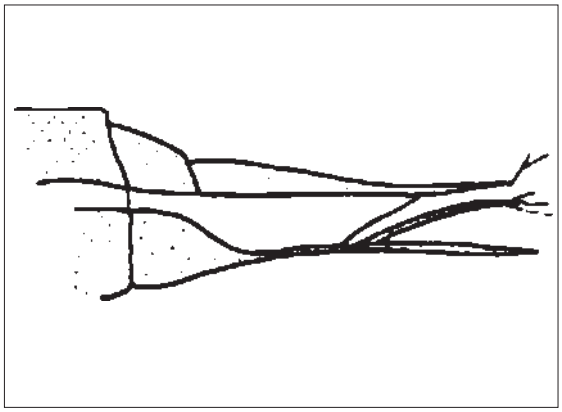
Forewing length: 3.5 mm

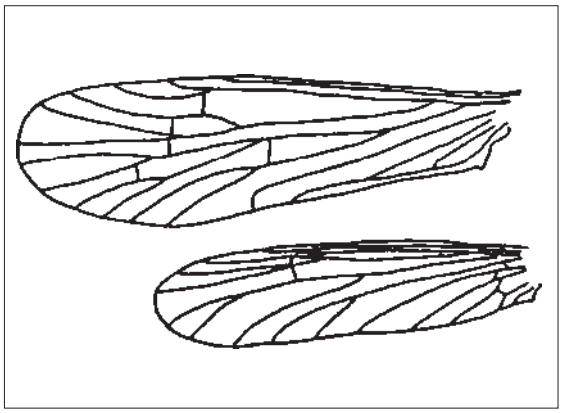
Type Locality: Kauri Gully, Auckland (Wise 1958).

Specimen Holdings: -

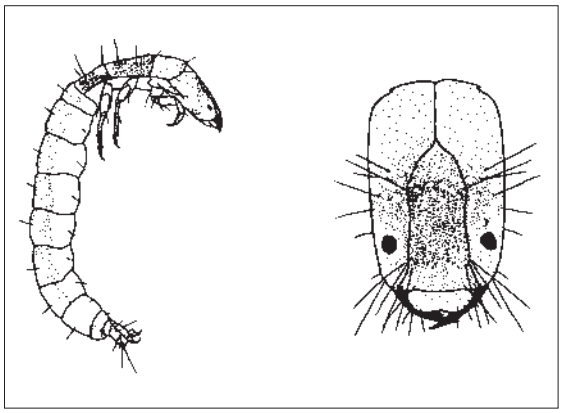
Distribution: Has been found in the Auckland; Taranaki, Egmont, Sounds-Wellington, and Whataroa Ecological Regions[2]. It has been collected from Kauri Gully, Auckland (old record 1919)[1, 5]; Otahu Stream, Coromandel[3, 5] near Whangamata; Pomare, Lower Hutt (old record 1958)[1, 5]; Titirangi[5]; Cascade Stream, Waitakere Ranges[1,2]; tributary of the Kiripaka Stream, Whatawhata, Waikato (B. Smith pers. comm. 2000). Larval records are unreliable because they can easily be confused with another species (I. Henderson pers. comm. 2000). There have been no records from Auckland or Sounds-Wellington in the last 20 years (K. Collier pers. comm. 1999).

[1]Henderson 1985; [2]Collier 1992b; [3]Collier & Smith 1996; [4]K. Collier pers. comm. 1999; [5]J. Ward pers. comm. 1999.





Top: Female genitalia, lateral view.
Bottom: Female wings.
Permission: Auckland Museum. Wise 1958, p 62, Figs. 11a, b.



Larva, right lateral view of body and frontal view of head.
Permission: SIR Publishing. Cowley 1978, p 667, Figs. 11a, b.

Habitat: Occurs in cobble bedded, lowland native streams (K. Collier pers. comm. 1999), and has been collected from altitudes between 0-305 m (J. Ward pers. comm. 1999), Cowley 1978). Larvae have been collected in moss (*Fissidens* sp.).

Threats: Not known. Silting of streams may be a problem if the larvae browse on stones or live under them.

Work Undertaken to Date: -

Priority Research, Survey, and Monitoring: 1) Survey to obtain an estimate of distribution and abundance, and determine whether this species is of conservation concern.

Management Needs: -

Contacts: Kevin Collier, Brian Smith, John Ward.

Order: Trichoptera

Family: Hydrobiosidae

Taxonomic Name: *Atrachorema mangu* McFarlane, 1964

Common Names: -

Synonyms: -

M&D Category: I

Conservancy Office: NL, AU

Area Office: Whangarei, Auckland

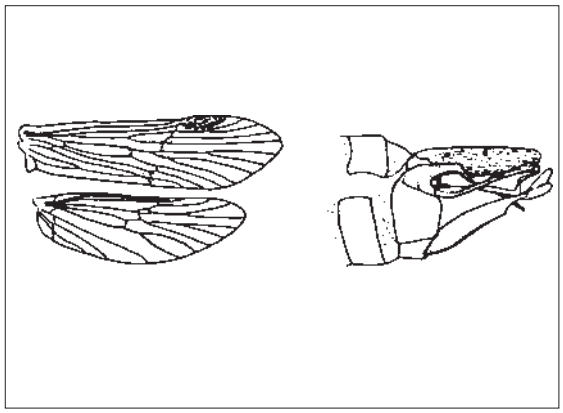
Description: A small, dark caddisfly, with a very sparse clothing of hairs on the wings and elsewhere. The head capsule is clear brown, with a darkly pigmented area in the middle. The legs are dark brown, almost black. The antennae are shorter than wings. The forewing membrane is pigmented dark brown, almost black, and relieved by three small, transparent and glassy areas. The hind wings are not so darkly pigmented. The male forewing is 6 mm long, the female 7 mm (McFarlane 1964).

Forewing length: 7 mm

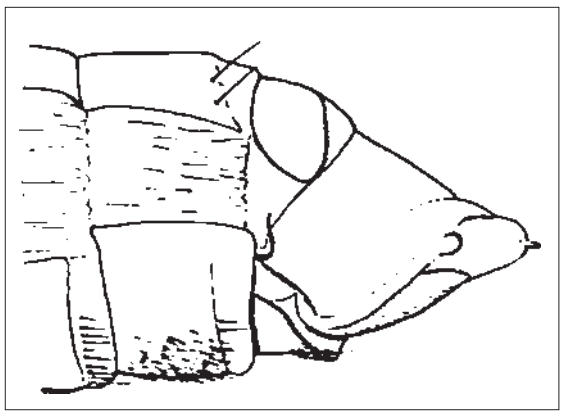
Type Locality: South end of Mangamuka Gorge at confluence of two main streams (McFarlane 1964).

Specimen Holdings: CMNZ.

Distribution: Found in western Northland and Auckland Ecological Regions (Collier 1992b). Has been collected from Waipapa River headwaters, Northland; Cascade Stream, Waitakere Ranges, Auckland (specimen possibly lost); Mangamuka Gorge, Northland (J.Ward pers. comm. 1999); Waitakere Stream, Cascades Kauri Park, Waitakere Ranges (McFarlane 1964; Norrie 1969); Mangaotama Stream, Waikato; Waiwawa River, Coromandel (this is a female record and identification is not certain, but no other members of this genus are known in the northern North Island)(I. Henderson pers. comm. 2000). A specimen from Blue Duck Stream originally assigned to *A. mangu* was later placed with *A. tuarua* (J.Ward pers. comm.1999).



Habitat: Medium to small streams in native forest. It has been collected from altitudes between 30 - 110 m (J.Ward pers.comm. 1999).



Top: Left: Male wings.
Top: Right: Male genitalia, lateral view.
Bottom: Female genitalia, lateral view.
Permission: Canterbury Museum. McFarlane 1964, p 64, Figs. 33, 34, 39.

Threats: Not known. Silting of streams may be a problem if the larvae browse on stones or live under them.

Work Undertaken to Date: -

Priority Research, Survey, and Monitoring: 1) Survey to obtain an estimate of distribution and abundance, and determine whether this species is of conservation concern.

Mangement Needs: -

Contacts: Brian Smith, John Ward.

Order: Trichoptera

Family: Hydrobiosidae

Taxonomic Name: *Psilochorema spiniharpax* Ward, 1995

Common Names: -

Synonyms: -

M&D Category: I

Conservancy Office: NM

Area Office: Golden Bay

Forewing length: 6.9 mm

Description: A caddisfly with uniform pale brown forewings, except for clear areas. The forewings are 6.9 mm long (Ward 1995).

Type Locality: Gouland Downs (Ward 1995).

Specimen Holdings: NZAC.

Distribution: Gouland Downs, north-west Nelson. Known only from a single male specimen collected in 1922 (Ward 1995).

Habitat: Not known.

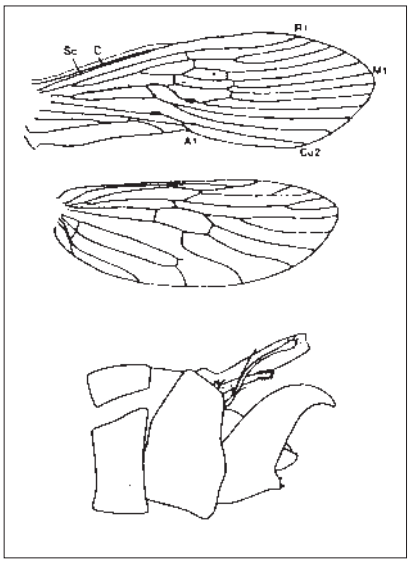
Threats: Not known.

Work Undertaken to Date: Light trapping at two sites in March 1998 failed to locate this species (I. Millar pers. comm. 2000).

Priority Research, Survey, and Monitoring: 1) Survey to obtain an estimate of distribution and abundance, and determine whether this species is of conservation concern.

Management Needs: -

Contacts: Brian Smith, John Ward.



Male wings and lateral view of male genitalia. Permission: SIR Publishing. Ward 1995, p 95, Figs. 13, 14.

Order: Trichoptera

Family: Oeconesidae

Taxonomic Name: *Oeconesus maori* McLachlan, 1862

Common Names: -

Synonyms: *Oeconesus lobatus*

M&D Category: I

Conservancy Office: TT

Area Office: Ruapehu

Forewing length: 13 mm

Description: A caddisfly with the forewing 13 mm long. The original listed species *Oeconesus lobatus* Wise, 1958, is now a junior synonym of *O. maori*. The original separation was based on a single male specimen, and differences in genitalia. These characters are now considered quite variable and insufficient to distinguish males of *Oeconesus* (Ward 1999).

Type Locality: Lectotype, no data, designated by Mosely.

Specimen Holdings: NHML (Ward 1999).

Distribution: A widely distributed species, not uncommon throughout the North and South Islands (J. Ward pers. comm. 2000). The specimen originally described as *O. lobatus* was from Raurimu (Wise 1958; Henderson 1985).

Habitat: -

Threats: -

Work Undertaken to Date: The species *Oeconesus lobatus*, originally listed in Molloy & Davis (1994), has been synonymised with another species (Ward 1999), and should be removed from the list (J. Ward pers. comm. 1999).

Priority Research, Survey, and Monitoring: -

Management Needs: 1) Recommend that this species is removed from the list based on current available information.

Contacts: Ian Henderson, Brian Smith, John Ward, Keith Wise.

Order: Trichoptera

Family: Oeconesidae

Taxonomic Name: *Pseudoeconesus bistirpis* Wise, 1958

Common Names: -

Synonyms: *Pseudoeconesus tristirpis*, "*Pseudoeconesus* species A" of Henderson (1985) and of Ward et al. (1996) (Ward 1997).

M&D Category: I

Conservancy Office: NL, AU, WK, BP, TT, EC/HB, WG, WL, NM, WC

Area Office: Widespread throughout North Island conservancies, and in Buller, Golden Bay, Motueka, Sounds, and South Marlborough Area Offices in the South Island.

Forewing length: 15 mm

Description: A brownish-yellow to pale brownish-yellow caddisfly. The forewings are closely freckled with rows of minute, almost colourless spots between the veins. The male forewing is 10 - 11 mm long, the female forewing 15 mm (Wise 1958). The organ present on abdominal segment five is finger-like in both sexes, as opposed to button-like. The anal margin and last anal vein of the male hindwings, has very long dark hairs. This is absent in other species (Ward 1997).

Type Locality: Tongariro (Wise 1958).

Specimen Holdings: -

Distribution: *Pseudoeconesus bistirpis* has been found all over the North Island from Northland to Wellington, Taranaki to Gisborne, and in the South Island regions of Nelson, Marlborough Sounds, Buller and Marlborough (Ward 1997).

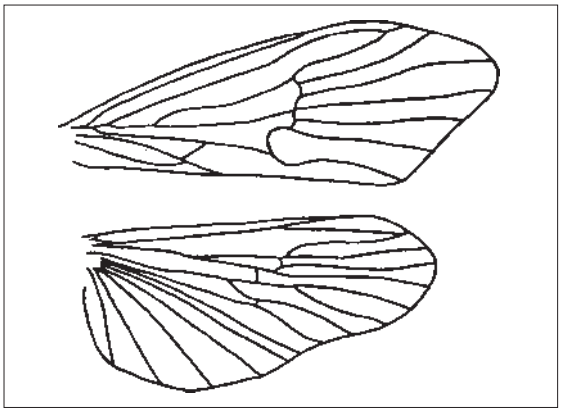
Habitat: Found in seepages in bush (I. Henderson pers. comm. 2000).

Threats: A very widespread and reasonably abundant species in the right habitat (I. Henderson pers. comm. 2000). Not believed to be under any threat.

Work Undertaken to Date: *Pseudoeconesus tristirpis* Wise, 1958 declared a junior synonym of *Pseudoeconesus bistirpis* Wise, 1958 (Ward 1997).

Priority Research, Survey, and Monitoring: -

Management Needs: 1) Recommend that this species is removed from the list based on current available information.



Male wings.
Permission: Auckland Museum. Wise 1958, p 60, Fig. 4a.

Contacts: Brian Smith, John Ward.

Order: Trichoptera

Family: Philopotamidae

Taxonomic Name: *Cryptobiosella furcata* Henderson, 1983

Common Names: -

Synonyms: -

M&D Category: I

Conservancy Office: WL

Area Office: Wairarapa

Description: A caddisfly, with the forewing measuring 7 mm long (Henderson 1983). The larvae are 8 mm long (Henderson 1983), and have an orange-brown head and thorax (Winterbourn & Gregson 1989).

Forewing length: 7 mm

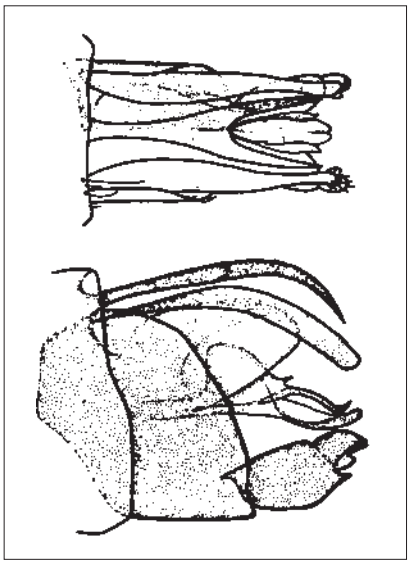
Type Locality: Te Matawai Hut, Tararua Ranges. A very small spring-fed stream in silver beech forest and leatherwood subalpine scrub (Henderson 1983).

Specimen Holdings: NZAC.

Distribution: Occurs in the Tararua Ecological Region (Collier 1992b), and has been collected from a stream near Roaring Creek and the track to Harris Creek, Mangahao River region; Magatainoka River; Mt Bruce; Te Matawai hut. These are all recent records, since 1980 (J. Ward pers. comm. 1999).

Habitat: Larvae are known only from small, forest streams (Winterbourn & Gregson 1989; Collier 1992b). The type locality is a very small spring-fed stream in silver beech (*Nothofagus menziesii*) forest and leatherwood subalpine scrub, 920 m. The stream substrate is varied - silt and vegetation litter, cushion bryophytes and plant roots, or loose, angular stones in a gravel or silt matrix (Henderson 1983). All recent records have been from small springfed streams and seepages, at lower altitudes than the type locality (I. Henderson pers. comm. 2000). Specimens have been collected from altitudes between 340 - 920 m (Henderson 1985; J. Ward pers. comm. 1999).

Threats: Not known. All known locations are on DOC protected land (I. Henderson pers. comm. 2000).



Top: Male genitalia, dorsal view.
Bottom: Male genitalia, lateral view.
Permission: SIR Publishing. Henderson 1983, p 166, Fig 3.

Work Undertaken to Date: -

Priority Research, Survey, and Monitoring: 1) If working in the Tararua Ranges, and in the vicinity of small spring-fed streams or seepages, collect specimens of caddisflies for identification. This will help build up a picture of the species' distribution and abundance.

Management Needs: -

Contacts: Ian Henderson, Brian Smith, John Ward.

Order: Trichoptera

Family: Philopotamidae

Taxonomic Name: *Cryptobiosella spinosa* Henderson, 1983

Common Names: -

Synonyms: -

M&D Category: I

Conservancy Office: WL

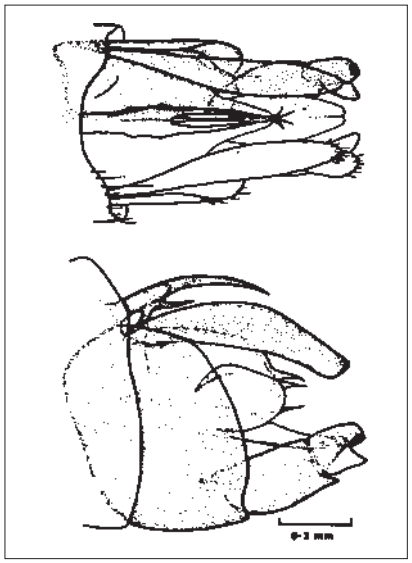
Area Office: Poneke, Wairarapa

Forewing length: 6.6 mm

Description: A caddisfly, with the forewing measuring 6.6 mm long (Henderson 1983, 1985). The larvae have an orange-brown head and thorax (Winterbourn & Gregson 1989).

Type Locality: South Whakanui Track, Rimutaka Range, on a ridge top in beech forest, 700 m (Henderson, 1983).

Specimen Holdings: NZAC.



Top: Male genitalia, dorsal view. Bottom: Male genitalia, lateral view. Permission: SIR Publishing. Henderson 1983, p 168, Fig. 6.

Distribution: Found at two locations in the Tararua and Rimutaka Ranges. It has been collected from south Whakanui Track, Rimutaka Range, ridge top in beech forest, 700 m (Henderson 1983, 1985); Waiotauru River tributaries, Tararua Range; Waiotauru Valley, road end. These are all recent collections, after 1980 (J. Ward pers. comm. 1999).

Habitat: Larvae are known only from small, forest streams (Winterbourn & Gregson 1989; Collier 1992a). Occurs in beech forest (Henderson 1985), and has been collected from altitudes between 150 - 700 m (J. Ward pers. comm. 1999).

Threats: Not known.

Work Undertaken to Date: -

Priority Research, Survey, and Monitoring: 1) Survey areas in the Rimutaka and Tararua Ranges in an attempt to determine the distribution and abundance of this species, and whether it is in need of conservation action.

Management Needs: -

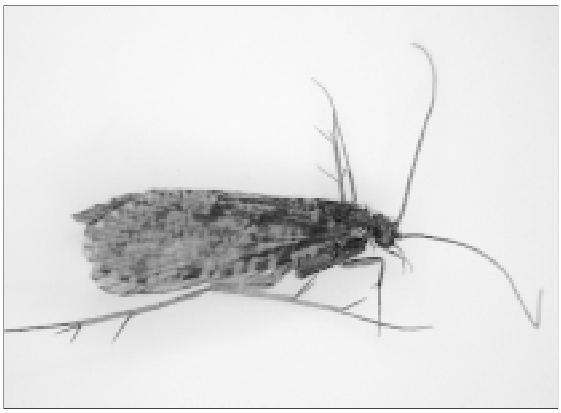


Photo: I. M. Henderson.

Contacts: Ian Henderson, Brian Smith, John Ward.

Order: Trichoptera

Family: Philopotamidae

Taxonomic Name: *Neobiosella irrorata* Wise, 1958

Common Names: -

Synonyms: -

M&D Category: I

Conservancy Office: NL

Area Office: Whangarei

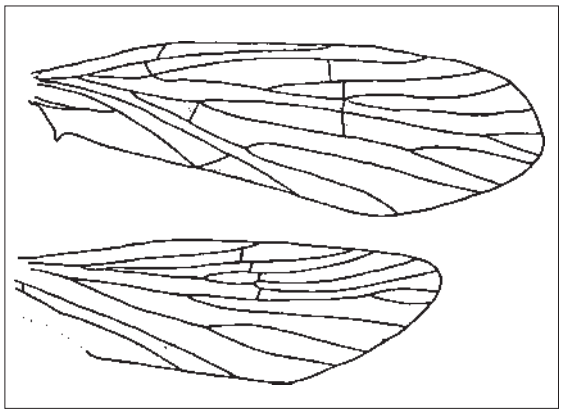
Description: A dark brown, almost black, caddisfly, with brownish-yellow legs and antennae. The forewing is light brownish-yellow, and strongly freckled with minute, dark brown, almost black, spots (Wise 1958). The average male forewing is 5.5 mm long, the female 5.37 mm (Ward 1999).

Forewing length: 5.5 mm

Type Locality: Whangarei (Wise 1958).

Specimen Holdings: -

Distribution: Found in Eastern Northland and Auckland Ecological Regions (Collier 1992b). It has been collected from Whangarei County (Wise 1990);Waiokumarau Stream, Tutamoe, Northland (1999);Whangarei (1927);Whangarei Falls Reserve (1998) (J.Ward pers. comm. 1999).



Habitat: Found in small streams and rivers. It has been collected from between 5 - 435 m altitude (J.Ward pers. comm. 1999).

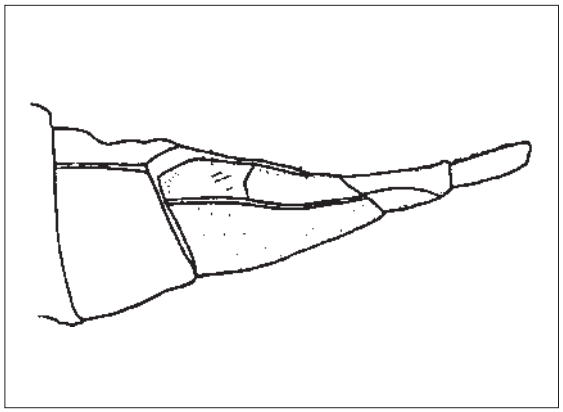
Threats: Not known.

Work Undertaken to Date: -

Priority Research, Survey, and Monitoring: 1) Survey to obtain an estimate of distribution and abundance, and determine whether this species is of conservation concern.

Management Needs: -

Contacts: Brian Smith, John Ward, Keith Wise.



Top: Male wings.
Bottom: Male genitalia, lateral view.
Permission: Auckland Museum. Wise 1958, p 62, Figs. 12a, b.

Order: Trichoptera

Family: Polycentropidae

Taxonomic Name: *Polyplectropus puerilis*

Common Names: -

Synonyms: *Polyplectropus puhia*

M&D Category: I

Conservancy Office: NM

Area Office: South Marlborough

Description: A caddisfly with a light brownish back, and pale straw colour underneath. The legs, antennae and palpi are also a pale straw colour. The forewing is 9.5 mm long, dark brown, almost black, with white markings (McFarlane 1956). *Polyplectropus puhia* McFarlane, 1956 is now a junior synonym of *Polyplectropus puerilis*. The original separation was based on a single male specimen, which is believed to have deformed genitalia (Ward 1999).

Forewing length: 9.5 mm

Type Locality: For *Polyplectropus puhia*: Education Reserve, Puhipuhi, Kaikoura (McFarlane 1956).

Specimen Holdings: CMNZ.

Distribution: Common and widely distributed throughout the South Island and Stewart Island (J. Ward pers. comm. 2000). The specimen originally described as *P. puhia* was from Puhipuhi Valley, Kaikoura (Ward 1999).

Habitat: -

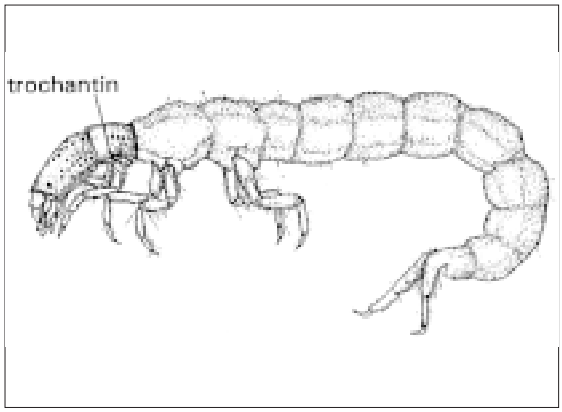
Threats: -

Work Undertaken to Date: Ward (1999) determined that the holotype of *Polyplectropus puhia* is a deformed specimen of *P. puerilis*, and declared *P. puhia* a junior synonym of *P. puerilis*.

Priority Research, Survey, and Monitoring: -

Management Needs: 1) Recommend that this species is removed from the list based on current available information.

Contacts: Ian Millar, Brian Smith, John Ward.



Drawing of a typical Polyplectropus *larva,* Polyplectropus *sp. Permission: Entomological Society of New Zealand. Winterbourn & Gregson 1989, p 38, Fig. 109.*

Class: Chilopoda (Gr. *cheilos*, claw + *pous*, foot)

Common name:	**Centipedes**
Characteristics:	Elongated trunk composed of many similar segments with one pair of legs per trunk segment.
Order:	**Scolopendromorpha (Gr. *Scolopentra*, generic name, + *morphé*, form)**

Scolopendromorpha

Centipedes

Order: Scolopendromorpha

Family: Cryptopidae

Taxonomic Name: *Cryptops* sp.

Common Names: -

Synonyms: -

M&D Category: I

Conservancy Office: NM

Area Office: Golden Bay

Description: A centipede. No eyes present (Archey 1936).

Type Locality: Not described.

Specimen Holdings: -

Distribution: Council (Motupipi) Cave, Takaka, Golden Bay.

Habitat: A cave dweller. Council Cave is replenished with detritus through flooding, the lower cave floods and spills over into the upper cave where *Cryptops* is found (I. Millar pers. comm. 1999).

Threats: Not known.

Work Undertaken to Date: Occasionally seen on trips through Council Cave (I. Millar pers. comm. 1999).

Priority Research, Survey, and Monitoring: 1) Survey caves at Golden Bay in an attempt to determine *Cryptops* abundance and distribution (I. Millar pers. comm. 1999).

Management Needs: 1) Maintain habitat at Council Cave.

Contacts: Peter Johns, Ian Millar.

Order: Lithobiomorpha (Gr. *Lithobius*, generic name + *morphé*, form)

Order: Lithobiomorpha

Family: Henicopidae

Taxonomic Name: *Haasiella* sp.

Common Names: -

Synonyms: -

M&D Category: I

Conservancy Office: NM

Area Office: Golden Bay

Description: A pale-yellow, blind centipede, about 12 mm long excluding antennae and legs. The most distinguishing characteristic are the extremely long, multisegmented antennae (G. Edgecombe pers. comm. 2000).

Type Locality: Not described.

Specimen Holdings: -

Distribution: Council (Motupipi) Cave, Takaka, Golden Bay.

Habitat: Cave dweller.

Threats: Not known.

Work Undertaken to Date: Greg Edgecombe of the Australian Museum Sydney will be describing this species (P. Johns pers. comm. 1999).

Priority Research, Survey, and Monitoring: 1) Survey caves around Nelson/Marlborough and the West Coast in an attempt to locate this species and determine its distribution and abundance.

Management Needs: -

Contacts: Peter Johns, Ian Millar.

Subphylum: Crustacea (L. *crusta* – hard surface)

Common name: **Crustaceans**

Characteristics: Head with two pairs of antennae.

Class: Malacostraca (Gr. *malakos*, soft + *ostrakon*, shell)

Characteristics: Trunk composed of an eight-segmented thorax on which the legs are located, and a six-segmented abdomen.

Order: Amphipoda (L. *amphi*, on both sides + Gr. *pous*, foot)

Common name: **Amphipods**

Characteristics: Body laterally compressed. Thorax has one pair of maxillipeds and seven pairs of legs.

Family: Corophiidae

Common name: **Freshwater amphipods**

Order: Amphipoda

Family: Corophiidae

Taxonomic Name: *Chaetocorophium lucasi* (Hurley, 1954)

Common Names: -

Synonyms: *Paracorophium lucasi, Paracorophium excavatum* (part.) (Karaman 1979)

M&D Category: I

Conservancy Office: BP, CA

Area Office: Rotorua Lakes, North Canterbury

Body length: 5.5 mm

Description: An amphipod, up to 5.5 mm long (Chapman & Lewis 1976), with round, black eyes (Hurley 1954).

Type Locality: Lake Rotoiti, Rotorua district (Hurley 1954).

Specimen Holdings: CMNZ.

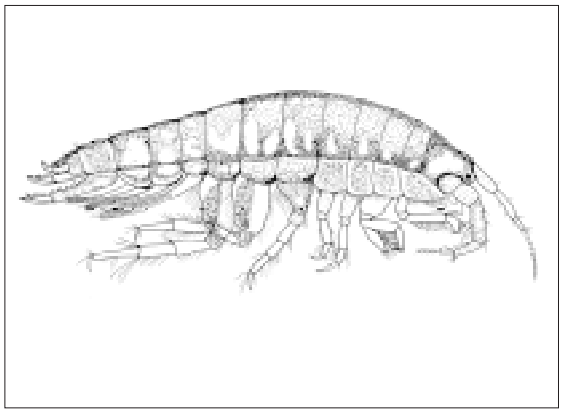
Distribution: A widespread species, with most records from estuarine mudflats in the North Island and Nelson (A. Chapman pers. comm. 1999). It has also been found in the North Island at Lake Waikare (Hurley 1954); Lake Rotoiti; Hamurana Springs, Lake Rotorua; and from the South Island at Avon-Heathcote Estuary and Lake Ellesmere (Collier 1992b). There is confusion between *Chaetocorophium lucasi* and *Paracorophium excavatum*, and all records need to be checked (A. Chapman pers. comm. 2000).

Habitat: Mischewski (1993) refers to it as a common estuarine amphipod. Occurs in shallow water on lake edges, but predominantly brackish water in Canterbury (Collier 1992b).

Threats: Potentially threatened if many estuaries become contaminated (A. Chapman pers. comm. 2000).

Work Undertaken to Date: Genetic work has been done on this species. Work is underway to clarify the differences between *C. lucasi* and *P. excavatum* (A. Chapman pers. comm. 2000).

Priority Research, Survey, and Monitoring: 1) Check all records of *C. lucasi* to determine if they are this species or *P. excavatum*.



Female, lateral view.
Permission: Harper Collins Publishers. Chapman & Lewis 1976, p 173, Fig. 11.3a.

Management Needs: 1) Recommend that this species is removed from the list based on current available information.

Contacts: Ann Chapman.

Family: **Talitridae**

Common name: **Terrestrial amphipods**

Order: Amphipoda

Family: Talitridae

Taxonomic Name: *Tara taranaki* Duncan, 1994

Common Names: -

Synonyms: -

M&D Category: I

Conservancy Office: WG

Area Office: Stratford

Body length: 40 mm

Description: The largest terrestrial landhopper in the world (K. Duncan pers. comm. 2000), up to 40 mm in length (Goodman 1997). In alcohol the legs develop red and cream stripes, but these appear more muted and subtle in live specimens. Red stripes can also be seen horizontally on the body (Goodman 1998). The holotype male was 14.9 mm long, 2.8 mm wide, and 2.5 mm deep (Duncan 1994).

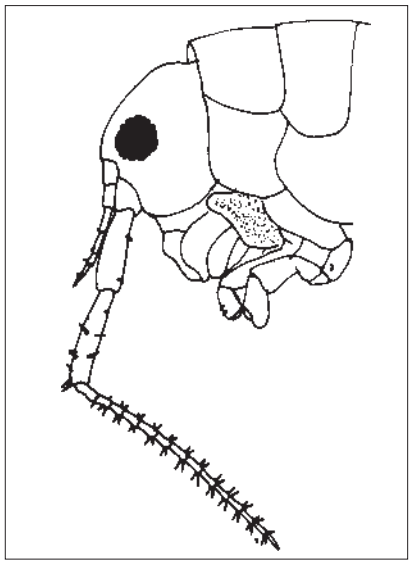
Type Locality: Dawson Falls, 945 m, Mt Taranaki (Duncan 1994).

Specimen Holdings: CMNZ, MONZ, KDNZ.

Distribution: Found throughout Egmont National Park (Goodman 1998).

Habitat: Abundant in mid-altitude native forest on Mt Taranaki (Duncan 1994). Has been found at altitudes between 400 - 1060 m. A nocturnal species it has been observed walking on toii (mountain cabbage tree - *Cordyline indivisa*) trunks at night (Goodman 1997). It has been collected by beating mountain cabbage trees (Duncan 1994), tree ferns (*Dicksonia* spp.) and nikau palms (*Rhopalostylus sapida*) (Goodman 1998). This landhopper is active in all seasons (K. Duncan pers. comm. 2000).

Threats: Not known. Possibly possum predation. 1080 poison could also pose a threat if used in areas where the landhopper occurs. However, the benefits of these operations due to reduced possum numbers, outweighs the direct risk to the amphipods through ingestion of the poison (K. Duncan pers. comm. 2000).



Lateral view of anterior end of body. Permission: Manaaki Whenua Press. Duncan 1994, p 110, Plate 28.

Work Undertaken to Date: Distribution and abundance studies have been done by Goodman (1998). Three predator exclosures built and sampled in November 1997 (Goodman 1998). Plots checked again in 1998 (T. Holmes pers. comm. 2000).

Priority Research, Survey, and Monitoring: 1) Monitor predator exclosure plots yearly until 2003. If *T. taranaki* inside the plots are larger on average than those outside, then it is recommended that the feasibility of some form of predator control at Egmont National Park is investigated (Goodman 1998). Confirm that the exclosure plots are predator free prior to monitoring, by the use of chew sticks or similar indicators of predator presence (T. Holmes pers. comm. 2000).

Management Needs: 1) Check predator exclosures regularly to ensure that they are not in a state that would facilitate predator entry e.g. damaged, vegetation overgrowth etc. (Goodman 1998).

Contacts: Kelly Duncan, Andrea Goodman.

Order: Isopoda (Gr. *isos*, equal + *pous*, foot)

Common name: **Isopods**

Characteristics: Body is dorsoventrally flattened. Thorax has one pair of maxillipeds and seven pairs of legs.

Order: Isopoda

Family: Idoteidae

Taxonomic Name: *Austridotea annectens* Nicholls 1937

Common Names: -

Synonyms: -

M&D Category: I

Conservancy Office: CA, OT, SL

Area Office: North Canterbury, Coastal Otago, Southern Islands

Description: A dark grey or grey-brown isopod. Males are 11-12 mm long (Chapman & Lewis 1976), and 4.5 mm wide, females around 9.5 mm long, and 4 mm wide (Nicholls 1937).

Body length: 12 mm

Type Locality: Stewart Island, a tiny creek, flowing through very dense bush, a hundred metres or less from where the creek discharges into Horseshoe Bay (Nicholls 1937).

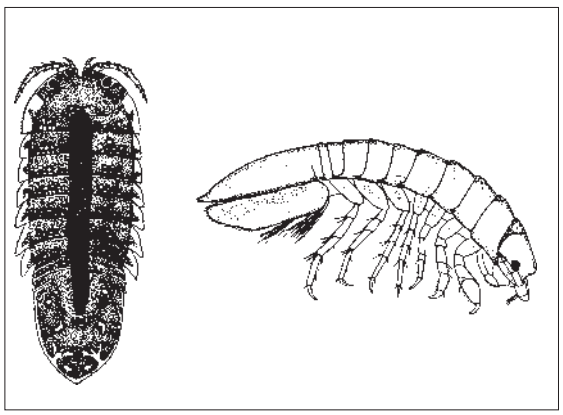
Specimen Holdings: -

Distribution: Has been collected from Leeston Drain (a free running stream 56 km north-east of Christchurch, which flows into Lake Ellesmere) (Marshall 1974); Lake Ellesmere (Ryan 1986); Catlins (L. Chadderton pers. comm) and from Stewart Island at Horseshoe Bay (Nicholls 1937; Chadderton 1990) and Rakeahua Valley (Chadderton 1990).

Habitat: Associated with woody debris and leafpacks on stony or sandy substrata (Chadderton 1990). *Austridotea annectens* is an active swimmer, and forages in 'dead' spaces amongst the shingle. It appears to be intolerant of fine sediment and organic enrichment of the water (Marshall 1974), and its distribution may be related to salinity similar to (*Austridotea benhami*). Presumably, like *A. benhami*, they are omnivorous and commonly prey on leptophlebiids (mayflies), simuliids (sand flies) and chironomids (midges, gnats) (Chadderton 1990).

Threats: Not known.

Work Undertaken to Date: Type specimen locality at Horseshoe Bay searched in 2000, and *A. annectens* is still present (L. Chadderton pers. comm. 2000). Poore & LewTon (1993) states that *A. annectens* is in fact a chaetiliid of uncertain generic placement.



Top: Dorsal view.
Bottom: Left: Dorsal view.
Bottom: Right: Male, lateral view.
Permission: Harper Collins Publishers. Chapman & Lewis 1976, Plate 7, Fig. 7a, p 159, Figs. 10.3a, b.

Priority Research, Survey, and Monitoring: 1) May be more than one species, taxonomy needs clarification (A. Chapman pers. comm. 1999).

Management Needs: -

Contacts: Lindsay Chadderton.