

Part II Giant Weta (*Deinacrida carinata*) on Pig Island, Foveaux Strait, March 1993

1. Introduction

This survey of *Deinacrida carinata* distribution and status on Pig Island, Foveaux Strait, was conducted by the Weeds and Pests Division, Manaaki Whenua - Landcare Research, Lower Hutt, for the Department of Conservation during March 1993.

2. Background

Deinacrida carinata, the smallest of the giant wetas, was first described from specimens obtained from Herekopare Island (Salmon 1955). A specimen is held by the Museum of New Zealand and labelled "Kundy Island off Stewart Island". It was collected by Major R.A. Wilson in December 1929. No formal surveys have been made for *D. carinata* on either of these islands, but large numbers of unidentified wetas (possibly *D. carinata*) were found in cat scats, when cats were being removed from Herekopare Island in 1970 (Fitzgerald & Veitch 1985).

During DoC surveys in the Foveaux Strait area a single weta was found under driftwood on Pig Island, and from a photograph by P.McClelland, tentatively identified by M. Meads as a species of *Deinacrida*, possibly *carinata*.

3. Objectives

- To confirm the presence of *Deinacrida carinata* on Pig Island and survey their distribution, habitat and numbers on the island.
- To measure *D. carinata* on Pig Island for comparison with other *Deinacrida* spp.
- To remove up to three pairs of wetas for observation and captive breeding.

4. Methods

4.1 SEARCH AREA AND EFFORT

Because Pig Island is a small (11 ha) low lying island, all areas could be readily accessed and searched. Searches were concentrated in and around areas that appeared to provide good refuges. Initially, day searches concentrated on driftwood in the upper wrack zone (on or near vegetation) where the first specimen was found. Searching then broadened to potential refuges in and under sedgeland vegetation, particularly dead foliage of flax (*Phormium tenax*), *Carex trifida*, and club rush (*Isolepis nodosa*). Night searching, with headlamps, concentrated on the clear areas below and adjacent to flax and sedges, the foliage of sedges, grasses, herbs and weeds, and open grassland.

The numbers of people and the time they spent searching for *D. carinata* were recorded, and the observation rate used as an index of weta density.

4.2 MEASUREMENTS OF *D. CARINATA*

For comparison with other deinacrid wetas, dial calipers were used to measure the length of the rear tibia and the thoracic shield of *D. carinata* captured during night surveys. Some of the *D. carinata* were also weighed (using a 10-g Pesola spring balance), although a 15-knot north-west wind made weighing adults difficult, and juveniles were too small to weigh. Only the overall body length of juveniles was recorded.

5. Results

5.1 DISTRIBUTION AND HABITAT OF *D. CARINATA*

A total of 34 *D. carinata* were observed during 20 person-hours spent searching on Pig Island. This included 8 person-hours/day searching, during which 13 wetas were observed at a rate of 1.62 wetas/h and 12 person-hours/night searching, during which 21 wetas were observed at a rate of 1.75 wetas/h.

In other studies, the presence of giant wetas has been readily indicated by their large distinctive faecal droppings. No droppings were found during this survey in the field. Droppings from captured specimens were very small and uncharacteristic of other giant weta species.

All wetas were observed close to or on the ground, but this most likely reflects the herbaceous nature of the vegetation on the island. With the exception of flax plants and the solitary cabbage tree (*Cordyline australis*), most plants are less than 500 mm high.

The plant species/substrates where each *D. carinata* was found are recorded in Appendix 9.1.

5.2 MEASUREMENTS OF *D. CARINATA*

Three age classes were evident among the wetas captured at night: Juvenile, Intermediate, and Adult (Table 1). The juveniles were very small animals, just over 1 cm long with the ovipositors of females barely discernible (these juveniles were difficult to sex at night). Male intermediates and adults were readily distinguished by size. For females, the distinction between intermediate and adult was complicated by some individuals in their penultimate instar having ovipositors nearly as long as adults.

TABLE 1. *DEINACRIDA CARINATA* MEASUREMENTS FROM PIG ISLAND SPECIMENS CAPTURED AT NIGHT (16 MARCH 1993)

AGE CLASS AND SEX	WEIGHT (g)	THORAX (mm)	REAR TIBIA (mm)	OVERALL LENGTH (mm)
Juveniles				10.6 10.9 11.1 11.3 11.6 12.2 12.3
Intermediate males	1.1 1.1 1.4 1.5 1.5	4.7 4.9 6.2 5.7 5.7	10.9 10.0 14.7 13.3 13.3	
Adult males	2.1 2.1	6.3 7.2	16.7 16.3	
Intermediate females	2.6 4.1	6.9 7.3	16.2 17.8	
Penultimate adult females	4.9 5.0 5.4	8.0 8.0 7.8	17.6 17.7 18.0	
Adult female	6.2 6.2	8.0 8.4	18.4 19.4	

Comparison of size with other *Deinacrida* species

A comparison of adult female size for five *Deinacrida* species indicates *D. carinata* is far smaller than other deinacrid species (Table 2).

TABLE 2. RANGE OF MEASUREMENTS OF ADULT FEMALE *DEINACRIDA* SPP. THE DATA FOR OTHER SPECIES WAS OBTAINED FROM PREVIOUS REPORTS (MEADS & NOTMAN 1991, 1992, 1993 UNPUBLISHED DSIR & LANDCARE RESEARCH REPORTS).

SPECIES (NUMBER OF MEASUREMENTS)	WEIGHT (g)	THORAX LENGTH (mm)	TIBIA LENGTH (mm)
<i>D. heteracantha</i> (6)	27.1 - 41.0	14.5 - 17.6	45.15 - 53.2
<i>D. rugosa</i> (34)	18.0 - 32.0	11.9 - 14.3	30.0 - 38.2
<i>D. "maungakoura"</i> (3)	11.35 - 16.5	10.9 - 11.4	36.3 - 38.9
<i>D. parva</i> (8)	9.4 - 13.0	10.0 - 10.9	24.2 - 27.6
<i>D. carinata</i> (3)	6.2	8.0 - 8.4	18.4 - 19.4

5.3 CAPTIVE BREEDING

Two pairs of adults, and a pair of intermediate *D. carinata* were collected for biological observation and captive breeding.

5.4 PROBABLE WETA PREDATORS

Weka

Pig Island is recorded as being "reserved in 1965 to protect [the] weka colony" a population of weka thought to have been liberated there by Maori or sealers (Allen *et al.* 1989). The birds were secretive, and we initially thought only one or two were present. However, a census of the island indicated that there were as many as 16 and possibly 18 weka on the island (1.5 - 2.0/ha).

The weka observed included several large chicks, indicating that food sources on the apparently barren, small Pig Island were sufficient to permit breeding and sustain the present population. Our assessment of weka numbers is similar to the 1989 estimate of "perhaps 15 weka" (Allen *et al.* 1989).

Most wetas were found near areas of dense cover, suggesting that weka were having an impact on wets numbers. Much of the sedgeland (where *D. carinata* were found) was tunnelled by weka, and we assumed that weka feed on *D. carinata* in these locations.

Predation on *D. carinata* by weka may be seasonal and occur only during the winter, when food from other sources is limited. At other seasons, particularly when southern black back gulls (*Larus dominicanus*) nest on the island, nest mortality would provide food for weka. Thus any assessment of weka impact on *D. carinata* should take possible seasonal differences into account.

Lizards

Very few lizards were seen. Several small-eared skinks, an undescribed species of *Leiopisma* (the belly of one captured specimen was a distinctive light yellow with a greenish hue), were occasionally found under driftwood on the stony southern beaches. Several *Hoplodactylus maculatus* geckos were observed, but only one was seen out at night.

6. Conclusions

6.1 STATUS OF *D. CARINATA* ON PIG ISLAND

- Although the small size, easy terrain, and number of searchers meant most of the island was thoroughly covered, *D. carinata* is a small, well camouflaged weta, and does not move, even when uncovered or lit by torchlight. The 34 wetas seen therefore indicates that a large viable population is present on the island.
- The presence of three age classes in March indicates that the life cycle of *D. carinata* matches that of other lowland *Deinacrida* species.
- Because droppings of *D. carinata* are difficult to observe in the field, they do not provide a useful indicator of the presence of *D. carinata*.
- *D. carinata* is the smallest of the Deinacrid species. No females were observed ovipositing during this survey, but the larger females measured were in their penultimate or final instars. Adult female *D. carinata* are not expected to exceed the measurements of the largest female encountered.

6.2 WEKA

- The presence of weka on the island may be of historical and cultural significance.
- Weka predation is almost certainly having a considerable impact on the numbers of wetas on Pig Island. If weka were removed, wetas would increase in numbers and use sites presently untenable (such as open vegetation and driftwood piles). Because the two species co-exist at present, weka control rather than eradication, may be an acceptable management option.

7. Recommendations

- DOC should, in consultation with Maori and other groups, consider removing or at least controlling the weka population on Pig Island to alleviate the impact on *D. carinata*.
- The population of *D. carinata* should be monitored to assess any change in the management of Pig Island (i.e, weka removal, revegetation).
- Action should be taken to reduce the possibility of rodents establishing on the island (placement and maintenance of rodent poison stations).
- Although *D. carinata* has been reported on Herekopare Island, the current status of the population there is not known and needs to be assessed as soon as possible. Similar, adjacent island sites in the Foveaux Strait region and Kundy Island (southeast of Stewart Island) should be surveyed for the presence of *D. carinata*.
- DoC staff visiting other Foveaux Strait islands should be instructed to look for *D. carinata*, particularly if visiting Kundy Island, where the 1929 specimen held by the National Museum was obtained.

8. Acknowledgements

We wish to thank P. McClelland, DoC, South land for participating in surveys and assisting with the logistics and transport to the island. G. Miller, DoC, Southland ferried the team safely to and from the island. A. Ballance and M. Hantler (TVNZ) also assisted with the surveys. G. Nugent commented on an earlier draft. Funds for this research were provided by Department of Conservation, Science and Research and the Foundation for Research, Science and Technology.

9. Appendices

9.1 LIST OF *DEINACRIDA CARINATA* OBSERVATIONS MADE ON 16 MARCH 1993

The search began at 1400 h and initially focused on the large logs and debris in the upper wrack zone, where a possible specimen was located on a previous trip by Peter McClelland.

- 1555 h Searches of the wrack debris were unsuccessful and searching was then concentrated in the dead fronds of *Carex trifida* on the south-eastern corner of the island. Two intermediate males were found in among the dead fronds of a particularly browsed plant on the edge of a rock escarpment.
- 1600 h Five further intermediate males were located in the same plant.
- 1602 h A male and female were found in a similar situation among dead *Carex* leaves in an isolated patch 10 m north-west of the first site.
- 1610 h An intermediate female was found on a *Carex* plant adjacent to the 1555 h and 1600 h sightings.
- 1620 h Two male *D. carinata* were found in a clump of *Carex* adjacent to the trig remnants on the high point at the south-west corner of the Island.
- 1633 h A small juvenile female *D. carinata* was found in a hollow flax stem from a flax plant due south of the trig.

Searching finished at 1700 h, and resumed at 2100 h.

- 2112 h A mature adult female *D. carinata* was located on the *Scirpus nodosus* at ground level adjacent to a flax plant within 8 m north-west of the solitary cabbage tree on the north-east end of the island.
- 2128 h A very small juvenile *D. carinata* was observed sitting on dead leaf 'skirt' material of a flax plant approximately 15 m east of the cabbage tree.
- 2150 h Intermediate female *D. carinata* on red clover (*Trifolium pratense*) was found further eastwards.
- 2151 h Intermediate male *D. carinata* was observed on a Californian thistle (*Cirsium arvense*) that was adjacent to some flax plants.
- 2155 h An intermediate male *D. carinata* was found on the ground immediately adjacent to a flax plant
- 2158 h intermediate male *D. carinata* was observed on bidibid (*Acaena sp.*) foliage.
- 2205 h Intermediate male *D. carinata* was found near *Scirpus nodosus* sedgeland.
- 2210 h A juvenile *D. carinata* was found on *Scirpus nodosus* sedges adjacent to a flax plant.
- 2222 h A penultimate adult female *D. carinata* was found just north of the trig in the open on *Scirpus nodosus*.

- 2233 h An adult male was found on hawkweed (*Hieracium* sp.) SE of the trig.
- 2259 h An intermediate male *D. carinata* was found on dandelion (*Taraxacum officinale*) adjacent to and on the southern side of the flax plants that line the low ridge on the western part of the island.
- 2303 h An adult male was found on clover in similar situation to above.
- 2303 h Adult female found under fathen (*Chenopodium* sp.) adjacent to and west of above.
- 2303 h juvenile *D. carinata* found on fathen next to flax.
- 2304 h juvenile *D. carinata* found on New Zealand spinach (*Tetragonia trigyna*).
- 2307 h juvenile *D. carinata* found on grass.
- 2310 h juvenile *D. carinata* found on dandelion.
- 2316 h Penultimate female *D. carinata* found on a dead nettle (*Urtica australis*) adjacent to a flax plant.
- 2320 h Penultimate female *D. carinata* found on a dead *Urtica australis* 1 m west of the above observation.
- 2334 h Intermediate female *D. carinata* found on bare sand at the edge of the grass sward near flax plants.
- 2342 h juvenile *D. carinata* found among dry grasses on the western corner of the island.

Searching concluded at 2400 h.

Part III The Giant Weta Species (*Deinacrida* "talpa" and *Deinacrida* "occidentalis") in the Southern Alps

1. Introduction

Manaaki Whenua - Landcare Research surveyed the presence and status of giant weta *Deinacrida* "occidentalis" ("Mt Cook giant weta") and *Deinacrida* "talpa" ("giant mole weta") at two sites in the southern alps where recent sightings have been made. This was a discrete project within an ongoing investigation of the 'Status and Conservation of Giant Weta Species' for the Department of Conservation, and was compiled in March 1994.

(With regard to "giant weta", note that Article 1(b) Exclusions (6) of the International Code of Zoological Nomenclature states:- "as means of temporary reference and not for formal taxonomic use as scientific names in zoological nomenclature".

In this paper:

- *Deinacrida* "occidentalis" is used for the "Mt Cook giant weta".
- *Deinacrida* "talpa" is used for the "giant mole weta" accordingly.)

2. Background

Since 1947 "giant-sized" wetas have been observed in a variety of localities in the Southern Alps, but any specimens collected do not show up in the records of national repositories.

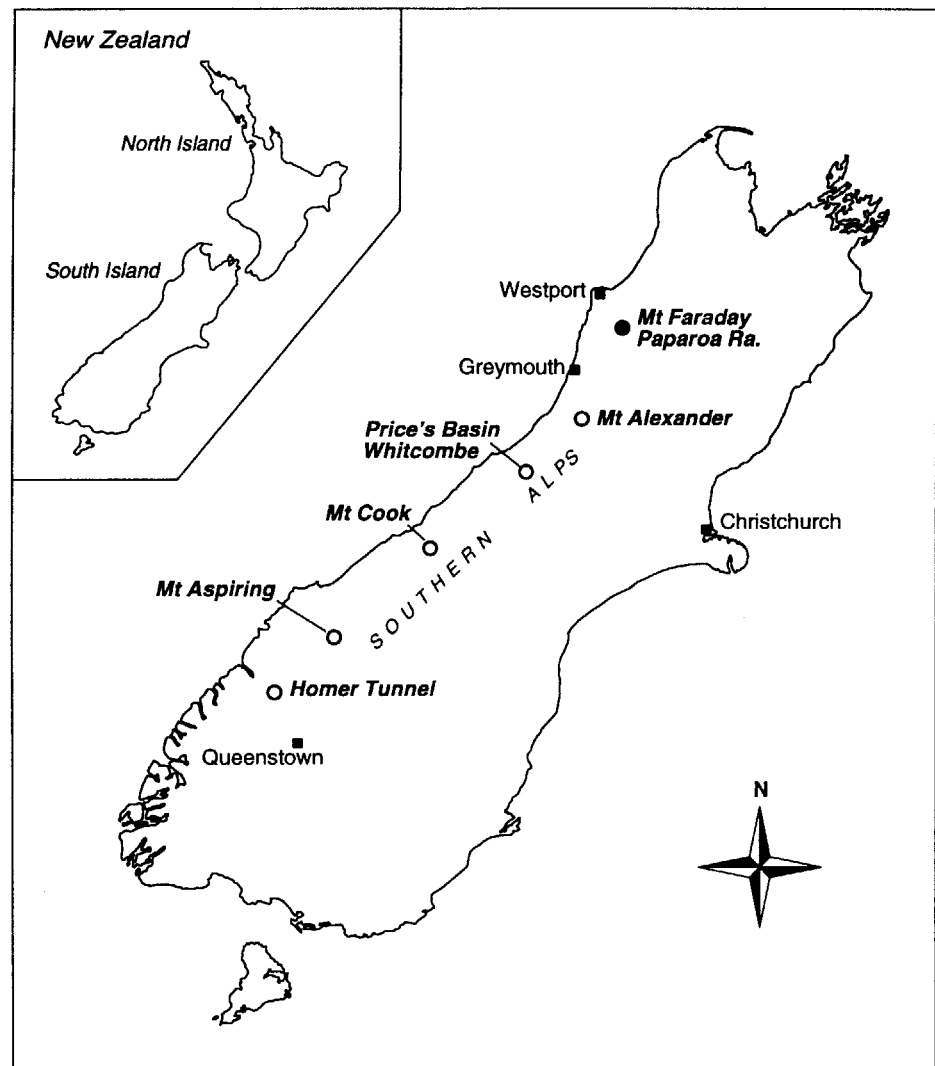
The earliest record is of a giant weta in the Sawyer Stream area, Mt Cook. This weta was subsequently called the "Mt Cook giant weta", and in this report is designated *Deinacrida* "occidentalis". A juvenile located near the Homer Tunnel, Milford, in the sixties by Dr John Salmon (Dominion Museum) is attributed to this species (and remains the most southern record). During 1965 MAF scientist Dr Don Robertson photographed a weta in the head basin of the West Matukituki Valley, on the west of Lake Wanaka. An appraisal of the photograph in Victoria News' 5(4) in 1992 indicated this was also a "Mt Cook giant weta". In 1989 Jane Forsythe (NZ Geological Survey, DSIR) reported "large alpine wetas" from around the Dart Glacier, Mt Aspiring National Park (species unconfirmed). In 1991 Jan and Arnold Heine (Lower Hutt) discovered and

photographed an unusual weta in the snow tussock country at Price's Basin, in the Whitcombe catchment, Westland. The most northerly record (an old undocumented museum specimen awaiting confirmation) is from Mt Alexander, Kaimata Range, above the Taramakau River (Fig. 1).

Owen Dennis (Waimangaroa-Buller) photographed a weta he found while tramping near the summit of Mt Faraday, northern Paparoa Range in 1992. He reported that the weta was "deep brown-grey" and 50 mm long. At first researchers at Victoria University of Wellington thought this finding extended the distribution of the "Mt Cook giant weta". However, this morphologically and behaviourally different weta is yet another new species of giant weta, and in this report is designated *Deinacrida* "talpa" ("giant mole wets").

To investigate and confirm these sightings, in March 1994 we surveyed Price's Basin and the summit of Mt Faraday. Bad weather prevented landing on Mt Alexander (Fig. 1).

FIG. 1 DISTRIBUTION OF *DEINACRIDA* "TALPA" (e) AND *DEINACRIDA* °OCCIDENTALIS" (o)



3. Objectives

- 1 To continue to assess the abundance, distribution, and status of each species of giant weta (*Deinacrida*) spp.
- 2 To confirm the presence of a new species of *Deinacrida* on mountains of the West Coast, and survey their status, habitat, and numbers.
- 3 To take morphometric measurements of wetas found for comparison with other *Deinacrida* spp.

4. Methods

4.1 SEARCH AREA AND EFFORT

The survey was conducted between 26-31 March 1994.

Sites searched for wets included granite rock outcrops and vegetated slopes above 1200 m on Mt Faraday and screes and narrow snow-melt water courses on the upper slopes (>1300 m) above Price's Basin Hut. Slopes that received the most sun were considered to be the most likely places for weta activity.

The number of weta found and total time spent searching were used as an index to weta density.

4.2 SEARCHING METHODS

At Mt Faraday we searched at night with headlamps for weta activity. However, the moon was full and rose at 1753 h, providing bright lighting in a clear sky. This made searching difficult and influenced weta activity (wetas are less active on bright nights to reduce the possibility of predation). Thick low fog prevented night searching at Price's Basin.

Giant wetas are large herbivores with simple gut systems and produce copious amounts of droppings. Their droppings are distinctive in appearance and odour. Day searching concentrated on locating giant weta droppings to establish presence, distribution, and habitat requirements. Key situations searched were on rock ledges, at the base of rock outcrops, in cracks and crevices, and around the base of plants. Plants were closely checked for chewing sign that might indicate weta presence. All weta droppings found were retained for cuticle analysis to determine diet.

4.3 MEASUREMENTS OF WETA

For comparison with other deinacrid wetas, captured live wetas were weighed (using either 10-g or 30-g Pesola spring balances as appropriate). Measurements were made of the length of the rear tibia, the length of the thoracic shield, and overall body length using standard dial callipers.

5. Results

5.1 STATUS, HABITAT, AND NUMBERS OF GIANT WETA

Deinacrida "occidentalis"

A total of seven *D.* "occidentalis" were found during 6 hours searching during daylight (1.16 weta/h). All wetas were found under loose schist stone lying in bare scoured snow-melt water courses. These narrow (<2 m wide) water courses were spaced about 50 m apart across the eastern facing slopes of Mt Wylde Brown at >1200 m in Price's Basin.

Vegetation was primarily alpine grasslands with *Chionochloa* sp. *Aciphylla* sp. and *Ranunculus* spp. Other prevalent species included *Dracophyllum* sp., *Carmichaelia* sp., *Celmisia* spp., *Coprosma perpusilla* group, *Leucogenes grandiceps*, *Olearia ilicifolia* and *O. lacunosa*. Other plants that are possible food for wetas include: *Gaultheria* sp., *Anisotome aromatica*, *Acaena* sp., and *Gentiana* sp.

Deinacrida "talpa"

A total of 14 *D.* "talpa" were found during 15 hours searching at Mt Faraday (0.93 wetas/h). This included 9 hours of daytime searching, during which 13 wetas were found (1.44 wetas/h) and 6 hours of night time searching, during which 1 weta was found (0.16 weta/h).

All of the *D.* "talpa" found during the day were in tunnels concealed under the fringes of carpet grass (*Chionochloa australis*). These tunnels, found only on north-facing slopes above 1200 m, were clustered in groups of three or four, each about 200 mm apart. The tunnels were about 200-300 mm in length and about 25 mm wide. The tunnels were constructed more or less horizontally under the roots of the plants for the first two-thirds of their length, and then dipped down at the end. The distance between the end of the tunnel and the surface was always more than 120 mm. The sides were smooth and all the tunnels inspected (>40) were moist. The ground beneath the carpet grass was noticeably warmer than that of the surface. No other giant weta of the genus *Deinacrida* is known to tunnel, although I suspect that *D. tibiospina* (north-west Nelson) may likewise tunnel under carpet grass.

Vegetation was primarily carpet grass, red tussock (*Chionochloa rubra*), interspersed with *Celmisia* (4 spp.), *Forstera setifolia*, *Coprosma cheesemanii*, *Coprosma* sp. (aff. *pseudocuneata*), *Olearia colensoi*, and *Dracophyllum uniflorum*. Other plants of note were *Leucogenes grandiceps*, *Gaultheria* sp., *Anisotome* sp., *Acaena* sp., *Gentiana* sp., and *Carpha alpina*

5.2 MEASUREMENTS OF *DEINACRIDA* " OCCIDENTALIS" AND *DEINACRIDA* " TALPA"

Depending on the time of the year, giant wets have normally two, but occasionally three age classes present in a population (small juveniles up to 6 months old, intermediates 6-18 months old, and adults 18-26 months old). All the *Deinacrida* "occidentalis" found were adults (2 years old), except for a very small juvenile (indicating three age classes present). All the *Deinacrida* "talpa" captured were adult. Other adults and several intermediate class wets were observed deep in burrows, but were not measured (Table 1). Only two age classes were obvious for *D.* "talpa".

TABLE 1. *DEINACRIDA* "OCCIDENTALIS" AND *DEINACRIDA* "TALPA" MEASUREMENTS (ONLY WETAS REMOVED FOR CAPTIVE BREEDING WERE MEASURED).

SPECIES AND SEX	WEIGHT (g)	THORAX (mm)	REAR TIBIA (mm)	OVERALL LENGTH (mm)
<i>D. occidentalis</i> (F)	11.1	9.3	27.5	51.1
<i>D. occidentalis</i> (F)	8.7	9.3	24.6	47.0
<i>D. occidentalis</i> (M)	6.4	6.8	26.3	40.4
<i>D. occidentalis</i> (M)	4.7	6.0	25.6	39.8
<i>D. talpa</i> (F)	11.9	10.5	27.5	50.0
<i>D. talpa</i> (F)	11.1	11.3	27.7	51.2
<i>D. talpa</i> (M)	5.9	8.9	26.8	45.2
<i>D. talpa</i> (M)	7.5	8.7	27.3	47.5
<i>D. talpa</i> (M)	6.1	8.1	23.8	40.5

Adult female *Deinacrida* "occidentalis" and *Deinacrida* "talpa" differ morphologically from the other *Deinacrida* spp. (7), but are within the range of measurements of those species found at high altitudes (Table 2).

TABLE 2. RANGE OF MEASUREMENTS OF ADULT FEMALE *DEINACRIDA* *SPP.* DATA FOR OTHER SPECIES OBTAINED FROM PREVIOUS UNPUBLISHED REPORTS (MEADS 1989, 1990, MEADS & NOTMAN 1992, 1993A,B).

SPECIES (NUMBER OF MEASUREMENTS)	WEIGHT (g)	THORAX LENGTH (mm)	TIBIA LENGTH (mm)
<i>D. heteracantha</i> (6)	27.1 - 41.0	14.5 - 17.6	45.1 - 53.2
<i>D. rugosa</i> (34)	18.0 - 32.0	11.9 - 14.3	30.0 - 38.2
<i>D. "maungakoura"</i> (3)	11.3 - 16.5	10.9 - 11.4	36.3 - 38.9
<i>D. "talpa"</i> (2)	11.1 - 11.9	10.5 - 11.3	27.5 - 27.7
<i>D. parva</i> (8)	9.4 - 13.0	10.0 - 10.9	24.2 - 27.6
<i>D. "occidentalis"</i> (2)	8.7 - 11.1	9.3 - 9.3	24.6 - 27.5
<i>D. carinata</i> (3)	6.2 - 6.2	8.0 - 8.4	18.4 - 19.4

5.3 CAPTIVE BREEDING

Two pairs of adult *Deinacrida* "occidentalis" and *D. "talpa"* were taken into my captive breeding facility near Wellington for photography, biological observation, and captive breeding.

5.4 PROBABLE WETA PREDATORS

Giant wetas are seldom at risk during the day, but kiwi (*Apteryx* sp. - heard on Mt Faraday) and weka (*Gallirallus australis* - feather found on Mt Faraday), will prey on giant wetas. Native predators have easier access to wetas with the suppression and removal of many alpine plants by deer, goats, possums, and hares (Meals *et al.* 1984).

Possums will eat insects. Faecal pellets of possums and hares were seen on Mt Faraday, and Dennis Owen reported goats. At Price's Basin, the snow tussock/alpine herbland vegetation was more dense, and we saw only possum faeces and a few chamois. Rats have not been reported from the mountains above the treeline this century, but mice are occasionally reported and would prey on juvenile wetas.

6. Conclusions

- This survey confirms *Deinacrida* "occidentalis" (Mt Cook giant weta) as a new species of giant weta. It has now been reported from six locations along the western side of the Southern Alps, from Mt Alexander, Taramakau, in the north and Homer Tunnel, Milford, in the south. The species appears to be present in relatively good numbers in at least two sites and is not considered to be at threat.
- This survey indicates that *Deinacrida* "talpa" (giant mole weta) on Mt Faraday is a new undescribed species, quite distinct in morphology and behaviour from the Mt Cook giant weta and other *Deinacrida*. *Deinacrida* "talpa" is the only ground-tunnelling giant weta species known.

7. Recommendations

- Mt Alexander, Mt Cook, Mt Aspiring, and the vicinity of the Homer Tunnel, Milford, should be surveyed to confirm the presence of *D.* "occidentalis" and to assess their conservation status.
- The population of *D.* "talpa" on Mt Faraday should be monitored to assess the effect of any change in the management of the area (Le, goat and possum control).
- Mountain sites near, and similar to, Mt Faraday should be surveyed to determine whether *D.* "talpa" exists at other sites.

8. Acknowledgements

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9. References

- Allan, R.B.; Lee, W.G.; Johnson, P.N. 1989: Southland. Biological survey of reserves series no. 19. Department of Conservation. Pp. 160-161.
- Fitzgerald, B.M.; Veitch, C.R. 1985: The cats of Herekopare Island, New Zealand; their history, ecology and effects on birdlife. *New Zealand journal of zoology* 12: 319-330.
- Meads, M.J., Walker, K.J., Elliot, G.P. 1984: Status, conservation, and management of the land snails of the genus *Powelliphanta* (Mollusca: Pulmonata). *New Zealand journal of zoology* 11(3): 277-306.
- Meads, M. 1989: The conservation status of the giant wets (*Deinacrida tihiospina*) in Northwest Nelson: report of a field visit, and notes on other invertebrates. DSIR Ecology Division Report No. 21 (unpublished) 14 p.
- Meads, M. 1990: Threatened Weta Recovery Plan: technical draft. DSIR Land Resources contract report 90/25 (unpublished) 41 p.
- Meads, M.; Notman, P. 1991: A survey of the Giant Wetas (*Deinacrida parva* and *Deinacrida sp.*) in the north branch of the Hapuku River, Kaikoura, 29 April-3 May 1991. DSIR Land Resources technical record no. 43 (unpublished) 34 p.
- Meads, M.; Notman, P. 1992: Survey of the status of three species of Giant Wetas (*Deinacrida*) on Seaward and Inland Kaikoura Ranges. DSIR Land Resources technical record no.89 (unpublished) 35 p.
- Meads, M.; Notman, P. 1993x: Giant weta *Deinacrida heteracantha* survey of Little Barrier Island October 1992. Manaaki Whenua-Landcare Research contract report LC9293/105 (unpublished) 18 p.
- Meads, M.; Notman, P. 1993b: Giant weta *Deinacrida carinata* on Pig Island, Foveaux Strait, March 1993. Landcare Research contract report LC9293/116. (unpublished) 14 p.