

An insect survey of Paengaroa Scenic Reserve, Mataroa

J I Townsend
30B The Avenue
Levin

Published by
Department of Conservation
Head Office, PO Box 10-420
Wellington, New Zealand

This report was commissioned by Wanganui Conservancy

ISSN 1171-9834

© 1997 Department of Conservation, P.O. Box 10-420, Wellington, New Zealand

Reference to material in this report should be cited thus:

Townsend, J.I., 1997.

An insect survey of Paengaroa Scenic Reserve, Mataroa. *Conservation Advisory Science Notes No. 152*,
Department of Conservation, Wellington.

Keywords: Divaricating shrubs, Puriri moth, Tree wets, ground-beetles, Carabidae.

Introduction

PHYSICAL FEATURES

Paengaroa Scenic Reserve is an area of approximately 100 hectares of native forest clothing a south-facing slope, ranging in height from 520m near the bank of the Hautapu Stream up to a hill of 706m. It remains almost totally shaded during the winter months during which time heavy frosts build upon each other, particularly along the river terrace. This is the area where many of the unusual divaricating shrubs occur and is the main focus of this survey. Apart from the pooling of water along parts of the river terrace during heavy rains, the only semi-permanent water in the Reserve is from a small stream flowing south in a central valley.

SCOPE OF SURVEY

The survey was requested by the Wanganui Conservancy of the Department of Conservation (DoC) to see if there is any particular species of insect that could be used in future monitoring changes in the Reserve as a result of predator control. Due to budget constraints this report is based on a short one-season survey of the lower parts of the Reserve, carried out during two visits in December 1995 and January 1996.

The limitations of such a brief survey are obvious, particularly with general entomology, where the details noted here could almost be described as "lucky finds". Further visits would surely reveal many more records. In the short time available, a deliberate attempt was made to record as many Carabidae as possible, as these beetles have been quite thoroughly studied throughout the country and their assessment would provide one of the best means of comparing this area with other places. Although 15 different species were seen, this list too, should not be regarded as complete as some other carabids are known from the district, and would be expected to show up in the Reserve with continued surveying.

METHODS

On both visits, general observations, beating foliage, ground searching under logs, stream sampling and dusk and night collecting were carried out. In December, 25 pit-fall traps were put in, in four main areas, namely -

- (A) the tall podocarp area on the frost flats just west of the swing bridge,
- (B) a better drained area near the end of the track downstream of the swing bridge,
- (C) matai / kahikatea / maire forest near the west entrance to the river track and

- (D) half a kilometre further along this track amongst some blocks of old decayed podocarp logs.

These traps were retrieved in January. It was interesting to note the quantity of litter-fall during this month-long exposure; many of the trap covers were completely buried.

General entomology

Day-biting mosquitos are an unfortunate feature of the river flats immediately west of the swing bridge, where pooling of storm water can occur. Sandflies were also present in this area. Neither were prevalent in other parts of the Reserve during my visits.

One of the most striking entomological features of this forest is the numerous holes made by caterpillars of the puriri moth (*Aenetus virescens* (Doubleday) : Hepialidae) in tree trunks, particularly lacebark and putaputaweta. It was noted in the following host trees:

Aristotelia serrata *
Carpodetus serratus *
Hoheria angustifolia
Hoheria populnea *
Melicope simplex
Melicytus lanceolatus
Myrsine divaricata
Nestegis cunninghamii
Plagianthus regius
Pseudowintera colorata

*Also recorded (along with other plants) by Hudson (1928)

The life cycle of puriri moth takes 3-5 years from egg to adult (Alma 1977). It is thought that eggs are scattered randomly by the female moth, and larvae spend about the first year of their life in decaying wood on the ground where they feed mainly on fungi. Then the larva completely changes its life style by seeking out a host tree, and in some cases climbing a considerable distance from the ground before beginning to bore a tunnel into the living trunk. At this point it protects itself by spinning a silk cover over the hole, enlarging it as it grows. Its tunnel first slopes slightly upwards and then more or less vertically down inside the trunk.

For the rest of its life as a caterpillar, it feeds on callus tissue immediately beneath its web covering and retreats into the vertical tunnel for shelter. It eventually pupates in this part of the tunnel but the pupa remains remarkably active, frequently climbing up and down the tunnel and just before it is due to emerge it climbs back up to be near the surface (Miller 1984, Grehan 1983).

The many abandoned tunnels of this caterpillar form favourite homes for tree weta (*Hemideina*) which can be heard rasping in the evenings. The actual

species of *Hemideina* present at the Reserve is a point of considerable interest to Dr Gibbs, who has been consulted for an identification. The reference specimen collected is very similar to the newly described *Hemideina trewicki* Morgan-Richards from Mohi Bush, Hawkes Bay. However there is a very real possibility of the Wellington weta *H. crassidens* (Blanchard) and/or the Auckland weta *H. thoracica* (White) also being in the area. A detailed survey of the populations in the Paengaroa Scenic Reserve, including DNA studies, would be most rewarding in the future, as there is a certain amount of overlap of these species, both geographically and also with the morphological characters on which they are separated.

In May, 1996 DoC staff collected 12 weta from the reserve which were forwarded to Dr Gibbs. The specimens were easily found by breaking open standing dead tree trunks (J. Barkla, C. Ogle pers. comms.). Dr Gibbs visually identified 11 as *H. crassidens* and one as like *H. trewicki*. It will be some time before DNA studies are completed.

Several species of cave wetas were seen at night and some specimens were caught in pit-traps. An interesting ground weta (*Hemiandrus furcifer* Ander [Det. M. J. Meads]) was also found in pit-traps in area B. This species would be expected in the area.

"Vegetable caterpillars" were found along the track approximately half a kilometre in from the west entrance. The fungus *Cordyceps robertsii* parasitizes large ground dwelling caterpillars of another hepialid moth, *Dumbletonius*.

Dusk flights of a large green cockchafer (*Stethaspis longicornis* Arrow) were noticeable in January, but not December.

This is the species which is more common in the northern part of the North Island, south to about Rotorua.

Ant nests of *Huberia striata* (Fr. Smith) are common in and under fallen logs. These ants are host to an unusual fly, *Microdon* (Syrphidae). This genus is known from Australia; the only place in New Zealand where I have found similar flies is in nests of the same ant species (which is widespread throughout the country) on Takaka Hill, Nelson. That was in the spring of 1969. [However, as far as I am aware, no research has been done on *Microdon* in New Zealand, and the apparently anomalous distribution may simply be a result of a lack of field data.]

The larvae of these flies are oval and convex dorsally, flat on the underside and soft bodied. They move around in the ant nest, either as scavengers or predators, and are ignored by the ants, which would quickly attack any other intruders.

The following list includes the beetles taken from pit-traps other than Carabidae. They have been identified by John Nunn, who is a private entomologist living at 142 Mitchell Street, Brooklyn, Wellington.

CERAMBYCIDAE
CHRYSOMEDLIDAE

Somatidia sp.
Eucolaspis sp.

COCCINELLIDAE	<i>Rhyxobius rarus</i> (Broun, 1880)
COLYDIIDAE	<i>Enarsus backwelli</i> Pascoe, 1886
COLYDIIDAE	<i>Gleneteia costata</i> Broun, 1893
CURCULIONIDAE	Brachycerinae Indet. 1
CURCULIONIDAE	Brachycerinae Indet. 2
CURCULIONIDAE	Brachycerinae Indet. 3
CURCULIONIDAE	<i>Catoptes binodes</i> (White, 1846)
CURCULIONIDAE	<i>Crisius ?gerisealis</i> Broun, 1921
CURCULIONIDAE	<i>Crisius semifuscus</i> Broun, 1913
CURCULIONIDAE	<i>Erymneus probus</i> Broun
CURCULIONIDAE	<i>Lyperobates</i> sp.
CURCULIONIDAE	<i>Phrynixus</i> sp.
EROTYLIDAE	<i>Cryptodacne</i> sp.
HISTERIDAE	Indet.
HYDROPHILLIDAE	<i>Cyloma lawsona</i> Sharp, 1872
HYDROPHILIDAE	Indet.
LATHRIDIIDAE	Indet.
LEIODIDAE	<i>Colon hirtale</i> Broun, 1880
LEIODIDAE	<i>Isocatops concinnus</i> Broun
LEIODIDAE	<i>Isocolon</i> ? sp.
LEIODIDAE	<i>Mesocolon</i> sp.
LEIODIDAE	<i>Paracatops lugubris</i> (Sharp, 1882)
LEIODIDAE	<i>Zeadolopus</i> sp. 1
LEIODIDAE	<i>Zeadolopus</i> sp. 2
SCARABAEIDAE	<i>Saprosites inflatipes</i>
SCARABAEIDAE	<i>Saprosites</i> sp.
SCYDMAENIDAE	Indet. 1
SCYDMAENIDAE	Indet. 2
STAPHYLINIDAE	<i>Hadrotus wakefieldi</i>
STAPHYLINIDAE	<i>Quedius</i> sp.
STAPHYLINIDAE	<i>Sepedophilus</i> sp.

Carabidae

Most of our native ground-beetles are flightless and many are very restricted in their distribution. For this reason they are of particular interest in zoogeography, being useful indicators of relationships of different land areas.

Being predators near the top of the food-chain, ground beetles are also indicators of the "healthiness" of the area. There are approximately 500 species throughout the country and on an average any one area could contain up to twenty or more species, occupying specialised niches. If an area is particularly "poor" in species, then this could indicate a history of modification of the environment from which it has not yet recovered. For instance pasture contains few carabid species and most of those that are there are introduced and/or fully winged.

The following species of Carabidae were noted in the Reserve:

***Neocicindela tuberculata* (Fabricius)**

This is the commonest of the 14 species of tiger beetles found in New Zealand. In fact it has the distinction of being one of the insects collected on Cook's voyage to New Zealand. For a long time, tiger beetles were thought to be a separate family from the Carabidae, but most workers now class them as a Subfamily within the Carabidae. This is the only carabid seen at Mataroa that has fully developed wings and flies readily.

Specimens were seen stalking other insects along the clay edge of the roadside near the Reserve. [Fabricius (1770-1830) was a pupil of Linnaeus and continued his system of nomenclature which is still followed today.]

***Mecodema cf. o'connori* Broun**

This is a large ground beetle, up to 35mm in length, belonging to the tribe Broscini. Typical *o'connori* occurs in the Levin area and is quite restricted in distribution, but the very similar (although separable) unnamed form has a far more scattered distribution in the North Island. I have records from Coromandel, East Cape, Waikato, Mt. Egmont / Taranaki, Maraetotara, Norsewood, Hunterville, Pohangina and Kimbolton.

So it is not surprising for it to be at Mataroa. In the Reserve it was seen under a log in the area downstream from the swing bridge, and also one was caught in a pit-trap there.

***Plocamostethus planiusculus* (White)**

This ground beetle is almost as large (30mm) but belongs in the tribe Pterostichini. It is common in moist bush areas throughout the North Island south of Auckland (except much of Hawkes Bay), and also occurs in the northern part of the South Island.

***Holcaspis hispida* (Broun)**

A smaller pterostichine, usually less than 25mm in length. Five specimens were taken in pit-traps from area C. Luckily one of these was a male from which the identification was made - females can look deceptively like some closely allied species. In fact there may be another species there as well, but this cannot be decided until more males are found.

***Prospodrus occultus* Britton**

This carabid is restricted to the immediate vicinity of water, either in caves or small rocky streams. They are so used to the watery environment, that when disturbed, their usual reaction is to crawl down under water amongst the stones and gravel. One adult and one larva were found in the central stream. The species was first described in 1960 from a cave near Wairoa.

Since then further specimens have been found in creeks in the Urewera - Gisborne district, Puketitiri, Makuri and south to Akatarawa. It has also been taken as far west as Hihitahi, Apiti, Rangiwahia and Wharite and also Turakina

Valley and Parapara. A different species, *Prospodrus waltoni*, was described from caves in the Waikato, and this species has been found as far south as Taranaki and east to Jerusalem on the Wanganui River and Parapara. The full interplay of these two species, seemingly from the east and west, has yet to be resolved. However, the Mataroa specimen is clearly of the eastern species.

***Duvaliomimus watti* Britton**

This belongs to the tribe Trechini, and is a southern representative of a species described from the Hunua Range, near Auckland. It has also been seen from Coromandel Range, and Mt. William near Pokeno. Perhaps not surprisingly, there appears to be a gap in its distribution around the Taupo volcanic area, but it appears again at Wairahue and Hihitahi, and now at Mataroa.

It also occurs in the Manawatu Gorge and along the western Tararua foothills and down to Wellington. It is a rather variable species with different forms appearing at different localities. However two forms appear to exist sympatrically at Mataroa. A single specimen of the smaller type-form and four of a larger form were found in flood debris associated with the central stream. Also its larva was found for the first time.

***Zolus atratus* Broun**

Type locality for this species is Mt. Egmont, but it appears to be quite widely distributed, at least in the southern half of the North Island. A specimen was found under loose bark of a fallen log near the western entrance to the Reserve.

***Zolus femoralis* Broun**

Type locality for this species is Wellington, and is very similar to the above species but has a narrower head - maximum width at the eyes is less than 1.5mm. It is also widely distributed in the southern half of the North Island. A specimen was found under bark near the western entrance to the Reserve.

***Oopterus fulvipes* Broun**

This small (6mm) carabid belongs to the tribe Zolini, as does the previous one. Its type locality is Midhurst and I have previously found it only from Mt. Egmont and Lake Rotokare, Eltham, never commonly. So it was interesting to note over a dozen specimens on one particular mossy log in the Reserve at night on both visits (but not seen on any other logs). Whether the very tightly growing moss, or the stage of decay of the log or some other factors influenced their presence, is not known.

***Demetrida nasuta* White**

These small (7mm) carabid beetles are widespread in the North Island and northern part of the South Island. They can be easily identified by the cream and dark markings on the elytra.

Often found by beating shrubbery; the two specimens seen at Paengaroa were seen crawling on a mossy log at night. (The same mossy log that harboured *Oopterus flavipes*.) Tribe Lebiini.

***Dicrochile cephalotes* Broun**

The type locality of this licinine is Ngatira, near Rotorua and it is known from there south to Wellington, and westward to Taranaki, so its occurrence at Mataroa is not surprising. A specimen was seen in the Reserve in October 1993, and two were found in pit-traps in area C during the survey. It only occurs sporadically and in my experience it is never common.

***Selenochilus ?ruficornis* (Broun)**

This genus has not been revised since the original descriptions were made by Broun, so accurate identification is difficult. *S. ruficornis* is the only species described from the North Island, but the type locality is Wellington and it (or related species) is known to occur along the west coast as far north as the Upper Awakino. The specimen from Mataroa was taken in a pit-trap from area B.

***Molopsida pretiosa* (Broun)**

This small (5mm) carabid was found to be quite common in leaf litter samples from moist areas under white pine. It also occurred in several of the pit-traps. The type locality for the species is Raurimu, so it could be expected at Mataroa. However it does have an unusual distribution, being apparently absent from the southern part of the North Island, but appearing again in the Nelson area.

***Molopsida seriatopora* (Bates)**

Another small ground beetle found within a rotting log from area B, downstream from the swing bridge during the December visit. Is known to be in the district and has a wide distribution.

***Molopsida strenua* (Broun)**

Similar to the above species in general morphology and distribution. A specimen was found in decaying wood on the underside of a log during the January visit.

Discussion

MATAROA - THE MEETING PLACE

To summarise the above, Mataroa is an area where species meet, that appear to have different centres of distribution: *Oopterus fulvipes* from Taranaki to

the west, *Duvaliomimus watti* from the north, *Prospodrus occultus* from the east and *Selenochilus rufipes* from the south. These appear to be the most striking "outsiders". Other species are either well distributed in the central area or are of wider distribution, so that they would be expected there, anyway. There is one example (mentioned above) of a carabid of restricted North Island distribution and also appearing in the South Island; that is *Molopsida pretiosa* which was described from the Central Plateau area, and not known to occur south of about Raetihi and Taranaki (and now Mataroa) in the North Island, but occurs again in the South Island in the Golden Bay, Nelson District. Perhaps *Molopsida seriatopora* could also come into this category as it is recorded in the North Island from the Kaimai Ranges south, but appears to be absent from the Tararuas. However it is present again in the northern part of the South Island, down to about the Murchison area.

This survey of insect fauna has not revealed distribution patterns amongst the arthropods that parallel the southern botanical connections as shown in Ogle & Barkla (1995); however, there are some eastern affinities. At this stage it would be too premature to quote the syrphid fly as an example, without knowing more about its general distribution. Perhaps the closest equivalents amongst the Carabidae would be the two *Molopsida* species (*pretiosa* and *seriatopora*), but in spite of the Tararua gap, they would not be regarded particularly as "South Island species living in the north", rather species whose distribution covered both islands.

Future study

In the future it would be worth while to continue monitoring the Carabidae to see if other species can be found in the Reserve. Another interesting group to explore with regard to southern connections would be the Lepidoptera, and possibly caddis flies.

The strong suspicion that *Hemideina trewicki* may be present in the area calls for follow-up studies. Dr Gibbs has asked if ten live specimens of *Hemideina* could be collected from the Reserve, obtaining as wide a range of colour variations as possible. DNA studies on these would help determine which species is present, if more than one species occurs there, and the possible presence of hybrids. This may help clarify the true nature of *H. trewicki* as this is the first area where a good population is known.

I cannot define any one species of insect that would be suitable for a quick guide to the "healthiness" of the fauna, for future surveys. Any specialist would be able to draw comparisons within their group, and the Carabidae would be an example of this, but the larger, more obvious species such as wetas or puriri moths would pose problems for sampling. The total richness of the fauna would be a better guide, but this is not always easy to interpret.

Acknowledgements

This work was carried out with the generous assistance of DoC staff from the Wanganui Conservancy, and their involvement is gratefully acknowledged. I would also like to sincerely thank Dr Gibbs and Mr Meads for their very prompt assistance with weta identifications. Also I thank Mr Nunn for the painstaking identifications of small beetles from the pit-traps. My special thanks to Mr Colin Ogle who made helpful comments on the draft manuscript.

References

- Alma, P. J., 1977: *Aenetus virescens* (Doubleday) (Lepidoptera: Hepialidae) *Forest and Timber Insects of New Zealand*, No. 16. Forest Research Institute, Rotorua.
- Grehan, J. R., 1983: Larval establishment behaviour of the borer *Aenetus virescens* (Lepidoptera: Hepialidae) in live trees. *New Zealand Entomologist* 7 (4) 413-417.
- Hudson, G. V., 1928: "Butterflies and Moths of New Zealand." Ferguson and Osborn, Wellington.
- Miller, D., 1984: *Common Insects in New Zealand*. A. H. & A. W Reed, Wellington.
- Morgan-Richards, M., 1995: A new species of tree weta from the North Island of New Zealand (*Hemideina*: Stenopalmatidae: Orthoptera) *New Zealand Entomologist*, 18 15-23.
- Ogle, C. C.; Barkla, J. W., 1995: *Brachyglottis sciadopbila* at Mataroa, Taihape; a new record for the North Island. *New Zealand Botanical Society Newsletter* 40: 7-9.