

Taukihepa/Big South Cape Island: Invertebrate investigation March 2008

E. Edwards, Department of Conservation, June 2008



View from top of Taukihepa across to southern Stewart Island, &, some of the fauna.

"When we were there in 1968 the canopy of the Olearia forest at night was alive with rats and the only large beetles on the forest floor were a carabid and a tenebrionid, both smelly when picked up. We found no Hadramphus or Anagotus weevil adults. There were no signs of Hadramphus larvae around the root masses of Stilbocarpa and only old evidence of one Anagotus workings, in Drachophyllum ... The moderately-sized (12 -15mm) weevil Cuneopterus was not uncommon under large logs, and that was about it for the macrofauna really. From what I know now from work on rat free Breaksea I., before rats got to Taukihepa the Olearia and teteaweka branches would have had larval workings in the outer sapwood just a rats gnaw through the bark, and the foliage would have concealed countless adults." (J.S. Dugdale comment 2008)

Context

This investigation was invited by iwi of Taukihepa following an interesting history which includes the ecosystem disrupting effect of ship rats that arrived in the early 1960,s and subsequent restoration effort of removing the rats in the winter of 2006. Moths, beetles and other insects inhabiting the island are documented and, comments about their significance or the impact of rats on them are discussed.

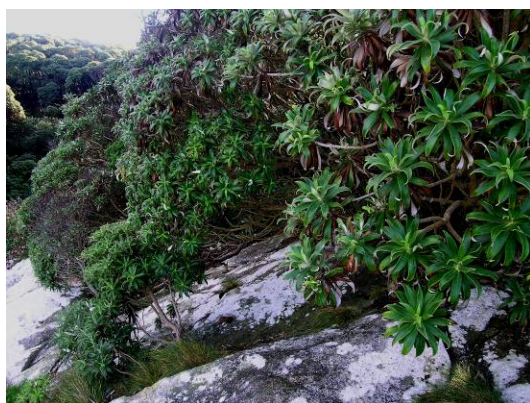
The weather was mild with westerly winds having little effect in the region of Murderers Cove. The first of two evenings was calm, warm and low cloud with slightly misty periods. The second evening was partly cloudy and cooler. Light trapping attracted a good number of moths and also drew many colonial seabirds some of which landed at the light –particularly in the misty conditions. Using light trapping, hand collecting and including old records, 76 invertebrate taxa are noted (appendix 1). These include 54 moth species, twelve beetles and 10 other taxa.



Mutttonbird forest (puheretaiko-tupare –*Brachyglottis reinoldii*-*Olearia colensoi* var. *grandis*)

Habitats

Deep peaty soils with abundant seabird burrows surround the cove. Within the region of Murderers Cove a range of vegetation and habitats occur including coastal fringing teteaweka (*Olearia oporina*) forest, coastal cliff and crevice turf/*Poa astonii*/herb community, Punui (*Stilbocarpa lyallii*) community, mutttonbird forest (puheretaiko-tupare –*Brachyglottis reinoldii*-*Olearia colensoi* var. *grandis*) and hardwood-podocarp forest.



Coastal fringing teteaweka (*Olearia oporina*) forest, &, coastal cliff and crevice turf/*Poa astonii*/herb community



Patch of Punui *Stilbocarpa lyallii* former habitat of giant punui weevil *Hadramphus stilbocarpace*. Feeding damage shown on the right is seasonal from early to mid summer and from moth larvae –unfortunately not weevils.

Feature insects

Rakiura ghost moth

Of note at the time of sampling was the abundance of the large Rakiura endemic ghost moth *Aoraia insularis*. Males were abundant while females are flightless and are not well known. Taukihepa is the Type Locality from which this moth is described and Whenua Hou is the only other known locality.



The large strikingly coloured moths with plumose antennae are males of the Rakiura endemic ghost moth *Aoraia insularis*. Moths that feed on ferns, hardwood trees, *Hebe elliptica*, mosses and leaf litter are also represented.

Extinct giant weevils

Punui giant weevil *Hadramphus stilbocarpae* were first described from Big South Cape – Taukihepa and are known on Snares Islands and a few rodent free islands in Fiordland. These weevils would have been present in a number of places in Southland and Stewart Island a few hundred years ago when kiore and ship rats were not present. When the ship rat plague occurred at Taukihepa these weevils were clearly at risk on the island and appear to have gone extinct. During the survey in 2008, Punui plant patches have been searched for this weevil but none have been found. Another search should be done in 2010 to allow more time for any possible remnant population of these weevils to grow and be detected. If no giant weevils can be found in 2010, it may be worth considering a beetle transfer.

Another giant weevil *Anagotus* species is known from coastal Teteaweka round Fiordland Islands. No examples of this beetle were discovered in searches either. To know more about the history of this weevil and other beetles and native snails it would be possible to do professional archaeological analysis of soil deposits at bluff and cave sites on the island.

Australian immigrants

In the weeks prior to the survey, It appears that the weather has carried numerous insects across the Tasman Sea from Australia to Taukihepa. This is shown by finding many

examples of the moths *Agrotis ipsilon aneituma* and *Spoladea recurvalis* and the southern most record ever of a semi-tropical *Anomis* species moth. These last two are certainly not able to breed here.

Big tough leaf rollers

The leaf roller moth *Planotortrix puffini* has caterpillars that are capable of tying the large thick leathery leaves of puheretaiko –*Brachyglottis reinoldii* together with silk and also eats these leaves. This is quite a feat for such a small insect. Another related leaf roller moth *Ctenopseustis herana* is common with larvae on a range of trees and ferns. Most tree ferns showed the larval damage on some fronds where part of the leaf crumples often spiralling upwards in a mess which occurs when the frond keeps growing after being tied with silk.

Traill's ground beetle

Traill's ground beetle *Mecodema trailli* is named for Traill a pioneer naturalist of Stewart Island. This large beetle is among many insects and some snails that are found only in the region of Stewart Island and some outlying islands but it is one of few invertebrates that are also found at Motupohue/Bluff Hill which has the same, geology, soils and vegetation as Rakiura.

Rodent responses

The vegetation and insects have been released from the sustained predator, scavenger and herbivore effect of ship rats for almost two years. In this situation moths, beetles and other invertebrates respond. The response has not been assessed for Taukihepa but it is likely that the two cave weta species that were abundant in the 2008 survey (see appendix notes) were less abundant when rats were present.

The abundance of ground beetles, large bodied spiders, Rakiura ghost moth, Rakiura carnivorous snail *Rhytida australis*, ground weta *Hemiandrus* species (not seen in 2008 survey), Helm's stag beetle *Geodorcus helmsi* and cave weta are all expected to increase and maintain higher densities in the absence of rats and mice.

Recommendations for invertebrates

With rats and mice absent, prevent new arrivals of these rodents or other exotic invertebrates and plants.

During 2010 (or some later date) search specifically for Punui giant weevil *Hadramphus stilbocarpae*. This was one of the icon animals that has likely been lost along with the reported bat and birds. If the beetle is not found, an assessment for recolonisation could be considered.

Of lesser priority but still of significance for the region, carry out a professional archaeological investigation of soil deposits at bluff and cave sites on the island. This may provide information about human occupation but would be targeted at historical information on large bodied snails, beetles and weta as well as birds and bats. It may be possible for example, that Herekopare weta *Dienacrida carinata* once existed on Taukihepa. This kind of information for the weta or other insects and birds would have consequences for management of both the species and islands in the region.

Acknowledgements

Teno pai to Ron Bull and his whanau for encouragement and hot stove. John Dugdale, Peter Johns and Brian Patrick supplied great historical accounts and insect records.

Appendix 1.

**Inventory of moths and some other invertebrates from Taukihepa/
Big South Cape Island, April 2008**

All invertebrates noted from Murderers Cove 20 -40 metres above sea level with few exceptions noted. A few records of roaches, flies, weta and some beetles were forward to me by Peter Johns who visited the Island in 1964, 1968 and 1969 with a number of Insect experts. This data is shown in comments.

Taxon	Comments
Beetles -Coleoptera	
<i>Family</i> Carabidae -predator ground beetles	
<i>Mecodema trailli</i>	Trail's ground beetle, a large predacious ground beetle endemic to Rakiura region. Named for Roy Trail of Stewart Island
<i>Mecodema trailli</i>	Big South Cape Island, Puwai Bay,10-30,24.viii.64,Johns, PM; Bell BD,logs,,
<i>Family</i> Cerambycidae -longhorn beetles	
<i>Prionoplus reticularis</i>	Huhu beetle, Larvae bore in dead wood
<i>Family</i> Curculionidae -weevils	
<i>Anagotis species</i>	Teteaweka weevil. Not recorded but associated with <i>Olearia oporina</i> teteaweka coastal muttonbird scrub in Fiordland and likely Rakiura region. Would be vulnerable to ship rat predation where these are present.
<i>Hadramphus stilbocarpae</i>	Punui weevil/knobbled weevil, larvae bore in puni <i>Stilbocarpa lyalli</i> roots & adults eat the leaves. Taukihepa is the Type Locality for this rare giant beetle species that most likely became extinct on the island during ship rat plagues of the 1960's. It was not rediscovered in this survey
sp. 1	sp. 1, wood/bark boring weevil, abundant in muttonbird scrub
sp. 2	sp. 1, wood/bark boring weevil, abundant in muttonbird scrub
<i>Family</i> Lucanidae -stag beetles	
<i>Geodorcus helmsi</i>	Helm's stag beetle, widespread in forests but currently rare in the region of Murderers Cove. This long lived and large soil wood dwelling beetle is probably reduced in numbers when rats or mice are present.
<i>Mitophyllus parrianus</i>	Parry's stag beetle,larvae bore in wood
<i>Family</i> Oedemeridae -blister beetles/lax beetles	
<i>Thelyphassa lineata</i>	Striped lax beetle, larvae in rotting wood in forests
<i>Family</i> Staphylinidae -rove beetles	
<i>Creophilus oculatus</i>	Devil's coachhorse, a common carrion feeding rove beetle. These beetles are a more obvious part of a fauna that make good use of the few birds that die on land.
<i>Family</i> Tenebrionidae -darkling beetles	
<i>Pseudhelops capitalis</i>	Big South Cape Island (no other data),,-.ii.69,Townsend, JI,at night
	Big South Cape Island (no other data),,16.ii.69,McBurney, J,on Dracophyllum longifolium
<i>Zeadelium australe</i>	Big South Cape Island, Puwai Bay,10-30,21.viii.64,Johns, PM,coastal Olearia, at night

Taxon	Comments
Hemiptera –Cicada, aphids, honey scale and bugs	
<i>Family Cicadidae -cicada</i>	
Kikihia sp. 'murihiku' (Charles Fleming)	Noted in 1968 (J.S. Dugdale)
Kikihia subalpina	Noted in 1968 (J.S. Dugdale)
Moths -Lepidoptera	
<i>Family Batrachedridae -micro moths</i>	
<i>Batrachedra arenosella</i>	found at Murderers Cove and 80 m asl.
<i>Family Geometridae -looper caterpillar moths</i>	
<i>Chalastra pellurgata</i>	A fern looper, Larvae eat tree ferns
<i>Chloroclystis filata</i>	Australian plug, an Australian species
<i>Chloroclystis inductata</i>	Flower plug, larvae polyphagous on flowers
<i>Declana leptomera</i>	Spotted manuka moth, larvae eat vareous shrubs
<i>Epicyme rubropunctaria</i>	Heath looper, Inhabits heaths
<i>Homodotis falcata</i>	Larvae eat litter
<i>Ischalis fortunata</i>	Zigzag fern looper, larvae eat <i>Polysticum</i> sheild ferns
<i>Pasiphila charybdis</i>	Larvae eat coastal hebe <i>Hebe elliptica</i>
<i>Phrissogonus testulata</i>	
<i>Pseudocoremia rudisata</i>	Tree daisy looper, larvae feed on <i>Olearia</i> spp. (<i>Olearia colensoi</i>)
<i>Pseudocoremia suavis</i>	Common forest looper, larvae polyphageous, found 180 metres in podocarp-hardwood forest
<i>Xyridacma alectoraria</i>	Fivefinger looper, larvae eat <i>Pseudopanax</i> five finger
<i>Xyridacma veronicae</i>	Large hebe looper, Larvae on <i>hebe</i> spp.
<i>Family Hepialidae -ghost moths</i>	
<i>Aoriaia insularis</i>	Rakiura ghost moth, only known from Whenua Hou and Taukihepa/Big South Cape. Taukihepa is the Type Locality. Females not known but almost certainly flightless. This may have increased in abundance with rat removal.
<i>Family Noctuidae -owlet moths</i>	
<i>Agrotis ipsilon aneituma</i>	Greasy cutworm, common travelling from Australia and also established NZ
<i>Aletia longstaffi</i>	Larvae eat Inaka <i>Dracophyllum</i> spp. and herbs
<i>Anomis</i> sp. (?flava)	vagrant from Australia. Southern most record for New Zealand
<i>Graphania mutans</i>	Common garden owlet, polyphageous
<i>Graphania plena</i>	Green carpet owlet, polyphageous
<i>Graphania</i> sp.	un-named from Rakiura region -Solander only other known locality. (Det. B Patrick)
<i>Meterana ochthistis</i>	An owlet
<i>Meterana stipata</i>	Mottled brown owlet, larvae eat Pohuehue <i>Muehlenbeckia australis</i>
<i>Tmetolophota purdi</i>	Orange astelia wainscot, larvae eat <i>Astelia fragrans</i>
<i>Family Oecophoridae -litter moths</i>	
<i>Gymnobathra tholodella</i>	Larvae inhabit litter, found at Murderers Cove and 140 metres asl.
<i>Phaeosaces aptocrypta</i> (?)	
<i>Tingena</i> sp. (?undescribed)	
<i>Trachypepla anastrella</i>	
<i>Family Plutellidae -cabbage moths</i>	
<i>Plutella xylostella</i>	Diamondback moth, larvae eat cruciferae
<i>Family Psychidae -bagmoths</i>	
<i>Rathamictis</i> sp. (southern South Is.)	A small bag moth, inhabits sooty mould -tree trunks

Taxon	Comments
Family Pyralidae -snout moths	
<i>Diplopseustis perieresalis</i>	
<i>Eudonia feredayi</i>	Inhabits open areas of short vegetation, found Murderers Cove and 220 metres asl.
<i>Eudonia leptalea</i>	Inhabits open areas
<i>Eudonia octophora</i>	Inhabits wetland with rushes
<i>Eudonia philerga</i>	Inhabits rocky areas
<i>Spoladea recurvalis</i>	vagrant from Australia, beet webworm
<i>Musotima nitidalis</i>	Golden brown fern moth, common Aust. & NZ, larvae eat ferns
<i>Scoparia autumnata</i>	
<i>Scoparia minusculalis</i>	Larvae eat understorey mosses
Family Tineidae cloths moths	
<i>Monopis ethelella</i>	sheeps wool moth, larvae eat fir or feathers
<i>Proterodesma byrsopola</i>	found at Murderers Cove and 140 m asl.
<i>Sagephora phortegella</i>	
<i>Tinea atmogramma</i>	
Family Tortricidae leafrollers	
<i>Apoctena persecta</i> (Meyrick)	Larvae eat <i>Coprosma foetidissima</i> , Recorded by J.S Dugdale 1968
<i>Catamacta gavisana</i>	Larvae polyphagous eat <i>Myrsine australis</i> and other understorey trees/shrubs
<i>Ctenopseustis filicis</i>	Larvae eat tree ferns. The rusty brown colour is characteristic
<i>Ctenopseustis herana</i>	Larvae polyphagous on most trees/shrubs and ferns like <i>Blechnum</i> 'black spot' (sensu Hugh Wilson); another South & Stewart Island endemic. The larva ties leaves into a crumpled mess, in which it lives
<i>Cydia succedana</i>	Gorse pod moth, an introduced biocontrol agent. This species is highly dispersible.
<i>Ericodesma melanosperma</i>	Larvae eat <i>Dracophyllum longifolium</i> Recorded by J.S Dugdale 1968
<i>Eurythecta siriana</i>	
<i>Planotortrix octo</i>	Larvae polyphagous on broadleaved trees e.g., <i>Coprosma lucida</i> , <i>Metrosideros</i> , <i>Griselinia</i> . The caterpillar ties the leaves flat together like a sandwich, in which it lives.
<i>Planotortrix puffini</i>	larvae eat <i>Brachyglottis reinoldii</i> , <i>Olearia oporina</i> , <i>O. colensoi</i> var <i>grandis</i> , <i>O. angustifolia</i> and <i>Celmisia lindsayi</i> at Nuggets. Recorded by J.S Dugdale 1968
<i>Pyrgotis</i> sp. <i>plagiata</i> s.l.	Painted wedge, polyphagous on shrubs and likely on <i>Hebe elliptica</i> , note from J. S. Dugdale: This is like the Open Bay Is WD entity, which in turn is like the Auckland & Campbell population Salmon & Bradley called <i>Epagoge parallela</i> . It was synonymised with <i>plagiata</i> (Dugdale 1971:1 66, Auckland Is Lepidoptera)
Roaches -Blattodea	
Family Blattellidae	
<i>Parellipsidion pachycercum</i>	A native roach, Puwai Bay, 10-30, 24.viii.64, Johns, PM, logs,,
	Puwai Bay, 10-30, -.65, Bell, BD,,,
	Puwai Bay, 10-30, 22.viii.64, Johns, PM, tree trunks, Olearia, night,,
	Puwai Bay, 10-30, 30.viii.64, Johns, PM, rocks, supralittoral, night,,
Flies -Diptera	
Family Coelopidae -seaweed flies	
<i>Chaetocoelopa littoralis</i>	Hairy kelp fly

Taxon	Comments
Family Tipulidae -craneflies	
<i>Tipulidae, Limnophilella serotina</i>	A long legged crane fly species, Big South Cape Island, North Peak, 222, 10.ii.69, Eyles, AC, sweep moor,,
	Big South Cape Island, North Peak, 222, 11.ii.69, Eyles, AC,,
<i>Tipulidae, Molophilus jenseni</i>	A long legged crane fly species, Big South Cape Is, Murderers Cove,, 26.viii.64, Johns, PM, ferns, etc,,
Weta & grasshoppers -Orthoptera	
Family Anostomatidae -weta	
<i>Hemiandrus zzsaxatilis n. sp. (Peter Johns)</i>	A southern ground weta species, Likely to have decreased in abundance in the presence of ship rats. Not found during 2008 visit. Big South Cape Island (no other data),, 12.xi.68, Watt, JC, under logs,,
<i>Hemiandrus zzsaxatilis n. sp. (Peter Johns)</i>	Big South Cape Island, North Peak, 222, 10.ii.69, Eyles, AC, under tussock,,
<i>Hemiandrus zzsaxatilis n. sp. (Peter Johns)</i>	Big South Cape Island, northeast end,, 13.ix.68, Dugdale, JS, at night,,
<i>Hemiandrus zzsaxatilis n. sp. (Peter Johns)</i>	Big South Cape Island, northeast end,, 9-14.ii.69, Townsend, JI; McBurney, AJ, at night,,
<i>Hemiandrus zzsaxatilis n. sp. (Peter Johns)</i>	Big South Cape Island, Patupahe Bay,, 16.ii.69, Townsend, JI, ex Poa clump,,
<i>Hemiandrus zzsaxatilis n. sp. (Peter Johns)</i>	Big South Cape Island, Puwai Bay, 10-30, 22.viii.64, Johns, PM, coastal Olearia, at night,,
Family Raphidophoridae -cave weta	
<i>Species 1.</i>	An orange cave weta species common at night in forest (2008)
<i>Species 2.</i>	A dark grey cave weta species in forest (2008)
Centipedes -Chilopoda Geophilomorpha	
Family Chilophilidae	
<i>Tasmanophilus spenceri</i>	A native centipede, Murderers Cove,, 26.viii.64, Johns, PM, logs,,
<i>Tasmanophilus spenceri</i>	Puwai Bay, 10-30, 21.viii.64, Johns, PM; Bell BD, logs, 2 tubes,

