

Translocation of the Middle Island tusked weta *Motuweta isolata*, The Mercury Islands, New Zealand

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SUMMARY

Totals of 67 Middle Island tusked weta *Motuweta isolata* were released on Red Mercury Island and 80 on Double Island between 2000 and 2003. In 2005 surveys located 11 wetas on Red Mercury and 4 on Double Island. Juvenile wetas were found on both islands in 2004 and 2005 showing that successful breeding had occurred.

BACKGROUND

The Middle Island tusked weta *Motuweta isolate* (Photo 1), is a nocturnal endemic New Zealand Orthopteran listed as a 'Nationally Critical' species (under the New Zealand threat classification system). It grows to about 7 cm long and occurs naturally only on Middle Island, a 13 ha island in the Mercury Islands group situated 6 km to the east of the Coromandel Peninsula (North Island). As well as the weta, the island is important for its seabirds (supporting five species of burrow-nesting petrels and shearwaters which nest in thousands), tuatara *Sphenodon punctatus* and 10 species of smaller lizard, giant centipedes and numerous other invertebrates. Tusked weta are now rarely seen on Middle Island. Only four were found during 65 nights of searching between October 1998 and December 2001.

The tusked weta is suspected to have been present on the other Mercury Islands in the past, but extirpated upon introduction of predatory rats *Rattus*. Middle Island and Green Island (3 ha) differ from the other five Mercury Islands in that mammalian predators never reached them. Now, all introduced mammals have now been removed from Double, Korapuki, Stanley and Red Mercury Islands, and these islands are slowly being rehabilitated as vegetation regenerates and selected native fauna re-introduced. A plan to translocate tusked weta to Double and Red Mercury Islands was proposed in order to increase its chances of survival - with such a small range and population it was feared that, if for

example, rats reached Middle Island or if there was a fire, this could result in its extinction.

ACTION

Captive-breeding: Two adult female Middle Island tusked weta, obtained as juveniles during 1993, were paired with a male during autumn 1994. Both females produced fertile eggs: 153 eggs were laid, 21 juveniles were recovered, and 15 of these were reared through to adult. All were used for breeding.

In 1998, two captive-reared adult females (1994 offspring) were mated with a male obtained (as a juvenile earlier in 1998) on Middle Island. These two females produced 505 eggs, 181 juveniles hatched: 21 of these were reared at Massey University (by I.Stringer) mostly for research; 60 were reared at Auckland Zoological Park (by Paul Barrett), and the remaining 100 were reared at Landcare Research Ltd (by Chris Winks).

The rearing method was developed during previous work at Landcare Research Ltd., the key being to rear them individually as they are carnivorous and potentially cannibalistic. However, individual care is both time consuming and expensive, so most were reared until only half grown (body lengths about 2-3 cm) for the purpose of translocation to Double and Red Mercury Islands. At this release size most invertebrate predators on the islands, such as spiders and ground beetles, were considered to pose little threat to them.

Weta re-introduction: The captive-bred weta were transferred by boat to the two release islands in individual travel boxes approximately 20 cm long x 10 cm high. Releases took place in batches between April 2000 and April 2001 as and when individual weta reached the required size. Three females and three males were released into a 5 x 5 m cage on Red Mercury Island so that their survival and growth could be followed (and in case none of the released wetas were seen again). The sides of the cage were constructed of fine shade cloth with aluminium flashing around the top to prevent lizards from climbing in. The cage was covered in fine chicken-wire netting to stop sea birds (petrels and shearwaters) returning to their nests at night, from accidentally dropping in. Four containers of a suitable potting mix (developed by Landcare Research Ltd.) were put into the cage as potential weta egg-laying sites.

Fifty weta were released onto Red Mercury Island and 82 released onto Double Island. Of these, 106 were released under individual artificial refugia (a depression dug into the ground, 30 cm in diameter, covered first with a clear Perspex disk and then a plastic plant pot saucer. The refugia were wide enough so that little spotted kiwi *Apteryx owenii*, present on Red Mercury Island, could not reach under with their bills and eat the wetas. The remaining 26 weta were released into man-made burrows in the ground.

There was a second release on Red Mercury in 2002/2003 of 77 weta hatched from the first generation weta reared in captivity. Of these 17 were released onto Red Mercury Island at a new location in an adjacent valley about 500 m from the original release location. The remaining 60 weta were retained in captivity for breeding and research. The numbers of releases on Red Mercury Island and Double Island are shown in Table 1.



Photo 1. Tusked weta (Photo: Brett Robertson, courtesy of Department of Conservation).

Table 1. Summary of tusked weta releases on Red Mercury Island and Double Island (Note: a few individuals were later moved between islands to even-up the sex ratio).

Release date	Red Mercury Island	Double Island	Age
May 2000	50	44	half-grown juvenile
September 2000	0	17	large juvenile
Autumn 2001	0	19	adult
September 2002	15	0	half-grown juvenile
March 2003	2	0	adult
<i>Total</i>	67	80	

CONSEQUENCES

Red Mercury Island weta cage: Two eggs were found in the potting mix in April of 2002 (tusk weta eggs look like black grains of long-grain rice). The adult wetas were then immediately removed from the cage and released so that they would not eat any juveniles that hatched. The next indication of success occurred in April 2002 when a newly hatched weta was found in the cage. The cage was then left alone until March 2003 to prevent any juveniles being potentially killed by human trampling during searches. This was sufficient time for the juveniles to be big enough to find easily.

Weta surveys in 2004: During nocturnal spotlight surveys six juveniles were seen (outside the enclosure) on Red Mercury Island over two nights. A further two were seen on Double Island. These represented a first generation of entirely island bred weta on each island. In addition to spot-lighting, two other methods of searching for weta were tried. The first consisted of measuring out a large area of ground and then scraping off the top 1 cm of soil in order to hopefully expose the weta in their shallow underground chambers. Two weta were found this way on each island. This method was not used on Middle Island because of the potential of collapsing seabird burrows (present in high densities) during searches.

A second method was used to find adult weta. It consisted of gluing a harmonic radar transponder or micro-transmitter to the back of an adult weta, and then tracking and locating them the next day. Male weta proved excellent at finding adult females, and so either male or female weta with these tags were often found in chambers paired with an un-tagged weta of the opposite sex. Harmonic radar works by

sending out radio waves from a detector which is absorbed by a transponder and re-emitted at a higher frequency. The advantage of this system is that the transponders work indefinitely as the battery is located in the hand held detector. Their disadvantage is that the detector has to be within a metre or two of the transponder, if underground, to detect it. In contrast, micro-transmitters can be detected up to several hundred metres away, but the battery lasts only about 50 days.

Weta surveys in 2005: In April 2005, about the time when any second generation of island bred weta should have been large enough to locate reasonably easily, both release islands were surveyed:

Red Mercury Island - One adult female was found in the cage on Red Mercury Island where it was subsequently liberated. In the release area outside the cage, five weta were found in underground chambers by scraping off the topmost layer of soil (two large juveniles in chambers within a 100 m² search area; three large juveniles in a 30 m² search area). Five weta (including an adult female) were observed by searching with spotlights on two nights.

Double Island - Four weta were found by soil scraping (two large juveniles and an adult male in chambers within 62 m²; a large juvenile in a chamber outside the search area).

Conclusions: These observations suggest that the re-introduction has been successful with the establishment of breeding colonies of Middle Island tusked weta on both Red Mercury and Double Islands.