LIZARD TRANSFERS FROM MATAPIA ISLAND TO MOTUOPAO ISLAND, NORTHLAND AND OBSERVATIONS ON OTHER FAUNA

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SUMMARY

Forty-one Matapia gecko (*Hoplodactylus* aff. *pacificus*) and 30 robust skink (*Cyclodina alani*) were transferred from Matapia Island to Motuopao Island on 30 April 1997. Snout to vent length, tail length, and weight are given for these lizards. Appearances and habits of both species are described. Three other lizard species were observed on Matapia Island. Five new bird records, 8 insect, 2 crustacean and 3 spider records are recorded for Matapia Island.

Keywords: robust skink (*Cyclodina alani*); Matapia gecko (*Hoplodactylus* aff. *pacificus*); transfer; morphometric data; fauna; northern North Island.

INTRODUCTION

Northland members of the New Zealand herpetofauna have undergone numerous range declines and extinctions following human colonisation. Data from local extant species and subfossil deposits indicate that 22 species of herpetofauna (4 frogs, 1 tuatara, 6 geckos & 11 skinks) once inhabited the Northland mainland (Towns & Dougherty 1994). Only 10 species (1 frog, 4 geckos & 5 skinks) now survive on the mainland. A further 6 species survive only on islands off Northland’s coast (1 tuatara, 1 gecko & 4 skinks) (Towns & Daugherty 1994). Almost 40% of New Zealand’s herpetofauna is confined largely or totally to offshore islands. Some species, including robust skink (*Cyclodina alani*) and McGregor’s skink (*C. macgregori*) are now totally confined to islands despite formerly being widespread on the mainland (Towns & Daugherty 1994). Those species confined to islands are very vulnerable to the introduction of mammalian predators. Actions to reduce this vulnerability are identified in the Whitaker’s and Robust Skink Recovery Plan (Towns 1992). One location identified for reintroduction of the robust skink was Motuopao Island, with Matapia Island being identified as the source for the skinks (Towns 1992, Parrish & Pierce 1993). The Whitaker’s and Robust Skink Recovery Plan also identified the Matapia gecko (*Hoplodactylus* aff. *pacificus*) as a compatible species for [re]introduction to Motuopao Island. The Matapia gecko is currently only known from Matapia Island.
Both the Matapia gecko and the robust skink are ranked as Category B (second priority species for conservation action) by the Department of Conservation (DoC) (Molloy & Davis 1994). The robust skink is known to occur elsewhere only on Moturoa Island (Karikari Peninsula), Middle and Green Islands (Mercury Group), Castle Island (Coromandel), Tatapihi (Groper) Island (Mokohinau Group), and on Korapuki Island (Mercury Group) where it was recently [re]introduced (Towns 1991). The total area of the islands on which it occurs naturally is less than 50 ha.

This paper describes the translocation of robust skinks and Matapia geckos from Matapia Island to Motuopao Island. The intention of these translocations is to create additional populations of the threatened robust skink and Matapia gecko and to restore to Motuopao Island a lizard community which may well have occurred there before Pacific rats (*Rattus exulans*) arrived. After consultation with and approval by the Aupouri and Ngati Kuri Trust Boards, the transfer was approved by DoC.

**STUDY AREAS**

Matapia Island (1.3 ha) (Lat 34° 36' S, Long 172° 48'E) and Motuopao Island (30 ha) (Lat 34° 28' S, Long 172° 38' E) are the only islands on the western side of the Aupouri Peninsula.

Motuopao Island comprises two hills rising to 110 m with moderate rolling inland slopes and steep basaltic seaward cliffs separated by a wide sand saddle (Forester 1993, Parrish & Sherley 1993, Parrish & Pierce 1993). The island has a history of disturbance from human occupation. In pre-European times, it was a Maori fishing camp (Shirley 1985) and middens, hangi and stone heaps are visible in sand blow-outs in the sand saddle. In 1879 a lighthouse was built on the northern high point and up to three families occupied houses downhill from the lighthouse (Forester 1993). A tiny post office was also present during this time (Shirley 1985). A tramway ran from a large crane in the eastern bay up to the lighthouse. The island was occupied up to 1940 when the light was dismantled and shipped to Cape Reinga (Forester 1993) where it is still part of the modern Cape Reinga lighthouse. The island was presumably cleared of most woody vegetation during this period of human occupation, as it is now dominated by grass and flax (*Phormium tenax*). A sheep (*Ovis aries*) skeleton found in the old dump suggests that the island was grazed (Forester 1993). Motuopao Island is now a Nature Reserve under the Reserves Act 1977. Pacific rats were eradicated from the island in 1989 (McKenzie 1993).

The fauna of Motuopao Island was described by Parrish & Sherley (1993) (invertebrates), Parrish & Pierce (1993) (reptiles) and Pierce & Parrish (1993) (birds). The most significant species on the island from a conservation
perspective is the flax snail (*Placostylus ambiguus ambiguus*). Motuopao Island is the type locality for the species. Just four live snails were found during many hours of searching between 1988 and 1992 (Parrish & Sherley 1993). The plight of the flax snail was one of the principal reasons for eradicating Pacific rats from the island in 1989 (McKenzie 1993). Visits to the island in recent years have located a total of 13 live snails, so their recovery appears very slow but consistent with the very low numbers of survivors at the time of rat eradication.

Three species of lizard are known from Motuopao Island (*Oligosoma moco, O. smithi, Cyclodina aenea*). A further two species are known from the small rock stack off the northern point of island (*O. suteri, Hoplodactylus pacificus*). Parrish & Pierce (1993) suggested that following the eradication of Pacific rats there was an opportunity to reintroduce lizard species including *O. suteri* and *H. pacificus* from the rock stack and *C. alani* from Matapia Island. Since the publication of Parrish & Pierce (1993) a subfossil jawbone of a tuatara (*Sphenodon punctatus*) has been found in the dunes on Motuopao Island (F. Brook pers. comm.). Motuopao Island has an unusually high diversity of breeding seabirds with six species recorded (Pierce & Parrish 1993). The dominant species is the black-winged petrel (*Pterodroma nigripennis*) with 800-1000 pairs. Because of the lack of large woody vegetation, forest birds are poorly represented and it is likely to be many years before the island is able to attract or support such species.

Forester (1993) described eight basic vegetation types for Motuopao Island: taupata (*Coprosma repens*)-ice plant (*Disphyma australe*); buffalo grass (*Stenotaphrum secundatum*); flax association; brackish seepage; marram (*Ammophila arenaria*); spinifex (*Spinifex sericeus*) with shore bindweed (*Calystegia soldanella*); other grasses; and local knobby club-rush (*Isolepis nodosa*) and *Coprosma acerosa-Muehlenbeckia complexa*. Buffalo grass and flax association are the two dominant vegetation types and probably cover 60% of the island. Revegetation since the island was abandoned 58 years ago has been slow, probably because of the lack of a nearby seed source, the exposed environment and the dense cover of buffalo grass (Forester 1993).

Matapia Island is freehold Maori land and is vested in the Aupouri Trust Board (Forester & Anderson 1995). The highest point is 53 m asl and the island is a rounded pudding shape with steep cliffs to the west and south. The island consists of pebbly sandstone and sandstone (Matapia Formation) derived largely from keratophyre, spilite and clastic sediments of the Houhora Volcanic Group and other volcanic units (Forester & Anderson 1995). The island has never been permanently occupied, but midden material comprising shellfish have been found (Forester & Anderson 1995). The island is free of introduced mammals and appears to have never had any in the past.

and one species of seabird (black-winged petrel) are known to breed there. Three other seabird species were suspected of breeding on the island but were not present during their visit (diving petrel *Pelecanoides urinatrix* and/or white-faced storm petrel *Pelagodroma marina* and a larger petrel or shearwater). During two visits, both of 3 hours duration, Forester & Anderson (1995) found 3 robust skinks, 1 ornate skink and 5 Matapia geckos. Both shore skinks (*O. smithi*) and Pacific geckos were found to be abundant. One of the robust skinks was found in an old petrel burrow and the other two were beneath a large stone. The five Matapia geckos (3 caught) were all located in the dense sward of umbrella sedge (*Cyperus ustulatus*).

Forester & Anderson (1995) recorded the presence of darkling beetles (*Mimopeus* sp.) which were abundant and made up most of the remains in robust skink droppings.

Matapia Island’s vegetation is dominated by umbrella sedge. A dense sward with occasional taupata covers the centre of the island, thinning out to low mixed vegetation on the coastal banks (Forester & Anderson 1995). A low herbfield of ice plant, knobby club-rush with some fathen (*Chenopodium album*), glasswort (*Sarcocornia quinqueflora*), Mercury Bay weed (*Dichondra repens*) and a patch of Cook’s scurvy grass (*Lepidium oleraceum*) forms a patchy band around the island above the coastal banks. Although umbrella sedge is now the dominant vegetation on the island it was not so 15-20 years ago when it was limited to a few small clumps. It is not certain whether umbrella sedge dominance is the result of massive disturbance or if it is a recent colonist (Forester & Anderson 1995). The summit of the island is open with a few low shrubs and areas of shattered rock covered in lichen. An interesting feature of the vegetation is the lack of flax, which is a dominant species on Motuopao Island.

**METHODS**

Some invertebrates were collected by hand on Matapia Island on an opportunistic basis and stored in 70% ethanol for later identification. Lizard droppings, believed to be from robust skinks (judging by their size) were collected for invertebrate remains. The results were used for comparison with invertebrates on Motuopao Island (Parrish & Sherley 1993) to see if there were suitable prey items to sustain robust skinks. Spiders were collected and deposited in the Museum of New Zealand. Other invertebrates were deposited in the Auckland Museum.

Twenty pitfall traps (4 litre paint tins) baited with either “Chef Jellimeat” catfood or peanut butter were set 2-4 m apart along a wandering transect which traversed a small part of the eastern face of Matapia Island. All traps were dug into the ground so that the lip of the paint tin was level with the ground. All
were placed at the interface of ice plant and low sprawling taupata or taupata and umbrella sedge. The traps were set from 1400 h on 28 April till 0800 h on 29 April and 1800 h till 2100 h on 29 April.

Lizards were also captured by turning over rocks, searching the dead leaf bases of umbrella sedge, and spotlighting at night. These searches were conducted over most of the island during the day and on two nights.

The “catch-per-unit-effort” (CPUE) technique (Towns 1991) was used to calculate catch rates. The number of “person-hours” (P/H) was recorded when conducting hand or visual searching on both Matapia and Motuopao Islands. This method had been used on previous visits (Parrish & Pierce 1993). The transfer proposal set minimum collecting criteria of 10 Matapia gecko per P/H of searching and 20 robust skink per 100 trap nights (T/N). These criteria were set using the only density information available (Forester & Anderson 1995) which suggested numbers of both species were low.

All adult robust skinks and Matapia geckos transferred were measured (snout-vent length, original tail & regenerated tail lengths), weighed (10 g Pesola balance for geckos, 100 g Pesola balance for skinks), photographed (ventral aspect for skinks, dorsal and some ventral aspects for geckos). These data are kept in the DoC Northland Conservancy office. All lizards captured were kept in cloth collecting bags and placed in large plastic expedition boxes (skinks in one box, geckos in another) until transported to Motuopao Island by helicopter on 30 April 1997.

Following the release of robust skinks and Matapia geckos on Motuopao Island, three hours were spent conducting a general lizard survey of the island.

RESULTS

Lizards on Matapia Island

Robust skink

A total of 44 robust skinks were seen or caught. Twenty-three were caught in pitfall traps at a capture rate of 104 per 100 T/N. Another 18 were caught by hand on ice plant at night; one was found beneath a rock and two were seen (but not caught) within the umbrella sedge leaves during daytime searches.

Thirty of these captured skinks were selected for release onto Motuopao Island. Determining their sex was very difficult. Eight were assessed as being female because they appeared gravid (swollen abdomens) and weighed on average 5.6 g heavier and were 5.7 mm longer snout-vent than the others (Table 1). Three of the released skinks were probably large juveniles (89, 89 & 80 mm snout-vent length; 18, 16.5 & 12.5 g respectively). Six of the released skinks had missing toes and seven had regenerated tails.

Hardy (1977) stated that the maximum snout-vent length for robust skink
Table 1. Measurements and weights of adult robust skinks transferred from Matapia Island to Motuopao Island.

<table>
<thead>
<tr>
<th></th>
<th>Mean Snout-vent (mm)</th>
<th>Range (mm)</th>
<th>Mean weight (g)</th>
<th>Range (g)</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>117.7</td>
<td>112-132</td>
<td>40.13</td>
<td>33.0-49.5</td>
<td>n=8</td>
</tr>
<tr>
<td>Unknown sex</td>
<td>112.0</td>
<td>102-126</td>
<td>34.55</td>
<td>25.5-45.5</td>
<td>n=19</td>
</tr>
<tr>
<td>Collectively</td>
<td>113.7</td>
<td>102-132</td>
<td>36.13</td>
<td>25.5-49.5</td>
<td>n=27</td>
</tr>
</tbody>
</table>

was 125 mm based on 10 specimens from the Mercury Islands. Gill & Whitaker (1996) give a maximum of 142 mm snout-vent and 60 g weight. The two larger specimens caught on Matapia Island were 126 mm (39.5 g) and 132 mm (49.5 g) respectively (Table 1). In his description of the dorsal surface Hardy (1977) states it is “coppery to dark brown, with an irregular series of paler but dark edged blotches extending on to the dorsolateral surface”. Although the majority of the skinks we inspected conformed to this description, two were exceptionally pale dorsally, almost completely lacking in dark markings. Three of them had “salmon-pink” on the ventral surface; two between the forelimbs and one on the throat. Hardy’s (1977) description gives the impression that all specimens have this “salmon-pink”, however Gill & Whitaker (1996) state that only some individuals have “salmon-pink”. Most of the skinks examined had various amounts of spots and speckles on the ventral surface. Two had no markings while four were heavily speckled. Most had spots or speckles clustered between the forelimbs and between the rearlimbs. Three had yellowish to yellowish-cream ventral surfaces but most were a non-descript grey whereas Hardy (1977) indicates they are strongly yellow on the ventral surface and Gill & Whitaker (1996) state the undersurface is usually yellowish.

On the second night of capture the weather conditions were cloudy and cool with winds of approximately 45 knots from the south-west. These conditions did not affect the number or activity of the robust skinks. Ten were caught by hand out on low ice plant fully exposed to the very strong winds.

The skinks were released into the burrows of grey-faced petrels (Pterodroma macroptera) on Motuopao Island. The releases were made within an area of approximately 40 m² in a grove of mature taupata on the southern slopes of the island.

Matapia gecko

A total of 91 Matapia geckos were caught or seen. Four hours and 20 minutes P/H were spent searching umbrella sedge during the day because this was the habitat where the geckos were found on previous trips (Forester & Anderson 1995). Five were seen with four caught (0.86 per P/H). A night time
search of the same habitat using torches produced three in one hour (3 per P/H). A further two hour search of taupata shrubs with torches resulted in 50 being seen or caught (25 per P/H). Of these, 32 were retained for translocation. The remaining 26 were juveniles. The following night a further 33 were seen in one hour of searching and eight females were captured and retained for translocation. One was discovered while we were dismantling a tent and was also taken for release. The total number released on Motuopao Island was 41; five of these were juveniles. The snout-vent lengths, weights and sex of the latter were 35 mm, 0.9 g F, 38 mm, 1.1 g F, 39 mm, 1.3 g M, 40 mm, 1.1 g M? and 41 mm, 1.1 g M? respectively. Measurements and weights of the adult transferred geckos are shown in Table 2.

Table 2. Measurements and weights of adult Matapia geckos transferred from Matapia Island to Motuopao Island.

<table>
<thead>
<tr>
<th></th>
<th>Mean Snout-vent (mm)</th>
<th>Range (mm)</th>
<th>Mean weight (g)</th>
<th>Range (g)</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>51.55</td>
<td>45-57</td>
<td>2.69</td>
<td>1.7-3.4</td>
<td>n=20</td>
</tr>
<tr>
<td>Male</td>
<td>52.00</td>
<td>46-57</td>
<td>2.70</td>
<td>1.9-3.5</td>
<td>n=16</td>
</tr>
<tr>
<td>Collectively</td>
<td>51.75</td>
<td>44-57</td>
<td>2.70</td>
<td>1.7-3.5</td>
<td>n=36</td>
</tr>
</tbody>
</table>

Forester & Anderson (1995) gave some descriptions of the Matapia gecko based on a total of five animals examined. Our description and observations based on the 91 specimens we observed is as follows: the species is small with an average adult snout-vent length of approximately 51 mm and weight of about 2.75 g (Table 2). They are yellowish-green to gold-brown dorsally with two darker brownish dorsal lateral stripes. Most are paler ventrally and generally unmarked although a few are lightly spotted. They are nocturnal, arboreal and very active, jumping from branch to branch when approached. The tail is prehensile and is used in a similar way to that of the green geckos (Naultinus spp.). Twenty-four of the 41 individuals transferred had regenerated tails and none had missing toes. Of the 91 observed, 44% were small juveniles. One of the 41 transferred to Motuopao Island appeared gravid.

Like the robust skink, Matapia geckos were seen out and active on the second night when the wind was blowing at approximately 45 knots. The geckos were on the outermost branchlets which were fully exposed to the wind and the branchlets were being blown about violently.

None of the taupata shrubs which contained Matapia geckos were flowering or fruiting, so there appeared little to attract the geckos to these shrubs, however, hundreds of small black flies were observed around the branches the geckos were on. Although we did not observe any gecko catch or eat these flies it appears they were what was attracting the geckos. None of these flies were
collected or identified. The geckos were released on Motuopao Island in an area of large spreading taupata surrounded by flax situated on the old tramline bench to the lighthouse. This was the habitat that was closest to that on Matapia Island. All were released within an area of approximately 15 m².

Shore skink (*Oligosoma smithi*)
A total of 14 shore skinks were observed on Matapia Island. Six of these were caught in pitfall traps and the remainder were found beneath rocks. They were found from near the splash zone to the bare rocky summit, but none were seen in the dense umbrella sedge.

Ornate skink (*Cyclodina ornata*)
Five ornate skinks were caught; one beneath a rock and four in pitfall traps. All five were found in areas of ice plant and low sprawling taupata and none in the dense umbrella sedge, despite several hours searching that habitat.

Pacific gecko (*Hoplodactylus pacificus*)
A total of 43 Pacific geckos were seen. This was similar to the “about 40” recorded by Forester & Anderson (1995). Their search effort was about 6 hours with a CPUE of 6.66 per P/H. Thirty of the 43 seen by us were found in 1.5 P/H at a CPUE of 20 per P/H. None were found in the dense umbrella sedge sward; however, two were seen at the base of taupata shrubs within the umbrella sedge sward which contained Matapia geckos. The ground beneath these taupata shrubs was free of litter other than sparse taupata leaves. No Pacific geckos were seen above ground level in any shrubs. The other 41 were found in areas of fractured rock around the periphery of the island between the splash zone and the areas of denser umbrella sedge or on open areas of lichen covered rock on the island’s summit.

**Lizard observations on Motuopao Island**

Shore skink
Ten adults, four sub-adults and 13 juveniles were found. Many were found beneath metal and timber objects scattered on the ground and around the old lighthouse. Some were seen running beneath sparse spinifex. The 27 observed were found in approximately 2 P/H of searching at a CPUE of 13.5 per P/H. Shore skinks were found at a CPUE rate of 0.1 and 0.2 per P/H in February and November 1990 respectively in the presence of Pacific rats. CPUE increased to 5.4 per P/H in January 1992 following rat eradication (Parrish & Pierce 1993). Subsequent searches have located shore skinks at 7.5 per P/H (11 May 1994) and 18 per P/H (10 October 1996). The CPUE rate on this visit of 13.5 per P/H
was probably greater as seven unidentified skinks were also seen (see below).

**Moko skink (Oligosoma moco)**

Four large juveniles were observed in grass and one small juvenile was found beneath old timber by the lighthouse. Previously, two had been observed in 1988 and one in 1992 (Parrish & Pierce 1993). On 18 October 1996 six skinks were seen in 2 P/H searching (3 per P/H) while on this visit the CPUE was 2.5 per P/H.

**Copper skink (Cyclodina aenea)**

Seven adults, four large juveniles and one small juvenile were found. Most were under rock jumbles on the old tramline bench near the concrete derrick base. Two P/H were spent specifically searching this area which was where copper skinks were observed previously, one in 1988 (Parrish & Pierce 1993) and four on 10 October 1996 at a CPUE rate of 4 per P/H. The 12 found on this visit were found at a CPUE rate of 6 per P/H. One of these was found at the old lighthouse, the first time one has been seen there.

Seven other skinks were seen which could not be identified. These are likely to have been either shore or moko skinks.

**Birds observed on Matapia Island**

Twelve species of birds were recorded on Matapia Island and a further four offshore.

**Black-winged petrel (Pterodroma nigripennis)**

Two large chicks were found in burrows and 10-20 adults were heard flying around at dusk, and presumably landed. The population on the island appears small, probably fewer than 50 pairs.

**Common diving petrel (Pelecanoides urinatrix)**

On both nights of our visit many thousands of diving petrels came ashore. It appeared from the birds’ behaviour to be the pre-laying period for this species. Birds called continuously all night and much fighting and burrow cleaning was observed. We found burrows at a density of up to 5 per m² in some areas of ice plant and low taupata and estimate there were probably 3-5000 pairs breeding on the island.

**Blue penguin (Eudyptula minor)**

One was present on the rocky platform from dusk onwards and one was observed climbing up the island, about halfway to the summit. It is not known if they breed on the island. The remains of a blue penguin was found amongst the regurgitated food remains from a fur seal (Arctocephalus forsteri).
Paradise shelduck (*Tadorna variegata*)

A nest of six abandoned eggs of this species was found beneath dense umbrella sedge litter.

Other bird species observed were the New Zealand pipit (*Anthus novaeseelandiae*), Australasian harrier (*Circus approximans*), welcome swallow (*Hirundo tahitica*), goldfinch (*Carduelis carduelis*) and redpoll (*C. flammea*). (Redpoll were also recorded on Motuopao Island; they had not been recorded there before (Pierce & Parrish 1993)). Other species observed around the shoreline and just offshore include flesh-footed shearwater (*Puffinus carneipes*), fluttering shearwater (*P. gavia*), Australasian gannet (*Morus serrator*), black-backed gull (*Larus dominicanus*), red-billed gull (*L. novaehollandiae*), white-fronted tern (*Sterna striata*) and starling (*Sturnus vulgaris*).

**Fur seal**

An estimated 60 fur seals were present when the helicopter flew in but the highest count during our visit was 49. All age classes (except new born pups) and both sexes were present.

**Invertebrates**

Two species of Crustacea, three species of Arachnida, one species of centipede, three species of Isopoda and eight species of Insecta were recorded from Matapia Island (see Table 3).

Species of invertebrates recorded in lizard scats included two specimens of Isopoda, a hind leg fragment of *Ocnodus piceus* (Coleoptera: Scarabaeidae), a wing case from a Curculionidae (Coleoptera) and a wing case from another Coleoptera (family indeterminate) and part of a leg of an unidentified Aranae.

**DISCUSSION**

Eight of the 30 robust skinks transferred appeared to be gravid. Southey (1985) found that they gave birth from late March to early April on Middle Island. So it appears that this species gives birth around the time of our visit (April-May). Only one of the 41 Matapia geckos transferred was gravid and 44% of all the Matapia geckos seen were small juveniles. This indicates that the Matapia gecko probably gives birth earlier than the robust skink i.e., January-April.

No robust skinks smaller than 80 mm snout-vent were observed in contrast to the number of juvenile Matapia geckos seen. The reason/s for this is not known.

Prior to this visit to Matapia Island little was known about the abundance of Matapia geckos and robust skinks on the island. Forester & Anderson (1995)
found three robust skinks in two visits (6 hours total) to the island (0.5 per P/H). On Tatapihi (Groper) Island, two were observed during visits totalling 49.5 hours (de Lange et al. 1995). Miller (unpublished report, DoC files, Whangarei 1985) located two robust skinks on Moturoa Island and Parrish (unpublished report, DoC files, Whangarei 1993) also observed two: however, neither authors give the number of hours spent searching. Southey (1985) conducted pitfall trapping on Middle Island. His capture rate was 6 per 100 TN. Towns (1991) recorded capture rates of robust skinks at 15 per P/H and 1.5 per 100 T/N on Middle Island. The capture rate on Matapia Island of 102 per 100 T/N shows that Matapia Island has a very high density of robust skinks. The island may well be able to sustain further translocations to Motuopao Island or to other islands.

Table 3. Invertebrates collected from Matapia Island.

<table>
<thead>
<tr>
<th>Specimen</th>
<th>Accession number</th>
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<tbody>
<tr>
<td>Crustacea: Isopoda: Oniscidae Sphaerillo danae?</td>
<td>AMNZ* 1828</td>
</tr>
<tr>
<td>Crustacea: Isopoda: Oniscidae Philoscia pubescens?</td>
<td>AMNZ 1820</td>
</tr>
<tr>
<td>Arachnida: Araneae: Gnaphosidae: Juvenile</td>
<td></td>
</tr>
<tr>
<td>Arachnida: Araneae: Lycosidae: “Zeacosa” sp. (manuscript name; female).</td>
<td></td>
</tr>
<tr>
<td>Arachnida: Araneae: Nemesiidae: Stanwellia sp</td>
<td></td>
</tr>
<tr>
<td>Chilobola: Scolopendromorpha: Cormocephalus rubriceps</td>
<td></td>
</tr>
<tr>
<td>Collembola: Isotomidae</td>
<td>AMNZ 6438</td>
</tr>
<tr>
<td>Insecta: Thysanura: Lepismatidae</td>
<td>AMNZ 6437</td>
</tr>
<tr>
<td>Insecta: Hemiptera: Cydnidae: Philapodemus australis (Erichson)</td>
<td>AMNZ 22933-22935</td>
</tr>
<tr>
<td>Insecta: Siphonaptera</td>
<td></td>
</tr>
<tr>
<td>Parapsyllus jacksoni</td>
<td></td>
</tr>
<tr>
<td>Insecta: Coleoptera: Tenebrionidae: Mimopeus? elongatus (Brème)</td>
<td>AMNZ 22928</td>
</tr>
<tr>
<td>Insecta: Coleoptera: Scarabaeidae: Ocnodus picus (Broun)</td>
<td>AMNZ 22929, 22932, 22936-22944</td>
</tr>
<tr>
<td>Insecta: Hymenoptera: Formicidae: Heteroponera brouni (Forel)</td>
<td>AMNZ 22945</td>
</tr>
</tbody>
</table>

*AMNZ = Auckland Museum, New Zealand
Capture of both species was confined to a small area of Matapia Island and is unlikely to have depleted numbers significantly.

The habitat separation of Matapia and Pacific geckos on Matapia Island is interesting. Elsewhere, e.g., Poor Knights Islands, Pacific geckos are frequently arboreal (GRP pers. obs.). On Matapia Island, Matapia geckos appear to occupy the arboreal habitat while Pacific geckos appear to be confined to terrestrial habitats. Given that Pacific geckos are substantially larger than Matapia geckos, it is surprising that they do not out-compete the Matapia geckos in these arboreal habitats.

Forester & Anderson (1995) indicated that the vegetation on Matapia Island has changed substantially in the last 20 years. Umbrella sedge has expanded from a few clumps to a dense sward. The prime habitat for Matapia geckos appears to be in emergent taupata shrubs which are limited to about 20 on the island. It is not known if the number of taupata shrubs have declined or if they will decline. If umbrella sedge continues to expand it may impact upon the Matapia gecko population and could lead to a decline in numbers.

Potential and actual invertebrate prey items for robust skinks on Matapia Island are given in this paper and for Motuopao Island (Parrish & Sherley 1993). Southey (1985) recorded a wide range of invertebrates eaten by robust skinks on Middle Island (73 items). Although our invertebrate survey on Matapia Island was not comprehensive, the diversity appears low. Likewise, invertebrate sampling on Motuopao Island has been cursory (Parrish & Sherley 1993). Forester & Anderson (1995) found Mimopeus sp. made up most of the remains in robust skink droppings on Matapia Island, whereas our samples contained species of Isopoda, Coleoptera and Araneae. As Motuopao Island has been free of rats since 1990, invertebrate numbers should have increased (Parrish & Sherley 1993) and, given the wide range of prey items taken by robust skinks, availability of food should be adequate.

The diet of Matapia geckos is unknown. The geckos released onto Motuopao Island were released into large taupata shrubs, the same habitat they were found in on Matapia Island. Hence, it is presumed the same food source will be available to the released geckos.

The presence of five species of lizards on Matapia Island is comparable to the highest diversity recorded on any island of a similar size. Whitaker (1978) and de Lange et al. (1995) showed that only four islands of less than 3 ha have five or more species: Half (Aldermen Islands) 1.2 ha, 5 species; Lizard Island (Mokohinai Islands) 1 ha, 5 species; Green Island (Mercury Islands) 3 ha, 7 species (includes tuatara) and Tatapihi Island (Mokohinai Islands) 3 ha, 7 species.

Forester & Anderson (1995) reported finding one, possibly two, ornate skinks. The finding of five on this visit, fewer than any other species on this island, suggests it is the rarest lizard on the island.
The co-existence of robust and ornate skinks is only known on three islands: Tatapihi, Moturoa and Matapia Islands. On Tatapihi Island, Whitaker (1978) considered ornate skinks to be abundant. On Moturoa Island they appear to be rare (Hitchmough 1977). The two species would have co-existed throughout much of the North Island (Towns & Daugherty 1994). Consideration is being given to reintroducing ornate skinks to Motuopao Island. It would appear that the Matapia Island population of ornate skink may not be able to sustain 30 or more being removed and the animals for Motuopao Island may have to be obtained from the adjacent mainland.

Forester & Anderson (1995) recorded four species of birds on Matapia Island and six offshore. We recorded five additional species: New Zealand pipit, Australasian harrier, welcome swallow, goldfinch and redpoll. Forester & Anderson (1995) speculated that the New Zealand pipit, welcome swallow and Australasian harrier would be infrequent visitors to Matapia Island and all three were confirmed on this visit. Forester & Anderson (1995) also commented on the small burrows present on the island which were unoccupied during their visit and concluded that they were either burrows of common diving petrels or white-faced storm petrels. Our visit confirmed they were burrows of common diving petrels with an estimated 3-5000 pairs present. As white-faced storm petrels depart from their breeding colonies between January and early April, some of the burrows on Matapia Island may still be of this species.

Monitoring of the released lizards on Motuopao is not scheduled to begin until 2002. Towns (1994) showed that determining establishment by recording progeny at release sites of Whitaker’s skinks (Cyclodina whitakeri) is not detectable for five years, however, it is not known if this is true for robust skinks and Matapia geckos.

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