

THE LIZARDS OF WHALE ISLAND

by D. R. Towns*

SUMMARY

A species list, food and habitat preferences of the lizards of Whale Island is given, with some speculation on the effect of rats on the lizard population.

INTRODUCTION

Many of the offshore islands of New Zealand are inhabited by large faunas of lizards. Good examples are the Poor Knights and Stephen Island. Such islands usually have several features in common, namely steep cliffs and boulder beaches which make landing difficult, low coastal forest and large numbers of pretrel burrows. The burrows often provide a home for *Sphenodon punctatus* (Tuatara) and some skinks e.g. *Leiopisma infrapunctatum* (McCann, 1955). The large numbers of reptiles on these islands are protected by the difficult approaches which may prevent rats, cats and other mammals from being accidentally introduced.

Whale Island, in common with these islands is bordered by steep cliffs and boulder beaches and it also provides a home for many petrels. However, until recently the island harboured large numbers of goats and it is still inhabited by many rats (*Rattus norvegicus*) and rabbits.

The purpose of this work was to compile a species list of the lizards inhabiting Whale Island and to compare the nature and extent of this reptile fauna with that of an island not inhabited by mammals. The work of Whitaker (1968) on the islands of the Poor Knights group provided a useful basis for this comparison. In area, the island on which Whitaker was based, Aorangi, 68 hectares (168 acres), is smaller than Whale, 143 hectares (354 acres). No mammals have been present on any of the Poor Knights group since 1936 (Whitaker, 1968) and vegetation regeneration has been rapid, as compared with Whale Island where the vegetation cover appears to have been considerably affected by goats, and more recently, by rabbits.

LIZARDS PRESENT AND THEIR FOOD AND HABITAT PREFERENCES

The first visit of Field Club to Whale Island (July, 1970) produced only three lizards of one species of Scincidae and these after extensive searching (Anderson, Hayward, pers. comm.). The second visit (August, 1970), during which this work was undertaken, provided three lizard species, one of the family Gekkonidae and two of the Scincidae.

* Department of Zoology, University of Auckland.

Family Gekkonidae

- Genus *Hoplodactylus* Fitzinger
 H. pacificus Gray.

Family Scincidae

- Genus *Leiopisma* Dum. & Bibr.
 One species, not identified at time of writing.
- Genus *Sphenomorphus* Fitzinger
 S. pseudornatus McCann.

Hoplodactylus pacificus

This gecko is common throughout New Zealand. The average snout to vent length of 76 mm for *H. pacificus* (4 adults) captured on Whale Island falls into the upper region of the measurements given by McCann (1955) of 58 to 77 mm. The largest individual, a male, had a snout to vent length of 82 mm. and a vent to tail-tip length of 100 mm. On Whale Island *H. pacificus* is widespread in distribution, but as only 4 individuals were found they cannot be called 'common' especially when compared with Whitaker's figure of 107 in one evening on Aorangi. As in other areas, this gecko occupies various habitats on Whale Island. Two animals were found under the bark of *Metrosideros excelsa* (pohutukawa), one under a log behind sand dunes and one under a rock on a beach.

Leiopisma sp.

The leiopismid (fig. 1) is the most common lizard on Whale Island and shares some features with *L. ornatum*, *L. lineo-ocellatum* and *L. infrapunctatum*. Like these it is a large skink, the average snout to vent length of 10 adults being 67.5 mm. All of the animals captured were found under logs or rocks on the grassed areas behind boulder beaches on the southern side of the island, although some were seen amongst the boulders on one beach and others were observed basking on clumps of *Scirpus nodosus* further inland. During August these lizards were not present in large numbers (only 12 specimens were captured in 5 days), although summer visitors to the island found them to be more common (Bettesworth pers. comm.). It would therefore seem that these skinks, like many other New Zealand lizards (Fawcett 1964, Towns pers. obs., Barwick 1959) have a winter period of inactivity.

Sphenomorphus pseudornatus

Only two specimens of this skink (fig. 2) were captured, one an adult and one a juvenile. These were both found under logs behind the same boulder beach, one curled up with a leiopismid under the same log.

Faecal pellets were not obtained from *H. pacificus*, but those of both *Leiopisma* and *Sphenomorphus* contained the remains of very small arthropods, especially mites, and crustaceans.

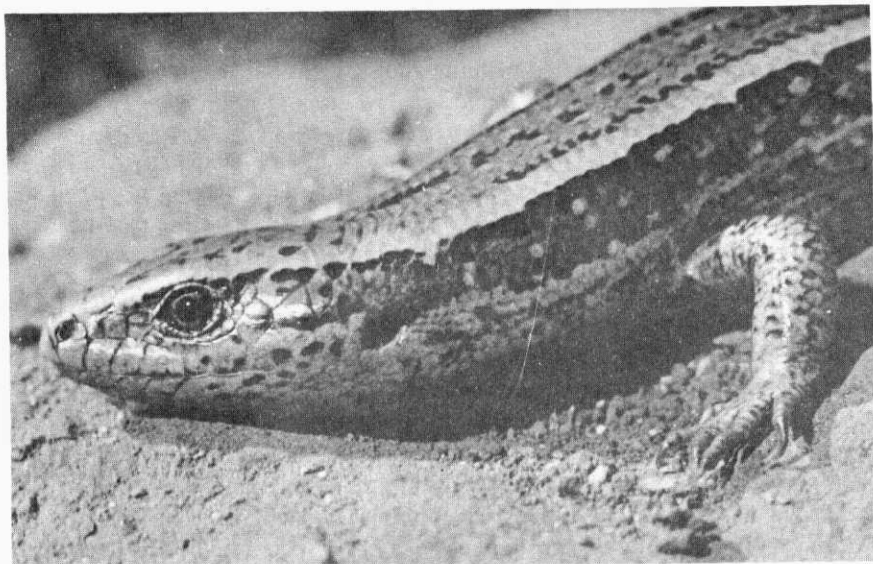


FIG. 1 *Leilopisma* sp. from Whale Island. Photo C.G. Quilter.

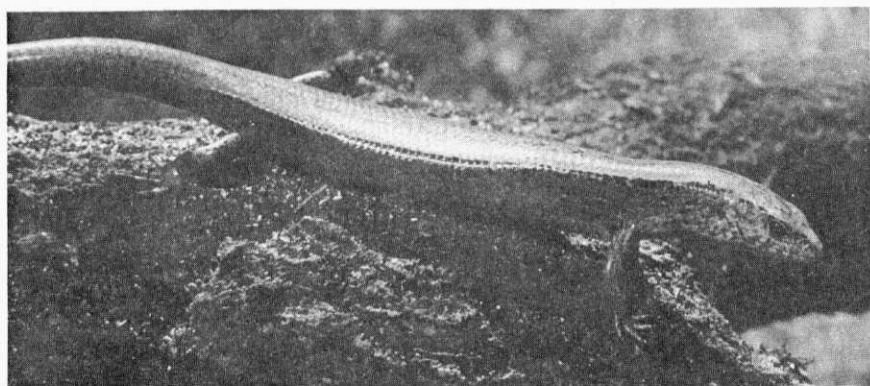


FIG. 2 *Sphenomorphus pseudornatus* from Whale Island. Photo C.G. Quilter.

DISCUSSION

Whale Island, when compared with the Poor Knights has an extremely small fauna of lizards. Whitaker (1968) found seven species of lizards, with a combined density of up to 3435 per hectare (1390 per acre) on Aorangi, an island smaller than Whale Island. Density estimates were not attempted on Whale Island in August because the lizards were so difficult to find. Aorangi does have a more complete forest cover than Whale Island, but this alone does not explain the higher lizard numbers as only one of the species found there (*L. oliveri*) is restricted to forested areas. One influence on the observed density on Whale Island during August could be winter inactivity, and a better comparison could be made by a summer visit. However, Bettesworth, during 14 days' stay on Whale Island in December (early summer) only sighted about two skinks per day (pers. comm.), which suggests that the lizard densities on this island are never high. Whitaker suggests that the high lizard densities on the Poor Knights are due to 'lack of predation and a plentiful food supply'. Predation would seem to be the major cause of the smaller number of lizards on Whale Island, with rats probably being the most important. This is supported by several factors. Firstly, where the Kiore (*Rattus exulans*) and morepork (*Ninox novae-seelandiae*) are present on offshore islands lizards are not common except on boulder beaches where they are protected by the stones. Secondly, where rats are present the nocturnal lizards suffer most e.g. Cuvier Island where nocturnal geckos are rare, but diurnal skinks common (Whitaker, 1968). Certainly on Whale Island the leiopodismid, which is diurnal (pers. obs.) is more common than the nocturnal *Hoplodactylus* or crepuscular *Sphenomorphus*.

Although the number of lizards found on the Poor Knights is high, Whitaker suggests that a lack of retreats in some habitats probably limits their density. Conversely, on Whale Island, where retreats were present, but rats were found in the same area e.g. the boulder spit near Camp Flat, lizards were often absent. On the Poor Knights in areas where logs and loose stones are uncommon, many lizards live in bird burrows, five of the species recorded there will use burrows as retreats (Whitaker, 1968). However, communication with the Wild Life Officers on Whale Island indicates that lizards very rarely inhabit petrel burrows there, possibly as they would then be more vulnerable to rats.

It therefore seems likely that rats, both through direct predations and possibly by competition for food are restricting the size of the lizard population on Whale Island. For this reason a large proportion of the ground-dwelling lizards present probably inhabit the boulder beaches where they are relatively inaccessible. Proof of the amount of influence of rats can only come through detailed food and habitat analyses of both the rats and the lizards, or investigation of the effect of a large scale reduction in the rat population on the size and distribution of the lizard population.

ADDENDUM

During a later visit to Whale Island (March 1971) G. Anderson and D. Bettesworth (pers. comm.) produced a rough density estimate for lizards based on the

number caught in a 50 ft. x 50 ft. quadrat. This was placed where the number of lizards appeared to be highest and provided about 15 skins.

On this basis the optimum density on Whale Island was approximately 645 per hectare. This does not compare favourably with Whitaker's figure of 3435 per hectare for Aorangi Island.

ACKNOWLEDGEMENTS

I wish to thank all those who assisted in compiling the material for this paper, Assoc. Prof. J. Robb for her criticism of the script, Messrs G. Anderson and D. Bettsworth for their assistance in collecting specimens and providing the density estimate and Mr. C.G. Quilter for the photography.

REFERENCES

- | | | |
|----------------|------|---|
| BARWICK, R.E. | 1959 | The life history of the common New Zealand Skink <i>Leiopisma zelandica</i> (Gray, 1843)
<i>Trans. R. Soc. N.Z.</i> 86: 331-80. |
| McCANN, C. | 1955 | "The lizards of New Zealand".
<i>Dom. Mus. Bull.</i> 17, Wellington. |
| FAWCETT, J.D. | 1964 | The life history of <i>Sphenomorphus pseudornatus</i> McCann (<i>Lacertalia</i> , <i>Scincidae</i>)
<i>Unpublished MSc Thesis</i> , Univ. of Auckland. |
| WHITAKER, A.H. | 1968 | Lizards of the Poor Knights Islands
<i>N.Z. J. Sci.</i> 11: 623-51. |

