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The future of indigenous fauna
on private land:
a case study of the habitat use of the
small-scaled skink (*Oligosoma microlepis*).

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Photo: Tony Whitaker

“...ask the animals, and they will teach you...”
Job 12 vs 7

Abstract

The small-scaled skink (*Oligosoma microlepis*) is a small (≤ 67 mm SVL) endemic New Zealand lizard that is currently listed as vulnerable by the IUCN (1994). The species is diurnal and heliothermic, inhabiting rock outcrops and piles scattered throughout the central North Island. All of the ca. 17 populations are small, isolated and confined to private land. The *Oligosoma* spp. Recovery Plan (2002) outlines the need to obtain basic biological data on the species, determine threats and to conduct advocacy with landowners.

The first part of my study was to obtain an understanding of the factors affecting *O. microlepis*' habitat use. This was achieved by using the programme PRESENCE to model site occupancy of the species as a function of site covariates, as well as detection probability as a function of sampling covariates. A total of 45 sites were used, spanning 25 km², on three stations in the Inland Patea district. Presence-absence data and sampling and site covariates were recorded using an active search method for lizards at each site. Results showed that detection probability of small-scaled skink was most affected by rock temperature, the time of day and month surveying was carried out. Site occupancy was correlated with three site covariates. The first important site covariate was distance to the nearest stock route. Probability of site occupancy decreased as the distance to the nearest stock route increased, suggesting that grazing may maintain lizard habitat by keeping rocks clear of vegetation. The second important site covariate was the presence of a tree on the site. No *O. microlepis* were found when a tree was present on the site, probably due to shade and predation by birds. Lastly, rock piles had a significantly higher occupancy than rock outcrops. This difference could be due to a number of factors, including competitive exclusion by common gecko (*Hoplodactylus maculatus*), which were abundant on rock outcrops as well as the biophysical nature of outcrops inhibiting thermoregulation.

The second part of my study was to conduct more extensive habitat analysis using ordination plots and a classification tree, and this analysis expanded on these site

covariates affecting occupancy. Sites were more likely to be occupied if the herbaceous plant *Gingidia montana* was absent, if the site was not in a gully, if the site had a north-northwest aspect, and the site was close to a public road. This information can potentially increase the efficiency in surveying new sites for *O. microlepis*.

The third part of my study was to conduct environmental education with the farming community to create awareness of *O. microlepis* and conservation issues in the district. I did this by the sharing of knowledge, the application of skills and subsequent steps towards conservation management on their land. This study demonstrates how environmental education at a local community level is a worthwhile activity in any research on private land.

Future research is still needed on current threats to *O. microlepis* (e.g., introduced predators), the long-term impact of farming, metapopulation dynamics, and effectiveness of management techniques for conserving the species.

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I wanted to design my thesis around my love for lizards, conservation and environmental education, but I was aware that it was potentially an impossible task to incorporate all three into a Masters, particularly since the majority of rare lizards are confined to offshore islands away from the general public. After meeting a friend by chance one day, he asked me about potential thesis topics, and when I told him about my problem he informed me of the small-scaled skink which had only ever been found on private land – and that was the conception of my Masters.

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