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**Efficiency of techniques for post-translocation monitoring of
the Duvaucel's gecko (*Hoplodactylus duvaucelii*) and evidence
of native avian predation on lizards**

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Dylan van Winkel
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Dedicated to

STEVE ROBERT IRWIN
(February 22, 1962 - September 4, 2006)

A true conservation hero

Abstract

Translocation of threatened reptile species to pest-free offshore islands is one of the most important conservation management tools available in New Zealand. However, a limited knowledge of how an animal responds to translocation and what factors threaten their survival prevails. Post-translocation monitoring is crucial and may help explain the reasons for translocation failure, but only if monitoring techniques are effective in detecting animals post-release. This thesis documents the post-release response of two small populations of Duvaucel's geckos (*Hoplodactylus duvaucelii*) using radio-telemetry, translocated to Tiritiri Matangi and Motuora Islands in December 2006. The efficiency of three standard reptile monitoring techniques, including spotlight searching, artificial refuges, and footprint tracking tunnels were tested and the impact of native bird predators on island lizards was investigated.

Following translocation, no mortalities were recorded and the geckos increased in body condition by 22%. Post-release activity was shown by small initial movements within the first week, followed by increasingly large-scale (up to 480 m), non-directional movements thereafter. Range areas were atypically large (up to 7,820 m²) as a result of the large-scale dispersal movements however few geckos did demonstrate small range areas. There were no sexual or island site differences in the dispersal movements or the range area estimates, suggesting that all geckos responded similarly to the translocations and release into a novel environment. Several neonate *H. duvaucelii* were captured on both Tiritiri Matangi and Motuora, and their high body condition scores indicated that they were capable of surviving and securing adequate resources.

All three reptile monitoring techniques were capable of detecting *H. duvaucelii* at low densities these methods however differed significantly in their detection abilities.

Footprint tracking tunnels demonstrated the most consistent detection rates, probably due to the provision of attractive baits. Spotlight searching resulted in the recapture of 21% and 75% of founders on Tiritiri Matangi and Motuora, respectively. However, this method relied heavily on skilled fieldworkers. Artificial refuges (A.R.s) were the least effective for detecting geckos at low densities and A.R.s were only occupied by *H. duvaucelii* on Tiritiri Matangi Island. Environmental conditions significantly influenced the effectiveness of the monitoring methods, with temperature having a highly positive influence on tracking rates and spotlight encounters.

Native birds, including kingfishers, pukekos, moreporks, and Swamp harriers are reportedly known to prey on lizards. Dietary analyses of these species revealed that lizards represented a large proportion of the prey for kingfishers on Tiritiri Matangi (88%) and Motuora (43%), and that kingfishers have the potential to seriously impact on small establishing lizard populations. Lizard remains were not present in the diet of any other bird species sampled and captive feeding experiments were inconclusive in determining if lizard remains could be detected in pukeko faeces.

This research can aid in the further understanding of post-release responses of lizards to translocations and the factors that threaten their establishment. The provision of adequate habitat quality and size, release locations with a reduced number of known bird predators, and the instatement of long-term monitoring programmes will help improve the translocation success of threatened lizard species in the future.

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