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**Monitoring strategies for the giant land snail
Powelliphanta traversi tararuaensis (Gastropoda:
Pulmonata: Rhytididae): an assessment and
exploration of current and future techniques.**



A thesis presented in partial fulfilment of the requirements for the degree
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Abstract

The current monitoring strategy employed in the management of *Powelliphanta traversi tararuaensis*, a threatened species of giant carnivorous land snail from the Manawatu region of New Zealand, was used to assess the state of two remaining population strongholds – Shannon Forest and Ohau. Conservation targets were found to be amiss in the Shannon Forest population. Average abundance of live *P. t. tararuaensis* there measured well below the recovery goal set by the *Powelliphanta* Recovery Plan. A decline in recruitment was also noted for the Shannon population, with the average size of snails found increasing between the surveys, and a significant drop in numbers of smaller individuals. *P. t. tararuaensis* populations in Ohau were found to be healthier with respect to conservation goals, with two study areas within the site having live *P. t. tararuaensis* numbers well above the target for recovery.

Questions were then asked about the current monitoring program for *Powelliphanta*, in particular concerning the apparent destructive nature of the methodology and the lack of collection of detailed data on life history parameters and population dynamics. I thus tested the effect of a monitoring event on the short-term behaviour of *P. t. tararuaensis* using a mark-recapture study design. The disturbance to the area associated with monitoring had an effect on the re-sighting probability of marked snails, with individuals less likely to be encountered in the days following the monitoring event.

New techniques for monitoring *Powelliphanta* snails were then explored to address the short-fall in methods of gaining life history data in the current program. Attaching tags to the shells of *P. t. tararuaensis* for individual identification using certain adhesives was found to affect the foraging behaviour of wild rats. Loctite and Araldite glues should be used with caution in a field setting, as they may predispose marked snails to depredation by rats. An alternative method for individual snail recognition was then trialled, utilising natural marks on snail shells and a photographic database. It was discovered that individuals of *P. t. tararuaensis* could be recognised by naturally occurring shell variation, but the accuracy decreased over a six month time-frame as new marks were gained and old ones evolved.

This thesis concludes that the current monitoring system for *Powelliphanta* could be improved, both in the type of data gained for assessing management and conservation goals, and in the lessening of impact on snail behaviour. Monitoring strategies for land snails would benefit from incorporation of a non-invasive mark-recapture approach, such as photographic identification. Such techniques would allow for more directed conservation action, without potentially negative impacts on *Powelliphanta* behaviour.

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