

Project title: Assessing the seed dispersal capabilities of weka (*Gallirallus australis*)

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Weka present a conservation dilemma. They are a charismatic species threatened by mammalian predation, but their predatory impacts on other native fauna have lead to them becoming somewhat maligned. Even though weka continue to decline on the North and South Islands, these predatory impacts have resulted in their removal from at least eleven smaller islands that they have been introduced to, and even from some islands where they occurred naturally (e.g. Anchor Island). Unfortunately, knowledge of the positive ecosystem services that weka may provide is still limited. Although their large gape and high fruit diet suggests that they may be significant seed dispersers, little effort has been made to quantify their contribution to seed dispersal services. However, our preliminary research has shown that they could be a key disperser for plant species that are specifically adapted for removal by flightless birds, such as hinau *Elaeocarpus dentatus* (Carpenter 2017, Unpublished data). Without better information on the beneficial effects on weka, it is impossible to determine the optimum management decisions where weka are involved.

We aim to assess the effectiveness of weka as seed dispersers for three common plant species (hinau, miro *Prumnopitys ferruginea*, and five-finger *Pseudopanax arboreus*). We will achieve this by generating mechanistic models for the three plant species. Mechanistic models combine gut processing times with detailed animal movement patterns to give explicit simulations of seed deposition patterns for a species. Short-term high-resolution movement patterns will be obtained from weka at two low weka density sites, and two high weka density sites. Seven weka at each site will be captured and fitted with GPS transmitters. Following data collection, we will develop a mechanistic seed dispersal model to estimate weka-driven seed dispersal kernels for the three plant species. This will give a one-dimensional probability distribution of dispersal distances. The information gained from this project will give an improved understanding of weka's role in ecosystem functioning. This knowledge will facilitate more holistic decision-making when debating their presence on certain islands, or when considering their reintroduction to areas where they have become locally extinct. For more information, or if you are interested in becoming involved in the project, please contact Jo Carpenter (carpenter.jk@gmail.com).



Photo: Still from trail camera footage of weka consuming hinau fruit on Blumine Island. (Jo Carpenter)