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Habitat requirements, translocation and management of the critically endangered Cromwell chafer beetle *Prodontria lewisii* Broun



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Abstract

Translocation is an important tool for the conservation of endangered species with threatened habitats and low population numbers. Without high habitat quality, translocations have low chances of success, regardless of how many organisms are released or how well they are prepared for the release. It is therefore crucial to be able to identify sites in which translocations are most likely to be successful based on key environmental characteristics specific to the species and habitat in question. Species information is also needed to determine critical life history traits and minimum habitat fragment sizes. The Cromwell chafer beetle *Prodontria lewisii* Broun is an ideal candidate for translocation because it has a very limited habitat range, being entirely confined to the 81 ha Cromwell Chafer Beetle Nature Reserve (CCBNR) in Cromwell, Central Otago. The entire population is estimated to contain about 3,000 individuals. This study aimed to identify key plant and soil sites for optimum larval and adult survival by using a combination of field and laboratory-based studies. Larvae survived significantly better on the cushion plant *Raoulia* and on the grass *Festuca rubra* than on silver tussock *Poa cita*, despite this being the plant with which they are traditionally associated. Plant and soil surveys were conducted both within the existing reserve and in a potential new site at the Lindis Crossing. Soil pH, density and particle size were measured, but were not significantly related to chafer beetle survival. However, both larvae and adults survived significantly better when raised in soil from the CCBNR sites than from the experimental Lindis translocation site. Survival varied within the different soil sites of the beetles' current range, with survival increasing significantly from south to north within the reserve. Results are discussed in the context of their management implications and a set of recommendations are presented. The approach taken here presents a model that could be applied to help identify suitable habitat for the translocation of other invertebrate species.

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