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THE BROWSING IMPACT AND ABUNDANCE OF EUROPEAN BROWN HARES (*Lepus europaeus*) IN THE CENTRAL NORTH ISLAND, NEW ZEALAND

A thesis presented in partial fulfilment of the requirements for the degree of Masters of Science in Ecology at Massey University, Palmerston North, New Zealand

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Abstract

The browsing impact and abundance of hares were investigated at several sites in the Central North Island, New Zealand. The traditional view has been that hares have a relatively minor effect on the vegetation when compared to larger ungulates due to their low, stable densities. However in some areas large grazing mammals have been controlled yet the vegetation continues to degrade, consequently attention is now being shifted towards the problems created by ongoing herbivory by smaller mammals. While the impact of hares on high altitude vegetation has generally been considered to be an issue of low conservation priority, they are now considered to be the main grazers in many alpine systems and there is a large shortfall in knowledge.

The suitability of the cleared plot pellet count method for assessing hare abundance, habitat use, and biomass consumption was investigated and was found to produce precise, easily obtainable results. It was found that hare numbers fluctuated over the course of a year, with a decrease in winter, followed by an increase in spring. Hare abundance was thought to primarily relate to habitat quality, with competition and anthropogenic influences also playing a role.

Hare impact was assessed using a variety of techniques including the utilization of existing exclosures, the construction of new exclosures, and selected monitoring of preferred browse species. The long-term exclosure plots indicated that hares were having no effect on any aspect of vegetation condition, either native or exotic in the Moawhango region. Conversely hares were having a significant effect upon the vegetation in the Manson region of the Kaweka ranges. Where hare browsing appeared to be benefiting native species through the suppression of exotics grass species. However, targeted monitoring of preferred browse species showed that hares browse heavily upon a range of native plant species.

While these results appear contradictory, when the results are considered collectively, and with knowledge of hare density a proposed feeding strategy was formulated. I suggest that the degree to which hares impact native vegetation is dependent upon the level of exotic species present. Where exotic species are present (particularly grasses), they are the preferred browse species. Where exotic species are not readily available, or

competition is high, hares then subsist at lower densities by browsing native vegetation. However if a native species occurs that fulfils hare nutritional requirements, then it will be preferentially targeted by hares resulting in significant detrimental effects.

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