Predicting the Efficacy of the Felixer Grooming Trap as a Population Control Device in the Tasmanian Midlands

Abstract summary of the thesis submitted by Morgan Humphrey[1] (BSc Hons)
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Predicting population-level effects of lethal control programs is critical to ensuring predator management is carried out in an efficient, effective and ethical manner. This is especially important for the use of novel control mechanisms. The Felixer is a novel, target-specific lethal control device designed to deliver toxin directly to free-roaming cats. The primary objective of this project was to investigate how the impact of Felixer devices on cat populations is influenced by the number of units deployed and their placement in the landscape. Population Viability Analysis (PVA) simulations were used as a preliminary assessment of the practical and economic feasibility of using Felixers for population control of free-roaming cats. Integration of demographic trends with analysis of Felixer target identification accuracy, frequency of cat detection and insights into cat habitat selection allowed the development of a predictive PVA model to estimate efficacy under a variety of control scenarios.

The model supported the application of the Felixer as a population control device, though per-unit efficacy was highly dependent on length of deployment. The results of the simulation models suggested a clear efficiency advantage in longer-term deployment scenarios. When implemented over long periods (> 12 months), even small numbers of devices were predicted to successfully reduce a target population of free-roaming cats by > 80 %. In contrast, short-term scenarios (≤ 6 months) required a four-fold higher Felixer density to reach maximum (65 – 80 %) population reduction, and full eradication of the target population was never achieved. Comparison of control scenarios identified that peak efficiency was achieved using a density of between 5 and 6 Felixers per 100 km^2 over a period of at least 18 months. Increasing the number of units used within this deployment period showed little effect on the rate of population decline. Although this estimate is highly specific to the context of this study, this result suggests that there exists a window of maximum per-unit monthly efficacy that could be derived for any given management scenario.

In areas where sustained cat suppression is required, the use of passive, automated devices may be more economically viable than more labour-intensive lethal control methods such as trapping and shooting. Predictive models such as these will allow preliminary assessment of the ecological and economic feasibility of Felixer devices to reduce free-roaming cat populations. As cat activity, density and detectability varies widely across different landscape contexts, site-specific parameters are essential for accurate predictions of population impact. Field deployed Felixers collect site-specific data on cat encounter and target identification rates, allowing for the potential integration of updated parameters to inform adaptive management of long-term control regimes.