TWO STUDIES ON THE CONTROL OF WILDLIFE-DERIVED TUBERCULOSIS: FARMER VIEWS AND MODEL VALIDATION

A THESIS PRESENTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF VETERINARY STUDIES IN EPIDEMIOLOGY AT MASSEY UNIVERSITY, PALMERSTON NORTH, NEW ZEALAND.

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Abstract

The two studies included in this thesis are part of a larger research programme evaluating tools to aid in the eradication of bovine tuberculosis (TB) from cattle in New Zealand. The first study was a survey of farmer's attitudes towards the National Pest Management Strategy (NPMS) and tuberculosis control. The second study validated the population component of PossPOP, a spatial stochastic simulation model of TB in a wild possum population.

A postal questionnaire survey identified variation of attitudes of 404 farmers in four regions of varying TB status within New Zealand. Farmers were stratified by region, enterprise type, area TB classification and herd TB status. Of the farmers contacted by telephone prior to sending out the questionnaire 91% agreed to participate in the study and 83% of these farmers returned a completed questionnaire. The questionnaire contained questions on farmer demographics, TB status, herd TB history, farm management practices and attitudes towards the control of TB. Farmers with infected herds were generally positive about the control program and believed that TB could be eradicated from their herds. A number of farmers were concerned about proposed changes to the NPMS, such as the implementation of direct payment of TB testing costs by farmers and removal of compensation for infected cattle. An important finding was that the majority of farmers were not aware that the Animal Health Board was in charge of the NPMS.

PossPOP was built using the first 22 months' data from a longitudinal study of a possum population run at Castlepoint in the lower North Island of New Zealand. Data from the remaining 9 years of the study was used set for model validation. PossPOP was validated by comparing age distribution, sex structure and the proportion of births, deaths and immigrations in the modelled population against the field population. There was general agreement between the model and the field population and also published population patterns. PossPOP produced a stable population over time at different densities, with similar temporal patterns to the field population. Emergent biological properties were examined, such as rate of population rebuilding after a major population cull, the removal of immigration from both populations and age specific mortality. The field population grew much more rapidly following a cull compared with the PossPOP population due to home range expansion of possums that were living on the periphery of the study site, which was not programmed into the model. These results showed that while PossPOP models a small area, it reflects patterns of control over large areas making it a useful tool to evaluate large scale possum control strategies.

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"Education is a valuable thing but every now and then it is wise to remember that anything worth knowing cannot be learned" Oscar Wilde

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