Stoat Trap Tunnel Location: GIS Predictive Modelling to Identify the Best Tunnel Location

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Geographic information systems have become an important method in wildlife-habitat mapping as demand for predictive models that relate single species to measurable components of their habitats has been an influential tool used by nature resource managers and decision makers to manage wildlife (Quinlan, Moro and Lund, 2004).

Abstract

Stoats are recognised as one of the biggest threats to New Zealand's threatened species. They are difficult to control because of their biological characteristics. Currently trapping is the most common type of control technique that has a proven success rate. Research studies have shown that some traps catch more stoats than others, however the reason for this is not well documented. The effectiveness of a trap set is difficult to determine because not all trap locations are the same and not all people have the same ability to select the best location for a trap.

This study uses GIS to spatially analyse stoat capture data from a control operation on Secretary Island in conjunction with commonly available vegetation, habitat, diet and home range spatial data to see if there are consistent patterns that could be used as variables in a model that would predict the best place to locate a stoat trap tunnel. The model would then be tested against a similar dataset from Resolution Island. The Department of Conservation supplied the stoat capture data from the control operations on both islands. Standard spatial analysis techniques were used to generate surfaces that combined the capture data with the vegetation, habitat, diet and home range surfaces to produce predictive surfaces.

The key finding from the research was that it is possible to produce a predictive model, although one was not created because the spatial datasets were not of a high enough resolution to provide conclusive evidence that could be confidently used as a variable in a model. The spatial analysis also indicated that stoats on both islands were caught mainly in the warmer northwestern parts of the islands although the study could not determine why there was a preference for these areas. In rugged terrain like that found on both islands the location of the track network will influence where the majority of stoats will be caught.

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The windrose in Figure 2.6 was created using WindRose PRO, Enviroware srl. http://www.enviroware.com

The topographic maps were sourced from Land Information New Zealand, Topographic Map Series 260 - A44 Five Finger, A45 West Cape, B42 Secretary, B43 Dagg and B44 Resolution, Crown Copyright Reserved

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List of Abbreviations

DEM	Digital Elevation Model
DOC	Department of Conservation
DSIR	Department of Scientific and Industrial Research
FSMS6	Forest Service Mapping Series
GIS	Geographical Information Systems
GPS	Global Positioning System
GRID	
IUCN	International Union for the Conservation of Nature
LCDB	Land Cover Database (Versions 1 and 2)
LENZ	Land Environments of New Zealand
LRI	Land Resource Inventory
LUC	Land Use Capability
MMU	Minimum Mapping Unit
NAWAC	National Animal Welfare Advisory Committee
NRFA	National Rural Fire Authority
NVS	National Vegetation Survey Databank
NZMG	New Zealand Map Grid