# Applications of GIS in the Research and Management of Wildlife Diseases

R. P. Young, A. N. S. de Leeuw, B. T. Garnett & R. J. Delahay
Central Science Laboratory, Sand Hutton, York, U.K. YO41 1LZ

## Introduction

The Wildlife Disease Ecology team at the CSL Woodchester Park Research Station is using GIS (ArcView 3.2) to aid the collection and interpretation of data for three research projects.

## A survey for *M. Bovis* infection in British wild mammals

A GIS is currently in use in a DEFRA funded project to collect data on the distribution, frequency and pathology of *M. bovis* infection in a range of British mammals. The initial phase of the work involves the collection of carcasses of wild mammals within 'TB hotspots' for cattle in England and Wales. A GIS is used to record the location of each collected carcass to allow resources to be targeted in under-represented areas. In the future the GIS will be used to investigate the spatial distribution of infected hosts and different *M. bovis* strain types, and to compare with data collected by DEFRA on infection in badgers and cattle.

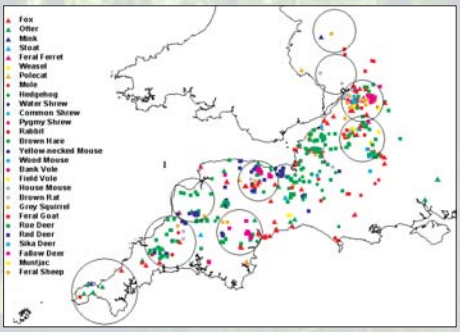


Figure 1. A map of South West England displaying the locations and species of carcasses collected to date (black circles approximate regions of recent 'TB hotspots' for cattle).

## The spatial relationship between hedgehog (*Erinaceus europaeus*) and badger (*Meles meles*) distribution

This study is part of a project to quantify changes in hedgehog abundance and distribution that may result from badger removal during the DEFRA Randomised Culling Trial. There is evidence that in rural habitats badgers exert a strong predation pressure on hedgehogs and may limit their abundance, distribution and behaviour. A GIS is used to investigate the spatial relationship between badger sett locations and preliminary field data collected on hedgehog distribution.

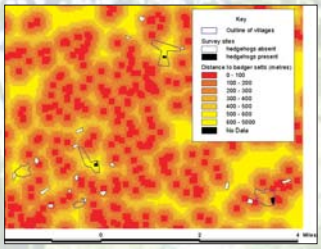

Figure 2. Presence and absence of hedgehogs at survey sites mapped relative to distance to badger setts.

## The ranging behaviour of badgers infected with *M. bovis*

There is limited evidence that *M. bovis* infection in badgers may cause changes in behaviour that could influence the likelihood of transmission to cattle. Data collected in the field from radio-tracking individual badgers have been entered into a GIS so that the spatial behaviour of infected and uninfected animals can be compared. Home range and core activity areas of badgers included farm buildings where cattle feed was stored, and preliminary results suggest that infected animals were more likely to exploit these sources of food. Due to the hilly topography of the study site TIN coverages, built from Digital Terrain Model (DTM) data, are used to estimate 'real' badger home range sizes.

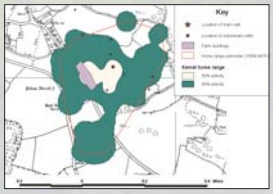

Figure 3. Kernel home range and home range perimeter (100% Minimum Convex Polygon) of an infected badger.

Figure 4. Kernel home range and home range perimeter (100% MCP) of an uninfected badger.

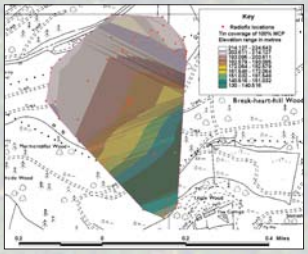

Figure 5. TIN coverage of a badger home range (100% MCP) and locations of radiofixes. The planimetric area of the home range is calculated at 28.74ha and surface area at 29.36ha.

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