Pest Population Dynamics in GIS
- a “Proof of Concept” Project

Client: Arthur Rylah Institute for Environmental Research, Parks Victoria

The Arthur Rylah Institute for Environmental Research (ARI) has an ongoing research program in pest management across Victoria, as well as academic links interstate. This research is currently focused on the development of a park-based concept in animal pest control called adaptive management. Underlying this concept is an appreciation of the dynamic nature of pest animals, such as foxes or buffaloes, and the need to incorporate population growth into the design and assessment of control programs.

ARI researchers recognise that land managers routinely use spatial information technology as a management tool, thus being strongly aware of the attractiveness of an integrated GIS-based solution to delivering population and control program modelling results.

Spatial Vision was invited to participate in this proof of concept project to develop a GIS-based pest animal growth/control simulation engine as a key component in the adaptive management approach.

Spatial Vision’s role involved key components to the population/control model concept. These include the development of:

- Growth/control parameter inputs in the form of GIS layers derived from available spatial data
- A simulation engine for forecasting animal population growth under variable control scenarios.

Spatial Vision utilised its expertise in analytical methodologies and application development to assist ARI’s research efforts in a spatial environment. Two test cases studies were conducted using the tools developed. The first study, in the Grampians National Park (Victoria) was based on foxes. The second, run over Kakadu National Park (Northern Territory), examined buffalo.

The culmination of this project was a comprehensive presentation by Spatial Vision outlining the key requirements to develop the concept within a GIS environment using the case studies as examples.
**Demonstrated Capabilities**

- Extensive experience in developing GIS process methodologies
- Extensive expertise in the development of raster-based cellular automata processes
- Development of raster-based spatial pattern analysis methodologies
- Effective working relationship with researchers in providing spatial information and analysis support to research outcomes
- Extensive experience in developing and delivering presentation materials for non-technical audiences.
- High-quality graphic support to research reports.

**Resources**

Milos Pelikan designed and developed the GIS analysis methodology, process concepts and reporting presentations.

**Technologies Applied**

- ArcGIS Spatial Analyst
- ArcGIS ArcMap

Multiple inputs (including Control, Barriers to movement, and Habitat types), have been used in a time-step process.

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