Exsys Case Study

Systematic Conservation Planning

water & forestry

Department:
Water Affairs & Forestry
REPUBLIC OF SOUTH AFRICA

South African Department of Water Affairs and Forestry

The prime aim of systematic conservation planning is the establishment of protected area networks that are representative of the biodiversity of a country or a region. Resources for conservation are often limited, and conservation may be competing with other forms of land use. This is particularly relevant to forest conservation planning in developing countries like South Africa which are characterized by high levels of rural poverty, and where rural communities may rely directly on natural resources for their survival.

Exsys Corvid® was used to build a knowledge automation expert system that captures conservation knowledge from forest experts, academics and consultants. This approach allowed for the incorporation of expertise on biodiversity persistence and pragmatic management and implementation issues. The conservation knowledge was integrated with an Arc View GIS system that contains forest spatial data sets, and a spreadsheet with forest patch information. The expert system modeling was used to automate the process of calculating multiple indicators for each forest patch.

The approach integrates two complimentary techniques to conservation planning, namely expert-based opinion and systematic computer optimization algorithms - both essential for identifying priority areas for conservation planning.

Effective planning involves looking at a very large number of administrative boundaries, requiring coordination between different levels of government and local communities. National level strategy provided a framework for fine-scale planning, necessary at provincial and local levels. Automation of the analysis allowed large numbers of areas to be examined systematically and consistently.

One of the key outputs of this conservation planning project was identification of priority forests for protection. This was done independently at both the forest patch and forest cluster levels. Prioritization was based on non-replaceability, threat, and livelihood analysis.

A total of 16,185 forest patches were evaluated, most of which were smaller than 25 acres, but which could be grouped into 3,016 forest clusters. Resulting conservation of forest clusters will ensure that ecological connectivity between patches is maintained, and valuable inter-patch habitat is protected. The Ecosystems under threat then receive a higher endangered status.

The output of the system provides the goals for specific conservation targets within the protected forest network, and recommends appropriate strategies that best meet these targets.

Details of the full study are available at:

http://bgis.sanbi.org/indigenousforest/ForestPatchesReport.pdf