GEOGRAPHIC INFORMATION SYSTEM ON INVASIVE ALIEN PLANT SPECIES IN KWAZU-NATAL, SOUTH AFRICA

J. M. K. Kandeh, J. L. Campos dos Santos and L. Kumar

International Institute for Geo-Information Science and Earth Observation
Hengelosestraat 99, P.O. Box 6
7500 AA Enschede – The Netherlands
Emails: {kandeh, santos, kumar}@itc.nl

Keywords: Invasive alien plants, Geographic Information Systems, Biological Diversity, Systems Development Methodology

ABSTRACT

Invasive alien plants are a huge problem in South Africa, affecting about 8.28% (10.1 million hectares of land) of the country. When converted to dense stands, this amounts to about 1.7 million hectares, and the problem is spreading rapidly. There is growing concern over the increasing rate at which the alien plants are replacing indigenous plants.

In response to the call of the convention on Biological diversity (UNEP, 1994), South Africa has over the years made efforts in compiling data on invasive alien plant species. A lot has been done in collating information on the distribution, abundance and habitat types of invasive alien plants, the role of biological agents in control of invasive alien plants, and modelling water use and spread of alien invasive plants.
Data on invasive alien plants in some part of the country are still weak and hence do not produce a comprehensive picture of alien plants invasion in the country. In the Greater St. Lucia Wetland Park of KwaZulu-Natal, the South African Government is implementing a mapping and control programme on invasive alien plant species.

Control of invasive aliens species in the Wetland Park is also undertaken by a number of other organisations including private landowners, sugar cane farmers and forest plantation owners. There is lack of a standardised methodology with regards to data capture amongst the organisations. There are differences in data formats, map projections, little or no data exchange taking place, and most of the data on invasive alien plants held are not in computerized format. Consequently, there is very little information on the extent and distribution of invasive alien plants in the Greater St. Lucia Wetland Park.
This paper presents the development of a prototype geographic information system, which integrates data from various organisations in the Wetland Park. Integrating data from various organizations requires standardisation in data acquisition methodology, data representation and data management amongst the organisations.

In standardising data acquisition methodology, the methodology of Le Maitre and Versfed developed for mapping invasive alien plants at a 1:50,000 scale for a fynbos catchment

management system was used, with the density classes grouped into four classes instead of seven without interfering with the class boundaries.

Using the Structured Systems Analysis Development Methodology, a prototype information system (APMIS) has been designed, tested and implemented. APMIS integrates data from various organisations in The Greater St. Lucia Wetland Park. APMIS is capable of providing geographic information on extent and distribution of invasive alien plants, assess eradication status of mapped areas, and provide operation maps of areas to be cleared. The APMIS strategy can be applied elsewhere where invasive alien plants are a problem and requires a coordinated approach both in mapping and control amongst all key players.