Mapping Invasive Alien Plants in South Africa

Invasive alien plant species pose as threats to both natural and managed ecosystems, a serious threat to biodiversity. In South Africa, alien plants have invaded about 10.1 million hectares of land, and there is growing concern that they are replacing the indigenous plants.

The Working For Water Programme (WFW) is one of the leading organizations involved in the programme of eradicating invasive alien plant species in South Africa. Currently, WFW is implementing alien plants control in the Greater St. Lucia Wetland Park, which is a heritage site. Bordering the site are vast tracks of land owned by forest plantation companies, sugar cane plantation farmers, private landowners, and village communities. The entire area has been invaded by alien plant species. The organizations and groups of people are aware of the environmental impact of alien plants. Identification and control of alien plants is a priority to them. There is very little collaboration and communication between the various organizations in the heritage site. Lack of a common standard amongst the various key players over the years has resulted in very little information on the extent and distribution of invasive alien plants, necessary for a management information system.

Using the SSADM, a prototype system of GIS on alien plants invasion in the Wetland Park has been designed, implemented and tested. The system integrates multi-source data on invasive alien plants species from WFW and Mondi Limited based on common standards of data acquisition, representation and data exchange.

Standards developed include:

* Minimum size of an invaded land to be mapped should not be greater than 100 hectares for a 1:50,000 scale mapping.
* Assigning a Geo-Code called NBAL (Natural Biology Alien) ID to each mapped land whether invaded or not. NBAL is keeping in conformity with the database naming convention of the Department of Water and Forestry (DWAF), and WFW in South Africa.
* Adoption of the methodology of Le Maître and Versfeld (1994) for mapping alien plants at the scale 1:50,000 for a Fynbos catchment management system.
* Based on the requirement analysis, the minimum required attributes for an invaded area are, species type, plant canopy (%) or density and plant size.
* Use of 4 density cover classes in mapping alien plants invasion.

Requirement analysis further revealed the need for three major map products: Density distribution, Eradication, and a Contract map showing mapped units to be cleared. The prototype system provides information on extent and distribution of invasive alien plants, assess eradication status of mapped areas, delivers information on new species that are becoming established in the area, and promotes a better understanding of how the distribution patterns and abundance of standardization in data capture, representation, analysis, and data exchange.

For more information:

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