MODELLING THE DISTRIBUTION OF *SERIPIUM PLUMOSUM* IN MSUKALIGWA LOCAL MUNICIPALITY, MPUMALANGA PROVINCE

By

Mutswari Hbelumani Brenny (11532484)

Dissertation Submitted in fulfillment of the requirements for the degree of Masters in Environmental Science in the Department of Geography and Geo-Information Sciences, School of Environmental Sciences, University of Venda

Supervisor : Dr N.S Nethengwe

Co-Supervisor : Mr F. Dondofema

April 2015
Abstract

The spread of *Seraphium Plamosum* is a critical ecological problem threatening grazing land in South Africa. *Seraphium Plamosum* is indigenous to South Africa and is spreading to other countries in Africa. Mapping the spatial distribution of *Seraphium Plamosum* is vital towards the management of its population and it will assist researchers, farmers and government to understand the environmental conditions favoured by the species. The main aim of the study is to examine and predict the spatial distribution of *Plamosum* using some abiotic factors. Remote sensing, Geographic Information System (GIS) modelling and ground truthing were combined, in order to achieve this goal. Unsupervised classification method was employed to classify the land cover and to guide the field work. Global Positioning System (GPS) coordinates were collected in the field to assist in manually digitizing the encroachment of *Seraphium Plamosum* from the satellite images and also to produce the locality map of *Seraphium Plamosum*. Digitized polygons were used to create training samples and to create the spectral signature of *Seraphium Plamosum*. Spectral signature and some abiotic factors were added into the Maximum likelihood classifier and classification results were seraphium Plamosum favourable conditions. The classification output indicates that *Seraphium Plamosum* prefers deep to very deep soil with loam clay, loams and sandy loams. It also indicates that *Seraphium Plamosum* prefers flat areas with rainfall between 651 to 750mm. The weight of each condition was ranked and incorporated into the model. The model output is in the form of a map which indicates the possible areas that can be invaded by *Seraphium Plamosum*. Ground verification was conducted to assess the accuracy of the model.

Key Words: Abiotic factors, Classification, Digitizing, Distribution, Modelling, Geographic Information System, Encroachment, Global Positioning System, Remote sensing, Seraphium Plamosum.