

Using remote sensing and GIS to map phytodiversity of Arly national park, eastern Burkina

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Abstract:

Spatial maps in the form of remote sensing data or GIS information remains the most practical and cost effective means of providing large scale and rapid information on landscape biodiversity degradation, especially in Africa. Protected areas in Africa often encompass important hotspots of biodiversity. However, the speed of biodiversity depletion is high in developing countries largely because of the near to total dependence of rural populations on biodiversity and ecosystem services provided by the land. Arly national park has a high potential biodiversity and ecotourism potential but the management tools are insufficient, especially regarding spatial explicit information on natural resources. and the degree of land transformation. Best conservation strategies thus need precise and spatial explicit landscape descriptions and information on biodiversity richness patterns. In this study remote sensing and GIS approaches were used in conjunction with field data to map plants communities' distribution along environmental gradients in the Arly national park in Burkina Faso, West Africa. The approaches used are based on the correlation between landform and plant communities. All in all 60 aerial photos were interpreted and used to map different phytocenoses along a topo-edaphic gradient. Plants communities were determined using multivariate ordination analysis (DCA). ArcInfo 3.5.2 was utilized for map digitization, and ArcGIS 3.2 for the generation of geomorphic map and for linking results of multivariate analysis to digital thematic information map.

A total of 454 species were recorded where alluvial plain describe 'hot spots' of phytodiversity. In general at a local scale, eg.1/50 000, each landform is colonized by two plant communities. We built a biodiversity database within a GIS for Arly national park, based on the aerial photographs and field observations, The GIS system renders information on species location, abundance, frequency and plant community type; the species occurrences data can also be depicted on the geomorphic map. The resulting GIS data set map on species distribution and occurrence is a practical tool for spatial explicit monitoring of species in the Arly national park.

The information derived herein can be extrapolated to the regional scale by generalization of the results. We thus plan to assess the present's results within the eastern protected area network and essentially model plant communities' distributions to ultimately support policies relevant to the distribution of medicinal plants. The medicinal plants occur within the buffer zone of the protected area, meaning the immediate area surrounding the park.

Key word: biodiversity, management, distribution, monitoring, remote sensing, GIS, Burkina

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