

**Standardizing Quarter Degree Grid data for  
plant species in the western Central Bushveld  
for more explicit use in spatial models**

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## ABSTRACT

South Africa is a megadiverse country, and its biodiversity is endangered by population pressure and the development needs of a developing country. In order to address the rapid decline in biological diversity, biodiversity planning has become a key focus area that aims at identifying priority areas for species and ecosystem conservation within and outside of formally protected areas. Plant conservation hotspots are identified by the quantification of indicator taxa such as plant taxa richness, rarity and endemism. But the urgent and enormous task of biodiversity assessment for conservation planning requires that we make most of what we know. Therefore, this study seeks to make a contribution by finding new ways of biodiversity pattern estimation from the extrapolation of incomplete sets of plant species distribution data at the Quarter Degree Grid level. Incomplete sampling across the grids of a study area results in false records of species absence and thus a biased biodiversity estimation. As a possible solution, plant distribution data for the western Central Bushveld Bioregion has been standardized using two profiles, namely the 'Centroid Grid' and 'Integrated Grid' profile. The former involves the strengthening of under-sampled grids by extrapolating species occurrences from three adjacent grids with the most similar vegetation units, whereas the latter integrates phyto-diversity data for the four grids intersecting at each grid reference point. Standardized data has proved to provide a means to counter the bias in plant diversity data linked to Quarter Degree Grids by a) strengthening of under-sampled grids and b) visibly smoothing out the gaps between under- and well-sampled grids, which resulted in improved biodiversity estimation for more representative spatial biodiversity modelling. Interpolation created geo-referenced polygons for more explicit use in the identification of areas of conservation concern at bioregional scale. However, well-sampled grids still dominate the outcomes of the analysis by creating spatial sampling bias. Therefore, this approach to calibrate Quarter Degree Grid resolution of spatial data is an additional attempt to achieve more representative mapping of biodiversity patterns, which is a prerequisite for strategic conservation planning for 'living landscapes'.

**Key words:** biodiversity; plant species distribution; western Central Bushveld; quarter degree grid data; spatial analysis; conservation hotspots

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