

SAFARI 2000 NBI Vegetation Map of the Savannas of Southern Africa

Abstract

The objective of the National Botanical Institute's (NBI) vegetation mapping project was to map woody plant species to provide estimates of the fraction of individual species contributing to the peak leaf area index for designated vegetation types in southern Africa. The target was to account for 80% of the woody vegetation leaf area in terms of named species, for 80% of the surface area of Africa south of the equator.

The data sources are both published and unpublished species lists for vegetation types and individual sample plots, with the species contribution estimated by local experts in terms of dominants and subdominants. Source maps include: Low and Rebelo (1998) covering South Africa, Lesotho, and Swaziland; Giess (1971) covering Namibia; Wild and Barbosa (1968) covering Botswana, Zimbabwe, Zambia, Malawi, and Mozambique; Barbosa (1970) covering Angola; White (1983) covering Tanzania, Kenya, Uganda, and Somalia; and White (1983) covering Ruanda, Burundi, Congo, and Gabon. Each source map delineates of a wide variety of land cover categories that differ from region to region.

Because vegetation discontinuities exist along some of the regional borders and a perfectly continuous regional map could not be achieved within the timeframe and budget of the project, the final regional map is made up of six independent sub-regional maps. The data set also includes a cross-referenced database of woody plant species, in order of species dominance, associated with all mapped units.

Background Information

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Project: SAFARI 2000

Data Set Title: SAFARI 2000 NBI Vegetation Map of the Savannas of Southern Africa

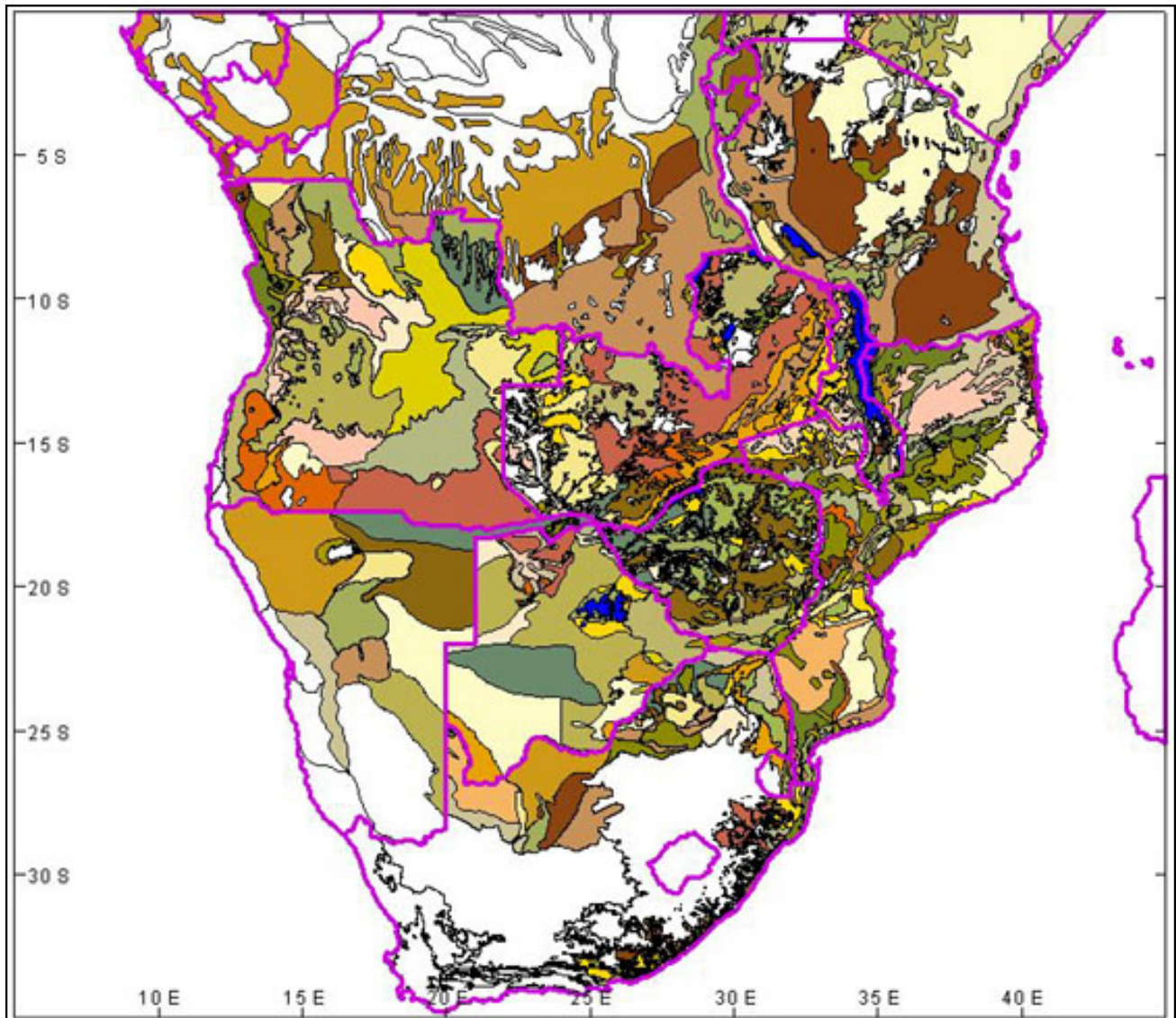
Site: Southern Africa

Westernmost Longitude: 8°
Easternmost Longitude: 43°
Northernmost Latitude: 0°
Southernmost Latitude: -35°

Data Set Citation:

Rutherford, M. C., P. O'Farrel, K. Goldberg, G. F. Midgley, L. W. Powrie, S. Ringrose, W. Mattheson, and J. Timberlake. 2005. SAFARI 2000 NBI Vegetation Map of the Savannas of Southern Africa. Data set. Available on-line [<http://daac.ornl.gov/>] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A.

Web Site: <http://www.nbi.ac.za/>



NBI Vegetation Map (includes a compilation of all 6 coverages listed below, with excluded areas appearing as white).

Data File Information

The data set consists of six Geographic Information System (GIS) shapefile archives of regions in southern Africa. Each archive contains a shape file for a given region on a 5 x 5 degree grid. There is also an accompanying ASCII file, **safari_species_compositions.csv**, described below, which contains the species list associated with the map files.

nbi_veg_angola.zip
nbi_veg_congo_area.zip
nbi_veg_east_africa.zip
nbi_veg_namibia.zip
nbi_veg_south_africa.zip
nbi_veg_zambezi_area.zip

The shapefile format is the current working and interchange GIS format for simple vector data with attributes. A Shapefile stores map (geographic) features and attribute data as a collection of files having the same prefix. The file format consists of three essential files:

XXX.shp - the file that stores the feature geometry (required)
XXX.shx - the file that stores the index of the feature geometry (required)
XXX.dbf - the dBASE file that stores the attribute information of features (required)

Additional files also included:

XXX.sbn - ESRI spatial index file (optional)
XXX.sbx - ESRI spatial index file (optional)
XXX.avl - ESRI ArcView legend file (optional)
XXX.txt - metadata file in text format (optional)

A spatial index results in significantly improved draw and search times. The spatial index is stored in two files (shapefile.SBN and shapefile.SBX) in the same directory as the associated shapefile. The shapefiles have the following attributes:

Field Name	Definition
Uid	Unique identifier
Veg_id	Numeric class ID linked to the valVegID field in the .csv file
Vegetation	Include the value of Veg_id as well as a text description of the vegetation class.

The regional NBI Vegetation Map (which includes a compilation of the 6 independent sub-regional coverages listed above) is provided in the data set as **safari_wooded_vegetation.jpg**.

The **safari_species_compositions.csv** file contains the following information:

Field Name	Definition	Sample Data Record
ShapeFile	Regional shapefile	Zambezi Area
valVegID	ID for vegetation unit in the specific shapefile	4
Rank	Abundance rank for species in vegetation unit	13
Taxon	Name of taxon	<i>Combretum elaeagnoides</i> Klotzsch
FamilyName	Family of taxon	COMBRETACEAE
TaxonInSource	Name of taxon name as used in the original source	<i>Combretum elaeagnoides</i>
Tree	Indication of whether the taxon is tree or probably tree (for cases where the operator was uncertain of the species in question)	Tree
Woody	Indication of whether the taxon is woody or probably woody (for cases where the operator was uncertain of the species in question)	

Product Description

The final product consists of a regional map made up of six independent sub-regional maps, and a cross-referenced database of woody plant species lists, in order of species dominance, associated with all mapped units. The species lists comprise those species that, together, comprise at least 80% of the peak leaf area of each vegetation type.

Due to problems of scale and local variations in dominance, it was not possible to estimate the relative contribution of each species to the peak leaf area of each vegetation type with any useful degree of confidence. Species dominance and equitability varies greatly even within short distances in most vegetation types, and it was a major subjective task to define even the cut-off point for 80% peak leaf area composition. Our degree of confidence in species rank designations is higher than our confidence of the 80% cut-off point except in mixed and mosaic vegetation types where several species appear as near equal contenders for first position, and also where White (1983) was the sole source of information and the list given is alphabetical.

The species ranks could be more useful in partitioning peak leaf area coarsely between component species if we had sufficient saturation sampling of large enough areas to provide definitive rules for all vegetation types. This is not a typical sampling strategy for vegetation ecologists. Very much more sampling would be required to establish 80% cut-off points with more certainty in almost all vegetation types that we have covered.

Data Sources and Source Maps

Data were derived from a number of disparate sources. These included published and unpublished species lists from field surveys, published traveler accounts, and species lists and descriptions associated with mapped units throughout the region. Effort was made to cross-check representative species lists derived from independent sources as much as possible.

Refinement of Digitized Mapped Units

Corrections were made to the mapped vegetation units originally supplied. These included corrections to the digitized units where these were not true to the original maps, and correction of errors on the original source maps. Refinements were also made in cases where dominant woody vegetation clearly could be differentiated within one mapped unit, and these were subdivided where appropriate. Inspection of available species list data for many mapped units bordered by national boundaries suggested that a perfectly continuous regional map would not be achievable within the time and budgetary constraints of the sub-project. Thus, the region was mapped in six relatively independent sub-regional zones. Vegetation discontinuities still exist along some of the regional borders.

Areas Excluded

The following areas and vegetation types were excluded according to the sub-project objectives: areas north of the Equator, evergreen moist forests, pure grasslands, desert and arid regions, Fynbos. These areas are indicated as such on the final product map. Main water bodies are also mapped specifically.

Plant Names and Life Forms

Considerable effort was expended in ensuring that plant scientific names are current and correct, and also in establishing which important species are indeed woody plants, especially where the project team was not familiar with the floristic composition of mapped units.

Additional Sources of Information

Related Data Sets

Otter, L. 2004. SAFARI 2000 Estimated BVOC Emissions for Southern African Land Cover Types. Data set. Available on-line [<http://daac.ornl.gov/>] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A.

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White, F. 1983. *The Vegetation of Africa*. Unesco, Switzerland. 356 pp.

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Revision Date: Tuesday, January 4, 2005