Vegetation Atlas of South Africa, Lesotho and Swaziland

Ladislav Mucina, Michael C. Rutherford and Leslie W. Powrie

with contributions by


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Introduction

The core of this book is the vegetation map of the region which is the culmination of many years of work by many people.

The vegetation units described become far more useful when they are made spatially explicit and the dimensions, distribution and shapes of each vegetation unit cannot adequately be described by text alone. Also the relationships between adjacent vegetation types as well as interdispersion patterns become clear through the device of the maps presented in this atlas.

The atlas is presented here as a systematic series of A4 maps. These depict 435 of the vegetation types of our subcontinental region. Not depicted in this edition is AZm 1 Cape Kelp Beds that is described in the text. The map of the vegetation types of the subantarctic Marion and Prince Edward Islands is to be found in Chapter 15. The mapping in this chapter corresponds closely to the large 1:1 000 000 map sheets of Mucina et al. (2005) and is also printed at this convenient scale. In this atlas a grey outline to polygons has been added to help differentiation between adjacent vegetation units. The A4 map pages include an area of overlap at the edges with the maps on overleaf pages and contain navigational arrows to adjacent sections of the map. The series of maps is preceded by an index map to page numbers of the maps of the atlas, followed by the legend to the vegetation types with colours and codes of the vegetation types. Given the large number of colours required for the atlas, the codes provide the definitive identity of vegetation types. For convenience this legend is reprinted as a separate booklet in a sleeve within the back cover of the book. Geographical names as approved by the South African Geographical Names Council are as gazetted before 1 January 2005.

A compact disc (CD) containing the electronic shape files of the map is placed in a sleeve within the front cover of the book. This CD also contains the software ArcReader suitable for viewing the map on computer. This is a particularly valuable and effective means of zooming in to view very small polygons and intricately divided vegetation types that are difficult to see on the printed maps. Some attributes are displayed when clicking on a polygon in the electronic map. These are Code used in the book, Name of the vegetation type, Conservation target, Percent of the vegetation type that is protected, Percent of the vegetation type that is unaltered, Conservation status and Protection status of the vegetation type, Area in square kilometres of the vegetation type, Area in square kilometres of the specific polygon, Code without space used on the map, Sort order (using numbers for biome, bioregion and vegetation type), Codes and names for biome, group and bioregion, and IDs for vegetation type, biome, group and bioregion used for linking data tables.

The maps of biomes and bioregions at much less detailed scales are to be found in Chapter 3.

Credits of work done are detailed in the individual major chapters (Chapters 4 to 14) and are therefore not repeated here.

Reference

Legend to the Vegetation Units and Topographical Features

FYNBOS BIOME

Sandstone Fynbos
- FFs 1 Bokkeveld Sandstone Fynbos
- FFs 2 Graafwater Sandstone Fynbos
- FFs 3 Olifants Sandstone Fynbos
- FFs 4 Cederberg Sandstone Fynbos
- FFs 5 Winterhoek Sandstone Fynbos
- FFs 6 Piketberg Sandstone Fynbos
- FFs 7 North Hex Sandstone Fynbos
- FFs 8 South Hex Sandstone Fynbos
- FFs 9 Peninsula Sandstone Fynbos
- FFs 10 Hawequas Sandstone Fynbos
- FFs 11 Kogelberg Sandstone Fynbos
- FFs 12 Overberg Sandstone Fynbos
- FFs 13 North Sonderend Sandstone Fynbos
- FFs 14 South Sonderend Sandstone Fynbos
- FFs 15 North Langeberg Sandstone Fynbos
- FFs 16 South Langeberg Sandstone Fynbos
- FFs 17 Potberg Sandstone Fynbos
- FFs 18 North Outeniqua Sandstone Fynbos
- FFs 19 South Outeniqua Sandstone Fynbos
- FFs 20 Tsitsikamma Sandstone Fynbos
- FFs 21 North Rooiberg Sandstone Fynbos

Quartzite Fynbos
- FFq 1 Stinkfonteinberge Quartzite Fynbos
- FFq 2 Swartriviersberg Quartzite Fynbos
- FFq 3 Matjiesfontein Quartzite Fynbos
- FFq 4 Breede Quartzite Fynbos
- FFq 5 Grootrivier Quartzite Fynbos
- FFq 6 Suurberg Quartzite Fynbos

Sand Fynbos
- FFd 1 Namaqualand Sand Fynbos
- FFd 2 Leiptoldtville Sand Fynbos
- FFd 3 Hopefield Sand Fynbos
- FFd 4 Atlantis Sand Fynbos
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DESERT BIOME

Namib Desert Bioregion

Gariep Desert Bioregion

Trans-Escarpment Succulent Karoo Bioregion

Rainshadow Valley Karoo Bioregion

Nama-Karoo Biome

Bushmanland Bioregion
### Upper Karoo Bioregion
- NK1 1: Western Upper Karoo
- NK2 2: Eastern Upper Karoo
- NK3 3: Northern Upper Karoo
- NK4 4: Eastern Upper Karoo

### Lower Karoo Bioregion
- NK1 1: Gamka Karoo
- NK2 2: Eastern Lower Karoo
- NK3 3: Lower Karoo Gwarrieveld
- NK4 4: Albany Broken Veld

### GRASSLAND BIOME

#### Drakensberg Grassland Bioregion
- Gd 1: Amathole Montane Grassland
- Gd 2: Amathole Mistbelt Grassland
- Gd 3: Stormberg Plateau Grassland
- Gd 4: Southern Drakensberg Highland Grassland
- Gd 5: Northern Drakensberg Highland Grassland
- Gd 6: Drakensberg-Amathole Afrotmone Fynbos
- Gd 7: uKhahlamba Basalt Grassland
- Gd 8: Lesotho Highland Basalt Grassland
- Gd 9: Western Lesotho Basalt Shrubland
- Gd 10: Drakensberg Afroalpine Heathland

#### Mesic Highveld Grassland Bioregion
- Gm 1: Zaaron Moist Grassland
- Gm 2: Sengu Montane Shrubland
- Gm 3: Eastern Free State Clay Grassland
- Gm 4: Eastern Free State Sandy Grassland
- Gm 5: Basotho Montane Shrubland
- Gm 6: Frankfort Highveld Grassland
- Gm 7: Northern Free State Shrubland
- Gm 8: Soweto Highveld Grassland
- Gm 9: Tsakane Clay Grassland
- Gm 10: Egoi Granite Grassland
- Gm 11: Rand Highveld Grassland
- Gm 12: Eastern Highveld Grassland
- Gm 13: Amersfoort Highveld Clay Grassland
- Gm 14: Wakkerstroom Montane Grassland
- Gm 15: Paulpietersburg Moist Grassland
- Gm 16: KaNgwane Montane Grassland
- Gm 17: Barberton Montane Grassland
- Gm 18: Lydenburg Montane Grassland
- Gm 19: Sekhukhune Montane Grassland
- Gm 20: Leolo Summit Sourveld
- Gm 21: Lydenburg Thornveld
- Gm 22: Northern Escarpment Dolomite Grassland
- Gm 23: Northern Escarpment Quartzite Sourveld
- Gm 24: Northern Escarpment Afrotmone Fynbos
- Gm 25: Woodbush Granite Grassland
- Gm 26: Wolkberg Dolomite Grassland
- Gm 27: Strydpoort Summit Sourveld
- Gm 28: Soutpansberg Summit Sourveld
- Gm 29: Waterberg-Magaliesberg Summit Sourveld

#### Dry Highveld Grassland Bioregion
- Gh 1: Karoo Escarpment Grassland
- Gh 2: Aliwal North Dry Grassland
- Gh 3: Xhariep Karroid Grassland
- Gh 4: Besemkaree Koppies Shrubland
- Gh 5: Bloemfontein Dry Grassland
- Gh 6: Central Free State Grassland
- Gh 7: Winburg Grassy Shrubland
- Gh 8: Bloemfontein Karroid Shrubland
- Gh 9: Western Free State Clay Grassland
- Gh 10: Vaal-Vet Sandy Grassland
- Gh 11: Vredefort Dome Granite Grassland
- Gh 12: Vaal Reefs Dolomite Sinkhole Woodland
- Gh 13: Klersdorp Thornveld
- Gh 14: Western Highveld Sandy Grassland
- Gh 15: Carletonville Dolomite Grassland
### Sub-Escarpment Grassland Bioregion

<table>
<thead>
<tr>
<th>Bioregion</th>
<th>Code</th>
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<tbody>
<tr>
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<tr>
<td>Ithala Quartzite Sourveld</td>
<td>Gs 2</td>
</tr>
<tr>
<td>Low Escarpment Moist Grassland</td>
<td>Gs 3</td>
</tr>
<tr>
<td>Northern KwaZulu-Natal Moist Grassland</td>
<td>Gs 4</td>
</tr>
<tr>
<td>Northern KwaZulu-Natal Shrubland</td>
<td>Gs 5</td>
</tr>
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<td>KwaZulu-Natal Highland Thornveld</td>
<td>Gs 6</td>
</tr>
<tr>
<td>Income Sandy Grassland</td>
<td>Gs 7</td>
</tr>
<tr>
<td>Mooi River Highland Grassland</td>
<td>Gs 8</td>
</tr>
<tr>
<td>Midlands Mistbelt Grassland</td>
<td>Gs 9</td>
</tr>
<tr>
<td>Drakensberg Foothill Moist Grassland</td>
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<td>Southern KwaZulu-Natal Moist Grassland</td>
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<td>East Griqualand Grassland</td>
<td>Gs 12</td>
</tr>
<tr>
<td>Mabela Sandy Grassland</td>
<td>Gs 13</td>
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<tr>
<td>Mthatha Moist Grassland</td>
<td>Gs 14</td>
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<tr>
<td>Tsomo Grassland</td>
<td>Gs 15</td>
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<td>Queenstown Thornveld</td>
<td>Gs 16</td>
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<tr>
<td>Tarkastad Montane Shrubland</td>
<td>Gs 17</td>
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<td>Bedford Dry Grassland</td>
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### Mopane Bioregion

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<tr>
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<tr>
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<td>SVm 3</td>
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<tr>
<td>Mopane Basalt Shrubland</td>
<td>SVm 4</td>
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<tr>
<td>Tsende Mopaneveld</td>
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<td>Lowveld Rugged Mopaneveld</td>
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<td>Phalaborwa-Timbavati Mopaneveld</td>
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<td>Mopane Gabbro Shrubland</td>
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### Savanna Biome

#### Central Bushveld Bioregion

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<tbody>
<tr>
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<td>Madikwe Dolomite Bushveld</td>
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<td>Zeerust Thornveld</td>
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<td>Dwarsberg-Swartruggens Mountain Bushveld</td>
<td>Svcb 4</td>
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<tr>
<td>Pilanesberg Mountain Bushveld</td>
<td>Svcb 5</td>
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<td>Marikana Thornveld</td>
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<td>Norite Koppies Bushveld</td>
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<td>Gold Reef Mountain Bushveld</td>
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<td>Gauteng Shale Mountain Bushveld</td>
<td>Svcb 10</td>
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<td>Andesite Mountain Bushveld</td>
<td>Svcb 11</td>
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<td>Central Sandy Bushveld</td>
<td>Svcb 12</td>
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### Lowveld Bioregion

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<td>Nwambya-Pumbe Sandy Bushveld</td>
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</tr>
<tr>
<td>Granite Lowveld</td>
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<td>Delagoa Lowveld</td>
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<tr>
<td>Tshokwane-Hlane Basalt Lowveld</td>
<td>SVI 5</td>
</tr>
<tr>
<td>Gabbro Grassy Bushveld</td>
<td>SVI 6</td>
</tr>
<tr>
<td>Gravelotte Rocky Bushveld</td>
<td>SVI 7</td>
</tr>
<tr>
<td>Tzaneen Sour Bushveld</td>
<td>SVI 8</td>
</tr>
<tr>
<td>Legogote Sour Bushveld</td>
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<tr>
<td>Pretoriuskop Sour Bushveld</td>
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</table>
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**ALBANY THICKET BIOME**

**Sub-Escarpment Savanna Bioregion**
- SVs 1 Thukela Valley Bushveld
- SVs 2 Thukela Thornveld
- SVs 3 KwaZulu-Natal Hinterland Thornveld
- SVs 4 Ngongoni Veld
- SVs 5 KwaZulu-Natal Sandstone Sourveld
- SVs 6 Eastern Valley Bushveld
- SVs 7 Bhisho Thornveld

**Eastern Kalahari Bushveld Bioregion**
- SVk 1 Mafikeng Bushveld
- SVk 2 Stella Bushveld
- SVk 3 Schweizer-Reneke Bushveld
- SVk 4 Kimberley Thornveld
- SVk 5 Vaalbos Rocky Shrubland
- SVk 6 Schmidtsdrift Thornveld
- SVk 7 Ghaap Plateau Vaalbosveld
- SVk 8 Kuruman Vaalbosveld
- SVk 9 Kuruman Thornveld
- SVk 10 Kuruman Mountain Bushveld
- SVk 11 Molopo Bushveld
- SVk 12 Kathu Bushveld

**INeAn INDIAN OCEAN COASTAL BELT**
- CB 1 Maputaland Coastal Belt
- CB 2 Maputaland Wooded Grassland
- CB 3 KwaZulu-Natal Coastal Belt
- CB 4 Pondoland-Ugu Sandstone Coastal Sourveld
- CB 5 Transkei Coastal Belt

---

**Kalahari Duneveld Bioregion**
- SVkd 1 Gordonia Duneveld
- SVkd 2 Gordonia Kameeldoring Bushveld
- SVkd 3 Auob Duneveld
- SVkd 4 Nossob Bushveld

---

**Sub-Escarpment Savanna Bioregion**

**Eastern Kalahari Bushveld Bioregion**

**INeAn INDIAN OCEAN COASTAL BELT**

---

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## FORESTS

### Zonal & Intrazonal Forests

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<td>FOz 3</td>
<td>Southern Mistbelt Forest</td>
</tr>
<tr>
<td>FOz 4</td>
<td>Northern Mistbelt Forest</td>
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<td>FOz 5</td>
<td>Scarp Forest</td>
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<td>FOz 6</td>
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<td>FOz 7</td>
<td>Northern Coastal Forest</td>
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<td>FOz 8</td>
<td>Sand Forest</td>
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### Azonal Forests

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<td>FOa 1</td>
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<td>FOa 3</td>
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## AZONAL VEGETATION

### Estuarine Vegetation

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<td>Cape Estuarine Salt Marshes</td>
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<td>AZe 3</td>
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### Seashore Vegetation

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<td>Namib Seashore Vegetation</td>
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<td>AZd 2</td>
<td>Namakualand Seashore Vegetation</td>
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<tr>
<td>AZd 3</td>
<td>Cape Seashore Vegetation</td>
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<td>AZd 4</td>
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### Freshwater Wetlands

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<td>AZf 1</td>
<td>Cape Lowland Freshwater Wetlands</td>
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<td>AZf 2</td>
<td>Cape Vernal Pools</td>
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<td>AZf 3</td>
<td>Eastern Temperate Freshwater Wetlands</td>
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<td>AZf 4</td>
<td>Drakensberg Wetlands</td>
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<td>AZf 5</td>
<td>Lesotho Mires</td>
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<td>AZf 6</td>
<td>Subtropical Freshwater Wetlands</td>
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### Inland Saline Vegetation

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<td>Algoa Dune Strandveld</td>
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<tr>
<td>AZs 2</td>
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<td>AZs 3</td>
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<td>AZs 4</td>
<td>Upper Gariep Alluvial Vegetation</td>
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<td>AZs 5</td>
<td>Highveld Alluvial Vegetation</td>
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<td>AZs 6</td>
<td>Albany Alluvial Vegetation</td>
</tr>
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<td>AZs 7</td>
<td>Subtropical Alluvial Vegetation</td>
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<td>AZs 8</td>
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<td>AZs 9</td>
<td>Cape Lowland Salt Pans</td>
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<td>AZs 10</td>
<td>Highveld Salt Pans</td>
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<td>AZs 11</td>
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<tr>
<td>AZi 1</td>
<td>Fynbos Riparian Vegetation</td>
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<td>AZi 2</td>
<td>Cape Lowland Alluvial Vegetation</td>
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<td>Lower Gariep Alluvial Vegetation</td>
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<td>AZi 7</td>
<td>Subtropical Alluvial Vegetation</td>
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<tr>
<td>AZi 8</td>
<td>Cape Lowland Alluvial Vegetation</td>
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<tr>
<td>AZi 9</td>
<td>Cape Lowland Salt Pans</td>
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<tr>
<td>AZi 10</td>
<td>Highveld Salt Pans</td>
</tr>
<tr>
<td>AZi 11</td>
<td>Subtropical Salt Pans</td>
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Glossary of Selected Scientific and Vernacular Terms

Michael C. Rutherford, Ladislav Mucina, Leslie W. Powrie, Robert A. Ward and Freddie Ellis

Introduction

This glossary contains terms, abbreviations and very widely used vernacular names of plants specific to southern African botanical and geographical terminology, and it is aimed at university and other students and at interested southern African amateur biologists and nature lovers. Professional botanists will benefit from definitions of many of the nonbotanical terms used in our book—especially those related to geography, soil, climate, GIS terminology and botanical terms not particularly familiar in South Africa, Lesotho and Swaziland. Some ‘endemic’ local terms not referenced are our original definitions.

Many of the terms are referenced. Most soil terms and definitions relate to Van der Watt & Van Rooyen’s (1995) glossary. The terms not referenced are our original definitions.

Glossary

Adamellite (geology) Type of granite containing a calcium-bearing plagioclase and a potassium feldspar in roughly equal amounts (Whitten & Brooks 1972).

Aeolian (soil) Wind-borne. Aeolian material is moved by wind rather than water or by decomposition of local rock. Most aeolian sand is of marine origin, although sand may be dispersed from some rivers by wind (modified after Low & Rebelo 1998).

Afromontane (biogeography) Pertaining to regions of high altitudes in the mountains of Africa. Sometimes used interchangeably with ‘afrotropical’.

Afrotropical (biogeography) Pertaining to regions in Africa characterised by temperate climate, usually found at higher altitudes (East African mountains, Drakensberg).

Agg. (taxonomy) Abbreviation of ‘aggregate’. A neutral taxonomic category designating a group of morphologically very similar plant taxa that are often confused, e.g. in field studies. In our book this term is used interchangeably with ‘complex’, another auxiliary taxonomic category.

Agrestal (vegetation) Pertaining to vegetation of weeds infesting arable land, synonymous with ‘segetal vegetation’.

Alluvium (geology, soil) Sedimentary material found in regions fringing river courses and composed of detrital matter transported and deposited by the river.

Amphibole (geology) Any of a class of rock-forming silicate and aluminosilicate minerals with fibrous or columnar crystals (Thompson 1995).


Andesite (geology) A fine-grained volcanic igneous rock of composition intermediate between basalt and rhyolite, characterised by the presence of oligoclase or andesine (both minerals with more sodium than calcium in their composition) plagioclase feldspar (after Whitten & Brooks 1972).

Anorthosite (geology) A coarse-grained plutonic igneous rock consisting of more than 90% plagioclase feldspar, the plagioclase being generally calcium-rich (Whitten & Brooks 1972). In South Africa, the Bushveld Igneous Complex contains many anorthosite layers formed by the cyclic fractional crystallisation from a gabbroic magma.

Apedral (soil) Pertaining to a soil having no visible internal structure (after Low & Rebelo 1998).

ARC/INFO® (GIS terminology) Name of software package made by Environmental Systems Research Institute, Redmund, California, for geographic information system (GIS) analysis. ARC/INFO® is used worldwide by thousands of different organisations for handling, managing and analysing geographical information.

ArcView® (GIS terminology) A geographic information system (GIS) software package made by Environmental Systems Research Institute with many of the features of ARC/INFO.

Arenite (geology) A broad term describing detrital sedimentary rocks, typically sandstone, of a particle size between 1⁄16 mm and 2 mm (Whitten & Brooks 1972).

Argillaceous (geology) Pertaining to a group of detrital sedimentary rocks, including clays, shales, mudstones and siltstones. Two grades of particle size are recognised, namely silt (from 1⁄16 mm to 1⁄256 mm) and clay (less than 1⁄256 mm). The rocks are composed of clay minerals and finely divided quartz and carbonates (Whitten & Brooks 1972).

Asteraceous (vegetation) Pertaining to vegetation dominated by members of the daisy family (Asteraceae or Compositae), e.g. asteraceous fynbos.

Banded ironstone (geology) Also known as jaspilite; a banded rock composed of alternating layers of iron oxide and jasper, a red variety of chaledony (cryptocrystalline variety of SiO₂). These rocks are chemical sediments deposited due to increased oxygen contents of a body of water precipitating dissolved iron in a cyclic nature. Huge iron ore deposits are found in South Africa in the Banded Iron Formation (Transvaal Supergroup).

Basalt (geology) Generally fine-grained dark-coloured volcanic igneous rock, composed primarily of calcic plagioclase and pyroxene, with or without olivine.

Batholith (geology) Term applied to very large bodies of intrusive igneous rock and generally composed of many smaller plutons. The term is most commonly used to describe granitic bodies.

Berg wind (climate) A katabatic (downslope and generally offshore) wind of especially the West and South Coast of South Africa, which is both hot and dry and therefore conducive to spread of fire (Low & Rebelo 1998).

Biodiversity (biology) The sum of all taxa of animals, plants, fungi and micro-organisms as well as their communities in a region (modified after Low & Rebelo 1998).
Biome (biology) A broad ecological spatial unit representing major life zones of large natural areas, and defined mainly by vegetation structure, climate as well as major large-scale disturbance factors (such as fire) (after Low & Rebelo 1998).


Bog (soil) An area of swampy ground generally with a layer of organic matter (peat).

Broken veld (geomorphology) A region characterised by rugged topography, preventing easy thoroughfare. The granitic landscapes of the Succulent Karoo are good examples (Low & Rebelo 1998).

Bushveld (vegetation) A local regional term translated from the Afrikaans ‘bosveld’ and generally applied to various forms of savanna vegetation south of the miombo belts in southern Africa. In regional terms (Central Bushveld), used for the elevated plateaus between Pretoria in the south and Limpopo River in the north.

Butt (geomorphology) Solitary, usually pointed hill with hard capping on the top, rising above surrounding flat landscape; often occurring in the Karoo. Often spelt ‘butte’ (from the French) and mainly applied in the western USA.

C₃ (plant physiology) A photosynthetic system in which Calvin Cycle photosynthesis occurs in both bundle sheath and mesophyll cells in the leaf. The name is derived from the initial fixing of CO₂ in three-carbon chain compounds.

C₄ (plant physiology) A photosynthetic system in which the initial fixation of CO₂ is via a four-carbon chain compound. These species have the Calvin Cycle photosynthesis cells concentrated around the vascular bundles (Kranz anatomy), whereas the cells elsewhere in the leaf specialise in absorbing CO₂ from the atmosphere. C₄ photosynthesis is more efficient than C₃, at higher light intensities and higher temperatures, hence its prominence amongst grasses (and other plant species) in the warmer, summer-rainfall regions (after Low & Rebelo 1998).

Calcareous (geology, soil) Pertaining to a soil or rock containing calcium carbonate, or related minerals, so that it effervesces (bubbles of CO₂) when treated with acid. Usually formed from shells or chemical precipitation, these soils and rocks tend to have a coastal distribution (modified after Low & Rebelo 1998).

Calcrete (geology) A rock formed in the soil profile at the water table when calcium carbonate accumulates and cements particles together to form a hard rock band (Low & Rebelo 1998).

CAM Abbreviation of ‘Crassulacean Acid Metabolism’ (plant physiology). A photosynthetic system found in many succulent plants whereby carbon fixation takes place at night (as opposed to daylight in C₃ and C₄ plants) when lower temperatures reduce the rate of water loss during CO₂ uptake through the stomata. A very strong form of CAM is referred to as CAM idling where stomata remain closed by day and night when there is an internal recycling of nocturnally refixed respiratory CO₂, usually in response to severe stress due to limitations of water availability. CAM cycling is yet another (weak) form of CAM metabolism with C₄ photosynthesis occurring throughout the light period (Lüttege 2004).

Cambic B-horizon (soil) A subsurface horizon containing illuvial clay, humus, or amorphous sesquioiudes, but not in sufficiency to be classed as spodic or argillic.

Cambisol (soil) Young soil with a cambic B-horizon and a A-B-C profile. Cambisols are typical in temperate or cooler regions, in which soils are either young or, depending on the climate, in which processes of soil formation occur slowly.

Cape Floristic Region (CFR) (biogeography) One of 37 global floristic regions (phytochoria) as defined by Takhtajan (1986), often referred to as the Cape Floristic Kingdom (CFK) which is one of six global floristic kingdoms.

Catena (soils) A related sequence of soil profile types created by changes from one drainage condition to another. These changes are usually transitional. Common example is from hilltop to valley bottom.

CE (biogeography) Abbreviation of ‘Centre of Endemism’ (see also Van Wyk & Smith 2001).

Chert (geology) Cryptocrystalline quartz of organic or inorganic origin. Also, the rock formed by the precipitation of this material, which can form bands or layers of nodules in sedimentary rocks (modified after Whitten & Brooks 1972).

Chlorite (geology) Green, flaky mineral of variable composition that is a common alteration product of ferromagnesian minerals; structurally resembling the micas (Deer et al. 1992).

Clastic (geology) Consisting of fragments of rock or of organic structures that have been moved individually from their places of origin (American Geological Institute 1976).

Climax (vegetation) That vegetation type or plant community structure that occurs at the end of the serial cycle. The climax communities may not be the final end point of the succession: frequent or even rare events, such as fire, frost, harvesting, or hurricanes, may hold the communities in a stable subclimax indefinitely (Low & Rebelo 1998).

Cobbles (geology) Generally rounded rock fragments with a diameter of between 64 mm and 256 mm, i.e. larger than a pebble and smaller than a boulder (Whitten & Brooks 1972).

Conglomerate (geology) A sedimentary rock type consisting of rounded pebbles (> 2 mm) or small rocks cemented with sands, silts or clays into a solid rock (Low & Rebelo 1998).

Coverage (GIS terminology) ARCMINFO data format of a digital spatial data set.

Craton (geology) Old, rigid, stable block of continental crust consisting mostly of coarse crystalline granitic rocks. Southern African geology has been dominated by the Kaapvaal Craton which has remained largely unaffected by several orogenic events along its fringes for the past two and a half billion years.

Cross-walk (analysis) A matrix table which usefully gives the degree of spatial correspondence between two mapped layers of information. A cross-walk represents one feature type as columns to compare with intersections with another feature represented as rows.

Cupressoid (botany) Pertaining to plants with small, awl-shaped leaves which clasp the stem, resembling those of a cypress (Low & Rebelo 1998).

Datum (GIS terminology) A set of parameters and control points used to accurately define the three-dimensional shape of the earth (e.g. as a spheroid). The datum is the basis for a planar co-ordinate system. VEGMAP uses the internationally related Hartebeesthoek94 datum based on the World Geodetic System 1984 (WGS84) reference ellipsoid. This replaces the previously used Cape datum.

Decimal degrees (geography) Degrees of latitude and longitude expressed in decimal format rather than in degrees, minutes and seconds.

DEM (GIS terminology) See ‘Digital elevation model’.

Diabase (geology) An ambiguous term used synonymously with dolerite. Other applications of the word are falling into disuse.

Diamictite (geology) A conglomerate with relatively few clasts (pebbles), such that they are not touching and forming a supporting network. A matrix of finer material surrounds and supports the clasts (Boggs 1992). Glacial deposits are often diamicitic.

Digital elevation model (GIS terminology) Cell-based, common digital data of the shape of the earth’s surface (ESRI 2006).

Digitising (GIS terminology) Transforming map features into digital form. Usually accomplished with a digitising tablet, or by creating a digital version and georectifying an image.

Diorite (geology) A coarse-grained plutonic igneous rock of a composition intermediate between granite and gabbro. It is the plutonic equivalent of andesite.

Dithionite (soil) As sodium dithionite (together with sodium bicarbonate and sodium citrate) an extracting reagent used for the determination of ‘free’ aluminium and iron in soils.

Dolerite (geology) An igneous rock with fine to medium grains, consisting of equal quantities of the minerals feldspar and pyroxene. Chemically, it is the same as basalt and gabbro. During the Jurassic Period, enormous quantities of dolerite were injected into the Karoo Sequence deposits as vertical dykes and horizontal sills. Because of its resistance to erosion, dolerite dykes and sills have shaped many landscapes, especially the eastern Karoo (Low & Rebelo 1998).

Dolomite (geology) A carbonate of calcium and magnesium, which only effervesces with dilute acid if powdered or heated. The Transvaal Supergroup comprises much dolomite, formed by chemical precipitation. Dolomite dissolves giving rise to sinkholes (as in Gauteng), but also stores water, giving rise to the ‘eyes’ (small lakes) in North-West Province (modified after Low & Rebelo 1998).

Donga (geomorphology) Local term for deep, usually dry erosion trench or ravine.

Dorbank (soil) A hard to extremely hard (silica-cemented) layer of soil. It occurs as a (usually reddish coloured) subsoil horizon in certain soils of arid regions. It does not slake in water but only in strong alkali. It is synonymous with the ‘duribank’ (or ‘duripan’) of other classification systems.

Doringveld (vegetation) Afrikaans term for vegetation (usually woodland) dominated by Acacia (for example Acacia karroo).

Duplex (soil) A soil type with a porous topsoil abruptly overlying a slowly permeable layer of soil, usually sand over clay. This does not apply to hardpan layers which form within a soil type due to cementing by iron oxides (ferricrete, laterite), silica (silcrete) or lime (calcrite) (after Low & Rebelo 1998).

Duribank (soil) Synonymous with ‘dorbank’ or ‘duripan’.

Duricrust (soil) A hard crust that formed near the land surface during the processes of weathering of rocks and during soil formation, usually in tropical or arid regions. The main types include calcrete, calcrite, ferricrete (laterite) and silcrete.

Duripan (soil) A term used in certain international classification systems for a mineral soil horizon that is cemented by silica to a point that air-dry fragments will not slake in water or HCl; synonymous with ‘dorbank’.


Dystrophic (soil) Pertaining to soil that has suffered marked leaching of the exchangeable basic cations (i.e. Ca, Mg, K and Na). Such soils are generally referred to as having a low base saturation. Synonymous with dystric.

Ecotone (vegetation) A zone in which two or more vegetation types or ecosystems merge. These areas may be rich in species from both systems, or may occur as species-poor fringes (Low & Rebelo 1998).

Eluvial (soil) Pertaining to weathered material which is still at, or near, its point of formation (Whitten & Brooks 1972).

Endemic (biogeography) Pertaining to a plant or animal species which is naturally restricted to a particular, well-defined region. This is not the same as the medical definition, which is ‘occurring naturally in a region’—it is thus often confused with indigenous (modified after Low & Rebelo 1998).

Ephemeral (botany) Referring to the life-form of a perennial plant that makes occasional appearances above-ground and maintains perennating organs underground (e.g. bulbous plants).

Epiphyte (botany): A plant which grows on another plant, but which is not parasitic and uses the other plant only as a perch for better obtaining light or nutrients (Low & Rebelo 1998).

Eutrophic (soil) Refers to soil that has suffered little or no leaching of the exchangeable basic cations (Ca, Mg, K and Na). Such soils are generally referred to as having a high base status.

Feldspar (geology) A group of the most abundant minerals in the earth’s crust. Most can be classified as members of the simple ternary system albite–potassium feldspar–anorthite (after Deer et al. 1992).

Ferricrete (geology) A rock formed in the soil profile at the water table when iron oxides accumulate around and cement grains together to form a gravelly or nodule-rich band. This may become impervious to water (compare ‘Duplex’). Also known as ‘ironpan’, ‘koffieklip’, ‘ouklip’ or ‘ngubane’ (modified after Low & Rebelo 1998).

Fjelfield (vegetation) Open-canopy, low vegetation composed of herbs, dwarf shrubs, mosses and lichens on shallow stony soils in the (sub)antarctic and (sub)arctic regions. Also spelt fellfield.

Floristic (vegetation) Referring to the use of plant species composition (flora) as criterion for characterising or classifying vegetation.

Forb (botany) A plant without secondary thickening (i.e. non-woody), usually living for only one or two seasons (Low & Rebelo 1998).

Forest (vegetation) A plant community having a continuous tree layer, with or without a shrub/herbaceous layer (Geldenhuys et al. 1988). In his structural classification of vegetation types, Edwards (1983) defined forest as a ‘vegetation type possessing canopy cover ≥ 75% of trees taller than two metres’.

Fynbos (biome) Large areas of Western (and partly also Northern and Eastern) Cape Provinces, characterised by a predominately winter-rainfall regime and supporting shrublands, herblands, grasslands and resti-lands. These can be (in some
cases partly) structurally classified as fynbos, renosterveld, strandveld and Cape thicket.

**Fynbos** (vegetation) The dominant vegetation of the Fynbos Biome, characterised by the presence of Restionaceae, and often with a high cover of ericoid shrubs in the families Ericaceae, Asteraceae, Rhamnaceae and Thymelaeaceae, and the common occurrence of Proteaceae. It occurs predominantly on nutrient-poor soils.

**Gabbro** (geology) A dark, coarse-grained igneous rock, consisting of the mineral calcium-feldspar and crystals of the pyroxene group (olivine may be present). It is the plutonic equivalent of basalt and dolerite (modified after Low & Rebelo 1998).

**Geodatabase** (GIS terminology) A logical collection of interrelated information managed and stored as a unit, usually on some form of mass storage system such as magnetic tape or disk. A GIS database includes data about the spatial location and shape of geographical features recorded as points, lines, areas, pixels, grid cells or TIN (Triangular Irregular Network) as well as their attributes (ESRI 2006).

**Geogenic mottling** (geology) Spots or blotches of colour or shades of colour interspersed with the dominant colour of the soil matrix; developing by weathering of rock consisting of different kinds of minerals.

**Geographic Information System** (GIS terminology) An organised collection of computer hardware, software, geographical data, and personnel designed to efficiently capture, store, update, manipulate, analyse, and display all forms of geographically referenced information (ESRI 2006).

**Geophyte** (botany) A plant with its permanent parts in the ground, and of which the aerial parts die back annually. The flowers are produced before, or after the leaves. Important groups of geophytes include plants with corms, bulbs and rhizomes (underground stems) (modified after Low & Rebelo 1998).

**Georeference** (GIS terminology) To establish the relationship between page co-ordinates on a planar map or image with known real-world co-ordinates (longitude/latitude). Also referred to as registering or georectifying.

**GEOXYLIC SUFFRETUS** (botany) A plant with annual or short-lived woody above-ground shoots sprouting from a massive or extensive, perennial, underground stem (after Low & Rebelo 1998).

**Glenrosa** (soil) Soil form with orthic A-horizon above a lithic B-horizon.

**Gleying** (soil) Intense chemical reduction in prolonged waterlogged soils, generally grey (no iron) or blue-green (iron present) (Low & Rebelo 1998).

**Gneiss** (geology) Banded rocks formed during high-grade regional metamorphism. Gneisses are generally coarse-grained, rich in quartz and feldspar and can form from a number of protoliths (precursor rocks) (modified after Whitten & Brooks 1972).

**Graben** (geology) A downthrown block between two parallel normal-faults (Whitten & Brooks 1972) that will commonly form a sedimentary basin. A half-graben is a similar structure formed to the downthrown side of a single normal-fault.

**Graminoid** (botany) Pertaining to a herbaceous growth form characterised by a ‘grass-like’ appearance (tufted growth, usually long and narrow leaves, secondary root system) and including plants such as grasses, restios, sedges and rushes.

**Granite** (geology) A coarse-grained igneous rock that is the plutonic equivalent of rhyolite. It consists essentially of quartz, alkali feldspar and mica.

**Granodiorite** (geology) A coarse-grained plutonic igneous rock, intermediate between granite and diorite.

**Granophyre** (geology) Very fine-grained granite displaying an intergrowth between quartz and feldspar.

**Grassland** (vegetation) Vegetation dominated by grasses (or graminoids) usually with a single-layered structure and sometimes with an open, woody plant cover.

**Greywacke** (geology) Type of arenaceous rock that is usually poorly sorted and contains fragments of rock in addition to an argillaceous (clay-rich) matrix (Whitten & Brooks 1972).

**GRID** (GIS terminology) A module of ARC/INFO that processes raster data.

**Gwarrieveeld** (vegetation) An Afrikaans term for low shrubland dotted by solitary large shrubs or small trees (especially Euclera undulata (gwarrie) and Pappea capensis). This type usually occurs on the interface between Karoo and the Albany Thicket in the east.

**Gya** (geology, palaeo-ecology) Abbreviation of ‘giga (10^9) years’.

**Gypsum** (geology) A rock formed in the soil profile at the water table when gypsum accumulates and cements particles together to form a hard rock band.

**Gypsumrich** (geology) Common calcium- and sulphur-rich evaporate mineral.

**Habitat** (environment) The home of any animal or plant species. Generally those features of an area inhabited by an animal or plant considered essential to its survival (Low & Rebelo 1998).

**Hardeveld** (geography) A colloquial (Afrikaans) term used to describe a region built of hard-rock geology and often to contrast with adjacent regions with softer, e.g. sandy, substrates.

**Hardpan** (soil) A layer of strongly cemented material occurring in unconsolidated sediments (or soil profile). Formed by the action of groundwater precipitating a cement (compare ‘calcrite’, ‘silcrete’, ‘ferricrete’, ‘gypscrete’); it is synonymous with the term ‘duricrust’ (Whitten & Brooks 1972).

**Headland** (geomorphology) A point of high land jutting out into the sea (Thompson 1995).

**Hematite** (geology) Fe_3O_4, a very important iron-ore found predominantly in sediments or their metamorphic equivalents. Its red streak is characteristic (Deer et al. 1992).

**Herbland** (vegetation) Structural vegetation type dominated by herbs.

**Heuweltjie** (geomorphology) Afrikaans term for a raised (sometimes very slightly) mound, about 10–35 m (but mostly
Hyaloclastite deposits (geology) Deposits of glassy material formed by the eruption of magma (usually basaltic) in a subaqueous environment. This type of rock is most commonly formed at mid-ocean ridges (adapted from Davis & Clague 2003).

Igneous (geology) A rock that forms by the intrusion of magma (plutonism) or the extrusion of lava (volcanism). Plutonic rocks are generally coarsely crystalline (such as granite and gabbro) whereas volcanic rocks are very fine-grained (basalt) or even glassy (rhyolite), although they can contain larger crystals formed at depth before eruption (common in andesite). The other major rock types are sedimentary (deposited by wind and water) and metamorphic (pre-existing rocks transformed by high pressure and temperature).

Illuvial (soil) Referring to a zone of deposition of leached material in a soil or to a soil possessing such zone (modified after Whitten & Brooks 1972).

Indigenous (botany) Occurring naturally in a defined area (contrast with endemic)—the area must be specified. Thus the baobab (Adansonia digitata) is indigenous and not endemic to South Africa, but it is not indigenous to KwaZulu-Natal (modified after Low & Rebelo 1998).

Indurated (geology) Hardened. Induration is the process by which soft sediment becomes hard rock due to heat, pressure or cementation (after Whitten & Brooks 1972).

Intertidal (geomorphology) Referring to a complex of coastal and estuarine habitats subject to periodic flooding due to the cyclic ebb and flow movements of the sea.

Intertropical Convergence Zone (ITCZ) (climate) Variable zone around the equator where airstreams from the northern and southern hemispheres converge and characterised by increased convectional activity (intensive air heating) (after Steigerer 1976).

Kameeldoring (vernacular) Afrikaans word for Acacia erioloba (Fabaceae), a conspicuous and important tree of the Kalahari savanna.

Kaolinite (geology) The most important mineral in the kaolinite group of clay minerals. It is a common product of the weathering of feldspar minerals.

Karoo (geography) South African word, originating in both Afrikaans and English, for ‘low-altitude veld’; encompassing the specific areas between the Eastern Escarpment and the Lebombo Mountains in Limpopo and Mpumalanga Provinces, the northern interior lowlands of KwaZulu-Natal as well as the lowlands of Swaziland and southeastern Zimbabwe. The term is never used to apply to the coastal lowlands.

Karfunkel (geology) Pertaining to rocks formed by the intrusion of magma; magma that contains large amounts of water, particularly in the upper crust.

Koppie (geography) Small hill or hillock, an Afrikaans term adopted by South African English.

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Marula (ethnobotany) Adaptation of the Setswana and North Sotho ‘morula’ name, possibly via Afrikaans ‘margele’, for Sclerocarya birrea (Anacardiaceae), popular native fruit tree, characteristic of many types of savanna vegetation in Africa.

MAT (climate) See ‘Mean annual temperature’.

Mean Annual Precipitation (MAP) (climate) Arithmetic mean of the precipitation at a locality over many years. Differs from median annual precipitation, which is the middle value of precipitation, with the number of years with higher precipitation equaling the number of years with lower precipitation. In southern Africa the number of years below average are more numerous than those above average (especially in areas of low rainfall), and therefore median annual precipitation is sometimes preferentially used to reduce risk in planning within precipitation-dependent enterprises such as farming (Schulze 1997). The median values thus provide some form of statistical expectation. Sometimes mean and median values are very similar.

Mean Annual Temperature (MAT) (climate) The temperature of the whole year arithmetically averaged over many years at a locality. In South Africa, where hourly data are generally unavailable, MAT is approximated by averaging all the daily maximum and minimum temperature values of each year. In South Africa the error is always in the form of a small (typically around 0.5°C) overestimate. Temperatures are measured in well-ventilated shade (typically Stevenson screens) and at a height of 1.2 m above ground, which can greatly overestimate (i.e. less cold) minimum temperature near the ground surface.

Median Monthly Precipitation (climate) The middle value of precipitation for a given month from those of each year ranked from highest to lowest for a locality. Mean monthly precipitation values are frequently ‘inflated’ by a few heavy and extreme events (especially in dry regions) while the median values are more representative of expected conditions which are important for planning in enterprises such as farming (Schulze 1997). Sometimes mean and median values are very similar.

Mekgacha (geomorphology) SeTswana word for ‘dry river canal’, similar to Herero ‘omuramba’, American ‘river wash’ or Arabic ‘waadi’.


Mesa (geomorphology) A flat-topped hillock or small mountain, formed for example by a hard sandstone sheet or dolerite sill capping that protects the underlying softer rock from erosion. Mesas and the smaller buttes (sometimes eroded to a striking pinnacle) are typical of many Karoo landscapes (Low & Rebelo 1998).

Mesor (soil, habitat) Intermediate between dry and wet in either climate or soil water characteristics (Low & Rebelo 1998).

Metadata (GIS terminology) Information about GIS data describing a collection of data. Metadata for geographical data may include the source of the data, their creation date and format, their projection, scale, resolution, and accuracy, and their reliability with regard to some standard. Metadata consist of properties and documentation. Properties are derived from the data source, while documentation is entered by a person. By default, ArcCatalog automatically creates and updates metadata, which are stored as well-formed XML data in a file alongside the data or within a geodatabase. Metadata for a folder can also consist of a well-formed HTML file describing its contents (ESRI 2006).

Metasediment (geology) Metamorphosed sedimentary rock.

Metavolcanic (geology) Pertaining to metamorphosed volcanic rock.

Middleveld (geography) A term very commonly used in Swaziland for the area between the highveld and lowveld, i.e. roughly between altitudes of 400 and 800 m. In South Africa rarely used to describe the plains between the highveld and lowveld, essentially the area north of Pretoria and west of the Eastern Escarpment. In KwaZulu-Natal this intermediate area is referred to as the Midlands.

Midlands (geography) Local term designating a mid-altitude area of KwaZulu-Natal.

Mielie (vernacular) Afrikaans word for maize (Zea mays).

Migmatite (geology) Essentially it is any ‘mixed’ rock. Usually used to describe a rock that has formed by partial melting. This results in a rock consisting of leucocratic material mixed with melanocratic material. The leucocratic material represents a former melt segregated from a residuum of mafic material, the melanocratic part.

Miombo (vegetation) Tropical savanna vegetation typical of Zimbabwe, Zambia, Mozambique, Malawi, southern Tanzania, southern Democratic Republic of Congo and Angola, and dominated by ceasalpinoid trees of the genera Brachystegia, Julbernardia and Isoberlinia. Ranging from sparse woodlands to closed-canopy deciduous miombo forests.

Mire (habitat) A peat-forming ecosystem also called ‘bog’ or ‘flush’. Does not include marshes since they are not peat-forming.

Mispah (soil) Soil form with orthic A-horizon above hard rock.

Mistbelt (geography) Variable altitudinal belt with high frequency of mist and fog resulting from precipitation of water-laden ascending airflows. Mistbelt occurs over much of the KwaZulu-Natal midlands and Northern Escarpment.

Mollisol (soil) One of the soil orders of the USDA Soil Taxonomy. It describes soils of subhumid to semi-arid grasslands with deep, dark, friable surface horizons, with a moderate to high base saturation.

Montmorillonite (soil) Clays with a 2:1 lattice arrangement, found mainly in fertile soils. They store water extremely well (Low & Rebelo 1998).

Mopane (vegetation) Type of savanna woodland, usually dominated by mopane trees or shrubs (Colophospermum mopane, Fabaceae), occurring on heavy soils on broad alluvia over large stretches of the Lowveld (Limpopo Province), Zimbabwe, Botswana, Zambia, northern Namibia, southern Angola, parts of Mozambique and southern Malawi.

Muthi (ethnobotany) Nguni word for plants (or animals or minerals) or parts thereof used in traditional African medicine (Low & Rebelo 1998).

mya (geology, palaeo-ecology) Abbreviation of ‘million years ago’.

Neocarbonate B-horizon (soil) A South African Soil Classification diagnostic subsoil horizon. It describes a horizon that has developed in recent sediments and unconsolidated material (usually transported), showing little signs of pedogenesis and is calcareous.

Neocutanic B-horizon (soil) The noncalcareous equivalent of the neocarbonate B-horizon.
Ngongoni veld (habitat) Type of wiry grasslands (usually secondary) in overgrazed coastal areas of Transkei and KwaZulu-Natal and dominated by Aristida junciformis. The word is the Nguni name of this grass species.

Norite (geology) A type of gabbro (see ‘Gabbro’).

Oligotrophic (soil) Poor in nutrients (see also ‘Dystrophic’).

Orogen (geology) Mountain belt, or the exposed core of such a belt after erosion has reduced the relief.

Orogeny or orogenesis (geology) The process of forming mountains, particularly by folding and thrusting (American Geological Institute 1976). Also the period of mountain building. Duration generally several tens of millions of years (Whitten & Brooks 1972).

Orthic A-horizon (soil) A South African Soil Classification diagnostic surface horizon. It is the most widely distributed surface horizon in South Africa and describes a surface horizon that does not qualify as organic, humic, vertic or melanic topsoil horizons.

Ortstein (soil) A massive soil material (hardpan) enriched with and strongly cemented by iron oxides and organic matter.

Palmveld (vegetation) Fairly limited wetland areas in Maputaland characterised by wet grasslands with patches of generally low Phoenix reclinata and dotted with Ilala palm (Hyphaene coriacea) occurring as solitary trees or in small groups.

Pediment (soil) The flat area at the foot slope of a mountain or hill (Low & Rebelo 1998).

Pedocutanic B-horizon (soil) Horizon with a moderate to strong blocky structure and clearly expressed cutans.

Pedologic (soil) Referring to soil. Pedology is the science of the soil.

Phreatomagmatic activity (geology) Volcanic activity caused by the rapid and violent conversion of groundwater to steam as a result of some magmatic heat source (Whitten & Brooks 1972).

Phyllite (geology) A cleaved metamorphic rock coarser-grained than slate, but finer-grained than mica schist (Whitten & Brooks 1972).

Physiognomy (vegetation) The structure and life form characteristics of a particular plant community or vegetation type (Low & Rebelo 1998).

Phytochorion (biogeography) Unit of phytogeographic classification of land, usually based on the co-occurrence (as well as striking assemblage) of groups of plant taxa. Floristic kingdom, floristic region, floristic province etc. are categories of phytochoria.

Placic pan (soil) A thin dark cemented layer, more or less parallel to the soil surface, associated with podzol B-horizons. It is commonly cemented with iron oxides and is slowly permeable or impermeable to water and roots.

Plagioclase (geology) One of the most common rock-forming minerals. A mineral series showing a complete compositional variation between sodium-rich plagioclase (albite) and calcium-rich plagioclase (anorthite) (American Geological Institute 1976).

Playa (geomorphology) Dry lake bed in desert area. It is synonymous with ‘dry salt pan’ or ‘vloer’.

Plinthic B-horizon (soil) A mottled and concretionary (iron and manganese oxide) horizon that is nonindurated and noncalcar-eous (soft plinthic). The hard plinthic B is the indurated equivalent of the soft plinthic B.

Pluton (geology) In the strictest sense, a body of igneous rock that has formed below the surface of the earth by consolidation from magma (American Geological Institute 1976).

Podzol (soil) A soil in which the minerals (especially iron), clay and organic matter, have been leached out, giving rise to a white middle layer (an E-horizon). This typically occurs in soils derived from quartzitic sands under acidic conditions (after Low & Rebelo 1998).

Polygon (GIS terminology) A two-dimensional multisided enclosed area representing any feature.

Prismacutanic B-horizon (soil) Horizon with an abrupt transition with respect to texture, structure or consistence. The structure is moderately to strongly prismatic or columnar.

Projection (GIS terminology) A mathematical formula that transforms feature locations between the earth’s curved surface and a map’s flat surface. Projections cause distortions in one or more of these spatial properties: distance, area, shape and direction (ESRI 2006). The VEGMAP wall map and atlas are projected using Albers Equal Area while the electronic data are presented in geographical co-ordinates (decimal degrees). Common projections in use for South Africa are Transverse Mercator for local authority level, Albers Equal Area or Gauss Conform for work on national scale.

Proteoid (vegetation) Vegetation-structural term used to designate fynbos shrublands dominated by the members of the family Proteaceae (such as the genera Protea, Leucadendron, Leucospermum).

QDS (cartography) ‘Quarter degree square’ comprising the area covered by one map sheet of the 1:50 000 South African topographic map sheet series. Each sheet depicts the area of one quarter degree latitude by one quarter degree longitude and approximates an area of 30 by 30 km. The QDS system was used extensively for designating the distribution of plants in the PRECIS database but more precise GPS co-ordinate recording of specimens is now encouraged.

Quartz patch (geology, soil) Usually arid or semi-arid habitat characterised by concentrations of quartz stones on the surface and in the upper soil layers. Often relatively cooler than surrounding vegetation and generally dominated by succulent ‘stone-plants’, many of which are endemic.

Quartzite (geology) Strictly it is a metamorphosed sandstone. During heating the constituent grains recrystallise to an interlocked texture, with little or no trace of cementation (modified after Whitten & Brooks 1972). Quartzite is commonly used to describe very pure, well-cemented sandstones of the Cape Supergroup.

Raster data (GIS terminology) Raster data record spatial information in a regular grid or matrix organised as a set of rows and columns (compare ‘Vector data”).

Reed bed (vegetation) Tall graminoid vegetation composed of reeds (Phragmites, Typha), usually found in wetlands.

Regic (soil) Pertaining to a blanket of soil, usually sand, which has been deposited over another soil or rock, and which has not yet had time to develop profiles or layers (after Low & Rebelo 1998).

Regosols (soil) A major group of soils described in the World Reference Base for Soil Resources. Soils with weak or no profile development.
Relational database (analysis) A method of structuring collections of data in tables that are logically associated with each other by shared attributes as opposed to a single table or 'flat table structure'.

Renosterveld (vegetation) An evergreen, fire-prone shrubland or grassland of the Fynbos Biome dominated by small, cupressoid-leaved, evergreen,Cupressaceae, or jarra-aceae, or Hyacinthaceae).

they erupt explosively and accumulate by pyroclastic flow or tuff cones refer to those similar to the type locality of Surtsey, which different plants and animals colonise an area following a kind of disturbance. The final stage of the succession is called the ‘climax’, but various disturbances may prevent the vegetation from attaining its potential climax. The Fynbos, Grassland and Savanna Biomes have a ‘fire-climax’, in which fire prevents the succession from progressing to forest, in suitable habitats (Low & Rebelo 1998) (see also ‘Seral’).

Seep (habitat) Usually sloping area temporarily (or permanently) waterlogged by groundwater seeping through to the surface. Small water springs develop in places.

Seral (vegetation) Pertaining to a stage in the natural progression of colonisation by plants from bare soil to climax vegetation. Even within climax vegetation, tree falls and other events result in a progressive series of stages (Low & Rebelo 1998) (see also ‘Succession’).

Serpentine (geology) A group of ultramafic rocks (including hartzburgite, peridotite, phonolite, gabbro, norite etc.) characterised by high magnesium-to-calcium ratios and often a high concentration of heavy metals (nickel, chromium, copper).

Silcrete (soil) A conglomerate formed in the soil profile at the water table when silica (SiO₂) accumulates and cements grains together to form a very hard rock layer.

s.l. (botany) Abbreviation of ‘sensu lato’ (Latin), meaning ‘in a broad sense’.

Solonetz (soil) A soil with a thin porous topsoil with a columnar, salty or sodium-rich subsoil (Low & Rebelo 1998).

Sour grass (vegetation) Veld management term for grasses that have very low nutritional value, especially outside the growing season, exacerbated by the withdrawal of nutrients to underground storage organs. They usually have a very low nitrogen-to-carbon ratio which makes them indigestible to livestock.

Sourveld (vegetation) Vegetation dominated by sour grass. Sourveld tends to occur on infertile and acidic soils (after Low & Rebelo 1998).

S. str. (botany) Abbreviation of ‘sensu stricto’ (Latin), meaning ‘in a narrow sense’.

Strandline (habitat) Narrow band on beach recognisable by deposition of sea-borne debris by wave action.

Strandveld (vegetation) A coastal vegetation type within the Fynbos Biome consisting of medium dense to closed shrublands dominated by succulent and sclerophyllous, broad-leaved shrubs. It is the least fire-prone of the vegetation types in the Fynbos Biome and characteristic Fynbos elements are absent, except as an early seral stage known as dune fynbos.

Stratum (plural ‘strata’) (geology, soil, vegetation) A horizontal layer or set of layers of rock or soil or plants within a plant community (after Low & Rebelo 1998).

Succession (vegetation) A series of stages (compare ‘sera’) in which different plants and animals colonise an area following some kind of disturbance. The final stage of the succession is called the ‘climax’, but various disturbances may prevent the vegetation from attaining its potential climax. The Fynbos, Grassland and Savanna Biomes have a ‘fire-climax’, in which fire prevents the succession from progressing to forest, in suitable habitats (Low & Rebelo 1998) (see also ‘Seral’).

Supratidal (habitat) Pertaining to flat areas located just above the maximum upper tidal mark, hence outside the direct influence of the tidal regime, but still with saline water or saline deposits present in the soil profile.

Surtseyan tuff cones (geology) Ash erupted from a volcano is called tuff once it has consolidated. Tuff cones form when the ash accumulates around a volcanic vent in a cone. Surtseyan tuff cones refer to those similar to the type locality of Surtsey, an island formed by the accumulation of ash from an initially submarine volcano near Iceland.
Sweet grass (vegetation) Veld management term for grasses that have a high nutritional value during and outside the growing season and hence can also be grazed in winter.

Sweet veld (vegetation) A vegetation type dominated by sweet grasses. This usually occurs on richer, more alkaline soils (after Low & Rebelo 1998).

Syndline (geology) A basin-shaped fold is known as a synform. It is referred to as a syncline if the rock layers defining the structure are younger closer to the core.

Tafelberg (geomorphology) Afrikaans name for ‘table mountain’, designating some flat-topped mountains; equivalent to ‘mesa’.

Terrane (geology) A crustal block or fragment that preserves a distinctive geological history that is different from the surrounding areas and that is usually bounded by faults.

Thicket (vegetation) Very dense vegetation usually formed by low or tall shrubs and some trees.

Thornveld (vegetation) A woodland savanna dominated by trees with thorns, mainly Acacia species.

Tillite (geology) A diamicrite formed by glacial activity. The ice is able to transport all grain sizes from rock-flour to large boulders and deposit them to form a poorly sorted conglomerate.

TMS (geology) Abbreviation of ‘Table Mountain Sandstone’. Quartz-rich, hard sandstone of Ordovician age, named after Table Mountain.

Tonalite (geology) A type of diorite, often defined as having accessory quartz (Whitten & Brooks 1972).

Ultramafic (geology) Pertaining to igneous rocks consisting of ferromagnesian minerals to the virtual exclusion of quartz and feldspar. These rocks are poor in silica and rich in iron and magnesium. They are very dark in colour (highly melanocratic) and also very dense.

Vector data (GIS terminology) Vector data record spatial information as x,y co-ordinates in a rectangular (planar) co-ordinate system. Point features are recorded as single x,y locations. Line features, including the outlines of polygons, are recorded as an ordered series of x,y co-ordinates (ESRI 2006).

Vegetation structure (vegetation) The horizontal, vertical and temporal arrangement of vegetation, i.e. spatially explicit, e.g. layers, patches etc. (see also ‘Vegetation texture’) (Barkman 1979).

Vegetation texture (vegetation) The composition of the vegetation in terms of species, growth forms, life forms, leaf morphological types, etc. (see also ‘Vegetation structure’) (Barkman 1979).

Veld (geography) Very broad term for open undeveloped countryside, usually applied in karroid, grassland and savanna areas and less so in fynbos areas and never in forests.

Veld type (vegetation) A well-known delimitation of vegetation types in South Africa carried out by John Acocks (1953) who defined a veld type as ‘a unit of vegetation whose range of variation is small enough to permit the whole of it to have the same farming potentialities’.

Vertic (Soil) Pertaining to a soil with a blocky structure, which shrinks and swells markedly depending on wetness, due to a high clay content. These soils have a black or dark colour (Low & Rebelo 1998).

Vesicular hardening (soil) See ‘Ortstein’.

Vlei (geomorphology, habitat) Afrikaans term for a depression usually filled with water, at least temporarily, to form a lake or a wetland.

Vloer (geomorphology) Literally Afrikaans for ‘floor’, a term used for a dry pan in Bushmanland. Also often referred to as ‘kolk’. Can be well vegetated (e.g. Grootvloer) or bare (e.g. Verneukpan).

Vygie (botany) Afrikaans vernacular name for all succulent members of the family Aizoaceae (formerly known as Mesembryanthemaceae).

Vygieveld (vegetation) A vegetation shrubland type dominated by succulent plants (storing water in their stems and/or leaves), usually vygies.

Wetland (habitat) Areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt. Includes areas of marine water, the depth of which at low tide does not exceed 6 m (RAMSAR Convention 1971, Article 1.1). Also land where the water table is, at least periodically, at or above the land surface for long enough to promote the formation of hydric (waterlogged) soils and the growth of aquatic plants (Rogers 1997).

WGS84 (GIS terminology) Abbreviation of ‘World Geodetic System of 1984’. A geocentric datum and geographical co-ordinate system created by the United States military and in worldwide use (ESRI 2006).

White grass (vegetation) Veld management term for (usually) tussock grasses (Stipagrostis, Aristida) turning veld into white plains through their conspicuous plumage of hairs on the seeds at the stage of ripening and dispersal.

Woodland (vegetation) See ‘Savanna’.

References


Pretoria.

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INDEX

This index contains comprehensive page number entries for the names of all vegetation types and bioregions. The vegetation types and the pages with their main descriptions are shown as bold text. Only main occurrences of biomes and larger protected areas, mainly national parks, are included. Geographical features are mainly limited to regional names and some major mountains and rivers. The index includes the captions of figures and headings of tables. Plant taxa are not listed. Terms that appear frequently are either selectively listed or omitted. Terms occurring in the reference lists, credit sections and on the Atlas sheets (chapter 18) are not presented. References to authors are limited to Acokos but are not given for the vegetation description sections.
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