



Vegetation Atlas of South Africa, Lesotho and Swaziland

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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.

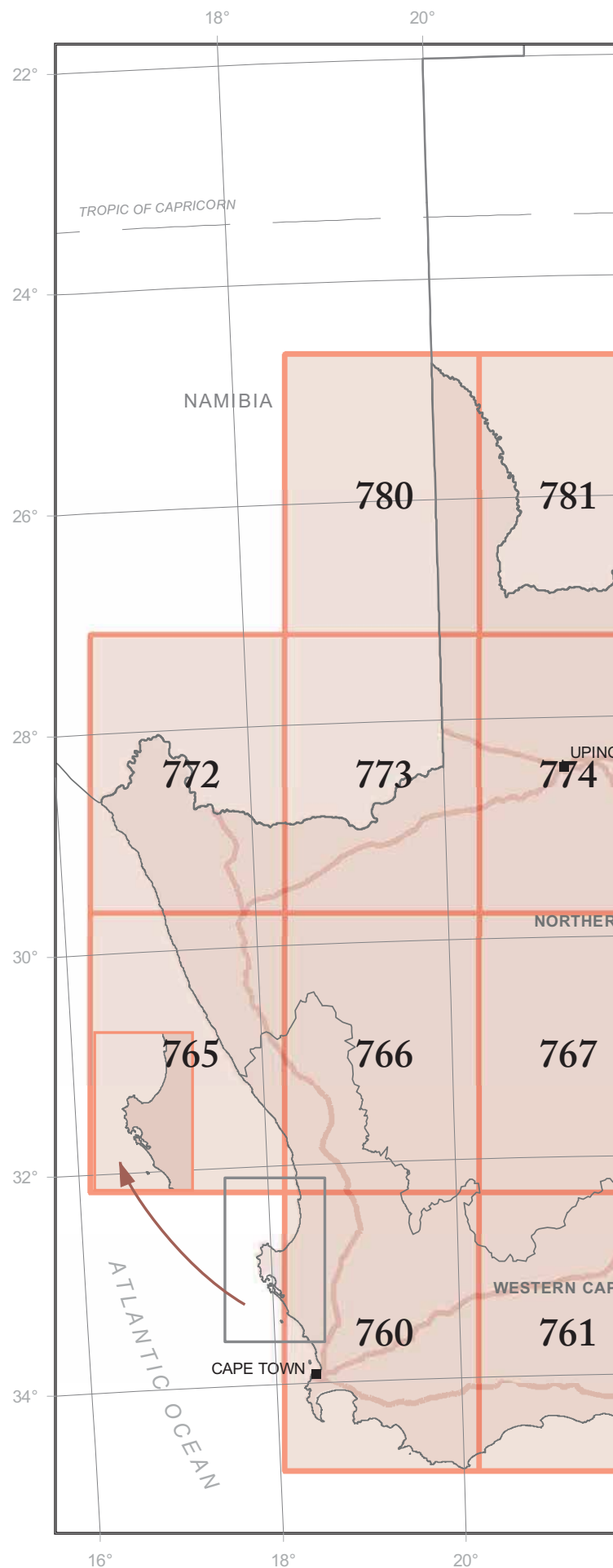
A compact disc (CD) containing the electronic shape files of the map is placed in a sleeve within the front cover of the book. This CD also contains the software ArcReader suitable for viewing the map on computer. This is a particularly valuable and effective means of zooming in to view very small polygons 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.

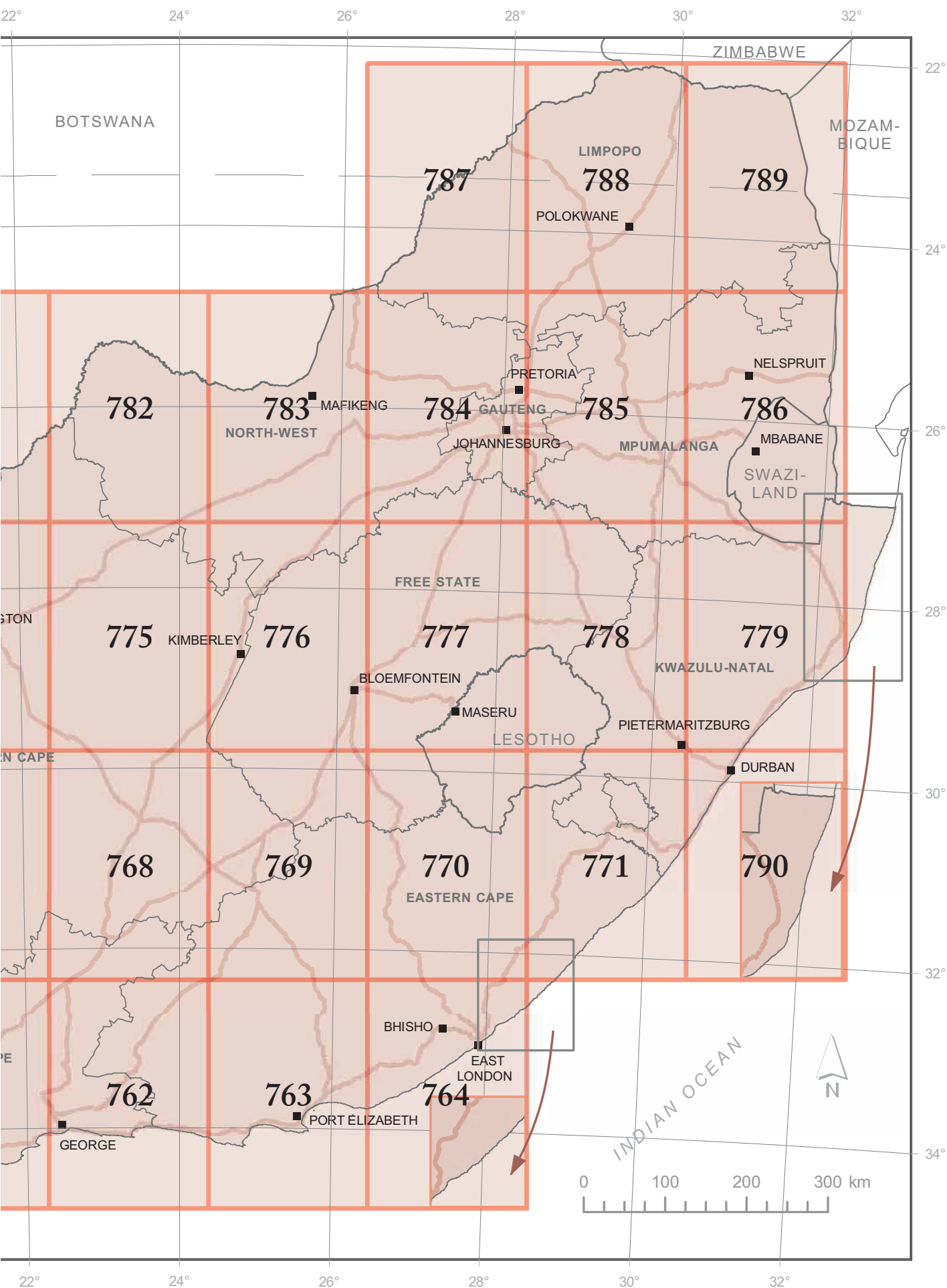
The maps of biomes and bioregions at much less detailed scales are to be found in Chapter 3.

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

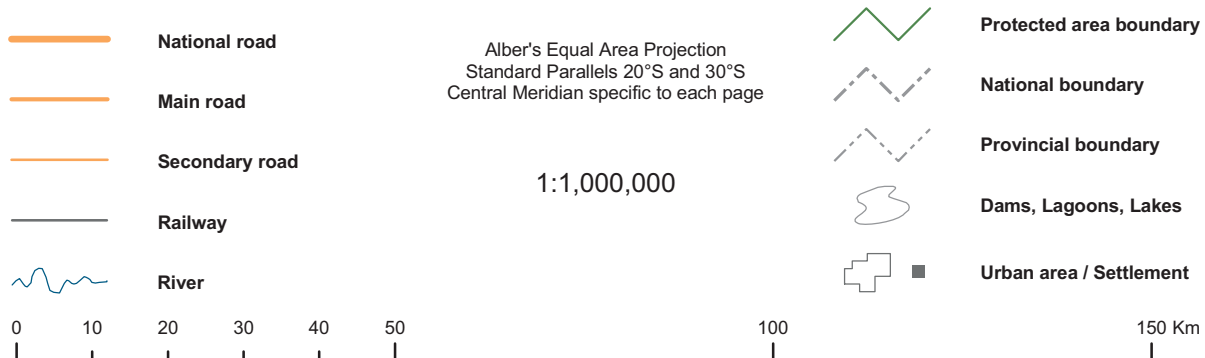
Reference

Mucina, L., Rutherford, M.C. & Powrie, L.W. (eds) 2005. *Vegetation Map of South Africa, Lesotho and Swaziland, 1:1 000 000 scale sheet maps*. South African National Biodiversity Institute, Pretoria.





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

FFs 22	South Rooiberg Sandstone Fynbos
FFs 23	North Swartberg Sandstone Fynbos
FFs 24	South Swartberg Sandstone Fynbos
FFs 25	North Kammanassie Sandstone Fynbos
FFs 26	South Kammanassie Sandstone Fynbos
FFs 27	Kouga Sandstone Fynbos
FFs 28	Kouga Grassy Sandstone Fynbos
FFs 29	Algoa Sandstone Fynbos
FFs 30	Western Altimontane Sandstone Fynbos
FFs 31	Swartberg Altimontane Sandstone Fynbos

Quartzite Fynbos

FFq 1	Stinkfonteinberge Quartzite Fynbos
FFq 2	Swartruggens 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	Leipoldville Sand Fynbos
FFd 3	Hopefield Sand Fynbos
FFd 4	Atlantis Sand Fynbos

	FFd 5	Cape Flats Sand Fynbos
	FFd 6	Hangklip Sand Fynbos
	FFd 7	Agulhas Sand Fynbos
	FFd 8	Breede Sand Fynbos
	FFd 9	Albertinia Sand Fynbos
	FFd 10	Knysna Sand Fynbos
	FFd 11	Southern Cape Dune Fynbos

Shale Fynbos

	FFh 1	Kouebokkeveld Shale Fynbos
	FFh 2	Matjiesfontein Shale Fynbos
	FFh 3	Swartberg Shale Fynbos
	FFh 4	Breede Shale Fynbos
	FFh 5	Cape Winelands Shale Fynbos
	FFh 6	Elgin Shale Fynbos
	FFh 7	Greyton Shale Fynbos
	FFh 8	Montagu Shale Fynbos
	FFh 9	Garden Route Shale Fynbos
	FFh 10	Suurberg Shale Fynbos

Shale Band Vegetation

	FFb 1	Northern Inland Shale Band Vegetation
	FFb 2	Western Coastal Shale Band Vegetation
	FFb 3	Central Inland Shale Band Vegetation
	FFb 4	Central Coastal Shale Band Vegetation
	FFb 5	Eastern Inland Shale Band Vegetation
	FFb 6	Eastern Coastal Shale Band Vegetation

Conglomerate Fynbos

	FFt 1	Kango Conglomerate Fynbos
	FFt 2	Loerie Conglomerate Fynbos

Alluvium Fynbos

	FFa 1	Kouebokkeveld Alluvium Fynbos
	FFa 2	Breede Alluvium Fynbos
	FFa 3	Swartland Alluvium Fynbos
	FFa 4	Lourensford Alluvium Fynbos

Granite Fynbos

	FFg 1	Kamiesberg Granite Fynbos
	FFg 2	Boland Granite Fynbos
	FFg 3	Peninsula Granite Fynbos
	FFg 4	Robertson Granite Fynbos
	FFg 5	Garden Route Granite Fynbos

Silcrete Fynbos

	FFc 1	Swellendam Silcrete Fynbos
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Ferricrete Fynbos

	FFf 1	Elim Ferricrete Fynbos
	FFf 2	Potberg Ferricrete Fynbos

Limestone Fynbos

	FFl 1	Agulhas Limestone Fynbos
	FFl 2	De Hoop Limestone Fynbos
	FFl 3	Canca Limestone Fynbos

Shale Renosterveld

	FRs 1	Vanhynsdorp Shale Renosterveld
	FRs 2	Nieuwoudtville Shale Renosterveld
	FRs 3	Roggeveld Shale Renosterveld
	FRs 4	Ceres Shale Renosterveld
	FRs 5	Central Mountain Shale Renosterveld
	FRs 6	Matjiesfontein Shale Renosterveld
	FRs 7	Montagu Shale Renosterveld
	FRs 8	Breede Shale Renosterveld
	FRs 9	Swartland Shale Renosterveld
	FRs 10	Peninsula Shale Renosterveld
	FRs 11	Western Rûens Shale Renosterveld
	FRs 12	Central Rûens Shale Renosterveld
	FRs 13	Eastern Rûens Shale Renosterveld
	FRs 14	Mossel Bay Shale Renosterveld
	FRs 15	Swartberg Shale Renosterveld

	FRs 16	Uniondale Shale Renosterveld
	FRs 17	Langkloof Shale Renosterveld
	FRs 18	Baviaanskloof Shale Renosterveld
	FRs 19	Humansdorp Shale Renosterveld

Granite Renosterveld

	FRg 1	Namaqualand Granite Renosterveld
	FRg 2	Swartland Granite Renosterveld
	FRg 3	Robertson Granite Renosterveld

Dolerite Renosterveld

	FRd 1	Nieuwoudtville-Roggeveld Dolerite Renosterveld
	FRd 2	Hantam Plateau Dolerite Renosterveld

Alluvium Renosterveld

	FRa 1	Breede Alluvium Renosterveld
	FRa 2	Swartland Alluvium Renosterveld

Silcrete Renosterveld

	FRc 1	Swartland Silcrete Renosterveld
	FRc 2	Rûens Silcrete Renosterveld

Limestone Renosterveld

	FRI 1	Kango Limestone Renosterveld
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Western Strandveld

	FS 1	Lambert's Bay Strandveld
	FS 2	Saldanha Granite Strandveld
	FS 3	Saldanha Flats Strandveld
	FS 4	Saldanha Limestone Strandveld
	FS 5	Langebaan Dune Strandveld
	FS 6	Cape Flats Dune Strandveld
	FS 7	Overberg Dune Strandveld
	FS 8	Blombos Strandveld
	FS 9	Groot Brak Dune Strandveld

SUCCULENT KAROO BIOME

Richtersveld Bioregion Bioregion

	SKr 1	Central Richtersveld Mountain Shrubland
	SKr 2	Upper Annisvlakte Succulent Shrubland
	SKr 3	Goariep Mountain Succulent Shrubland
	SKr 4	Lekkersing Succulent Shrubland
	SKr 5	Vyftienmyl se Berge Succulent Shrubland
	SKr 6	Stinkfonteinberge Eastern Apron Shrubland
	SKr 7	Northern Richtersveld Scorpionstailveld
	SKr 8	Rosyntjieberg Succulent Shrubland
	SKr 9	Tatasberg Mountain Succulent Shrubland
	SKr 10	Die Plate Succulent Shrubland
	SKr 11	Rooiberg Quartz Vygiveld
	SKr 12	Kosiesberg Succulent Shrubland
	SKr 13	Southern Richtersveld Scorpionstailveld
	SKr 14	Southern Richtersveld Inselberg Shrubland
	SKr 15	Anenous Plateau Shrubland
	SKr 16	Umdaus Mountains Succulent Shrubland
	SKr 17	Eenriet Plains Succulent Shrubland
	SKr 18	Bushmanland Inselberg Shrubland
	SKr 19	Aggeneys Gravel Vygiveld

Namaqualand Hardeveld Bioregion

	SKn 1	Namaqualand Klipkoppe Shrubland
	SKn 2	Namaqualand Shale Shrubland
	SKn 3	Namaqualand Blomveld
	SKn 4	Namaqualand Heuweltjieveld
	SKn 5	Platbakkies Succulent Shrubland
	SKn 6	Kamiesberg Mountains Shrubland

Namaqualand Sandveld Bioregion

	SKs 1	Richtersveld Coastal Duneveld
	SKs 2	Northern Richtersveld Yellow Duneveld
	SKs 3	Southern Richtersveld Yellow Duneveld
	SKs 4	Richtersveld Sandy Coastal Scorpionstailveld
	SKs 5	Richtersveld Red Duneveld

	SKs 6	Oograbies Plains Sandy Grassland
	SKs 7	Namaqualand Strandveld
	SKs 8	Namaqualand Coastal Duneveld
	SKs 9	Namaqualand Inland Duneveld
	SKs 10	Riethuis-Wallekraal Quartz Vygiveld
	SKs 11	Namaqualand Arid Grassland
	SKs 12	Namaqualand Spinescent Grassland
	SKs 13	Klawer Sandy Shrubland

Knersvlakte Bioregion

	SKk 1	Northern Knersvlakte Vygiveld
	SKk 2	Central Knersvlakte Vygiveld
	SKk 3	Knersvlakte Quartz Vygiveld
	SKk 4	Knersvlakte Shale Vygiveld
	SKk 5	Vanrhynsdorp Gannabosveld
	SKk 6	Knersvlakte Dolomite Vygiveld
	SKk 7	Citrusdal Vygiveld
	SKk 8	Piketberg Quartz Succulent Shrubland

Trans-Escarpment Succulent Karoo Bioregion

	SKt 1	Western Bushmanland Klipveld
	SKt 2	Hantam Karoo
	SKt 3	Roggeveld Karoo

Rainshadow Valley Karoo Bioregion

	SKv 1	Doringrivier Quartzite Karoo
	SKv 2	Swartruggens Quartzite Karoo
	SKv 3	Agter-Sederberg Shrubland
	SKv 4	Tanqua Escarpment Shrubland
	SKv 5	Tanqua Karoo
	SKv 6	Koedoesberge-Moordenaars Karoo
	SKv 7	Robertson Karoo
	SKv 8	Western Little Karoo
	SKv 9	Western Gwarrieveld
	SKv 10	Little Karoo Quartz Vygiveld
	SKv 11	Eastern Little Karoo
	SKv 12	Willowmore Gwarrieveld

	SKv 13	Prince Albert Succulent Karoo
	SKv 14	Steytlerville Karoo

DESERT BIOME

Namib Desert Bioregion

	Dn 1	Alexander Bay Coastal Duneveld
	Dn 2	Namib Lichen Fields
	Dn 3	Western Gariep Plains Desert
	Dn 4	Western Gariep Lowland Desert
	Dn 5	Western Gariep Hills Desert

Gariep Desert Bioregion

	Dg 1	Noms Mountain Desert
	Dg 2	Richtersberg Mountain Desert
	Dg 3	Richtersveld Sheet Wash Desert
	Dg 4	Kwaggarug Mountain Desert
	Dg 5	Kahams Mountain Desert
	Dg 6	Helskloof Canyon Desert
	Dg 7	Northern Nababiepsberge Mountain Desert
	Dg 8	Southern Nababiepsberge Mountain Desert
	Dg 9	Eastern Gariep Plains Desert
	Dg 10	Eastern Gariep Rocky Desert

NAMA-KAROO BIOME

Bushmanland Bioregion

	NKb 1	Lower Gariep Broken Veld
	NKb 2	Blouputs Karroid Thornveld
	NKb 3	Bushmanland Arid Grassland
	NKb 4	Bushmanland Sandy Grassland
	NKb 5	Kalahari Karroid Shrubland
	NKb 6	Bushmanland Basin Shrubland

Upper Karoo Bioregion

	NKu 1	Western Upper Karoo
	NKu 2	Upper Karoo Hardeveld
	NKu 3	Northern Upper Karoo
	NKu 4	Eastern Upper Karoo

Lower Karoo Bioregion

	NKI 1	Gamka Karoo
	NKI 2	Eastern Lower Karoo
	NKI 3	Lower Karoo Gwarrieveld
	NKI 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 Afromontane Fynbos
	Gd 7	uKhahlamba Basalt Grassland
	Gd 8	Lesotho Highland Basalt Grassland
	Gd 9	Western Lesotho Basalt Shrubland
	Gd 10	Drakensberg Afroalpine Heathland

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	Klerksdorp Thornveld
	Gh 14	Western Highveld Sandy Grassland
	Gh 15	Carletonville Dolomite Grassland

Mesic Highveld Grassland Bioregion

	Gm 1	Zastron Moist Grassland
	Gm 2	Senqu 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	Egoli 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 Afromontane 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

Sub-Escarpment Grassland Bioregion

	Gs 1	Northern Zululand Mistbelt Grassland
	Gs 2	Ithala Quartzite Sourveld
	Gs 3	Low Escarpment Moist Grassland
	Gs 4	Northern KwaZulu-Natal Moist Grassland
	Gs 5	Northern KwaZulu-Natal Shrubland
	Gs 6	KwaZulu-Natal Highland Thornveld
	Gs 7	Income Sandy Grassland
	Gs 8	Mooi River Highland Grassland
	Gs 9	Midlands Mistbelt Grassland
	Gs 10	Drakensberg Foothill Moist Grassland
	Gs 11	Southern KwaZulu-Natal Moist Grassland
	Gs 12	East Griqualand Grassland
	Gs 13	Mabela Sandy Grassland
	Gs 14	Mthatha Moist Grassland
	Gs 15	Tsomo Grassland
	Gs 16	Queenstown Thornveld
	Gs 17	Tarkastad Montane Shrubland
	Gs 18	Bedford Dry Grassland

SAVANNA BIOME**Central Bushveld Bioregion**

	SVcb 1	Dwaalboom Thornveld
	SVcb 2	Madikwe Dolomite Bushveld
	SVcb 3	Zeerust Thornveld
	SVcb 4	Dwarsberg-Swaruggens Mountain Bushveld
	SVcb 5	Pilanesberg Mountain Bushveld
	SVcb 6	Marikana Thornveld
	SVcb 7	Norite Koppies Bushveld
	SVcb 8	Moot Plains Bushveld
	SVcb 9	Gold Reef Mountain Bushveld
	SVcb 10	Gauteng Shale Mountain Bushveld
	SVcb 11	Andesite Mountain Bushveld
	SVcb 12	Central Sandy Bushveld
	SVcb 13	Loskop Mountain Bushveld

	SVcb 14	Loskop Thornveld
	SVcb 15	Springbokvlakte Thornveld
	SVcb 16	Western Sandy Bushveld
	SVcb 17	Waterberg Mountain Bushveld
	SVcb 18	Roodeberg Bushveld
	SVcb 19	Limpopo Sweet Bushveld
	SVcb 20	Makhado Sweet Bushveld
	SVcb 21	Soutpansberg Mountain Bushveld
	SVcb 22	VhaVenda Miombo
	SVcb 23	Polokwane Plateau Bushveld
	SVcb 24	Mamabolo Mountain Bushveld
	SVcb 25	Poung Dolomite Mountain Bushveld
	SVcb 26	Ohrigstad Mountain Bushveld
	SVcb 27	Sekhukhune Plains Bushveld
	SVcb 28	Sekhukhune Mountain Bushveld

Mopane Bioregion

	SVmp 1	Musina Mopane Bushveld
	SVmp 2	Limpopo Ridge Bushveld
	SVmp 3	Cathedral Mopane Bushveld
	SVmp 4	Mopane Basalt Shrubland
	SVmp 5	Tsende Mopaneveld
	SVmp 6	Lowveld Rugged Mopaneveld
	SVmp 7	Phalaborwa-Timbavati Mopaneveld
	SVmp 8	Mopane Gabbro Shrubland

Lowveld Bioregion

	SVI 1	Makuleke Sandy Bushveld
	SVI 2	Nwambyia-Pumbe Sandy Bushveld
	SVI 3	Granite Lowveld
	SVI 4	Delagoa Lowveld
	SVI 5	Tshokwane-Hlane Basalt Lowveld
	SVI 6	Gabbro Grassy Bushveld
	SVI 7	Gravelotte Rocky Bushveld
	SVI 8	Tzaneen Sour Bushveld
	SVI 9	Legogote Sour Bushveld
	SVI 10	Pretoriuskop Sour Bushveld

	SVI 11	Malelane Mountain Bushveld
	SVI 12	Kaalrug Mountain Bushveld
	SVI 13	Barberton Serpentine Sourveld
	SVI 14	Swaziland Sour Bushveld
	SVI 15	Northern Lebombo Bushveld
	SVI 16	Southern Lebombo Bushveld
	SVI 17	Lebombo Summit Sourveld
	SVI 18	Tembe Sandy Bushveld
	SVI 19	Western Maputaland Sandy Bushveld
	SVI 20	Western Maputaland Clay Bushveld
	SVI 21	Makatini Clay Thicket
	SVI 22	Northern Zululand Sourveld
	SVI 23	Zululand Lowveld
	SVI 24	Zululand Coastal Thornveld

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	Schmidtsdrif 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

	SVk 13	Olifantshoek Plains Thornveld
	SVk 14	Postmasburg Thornveld
	SVk 15	Koranna-Langeberg Mountain Bushveld
	SVk 16	Gordonia Plains Shrubland

Kalahari Duneveld Bioregion

	SVkd 1	Gordonia Duneveld
	SVkd 2	Gordonia Kameeldoring Bushveld
	SVkd 3	Auob Duneveld
	SVkd 4	Nossob Bushveld

ALBANY THICKET BIOME

	AT 1	Southern Cape Valley Thicket
	AT 2	Gamka Thicket
	AT 3	Groot Thicket
	AT 4	Gamtoos Thicket
	AT 5	Sundays Noorsveld
	AT 6	Sundays Thicket
	AT 7	Coega Bontveld
	AT 8	Kowie Thicket
	AT 9	Albany Coastal Belt
	AT 10	Great Fish Noorsveld
	AT 11	Great Fish Thicket
	AT 12	Buffels Thicket
	AT 13	Eastern Cape Escarpment Thicket
	AT 14	Camdebo Escarpment Thicket

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

FORESTS

Zonal & Intrazonal Forests

	FOz 1	Southern Afrotropical Forest
	FOz 2	Northern Afrotropical Forest
	FOz 3	Southern Mistbelt Forest
	FOz 4	Northern Mistbelt Forest
	FOz 5	Scarp Forest
	FOz 6	Southern Coastal Forest
	FOz 7	Northern Coastal Forest
	FOz 8	Sand Forest
	FOz 9	Ironwood Dry Forest

Azonal Forests

	FOa 1	Lowveld Riverine Forest
	FOa 2	Swamp Forest
	FOa 3	Mangrove Forest

AZONAL VEGETATION

Estuarine Vegetation

	AZe 1	Arid Estuarine Salt Marshes
	AZe 2	Cape Estuarine Salt Marshes
	AZe 3	Subtropical Estuarine Salt Marshes

Seashore Vegetation

	AZd 1	Namib Seashore Vegetation
	AZd 2	Namaqualand Seashore Vegetation
	AZd 3	Cape Seashore Vegetation
	AZd 4	Subtropical Seashore Vegetation

Eastern Strandveld

	AZs 1	Algoa Dune Strandveld
	AZs 2	Albany Dune Strandveld
	AZs 3	Subtropical Dune Thicket

Alluvial Vegetation

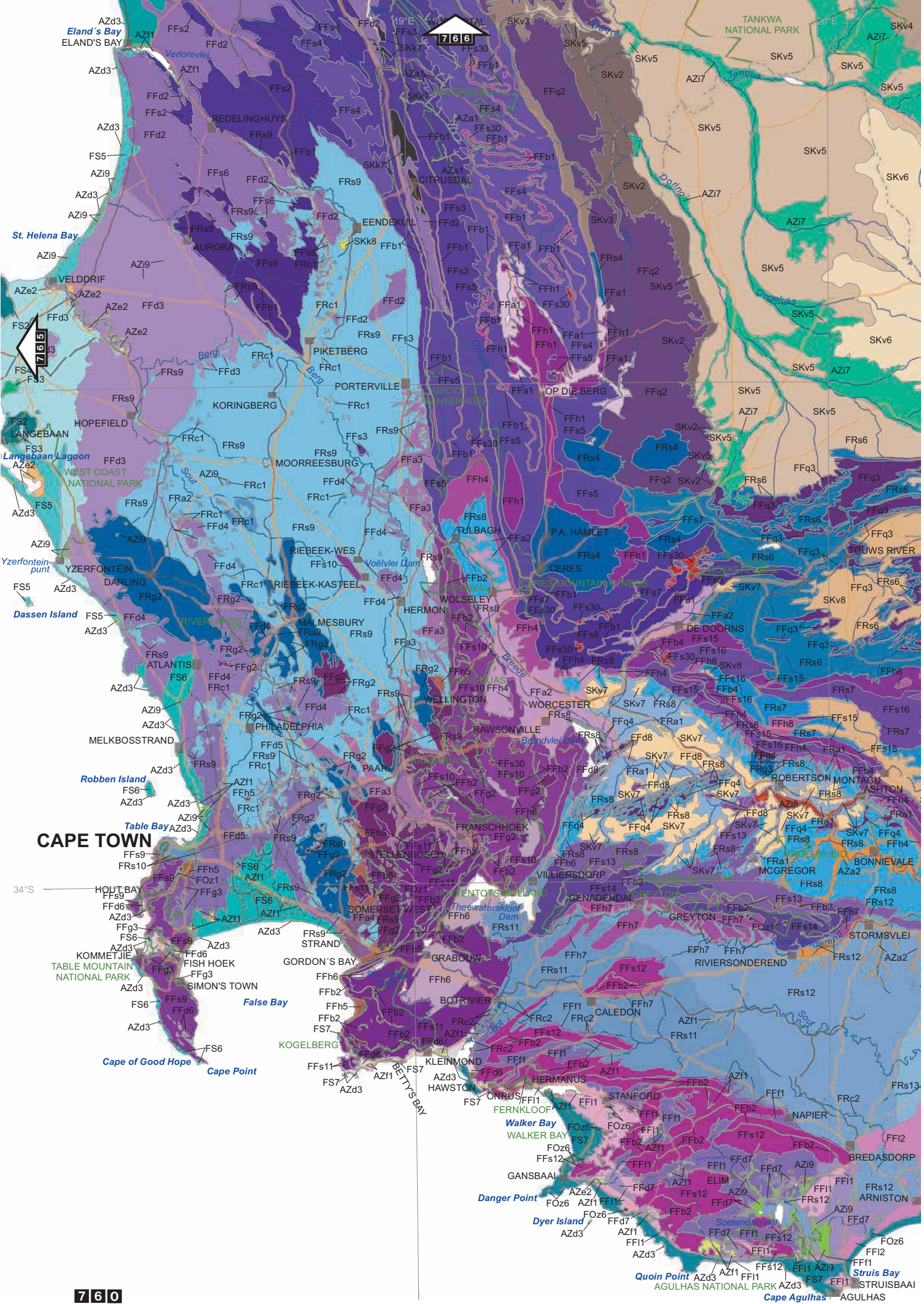
	AZa 1	Fynbos Riparian Vegetation
	AZa 2	Cape Lowland Alluvial Vegetation
	AZa 3	Lower Gariep Alluvial Vegetation
	AZa 4	Upper Gariep Alluvial Vegetation
	AZa 5	Highveld Alluvial Vegetation
	AZa 6	Albany Alluvial Vegetation
	AZa 7	Subtropical Alluvial Vegetation

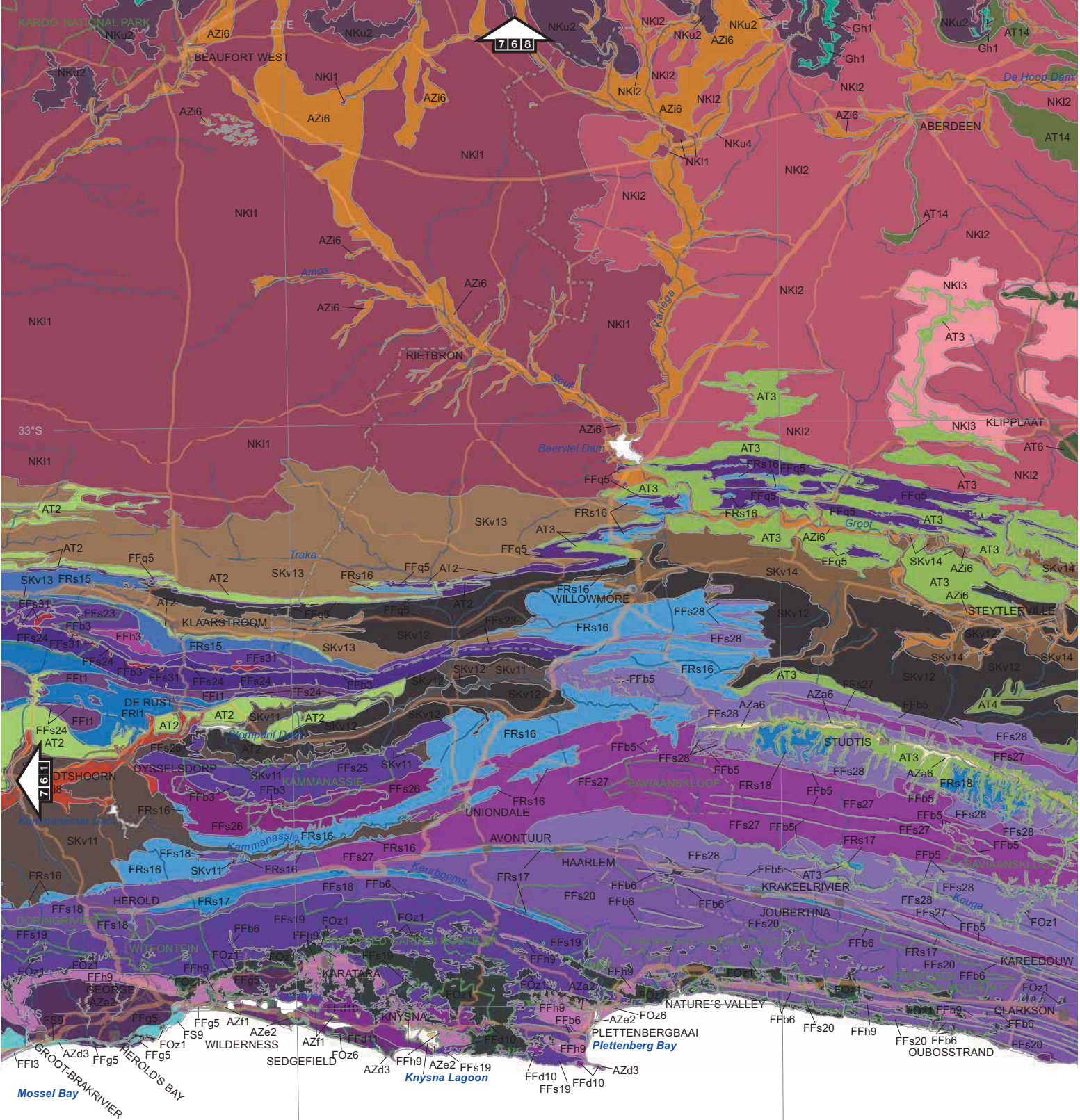
Freshwater Wetlands

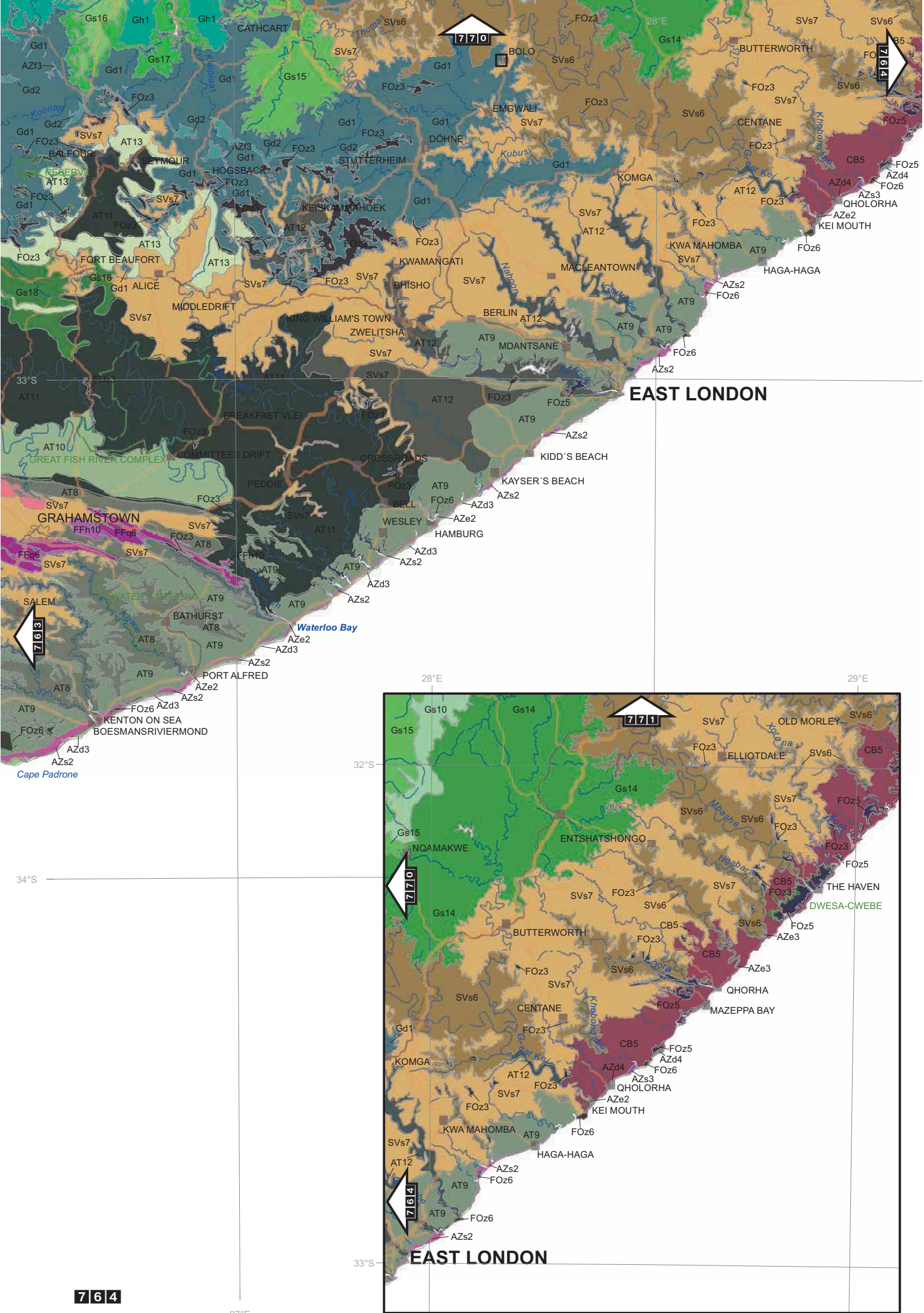
	AZf 1	Cape Lowland Freshwater Wetlands
	AZf 2	Cape Vernal Pools
	AZf 3	Eastern Temperate Freshwater Wetlands
	AZf 4	Drakensberg Wetlands
	AZf 5	Lesotho Mires
	AZf 6	Subtropical Freshwater Wetlands

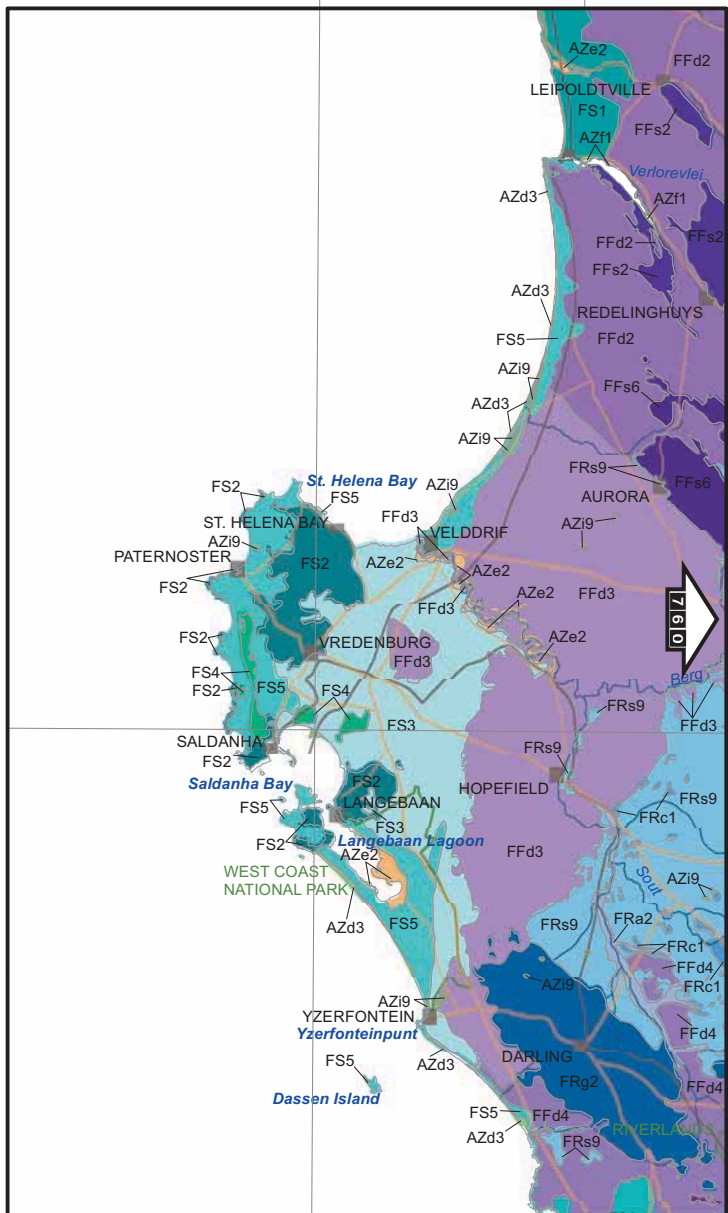
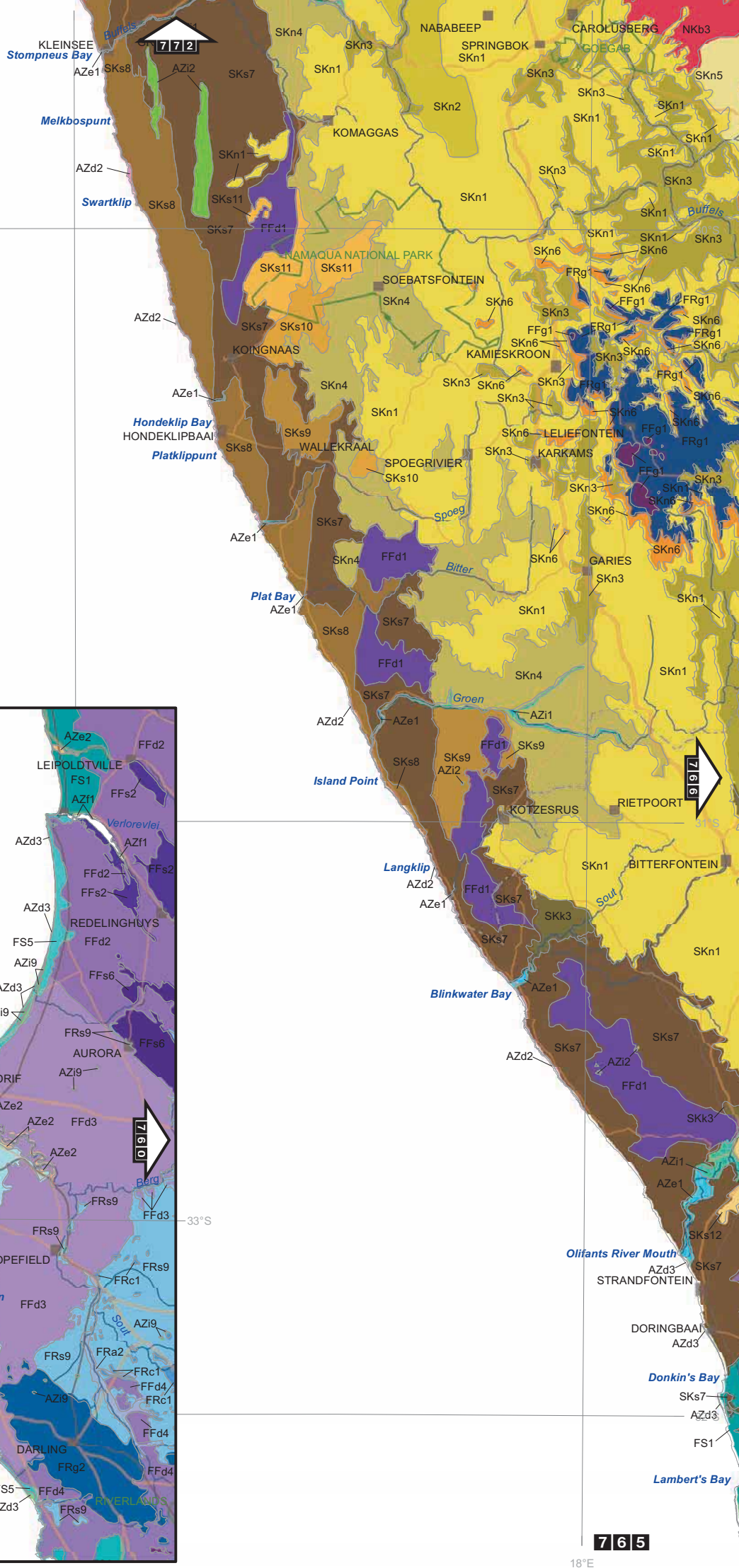
Inland Saline Vegetation

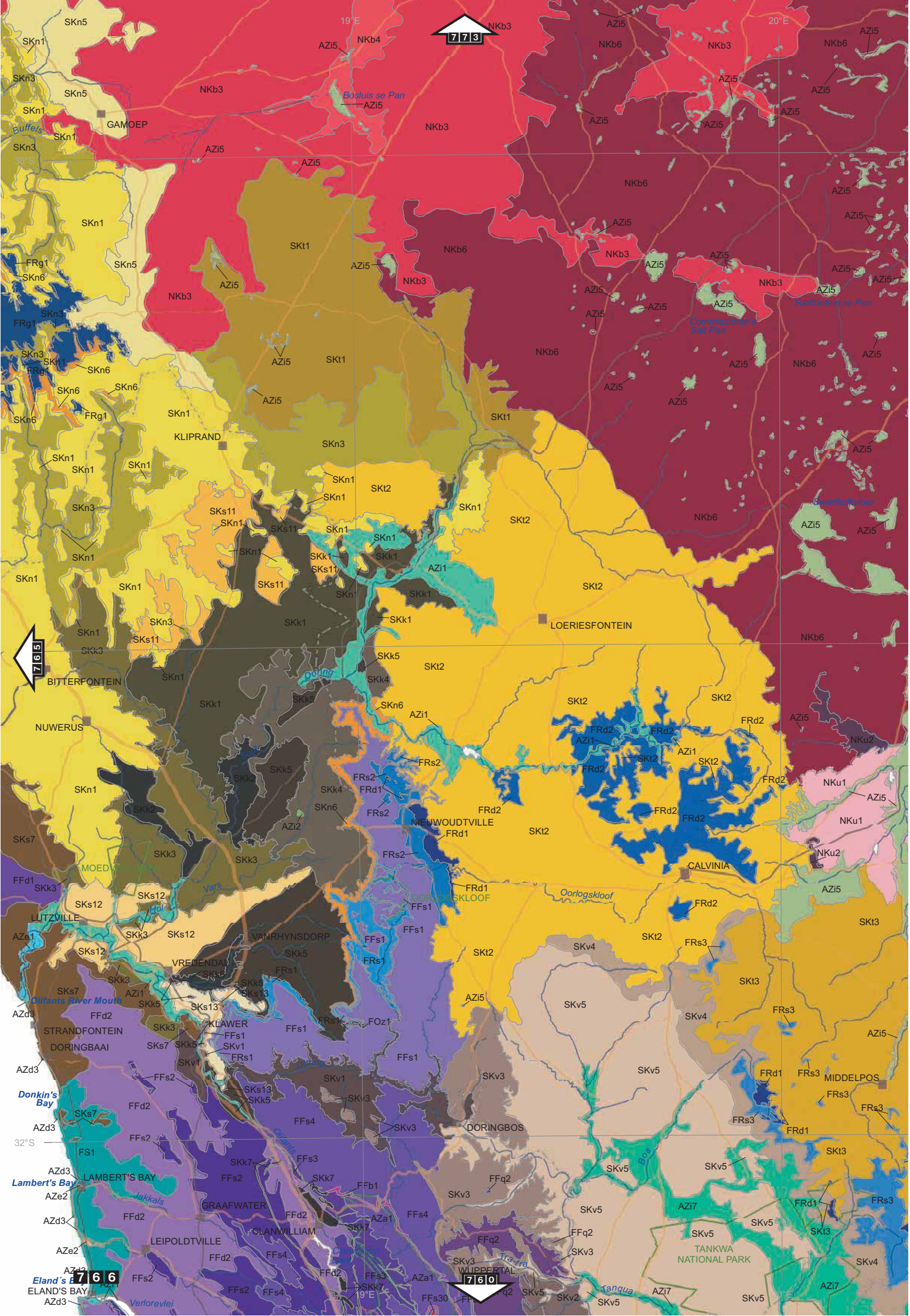
	AZi 1	Namaqualand Riviere
	AZi 2	Namaqualand Salt Pans
	AZi 3	Southern Kalahari Mekgacha
	AZi 4	Southern Kalahari Salt Pans
	AZi 5	Bushmanland Vloere
	AZi 6	Southern Karoo Riviere
	AZi 7	Tanqua Wash Riviere
	AZi 8	Muscadel Riviere
	AZi 9	Cape Inland Salt Pans
	AZi 10	Highveld Salt Pans
	AZi 11	Subtropical Salt Pans

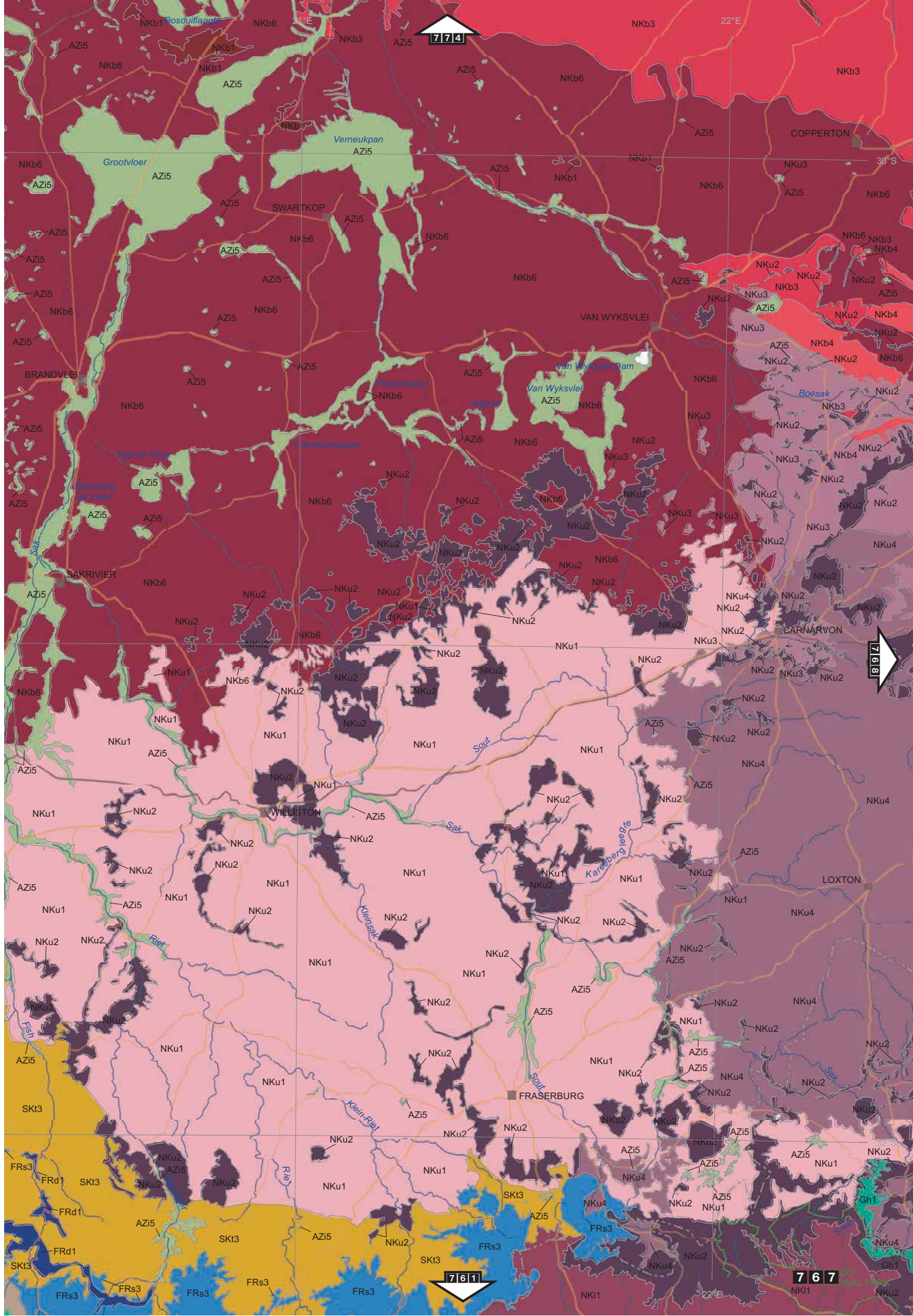


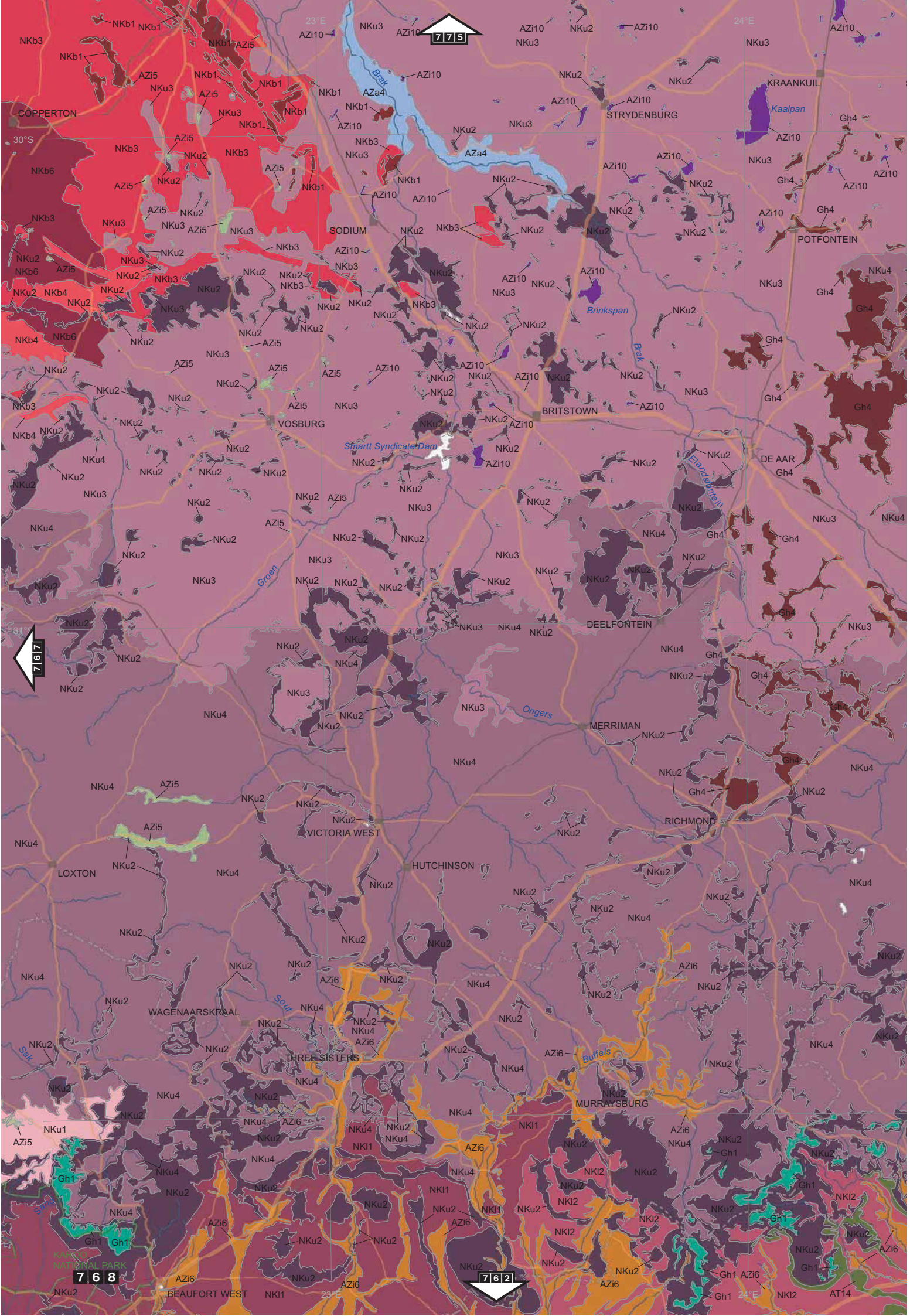


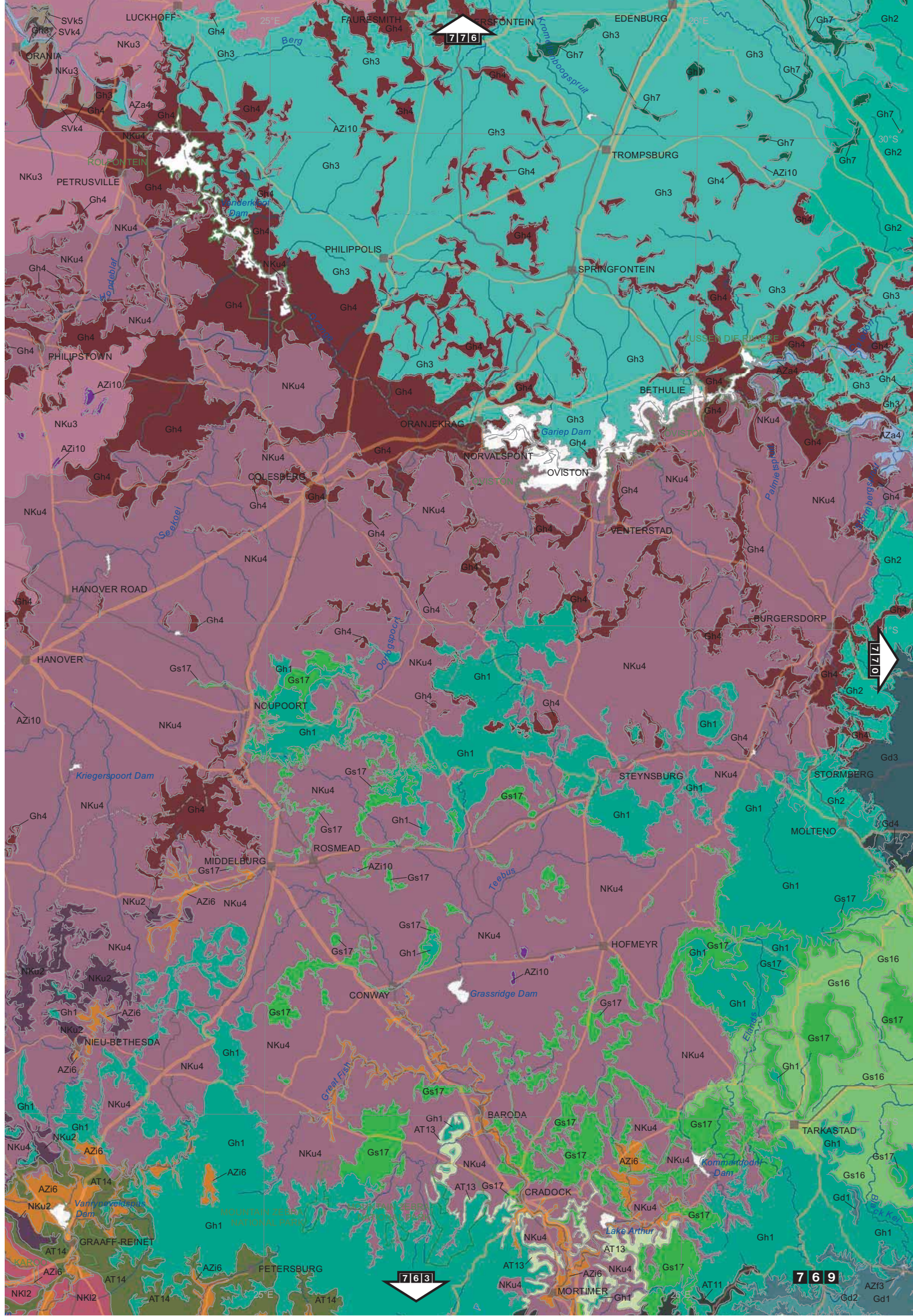


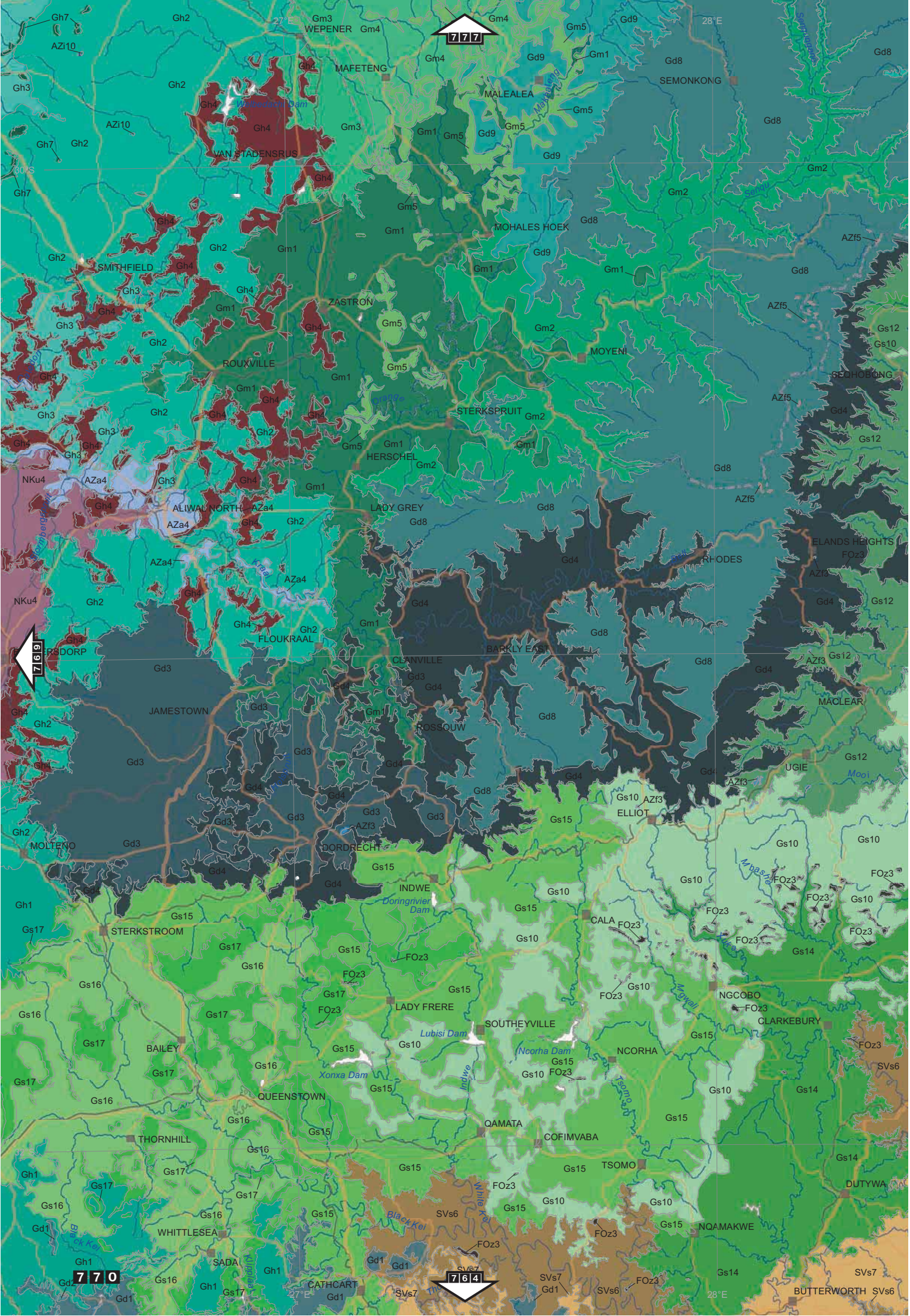


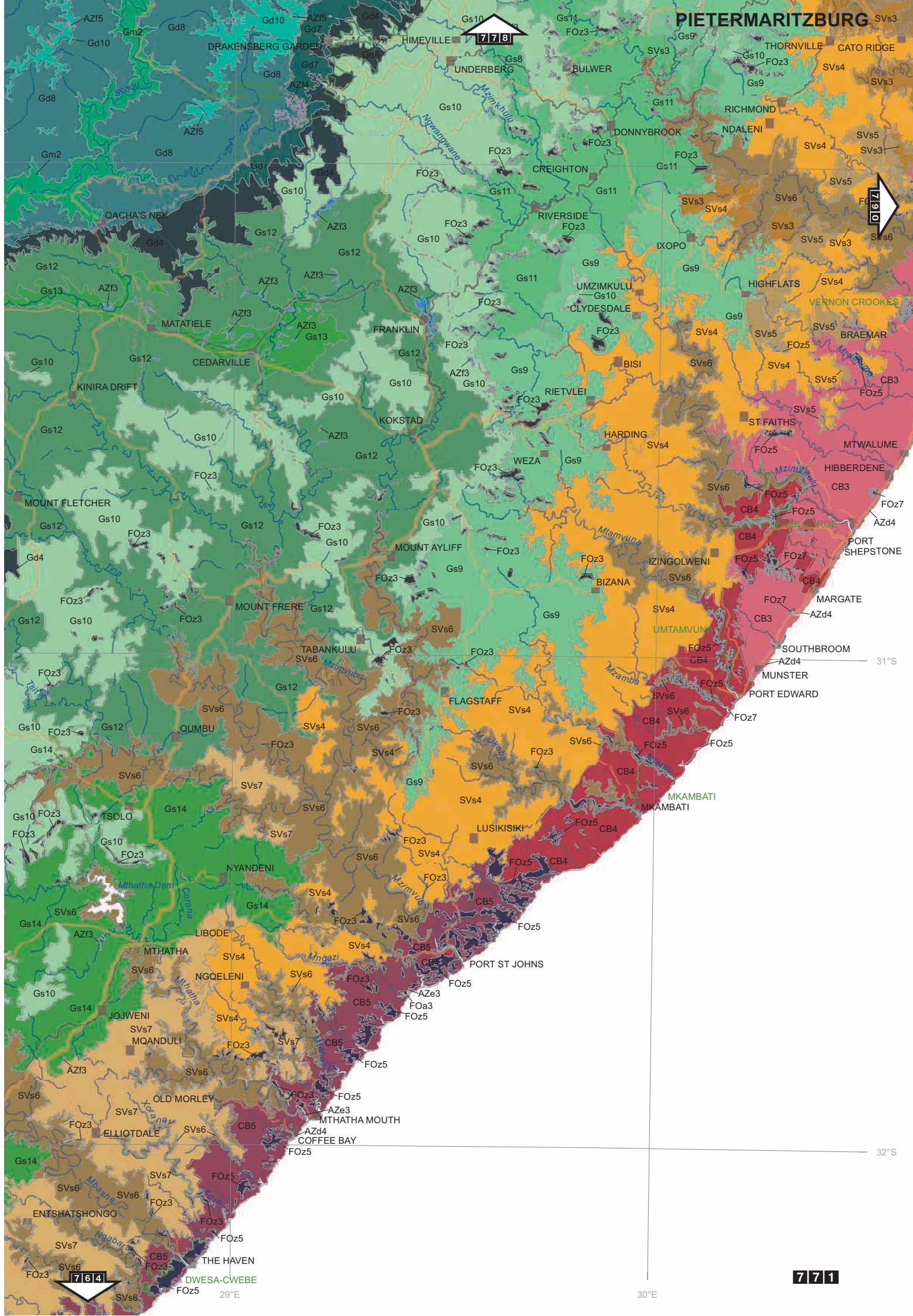












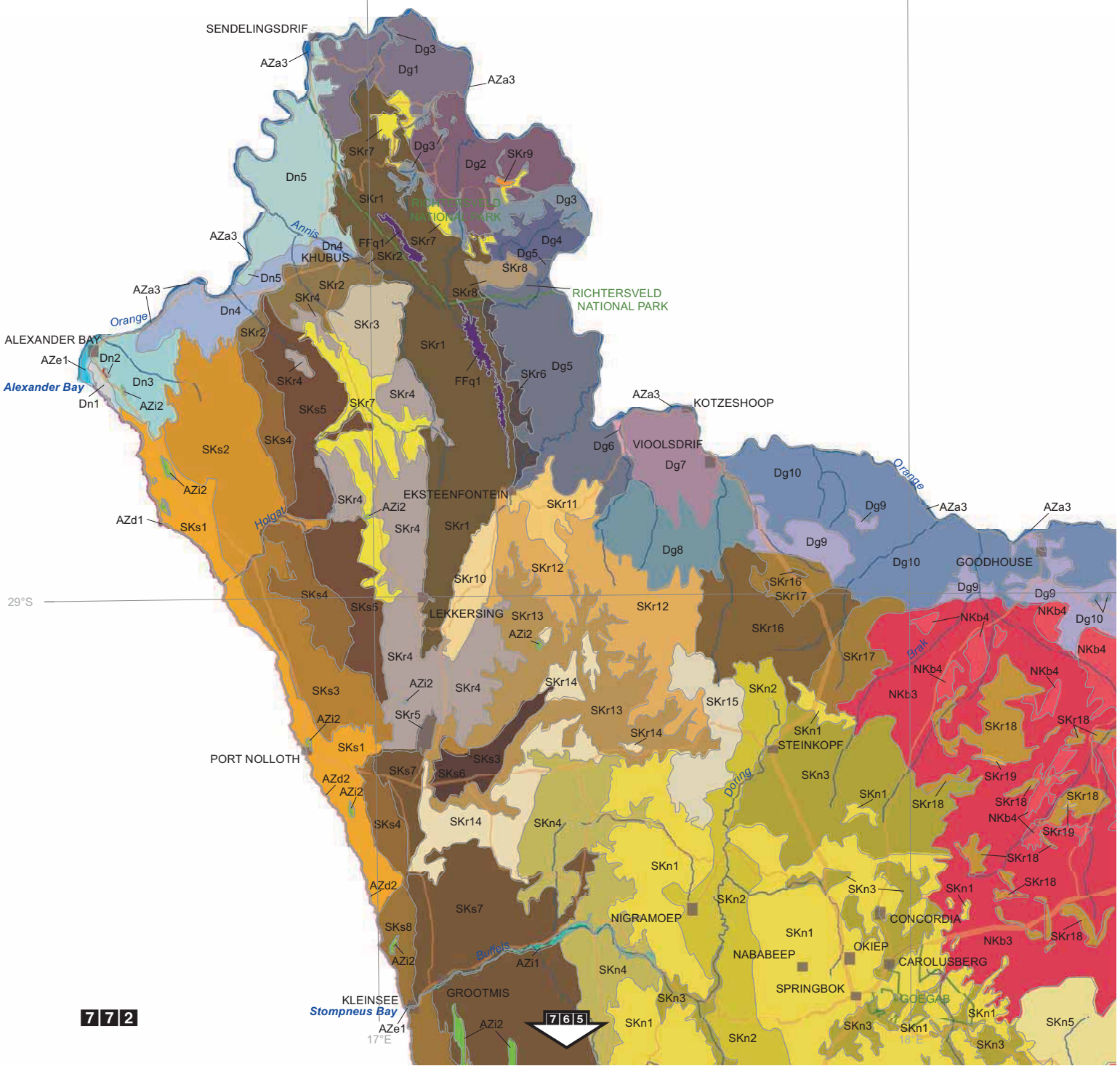
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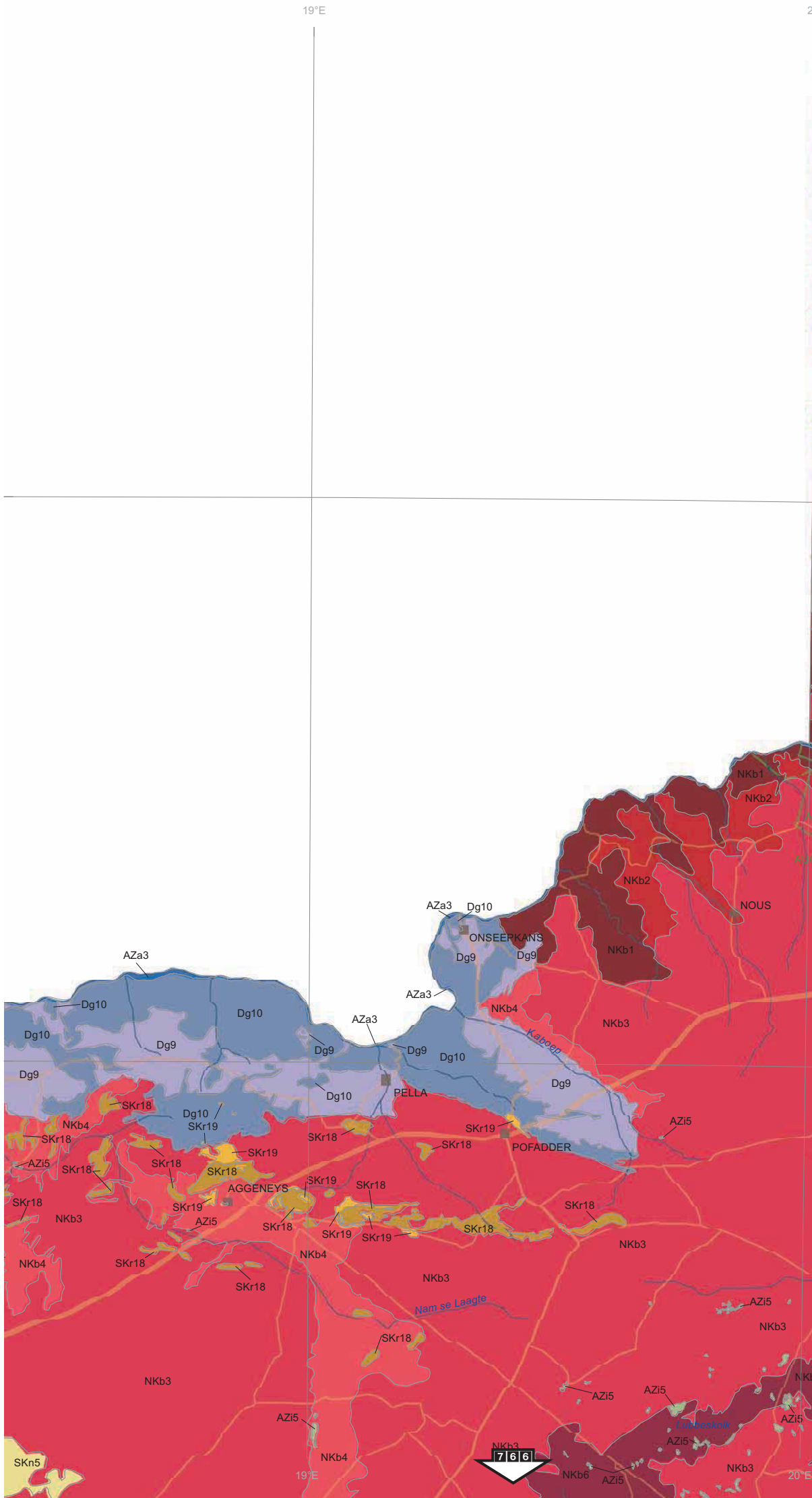
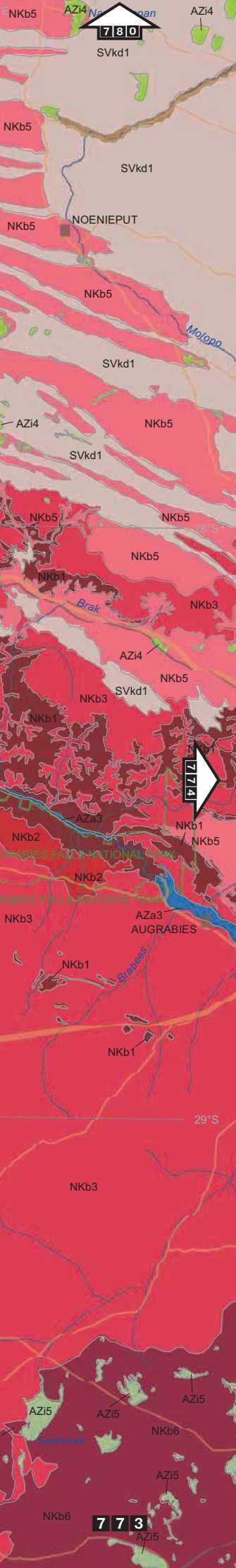
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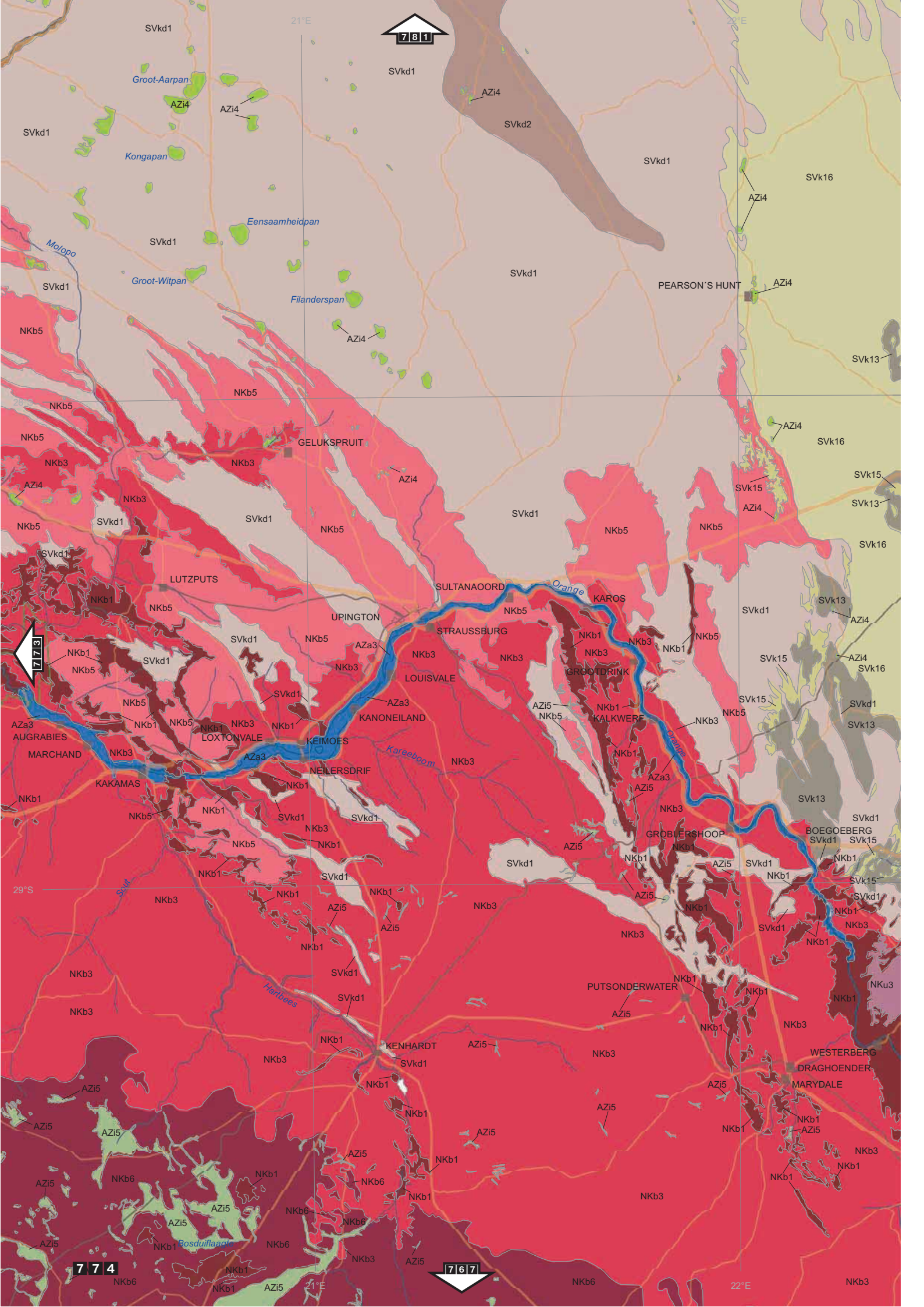
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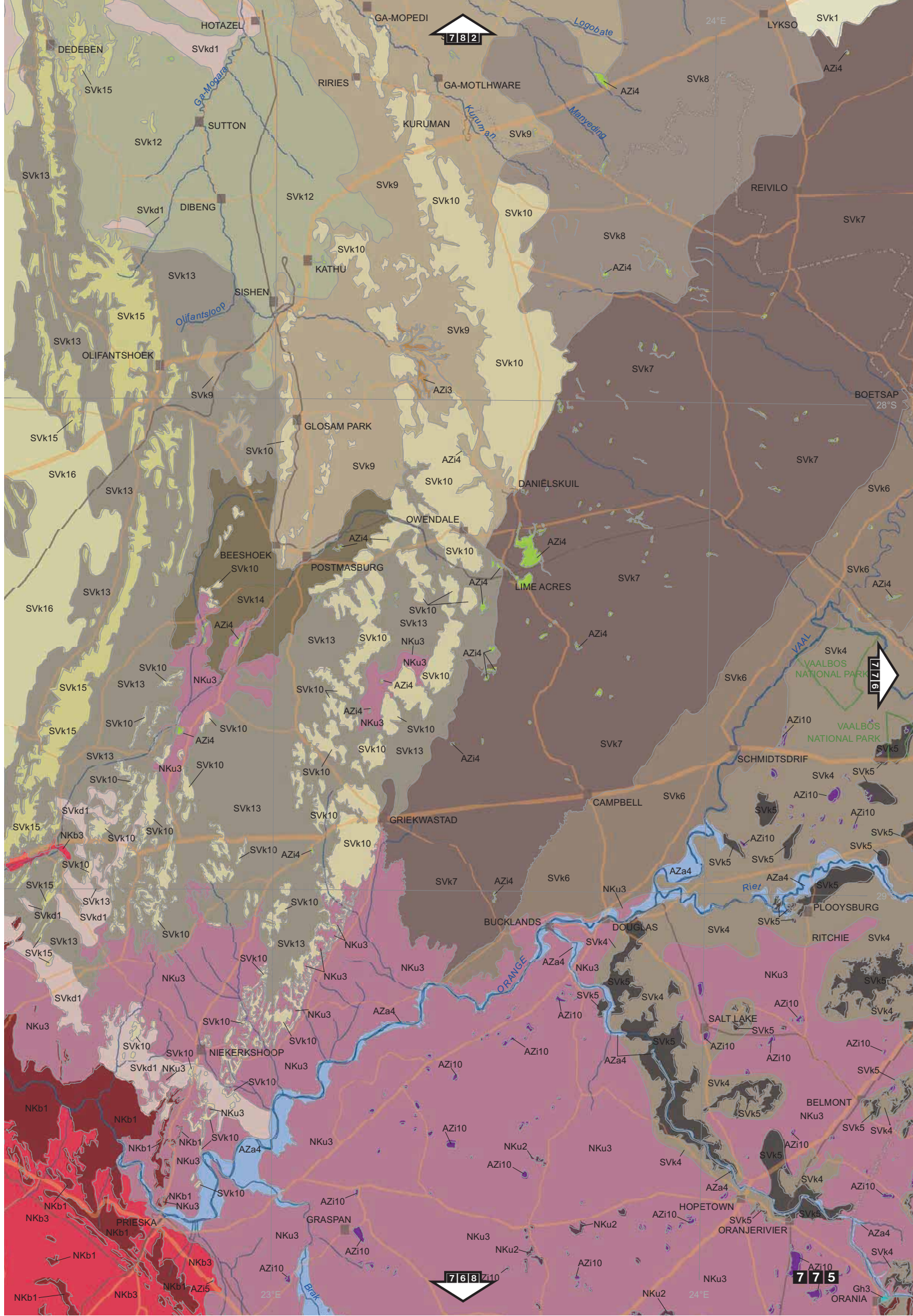


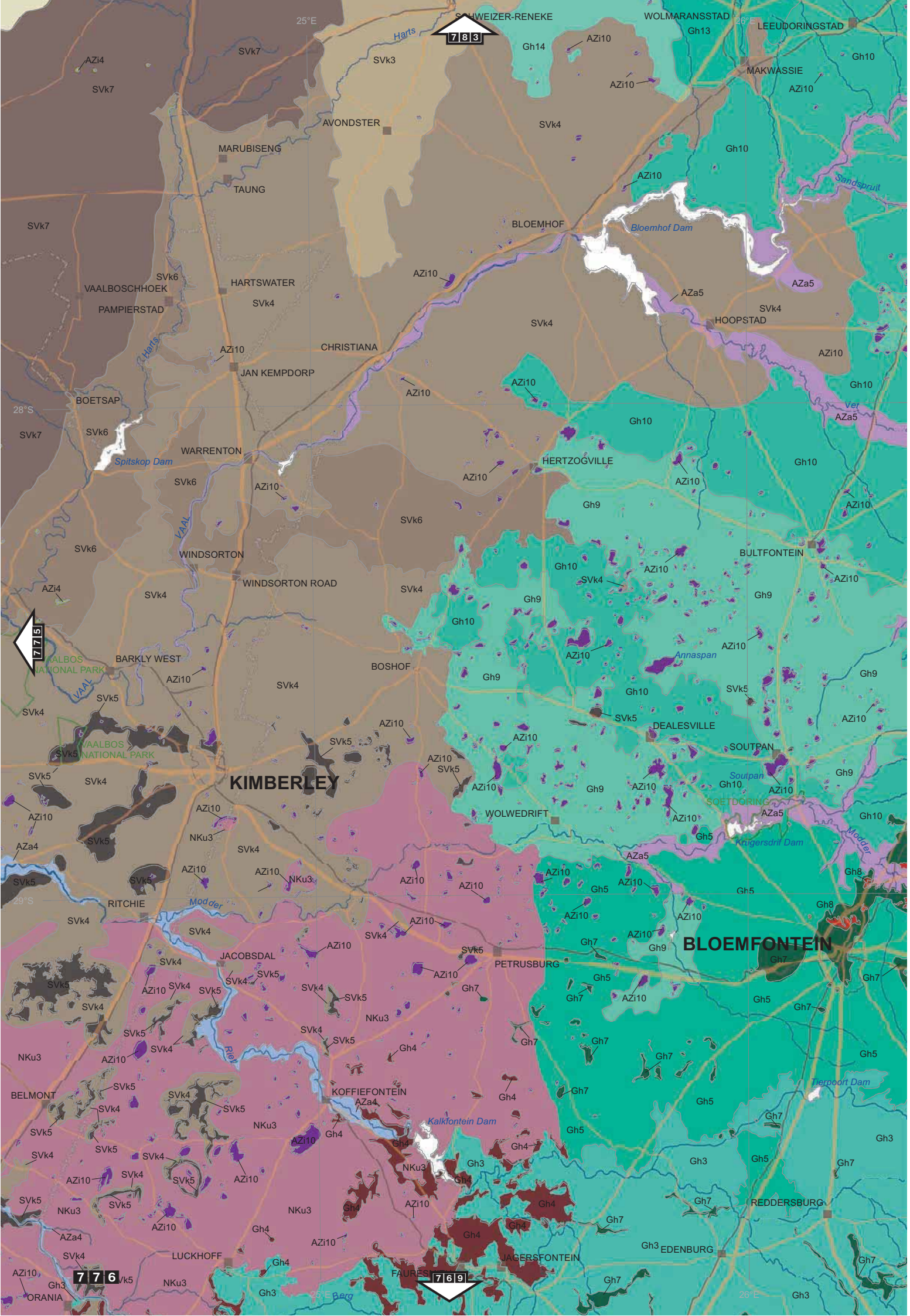
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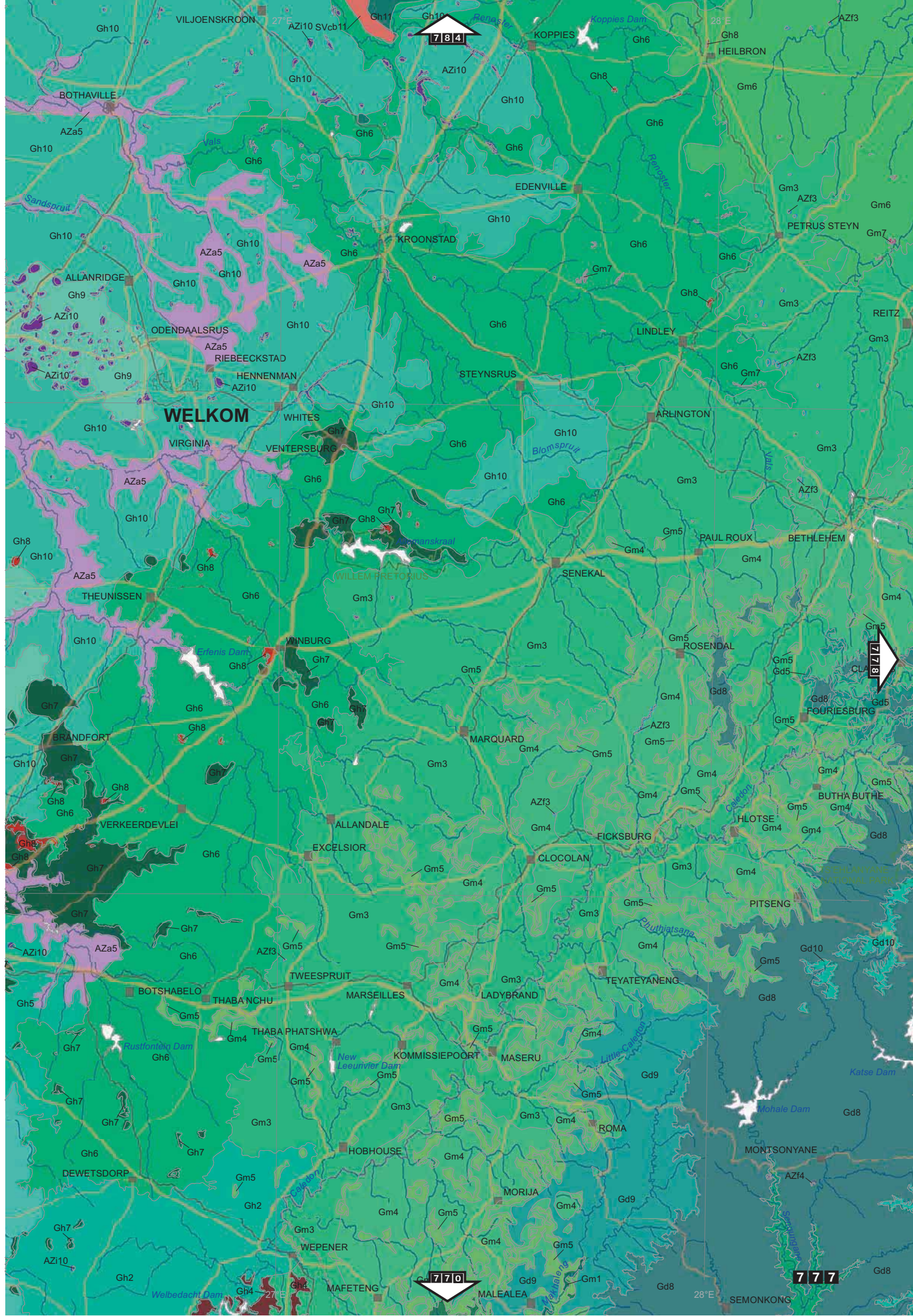
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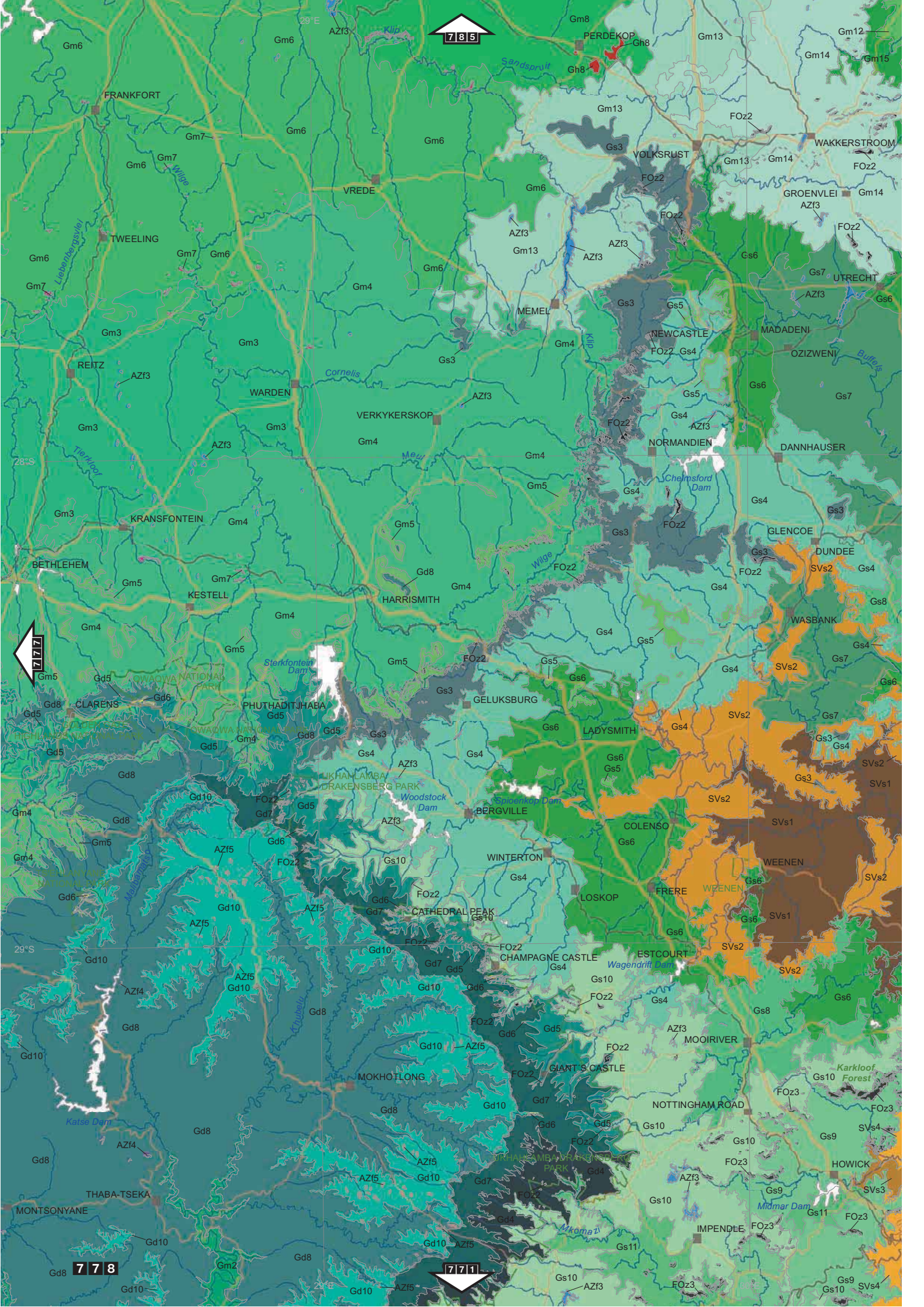


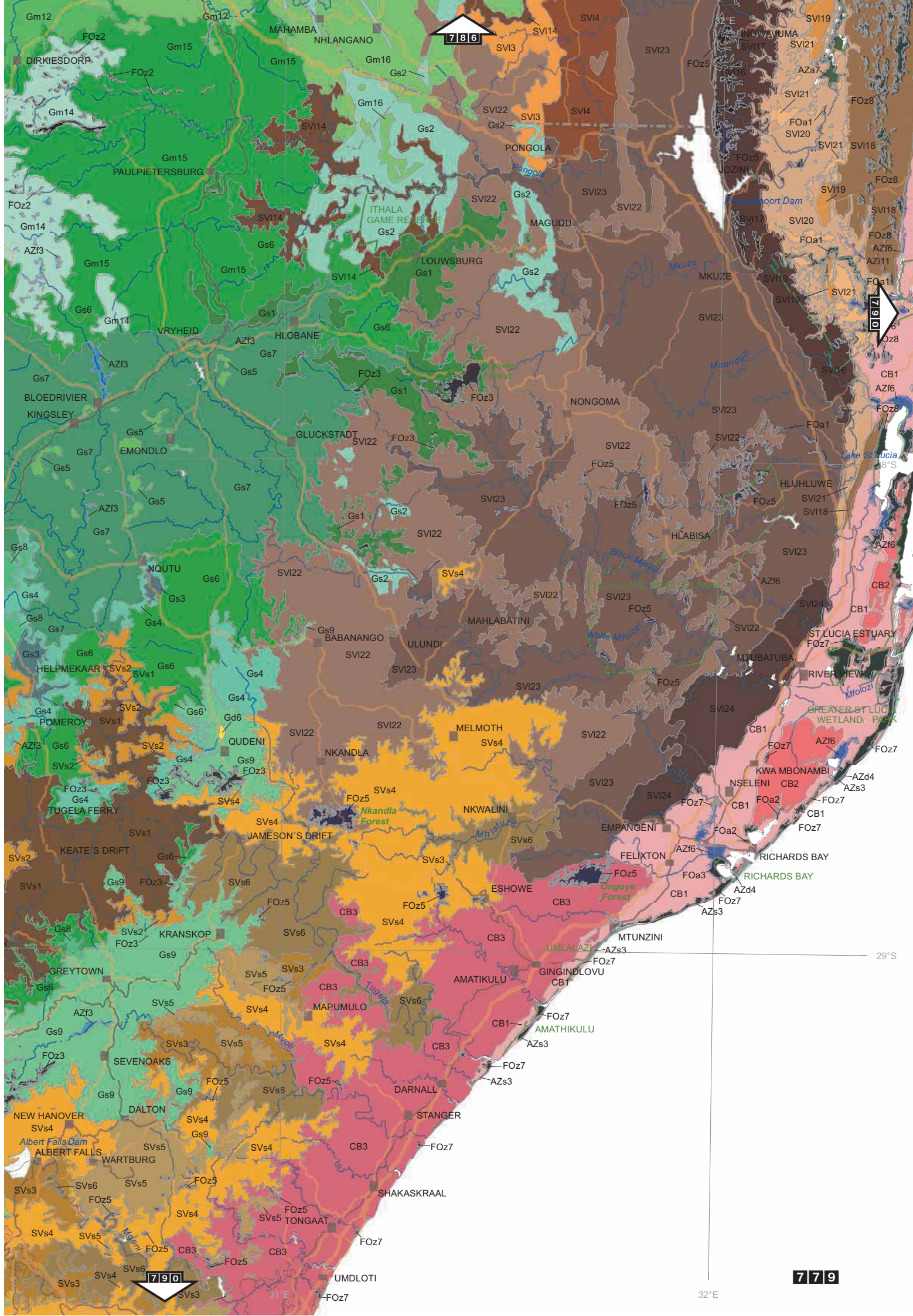












786

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790

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19°E

20°E

25°S

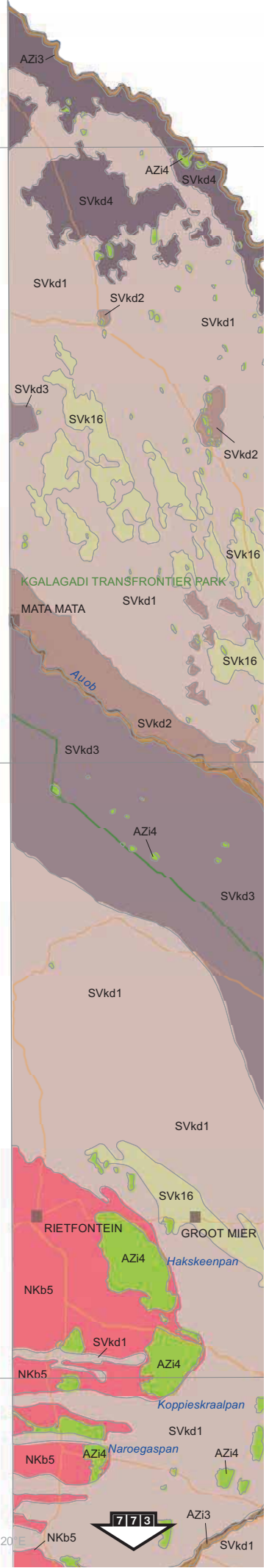
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27°S

780

19°E

20°E

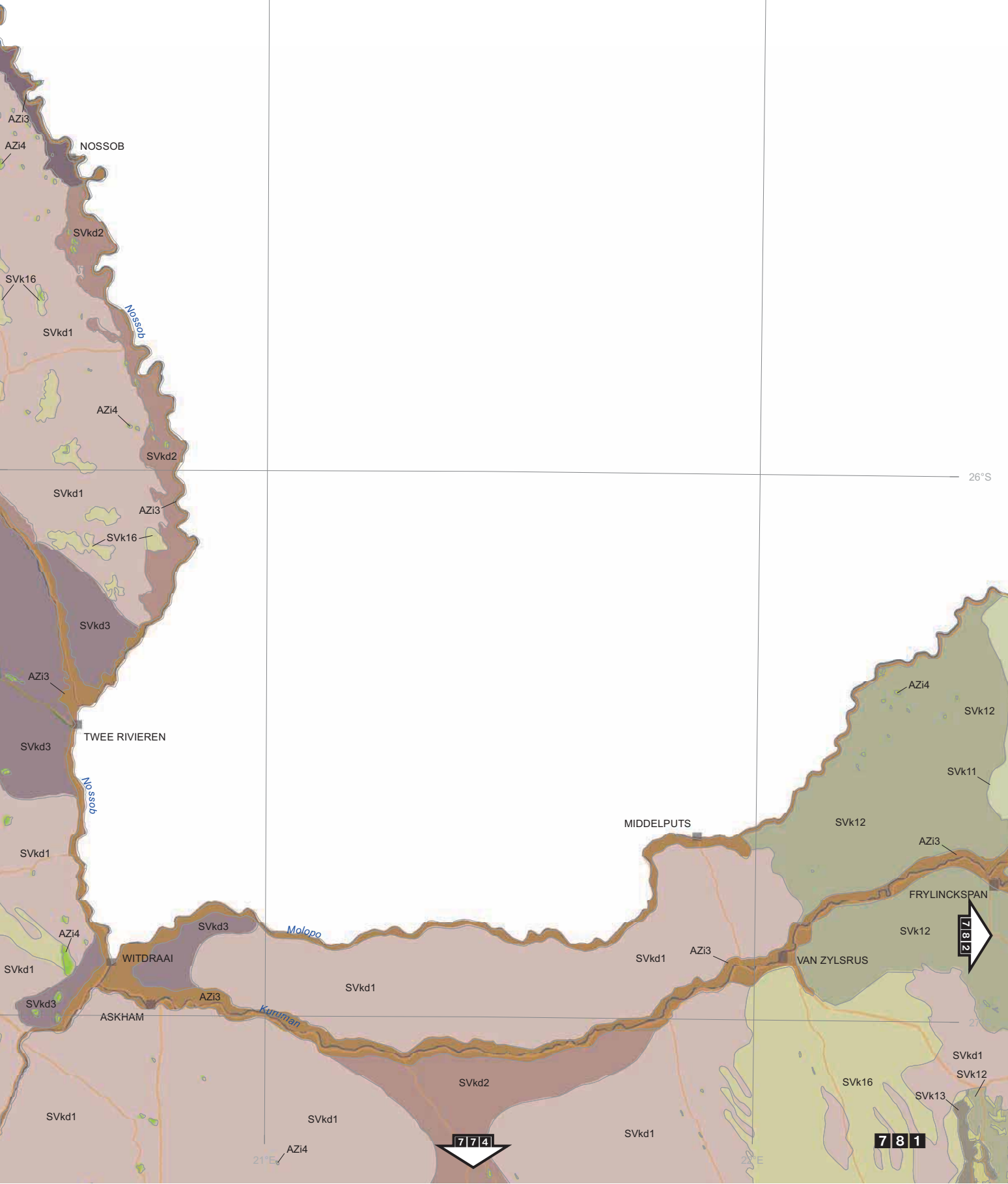


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22°E

25°S

26°S

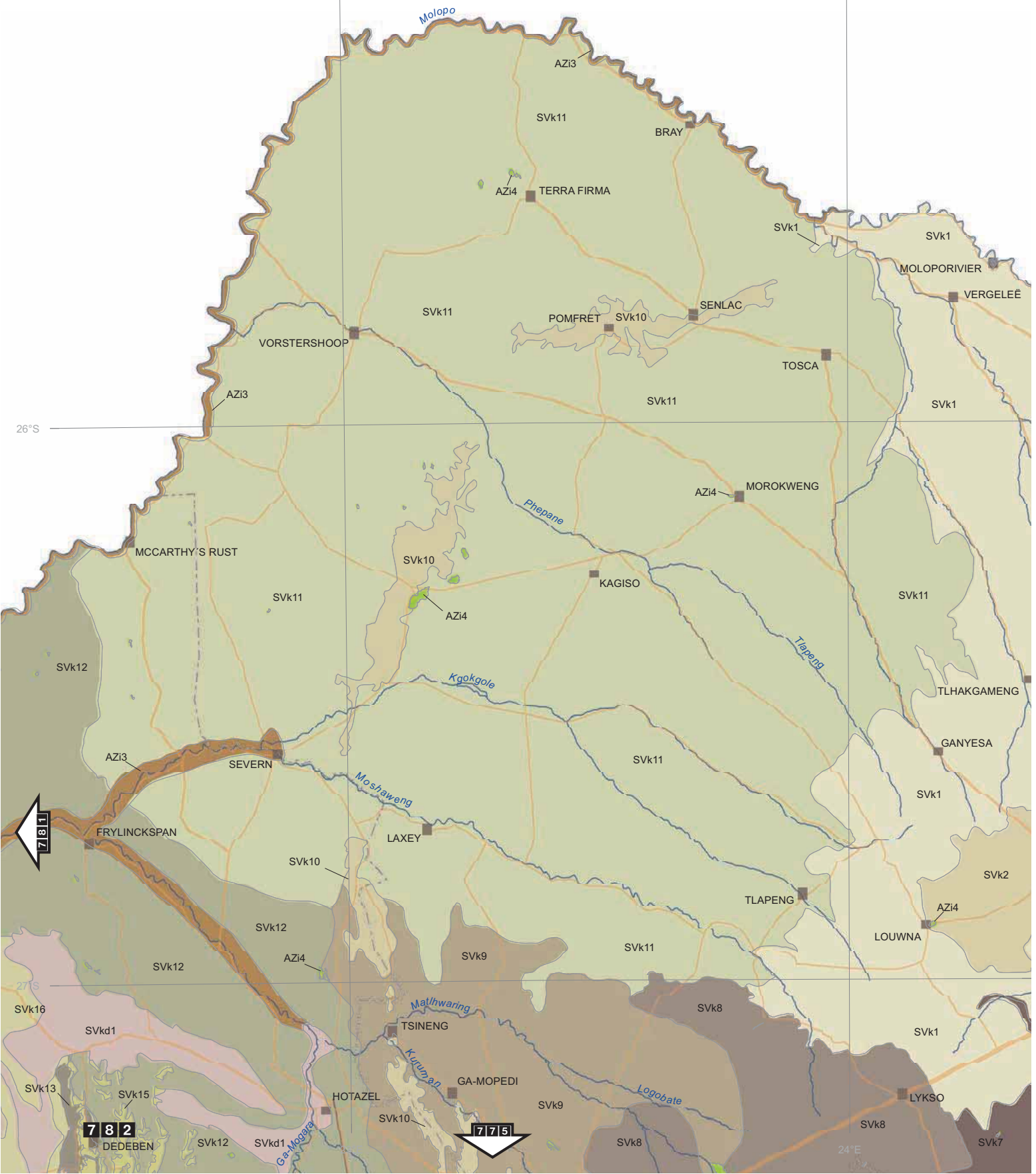


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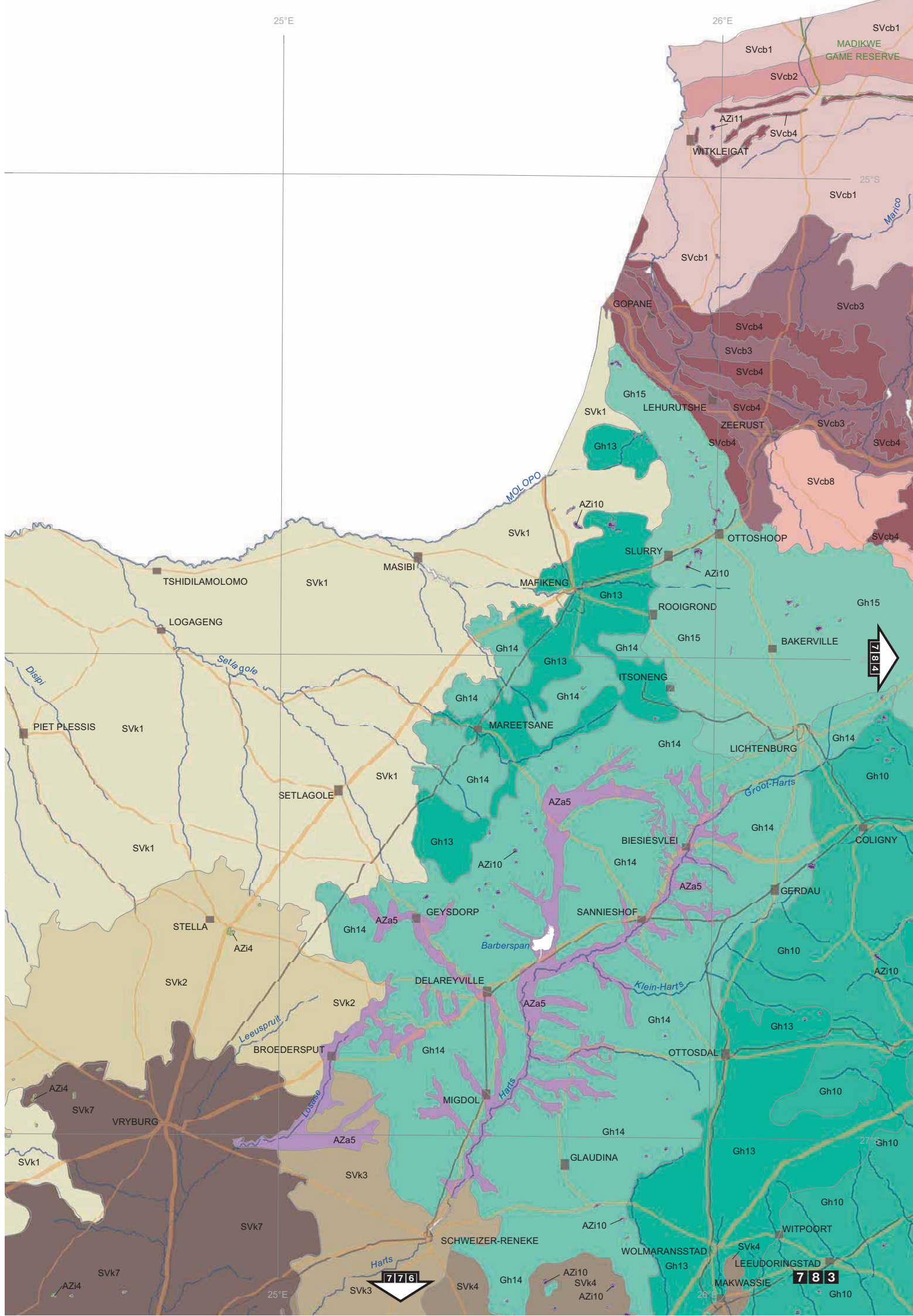
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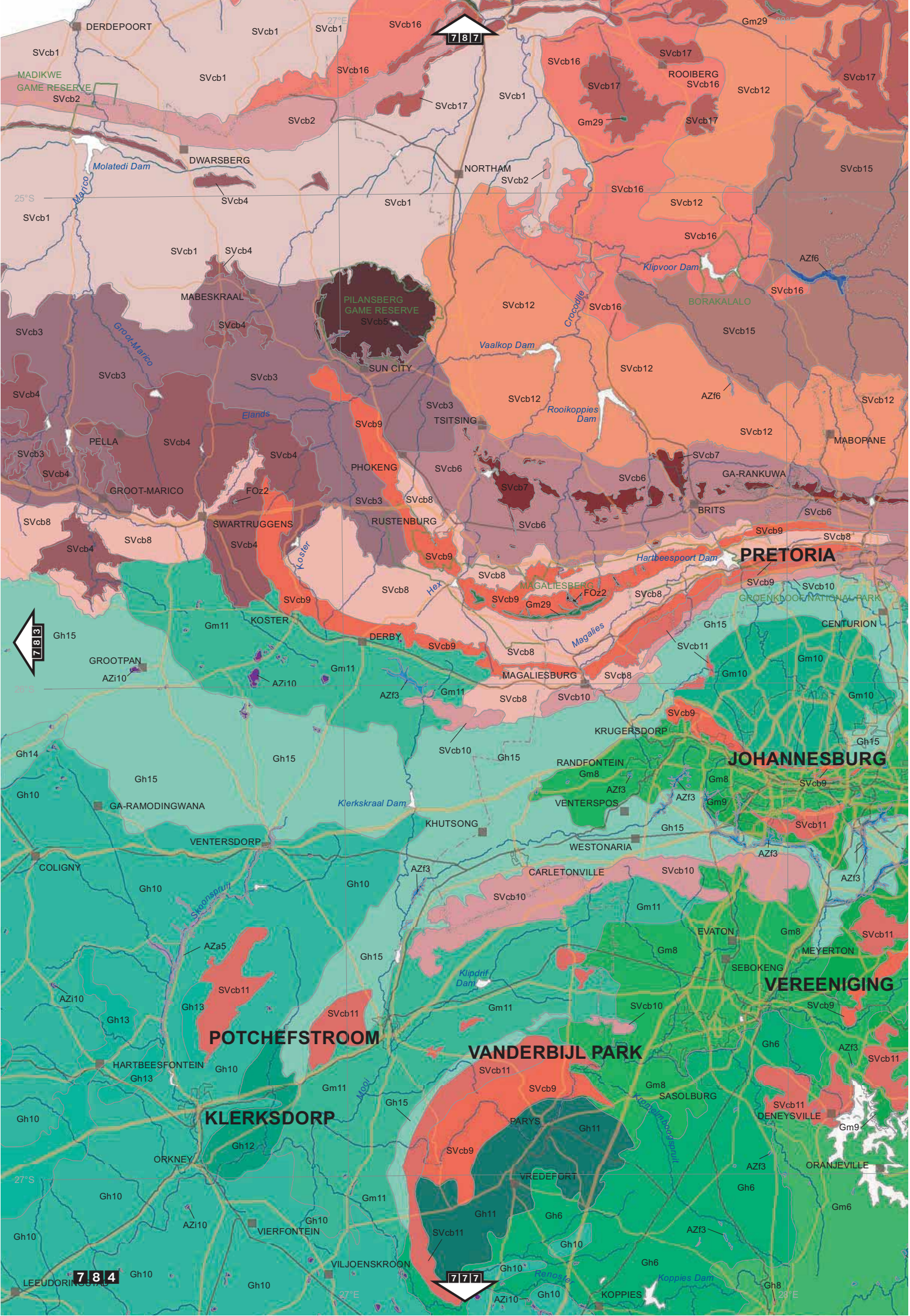
25°S

26°S



24°E





25°S

25°S

27°S

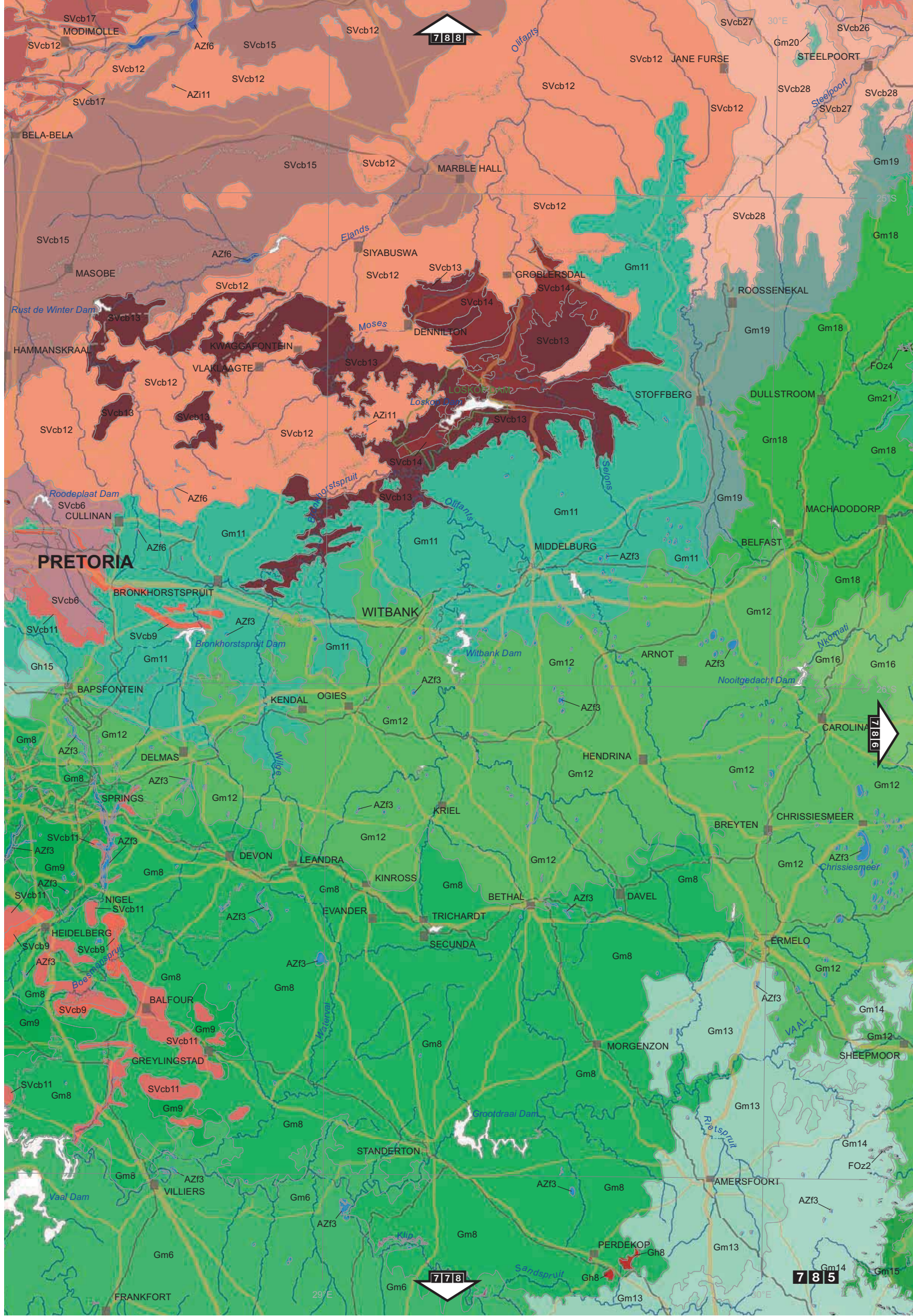
27°E

27°E

Gm29

Gm29

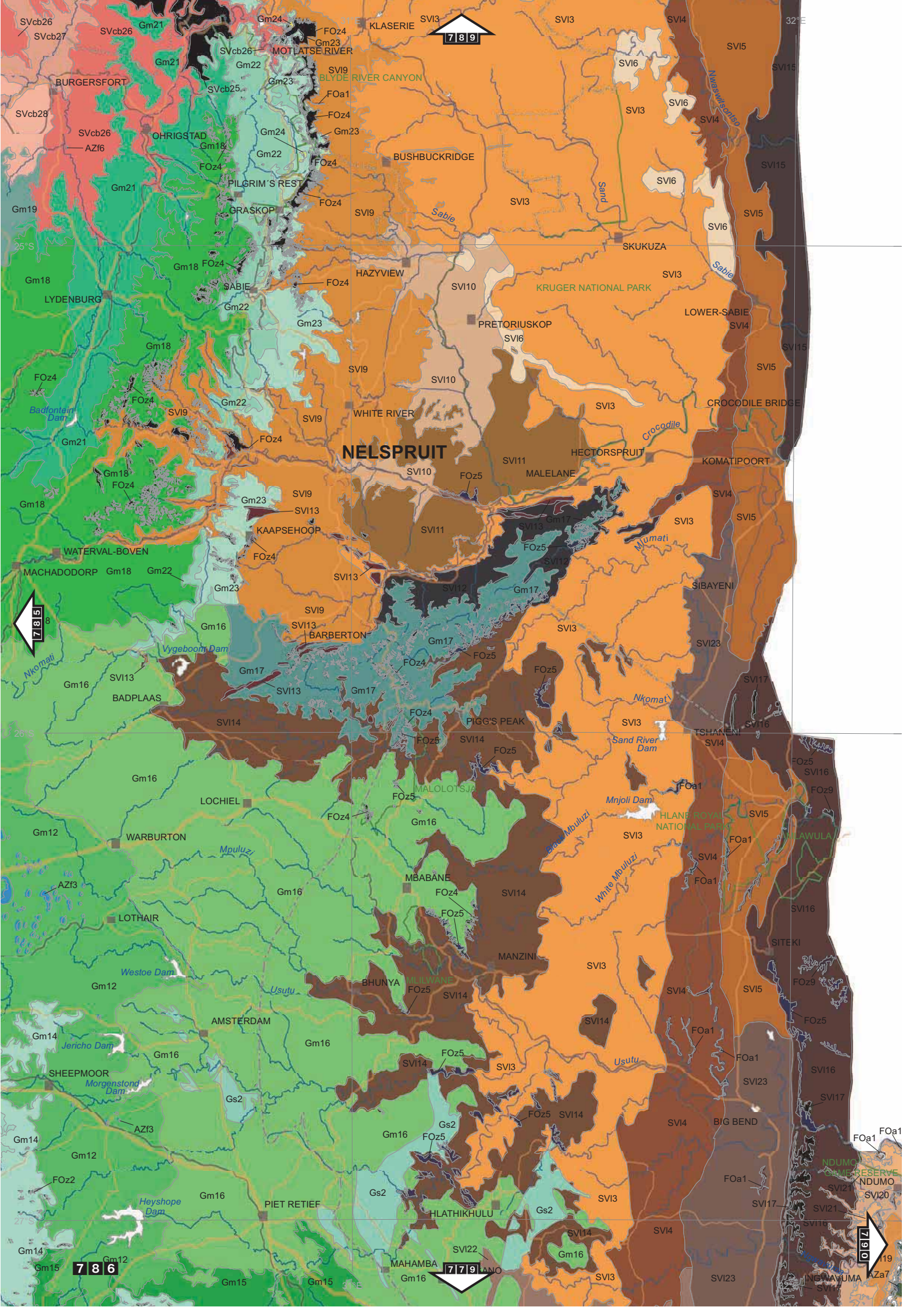
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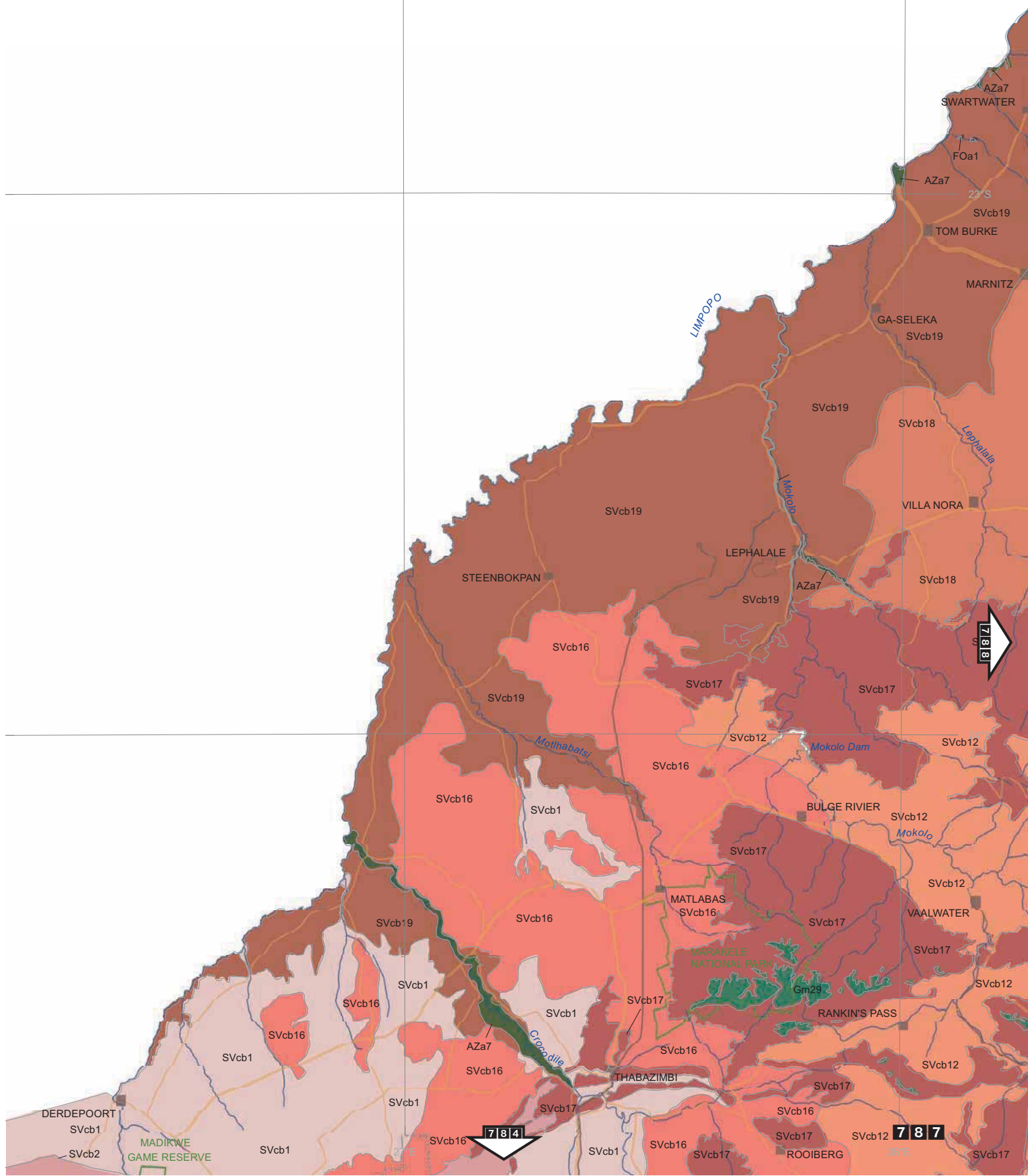


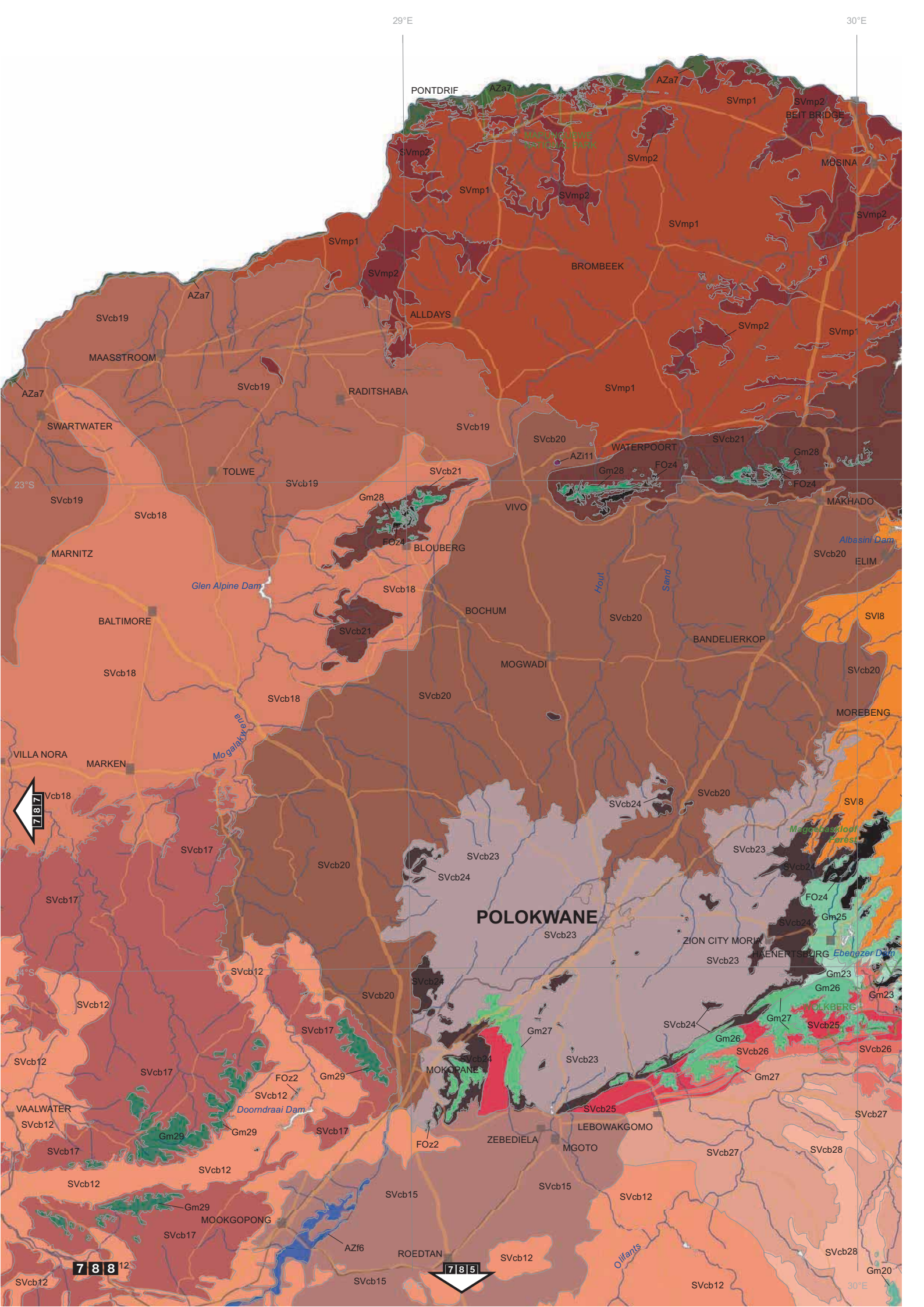
PRETORIA

WITBANK

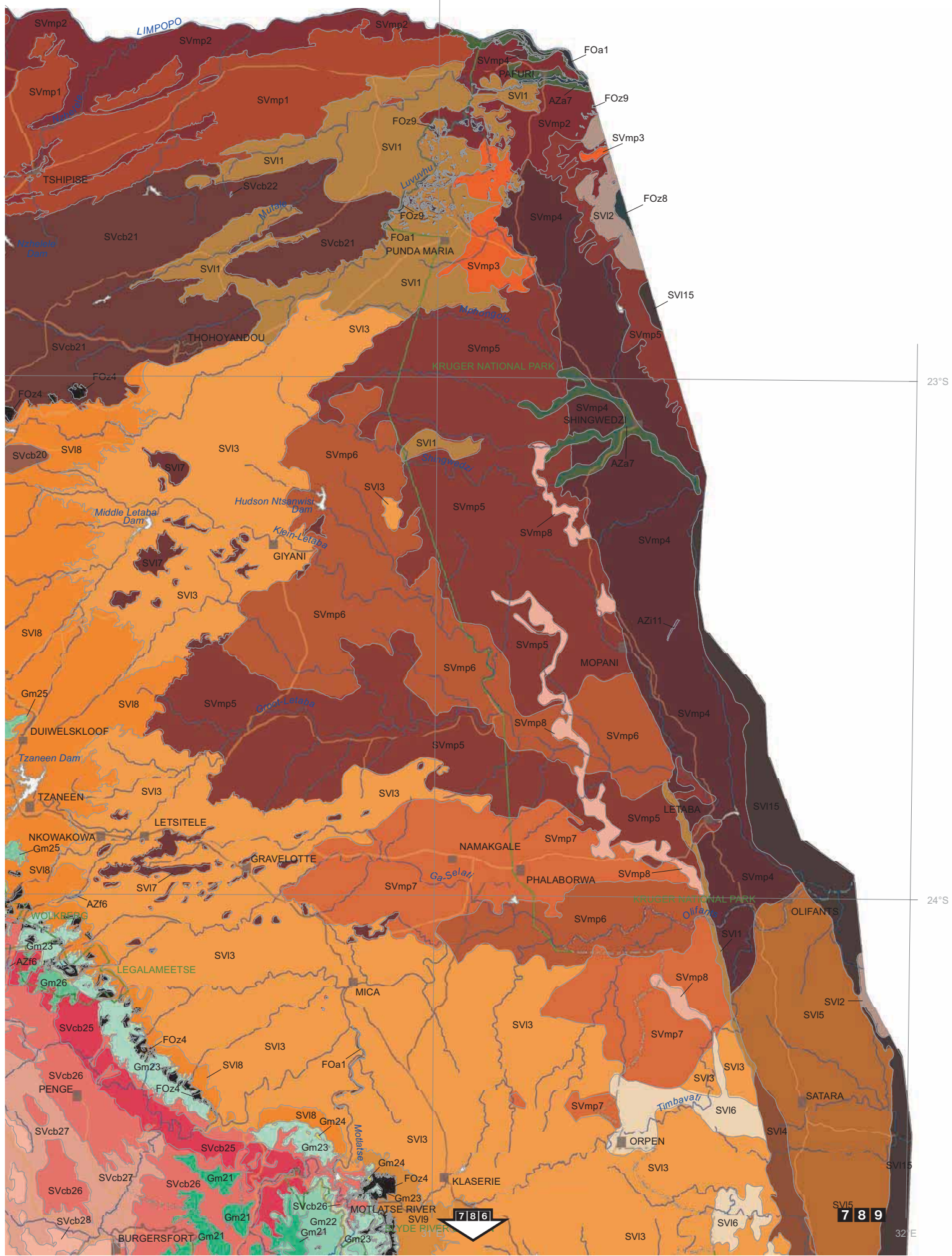
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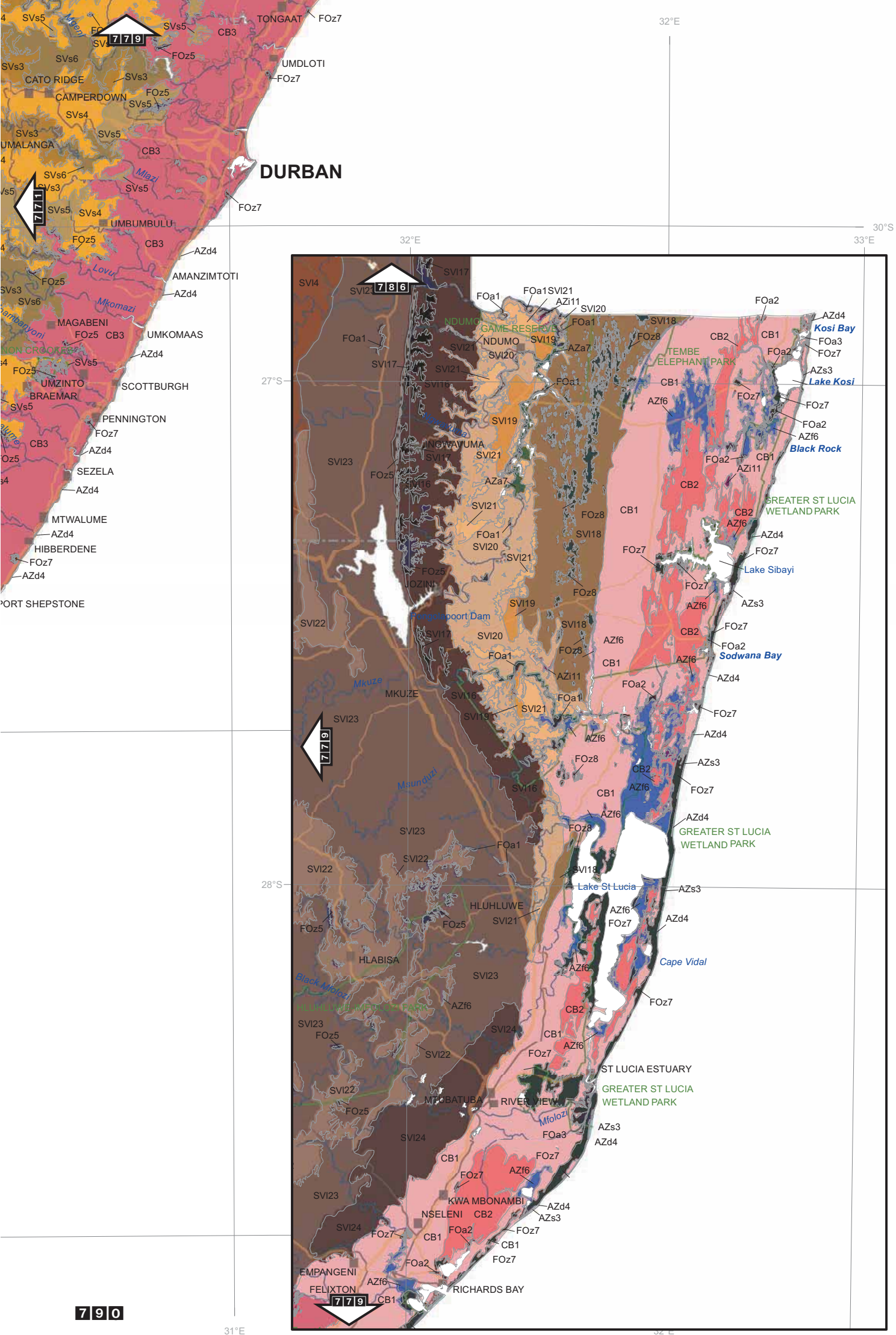
31°E



23°S

24°S

32°E



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 nonbiological terms used in our book—especially those related to geology, soil, climate, GIS terminology and botanical terms not particularly familiar in South Africa, Lesotho and Swaziland. Some 'endemic' local terms such as those related to landscape (koppie, donga etc.) and biota (bushveld, strandveld etc.) are included. Almost all terms have been extracted from the text of this book.

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 'afrotemperate'.

Afrotemperate (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).

Amphibolite (geology) A metamorphic rock composed mostly of amphibole minerals (Whitten & Brooks 1972).

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.

Apedal (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 $\frac{1}{16}$ 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 $\frac{1}{16}$ mm to $\frac{1}{256}$ mm) and clay (less than $\frac{1}{256}$ 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 chalcedony (cryptocrystalline variety of SiO_2). 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).

Biotite (geology) Dark-coloured tri-octahedral mica common in igneous and metamorphic rocks (Deer et al. 1992).

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 fixing of CO₂ is via a four-carbon chain compound. These species have the Calvin Cycle photosynthesising 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 C₃ photosynthesis occurring throughout the light period (Lüttge 2004).

Cambic B-horizon (soil) A subsurface horizon containing illuvial clay, humus, or amorphous sesquioxides, 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 hill-top 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 seral 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) ARC/INFO 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.

DEAT (institution) Abbreviation of the national 'Department of Environmental Affairs and Tourism', a ministry of the Government of the Republic of South Africa.

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 diamictic.

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 sink-holes (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 (calcrete) (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 alcrete, calcrete, 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'.

DWAF (institution) Abbreviation of the national 'Department of Water Affairs and Forestry', a ministry of the Government of the Republic of South Africa.

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).

Ephemeroid (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 $\geq 75\%$ of trees taller than two metres'.

Fynbos (biome) Large areas of Western (and partly also Northern and Eastern) Cape Provinces, characterised by a predominantly winter-rainfall regime and supporting shrublands, herblands, grasslands and restiols. These can be (in some

cases partly) structurally classified as fynbos, renosterveld, strandveld and Cape thickets.

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, with 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 suffrutex (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).

Gilgai (soil) The microrelief of soils produced by swelling clays during prolonged expansion and contraction as water content changes resulting in microbasins and microknolls in nearly level areas and small microvalleys and microridges parallel to the direction of the slope.

GIS See 'Geographic Information System'.

Glenrosa (soil) Soil form with orthic A-horizon above a lithocutanic 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.

Gwarrieveld (vegetation) An Afrikaans term for low shrubland dotted by solitary large shrubs or small trees (especially *Euclea 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 (10⁹) years ago'.

Gypcrete (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.

Gypsum (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).

Halophyte (botany) A plant growing in salty environments and able to tolerate high levels of salt contents in the environment (water and/or soil) (after 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 'calcrete', 'silcrete', 'ferricrete', 'gypcrete'); 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) Fe₂O₃, 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

20–30 m) in diameter, which occurs in the winter-rainfall areas of the western Northern Cape and Western Cape Provinces and usually at lower altitudes. These mounds are thought to have been formed by termites. With their higher calcium levels and more clayey soils, they often support distinctive plant communities. Also termed mima-like earth mounds (after Lovegrove & Siegfried 1989, Low & Rebelo 1998).

Hyaloclastite deposits (geology) Deposits of glassy material formed by the eruption of magma (usually basaltic) in a sub-aqueous 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 Stiegener 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) The arid parts of South Africa but as a geographical term it usually excludes the arid parts of the southern Kalahari and specific areas in the west such as Namaqualand and Richtersveld. However, in terms of biome nomenclature, Namaqualand and Richtersveld are linked to 'Karoo' through the Succulent Karoo Biome.

Karstic (geomorphology) Pertaining to a landscape formed in limestone and dolomite areas characterised by sinkholes and caverns formed by rainwater and groundwater dissolving these carbonate rocks; named for the Karst region of Croatia (former Yugoslavia).

KNP (conservation) Abbreviation of Kruger National Park.

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

Lagoon (geomorphology) A stretch of coastal water body, more or less enclosed and separated from the sea by a barrier (usually sand dune cordon) (after Stiegener 1976).

Land Type (soil) Map unit denoting land, mappable at 1:250 000 scale, over which there is a marked uniformity of climate, terrain form and soil pattern.

Late Glacial Maximum (LGM) (climate) A period during the latest glacial cycle approximately 18 000–20 000 years ago characterised by lower temperature (on average about 6°C lower than today) and drier climate in the eastern part of southern Africa. The winter-rainfall part of the region is supposed to have been wetter during the LGM than today.

Laterite (geology) A residual deposit of hydrated iron oxides formed under special climatic conditions in tropical and subtropical climates by leaching of the rock by groundwater (after Whitten & Brooks 1972).

Latosols (soil) A general term in tropical pedology for soils that have reached a fairly advanced stage of lateritic weathering (Soil Classification Working Group 1991).

Leptosols (soil) A major group of soils described in the World Reference Base for Soil Resources. It defines shallow, stony or very stony soils overlying rock, partially altered rock or strongly calcareous material.

Leucocratic (geology) Pertaining to igneous rocks consisting mainly of light-coloured minerals (quartz, feldspar, white micas etc.). Such rocks often appear dark in hand specimens, but the leucocratic nature is revealed in thin-section (Whitten & Brooks 1972).

LGM (climate) See 'Late Glacial Maximum'.

Liana (botany) Plant with long dangling stems, with roots in the ground and leafy parts in the canopy, usually supported by the branches of trees (after Low & Rebelo 1998).

Lithocutanic B-horizon (soil) A South African Soil Classification diagnostic subsoil horizon. It has distinct affinities with the underlying parent rock into which it merges. It has a cutanic character usually expressed as tongues of prominent colour variegations.

Lithosol (soil) A shallow soil, comprising mostly bedrock or rock fragments, some weathered.

Lowveld (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.

Mafic (geology) Pertaining to ferromagnesian minerals (rich in iron and magnesium). It is often used to describe rocks rich in these minerals although, strictly, melanocratic is the correct term (Whitten & Brooks 1972).

MAP (climate) See 'Mean annual precipitation'.

Map scale (geography) The reduction needed to display a representation of the earth's surface on a map usually expressed as a fraction of the measure on the map over the equivalent measure on the earth's surface (e.g. 1:50 000). A common error is to confuse the geographical terms 'larger' and 'smaller' scales. Large-scale maps such as 1:50 000 show great detail, whereas smaller scale maps such as 1:250 000 show few details but large areas, i.e. maps covering broader areas and usually with less detail are at a smaller scale.

Marula (ethnobotany) Adaptation of the Setswana and North Sotho 'morula' name, possibly via Afrikaans 'maroela', 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 equalling 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) winter minimum temperatures 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'.

Melanocratic (geology) Pertaining to igneous rocks consisting mainly of dark minerals (Whitten & Brooks 1972). 'Melanic' means 'dark'.

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 butts (sometimes eroded to a striking pinnacle) are typical of many Karoo landscapes (Low & Rebelo 1998).

Mesic (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 *Isobertia*. 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 Maputland 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 (plural 'phytochoria') (biogeography) Unit of phytogeographic classification of land, usually based on the co-occurrence (as well as striking absence) 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 asteraceous shrubs (principally *Renosterbos* *Elytropappus rhinocerotis*) with an understorey of grasses and a high biomass and diversity of geophytes (Iridaceae, Amaryllidaceae and Hyacinthaceae).

Restioid (vegetation) Pertaining to vegetation dominated by restios (graminoid plants of the family Restionaceae), commonly occurring within the Fynbos Biome.

Restioidland (vegetation) A vegetation type dominated by the Restionaceae.

Rhyolite (geology) Fine-grained to glassy volcanic rock of a granitic composition. Silica-rich magmas such as these are very viscous and never form extensive flows around vents; instead they erupt explosively and accumulate by pyroclastic flow or ash-fall (modified after Whitten & Brooks 1972).

Riparian (habitat) Referring to habitats in and around rivers.

River wash (geomorphology) Gently sloping area in arid region resulting from flash discharge of precipitation over surface; the habitat is similar to a broad alluvial fan.

Rivier (geography) Afrikaans word for 'river'; in arid regions used for normally dry river courses.

SANBI (institution) Abbreviation of 'South African National Biodiversity Institute', a statutory body falling under DEAT, with its head office in Pretoria, and research, herbaria, environmental education and botanical gardens located around South Africa.

Sandveld (region) Afrikaans word for a region characterised by deep sandy soils; found in Grassland, Savanna and Succulent Karoo Biomes.

Saprolite (soil) Weathering rock in various stages of decomposition. It has a general organisation with respect to colour, structure or consistence that still has distinct affinities with the parent rock.

Savanna (vegetation) Typically vegetation with a grass-dominated herbaceous layer and scattered low to tall trees. It includes the closed woodland and open woodland of Edwards (1983) with a tree cover less than 75% and generally greater than 1%.

Savannoid (vegetation) Pertaining to open wooded grassland structurally similar to savanna, but for climatic reasons not belonging to the Savanna Biome. Savannoid vegetation is encountered within temperate zones.

Schist (geology) A regionally metamorphosed rock characterised by a parallel arrangement of the bulk of the constituent minerals. Schist is coarser-grained than phyllite and tends to have undulose cleavage. Mica minerals are generally responsible for the 'schistosity' (Whitten & Brooks 1972).

Sclerophyllous (botany) Referring to plants characterised by hard, woody leaves, which snap rather than bend and possess high carbon to nitrogen ratios, making them unpalatable to browsers. Sclerophyllous plants are typically found on nutrient-poor soils in fynbos (Low & Rebelo 1998).

Scorpionstailveld (vegetation) Type of 'vygieveld' dominated by *Brownanthus pseudoschlichtianus* in or near the Richtersveld.

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).

Syncline (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 diamictite 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 world-wide 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'.

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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 Acocks but are not given for the vegetation description sections.

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