

ENVIRONMENTAL POTENTIAL FOR GAME SPECIES

Limpopo Province

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Following the previous series on the phylobiogeography of game species, this new series simplifies the main parameters of geographic distribution and the potential for different game species in each province of South Africa.

Animal evolution and geographic distribution is a consequence of environmental change, as described in detail in the previous series. Distribution and performance of game species at present is a result of the ambient environmental conditions that are constantly changing. Global warming since 1940 and human development have contributed to major continuous habitat and environmental change across South Africa and it is ongoing. Government authorities are reluctant in recognising and acting according to the phylogeographic science of change. Animal species are most affected by climate and vegetation, whereas vegetation is most affected by climate and by soil derived from geology.

Natural resources of Limpopo Province

Except for a small highland region adjoining the Great Escarpment, the majority of the Limpopo Province comprises subtropical (moist and warm) habitat, no snow and little frost. Taking into account geology, landscape, present climate and present vegetation, several natural animal potential bioregions can be defined.

Bioregion 1

Mostly a plains landscape in the northern section of the province, on Archaean granites covered by sand that is partly blown in from the central Kalahari and partly derived from the erosion of granite. The climate is hot and arid with between 250 and 400 mm of rainfall. It consists of sweet, dry bushveld, being an event-driven system with low but palatable grass production (average long-term grazing capacity varies from 10 ha [good rainfall events] to 25 ha [poor rainfall events] per large stock unit [LSU]). Browse

capacity (BU) is an average of 12 to 15 ha/BU. Extreme drought events with no grass production are a frequent phenomenon. The veld is at high risk of global warming-resistant tree and shrub encroachment, such as mopane (*Colophospermum mopane*), sicklebush (*Dichrostachys cinerea*) and swarthaak (*Acacia melifera*). A low risk of diseases and few parasites are among the advantages.

Bioregion 2

A mountainous area in the south-west, formed by the metamorphic Waterberg mountains and hills with small valleys and plains in between. The mountain slopes are covered by rocky gravel, and the valleys and plains mostly by shallow sand and silt washed from the hills. The climate is warm and moist (600 to 700 mm rainfall) with moderate frost in winter. The veld varies from mixed to sour bushveld, and both grass and browse are less palatable to most animal species. Average long-term grazing capacity varies from 6 to 10 ha/LSU and browse capacity from 9 to 35 ha/BU. Diseases, especially tick infestations, are of major concern.

Bioregion 3

Mostly a plains landscape in the central, southern and western areas of the province, on a mixture of geological formations of both the Bushveld Igneous Complex and the Waterberg Supergroup. Soil varies from loam to different depths of sand. The climate is warm in summer, with moderate winters and little to no frost, and moderately dry with 450 to 600 mm rainfall. It mostly consists of mixed veld that varies from open thorn veld savanna to dense, mixed broadleaf bushveld, with an average long-term grazing capacity of between 8 and 12 ha/LSU and a browse capacity of 6 to 25 ha/BU. Large areas are heavily encroached by various tree and shrub species, mainly as a result of past overgrazing in combination with global warming. These include sicklebush, swarthaak, vaalboom (*Terminalia sericea*), haak-en-steek (*Acacia tortilis*), sweet thorn (*Acacia karoo*) and blouhaak (*Acacia erubescens*). A high risk of diseases and parasite infestations exists.

Figure 1: Game species potential bioregions defined for Limpopo Province

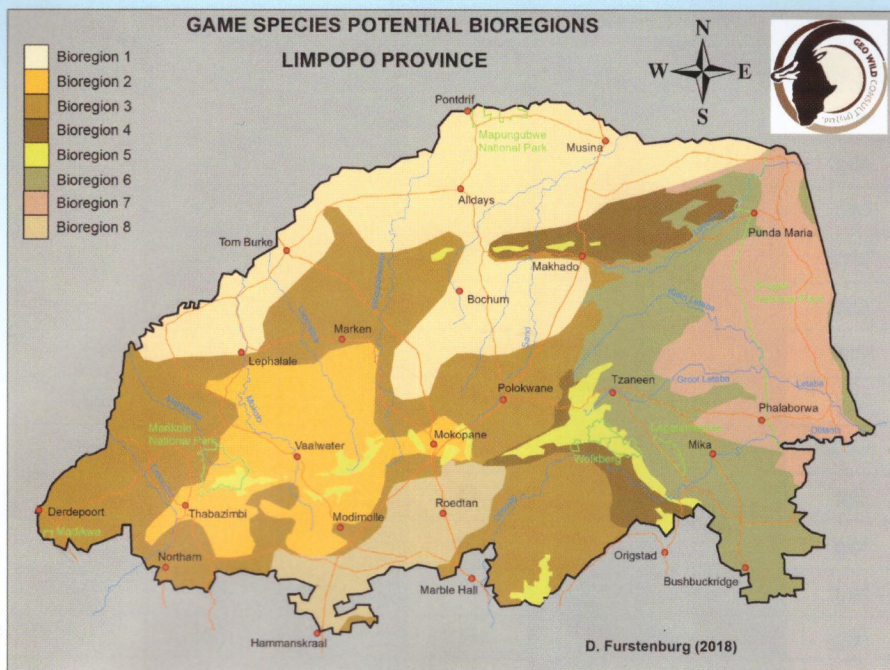
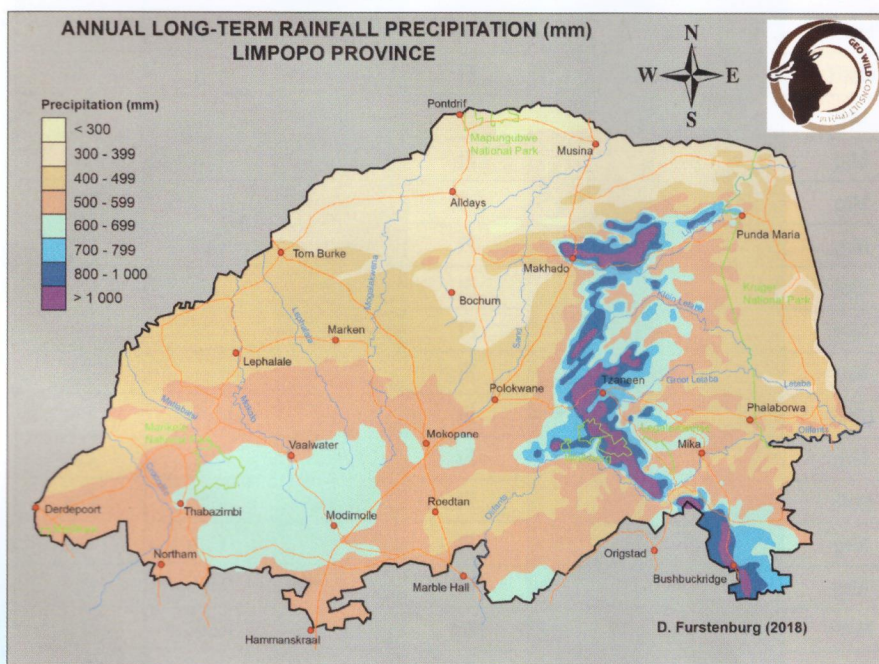


Figure 2: Long-term annual rainfall precipitation for Limpopo Province
(data amended from Weather SA and ARC)



Bioregion 4

Mountainous landscape that is subtropical – warm to hot and wet with 600 to 1 200 mm rainfall and no frost. It includes the Soutpansberg in the north and the central highland, which forms part of the eastern Drakensberg escarpment, stretching from south to north through the eastern central area of the province. Vegetation is sourveld of high

Bioregion 7

Sweet bushveld dominated by mopane woodland and encompassing almost the entire northern half of the Kruger National Park. Lowveld plains on Archaean granite (western section) and mainly Lebombo basalts in the eastern and northern sections. The climate is dry and warm with no

production but mostly unpalatable grazing and poor to no browsing, including rainforests and mist-belt timber plantations. Average long-term grazing capacity is >35 ha/LSU and browse capacity is between 15 and 100 ha/BU.

Bioregion 5

Montane fire climax grassland on mountain crests, plateaux and undulated highlands on the Waterberg, Soutpansberg and the eastern escarp highland. The climate is temperate, moist and wet, being cool in summer and cold in winter, with severe frost and rainfall of 700 to 1 200 mm. Soil varies from rocky gravel to shallow, sandy loam to hutton clay in highland marshlands. It is predominantly sourveld of high-vigour production, high fibre, poor nutrition and mostly unpalatable. Average carrying capacity is 7 to 10 ha/LSU with no browsing capacity. A high risk of diseases and parasite infestations exists.

Bioregion 6

Lowveld sour bushveld on the foot slopes of the eastern escarp and the adjoining undulated hills and plains. It occurs mostly on Archaean granite and shallow, sandy loam soils. The climate is moist, warm in summer and moderate in winter, with little to no frost. Rainfall is between 500 and 1 000 mm per year. It is mostly sour bushveld with a mixture of broadleaf trees and shrubs. Average long-term grazing capacity is between 9 and 15 ha/LSU with a browse capacity of 12 to 18 ha/BU. The greater part of the region is severely overgrazed and the veld-condition index is very low, with the grass layer largely transformed by increaser species. Subtropical diseases and ticks are a major problem.

➔ **Table 1: Relative suitability of the game potential bioregions of Limpopo Province for different animal species (column colours correspond with Fig 1).**

Species	Game potential bioregions for Limpopo Province (Fig 1)							
	1	2	3	4	5	6	7	8
Blesbok	NotR	NotR	NotR	Ft	Mrg	NotR	Ft	Mrg
Buffalo	Opt	Mrg	Opt	NotR	Ft	Mrg	Opt	Opt
Bushbuck	Mrg	Mrg	Opt	Opt	Ft	Mrg	Opt	Mrg
Bushpig	Opt	Mrg	Opt	Opt	Ft	Mrg	Opt	Opt
Duiker, grey	Opt	Opt	Opt	Mrg	Mrg	Opt	Opt	Opt
Eland	Opt	NotR	Mrg	NotR	Mrg	Mrg	Opt	Opt
Elephant	Opt	Mrg	Opt	NotR	Ft	Opt	Opt	Opt
Gemsbok	Opt	NotR	Mrg	Ft	Ft	NotR	Mrg	Mrg
Giraffe	Opt	Opt	Opt	Ft	Ft	Opt	Opt	Opt
Grey rhebok	NotR	Mrg	Mrg	Mrg	Mrg	Mrg	Mrg	Ft
Hippo	Opt	Mrg	Opt	Ft	Ft	Mrg	Opt	Opt
Impala	Opt	Mrg	Opt	Ft	Ft	Mrg	Opt	Opt
Klipspringer	Opt	Opt	Opt	Mrg	Ft	Mrg	Opt	Ft
Kudu	Opt	Opt	Opt	Mrg	Ft	Opt	Opt	Opt
Nyala	Opt	Mrg	Opt	NotR	Ft	Mrg	Opt	Opt
Oribi	Mrg	NotR	NotR	Mrg	Mrg	NotR	Mrg	Mrg
Ostrich	Mrg	NotR	Mrg	Ft	Ft	NotR	Mrg	Opt
Red hartebeest	Opt	Mrg	Opt	Ft	Ft	NotR	Mrg	Opt
Reedbuck, common	NotR	Mrg	Mrg	Mrg	Ft	Mrg	Mrg	Opt
Reedbuck, mountain	NotR	Mrg	Mrg	Mrg	Opt	Mrg	NotR	NotR
Rhino, black	Opt	Mrg	Opt	NotR	Ft	Mrg	Opt	Mrg
Rhino, white	Opt	Opt	Opt	NotR	Ft	Opt	Opt	Opt
Roan antelope	Opt	Mrg	Opt	Ft	Ft	Mrg	Opt	Opt
Sable antelope	Opt	Mrg	Opt	Ft	Ft	Mrg	Opt	Opt
Springbok	Mrg	NotR	Mrg	Ft	Ft	Ft	NotR	Opt
Steenbok	Opt	Mrg	Mrg	Ft	Ft	NotR	Opt	Opt
Tsessebe	Opt	NotR	Mrg	Ft	Ft	NotR	Mrg	Opt
Warthog	Opt	Mrg	Opt	NotR	Ft	Mrg	Opt	Opt
Waterbuck	Opt	Mrg	Opt	NotR	Ft	Mrg	Opt	Opt
Wildebeest, black	NotR	NotR	NotR	Mrg	Mrg	NotR	NotR	Mrg
Wildebeest, blue	Opt	Mrg	Opt	NotR	Ft	Mrg	Opt	Opt
Zebra, mountain	NotR	Mrg	Mrg	NotR	Ft	NotR	NotR	NotR
Zebra, plains	Opt	Mrg	Opt	Ft	Ft	Mrg	Opt	Opt
Cattle	Opt	Opt	Opt	Mrg	Mrg	Opt	Opt	Opt
Sheep	NotR	NotR	Mrg	Mrg	Opt	NotR	NotR	Mrg

Legend: Opt – Optimal
 Mrg – Marginal
 NotR – Not Recommended
 Ft – Fatal / Unsuitable

Figure 3: Simplified main geological features of Limpopo Province (amended from Geo Science SA and McCarthy & Rubidge, 2005)

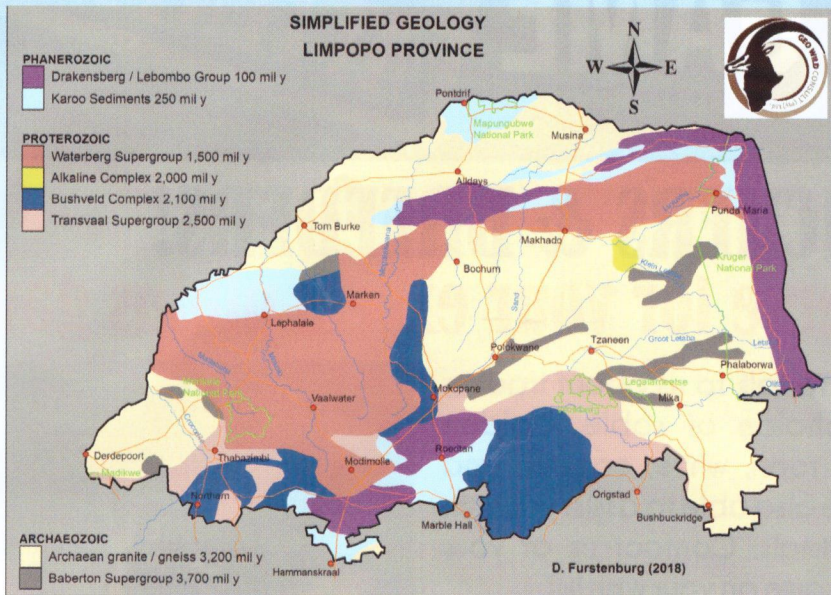
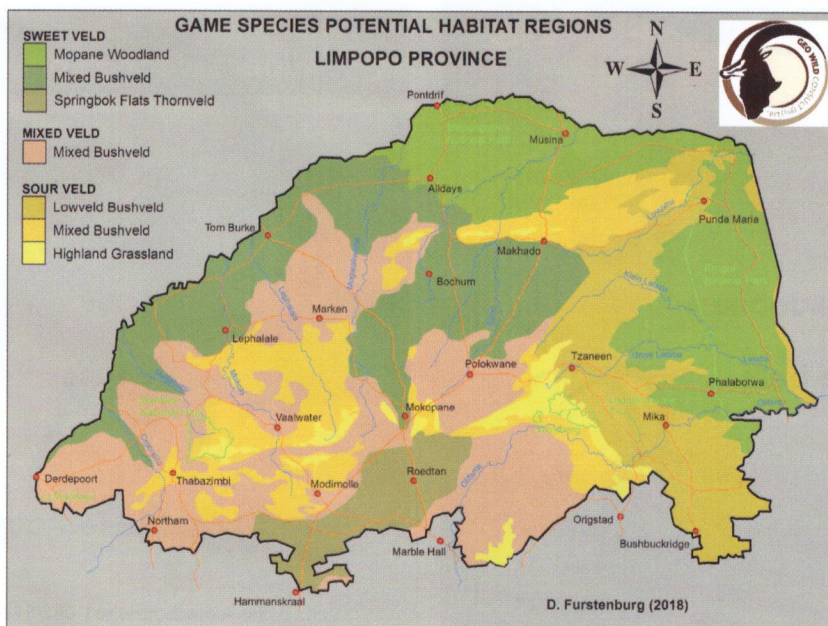


Figure 4: Game species potential major habitat regions defined for Limpopo Province (data amended from Mucina & Rutherford, 2006 and Tainton, 1999)



frost. Rainfall is 350 to 400 mm per year. Average long-term grazing capacity is between 6 and 15 ha/LSU with a browse capacity of 12 to 18 ha/BU. Subtropical diseases and ticks are a major problem.

Bioregion 8

Also known as the Springbok Flats. A sweet thornveld savanna dominated by *Acacia* trees and shrubs on sedimentary alluvial hutton clay soil, derived from Karoo sediments and Drakensberg basalt. The rocky outcrops are mostly vegetated by a mixture of sweetveld broadleaf trees and shrubs. The climate is warm in summer with cool winters and heavy frost. Rainfall varies from 450 to 650 mm per year. Average long-term grazing capacity is 5 to 8 ha/LSU with a browse capacity of 6 to 25 ha/BU. Large areas have been ploughed for agricultural produce. There is severe encroachment by various tree and shrub species on old lands, mainly due to global warming, including sicklebush, *swarthaak*, *vaalboom*, *haak-en-steek* and sweet thorn.

Take special note that the bioregion descriptions are simplifications on a macro scale. Localised variations and specific habitat parameter evaluations per land unit or game farm remain essential for best-practice game farming and animal management. 🐾

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VOL 24/06 JUNE/JUNIE 2018

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