LONG TERM GRAZING CAPACITY MAP FOR SOUTH AFRICA 2016

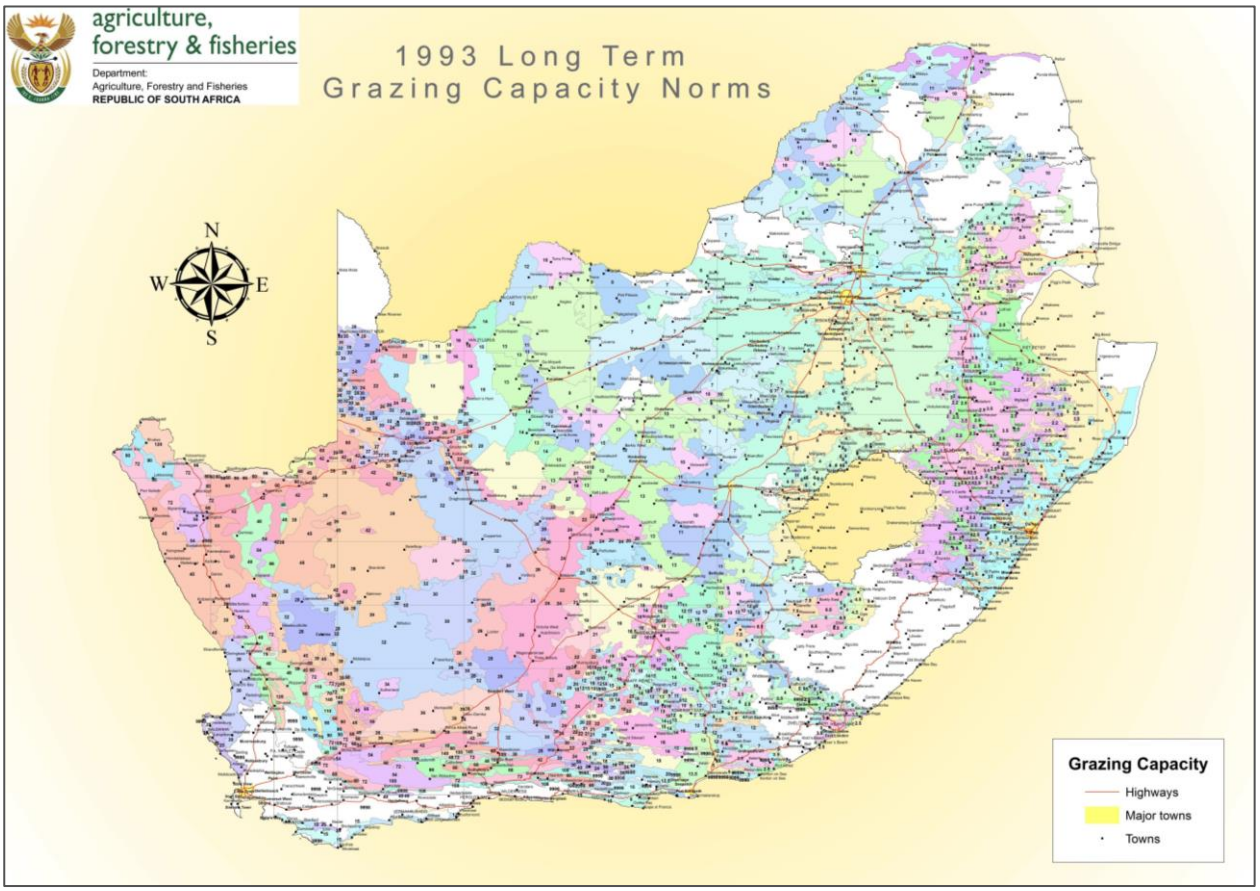
Background

Act 43 of 1983 CONSERVATION OF AGRICULTURAL RESOURCES ACT (CARA)

As stipulated in Regulation 10 (1) of CARA, it is the mandate of the Department of Agriculture, Forestry & Fisheries to provide a long term grazing capacity map for South Africa. This responsibility resides with the Directorate Land Use & Soil Management.

10.(1) The grazing capacity of veld, expressed as a specified number of hectares per large stock unit, shall be as indicated on a topo-cadastral map that is kept at the office of the executive officer for this purpose.

During the development of this map, expert opinion of pasture scientists, agricultural extension officials and farmers were explored. Areas of more or less homogenous potential were demarcated on 1: 250 000 scale topo-cadastral maps and then digitised into a single map of the country. Unfortunately the previous self-governed homeland areas were not included into this exercise. This map was published in 1993.



To cover the gaps in the former homeland areas and to compromise for long term veld degradation in certain parts of the country, it became inevitable to update the 1993 grazing capacity map.

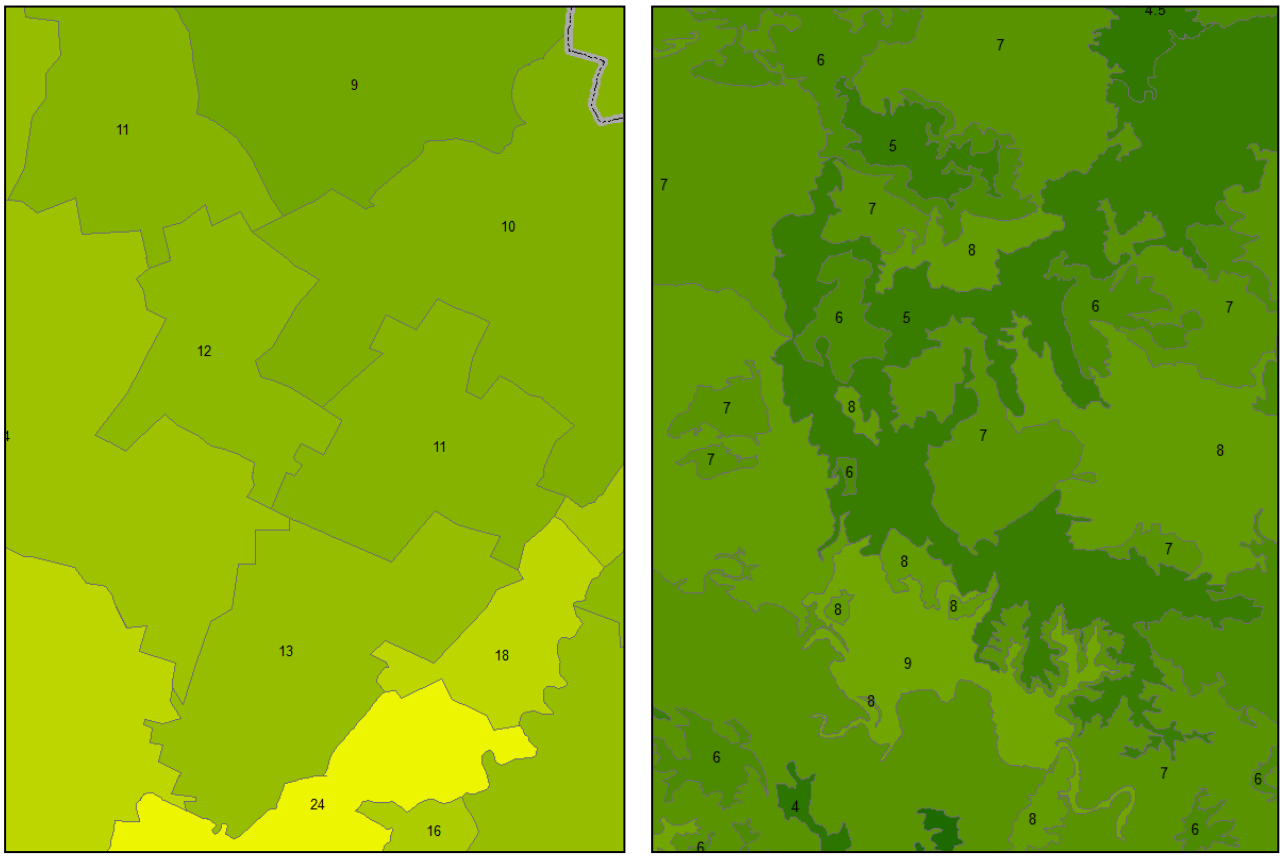
New technology such as Geographical Information Systems and new data sets that were developed such as the refined vegetation types of South Africa (Vegmap), Mucina & Rutherford 2006 *, prepared the way for the development of the new grazing capacity map.

*MUCINA, L. & RUTHERFORD, M.C. (eds) 2006. The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.

Methodology

GIS software and statistical analysis programmes were used to develop the new grazing capacity map. The median and majority (modal) statistics were generated from zonal statistical analysis using Vegmap as zones and the 1993 grazing capacity map as reference dataset. The developed data set was then put through various provincial workshops where pasture scientists, agricultural extension services and natural resource specialists of each province made valuable inputs to ensure a realistic presentation of the long term grazing capacity of each province respectively.

Some provinces incorporate other sources into the product as well. These products were developed, verified and used by the provinces over an extended period of time. This explains the fact that polygons from one province will differ in size and structure, compared to another province. For example, polygons of the Northern Cape will follow farm or district boundaries and cover larger areas than Eastern Cape boundaries that follow natural vegetation boundaries and usually cover smaller areas. See figure below:



Rigid boundaries vs soft boundaries

The following data sets were incorporated to a lesser or lager extent into the final map:

1. **Grazing Capacity map of 1993.**

   RSA grazing capacity map. 1993. Department Agriculture.

2. **Vegetation types of SA (Vegmap) 2006.**

   MUCINA L & RUTHERFORD MC (eds.) 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

3. **Land Types of South Africa data set.**

   The national land type survey (MacVicar et al., 1974; Eloff, 1977, Land Type Survey Staff, 1984; Turner & Rust, 1996; Turner, 1996) is the source of information of generalized soil maps of the country.

4. **KZN Bioresouce classification data**

   CAMP K.G.T. 1999. A Bioresource classification for KwaZulu-Natal, South Africa. University of Natal (Pietermaritzburg). M.Sc. Thesis.

Unit of measurement

The value depicted on the map is the number of **hectares per large stock unit (ha/LSU)**. This unit is described in literature as follow:

A homogeneous unit of vegetation expressed as the area of land required (in hectares) to maintain a single animal unit (LSU) over an extended number of years without deterioration to vegetation or soil.
Where a LSU = An animal with a mass of 450 kg and which gains 0,5 kg per day on forage with a digestible energy of 55%
Reference: W.S.W. Trollope, Lynne A. Trollope & O.J.H. Bosch (1990) Veld and pasture management terminology in southern Africa, Journal of the Grassland Society of Southern Africa, 7:1, 52-61.

Tree crown cover was not incorporated into the map. Areas with high tree densities may influence the grazing capacity extensively. Browsing capacity was also not incorporated into the grazing capacity value.

The mean grazing capacity value for the three most important livestock farming biomes are as follow:

BIOME	Mean Ha/LSU
GRASSLAND	6
SAVANNA	12
NAMA-KAROO	25

Use & Limitations

It is very important to remember that the grazing capacity values indicated on the map are long term values of veld that is in a relatively **good condition**, thus can only be used as a guideline in farm planning and grazing management.

WHAT IS VELD IN A GOOD CONDITION?

When assessing veld condition there are many parameters that can be measured. A few of the most important ones are discussed here shortly:

1. **SPECIES COMPOSITION**
    - Need to be representative of the benchmark site.
    - Need to consist of the correct composition of palatable – unpalatable species.
    - Need to be free of alien invasive plants
    - Need to have an acceptable distribution and density of woody plants where applicable. (no encroachment)
2. **COVER**
    - Optimum cover as depicted by the specific vegetation type
    - In line with the rainfall regime for that specific season
    - No signs of surface erosion (wind or water)

3. **BIOMASS PRODUCTION**
    - Sufficient to carry the recommended number of animals for one year.
    - At a utilization factor of 40-50 %
    - In line with the rainfall regime for that specific season
    - Healthy plant vigor (small tufts vs. big tufts)

4. **Not severely damage by:**
    - Overgrazing
    - Locust
    - Termites
    - Fire
    - Hail
    - Floods

Actual veld condition and biomass production that determine grazing capacity will vary from season to season and is influenced by factors such as rainfall, temperature, bush encroachment, fire and the type of management system practised by the land owner.
It is therefore the **responsibility of the land owner** to manage his animal numbers in such a way that there will be no degradation of natural resources such as overgrazing of veld and erosion of soil.

From a geographical perspective it is also important to remember that the map was developed for use at a 1: 250 000 scale. This means that there may be smaller areas within a “homogenous” polygon that may differ from the applied value, but are just too small and insignificant at this scale.

Revision of polygons and values

Changes to values or boundaries on the new grazing capacity map will be considered at a yearly basis under the following conditions:

1. Requests for revision will have to be substantiated by actual veld condition surveys done by a registered pasture scientist or person with a similar relevant qualification.
2. The provided evidence must be representative of a homogenous geographical area.
3. Requests for exceptions on the long term grazing capacity norm for an individual farm will be handled by the Resource Auditors and permits valued for ONE year may be issued. (CARA - Regulation 10.3).
4. Requests for revision may be send to:

   DAFF – LUSM
   Private Bag X120
   Pretoria
   0001

   Faxed to: LUSM – NRIA (012) 329 5938
   E-mailed to: PaulA@daff.gov.za

Metadata Date Stamp: October 2016

DATASET DESCRIPTION

Dataset Title: 2016 Long term grazing capacity map for South Africa

Dataset Reference Date: *2016/10/10*

Data quality: *Good – some errors may occur due to quality of input data sets.*

Dataset Responsible Party: *Department of Agriculture, Forestry and Fisheries / Directorate: Land Use and Soil Management*

Geographic Location of the Dataset: *RSA*
West: *16.00*
East: *33.20*
North: -22.00
South: *-35.00*

Keywords: Grazing capacity; Grazing potential; Hectares per Large Stock Unit.

Dataset Language: *English*

Dataset Character Set: *N/A*

Dataset Topic Category: *Agricultural Potential – grazing capacity*

Spatial Resolution of the Dataset: *1:250 000*

Data Release classification: Official release 2016

Citation Information:
Originator: *Department of Agriculture, Forestry and Fisheries (D:LUSM)*
Publication Date: *2016/10/10*
Title: 2016 Grazing Capacity map of South Africa
Geospatial Data Presentation Form: *Vector - polygon*
Other Citation Details: *None*
Online Linkage*:* www.daff.gov.za

Abstract:
The Grazing capacity layer is a wall-to-wall polygon layer indicates the grazing capacity for a specific polygon in ha/LSU. This value indicates the amount of hectares required to sustain production of an Large Stock Unit, defined as an animal with a mass of 450 kg and which gains 0,5 kg per day on forage with a digestible energy of 55%.The map was developed as part of the requirements of Act 43 of 1983 Regulation 10 (Conservation of Agricultural Resources Act).

Purpose:
The purpose of this map is to provide a guideline for land owners on how many grazing animals may be kept on a relatively homogenous area of natural veld without degrading the natural resources, taking into account that the value was calculated for veld in a good condition.

Supplemental Information:
See detailed description

Lineage Statement:

ATTRIBUTE INFORMATION

Attribute Description:

Field name	Alias Name	Data Type	Description	Example
ha_LSU	*Ha/LSU*	*Integer*	*This field contains the value indicating the number of hectares needed for one large stock unit.*	*Value ranges from 1.5 - 140*
Area_Ha		*Integer*	*This field indicates the area of each polygon in hectares (ha)*	*100.20*

SUPPLEMENTARY INFORMATION

DATA MAINTENANCE

Dataset last updated: ***2016***

Time Period of Content: ***Continuous***

Progress: ***Completed***

Maintenance and update frequency:
The data layer will be updated once a year if requests for updates are received from the users or new information becomes available through research.

DISTRIBUTION AND CONSTRAINTS

Online Resource: ***www.daff.gov.za***

Distribution Format: ***ArcGIS 10.2 shape/layer file***

Access constraints:
The data can be obtained from Department of Agriculture, Forestry and Fisheries. The department must be acknowledged in the use of the data as per citation information.

Distribution constraints:
Use limitations:
Please refer to the License Agreement. The user shall not sell or license the spatial data. The Department of Agriculture, Forestry and Fisheries cannot give any warranty on the accuracy of the data. The Department of Agriculture, Forestry and Fisheries shall in no way be liable for results related to the use of the data. Users of the data must acknowledge the copyright.
Source: Department of Agriculture, Forestry and Fisheries

METADATA INFORMATION

Metadata Point of Contact: ***Directorate: Land Use and Soil Management***
Mr. Paul Avenant

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Private Bag X 120
Pretoria
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South Africa
0001

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Delpen Building
Cnr Annie Botha and Union Streets
Riviera
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0083

Telephone: *+27 12 319 7549*

Additional Extent information for the Dataset (Vertical & Temporal): *N/A*

Spatial Representation Type: *Vector*

Reference System:
Projection – WGS_1984_Albers
Coordinate Reference – D_WGS_1984

Metadata File Identifier: *2016 Grazing Capacity map for South Africa*

Metadata Standard Name: *SANS 1878*

Metadata Standard Version: *SANS 1878/1:2005*

Metadata Language: *English*

Metadata Character Set: *US/Ascii*