

SAVORY OR UNSAVORY? : The Application of Holistic Resource Management in the Mesic Grasslands of KwaZulu-Natal

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INTRODUCTION

- In recent times many farmers have adopted the principles of Holistic Resource Management (HRM).
- This management paradigm has also gained support in the mesic grasslands of KwaZulu-Natal.
- It is important that Agricultural advisors and policy makers keep abreast of changing land-use management systems, and are able to make objective assessments of them.
- For the biodiversity sector it is important to promote land-use practices that are compatible with both agriculture and biodiversity conservation.



SUSTAINABLE GRAZING OBJECTIVES

- Sustainable agricultural objectives:
 - A palatable sward that remain productive in the long-term.
 - Good basal cover and a healthy soil layer.
 - High levels of animal production both at an animal unit and area unit basis.
- Additionally from a biodiversity perspective it is important to:
 - Maintain species diversity that includes sensitive long-lived plant species (e.g. geophytes).
 - Maintain habitat heterogeneity that reflects both species diversity and structural diversity.
- There is concern that HRM does not allow components of these objective to achieved.



PRINCIPLES OF HRM

Principles of HRM are based on the observations and philosophy of Alan Savory namely:

1. A holistic perspective is essential.
2. Brittle vs non-brittle environments:
 - Brittle lands deteriorate when rested.
 - Non-brittle lands do not.
3. In brittle environments concentrated animal numbers (high stock density) do more good than harm.
4. Over grazing is a factor of time – grazing of plants for too long, not simply by too many animals.



MANAGEMENT TOOLS OF HRM

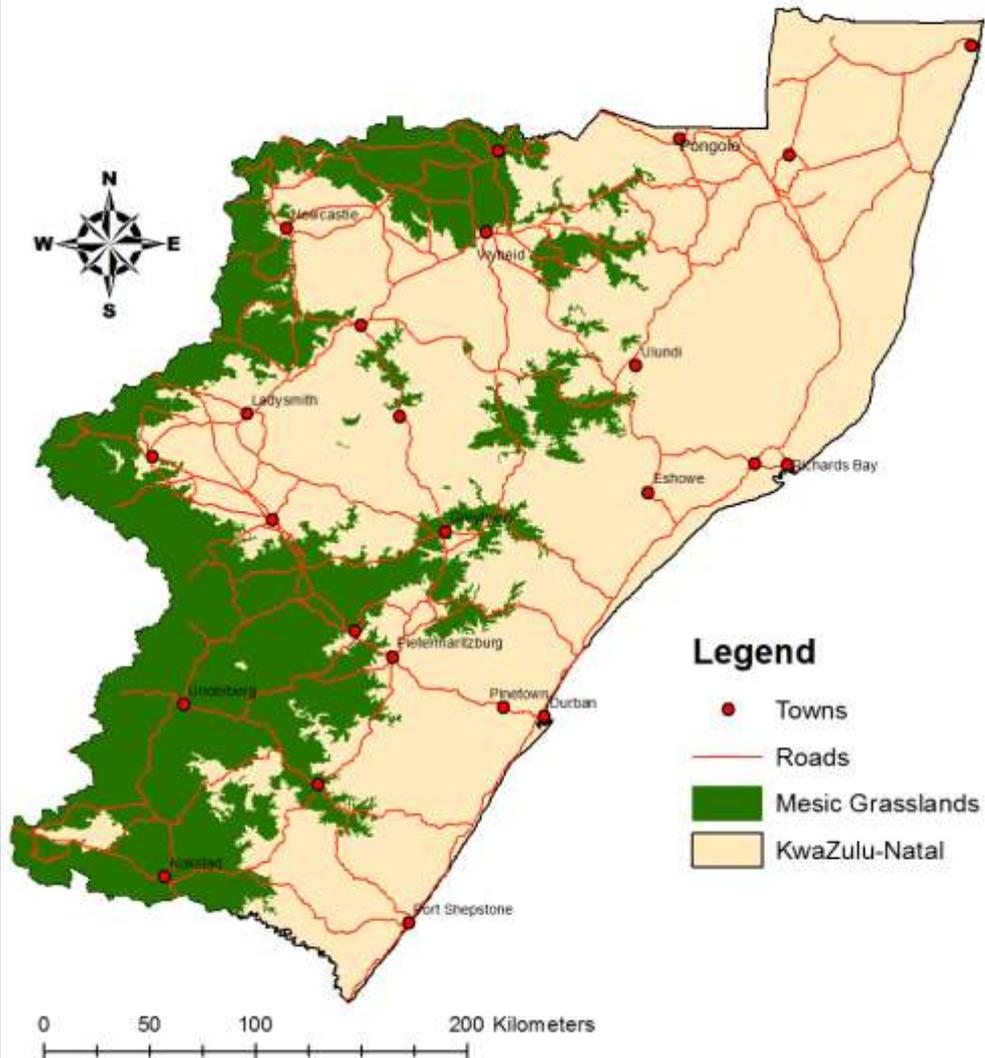
Rangeland Management Tools used in HRM include the following:

- Technology – fences, water pumps and herbicides.
- Fire – do not advise using fire.
- Rest – HRM uses “effective recovery periods” – rotationally withdrawing animals in order for plants to produce leaves – period can vary from 30 – 120 days.
- Grazing.
- Animal impact – effect of hoof action.



STUDY AREA

MESIC GRASSLANDS OF KWAZULU-NATAL



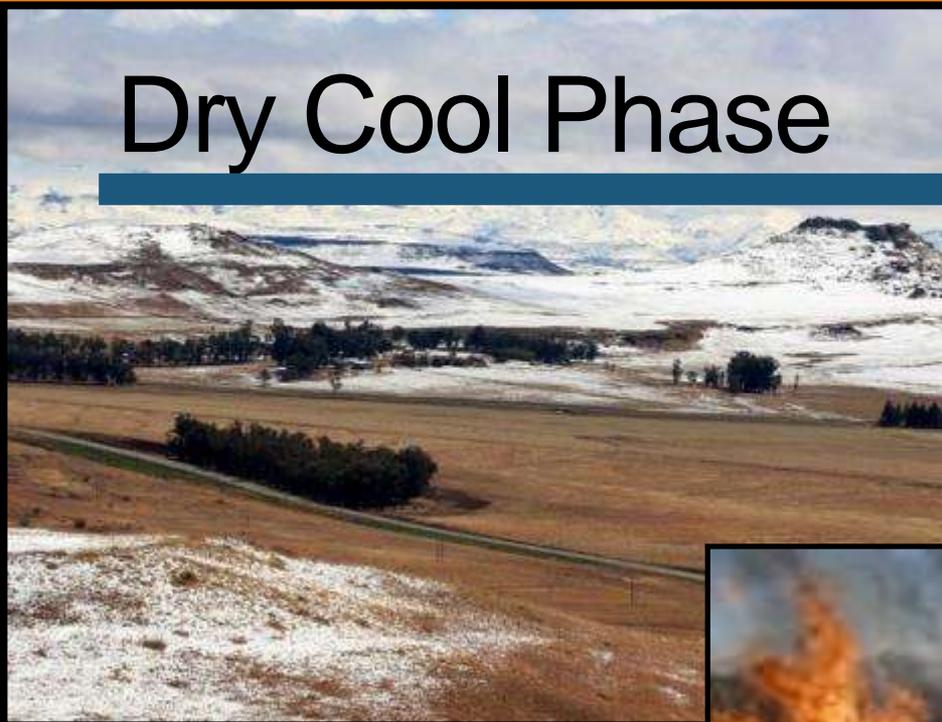
Environmental Parameter	Mesic Grasslands		
	Dry Cool	Moist Cool	Moist Warm
MAP	<800mm	>800mm	>800mm
Altitude range	900-1400m	1400-1800m	900-1400m
MAT	14.3°C	14.1°C	17°C

MESIC GRASSLANDS

The Mesic Grassland Bioregion (Sourveld) covers 29% of KwaZulu-Natal of which the majority consist of natural veld.

Red meat production on veld contribute 20% to the Agricultural GDP of KwaZulu-Natal.

Dry Cool Phase



Moist Cool Phase



Moist Warm Phase



THE BRITTLENESS SCALE

The Brittleness Scale

Non-brittle

1 2 3 4 5 6 7 8 9 10

Brittle

Jungle

Humidity year-round

Vegetation breaks down quickly

Desert

Humidity erratic

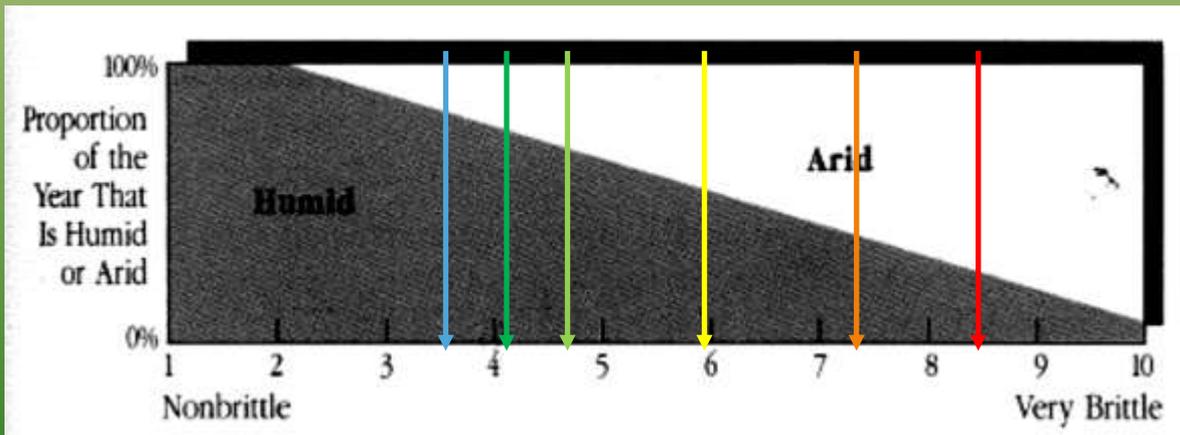
Vegetation lingers



The scale is subjective, there is no formula for its calculation.

Position on the scale is determined not from rainfall records but from field observations - altitude or prevailing winds.

Practitioner decide where their land sits on the brittleness scale.



- Warm Moist
- Cool Moist
- Cool Dry
- Zululand Thornveld
- Thabazimbi
- Vryburg

Relationship between humidity and the brittleness scale – Savory (1999)



NON BRITTLE ENVIRONMENTS

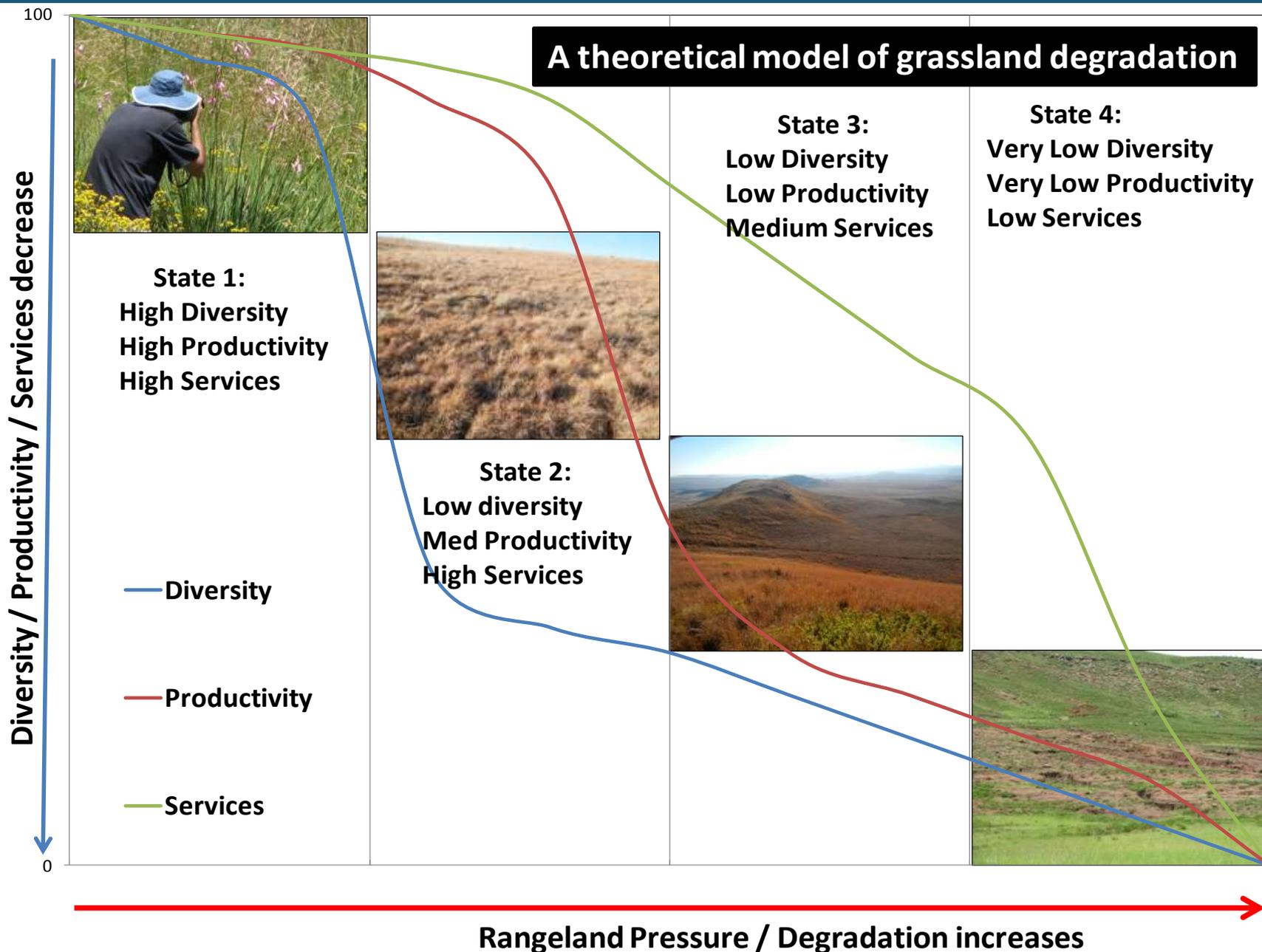
How are non-brittle Mesic Grasslands unsuited to the application of HRM?

High rainfall, climatic conditions and ecology of these grasslands:

- High productivity
 - Difficult to maintain a non-selectively grazed grass sward.
- Loss of palatability during winter
 - Leads to a moribund sward after winter.
- Soil characteristics
 - Topsoil, if compacted, leads to loss of soil organic C and erosion.
- Reproduction and dispersal
 - Grass reproduction and dispersal is driven by tillering, not seeding, which is impeded by heavy grazing and trampling.



DEGRADATION OF MESIC GRASSLANDS



RESILIENCE OF MESIC GRASSLANDS

- Mesic grasslands have ecologically low resilience.
- Once the impact on these grasslands has exceeded a threshold, they move into a new state, characterised by a different species composition, in which their previous state cannot be recovered.
- The implication of this is that:
 - Palatable species are largely unable to recover once this threshold has been breached.
 - There is usually a significant loss of the topsoil layer and soil carbon that cannot be regained.



HERD EFFECT

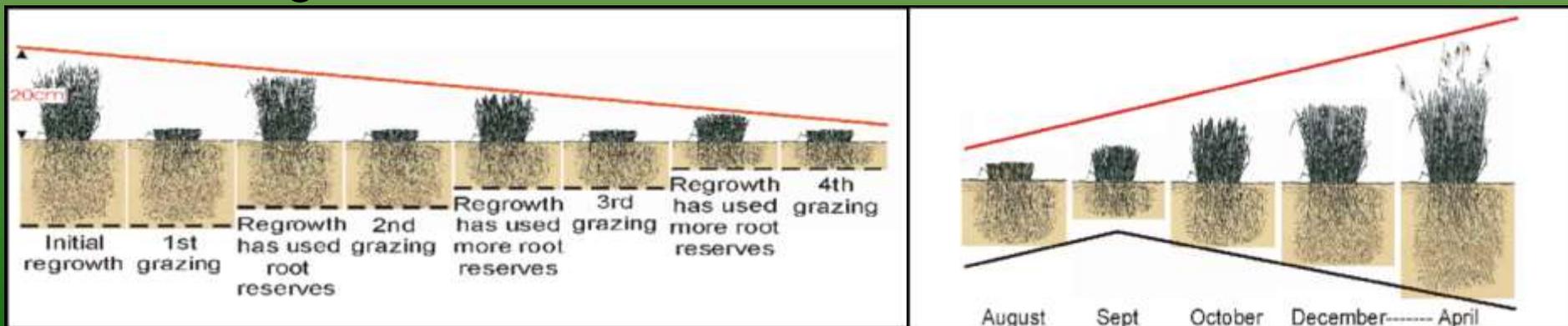
Mesic grasslands are susceptible to the following impacts of herd effect:

- Trampling resulting in compaction of the topsoil layer leads to a:
 - Detrimental change in grass species composition.
 - The proliferation of alien, ruderal and pioneer species.
- Trampling impacting on susceptible long-lived non-grass species such as geophytes.
- Other impacts include those on ground-nesting bird species and other fauna.



THE IMPORTANCE OF REST

- An effective rest is the removal of grazing from first rain to first frost i.e. the entire growing season.
- Substantial research has shown that grazing during any part of the growing season leads to a reduction of sward vigour.
- Hence an effective periodic rest is essential to maintain sward vigour especially of palatable species.
- Rest results in increased productivity in the season following the rest.



THE IMPORTANCE OF REST FOR BIODIVERSITY

- The removal of impact to allow non-grass species to recover from grazing and trampling impacts.
- Provision of structural heterogeneity:
 - Mixture of short, grazed grass and longer grass in the sward.
 - Provision of shelter to many faunal species – e.g. grassland birds and oribi.



THE IMPORTANCE OF FIRE

- Clear scientific evidence of the importance of fire in the evolution of mesic grasslands.
- It is an important aspect of the ecology of these grasslands.
- Fire can be beneficial or deleterious depending on the timing and frequency of its application.
- Application of fire following rest facilitates the removal of moribund material and the achievement of a non-selective graze – it overcomes the competitive advantage of non-palatable species.



THE IMPORTANCE OF FIRE

- The absence of fire favours the development a tall robust sward that can over shadow palatable species and lead to a reduction in basal cover.
- The absence of periodic fire of sufficient intensity can lead to an increase in woody species and ultimately bush encroachment e.g. *Leucosidea sericea*.
- Fire is important in the maintenance of structural heterogeneity in the landscape.



ACHIEVING A NON-SELECTIVE GRAZE

- In mesic grasslands, a non-selective graze is most effectively achieved after a fire and applying a high stock density.
- The application of a non-selective graze in the absence of an effective rest will ultimately lead to a reduction in vigour of palatable species and productivity of the grass sward.



CONCLUSION

- Mesic grasslands are non-brittle environments that don't fit within the Savory model of HRM.
- The inter-relationship between effective rest, fire and non-selective grazing is fundamental to rangeland management and ecology of mesic grasslands.
- The lack of consideration of one of these elements can lead to deleterious effects from both an agricultural and biodiversity perspective.





INTRODUCTION

- Recent times have seen many farmers converted to the principles of Holistic Resource Management (HRM).
- Also in the mesic grasslands of KwaZulu-Natal this management paradigm has gained support.
- HRM is sold as a panacea for all problems relating to desertification and rangeland degradation;

“In HRM we undoubtedly have an economically sound, self sustaining answer to the desertification problem...” **Allan Savory (1983) - Rangelands**

“The fate of many countries depends on how HRM is developed and extended...” **Allan Savory (1983) - Rangelands**



INTRODUCTION

- However, often the underlying reasons are:
 - The hope of escaping the cost-price squeeze that has been hamstringing the red meat industry for a number of years;
 - Claims made by Holistic Resource Management trainers and practitioners of nearly doubling stocking rates;
 - Whilst, improving the grass sward and simultaneously lowering input costs.

“HRM can provide improved profit....and takes into account the desires of the people who makes decisions about the land”

“HRM is a goal driven process that overrides our conventional decision-making to ensure decisions are socially, economically and environmentally sound ...”

“HRM is all about healthy and happy people, healthy country and earning enough money to pay for things you want...” **Holistic Management International (2015)**

