



# HERBACEOUS PLANT SPECIES RICHNESS AND COMPOSITION:

How does it relate to veld condition in Mistbelt Grasslands in KZN?



**Petros Ngwenya**

Ecological Advice West

Ezemvelo KZN Wildlife



# BACKGROUND

- **Species Richness** – the oldest & simplest concept of **Species Diversity**.
- **Basic measurement problem** – often impossible to enumerate all of the species in a biological community.
- Veld condition assessment techniques are a popular means of rapidly determining the grazing potential of grasslands and, as such, are widely applied across southern Africa.
- Nature conservationists are showing interest in these techniques as a possible means to rapidly assess the biodiversity value of grasslands; however, this requires a **correlation** between the veld condition scores and total plant richness to first be established.



# BACKGROUND cont...

- **Perception** – current Veld Condition Assessment Techniques (VCAT) are agriculturally biased.
- **Veld condition assessments** derived from them – little or no value for biodiversity.
- **Reason** – current VCAT focus mainly on grasses as the key determinants of VC & lump all **forbs** into the **Increaser IIc ecological group**.

# BACKGROUND End

- **Plant diversity:** determined by various factors – e.g. climatic, edaphic, habitat diversity, etc.
- **Veld Condition:** determined by the ff. factors:
  - Species composition;
  - Vigour of palatable grass species;
  - Basal cover;
  - Soil surface condition.

**NB:** Only spp. composition can be **objectively measured**, thus the VC assessment procedure is based on this factor.

- According to current VCAT, veld dominated by **Decreaser spp. = good or excellent condition.**
- Veld dominated by **Increaser spp. = poor condition**



# AIM AND OBJECTIVES

## The aim of this study:

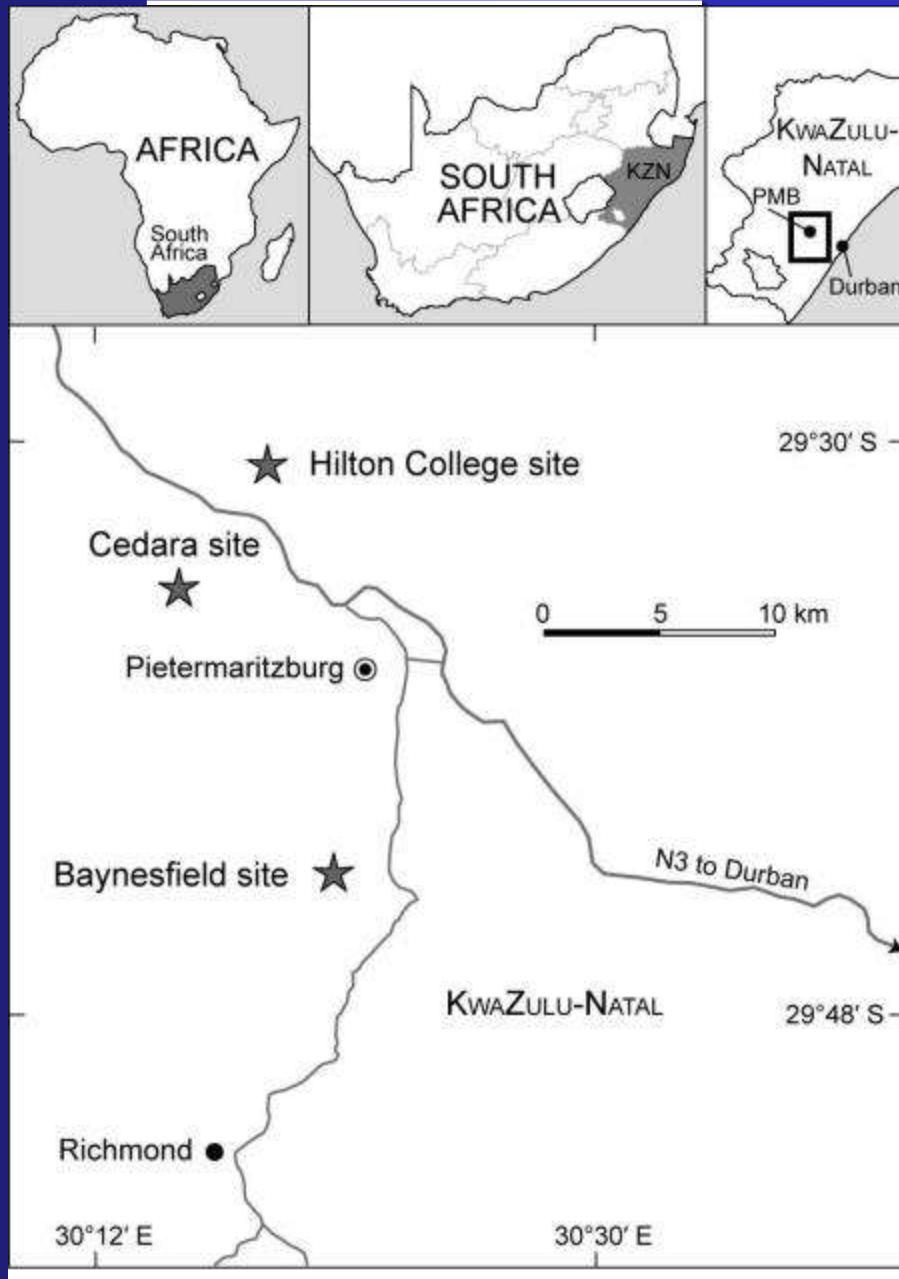
- To investigate whether a relationship exists between the **grazing veld condition** (GVC) and **herbaceous plant species richness**.

## The objectives were:

1. To assess veld condition of the 12 sample plots.
2. To determine herbaceous plant species richness of the 12 sample plots.
3. To **test** whether a **relationship** exists between **veld condition scores** & herbaceous plant **species richness** (CORRELATION).



# STUDY AREA



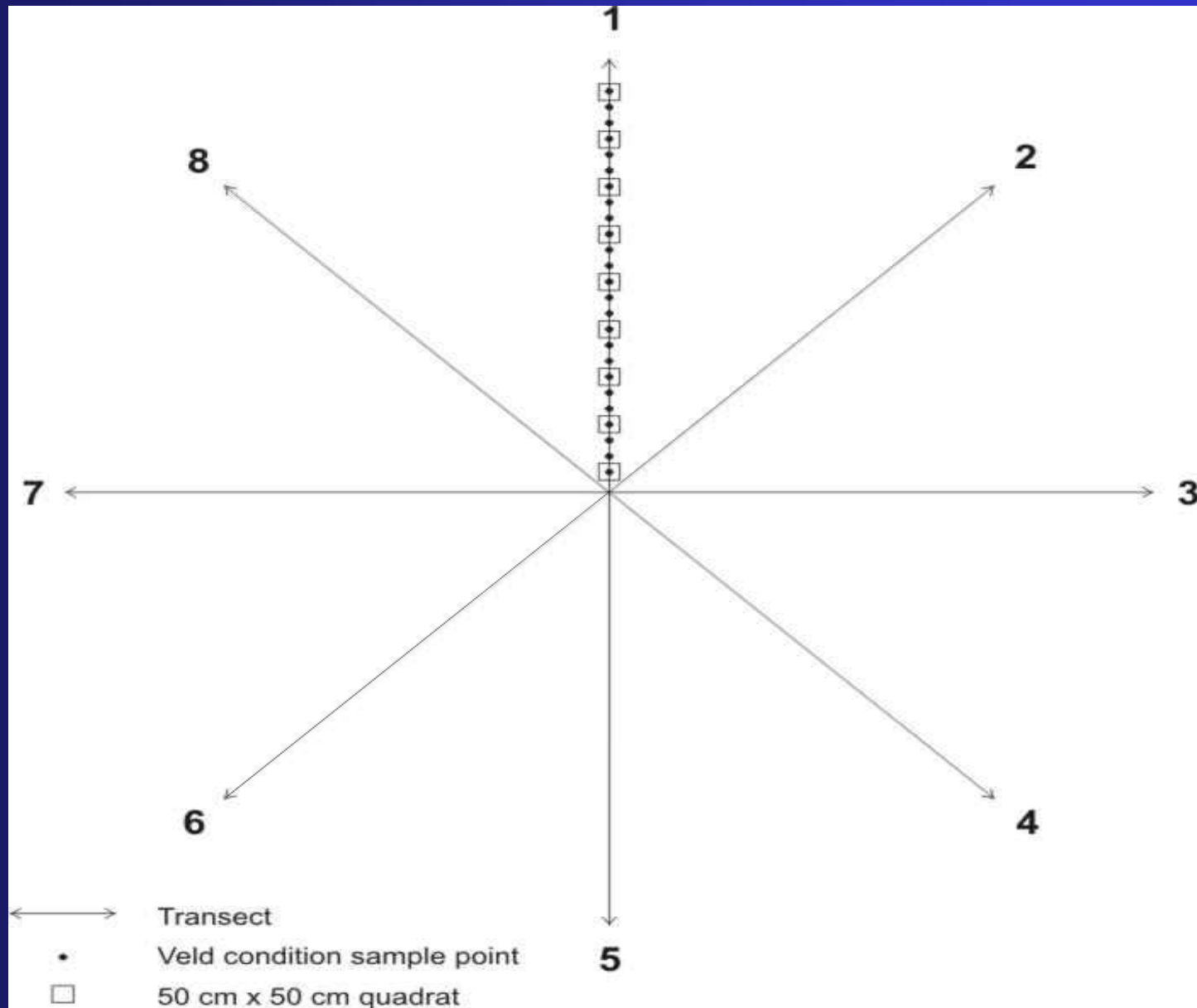
AJRFS (2012)

# METHODS: Data Collection

- VC data were collected from 12 sample plots using **modified wheel-point technique** [i.e. **step-point method**] (Tainton, 1999).
- Species Richness data were collected using **50cm x 50cm quadrats** (see Sampling Design).
- **A total of 75 quadrats & 200 step-points** sampled per plot at 3m & 1m intervals respectively along 8 fixed transects.



# METHODS: Sampling Design



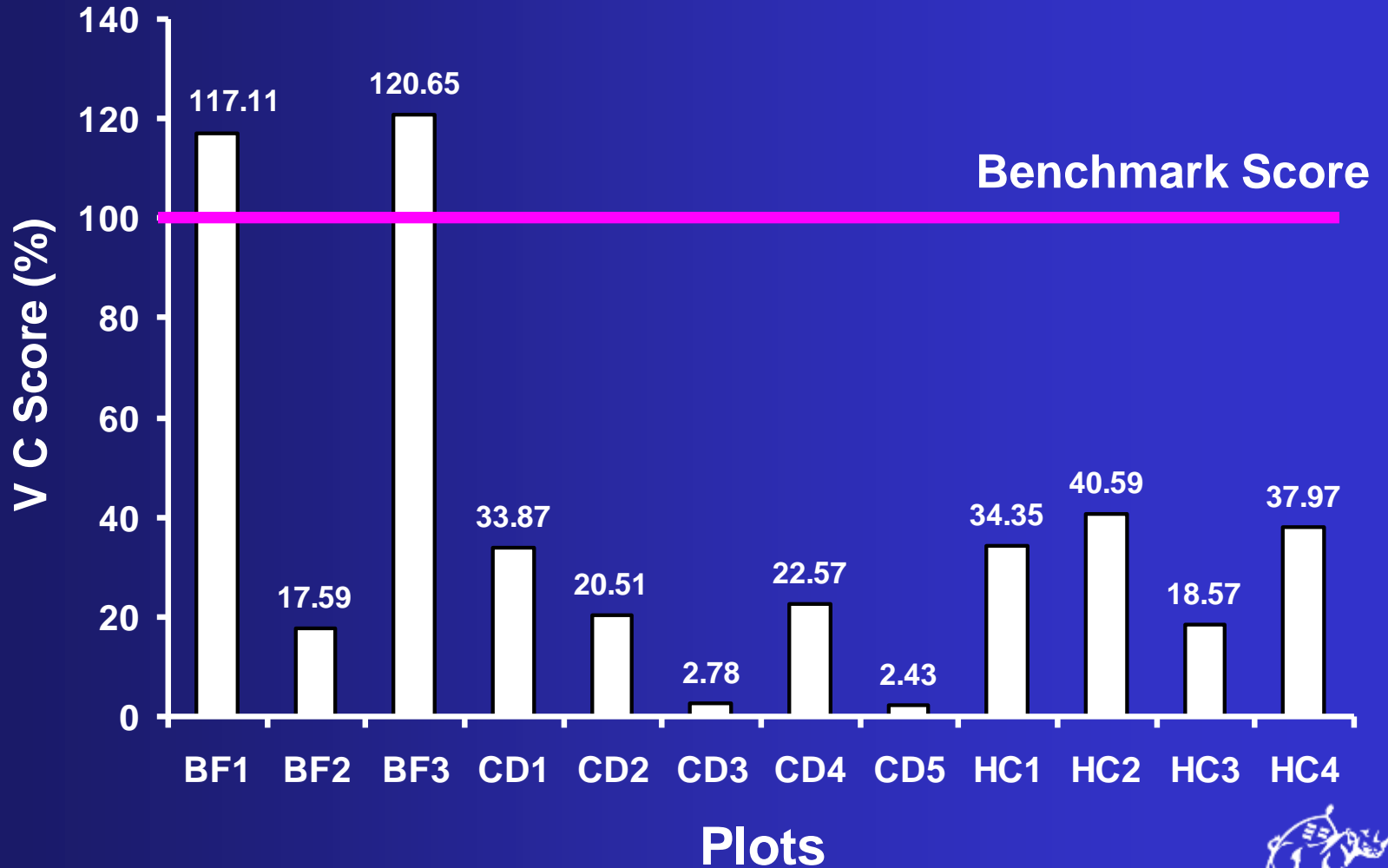


# METHODS: Data Analysis

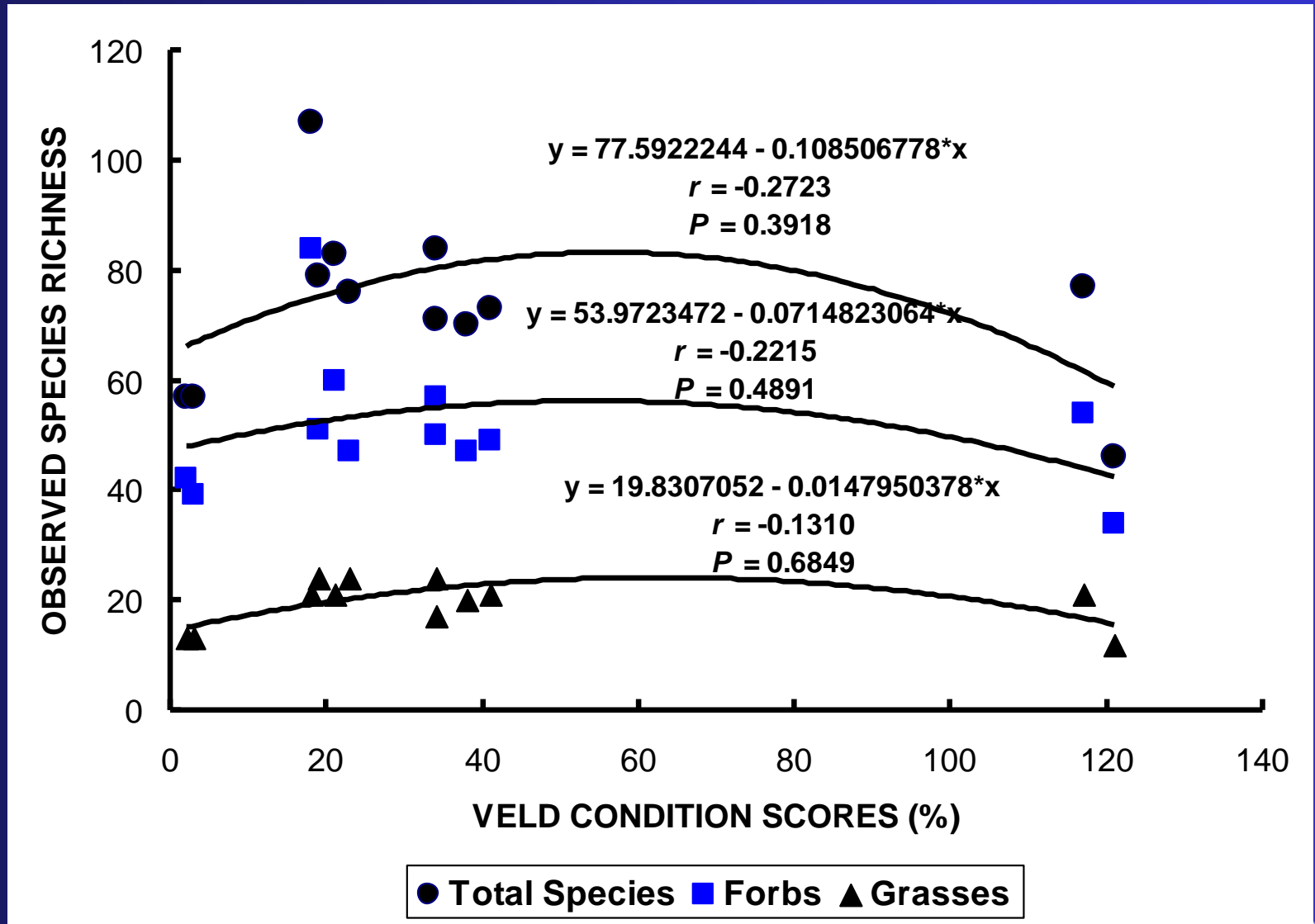
- **Veld condition data** were analyzed using the Benchmark method (Hardy *et al.*, 1999).
- **Estimated Species Richness** was calculated using the **Jackknife Estimator of Species Richness** (Krebs, 1999).
- **Correlation** analysis undertaken to determine relationship betw. **species richness & veld condition scores** using **STATISTICA**.



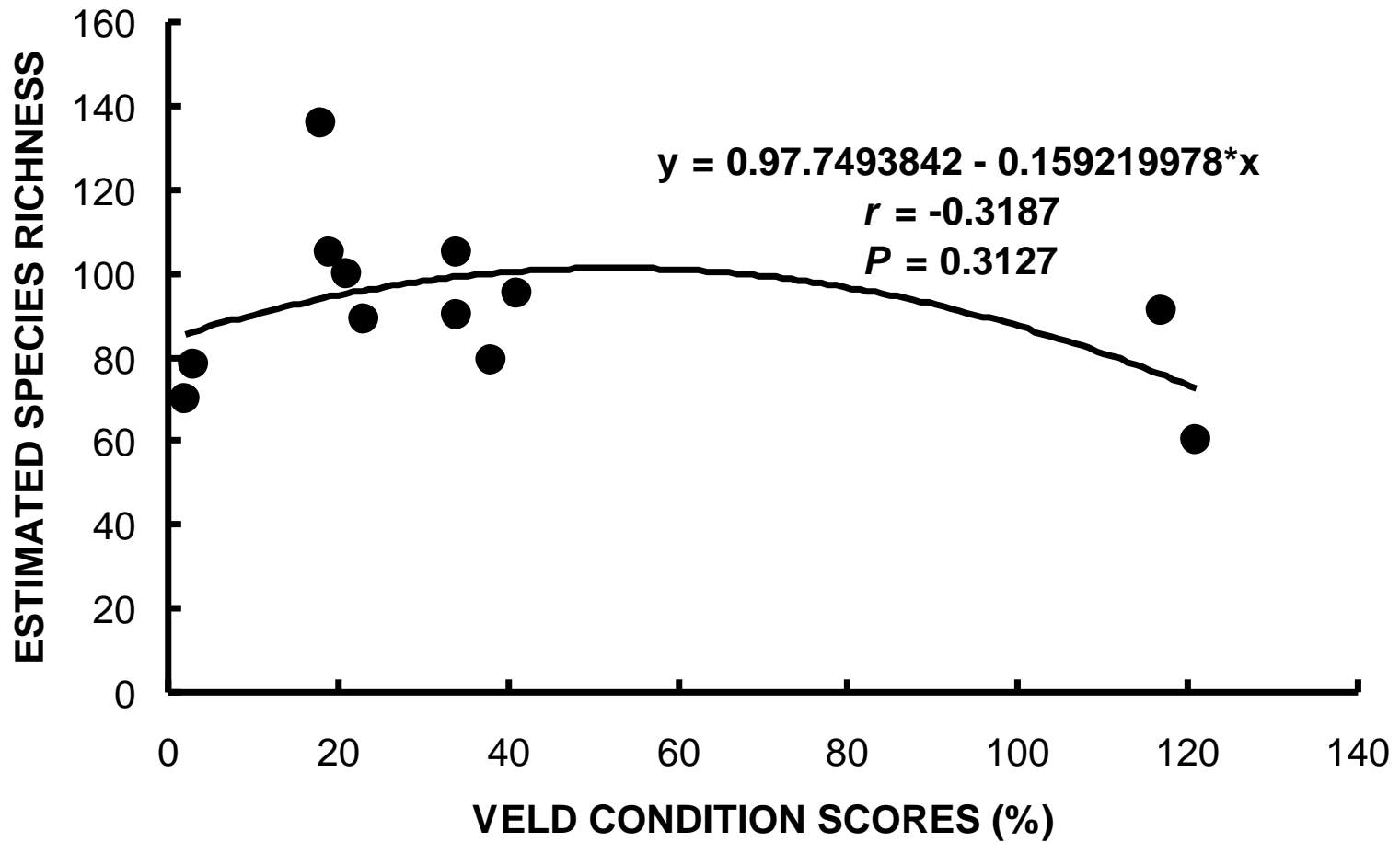
# RESULTS: Veld Condition



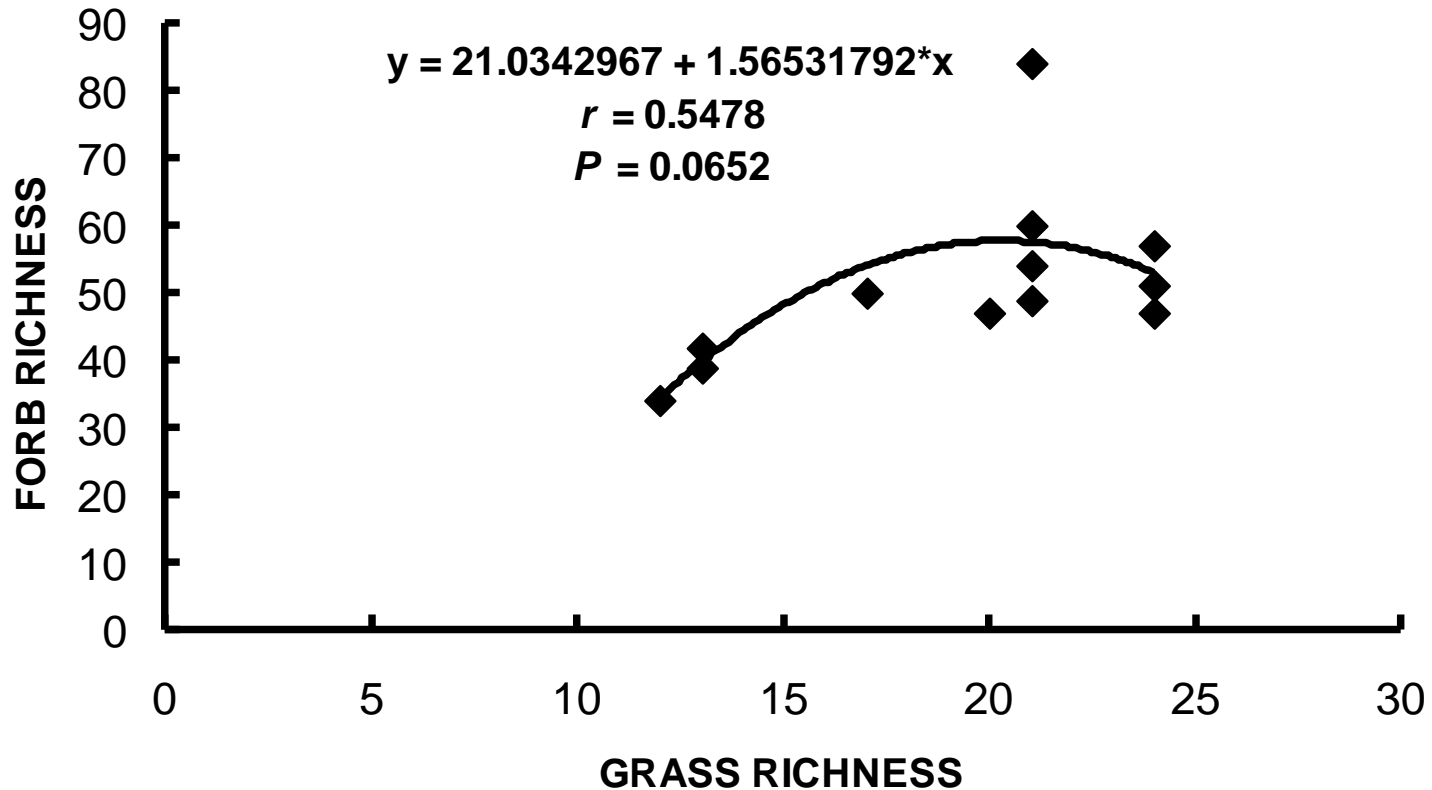
# RESULTS: Observed Species Richness vs VCS



# RESULTS: Estimated Species Richness vs. VCS



# RESULTS: Forb vs Grass Species Richness



# DISCUSSION & CONCLUSION

- This study found **no relationship** betw. GVC & Spp. Richness.
- ∴ GVC **cannot** be used as a **surrogate** for species richness or vice versa.
- Correlation 1:1 classical VCS & species richness could have enabled rapid assessments of plant diversity by technicians with basic botanical knowledge (i.e. **less necessity** for detailed & time-consuming plant **relevés**).
  - This could also have enabled the use of a wealth of **historical VCA data** to review **patterns** of **land use & degradation**.
- **Implications** for **decision making** pertaining to **development applications** evaluated by State Agencies for authorization.
- Assessment of veld in the **context of biodiversity** still requires different approaches to current VCAT (e.g. **Diversity Indices**, etc)

## DISCUSSION & CONCLUSION end.

- **Positive correlation** betw. grass & forb species richness suggests possibility for use of grass species richness as **indicator** of forb richness, but needs further investigation.
- **VCAT** only relevant in PAs for determining grazing capacity, stocking rates & monitoring changes in herbaceous species composition over time.



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**Email: [Petros.Ngwenya@kznwildlife.com](mailto:Petros.Ngwenya@kznwildlife.com)**



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