

CHARACTERISATION OF WETLANDS ON VARIOUS LANDSCAPES IN MARAKELE NATIONAL PARK, LIMPOPO PROVINCE, SOUTH AFRICA.

Savanna Science Network Meeting Venue: Skukuza-Kruger National Park

Khosa, D. S. (SANParks)

Grundling, P. L. (DFFE and CEM-UFS)

Brown, L. R. (UNISA)

2-6 March 2025



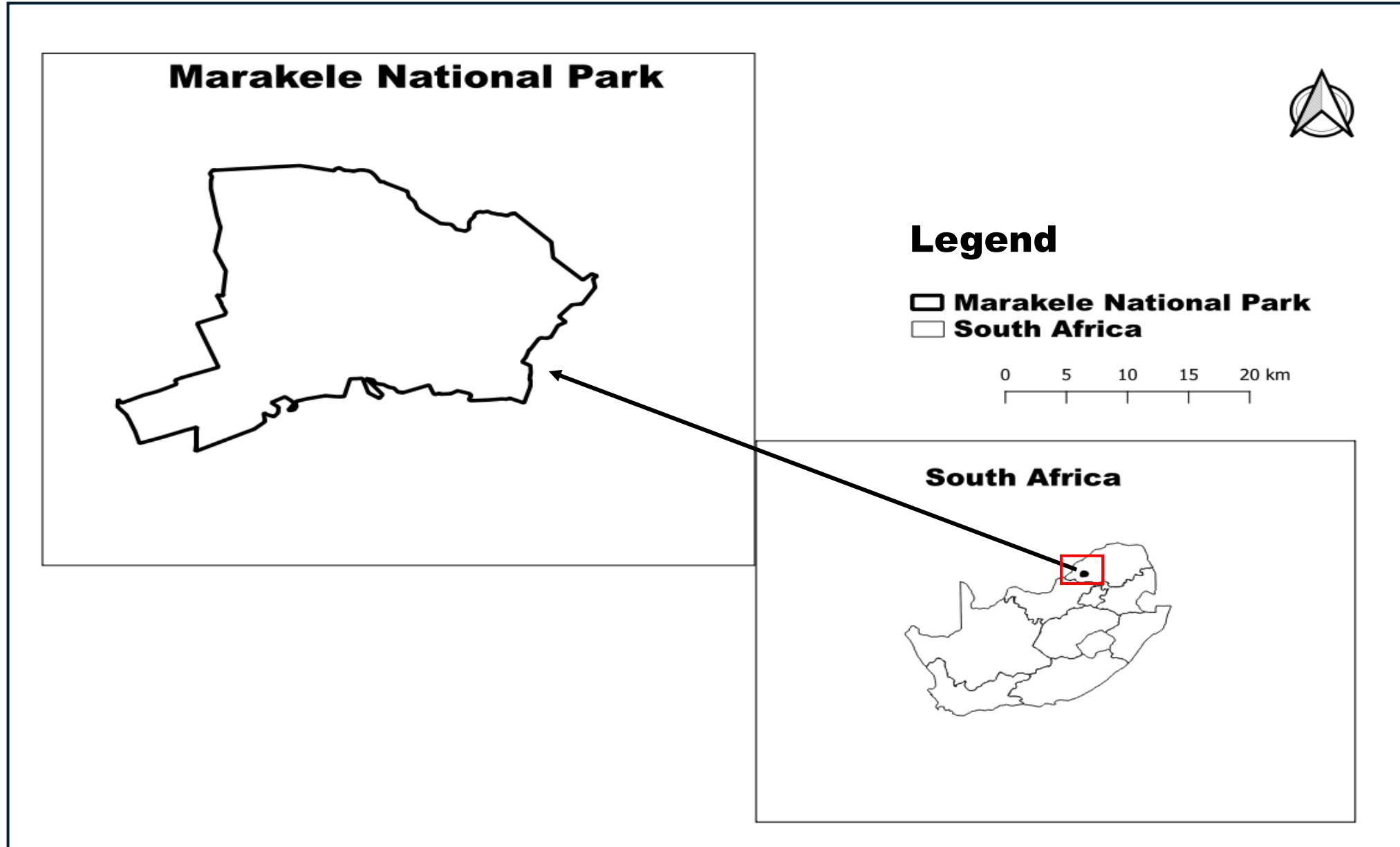
**South African
NATIONAL PARKS**



university
of south africa

UNISA

STUDY AREA



AIM & OBJECTIVES OF THE STUDY

PRIMARY AIM OF THE STUDY:

- The primary aim of this study is to characterise the wetlands of the MNP on a landscape level to understand their ecological value and function within the MNP.

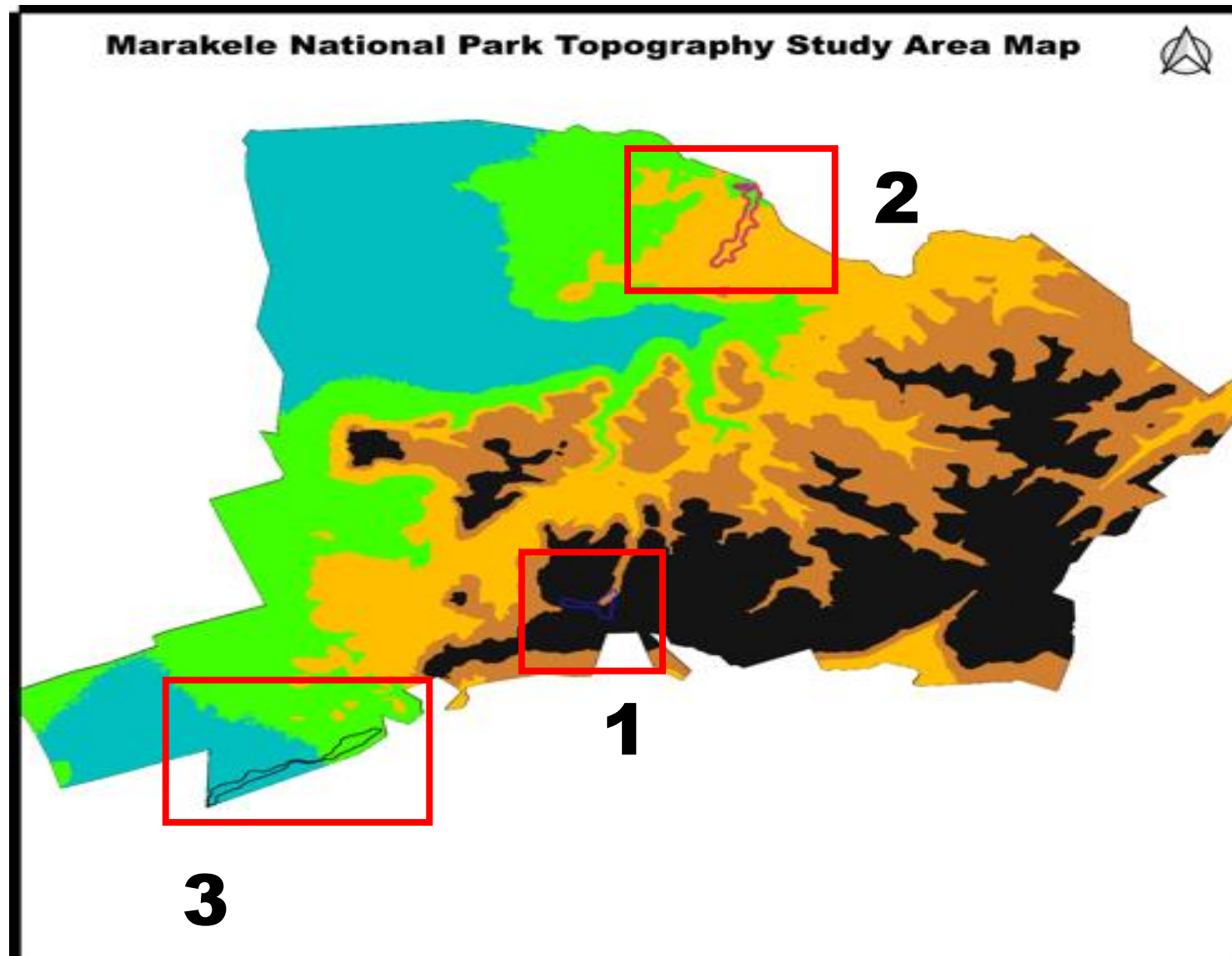
RESEARCH QUESTIONS:

1. What different hydrogeomorphic (HGM) wetland unit types occur within the three landscapes of the MNP park?
2. Do the different HGM wetland unit types in the landscape differ in terms of **soil**, **hydrology**, and **vegetation** composition?

SELECTED WETLANDS ON VARIOUS LANDSCAPE UNITS

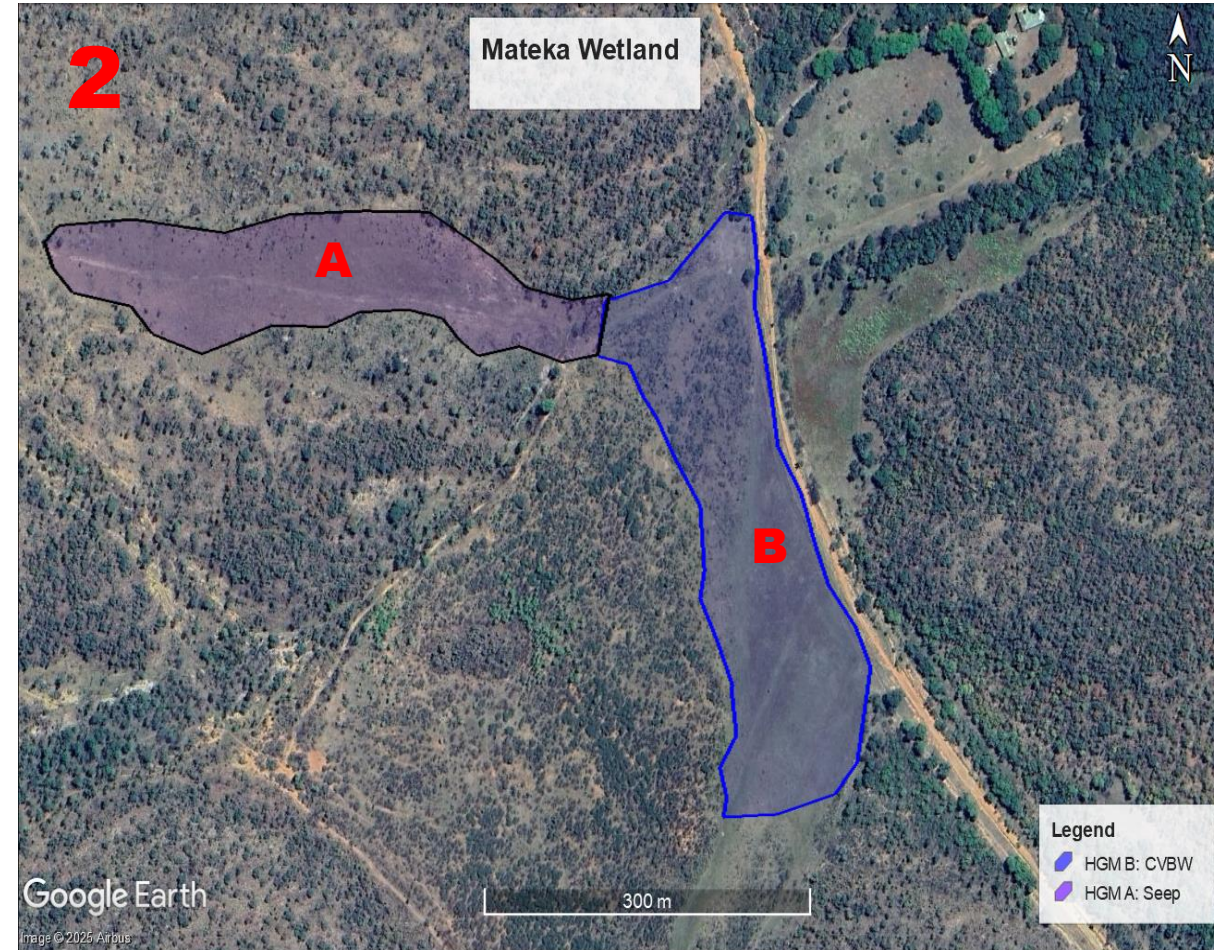
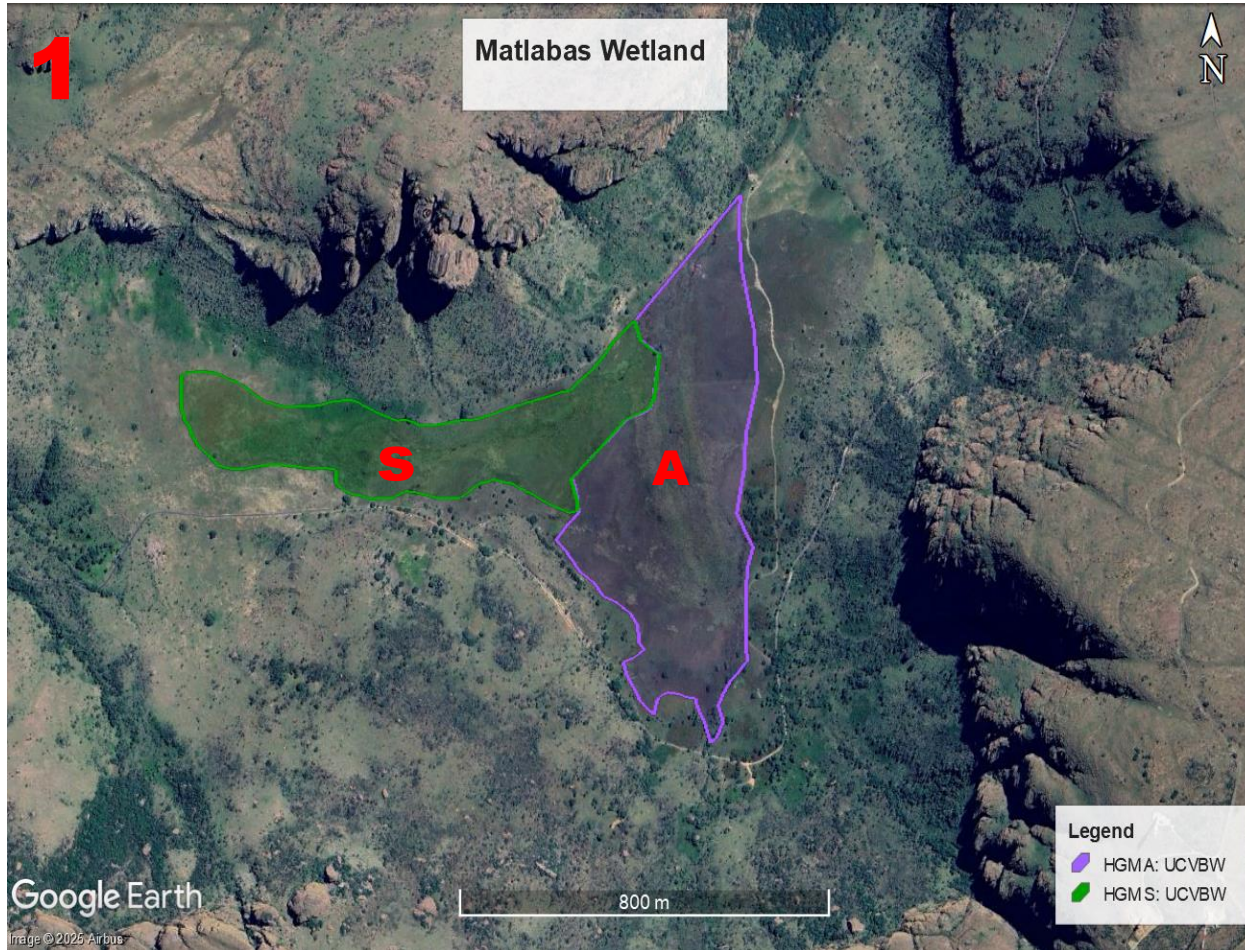
Three Terrain units

- 1) The Waterberg Upper plateau
- 2) The Waterberg mid plateau and
- 3) The plain landscape

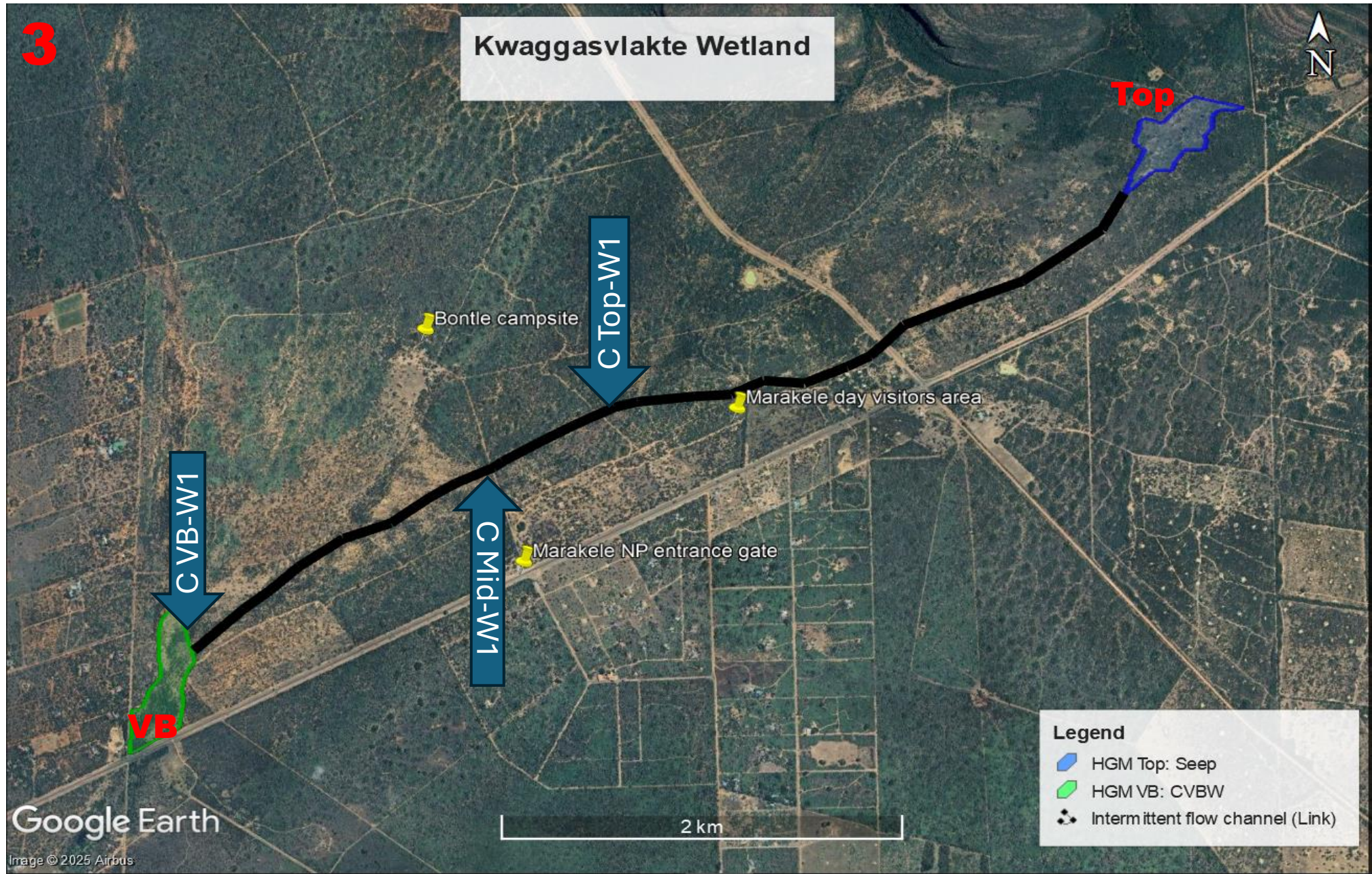


PRELIMINARY RESULTS

DIFFERENT HGM WETLAND UNIT TYPES (IN EACH WETLAND)



DIFFERENT HGM WETLAND UNIT TYPES (IN EACH WETLAND)



DIFFERENT SOIL TYPE IN EACH (HGM) WETLAND UNIT

Matlabas Wetland



Peat and highly organic soil indicate persistent water saturation, signifying a permanently wet environment

Mateka Wetland



**Mineral soil with organic enrichment on the surface.
The presence of a grey matrix and mottles at 10-20 cm suggests seasonal wet conditions**

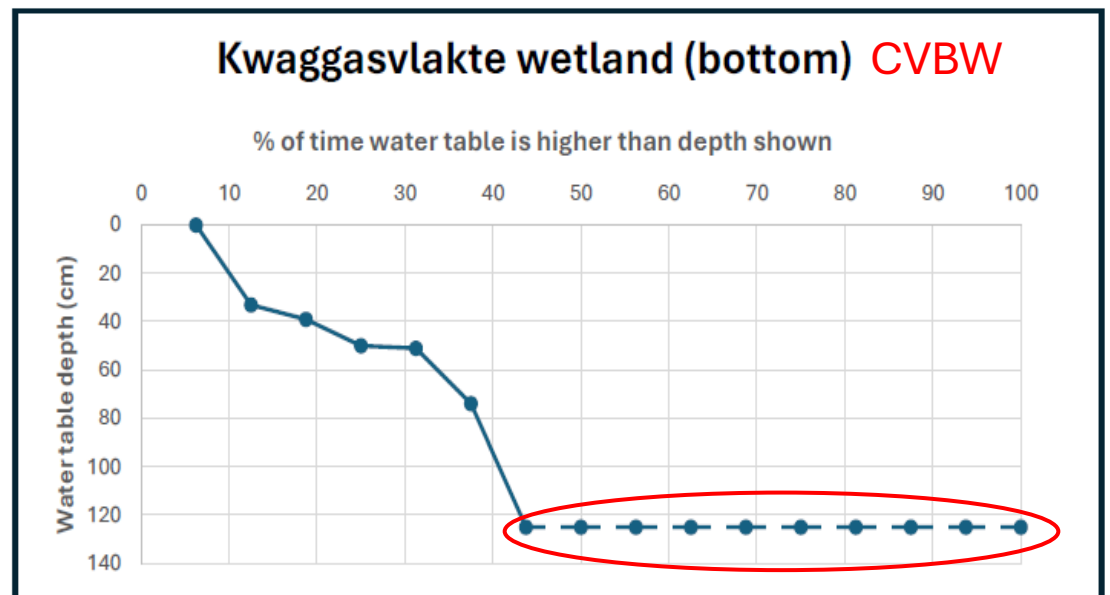
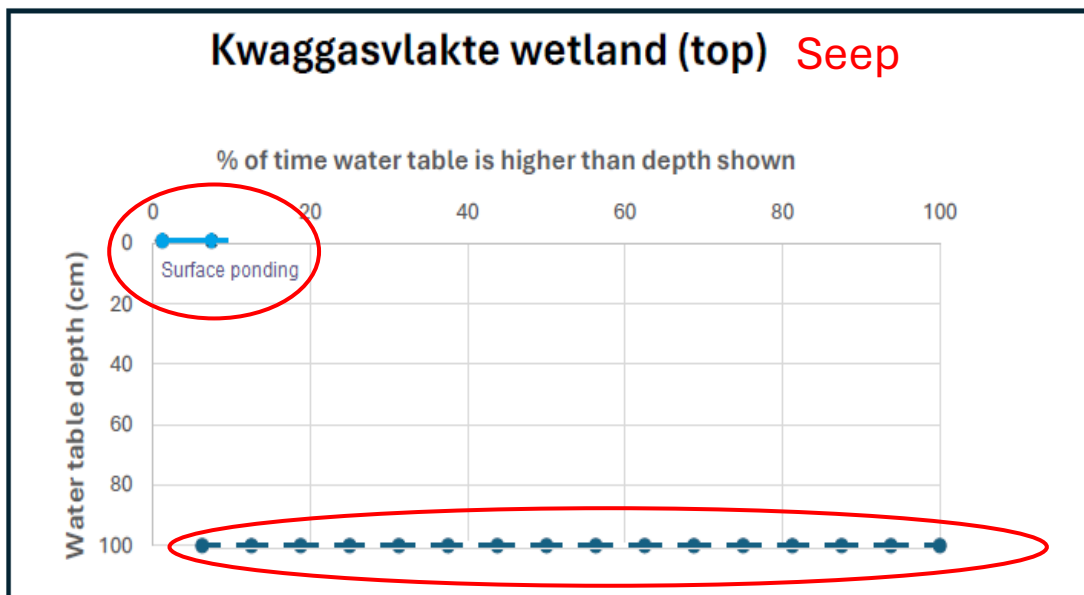
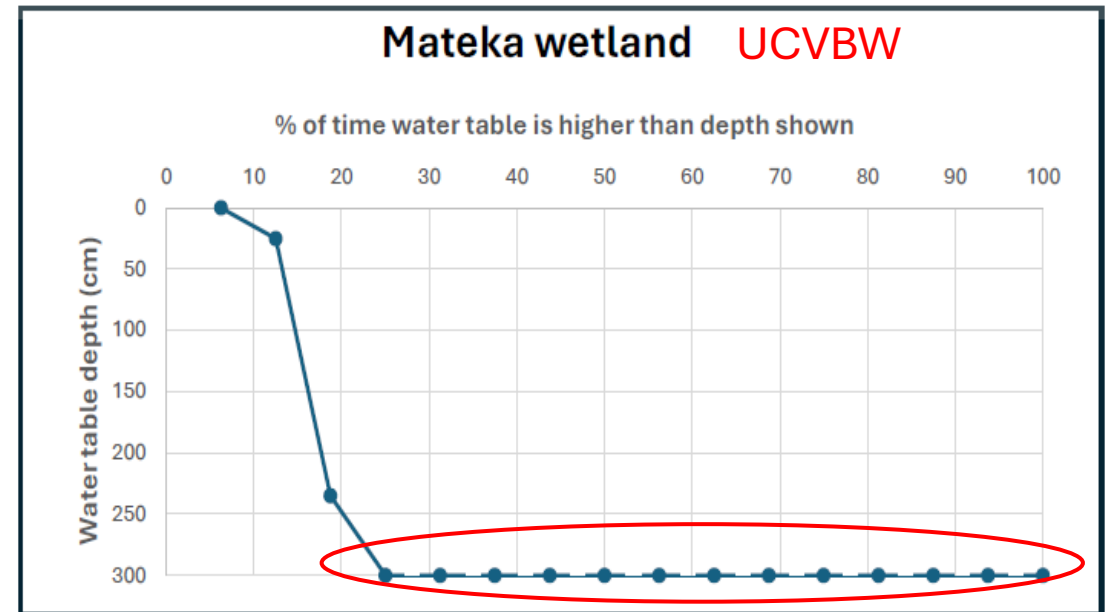
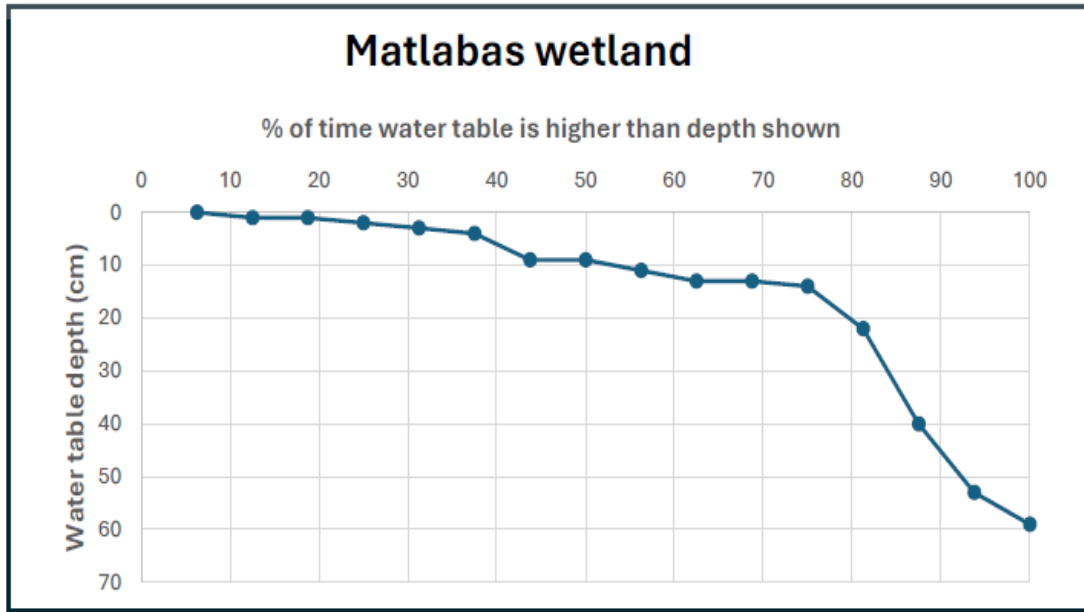
DIFFERENT SOIL TYPE IN EACH (HGM) WETLAND UNIT

Kwaggasvlakte Wetland

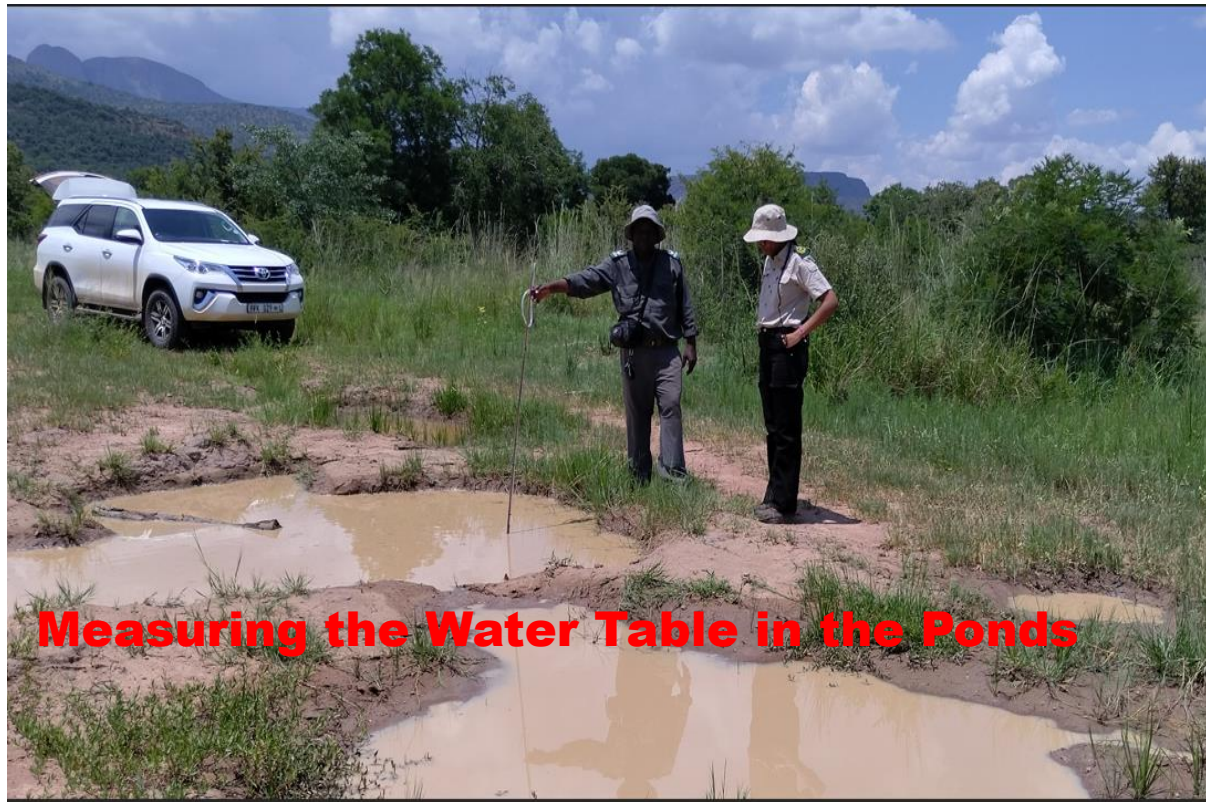


- In the upper Seep/top, the soil is mineral, reddish-yellow, with mottles appearing at a depth of 30–50 cm, indicating temporary wetness.
- Moving downstream, the soil gradually becomes more organic.
- In the midstream areas, mottles occur at depths of 10–30 cm, and this trend continues further downstream, where the soil becomes increasingly organic, suggesting a seasonal wetland.

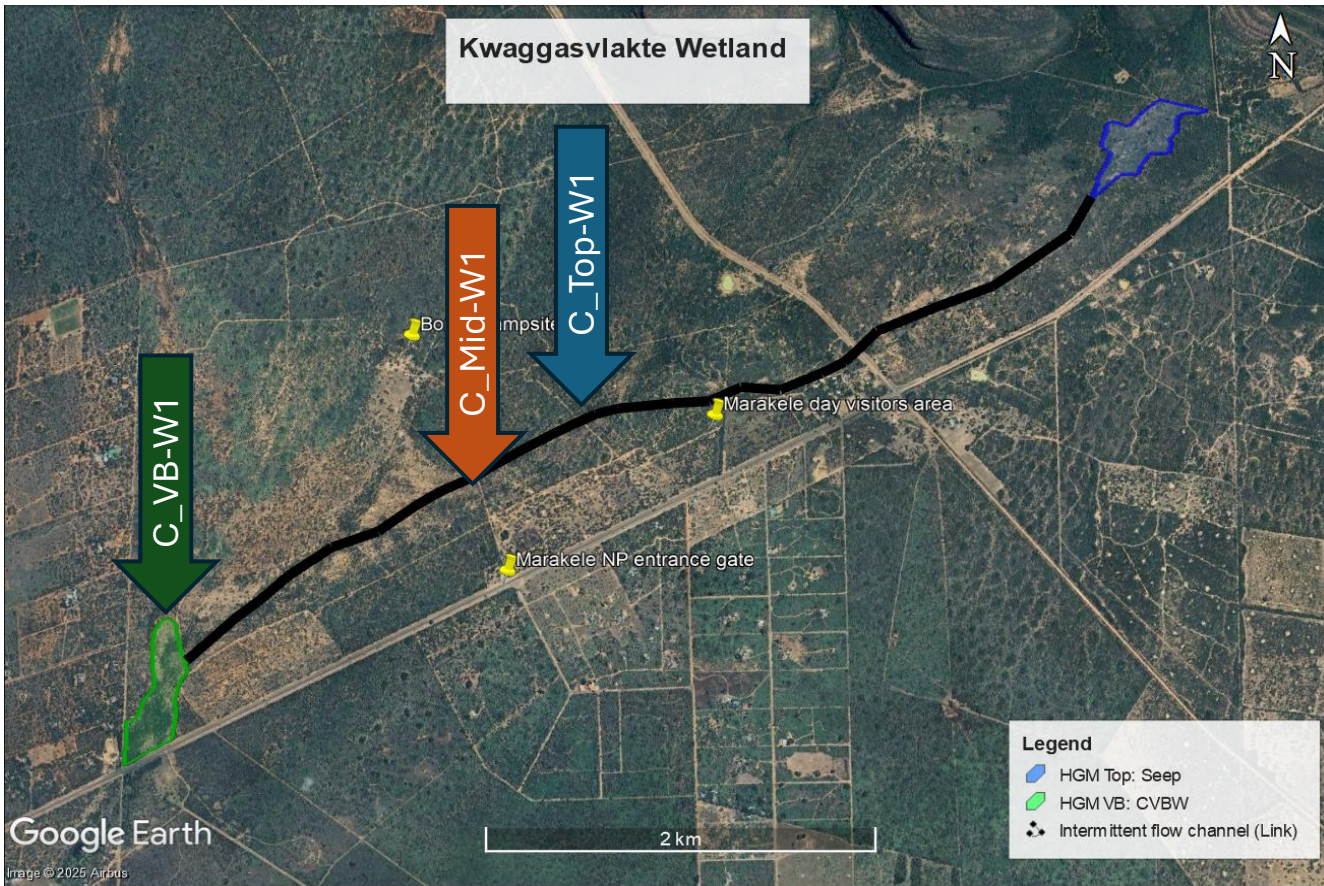
HYDROLOGY AS REFLECTED BY WATER TABLE DURATION CURVES



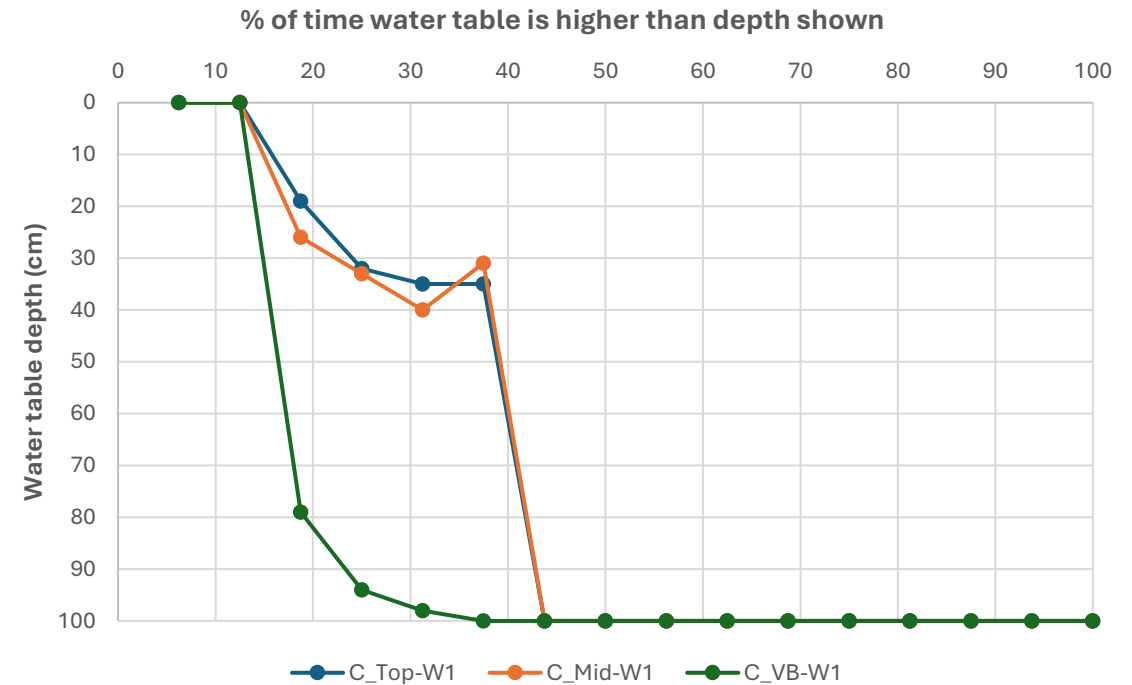
KWAGGASVLAKTE WETLAND SEEP (Top)



HYDROLOGY: KWAGGASVLAKTE WATER TABLE DURATION CURVES (CONTROLS)



WATER TABLE DURATION CURVE



HGM's WETLAND UNIT TYPES IN THE LANDSCAPE DIFFER IN TERMS VEGETATION

Matlabas Wetland

Diagnostic species	Constant species	Dominant species
<i>Arundinella nepalensis</i>		<i>Aristida canescens</i>
<i>Coleas kirkii</i>		<i>Coleas kirkii</i>
<i>Miscanthus junceus</i>		<i>Miscanthus junceus</i>
<i>Verbena bonariensis</i>		



Mateka Wetland

Diagnostic species	Constant species	Dominant species
<i>Eragrostis chloromelas</i>	<i>Cynodon dactylon</i> <i>Sporobolus africanus</i>	<i>Sporobolus africanus</i>



HGM's WETLAND UNIT TYPES IN THE LANDSCAPE DIFFER IN TERMS VEGETATION

Kwaggasvlakte Wetland Seep/Top

Diagnostic species	Constant species	Dominant species
	<i>Cynodon dactylon</i>	<i>Cynodon dactylon</i> <i>Sporobolus africanus</i>



Kwaggasvlakte Wetland CVBW

Diagnostic species	Constant species	Dominant species
	<i>Cynodon dactylon</i> <i>Dichrostyphis cineria</i>	<i>Cynodon dactylon</i> <i>Ocimum americanum</i> <i>Vachellia karoo</i> <i>Vachellia tortilis</i>



SUMMARY

- ❑ Different wetlands and HGM wetland units occur in various landscape settings within the park. However, it can generally be stated that headwater areas allow for hillslope seep formation, while valley bottoms naturally support valley bottom wetlands.

Additionally, the hydrological regimes of these HGM units vary significantly:

- ❖ **Upper plateau landscapes** typically contain **peatlands**.
 - ❖ **Mid-plateau landscapes** feature **permanent to seasonal wetlands**.
 - ❖ **Plains** are mostly composed of **seasonal to temporary wetlands**.
- ❑ Vegetation and soil characteristics also differ across wetland and HGM units. Hydrological studies confirm that **midslope wetlands** function as **seasonal wetlands**, while **high mountain wetlands** tend to be **more water-retentive peatlands**, and **plains wetlands** experience **greater seasonal variability with temporary water presence**.

WAY FORWARD



- Add vegetation plots at Matlabas**
- Second round of water quality sampling**
- Interpretation of water, soil, carbon samples results**
- Assess ecosystem services of HGM wetland units**
- Determine conservation value**

ACKNOWLEDGEMENTS

- SANParks:** Support and funding the project
- UNISA:** Funding
- Colleagues:** Support in the infield

Thank you

