water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

2030 NDP
NATIONAL DEVELOPMENT PLAN
Our Future - make it work

CLASSIFICATION OF SIGNIFICANT WATER RESOURCES AND DETERMINATION OF RESOURCE QUALITY OBJECTIVES FOR WATER RESOURCES IN THE USUTU TO MHLATHUZE CATCHMENTS (WP11387)

Project Steering Committee 2, Virtual: 4 November 2022



WATER IS LIFE - SANITATION IS DIGNITY

Step 3: Wetlands

James MacKenzie

WETLAND APPROACH:

The wetland assessment is based on the following data sources:

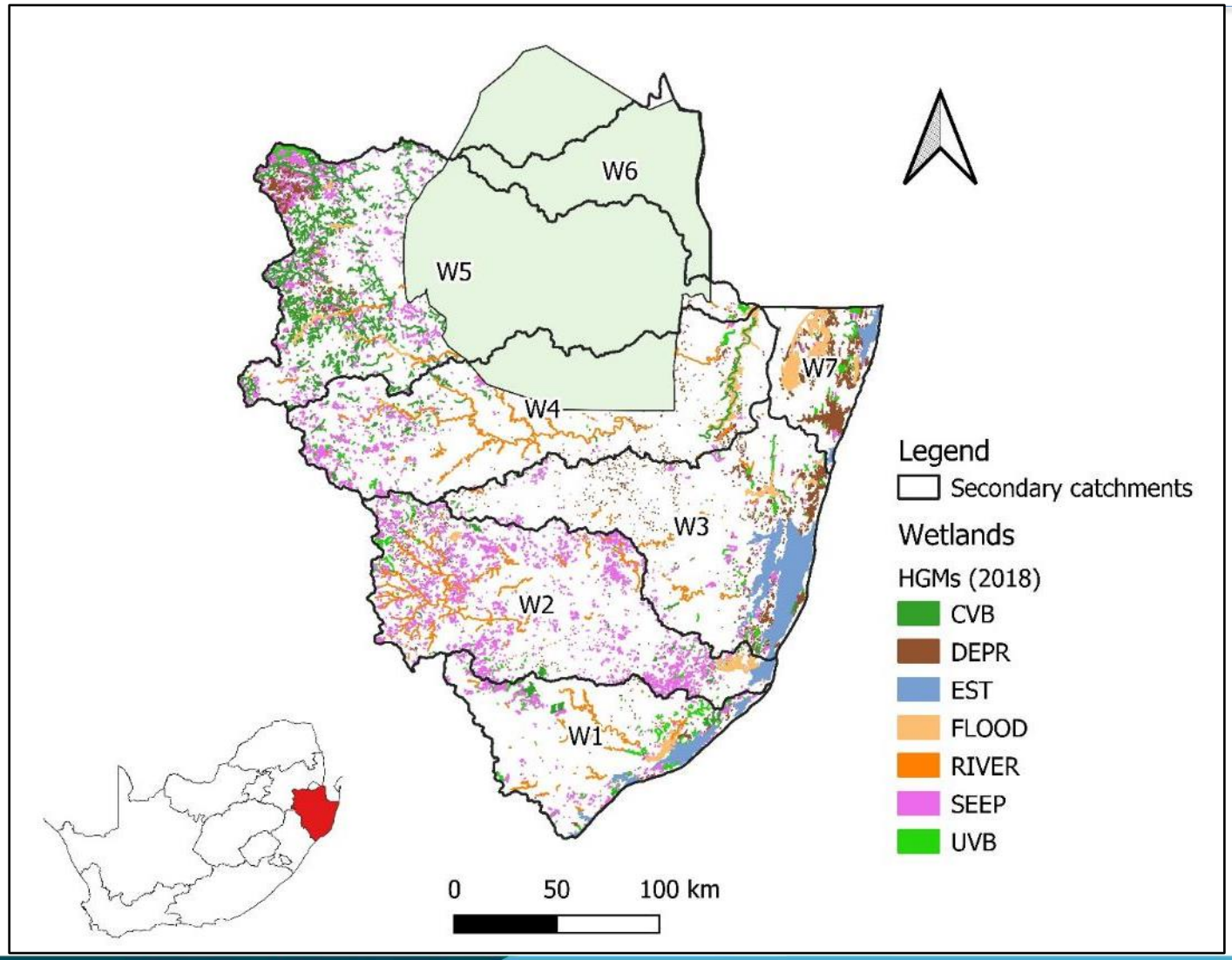
- The wetland spatial distribution and metadata from the 2018 national biodiversity assessment (van Deventer *et al*., 2018) – NWM 5.
- The wetland metadata from the National Freshwater Ecosystem Priority Areas study (NFEPA; Nel *et al.*, 2011).
- Wetland spatial and ecological data from the National Spatial Biodiversity Assessment (Driver *et al.*, 2005).
- Riparian and wetland metrics from the PES-EI-ES study (DWS, 2014) and current updates (this project)
- SANLC data (2020)

WETLAND APPROACH: (cont)

PES based on WETCON in NBA and PES-EI-ES and considers:

- Afforestation/Invasive plants
- Dams, irrigation, other flow reduction activities
- Extent of Urbanisation/catchment hardening
- Landuse activities (mining, agriculture, over grazing)
- Flow Modification
- Erosion of wetlands
- Sedimentation
- Potential Physico-chemical modification
- Bed and Channel disturbance
- Vegetation removal

WETLAND TYPES (HGM):



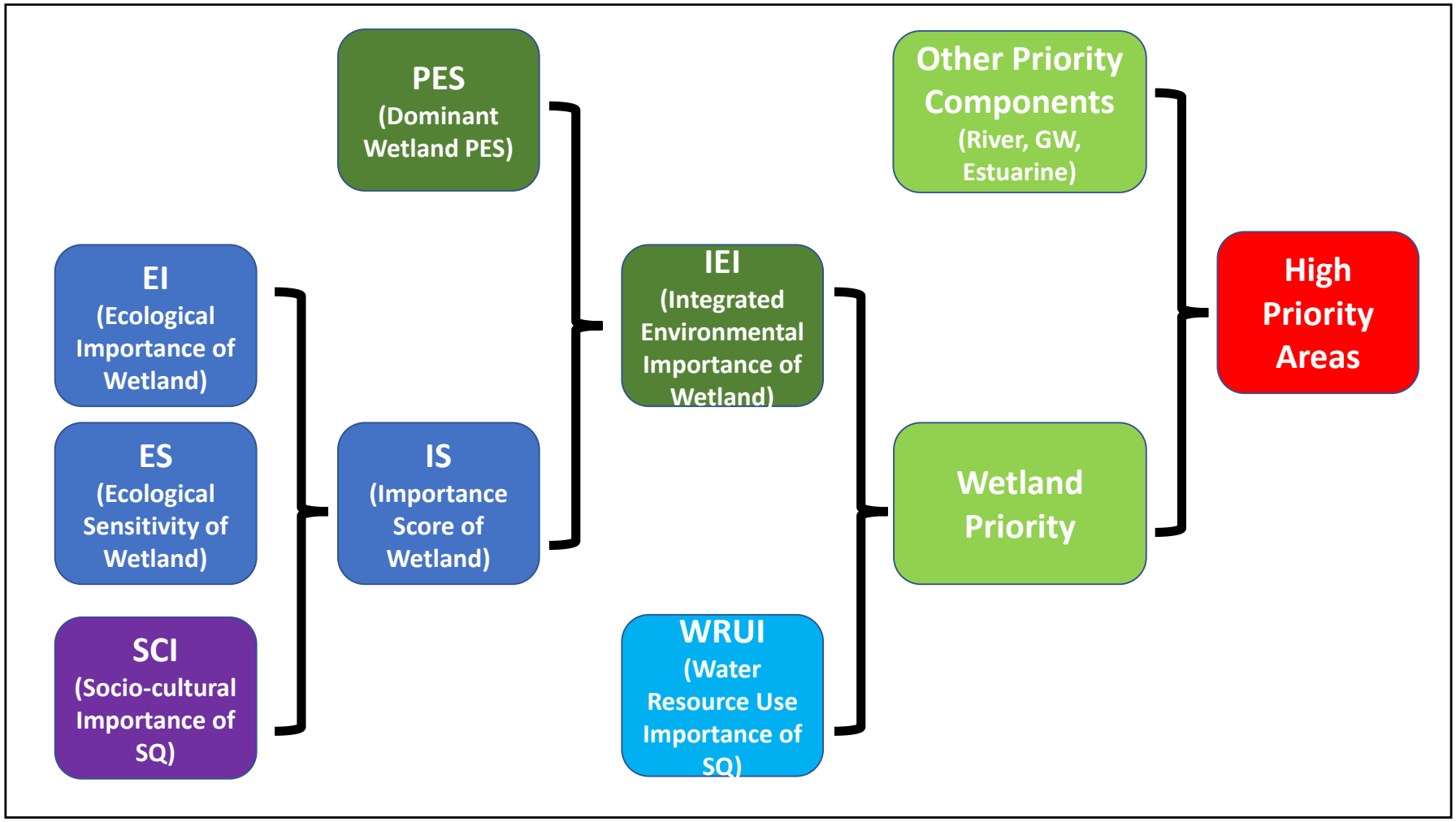
% Extent (area) excl. EST	
CVB	15.3
DEPR	15.1
FLOOD	20.2
RIVER	28.0
SEEP	16.7
UVB	4.8

WETLAND APPROACH: PRIORITY

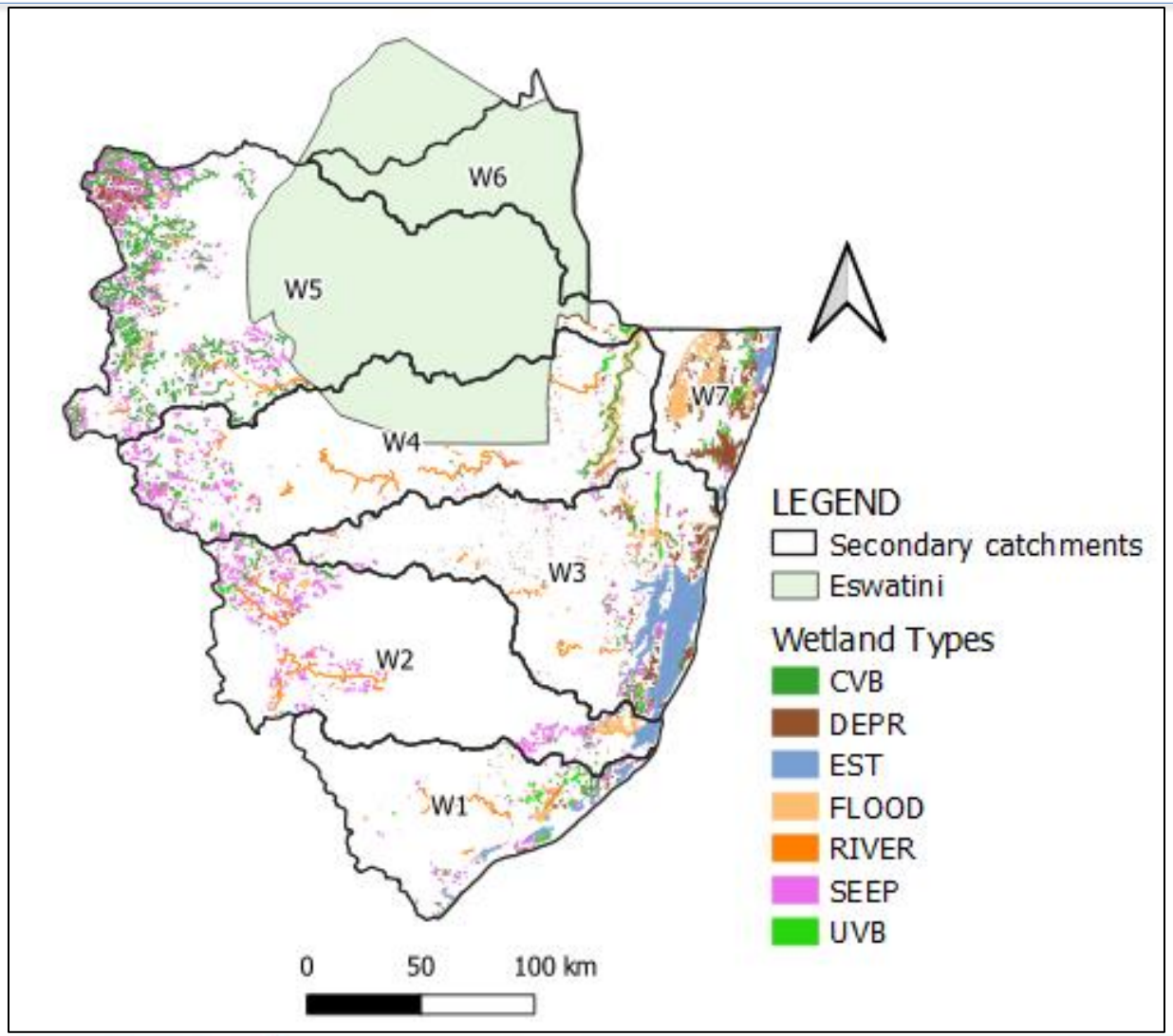
The prioritization of wetlands included the following:

- Step 1: Determine dominant wetland PES at SQ catchment / RU scale
- Step 2: Determine wetland ecological importance (EI) at the same scale as above
- Step 3: Determine wetland sensitivity (ES) at the same scale as above
- Step 4: Determine the wetland importance score (IS) by integration of EI, ES and socio-cultural importance (SCI)
- Step 5: Determine integrated environmental importance of wetland/s (IEI) by integration of IS and PES
- Step 6: Determine wetland priority by integration of IEI and Water Resource use importance (WRUI)

WETLAND APPROACH: PRIORITY



WETLAND TYPES (HGM): H & VH PRIORITY



WETLAND APPROACH: EWR

Wetland EWRs are only considered for those wetlands with a Very High and at times, High priority. As the calculation of priority includes ecological aspects only as a contribution to the calculation, some ecologically important wetlands do not necessarily score Very High for priority since water resource demand / use may not also be High.
For each Very High priority wetland, the EWR is determined according to the following steps:

1) Determine dominant wetland HGM type (update to NBA).
2) Determine appropriate level of RDM (Resource Directed Measures) study for wetlands according to HGM type.
3) Assess / validate EcoStatus of these priority wetlands, including the REC.
4) Determine EWR (or other RDM) to achieve the REC.

WETLAND APPROACH: EWR

3) Assess / validate EcoStatus of these priority wetlands, including the REC.

This was achieved by the validation / update of the PES and the determination of the REC. South African National land cover (SANLC, 2020), Google Earth © and WET-Health (Level 1, vegetation module) were used to determine the PES of Very High, and at times, High priority wetlands. The SANLC data was used to design a front-end data provider for the WET-Health, as well as assigned internal ecological integrity scores to calculate the PES value/s. Where the wetland HGM was not entirely applicable to WET-Health (e.g. riverine wetlands), PESEIS (DWS, 2014) metrics for the riparian/wetland assessments were additionally used as a starting point and were verified for each SQ / wetland polygon using Google Earth © and SANLC data.

WETLAND APPROACH: EWR

No.	Legend Colour	2018 NLC Class Name	Integrity Score
1		Contiguous (indigenous) Forest (*combined* very high, high, medium)	1
2		Contiguous Low Forest & Thicket (*combined classes*)	1
3		Dense Forest & Woodland (35 - 75% cc)	1
4		Open Woodland (10 - 35% cc)	1
5		Contiguous & Dense Planted Forest (*combined classes*)	0.1
6		Open & Sparse Planted Forest	0.2
7		Temporary Unplanted Forest	0.5
8		Low Shrubland (other regions)	1
9		Low Shrubland (Fynbos)	1
10		Low Shrubland (Succulent Karoo)	1
11		Low Shrubland (Nama Karoo)	1
12		Sparsely Wooded Grassland (5 - 10% cc)	1
13		Natural Grassland	1
14		Natural Rivers	1
15		Natural Estuaries & Lagoons	1

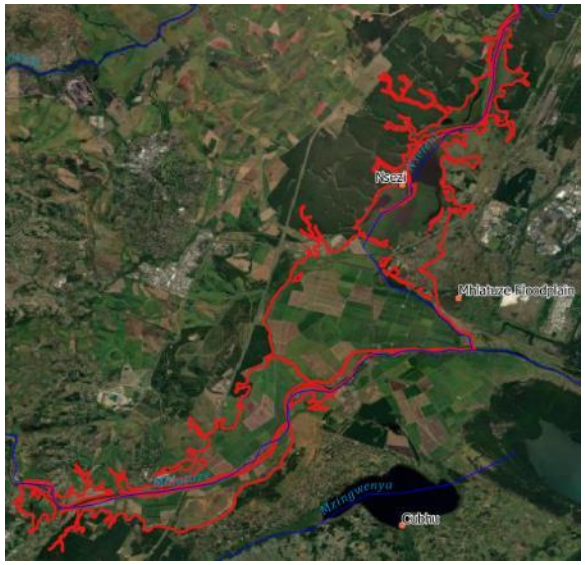
WETLAND APPROACH: EWR

No.	Legend Colour	2018 NLC Class Name	Integrity Score
40		Commercial Annuals Crops Rain-Fed / Dryland / Non-Irrigated	0.3
41		Subsistence / Small-Scale Annual Crops	0.3
42		Fallow Land & Old Fields (Trees)	0.4
43		Fallow Land & Old Fields (Bush)	0.4
44		Fallow Land & Old Fields (Grass)	0.4
45		Fallow Land & Old Fields (Bare)	0.2
46		Fallow Land & Old Fields (Low Shrub)	0.4
47		Residential Formal (Tree)	0.1
48		Residential Formal (Bush)	0.1
49		Residential Formal (low veg / grass)	0.1
50		Residential Formal (Bare)	0
51		Residential Informal (Tree)	0.1
52		Residential Informal (Bush)	0.1
53		Residential Informal (low veg / grass)	0.1
54		Residential Informal (Bare)	0

W1 Mhlathuze: 4 Wetland Groups

Group	SQ	SQ Name	Wetland description / note
1	W12E-03475	Mhlatuze	**Riverine wetlands** along the Mhlathuze River leading into the Mhlathze swamp system, including Lake Mpangeni.
2	W12H-03459	Nseleni	Floodplains along lower reaches of Nseleni, including Nsezi and portions of the **Mhlathuze floodplain**. For the sake of completeness, the remainder of the floodplain along the Mhlatuze (W12F-03494) was also included in the assessment. Wetland area of assessment was 4809 Ha.
3	W12J-03411		**Depressions and seeps surrounding the Nlabane** estuary. Wetland area of assessment was 547 Ha.
4	W12J-03392 W12J-03403 W12J-03450	Mpisini Nundwane	Extensive channelled and unchanneled valley bottom wetlands leading into Richard's Bay Estuary, includes **Mzingazi**. Mzingazi was historically part of the Richard's Bay estuary, but a weir was built between the lake and the connection to the ocean which results in the lake currently being a freshwater system. Wetland area of assessment was 1689 Ha.

W1: Mhlathuze Floodplain



HGM 1: Floodplain	
Ecological Integrity Score:	43.5
Ecological Category:	D
Area (Ha):	3147.8
HGM 2: Floodplain	
Ecological Integrity Score:	21.8
Ecological Category:	E/F
Area (Ha):	1661.2
WETLAND PES	
Ecological Integrity Score:	36.0
Ecological Category:	E
Area (Ha):	4809.0
WETLAND REC	
Ecological Integrity Score:	42.0
Ecological Category:	D

Vegetation Health

Present Vegetation State	E
Trajectory of change	↓

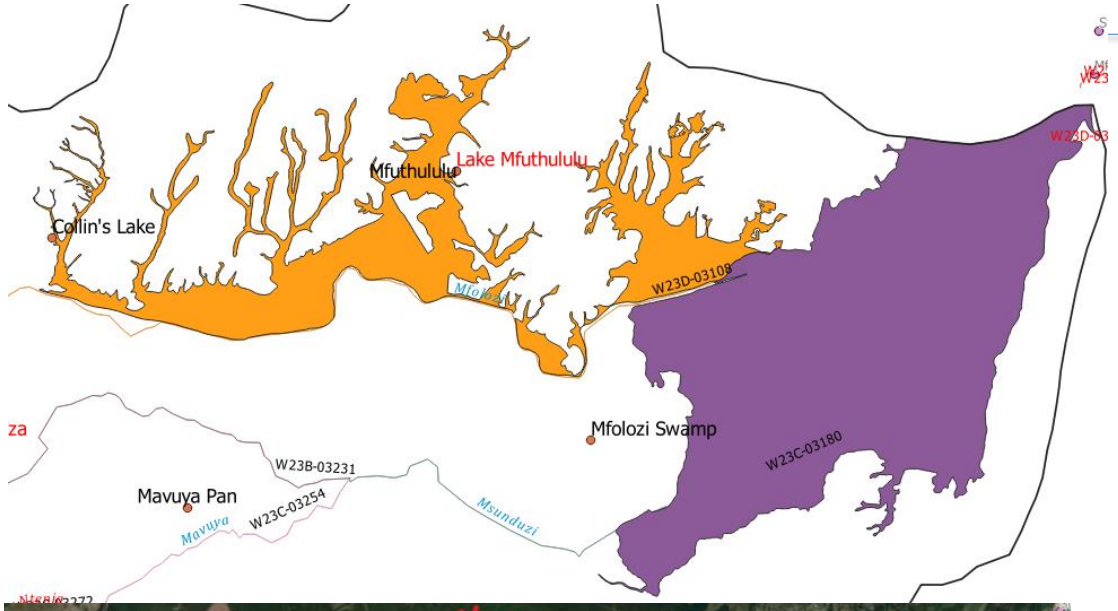
W1: Mhlathuze Floodplain Impacts

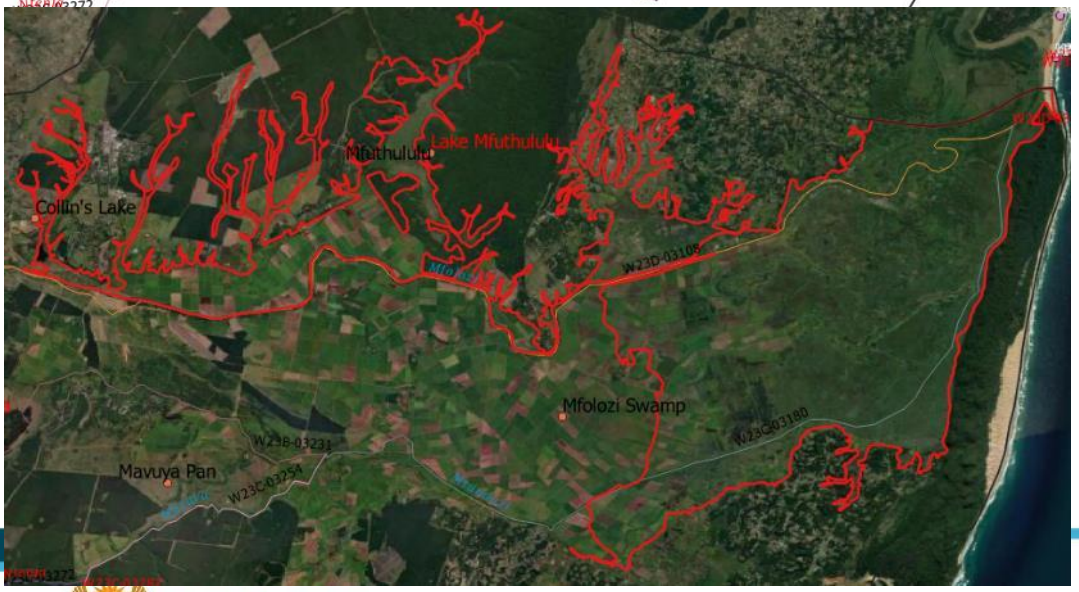
HGM 1: Floodplain (2018 NLC Class Name)	Cover (% wetland area)
Cultivated Commercial Sugarcane Non-Pivot (all other)	34.8
Herbaceous Wetlands (previous mapped extent)	17.8
Cultivated Commercial Sugarcane Pivot Irrigated	16.1
Natural Grassland	8.3
Contiguous Low Forest & Thicket (combined classes)	6.0
Natural Lakes	3.8
Contiguous (indigenous) Forest (combined very high, high, medium)	3.7
Contiguous & Dense Planted Forest (combined classes)	3.4
Artificial Dams (incl. canals)	1.6
Dense Forest & Woodland (35 - 75% cc)	1.4
HGM 2: Floodplain (2018 NLC Class Name)	**Cover (% wetland area)**
Cultivated Commercial Sugarcane Non-Pivot (all other)	59.8
Mines: Waste (Tailings) & Resource Dumps	9.9
Contiguous Low Forest & Thicket (*combined classes*)	6.8
Herbaceous Wetlands (previous mapped extent)	6.4
Cultivated Commercial Sugarcane Pivot Irrigated	5.3
Natural Grassland	4.5
Dense Forest & Woodland (35 - 75% cc)	2.4
Contiguous & Dense Planted Forest (*combined classes*)	1.3
Subsistence / Small-Scale Annual Crops	1.0
Herbaceous Wetlands (currently mapped)	0.7

W2 Umfolozi: 4 Wetland Groups

Group	SQ	SQ Name	Wetland description / note
1	W21G-02885	White Mfolozi	These SQs contain **riverine wetlands along the White Mfolozi** and have a very high priority mainly because the PES is B and WRUI is high.
	W21H-02897	White Mfolozi	
	W21H-03004	White Mfolozi	
2	W22A-02586	Black Mfolozi	These SQs comprise the **Aloeboom vlei**. Wetland area of assessment was 344 Ha.
	W22A-02591		
	W22A-02596	Black Mfolozi	
3	W23A-03160	Mvamanzi	**Mvamanzi Pan**. Wetland area of assessment was 485 Ha.
4	W23C-03180	Msunduzi	The Mfolozi and Msunduzi rivers both form part of the **Mfolozi swamp** in their lower reaches. Wetland area of assessment was 11911 Ha.
	W23D-03108	Mfolozi	

W2: Mfolozi Swamps





HGM 1: Floodplain	
Ecological Integrity Score:	40.2
Ecological Category:	D/E
Area (Ha):	3732.0
HGM 2: Floodplain	
Ecological Integrity Score:	52.5
Ecological Category:	D
Area (Ha):	8179.1
WETLAND PES	
Ecological Integrity Score:	48.7
Ecological Category:	D
Area (Ha):	11911.1
WETLAND REC	
Ecological Integrity Score:	48.7
Ecological Category:	D

Vegetation Health

Present Vegetation State	D
Trajectory of change	→

W2: Mfolozi Swamps Impacts

HGM 1: Floodplain (2018 NLC Class Name)	Cover (% wetland area)
Cultivated Commercial Sugarcane Non-Pivot (all other)	42.0
Herbaceous Wetlands (previous mapped extent)	22.4
Contiguous & Dense Planted Forest (combined classes)	9.4
Contiguous Low Forest & Thicket (combined classes)	5.2
Natural Grassland	4.2
Subsistence / Small-Scale Annual Crops	3.2
Residential Formal (low veg / grass)	2.5
Dense Forest & Woodland (35 - 75% cc)	2.4
Residential Formal (Tree)	1.8
Residential Formal (Bare)	1.2
HGM 2: Floodplain (2018 NLC Class Name)	**Cover (% wetland area)**
Cultivated Commercial Sugarcane Non-Pivot (all other)	31.5
Contiguous (indigenous) Forest (combined very high, high, medium)	27.4
Subsistence / Small-Scale Annual Crops	21.2
Herbaceous Wetlands (previous mapped extent)	12.1
Dense Forest & Woodland (35 - 75% cc)	3.2
Contiguous Low Forest & Thicket (combined classes)	1.6
Natural Grassland	1.3
Artificial Dams (incl. canals)	0.5
Contiguous & Dense Planted Forest (combined classes)	0.5
Coastal Sand Dunes & Beach Sand	0.2

W3 Mkuze: 5 Wetland Groups

Group	SQ	SQ Name	Wetland description / note
1	W31J-02469 W31J-02501	Mkuze Nhlohlela	Mkuze and Nhlohlela rivers including **Nhlonhlela Pan** near their confluence. Wetland area of assessment was 8.2 Ha.
2	W32F-02835	Hluhluwe	**Hluhluwe River floodplain** before entering the St Lucia estuary. Wetland area of assessment was 2310 Ha.
3	W32H-02854	Nyalazi	**Depressional wetlands with swamp forest in the Nyalazi** River catchment. Many pans are in the area known as the Makhakathana Flats but the largest, Nyalazi pan was taken to represent the area. Wetland area of assessment was 43.2 Ha.
4	W32H-02998	Mpate	**Channelled valley-bottom and depressional wetlands in the Mpate River** catchment that leads into St Lucia. Wetland area of assessment was 237 Ha.
5	W32B-02535	Mkuze	Mkuze River including the Mkuze swamp system and the **Mkuze floodplain**. The NWM coverage was insufficient, so desktop delineation has been added. Wetland area of assessment was 11223 Ha.

W3: Mkuze Floodplain

WETLAND HGM: Floodplain	
WETLAND PES	
Ecological Integrity Score:	87.6
Ecological Category:	**B**
Area (Ha):	11222.9
WETLAND REC	
Ecological Integrity Score:	87.6
Ecological Category:	**B**

Vegetation Health

Present Vegetation State	**B**
Trajectory of change	→

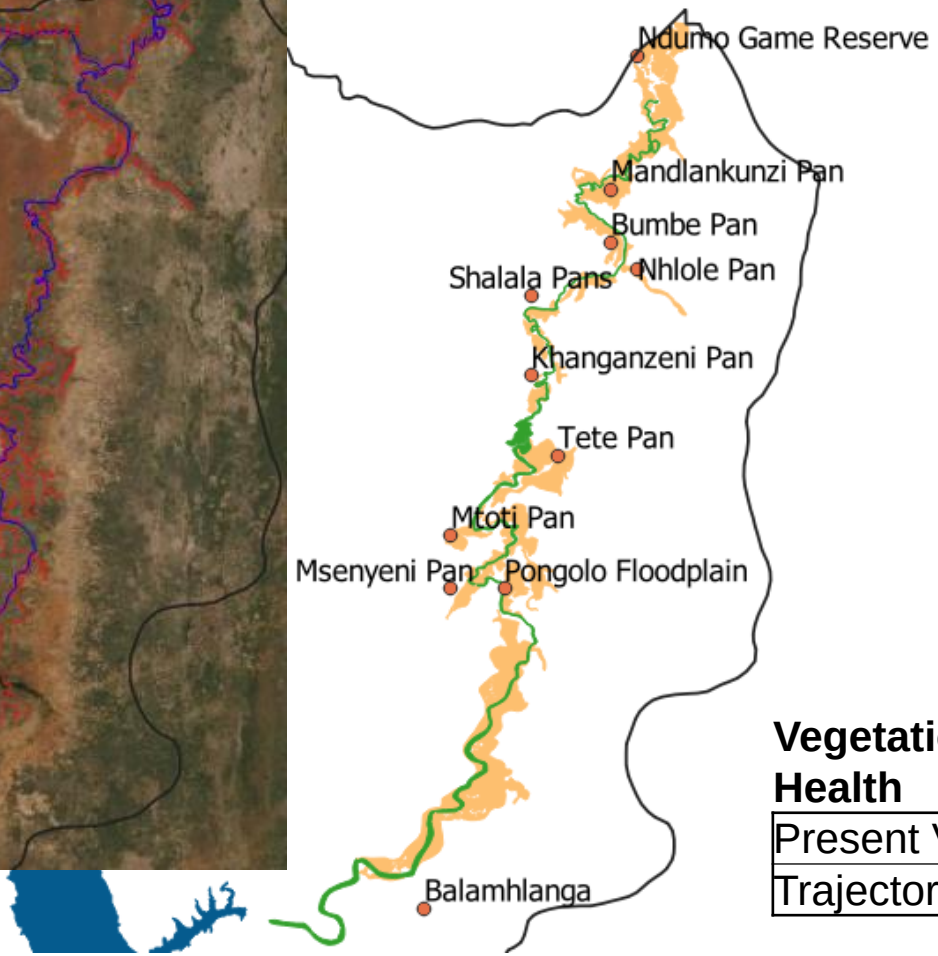
W3: Mkuze Floodplain Impacts

Floodplain: (2018 NLC Class Name)	Cover (% wetland area)
Herbaceous Wetlands (previous mapped extent)	60.7
Subsistence / Small-Scale Annual Crops	15.5
Natural Grassland	11.7
Herbaceous Wetlands (currently mapped)	5.4
Contiguous Low Forest & Thicket (combined classes)	2.0
Fallow Land & Old Fields (wetlands)	1.1
Dense Forest & Woodland (35 - 75% cc)	0.9
Contiguous (indigenous) Forest (combined very high, high, medium)	0.8
Commercial Annuals Crops Rain-Fed / Dryland / Non-Irrigated	0.6
Fallow Land & Old Fields (Grass)	0.4

W4 Pongola: 2 Wetland Groups

Group	SQ	SQ Name	Wetland description / note
1	W41B-02431	Bivane	This short section of **Bivane** river triggered a Very High priority because the WRUI was high and the PES was a B, but the updated PES (an exercise of this project) is a B/C due to agriculture on the floodplain and alien invasive plant species.
2	W45A-02216 W45A-02245 W45A-02246 W45A-02256 W45A-02275 W45A-02282 W45A-02285 W45A-02310 W45A-02316 W45A-02356 W45A-02367 W45A-02368 W45B-02029 W45B-02105	Zibayeni Zibayeni Phongolo Lubambo Mpontshane Phongolo Mpontshane Mangqwashi Mfongosi Mlambo Phongolo Phongolo Phongolo Phongolo	An unexpected outcome of the prioritisation process was that the **Pongola floodplain** had a High priority and not Very High. This is mainly due to poor ecological state (PES is mainly C/D, D or worse) even though ecological importance and WRUI were high. Nevertheless, the floodplain has been recognized as a priority wetland by several authors and has the Ndumo Game reserve (a RAMSAR site) in its lower reaches and has therefore been included in this study for further assessment of PES although the EWR set in 2015 (DWS, 2015) remains intact. Wetland area of assessment was 11803 Ha.

W4: Pongola Floodplain



HGM 1: Valley-bottom with a channel	
Ecological Integrity Score:	72.6
Ecological Category:	C
Area (Ha):	1884.6
HGM 2: Floodplain	
Ecological Integrity Score:	52.4
Ecological Category:	D
Area (Ha):	9918.0
WETLAND PES	
Ecological Integrity Score:	55.6
Ecological Category:	D
Area (Ha):	11802.6
WETLAND REC	
Ecological Integrity Score:	62.0
Ecological Category:	C

Vegetation Health

Present Vegetation State	D
Trajectory of change	↓

W4: Pongola Floodplain Impacts

Valley bottoms with a channel: (2018 NLC Class Name)	Cover (% wetland area)
Subsistence / Small-Scale Annual Crops	26.5
Contiguous (indigenous) Forest (combined very high, high, medium)	17.3
Herbaceous Wetlands (previous mapped extent)	14.5
Dense Forest & Woodland (35 - 75% cc)	12.1
Natural Grassland	7.2
Natural Rivers	6.4
Contiguous Low Forest & Thicket (combined classes)	4.7
Bare Riverbed Material	4.0
Cultivated Emerging Farmer Sugarcane Non-Pivot (all other)	1.8
Herbaceous Wetlands (currently mapped)	1.6
Floodplain: (2018 NLC Class Name)	**Cover (% wetland area)**
Subsistence / Small-Scale Annual Crops	49.9
Herbaceous Wetlands (previous mapped extent)	18.5
Herbaceous Wetlands (currently mapped)	10.2
Natural Grassland	6.9
Dense Forest & Woodland (35 - 75% cc)	5.2
Contiguous Low Forest & Thicket (combined classes)	3.2
Other Bare	1.0
Fallow Land & Old Fields (wetlands)	0.9
Natural Pans (flooded @ obsv time)	0.8
Dry Pans	0.8

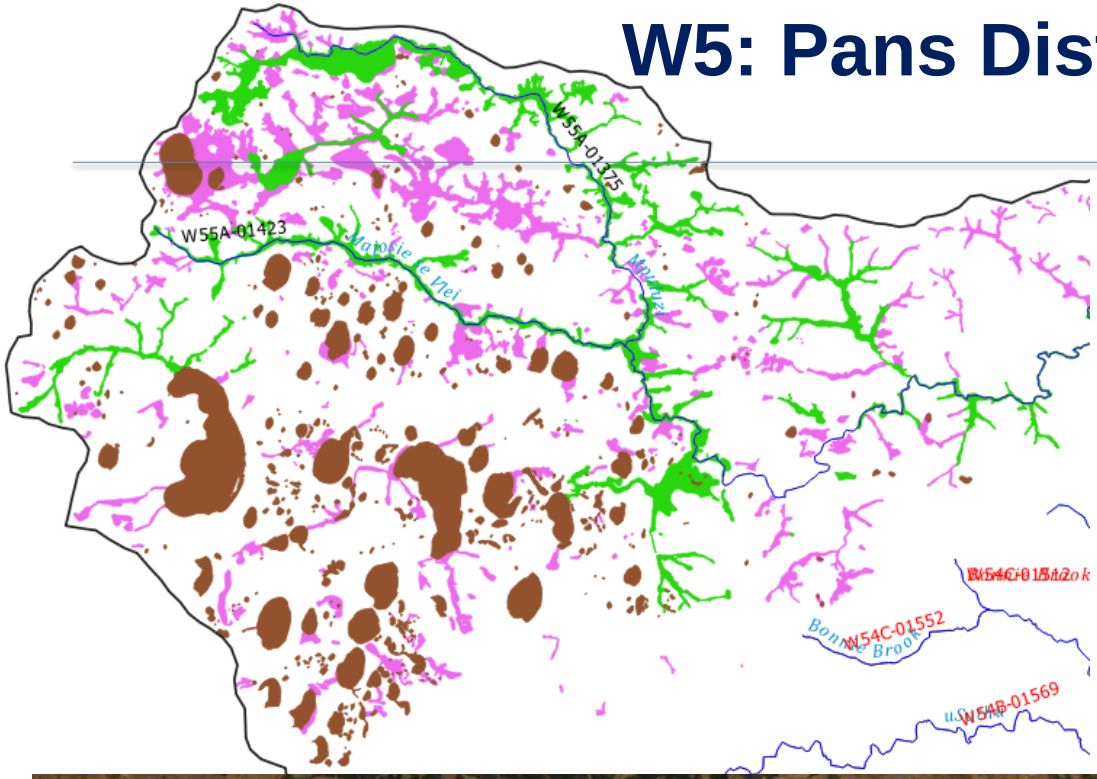
W5 Usuthu: 6 Wetland Groups (a)

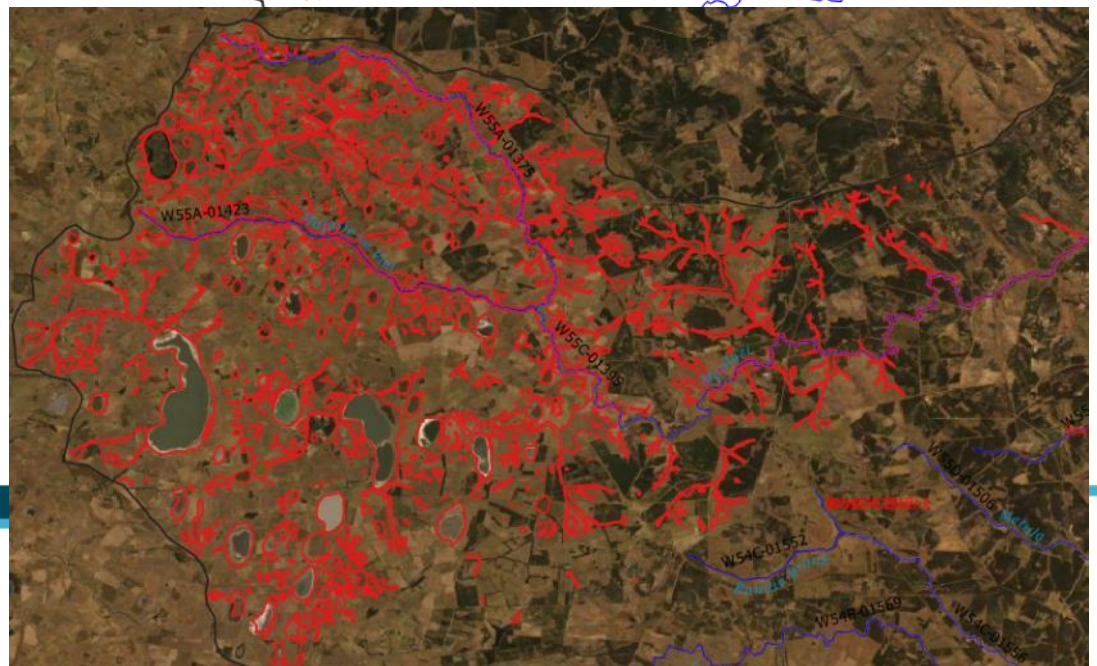
Group	SQ	SQ Name	Wetland description / note
1	W51C-01981 W51C-02011 W51C-02022 W51C-02067 W51C-02074 W51C-02109 W51D-02044 W51D-02151 W51D-02160 W51D-02171 W51D-02177 W51D-02193	Assegaai Assegaai Assegaai Anysspruit Boesmanspruit Assegaai Swartwater Klein-Assegaai Klein-Assegaai Swartwater	Floodplains along the **Assegaai** (W51C-01981 and W51D-02044 mainly) and tributary chanelled valley-bottom wetlands. Wetland area of assessment was 886 Ha.
2	W53A-01757 W53A-01804 W53A-01853	Sandspruit Ngwempisi Ngwempisi	Extensive channelled valley bottom wetlands along the **Sandspruit** (W53A-01757 mainly). Wetland area of assessment was 1677 Ha.
3	W54A-01534 W54A-01630	uSuthu	Extensive channelled valley bottom wetlands upstream of the Sandcliff Dam but not along an official SQ, rather a tributary of W54A-01534, the **Usuthu**. Wetland area of assessment was 767 Ha.

W5 Usuthu: 6 Wetland Groups (b)

Group	SQ	SQ Name	Wetland description / note
4	W54B-01569 W54B-01623	uSuthu Seganagana	Floodplain and channelled valley-bottom wetlands along the **Seganagana** (W54B-01623) upstream of the Westoe Dam. Wetland area of assessment was 1265 Ha.
5	W55A-01375 W55A-01423 W55C-01395	Mpuluzi Majosie se Vlei Mpuluzi	**Mpumalanga pan district** around Chrissiesmeer, Majosie se Vlei and Mpuluzi. Most of the pans are not directly associated with an official SQ. The area has high density of pans, extensive seepage wetlands and large areas of channelled valley-bottoms. These 3 HGM types were grouped to for amalgamated assessment. Wetland area of assessment was 21348 Ha.
6	W57J-01923 W57K-01929 W57K-02025	uSuthu uSuthu	Wetlands in this RU did not trigger as High priority but have been included here because floodplains along W57k-02025 form part of the Pongola floodplains in the **Ndumo** Game Reserve area and Banzi Pan occurs along the Usuthu River (W57k-01929) and are part of the RAMSAR site. Wetland area of assessment was 1310 Ha.

W5: Pans District





HGM 1: Depression (includes Pans)	
Ecological Integrity Score:	97.0
Ecological Category:	A
Area (Ha):	8347.7
HGM 2: Valley-bottom with a channel	
Ecological Integrity Score:	89.2
Ecological Category:	A/B
Area (Ha):	5843.0
HGM 3: Hillslope seepage linked to a stream channel	
Ecological Integrity Score:	85.3
Ecological Category:	B
Area (Ha):	7157.6
WETLAND PES	
Ecological Integrity Score:	90.9
Ecological Category:	A/B
Area (Ha):	21348.2
WETLAND REC	
Ecological Integrity Score:	90.9
Ecological Category:	A/B

Vegetation Health

Present Vegetation State	A
Trajectory of change	→

W5:Pans District Impacts

Depression (includes Pans): (2018 NLC Class Name)	Cover (% wetland area)
Natural Pans (flooded @ obsv time)	49.3
Natural Grassland	36.5
Herbaceous Wetlands (currently mapped)	5.9
Dry Pans	3.8
Fallow Land & Old Fields (Grass)	2.4
Commercial Annuals Crops Rain-Fed / Dryland / Non-Irrigated	1.0
Contiguous & Dense Planted Forest (combined classes)	0.4
Fallow Land & Old Fields (Trees)	0.3
Fallow Land & Old Fields (Bush)	0.3
Open & Sparse Planted Forest	0.1

W5:Pans District Impacts

Valley-bottom with a channel : (2018 NLC Class Name)	Cover (% wetland area)
Natural Grassland	33.5
Herbaceous Wetlands (currently mapped)	28.8
Herbaceous Wetlands (previous mapped extent)	20.7
Fallow Land & Old Fields (Grass)	4.7
Fallow Land & Old Fields (wetlands)	3.3
Commercial Annuals Crops Rain-Fed / Dryland / Non-Irrigated	3.2
Contiguous & Dense Planted Forest (combined classes)	1.6
Artificial Dams (incl. canals)	1.3
Temporary Unplanted Forest	1.3
Dense Forest & Woodland (35 - 75% cc)	0.7

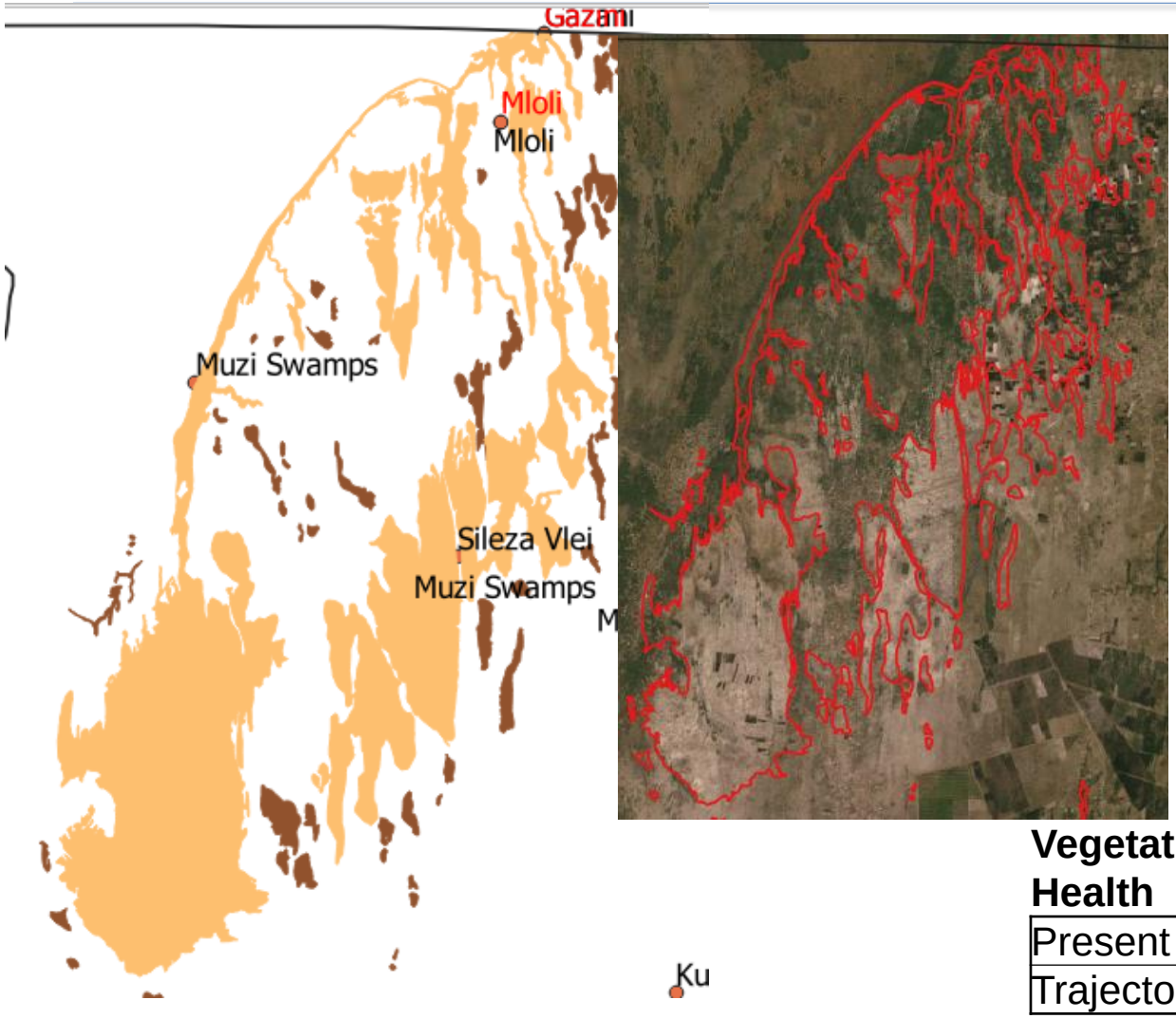
W5:Pans District Impacts

Hillslope seepage linked to a stream channel: (2018 NLC Class Name)	Cover (% wetland area)
Natural Grassland	50.6
Herbaceous Wetlands (currently mapped)	16.4
Herbaceous Wetlands (previous mapped extent)	9.8
Commercial Annuals Crops Rain-Fed / Dryland / Non-Irrigated	7.9
Fallow Land & Old Fields (Grass)	5.8
Fallow Land & Old Fields (wetlands)	3.3
Contiguous & Dense Planted Forest (combined classes)	3.1
Temporary Unplanted Forest	1.2
Dense Forest & Woodland (35 - 75% cc)	1.1
Natural Pans (flooded @ obsv time)	0.2

W7 Kosi & Sibaya: 2 Wetland Groups

Group	SQ	SQ Name	Wetland description / note
1	W70A-02278 W70A-02301 W70A-02381	Lake Sibaya	Includes **Lake Sibaya** and surrounding wetlands. Wetland area of assessment was 10168 Ha.
2	None		Depressional and floodplain wetlands that comprise the **Muzi swamps**. Wetland area of assessment was 25410 Ha.

W7: Muzi Swamps



HGM 1: Floodplain	
Ecological Integrity Score:	68.6
Ecological Category:	C
Area (Ha):	22002.3
HGM 2: Depression (includes Pans)	
Ecological Integrity Score:	86.8
Ecological Category:	B
Area (Ha):	3407.6
WETLAND PES	
Ecological Integrity Score:	71.1
Ecological Category:	C
Area (Ha):	25409.9
WETLAND REC	
Ecological Integrity Score:	71.1
Ecological Category:	C

Vegetation Health

Present Vegetation State	C
Trajectory of change	↓

W7: Muzi Swamps

Floodplain: (2018 NLC Class Name)	Cover (% wetland area)
Other Bare	34.4
Natural Grassland	32.4
Herbaceous Wetlands (previous mapped extent)	18.5
Contiguous & Dense Planted Forest (combined classes)	3.0
Subsistence / Small-Scale Annual Crops	2.7
Dense Forest & Woodland (35 - 75% cc)	2.1
Contiguous Low Forest & Thicket (combined classes)	1.8
Herbaceous Wetlands (currently mapped)	1.0
Temporary Unplanted Forest	1.0
Residential Formal (low veg / grass)	0.8
Depression (includes Pans): (2018 NLC Class Name)	**Cover (% wetland area)**
Dry Pans	47.5
Natural Grassland	30.0
Herbaceous Wetlands (currently mapped)	5.9
Contiguous & Dense Planted Forest (combined classes)	4.4
Subsistence / Small-Scale Annual Crops	3.3
Residential Formal (Bare)	2.1
Residential Formal (low veg / grass)	1.6
Temporary Unplanted Forest	1.3
Fallow Land & Old Fields (Grass)	1.1
Village Scattered (bare only)	1.1

EWR: Measures to achieve the REC

Name	Includes SQs	Size (Ha)	PES	Trajectory	REC	How to achieve the REC
		W4 Pongola				
Bivane Riverine Wetlands	W41B-02431	N/A	B	N/A	B	Maintain PES
Pongola Floodplain	W45A-02216 W45A-02245 W45A-02246 W45A-02256 W45A-02275 W45A-02282 W45A-02285 W45A-02310 W45A-02316 W45A-02356 W45A-02367 W45A-02368 W45B-02029 W45B-02105	11802.6	D	↓	C	Reduce / control subsistence and small-scale annual crops, continued implementation of EWR determined in 2015 (DWS, 2015)

EWR: Measures to achieve the REC

The Pongola EWR (DWS, 2015) comprised a release scenario that represented the best outcome for the ecosystem and social aspects combined. The releases for this scenario can be summarised as follows:

October:

- One day at 600 m^3s^{-1}
- Remaining days at 2.4 m^3s^{-1}.

December:

- Three days at 150 m^3s^{-1}
- Remaining days at 2.4 m^3s^{-1}.
- Two days at 56 m^3s^{-1}
- Four days at 28 m^3s^{-1}
- Remaining days at 2.4 m^3s^{-1}.

January:

- Two days at 50 m^3s^{-1}.
- One day at 35 m^3s^{-1}; followed by one day at 65 m^3s^{-1}. Repeat three times.
- Remaining days at 2.4 m^3s^{-1}.

February:

- Five days at 150 m^3s^{-1}.
- Remaining days at 50 m^3s^{-1}.

March:

- Fifteen days at 35 m^3s^{-1}.
- Remaining days at 50 m^3s^{-1}.

EWR: Measures to achieve the REC

Name	Includes SQs	Size (Ha)	PES	Trajectory	REC	How to achieve the REC
		W7 Kosi & Sibaya				
Lake Sibaya	W70A-02278 W70A-02301 W70A-02381	10168.0	B	→	B	Prevent expansion of surrounding forestry, residence and dry-land agriculture
MuziSwamps	None	25409.9	C	↓	C	Control forestry and subsistence and small-scale annual crops

EWR: Measures to achieve the REC

Name	Includes SQs	Size (Ha)	PES	Trajectory	REC	How to achieve the REC
W7 Kosi & Sibaya						
Lake Sibaya	W70A-02278 W70A-02301 W70A-02381	10168.0	B	→	B	Prevent expansion of surrounding forestry, residence and dry-land agriculture

The EWR for Lake Sibaya was outlined as a set of lake level requirements as follows (DWS, 2015):

REC water levels should:

- reflect natural climate conditions, in particular five to six year averages in rainfall, as well as shorter term (one year) rainfall conditions;
- retain variability, including periods of high and low water levels;
- median water levels over a 30-year period should be between 17.39 and 18.48 masl;
- should not have more than five consecutive years < 16.5 masl (DROUGHT water level threshold);
- should have at least six years in a 30 year cycle > 19.2 masl.

Thank You

EWR: Measures to achieve the REC

Name	Includes SQs	Size (Ha)	PES	Trajectory	REC	How to achieve the REC
		W1 Mhlatuze				
Mhlathuze Riverine Wetlands	W12E-03475	N/A	C	N/A	C	Maintain PES
Mhlathuze Floodplain	W12H-03459	4809.0	E	↓	D	Reduce / control sugarcane cultivation
Nlabane Wetlands	W12J-03411	546.9	D	↓	C/D	Reduce / control forestry
Mzingazi	W12J-03392 W12J-03403 W12J-03450	1689.0	B/C	→	B/C	Control expansion of forestry and residential development

EWR: Measures to achieve the REC

Name	Includes SQs	Size (Ha)	PES	Trajectory	REC	How to achieve the REC
			W2 Umfolozi			
White Mfolozi Riverine Wetlands	W21G-02885 W21H-02897 W21H-03004	N/A	B	N/A	B	Maintain PES
Aloeboom Vlei	W22A-02586 W22A-02591 W22A-02596	343.8	C	↓	B/C	Reduce / control forestry, control formal residential expansion
Mvamanzi Pan	W23A-03160	485.1	B/C	→	B/C	Control expansion of subsistence / small-scale crops and formal residential areas
Mfolozi Swamps	W23C-03180 W23D-03108	11911.1	D	→	D	Reduce / control sugarcane cultivation

EWR: Measures to achieve the REC

Name	Includes SQs	Size (Ha)	PES	Trajectory	REC	How to achieve the REC
			W3 Mkuze			
Nhlonhlela Pan	W31J-02469 W31J-02501	8.2	A	→	A	Preventative conservation: prevent expantion of surrounding forestry
Hluhluwe Floodplain	W32F-02835	2310.1	C/D	↓	C	Reduce / control cultivation of commercial and emerging farmer sugarcane
Nyalazi Pan	W32H-02854	43.2	C	→	C	Control existing forestry extent
Mpate Wetlands	W32H-02998	236.9	A	→	A	Preventative conservation: prevent expantion of forestry and small-scale subsistence farming
Mkuze Floodplain	W32B-02535	11222.9	B	→	B	Control extent of subsistence / small-scale annual crops

EWR: Measures to achieve the REC

Name	Includes SQs	Size (Ha)	PES	Trajectory	REC	How to achieve the REC
			W5 Usuthu			
Assegaai Floodplain	W51C-01981 W51C-02011 W51C-02022 W51C-02067 W51C-02074 W51C-02109 W51D-02044 W51D-02151 W51D-02160 W51D-02171 W51D-02177 W51D-02193	886.4	C	→	C	Control expansion of forestry and informal farming
Sandspruit Wetlands	W53A-01757 W53A-01804 W53A-01853	1676.8	C	→	C	Control expansion of commercial annual crops and dry-land agriculture
Upper Usuthu Wetlands	W54A-01534 W54A-01630	767.2	B/C	→	B/C	Control expansion of commercial annual crops and dry-land agriculture
Seganagana Wetlands	W54B-01569 W54B-01623	1264.7	A	→	A	Preventative conservation: Control expansion of forestry and dry-land agriculture
Pans District	W55A-01375 W55A-01423 W55C-01395	21348.2	A/B	→	A/B	Preventative conservation: Control expansion of forestry and commercial annual crops, rain-fed
Lower Usuthu (Ndumo)	W57J-01923 W57K-01929 W57K-02025	1310.0	A	→	A	Preventative conservation: prevent expansion of nearby slash & burn agricultural activities