water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

2030 NDP

DETERMINATION OF WATER RESOURCE CLASSES AND ASSOCIATED RESOURCE QUALITY OBJECTIVES IN THE THUKELA CATCHMENT: BACKGROUND

Wetlands

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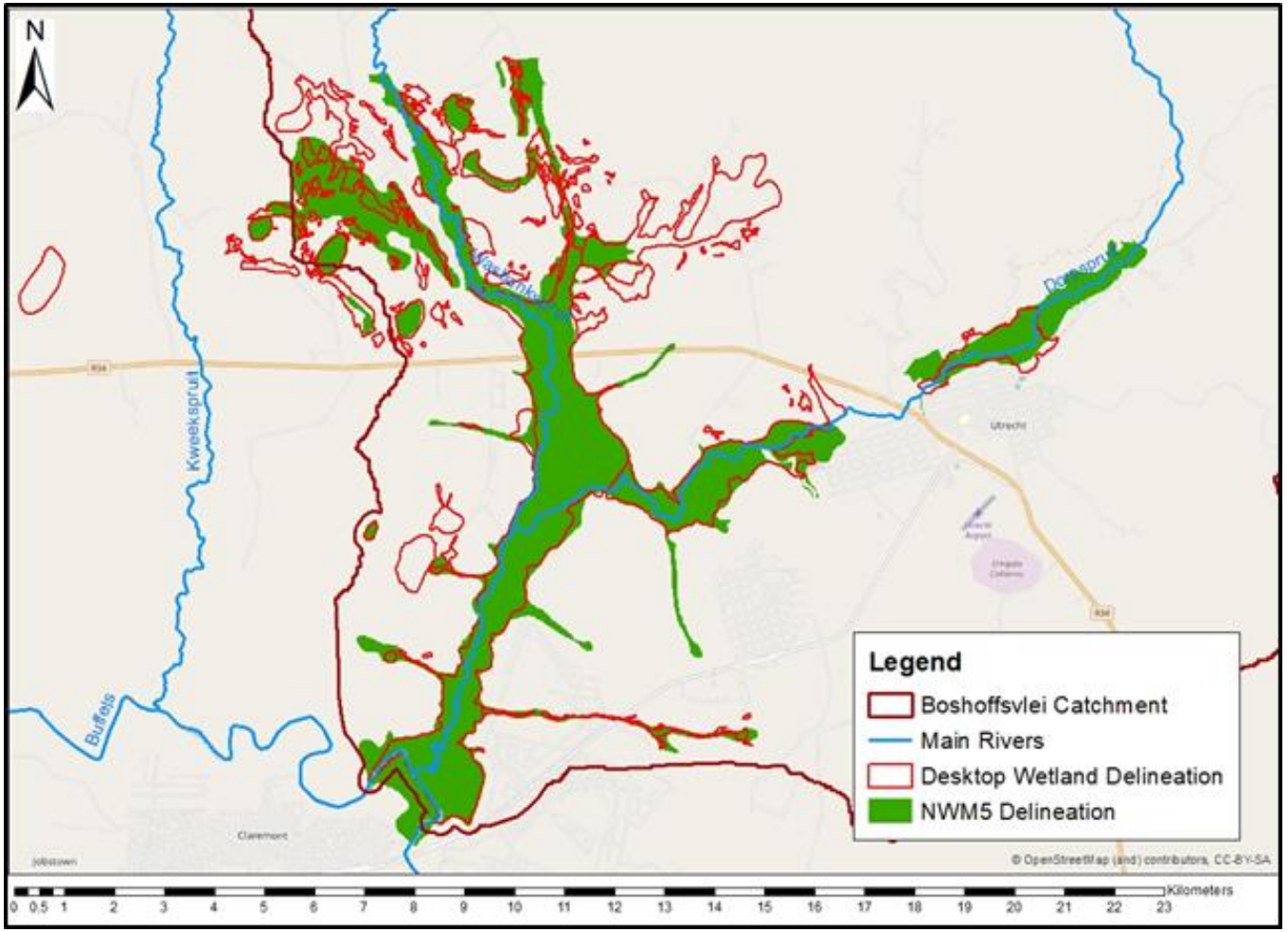
Date: 18 May 2021

Wetland Data

Wetland data availability	Confidence in the data	Approach used during this study to improve the confidence
Wetlands in the Catchment National Wetland Map 5 (Van Deventer *et al*., 2018) - (GIS layer) NFEPA wetland layer (Nel *et al*., 2011) - (GIS layer)	Low to medium confidence	Used available imagery of the Thukela catchment to identify gaps in the databases and/or verify the existing data where appropriate
Identification of Priority Wetlands Used mainly old hard copy maps and report from Begg (1989).	High confidence	-
Wetland Delineation	Low confidence as all desktop mapping	Undertook more detailed (higher confidence) desktop mapping of each of the Priority Wetlands
Wetland Typing	Low confidence	Focused predominantly on the main system in each case rather than tributaries
Wetland Categorisation PES or similar surrogate data only available for some systems - desktop level. No IS data available.	Low confidence	**PES** – Used a desktop assessment with 2018 National Landcover data for input. **IS** – Used surrogate databases together with information from site visits

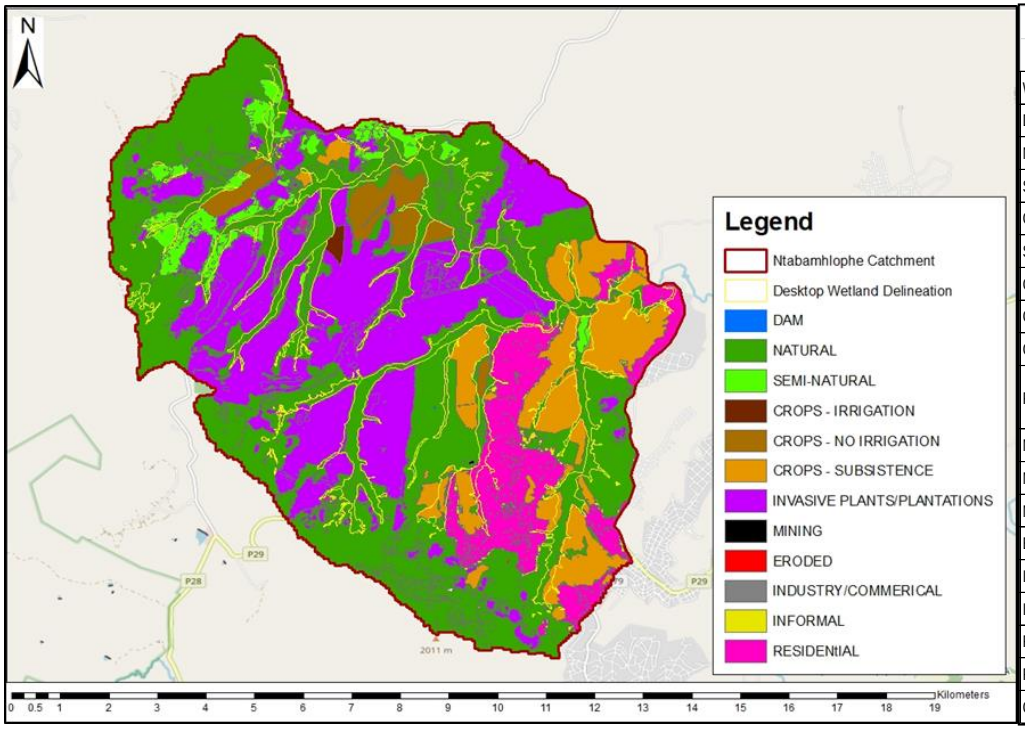
Updated Mapping - Approach

- Desktop mapping using ArcGIS and multiple date/year aerial imagery; and
- Typing was done at a coarse level focusing on the main systems.



Categorisation - Approach

- PES - Wet-Health Level 1a (MacFarlane *et al*., May 2020) desktop assessment;
- 2018 National Landcover data as the basis;
- 1990 National Landcover data used as a comparison to determine the trajectory of change; and
- IS – Desktop assessment using the method described in Rountree *et al*. (2013).



	Hydrology	Geomorphology		Water Quality	Vegetation
	Wet_Hydro	Wet_Geo_Pr	Wet_Geo_St	Wet_WQ	Wet_Veg
WATER_NAT	0	0	0	0	0
DAM	7	4	4	0	10
NATURAL	0	0	0	0.4	1
SEMI_NAT	4	2	1	0.8	6
ORCH_VINE	7	5	2	6.1	10
SUGARCANE	8	6	2	6.4	10
CROP_IRRIG	7.5	6	2	6.9	10
CROP_NOIRR	7	6	2	6.5	10
CROP_SUBS	7	4	2	3.6	10
PLANT_INV	7	1	1	1.2	10
MINING_L	9	9	10	2.1	9
MINING_M	10	10	10	8.4	10
MINING_H	10	10	10	10	10
ERODED	7	7	8	2.2	9
INDUS_COMM	10	10	10	8.2	10
INFORMAL	7	4	8	7.6	9
RESIDENT_H	10	8	8	5	10
RESIDENT_L	6	6	5	4	6
OPENSPACE	3	4	1	4.2	9

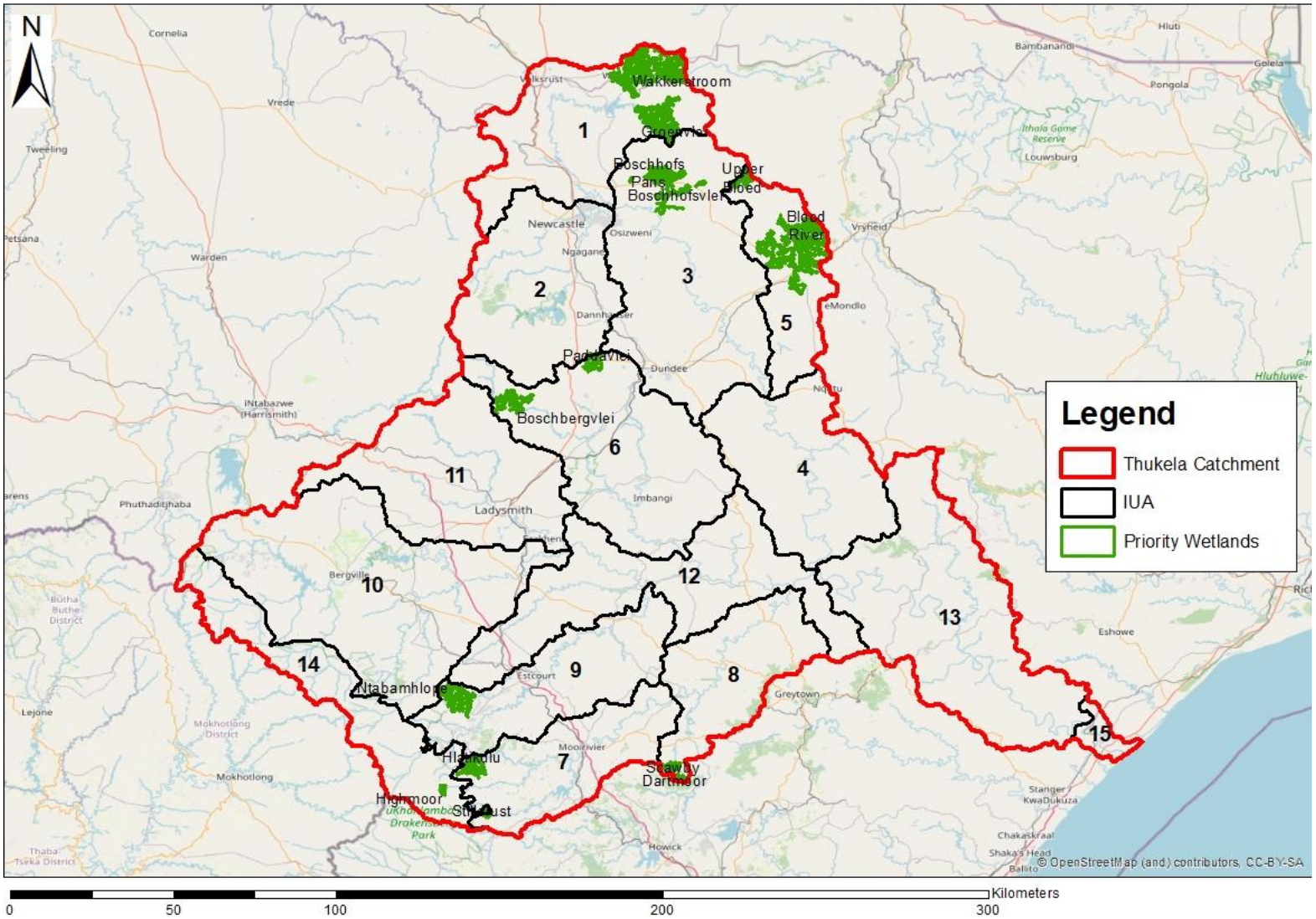
Categorisation - Approach

	Open Water – Natural	Open Water - Artificial	Natural / Minimally impacted	Semi-natural	Orchards and vineyards	Sugar cane	Commercial annual crops (irrigated)	Commercial annual crops (non-irrigated)	Subsistence crops	Plantations and dense alien vegetation	Mining - low risk	Mining - medium risk	Mining - high risk	Eroded areas (& heavily degraded land)	Urban Industrial/Commercial	Urban Informal	Urban Residential – high density	Urban Residential – low density	Urban Open Space	Total Area (ha)
Wetland_ID	WATER_NAT	DAM	NATURAL	SEMI_NAT	ORCH_VINE	SUGARCANE	CROP_IRRIG	CROP_NOIRR	CROP_SUBS	PLANT_INV	MINING_L	MINING_M	MINING_H	ERODED	INDUS_COMM	INFORMAL	RESIDENT_H	RESIDENT_L	OPENSPACE	AREA_TOT
NH1		0.2	10.4							1.1					0.1					11.8
NH10		0.0	78.5	0.8					6.6	0.7						0.4	2.6			89.6
NH11			96.0	14.1					27.2					0.0	0.0	0.3	1.6			139.3
NH12			117.8	0.1				0.3		1.4					0.0					119.5
NH13			31.9					11.8	0.9							0.5	22.3			67.4
NH14		0.2	123.3						0.5	6.8						0.1	2.6			133.5
NH15			15.0						0.8											15.8
NH16			4.4						4.2											8.6
NH17			2.1						0.3							0.3	1.2			3.9
NH18			5.7						6.3											12.0
NH19			47.4					0.8		1.5										49.7
NH2			16.3	13.6				0.2		0.0										30.1
NH20			13.9							0.9										14.7
NH21		0.1	70.5	21.6				0.0	0.4	0.9										93.6
NH3		0.0	13.4	11.2				0.0		0.2										24.8
NH4			18.3							3.1										21.4
NH5			9.7						18.6							0.4	2.0			30.7
NH6			11.7	0.1																11.9
NH7		0.2	0.9	0.1					0.2	0.8										2.2
NH8			69.8				0.1			1.8										71.6
NH9			36.7	2.8			0.1			2.9										42.5

	Open Water – Natural	Open Water - Artificial	Natural / Minimally impacted	Semi-natural	Orchards and vineyards	Sugar cane	Commercial annual crops (irrigated)	Commercial annual crops (non-irrigated)	Subsistence crops	Plantations and dense alien vegetation	Mining - low risk	Mining - medium risk	Mining - high risk	Eroded areas (& heavily degraded land)	Urban Industrial/Commercial	Urban Informal	Urban Residential – high density	Urban Residential – low density	Urban Open Space	Total Area (ha)
Wetland_ID	WATER_NAT	DAM	NATURAL	SEMI_NAT	ORCH_VINE	SUGARCANE	CROP_IRRIG	CROP_NOIRR	CROP_SUBS	PLANT_INV	MINING_L	MINING_M	MINING_H	ERODED	INDUS_COMM	INFORMAL	RESIDENT_H	RESIDENT_L	OPENSPACE	AREA_TOT
NH1			11.84732074							37.53702354				0.131662467	0.216130598					49.73213734
NH10		0.019423845	91.91906388	3.396841397					80.92505182	63.75532037				0.430546233	0.186643885	4.32043897	50.11504928			295.0683797
NH11			196.8370845	0.829220376					185.5473705	1.931806709				0.122161091	0.069844936	8.889844009	67.54728154			461.7712337
NH12			135.3818817	22.4677429				22.17025682		35.71333972				0.773744507	0.625232643					217.1321983
NH13			37.87289293					0.005112291	70.69726187		0.689844161					2.492475691	126.9794266			238.7370136
NH14		0.0243889	181.4039205						16.44922933	212.1262254						4.83328857	32.54659896			447.3836517
NH15		0.053994153	126.817892						18.88864556	10.89270603					0.020673443					156.6739112
NH16			24.45098264						46.40119971											70.85218234
NH17			4.372580417						19.18325112							2.773243276	23.85479248			50.1838673
NH18			11.24170565						66.75471821					0.025615234		1.453513825	1.448351438			80.92390436
NH19			35.213772					40.04637567		126.9373727					0.330140778					202.5276612
NH2			68.33499918	73.38398341				29.05864631		19.69008779										190.4677167
NH20			28.26933747	1.318413618						68.50886681					0.521768925					98.61038682
NH21		0.003839017	126.252213	65.68576166				12.00941885	6.932993408	87.45666605					0.116170357	0.08	1.002925068			299.5399874
NH3			61.44873423	23.56527894				7.226749872		17.4351986						2.977229586				112.6531912
NH4			111.6442554							58.83847154										170.4827269
NH5			54.99391405						18.07535111	0.940609398	0.768769684				0.060988198	1.743688596	27.13450436			103.7178254
NH6			113.5157123	13.08529939						1.598360292										128.199372
NH7		0.057146891	5.757722052	10.6861023					6.886424167	17.32450854										40.71190395
NH8			62.80408758	1.091893415			9.989730327		0.000573505	129.3400089						0.35084052	2.426750925			206.0038852
NH9			53.21978546	2.606796274			6.909560384			115.7737369										178.509879

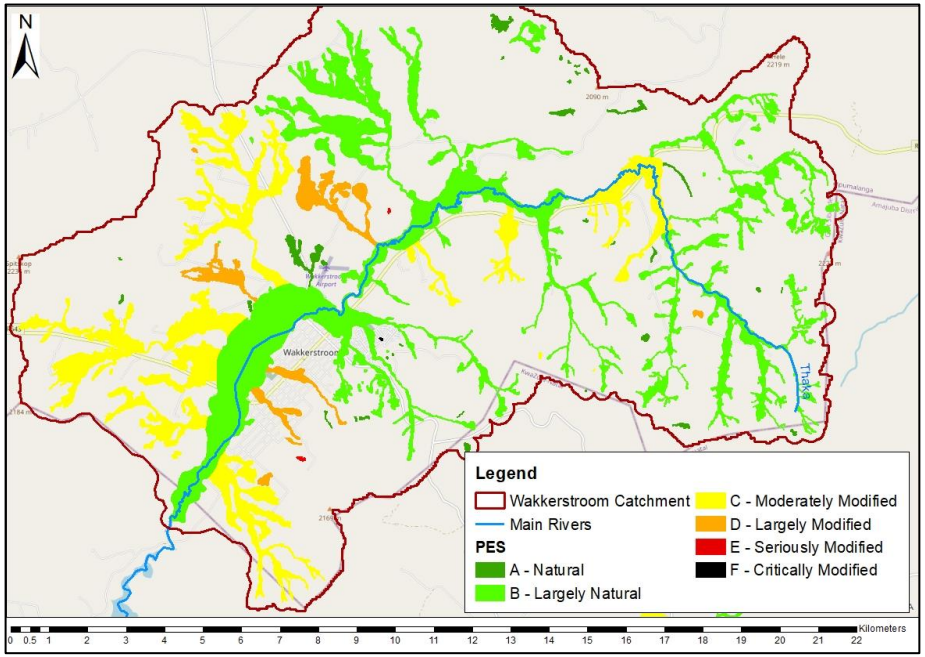
		HYDROLOGY			GEOMORPHOLOGY			WATER QUALITY			VEGETATION			OVERALL CONDITION			HECTARE EQUIVALENTS (based on Overall PES)
Wetland_ID	Wetland area (Ha)	Impact Score	PES Score (%)	Ecological Category	Impact Score	PES Score (%)	Ecological Category	Impact Score	PES Score (%)	Ecological Category	Impact Score	PES Score (%)	Ecological Category	Combined Impact Score	Overall PES Score (%)	Combined Ecological Category	
Wetland_ID	WET_AREA	IMPACT_HYD	PES_HYDRO	EC_HYDRO	IMPACT_GEO	PES_GEO	EC_GEO	IMPACT_WQ	PES_WQ	EC_WQ	IMPACT_VEG	PES_VEG	EC_VEG	IMPACT_ALL	PES_ALL	EC_ALL	HA_EQUIV
NH1	11.8	5.6	44.4	D	1.9	81.5	B	1.8	82.2	B	2.0	79.7	C	3.1	68.9	C	8.1
NH10	89.6	4.5	55.2	D	2.0	80.3	B	2.6	73.8	C	2.1	79.2	C	3.0	70.3	C	63.0
NH11	139.3	4.7	52.5	D	2.2	78.4	C	2.9	70.6	C	3.4	66.1	C	3.5	65.3	C	91.0
NH12	119.5	3.2	68.0	C	1.2	87.6	B	1.8	82.1	B	1.1	88.7	B	2.0	80.1	B	95.7
NH13	67.4	6.8	32.5	E	4.4	55.9	D	5.0	50.5	D	5.7	42.6	D	5.9	41.1	D	27.7
NH14	133.5	4.6	53.7	D	1.7	83.5	B	1.9	80.6	B	1.7	83.1	B	2.7	72.8	C	97.2
NH15	15.8	2.9	71.0	C	1.2	88.1	B	1.7	82.7	B	1.5	85.3	B	1.9	80.6	B	12.7
NH16	8.6	6.0	40.5	D	2.8	71.6	C	3.6	63.9	C	5.4	45.9	D	4.6	53.8	D	4.6
NH17	3.9	6.4	36.0	E	4.3	56.7	D	4.7	52.7	D	5.1	49.4	D	5.6	44.5	D	1.7
NH18	12.0	6.4	35.8	E	3.1	68.6	C	4.0	60.0	D	5.7	42.5	D	5.4	46.4	D	5.6
NH19	49.7	5.2	47.8	D	1.9	81.0	B	2.3	77.1	C	1.4	85.8	B	3.0	70.1	C	34.8
NH2	30.1	4.3	56.6	D	1.9	80.9	B	2.1	78.8	C	3.3	66.6	C	3.1	69.2	C	20.8
NH20	14.7	5.2	48.4	D	1.7	83.5	B	1.7	83.0	B	1.5	84.6	B	2.8	71.9	C	10.6
NH21	93.6	4.3	56.9	D	1.6	83.6	B	1.8	82.0	B	2.3	77.0	C	2.7	72.9	C	68.3
NH3	24.8	4.3	57.1	D	1.8	82.2	B	1.9	80.9	B	3.3	66.6	C	3.0	70.1	C	17.4
NH4	21.4	4.2	57.9	D	1.3	86.7	B	1.6	83.9	B	2.3	77.0	C	2.6	74.3	C	15.9
NH5	30.7	6.5	34.6	E	3.3	67.1	C	4.1	58.5	D	7.1	28.7	E	5.7	43.0	D	13.2
NH6	11.9	1.2	87.9	B	0.6	94.2	A	1.1	89.4	B	1.1	89.5	B	1.0	90.0	B	10.7
NH7	2.2	7.0	29.7	E	2.6	74.0	C	2.3	77.4	C	6.1	39.5	E	5.3	46.6	D	1.0
NH8	71.6	5.0	50.2	D	1.6	83.6	B	1.8	81.8	B	1.2	87.7	B	2.7	73.0	C	52.3
NH9	42.5	5.3	47.1	D	1.8	82.4	B	1.8	81.7	B	2.0	80.4	B	3.0	70.0	C	29.8

Priority Wetlands



Priority Wetland 1 – IUA 1

Wakkerstroom Wetland



Wakkerstroom Wetland

IUA 1

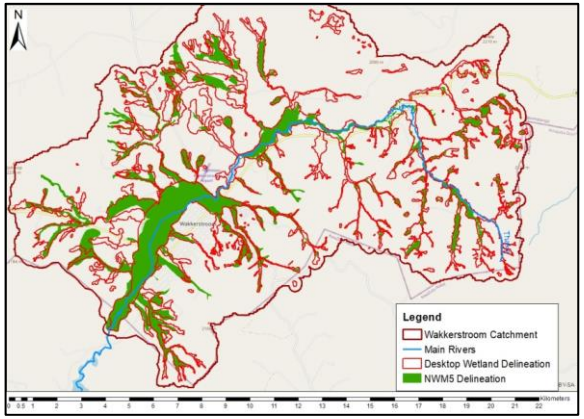
Quaternary Catchment – V31A

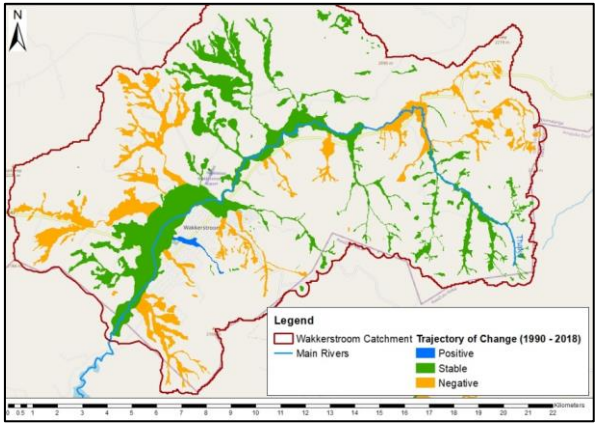
Total wetland area mapped – 4 101 hectares (main wetland ~ 715 ha)

Wetland sub-catchment – 20 973 hectares

HGM – Main wetland Unchannelled Valley Bottom (others include Floodplain, Valley Bottom, Seep, Depression)

- Flow reduction, WWTW inputs

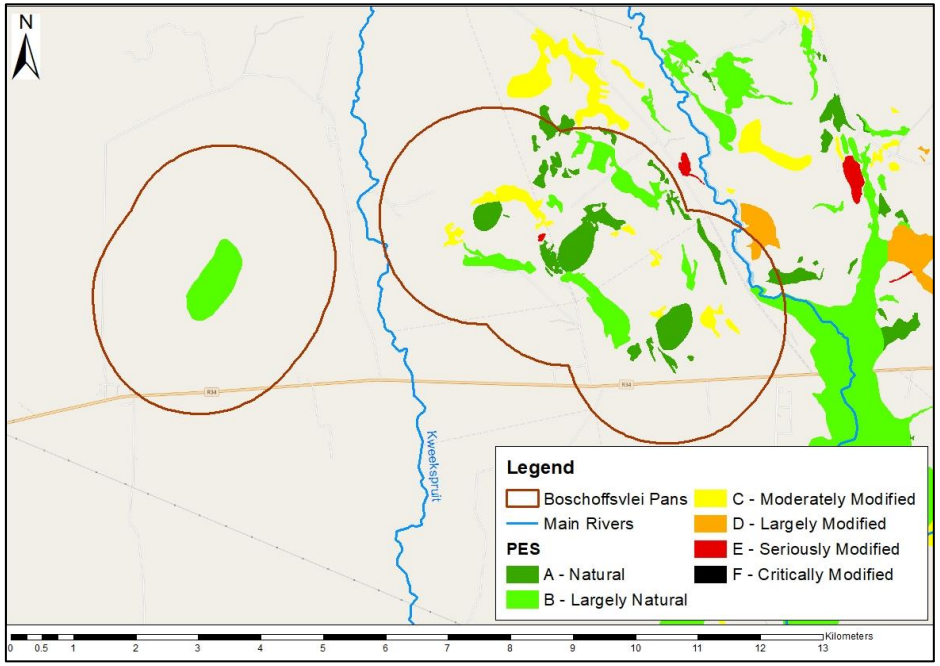




Wakkerstroom Catchment	
Landcover Class	**% cover**
Dams	0.2%
Natural	79.1%
Semi-Natural	8.4%
Cultivation (irrigated)	0.0%
Cultivation (non-irrigated)	**8.2%**
Cultivation (subsistence)	0.2%
Plantations & Aliens trees	**1.5%**
Mining	0.0%
Eroded areas	0.1%
Industrial/Commercial/Roads	0.1%
Informal Settlements	0.2%
Residential	**2.0%**
TOTAL	**100%**

Priority Wetland 3 – IUA 3

Boschoffsvlei Pans



Boshoffsvlei Wetland and Pans

IUA 3

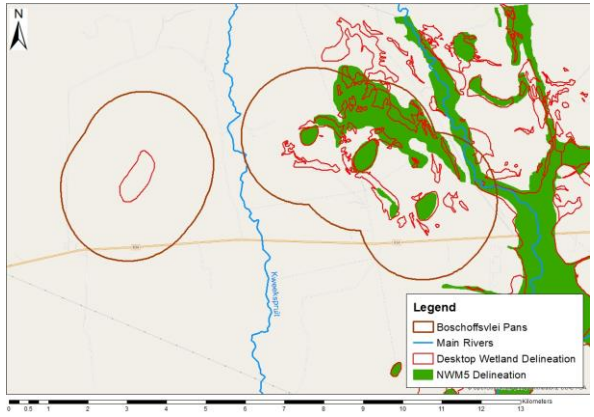
Quaternary Catchment – V32B

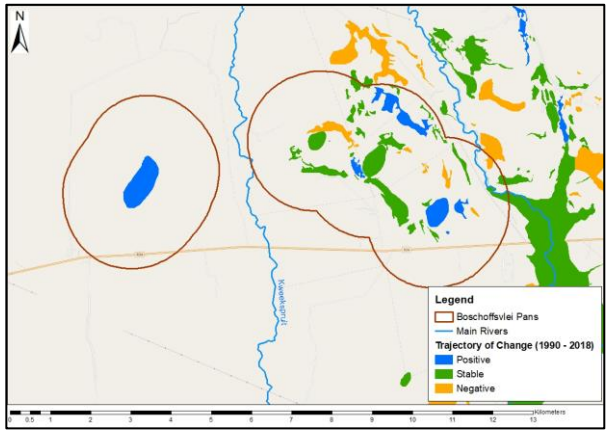
Total wetland area mapped – 2 836 hectares (main wetland ~ 1149 ha)

Wetland sub-catchment – 50 480 hectares

HGM – Main wetland Floodplain, Depressions and Seeps (others include Valley Bottom)

- Erosion
- Cultivation
- Overgrazing
- WWTW

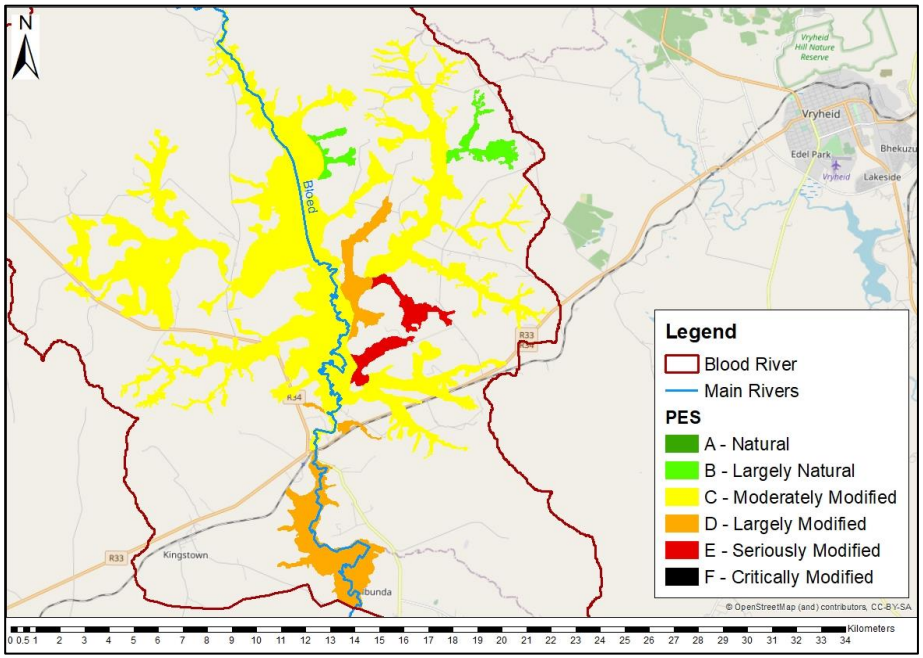




Boshoffsvlei Catchment	
Landcover Class	**% cover**
Dams	0.2%
Natural	77.3%
Semi-Natural	9.7%
Orchards	0.0%
Cultivation (irrigated)	0.6%
Cultivation (non-irrigated)	**4.7%**
Cultivation (subsistence)	1.0%
Plantations & Aliens trees	**1.6%**
Mining	0.4%
Eroded areas	**1.6%**
Industrial/Commercial/Roads	0.1%
Informal Settlements	0.4%
Residential (high density)	1.5%
Residential (low density	0.7%
Urban open space	0.1%
TOTAL	**100%**

Priority Wetland 5 – IUA 5

Blood River Vlei



Blood River Vlei

IUA 5

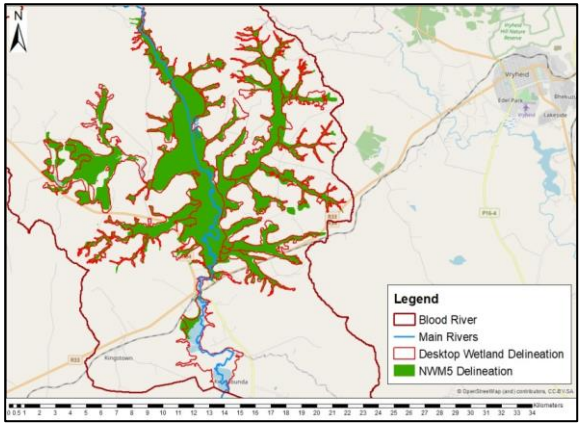
Quaternary Catchment – V32G & V32H

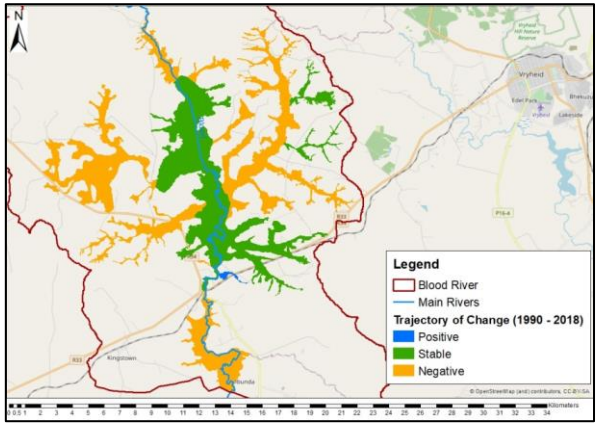
Total wetland area mapped – 8 899 hectares (main wetland ~ 2427 ha)

Wetland sub-catchment – 66 163 hectares

HGM – Main system Unchannelled Valley Bottom and Floodplain (others include Seep)

- Dams
- Cultivation





Blood River Wetland Catchment	
Landcover Class	**% cover**
Dams	1.1%
Natural	65.8%
Semi-Natural	10.5%
Cultivation (irrigated)	**3.2%**
Cultivation (non-irrigated)	**13.6%**
Cultivation (subsistence)	1.5%
Plantations & Aliens trees	**2.6%**
Eroded areas	0.3%
Industrial/Commercial/Roads	0.1%
Informal Settlements	0.4%
Residential (high density)	0.9%
TOTAL	**100%**

Priority Wetland 10 – IUA 8

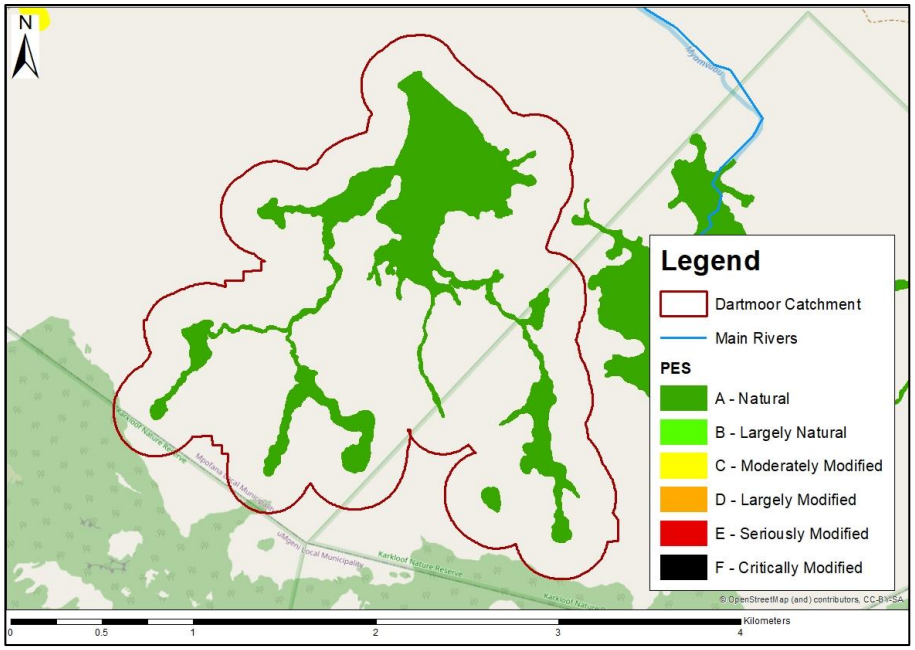
Myamvubu Vlei Systems – Dartmoor Wetland











Dartmoor Wetland

IUA 8

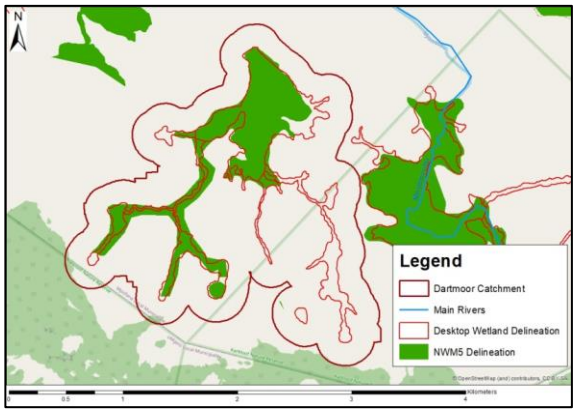
Quaternary Catchment – V20F

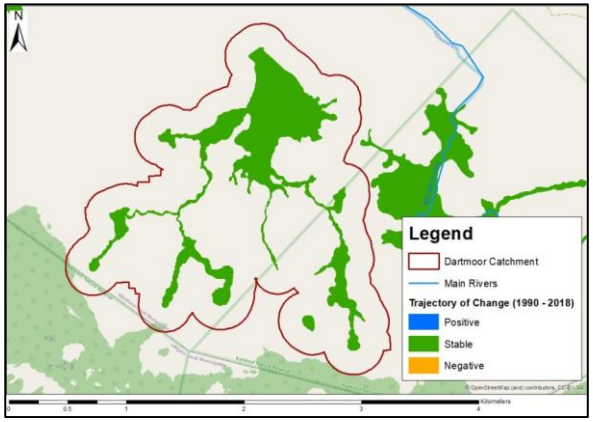
Total wetland area mapped – 92 hectares (main wetland ~ 53 ha)

Wetland sub-catchment – 479 hectares

HGM – Main system Channelled and Unchannelled Valley Bottom (others include Seep)

- Drains
- Wildlands Trust





Dartmoor Catchment	
Landcover Class	**% cover**
Dams	0.3%
Natural	99.3%
Cultivation (non-irrigated)	0.3%
Eroded areas	0.0%
TOTAL	**100%**

Categorisation Summary

No	IUA	Quaternary Catchment	Wetland Name	Wetland Type (main system)	PES	IS	REC	BAS	Conf. (0-5)
1	1	V31A	Wakkerstroom	UVB	B	VH	A	B/C	4
2	1	V31A	Groenvlei	CVB and FP	C	H	B/C	C	3
3	3	V32B	Boschoffsvlei	FP	C*	H	B/C	C	3
4	3	V32B	Boschoffsvlei pan complex	P and S	A & B	VH	A	A/B	4
5	5	V32G	Upper Blood River	S and UVB	A & B	H	A/B	A/B	4
6	5	V32G	Blood River	UVB and FP	C	VH	B	C	3
7	6	V60D	Paddavlei	CVB and UVB	B	H	A/B	B	3
8	6	V60B	Boschberg	FP	B/C*	H	B	C	3
9	7	V20C	Hlatikulu	UVB and CVB	C	VH	B	C	3
10	7	V20A	Stillerust	CVB and FP	A	VH	A	A	4
11	8	V20F	Melmoth	UVB	A	VH	A	A	4
12	8	V20F	Dartmoor	UVB and CVB	A	VH	A	A	4
13	8	V20F	Scawby	UVB	C	VH	B	B/C	3
14	9	V70D	Ntabamhlope	FP and UVB	B	VH	A	C	3
15	14	V11B,G; V13A; V70A,B; V20A,B,C	Natal Drakensberg Park including the Highmoor wetlands	UVB, CVB and S	A & C	H	A/B	A/B	4

* Modified PES based on expert opinion and site observations

Wetland RQO's – Limitations

- Limited to no flow or water quality data (especially updated information) are available for the majority of the Priority Wetlands, with the Wakkerstroom Priority Wetland being the exception.

RQO's for the wetlands are thus qualitative and confidence in the components is low for water quantity and quality where these are indicated and medium for Habitat and Biota, based on the limitations imposed by the existing information.

Wetland REC

- The PES and IS served as the starting point;
- Used a modification of the principles outlined in Rountree *et al*. 2013 to derive the REC; and
- Expert judgement and the trajectory of change over the past 28 years was used to derive a BAS (preliminary at this stage) for each priority wetland – whether the systems are likely to either stay the same or change depending on the pressures they previously experienced, and based on likely additional threats or pressures going forward.

Wetland RQO's

Setting Preliminary Wetland RQO's

- Generic and specific preliminary RQO's for each of the Priority Wetlands have been developed as applicable;

- These still need to be workshopped with the project team and amended as necessary;

Outcome – Preliminary RQO's for the Priority Wetlands

- Once amended, these will need to be presented for comments, review and inputs at the respective stakeholder meetings.

Outcome – Final RQO's for the Priority Wetlands

Preliminary Wetland RQO's - Wakkerstroom

Component prioritised	Indicator	RQO	Numerical Criteria
Quantity	River and groundwater indicators apply.	River objective to be added. A constant baseflow must be maintained that ensures that the system remains perennial and the peatland is permanently saturated.	River and groundwater numerical limits must apply (see river and groundwater numerical limits).
	Others TBD with inputs from various stakeholders involved with the system.		
Quality	River and groundwater indicators apply (see river and groundwater indicators).	River and groundwater RQO's apply (see river and groundwater indicators).	River and groundwater numerical limits apply (see river and groundwater numerical limits).
	Others TBD with inputs from various stakeholders involved with the system.		
Habitat	PES Category - As a minimum undertake a WET-Health Level 1a PES assessment (as per the method described by Macfarlane *et al*., 2020). For the PES assessment the latest available National or Provincial Land Cover datasets should be utilised for the wetland catchment, while detailed manual digitising of land cover within the wetland should be undertaken off latest available aerial imagery (and supplement through field verification where and if available) and used for the within-wetland land cover. Repeat as soon as new National or Provincial land cover data is available but at least every 5 years if possible and report on this with a view to assess if there have been any changes in the state of the system.	Maintain desktop PES category of B (84.1 %) although the likely BAS Category is C (70 %) due to flow reduction as a result of climate change factors.	Less than 10% deterioration in PES score from the baseline of 84.1% .
	Peat depth and humification – determine using the von Post Humification Scale (after von Post, 1922; von Post and Granlund, 1926) at selected points in the wetland to determine depth and humification of the peat. Determine baseline and repeat every 5 years.	Peat depth and humification should be constant over time	Less than 10% deterioration in peat depth and humification over time.
Biota	Presence of Critically Endangered White-winged Flufftail	Maintain a population of White-winged Flufftail in the wetland.	Continued presence of White-winged Flufftail.
	SABAP 2 reporting rates for aquatic/wetland dependent Red Data bird species: • White-Winged Flufftail, Grey Crowned Crane, African Marsh Harrier, African Grass Owl, Blue Crane, Maccoa Duck, Greater Flamingo, Lesser Flamingo, Half-Collared Kingfisher, Greater Painted Snipe Verify from monitoring records and recorded sightings from available avifaunal reporting data. Report on this every 3 to 5 years.	Overall diversity and populations of aquatic/wetland dependent bird species must be maintained.	TBD with inputs from various stakeholders involved with the system.

Preliminary Wetland RQO's – Boschoffsvlei Pans

Component prioritised	Indicator	RQO	Numerical Criteria
Quantity	Pan wetted perimeter as measured from desktop mapping in relation to antecedent rainfall. Compile an accurate desktop basemap for the pans prior to the start of monitoring using the most recent available remote imagery and determine the wetted perimeter in relation to antecedent rainfall for the pans. Repeat the above every 3 to 5 years and assess and report on this with a view to assess if there have been any measurable changes in the relationship between wetted perimeter and antecedent rainfall in the pan.	Water quantity impacts must be managed so as not to undermine the ecological value of the pans. In particular, abstraction or artificial water inputs should be limited in the pans so that the depth and duration of inundation is maintained within the normal range for high, average and low rainfall years.	TBD
Quality	pH, Electrical Conductivity, TDS, Total Alkalinity as CaCO3, Sodium, Calcium, Magnesium, Sulphate, Iron, Chloride, Potassium, Magnesium, Manganese, Aluminium, Phosphorous, Silica, Fluoride Ammonia, Nitrate and Fluoride. Sample every 3 to 5 years.	Water quality impacts to the pan systems must be restricted to ensure that the water and sediment chemistry remain within an acceptable normal range (anion and cation concentration to pan volume relationship) for this particular water chemistry pan type.	TBD
Habitat	PES Category - As a minimum undertake a WET-Health Level 1a PES assessment (as per the method described by Macfarlane *et al*., 2020). For the PES assessment the latest available National or Provincial Land Cover datasets should be utilised for the wetland catchment, while detailed manual digitising of land cover within the wetland should be undertaken off latest available aerial imagery (and supplement through field verification where and if available) and used for the within-wetland land cover. Repeat as soon as new National or Provincial land cover data is available but at least every 5 years if possible and report on this with a view to assess if there have been any changes in the state of the system.	Maintain desktop PES category of pans.	Less than 10% deterioration in PES score from the baseline. Baseline PES scores for pans from west to east: • 90 % • 92.8 % • 92.2 % • 90.7 %
Biota	Reporting rates for aquatic/wetland dependent Red Data bird species: • Grey Crowned Crane • African Marsh Harrier • Blue Crane • Greater Flamingo • Lesser Flamingo Verify from monitoring records and recorded sightings from available avifaunal reporting data. Report on this every 3 to 5 years.	Overall diversity and populations of aquatic/wetland dependent bird species must be maintained.	Blue and Grey Crowned Crane aspects TBD/confirmed with input from the EWT. Reporting rates for other aquatic/wetland dependent Red Data bird species TBD.

Preliminary Wetland RQO's – Blood River Vlei

Component prioritised	Indicator	RQO	Numerical Criteria
Quantity	Extent and frequency of flooding in relation to rainfall in the catchment. Using available suitable remote imagery, estimate the extent and frequency of inundation/flooding in relation to rainfall for the wetland. Repeat the above every 5 years and assess and report on this with a view to assess if there are any measurable changes in the relationship between flooding extent and rainfall events.	Floods are necessary to inundate the floodplain thereby providing the wetting regime required for supporting the floodplain vegetation, particularly the facultative hydrophytic grasses, sedges and forbs that are dependent on flooding for their life cycles.	TBD
	Extent of dams and Surface Flow Reduction (SFR) activities (e.g. irrigated cultivation, plantations, etc.)	Existing water inputs to the wetland from its' catchment must be maintained, with no increase in direct abstraction from the wetland.	Current extent of dams and SFR activities within the catchment. To be determined.
	River indicators apply for baseflow (see river indicators).	River RQO's apply (see river RQO's).	River numerical limits apply (see river numerical limits).
Quality	River indicators apply (see river indicators).	River RQO's apply (see river RQO's).	River numerical limits apply (see river numerical limits).
Habitat	PES Category - As a minimum undertake a WET-Health Level 1a PES assessment (as per the method described by Macfarlane *et al*., 2020). For the PES assessment the latest available National or Provincial Land Cover datasets should be utilised for the wetland catchment, while detailed manual digitising of land cover within the wetland should be undertaken off latest available aerial imagery (and supplement through field verification where and if available) and used for the within-wetland land cover. Repeat as soon as new National or Provincial land cover data is available but at least every 5 years if possible and report on this with a view to assess if there have been any changes in the state of the system.	Maintain desktop PES category of wetland.	Less than 10% deterioration in PES score from the baseline: North of R34 crossing – 75 % South of R34 crossing – 55.7 %
Biota	Reporting rates for aquatic/wetland dependent Red Data bird species: • Grey Crowned Crane • African Marsh Harrier • Blue Crane Verify from monitoring records and recorded sightings from available avifaunal reporting data. Report on this every 3 to 5 years.	Overall diversity and populations of aquatic/wetland dependent bird species must be maintained.	Grey Crowned Crane aspects TBD/confirmed with input from the EWT. Reporting rates for the African Marsh Harrier TBD.

Preliminary Wetland RQO's - Dartmoor

Component prioritised	Indicator	RQO	Numerical Criteria
Habitat	PES Category - As a minimum undertake a WET-Health Level 1a PES assessment (as per the method described by Macfarlane *et al*., 2020). For the PES assessment the latest available National or Provincial Land Cover datasets should be utilised for the wetland catchment, while detailed manual digitising of land cover within the wetland should be undertaken off latest available aerial imagery (and supplement through field verification where and if available) and used for the within-wetland land cover. Repeat as soon as new National or Provincial land cover data is available but at least every 5 years if possible and report on this with a view to assess if there have been any changes in the state of the system.	Maintain desktop PES category of wetland.	Less than 10% deterioration in PES score from the baseline – 95 %
Biota	Reporting rates for aquatic/wetland dependent Red Data bird species: • Wattled Crane • Grey Crowned Crane • African Marsh Harrier • Blue Crane Verify from monitoring records and recorded sightings from available avifaunal reporting data. Report on this every 3 to 5 years.	Overall diversity and populations of aquatic/wetland dependent bird species must be maintained. Species specific TBD with input from Willdlands Trust, Ezemvelo KZN Wildlife and the EWT.	TBD with input from Willdlands Trust, Ezemvelo KZN Wildlife and the EWT. Reporting rates for the African Marsh Harrier TBD.

THANK YOU