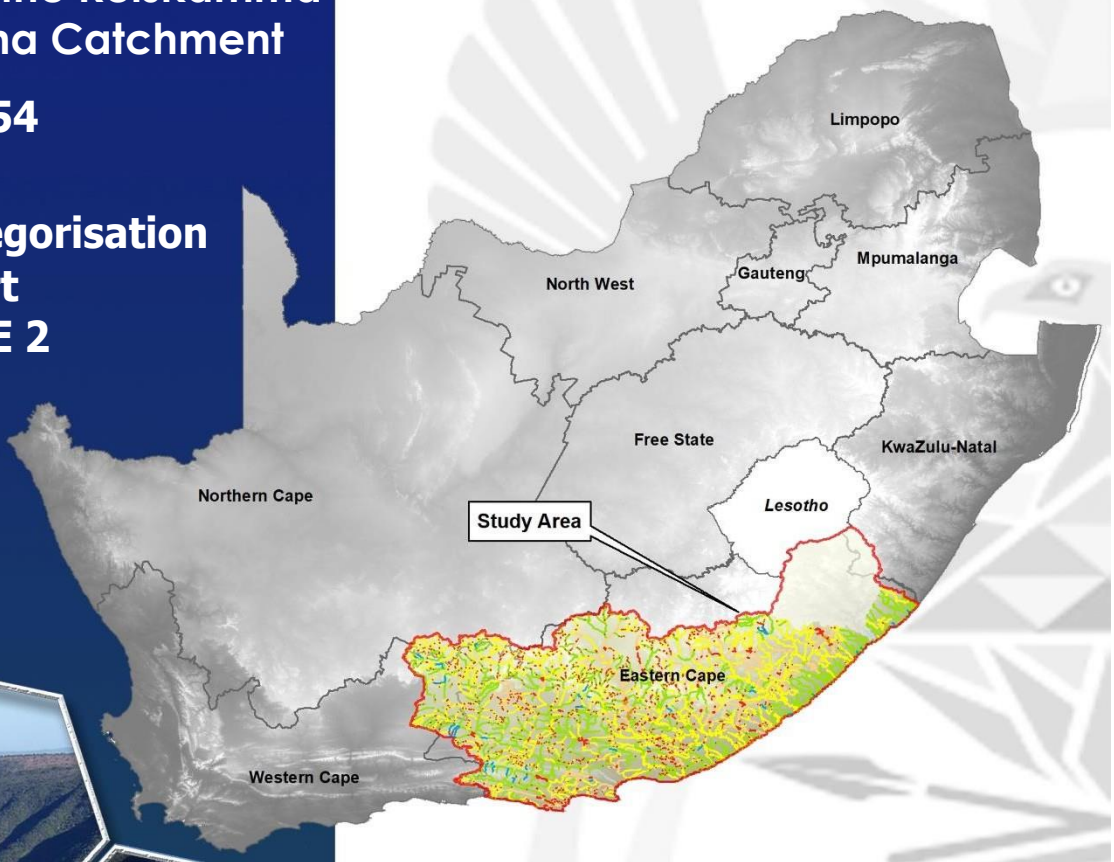
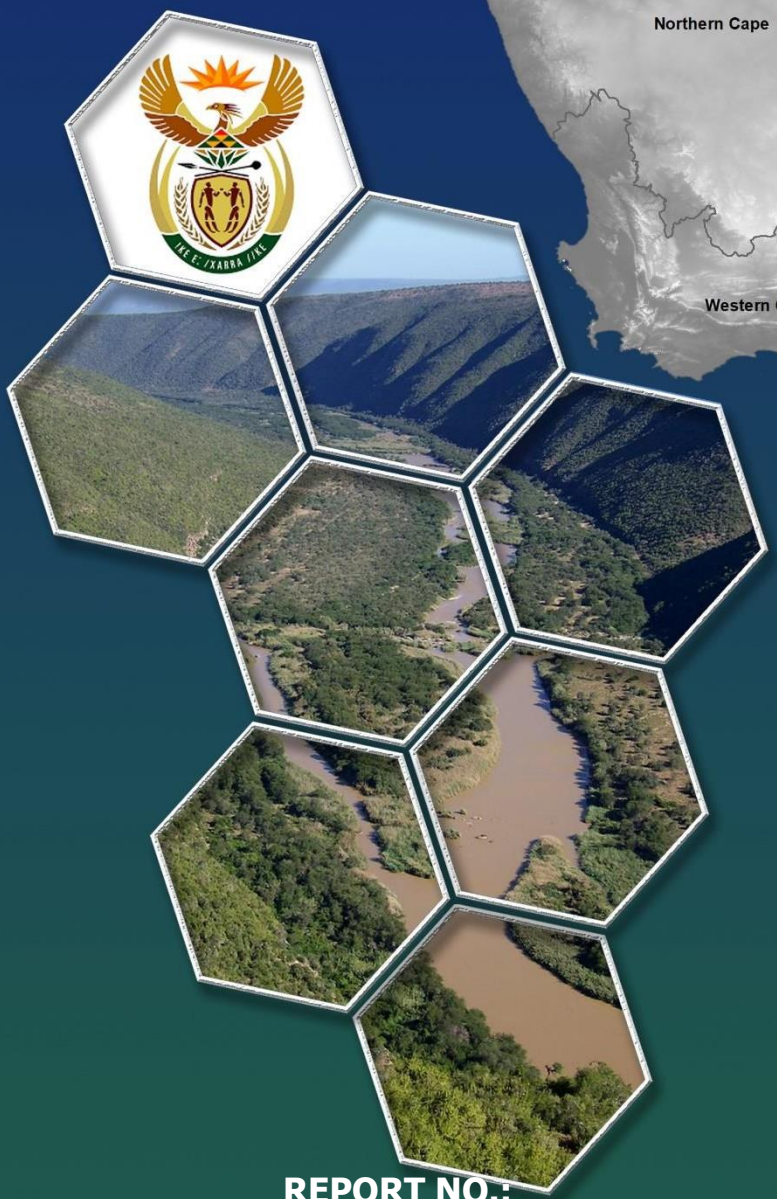
DEPARTMENT OF WATER AND SANITATION

Determination of Water Resource Classes, Reserve and the Resource Quality Objectives in the Keiskamma and Fish to Tsitsikamma Catchment

WP11354

Rivers Eco-Categorisation Report
VOLUME 2





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1. INTRODUCTION

The Eco-categorisation phase of the study forms part of Step 3 of the integrated steps for the determination of the Reserve.

Please note that this Report must be read in conjunction with Report number *WEM/WMA7/00/CON/RDM/1623: Eco-categorisation Report – Volume 1*. This Volume 2 includes all summaries of models and results/data for all EWR sites for the various components as follows:

- Appendix A: Diatom summary results
- Appendix B: Fish inventory and FRAI Models
- Appendix C: SASS5 data and MIRAI Models
- Appendix D: Riparian vegetation inventory and VEGRAI Models
- Appendix E: Summary of IHI Models
- Appendix F: EcoStatus Models
- Appendix G: Summary of HAI Models
- Appendix H: GAI Models
- Appendix I: Summary of EI-ES Models

Please note, that all completed electronic models (MIRAI, FRAI, VEGRAI, GAI and HAI) have been packaged and submitted to DWS for their records within a folder.

2. Appendix A: Diatom summary results

Site	EWR site	Count	No. spec.	SPI	Category	Water Quality	%incl. in SPI	BDI	%incl. in BD	%PTV	Evidence of organic pollution	% Deformed cells (>2)	*Dominant species*	Preference
INTERMEDIATE SITES (SEPTEMBER 2022)														
Mthatha River (Lower)	MTHA01_I	404	30	15.5	B	Good	97	17.7	83	6.9	Site free from organic pollution	4	*Achnanthidium spp.*	Moderate to good quality waters
Mbhashe River (Middle)	MBAS01_I	400	25	15.8	B	Good	100	20	80	2.3	Site free from organic pollution	0	*Achnanthes thienemannii Hustedt*	Limited research on this diatom species however the specialists feel that it may be indicative of low nutrient/low EC (previously identified in high mountainous streams in SA and Lesotho)
													Achnanthidium spp.	Moderate to good quality waters
Black Kei	BKEI01_I	405	38	13.3	B	Good	100	12.1	89	29.1	Some evidence of organic pollution	1.25	*Eolimna subminuscula (Manguin) Moser, Lange-Bertalot & Metzeltin*	A cosmopolitan species common in electrolyte-rich, strongly polluted rivers and flowing waters.
													Nitzschia dissipata (Kützing) Grunow	A cosmopolitan species found in waters of moderate to high electrolyte content, not present in waters of low electrolyte content.
Great Kei	GKEI01_I	400	31	14.5	B	Good	100	16.2	90	7.5	Site free from organic pollution	0	*Cocconeis placentula var. euglypta (Ehrenberg) Grunow*	Nutrient and salinity increases (eutrophication)
Tsomo	TSOM01_I	406	30	15.4	B	Good	100	18	84	3.2	Site free from organic pollution	1.5	*Achnanthes thienemannii Hustedt*	Limited research on this diatom species however the specialists feel that it may be indicative of low nutrient/low EC (previously identified in high mountainous streams in SA and Lesotho)
													Achnanthidium spp.	Moderate to good quality waters
Middle Buffalo	BUFF01_I	410	35	10.9	C	Moderate	100	12	83	10.2	Site free from organic pollution	2.5	*Cocconeis placentula var. euglypta (Ehrenberg) Grunow*	Nutrient and salinity increases (eutrophication)
Keiskamma (Upper)	KEIS01_I	203	18	13.2	B	Good	100	14.9	89	23.6	Some evidence of organic pollution	1.5	*Cocconeis placentula var. euglypta (Ehrenberg) Grunow*	Nutrient and salinity increases (eutrophication)
Upper Kat	KAT01_I	203	29	14.4	B	Good	100	13.5	72	4.9	Site free from organic pollution	1.5	*Achnanthidium spp.*	Moderate to good quality waters
													Cocconeis placentula var. euglypta (Ehrenberg) Grunow	Nutrient and salinity increases (eutrophication)
Lower Great Fish	FISH03_I	401	34	11.4	C	Moderate	97	9.7	88	13.7	Site free from organic pollution	0.25	*Cyclostephanos invisitatus (Hohn & Hellerman) Theriot, Stoermer & H å kansson*	Cosmopolitan, common in summer plankton nutrient-rich streams. These species when in abundance is a good indicator of eutrophication.
Swartkops	SWAR01_I	404	32	15.8	B	Good	97	19.4	75	11.6	Site free from organic pollution	1	*Psammothidium oblongellum (Oestrup) Van de Vijver*	Tolerant of mild pollution only and also pollution sensitive. This was the only site with endemic species: Achanthes subaffinis Cholnok. Its preference is slow flowing water and oligotropic streams
Upper Gamtoos	GAMT01_I	405	15	17.6	A	High	100	18.9	67	0	Site free from organic pollution	1.25	*Achnanthidium minutissimum (Kützing) Czarnecki*	Found in well-oxygenated, clean, fresh waters. Usually attached to a substratum by a short mucilage stalk.

Site	EWR site	Count	No. spec.	SPI	Category	Water Quality	%incl. in SPI	BDI	%incl. in BD	%PTV	Evidence of organic pollution	% Deformed cells (>2)	*Dominant species*	Preference
INTERMEDIATE SITES (MAY 2023)														
Black Kei	BKEI01_I	404	13	7.3	D	Poor	100	5.1	92	87.9	Site is heavily contaminated with organic pollution	1	*Nitzschia frustulum (Kützing) Grunow*	A cosmopolitan species found in electrolyte-rich and brackish waters. Tolerant of high conductivity, fluctuations in osmotic pressure and of critical levels of pollution.
Great Fish (Lower)	FISH03_I	406	18	6.7	D	Poor	100	5.1	89	86.2	Site is heavily contaminated with organic pollution	1.5	*Eolimna subminuscula (Manguin) Moser. Lange-Bertalot & Metzeltin*	A cosmopolitan species common in electrolyte-rich, strongly polluted rivers and flowing waters.
													Nitzschia frustulum (Kützing) Grunow	A cosmopolitan species found in electrolyte-rich and brackish waters. Tolerant of high conductivity, fluctuations in osmotic pressure and of critical levels of pollution.
Keiskamma (Upper)		403	18	16.3	B	Good	89	18.2	72	7.2	Site free from organic pollution	0.75	*Achnanthidium sp.*	Moderate to good water quality conditions
													Gomphonema pumilum (Grunow) Reichardt & Lange-Bertalot	Tolerates critically to strongly polluted waters
Kat (Upper)	KAT01_I	403	19	16.8	B	Good	95	14.1	68	3.2	Site free from organic pollution	0.75	*Achnanthidium sp.*	Moderate to good water quality conditions
Middle Buffalo	BUFF01_I	409	40	8.7	D	Poor	100	9.3	88	8.6	Site free from organic pollution	2.25	*Cocconeis placentula var. euglypta (Ehrenberg) Grunow*	Nutrient and salinity increases (eutrophication)
Middle Mbashe	MBAS01_I	404	21	14.7	B	Good	100	16.5	81	1.2	Site free from organic pollution	1	*Achnanthes thienemannii Hustedt*	Limited research on this diatom species however the specialists feel that it may be indicative of low nutrient/low EC (previously identified in high mountainous streams in SA and Lesotho)
Great Kei	GKEI01_I	408	27	12.9	B	Good	96	13.5	78	18.9	Site free from organic pollution	2	*Achnanthidium sp.*	Moderate to good water quality conditions
													Cocconeis placentula var. euglypta (Ehrenberg) Grunow	Nutrient and salinity increases (eutrophication)
													Encyonopsis minuta Krammer & Reichardt	Moderately motile, common in circumneutral water (low nutrient concentration)
Swartkops	SWAR01_I	412	26	16.1	B	Good	100	19.3	73	20.9	Site free from organic pollution	3	*Psammothidium oblongellum (Oestrup) Van de Vijver*	Tolerant of mild pollution only and also pollution sensitive. This was the only site with endemic species: Achanthes subaffinis Cholnok. Its preference is slow flowing water and oligotropic streams
Gamtoos	GAMT01_I	400	34	9.1	C	Moderate	97	10.1	74	9.5	Site free from organic pollution	0	*Navicula recens (Lange-Bertalot) Lange-Bertalot*	Cosmopolitan species, found in large eutrophic rivers with elevated electrolyte content, also found in brackish waters. Tolerant to critical levels of pollution.
													Nitzschia forfica Cholnoky	Not much known about his species but assumed to be associated with high EC (per comms Dr Jonathan Taylor)
Tsomo	TSOM01_I	400	13	16.8	B	Good	100	20.0	77	3.0	Site free from organic pollution	0	*Achnanthidium sp.*	Moderate to good water quality conditions

Site	EWR site	Count	No. spec.	SPI	Category	Water Quality	%incl. in SPI	BDI	%incl. in BD	%PTV	Evidence of organic pollution	% Deformed cells (>2)	*Dominant species*	Preference
RAPID 3 SITES (SEPTEMBER 2022)														
Mngazi	MNGA01_R	414	21	14.1	B	Good	100	13.3	76	1	Site free from organic pollution	3.5	*Achnanthes thienemannii Hustedt*	Limited research on this diatom species however the specialists feel that it may be indicative of low nutrient/low EC (previously identified in high mountainous streams in SA and Lesotho)
Nqabara	NQAB01_R	101	23	10.4	C	Moderate	100	9.6	83	29.7	Some evidence of organic pollution	1	*Achnanthidium spp.*	Moderate to good quality waters
													Cocconeis placentula var. euglypta (Ehrenberg) Grunow	Nutrient and salinity increases (eutrophication)
Mtentu	MTEN01_R	402	22	14	B	Good	91	14.2	64	0.7	Site free from organic pollution	0.5	*Cocconeis placentula var. euglypta (Ehrenberg) Grunow*	Nutrient and salinity increases (eutrophication)
Upper Mbashe	MBHA02_R	400	15	15.7	B	Good	87	15.8	83	0.8	Site free from organic pollution	0	*Achnanthes thienemannii Hustedt*	Limited research on this diatom species however the specialists feel that it may be indicative of low nutrient/low EC (previously identified in high mountainous streams in SA and Lesotho)
Gcuwa	GCUW01_R	403	27	7.3	D	Poor	96	8.6	85	45.2	Organic pollution likely to contribute significantly to eutrophication	0.75	*Fragilaria ulna var.acus (Kützing) Lange-Bertalot*	tolerates slightly saline water, alkalibontic (only in water pH>7), tolerates moderate orgainic pollution. Found in standing and flowing water.
													Gomphonema parvulum (Kützing) Kützing	A cosmopolitan species which is very widespread in a range of waters, from small pools to lakes and rivers and generally considered to be tolerant of extremely polluted conditions
													Navicula veneta Kützing	Cosmopolitan, common in heavily eutrophied, electrolyte-rich to brackish water. Very pollution tolerant, often the dominant species in industrially impacted waters.
Indwe	INDW01_R	400	16	16.6	B	Good	100	18.4	81	6.3	Site free from organic pollution	0	*Achnanthes thienemannii Hustedt*	Limited research on this diatom species however the specialists feel that it may be indicative of low nutrient/low EC (previously identified in high mountainous streams in SA and Lesotho)
													Achnanthidium spp.	Moderate to good quality waters
White Kei	WKEI01_R	302	28	14.3	B	Good	100	17.6	89	11.6	Site free from organic pollution	0.7	*Achnanthidium eutrophilum (Lange-Bertalot) Lange-Bertalot*	Found in well-oxygenated eutophic fresh water. Tolerant only to slight or moderate pollution
													Achnanthidium spp.	Moderate to good quality waters
													Encyonopsis minuta Krammer & Reichardt	Moderately motile, common in circumneutral water (low nutrient concentration)
Middle Kubusi	KUBU01_R	301	28	6.3	D	Poor	100	9.2	86	50.2	Organic pollution likely to contribute significantly to eutrophication	0.3	*Eolimna minima(Grunow) Lange-Bertalot*	Cosmopolitan, found in a wide range of waters including heavily polluted biotopes. May possibly be associated with organic detritus
													Nitzschia sp.	Generally, sitaltion and moderate pollution
Lower Buffalo	BUFF02_R	400	30	8.2	D	Poor	97	8.5	87	43	Organic pollution likely to contribute significantly to eutrophication	0	*Eolimna subminuscula (Manguin) Moser, Lange-Bertalot & Metzeltin*	A cosmopolitan species common in electrolyte-rich, strongly polluted rivers and flowing waters.
													Nitzschia frustulum (Kützing) Grunow	A cosmopolitan species found in electrolyte-rich and brackish waters. Tolerant of fluctuations in osmotic pressure and of critical levels of pollution.
													Planothidium engelbrechtii (Cholnoky) Round & Bukhtiyarova	Found abundantly in saline inland waters with very high electrolyte content. Capable of tolerating critical to very heavy organic pollution.

Site	EWR site	Count	No. spec.	SPI	Category	Water Quality	%incl. in SPI	BDI	%incl. in BD	%PTV	Evidence of organic pollution	% Deformed cells (>2)	*Dominant species*	Preference
RAPID 3 SITES (SEPTEMBER 2022)														
Keiskamma (Lower)	KEIS02_R	200	33	8.3	D	Poor	100	11.3	82	16	Site free from organic polluti	0	*Cocconeis placentula var. euglypta (Ehrenberg) Grunow*	Nutrient and salinity increases, so meso- or eutrophic conditions and is often related to standing water.
Tyume	TYUM01_R	208	32	11.4	C	Moderate	100	12.5	81	14.4	Site free from organic pollution	4	*Cocconeis placentula var. euglypta (Ehrenberg) Grunow*	Nutrient and salinity increases (eutrophication)
Koonap	KOON01_R	107	19	8.4	D	Poor	100	11.3	89	8.4	Site free from organic pollution	7	*Cocconeis placentula var. euglypta (Ehrenberg) Grunow*	Nutrient and salinity increases (eutrophication)
Lower Kat	KAT02_R	100	15	15.8	B	Good	100	15.9	87	1	Site free from organic pollution	0	*Achnanthidium minutissimum (Kützing) Czarnecki*	Found in well-oxygenated, clean, fresh waters. Usually attached to a substratum by a short mucilage stalk.
													Achnanthidium spp.	Moderate to good quality waters
Middle Great Fish	FISH02_I	400	34	13.4	B	Good	100	11.8	91	7	Site free from organic pollution	0	***Cyclostephanos invisitatus (Hohn & Hellerman) Theriot, Stoermer & H å kansson***	Cosmopolitan, common in summer plankton nutrient-rich streams. These species when in abundance is a good indicator of eutrophication.
													Nitzschia dissipata (Kützing) Grunow	A cosmopolitan species found in waters of moderate to high electrolyte content, not present in waters of low electrolyte content.
Great Fish Upper	FISH03_R	411	32	11.2	C	Moderate	97	11.3	78	20.2	Some evidence of organic pollution	2.75	*Amphora pediculus (Kützing) Grunow*	A cosmopolitan species found in waters with moderate electrolyte content (Increased salts and cultivated areas) and tolerating critical levels of pollution. pH>7
													Planothidium frequentissimum (Lange-Bertalot) Lange-Bertalot	A common species in standing and flowing, circumneutral to alkaline waters with a moderate to high electrolyte content. Capable of tolerating critically polluted conditions.
Tarka	TARK01_R	404	23	7.1	D	Poor	100	6.3	74	25.5	Some evidence of organic pollution	1	*Craticula buderi (Hustedt) Lange-Bertalot*	Nutrient and salinity increases (eutrophication)
													Planothidium sp.	First time our Diatom specialists have identified Planothidium and thus its preference is to be researched.
Lower Sunday	SUND02_R	414	36	8.2	D	Poor	100	9.6	86	19.8	Site free from organic pollution	3.5	*Cocconeis placentula var. euglypta (Ehrenberg) Grunow*	Nutrient and salinity increases (eutrophication)
													Cyclotella atomus Hustedt	Euplanktonic. Found in alkaline waters. Saline and nutrient tolerant. a-mesosaprobic (moderately oxygenated environment in which considerable organic material). These species when in abundance is a good indicator of eutrophication.
Kouga	KOUG01_R	408	35	15.9	B	Good	100	16.2	83	6.6	Site free from organic pollution	2	*Achnanthidium minutissimum (Kützing) Czarnecki*	Found in well-oxygenated, clean, fresh waters. Usually attached to a substratum by a short mucilage stalk.
													Achnanthidium spp.	Moderate to good quality waters
													Cocconeis placentula Ehrenberg	Occurring in mesotrophic to eutrophic flowing and standing waters. Found in abundance on plants, wood and stone.

Site	EWR site	Count	No. spec.	SPI	Category	Water Quality	%incl. in SPI	BDI	%incl. in BD	%PTV	Evidence of organic pollution	% Deformed cells (>2)	*Dominant species*	Preference
RAPID 3 SITES (MAY 2023)														
Lower Kubusi	KUBU03_R	400	31	15.2	B	Good	94	16.8	77	4.8	Site free from organic pollution	0	*Achnanthidium sp.*	Moderate to good water quality conditions
Kromme	KROM01_R	409	28	15.7	B	Good	89	18.4	57	4.2	Site free from organic pollution	2.25	*Achnanthidium sp.*	Moderate to good water quality conditions
													Psammothidium oblongellum (Oestrup) Van de Vijver	Tolerant of mild pollution only and also pollution sensitive. This was the only site with endemic species: Achanthes subaffinis Cholnok. Its preference is slow flowing water and oligotropic streams
Gcuwa	GCUW01_R	400	15	16.6	B	Good	87	19.9	67	0.3	Site free from organic pollution	0	*Achnanthidium sp.*	Moderate to good water quality conditions
													Fragilaria capucina Desmazieres	cosmopolitan taxon is found in circumneutral, oligo- to mesotrophic waters with moderate electrolyte content, may have some resistance to heavy metals

Site	EWR site	Count	No. spec.	SPI	Category	Water Quality	%incl. in SPI	BDI	%incl. in BD	%PTV	Evidence of organic pollution	% Deformed cells (>2)	*Dominant species*	Preference
FIELD VERIFICATION SITES (SEPTEBMER 2022)														
Mtakatye	MTAK01_FV	404	21	15.5	B	Good	95	16.1	71	1.5	Site free from organic pollution	1	*Achnanthes thienemannii Hustedt*	Limited research on this diatom species however the specialists feel that it may be indicative of low nutrient/low EC (previously identified in high mountainous streams in SA and Lesotho)
													Achnanthidium spp.	Moderate to good quality waters
Klipplaat	KLIP01_FV	402	46	12.8	C	Moderate	98	13.3	80	3.2	Site free from organic pollution	0.5	*Cocconeis placentula var. euglypta (Ehrenberg) Grunow*	Nutrient and salinity increases (eutrophication)
Klaas Smits	KSMI01_R	401	18	1.7	E	Critical	100	3.7	94	50.9	Organic pollution likely to contribute significantly to eutrophication	0.25	*Navicula veneta Kützing*	Cosmopolitan, common in heavily eutrophied, electrolyte-rich to brackish water. Very pollution tolerant, often the dominant species in industrially impacted waters.
													Nitzschia palea (Kützing) W.Smith	A cosmopolitan and very commonly occurring species found in eutrophic and very heavily polluted to extremely polluted waters with moderate to high electrolyte content
Upper Buffalo	BUFF03_VF	302	31	11.4	C	Moderate	97	13.5	74	10.6	Site free from organic pollution	0.7	*Cocconeis placentula var. euglypta (Ehrenberg) Grunow*	Nutrient and salinity increases (eutrophication)
Upper Kubusi	KUBU02_FV	414	35	12.1	C	Moderate	100	13.2	85	14.3	Site free from organic pollution	3.5	*Achnanthidium crassum (Hustedt) Potapova & Ponader*	Alkaline and slow flowing water
													Achnanthidium spp.	Moderate to good quality waters
													Nitzschia sp.	Generally, sitaltion and moderate pollution
Upper Great Fish (Craddock)	GFIS04_FV	400	32	11.1	C	Moderate	100	11	84	7	Site free from organic pollution	0	*Cyclostephanos dubius (Fricke) Round*	A euplanktonic species found in inland waters with elevated chloride concentration (high conductivity) as well as calcareous, alkaline waters. Sensitive to siltation (i.e. will dissapear).
													Cyclostephanos invisitatus (Hohn & Hellerman) Theriot, Stoermer & H å kansson	Cosmopolitan, common in summer plankton nutrient-rich streams. These species when in abundance is a good indicator of eutrophication.
													Gomphonema pumilum var. rigidum Reichardt & Lange-Bertalot	A cosmopolitan species found in mesotrophic to eutrophic waters with moderate electrolyte content. Not tolerant of more than critical levels of pollution.
Groot Brak	GBRA01_FV	400	30	11.9	C	Moderate	100	13.5	87	3	Site free from organic pollution	0	***Cyclostephanos invisitatus (Hohn & Hellerman) Theriot, Stoermer & H å kansson***	Cosmopolitan, common in summer plankton nutrient-rich streams. These species when in abundance is a good indicator of eutrophication.
													Gomphonema pumilum (Grunow) Reichardt & Lange-Bertalot	Tolerates critically to strongly polluted waters
Little Fish Upper	LFIS01_R	402	37	11.6	C	Moderate	95	97	70	9.2	Site free from organic pollution	0.5	*Gomphonema pumilum (Grunow) Reichardt & Lange-Bertalot*	Tolerates critically to strongly polluted waters
Little Fish Lower	LFIS02_R	403	38	10.6	C	Moderate	97	10.4	84	17.1	Site free from organic pollution	0.75	*Cocconeis placentula var. euglypta (Ehrenberg) Grunow*	Nutrient and salinity increases (eutrophication)
													Cyclostephanos dubius (Fricke) Round	A euplanktonic species found in inland waters with elevated chloride concentration (high conductivity) as well as calcareous, alkaline waters. Sensitive to siltation (i.e. will dissapear).
													Cyclostephanos invisitatus (Hohn & Hellerman) Theriot, Stoermer & H å kansson	Cosmopolitan, common in summer plankton nutrient-rich streams. These species when in abundance is a good indicator of eutrophication.

3. Appendix B: Fish inventory and FRAI Models

Intermediate Sites

	Site	**MTHA01_I: Mthatha River (Lower)**		**MBAS01_I: Mbhashe River (Middle)**		**BKEI01_I: Black Kei River**		**GKEI01_I: Great Kei River**		**TSOM01_I: Tsomo River**		**BUFF01_I: Buffalo River (Middle)**		**KEIS01_I: Keiskamma River (Upper)**	
	Survey	September 2022	May 2023	September 2022	May 2023	September 2022	May 2023	September 2022	May 2023	September 2022	May 2023	September 2022	May 2023	September 2022	May 2023
Species	**Abbreviation**														
Indigenous															
Anguilla marmorate	AMAR	14													
Anguilla mossambica	AMOS	4		3								4	3		1
Enteromius anoplus sl.	BANO						1			1					
Enteromius mandelai	BANO														
Enteromius pallidus	BPAL														
Enteromius viviparus	BVIV														
Gilchristella aestuaria	GAES	4													
Glossogobius callidus	GCAL	15										3	100	1	7
Labeo umbratus	LUMB														
Monodactylus falciformis	MFAL	14													
Oreochromis mossambicus	OMOS												6		
Pseudomyxus capensis	MCAP	2													
Sandelia bainsii	SBAI														
Sandelia capensis	SCAP														
Non-native															
Clarias gariepinus	CGAR	5						5	3	5		7	5		
Cyprinus carpio	CCAR						1			1			1		
Gambusia affinis	GAFF														
Labeo capensis	LCAP														
Labeo umbratus	LUMB												3		
Labeobarbus aeneus	BAEN					1	6	4	13	50	33				
Lepomis macrochirus	LMAC														
Micropterus dolomieu	MDOL														
Micropterus salmoides	MSAL														
Oreochromis mossambicus	OMOS														
Pseudocrenilabrus philander	PPHI														
Tilapia sparrmanii	TSPA											14	38		
No of Fish		**58**	**0**	**3**	**0**	**1**	**8**	**9**	**16**	**57**	**33**	**28**	**156**	**1**	**8**
No. of Species		**7**	**0**	**1**	**0**	**1**	**3**	**2**	**2**	**4**	**1**	**4**	**7**	**1**	**2**

	Site	**KAT01_I: Kat River (Upper)**		**FISH03_I: Great Fish River (Lower)**		**SWAR01_I: KwaZungu / Swartkops River**		**GAMT01_I: Gamtoos River**	
	Survey	September 2022	July 2022	September 2022	May 2023	September 2022	May 2023	September 2022	May 2023
Species	**Abbreviation**								
Indigenous									
Anguilla marmorate	AMAR								
Anguilla mossambica	AMOS	1						1	
Enteromius anoplus sl.	BANO								
Enteromius mandelai	BANO	27	45						
Enteromius pallidus	BPAL					15	51	23	23
Enteromius viviparus	BVIV								
Gilchristella aestuaria	GAES								1
Glossogobius callidus	GCAL	6	15			5	5	1	5
Labeo umbratus	LUMB								
Monodactylus falciformis	MFAL								
Oreochromis mossambicus	OMOS								
Pseudomyxus capensis	MCAP								
Sandelia bainsii	SBAI	5	5						
Sandelia capensis	SCAP					2	2		
Non-native									
Clarias gariepinus	CGAR				1		1		
Cyprinus carpio	CCAR								
Gambusia affinis	GAFF								
Labeo capensis	LCAP								
Labeo umbratus	LUMB								
Labeobarbus aeneus	BAEN			8	20				
Lepomis macrochirus	LMAC								
Micropterus dolomieu	MDOL								
Micropterus salmoides	MSAL								
Oreochromis mossambicus	OMOS						2		105
Pseudocrenilabrus philander	PPHI							23	137
Tilapia sparrmanii	TSPA						2		2
No of Fish		**39**	**65**	**8**	**21**	**22**	**63**	**48**	**273**
No. of Species		**4**	**3**	**1**	**2**	**3**	**6**	**4**	**6**

Rapid Sites

	Site	**MNGA01_R: Mngazi River**	**NQAB01_R: Nqabarha River**	**MTEN01_R: Mtentu River**	**MBHA02_R: Mbhashe River (Upper)**	**GCUW01_R: Gcuwa River**	**INDW01_R: Indwe River**	**WKEI01_R: White Kei River**	**KUBU03_R: Kubusi River (Lower)**	**KEIS02_R: Keiskamma River (Lower)**
	Survey	September 2022	September 2022	September 2022	September 2022	May 2023	September 2022	September 2022	May 2023	May 2023
Species	**Abbreviation**									
Indigenous										
Anguilla mossambica	AMOS			5	1					1
Enteromius anoplus sl.	BANO					2				
Enteromius pallidus	BPAL									
Enteromius viviparus	BVIV			10						
Glossogobius callidus	GCAL	24							1	
Labeo umbratus	LUMB									
Oreochromis mossambicus	OMOS	35		26						2
Pseudomyxus capensis	MCAP	10								2
Non-native										
Clarias gariepinus	CGAR						1	1	3	
Cyprinus carpio	CCAR					4				
Gambusia affinis	GAFF									
Labeo capensis	LCAP									
Labeo umbratus	LUMB									7
Labeobarbus aeneus	BAEN				13		31	23	8	
Lepomis macrochirus	LMAC									
Micropterus dolomieu	MDOL									
Micropterus salmoides	MSAL		2	5					3	
Tilapia sparrmanii	TSPA	1								
No of Fish		**70**	**2**	**46**	**14**	**6**	**32**	**24**	**15**	**12**
No. of Species		**4**	**1**	**4**	**2**	**2**	**2**	**2**	**4**	**4**

	Site	**TYUM01_R: Tyume River**	**KOON01_R: Koonap River**	**KAT02_R: Kat River (Lower)**	**SUND02_R: Sundays River (lower)**	**KOUG01_R: Kouga River**	**KROM01_R: Kromme River**
	Survey	September 2022	September 2022	September 2022	September 2022	September 2022	May 2023
Species	**Abbreviation**						
Indigenous							
Anguilla mossambica	AMOS	2					
Enteromius anoplus sl.	BANO						
Enteromius pallidus	BPAL				8		
Enteromius viviparus	BVIV						
Glossogobius callidus	GCAL	3			14		
Labeo umbratus	LUMB		3	7			
Oreochromis mossambicus	OMOS				8		
Pseudomyxus capensis	MCAP						
Non-native							
Clarias gariepinus	CGAR	2	4	2		1	
Cyprinus carpio	CCAR						
Gambusia affinis	GAFF				1		
Labeo capensis	LCAP		4				
Labeo umbratus	LUMB						
Labeobarbus aeneus	BAEN		28	7			
Lepomis macrochirus	LMAC						74
Micropterus dolomieu	MDOL					3	
Micropterus salmoides	MSAL						41
Tilapia sparrmanii	TSPA	4			1		
No of Fish		**11**	**39**	**16**	**32**	**4**	**115**
No. of Species		**4**	**4**	**3**	**5**	**2**	**2**

4. Appendix C: SASS5 data and MIRAI Models

RAPID 3 SITES

Mngazi River

SASS Version 5 Score Sheet

Time :

Version date: Sep 2005

Date (dd-mm-yr):	07-Sep-22		(dd.ddddd)
Site Code:	Mnga01_R	Grid reference (dd mm ss.s) Lat: S	-31.608958
Collector/Sampler:	Kylie Farrell	Long: E	29.405132
River:	Mngazi	Datum (WGS84/Cape):	
Level 1 Ecoregion:	31: EASTERN COASTAL BELT	Altitude (m):	
Quaternary Catchment:	T70B	Zonation:	
	Temp (°C):	Routine or Project? (circle one)	Flow:
Site Description: 52	pH:	Project Name:	Clarity (cm):
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	DO (mg/L):	WP11354	Turbidity:
	Conductivity:		Colour:
	Riparian Disturbance:		
	Instream Disturbance:		

Biotopes Sampled (tick & rate)	Rating (1-5)	Time (min)
	5	
Stones Out Of Current (SOOC)	5	
Bedrock	0	
Aquatic Veg	0	
MargVeg In Current	1	
MargVeg Out Of Current	1	
Gravel	4	
Sand	3	
Mud	2	
Hand picking/Visual observation	x	
Biotope Score (%)	47	

Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				
COELENTERATA (Cnidaria)	1				
TURBELLARIA (Flatworms)	3				
ANNELIDA					
Oligochaeta (Earthworms)	1	A	A		A
Hirudinea (Leeches)	3				
CRUSTACEA					
Amphipoda (Scuds)	13				
Potamonautidae* (Crabs)	3	A	A		B
Atyidae (Freshwater Shrimps)	8		A		A
Palaemonidae (Freshwater Prawns)	10				A
HYDRACARINA (Mites)	8				
PLECOPTERA (Stoneflies)					
Notonemouridae	14				
Perlidae	12	B	1	1	B
EPHEMEROPTERA (Mayflies)					
Baetidae 1sp	4				
Baetidae 2 sp	6				
Baetidae > 2 sp	12	B	B	A	B
Caenidae (Squaregills/Cainfles)	6	B		A	B
Ephemeridae	15				
Heptageniidae (Flatheaded mayflies)	13	B			B
Leptophlebiidae (Prongills)	9	B		A	B
Oligoneuridae (Brushlegged mayflies)	15				
Polymitarcyidae (Pale Burrowers)	10				
Prosopistomatidae (Water specs)	15				
Teloganodidae SWC (Spiny Crawlers)	12				
Tricorythidae (Stout Crawlers)	9	A		1	A
ODONATA (Dragonflies & Damselflies)					
Calopterygidae ST,T (Demoiselles)	10				
Chlorocyphidae (Jewels)	10				
Synlestidae (Chlorolestidae)(Sylphs)	8				
Coenagrionidae (Sprites and blues)	4		A		A
Lestidae (Emerald Damselflies/Spreadwings)	8				
Platycnemidae (Stream Damselflies)	10				
Protoneuridae (Threadwings)	8				
Aeshnidae (Hawkers & Emperors)	8				
Corduliidae (Cruisers)	8				
Gomphidae (Clubtails)	6	1		A	A
Libellulidae (Darters/Skimmers)	4	B			B
LEPIDOPTERA (Aquatic Caterpillars/Moths)					
Crambidae (Pyralidae)	12				

Taxon	QV	S	Veg	GSM	TOT
HEMIPTERA (Bugs)					
Belostomatidae* (Giant water bugs)	3		A		A
Corixidae* (Water boatmen)	3		A		A
Gerridae* (Pond skaters/Water striders)	5				
Hydrometridae* (Water measurers)	6		1		1
Naucoridae* (Creeping water bugs)	7				
Nepidae* (Water scorpions)	3		1		1
Notonectidae* (Backswimmers)	3				A
Pleidae* (Pygmy backswimmers)	4		1		1
Veliidae/M...veliidae* (Ripple bugs)	5				
MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
Corydalidae (Fishflies & Dobsonflies)	8				
Sialidae (Alderflies)	6				
TRICHOPTERA (Caddisflies)					
Dipseudopsidae	10				
Ecnomidae	8				
Hydropsychidae 1 sp	4	A			A
Hydropsychidae 2 sp	6				
Hydropsychidae > 2 sp	12				
Philopotamidae	10				
Polycentropodidae	12				
Psychomyiidae/Xiphocentronidae	8				
Cased caddis:					
Barbarochthonidae SWC	13				
Calamoceratidae ST	11				
Glossosomatidae SWC	11				
Hydroptilidae	6				
Hydrosalpingidae SWC	15				
Lepidostomatidae	10				
Leptoceridae	6		A		A
Petrothrincidae SWC	11				
Pisuliidae	10				
Sericostomatidae SWC	13				
COLEOPTERA (Beetles)					
Dytiscidae/Noteridae* (Diving beetles)	5		A		A
Elmidae/Dryopidae* (Riffle beetles)	8	1			1
Gyrinidae* (Whirligig beetles)	5	A			A
Haliplidae* (Crawling water beetles)	5				
Helodidae (Marsh beetles)	12				
Hydraenidae* (Minute moss beetles)	8				
Hydrophilidae* (Water scavenger beetles)	5		1		1
Limnichidae (Marsh-Loving Beetles)	10				
Psephenidae (Water Pennies)	10				

Taxon	QV	S	Veg	GSM	TOT
DIPTERA (Flies)					
Athericidae (Snipe flies)	10	A	1		A
Blepharoceridae (Mountain midges)	15				
Ceratopogonidae (Biting midges)	5	1			1
Chironomidae (Midges)	2	A		1	A
Culicidae* (Mosquitoes)	1				
Dixidae* (Dixid midge)	10				
Empididae (Dance flies)	6				
Ephydridae (Shore flies)	3				
Muscidae (House flies, Stable flies)	1				
Psychodidae (Moth flies)	1				
Simuliidae (Blackflies)	5	1		1	A
Syrphidae* (Rat tailed maggots)	1				
Tabanidae (Horse flies)	5	1		1	A
Tipulidae (Crane flies)	5	1			1
GASTROPODA (Snails)					
Ancylidae (Limpets)	6		1		1
Bulininae*	3				
Hydrobiidae*	3				
Lymnaeidae* (Pond snails)	3				
Physidae* (Pouch snails)	3				
Planorbinae* (Orb snails)	3				
Thiaridae* (=Melanidae)	3				
Viviparidae* ST	5				
PELECYPODA (Bivalvles)					
Corbiculidae (Clams)	5				
Sphaeriidae (Pill clams)	3				
Unionidae (Perly mussels)	6				
SASS Score					190
No. of Taxa					32
ASPT					5.9

Other biota:

Comments/Observations:

Nqabarha River

Date (dd-mm-yr):	09-Sep-22				(dd.ddddd)
Site Code:	Nqab01_R	Grid reference (dd mm ss.s) Lat:	S	-32.091927	
Collector/Sampler:	Kylie Farrell	Long:	E	28.400234	
River:	Nqabara	Datum (WGS84/Cape):			
Level 1 Ecoregion:	16: SOUTH EASTERN UPLANDS	Altitude (m):			
Quaternary Catchment:	T90A	Zonation:			
	Temp (°C):	Routine or Project? (circle one)	Flow		
Site Description: 52	pH:	Project Name:	Clarity (cm):		
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	DO (mg/L):	WP11354	Turbidity:		
	Conductivity:		Colour:		
	Riparian Disturbance:				
	Instream Disturbance:				

Biotopes Sampled (tick & rate)	Rating (1-5)	Time (min)
	1	
Stones Out Of Current (SOOC)	3	
Bedrock	5	
Aquatic Veg	3	
MargVeg In Current	4	
MargVeg Out Of Current	4	
Gravel	3	
Sand	3	
Mud	3	
Hand picking/Visual observation	x	
Biotope Score (%)	64	

Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				
COELENTERATA (Cnidaria)	1				
TURBELLARIA (Flatworms)	3	A			A
ANNELIDA					
Oligochaeta (Earthworms)	1			1	1
Hirudinea (Leeches)	3				
CRUSTACEA					
Amphipoda (Scuds)	13				
Potamonautidae* (Crabs)	3	A			A
Atyidae (Freshwater Shrimps)	8				
Palaemonidae (Freshwater Prawns)	10				
HYDRACARINA (Mites)	8	1			1
PLECOPTERA (Stoneflies)					
Notonemouridae	14				
Perlidae	12				
EPHEMEROPTERA (Mayflies)					
Baetidae 1sp	4				
Baetidae 2 sp	6				
Baetidae > 2 sp	12		B	B	B
Caenidae (Squaregills/Cainfles)	6	A	1		A
Ephemeridae	15				
Heptageniidae (Flatheaded mayflies)	13				
Leptophlebiidae (Prongills)	9	1	1	A	A
Oligoneuridae (Brushlegged mayflies)	15				
Polymitarcyidae (Pale Burrowers)	10				
Prosopistomatidae (Water specs)	15				
Teloganodidae SWC (Spiny Crawlers)	12				
Tricorythidae (Stout Crawlers)	9				
ODONATA (Dragonflies & Damselflies)					
Calopterygidae ST,T (Demoiselles)	10				
Chlorocyphidae (Jewels)	10				
Synlestidae (Chlorolestidae)(Sylphs)	8				
Coenagrionidae (Sprites and blues)	4		B		B
Lestidae (Emerald Damselflies/Spreadwings)	8				
Platycnemidae (Stream Damselflies)	10				
Protoneuridae (Threadwings)	8				
Aeshnidae (Hawkers & Emperors)	8				
Corduliidae (Cruisers)	8				
Gomphidae (Clubtails)	6				
Libellulidae (Darters/Skimmers)	4				
LEPIDOPTERA (Aquatic Caterpillars/Moths)					
Crambidae (Pyralidae)	12				

Taxon	QV	S	Veg	GSM	TOT
HEMIPTERA (Bugs)					
Belostomatidae* (Giant water bugs)	3				
Corixidae* (Water boatmen)	3		B		B
Gerridae* (Pond skaters/Water striders)	5				A
Hydrometridae* (Water measurers)	6				
Naucoridae* (Creeping water bugs)	7				
Nepidae* (Water scorpions)	3				
Notonectidae* (Backswimmers)	3				
Pleidae* (Pygmy backswimmers)	4				
Veliidae/M...veliidae* (Ripple bugs)	5				
MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
Corydalidae (Fishflies & Dobsonflies)	8				
Sialidae (Alderflies)	6				
TRICHOPTERA (Caddisflies)					
Dipseudopsidae	10				
Ecnomidae	8				
Hydropsychidae 1 sp	4				
Hydropsychidae 2 sp	6		B		B
Hydropsychidae > 2 sp	12				
Philopotamidae	10				
Polycentropodidae	12				
Psychomyiidae/Xiphocentronidae	8				
Cased caddis:					
Barbarochthonidae SWC	13				
Calamoceratidae ST	11				
Glossosomatidae SWC	11				
Hydroptilidae	6				
Hydrosalpingidae SWC	15				
Lepidostomatidae	10				
Leptoceridae	6				
Petrothrincidae SWC	11				
Pisuliidae	10				
Sericostomatidae SWC	13				
COLEOPTERA (Beetles)					
Dytiscidae/Noteridae* (Diving beetles)	5				
Elmidae/Dryopidae* (Riffle beetles)	8				
Gyrinidae* (Whirligig beetles)	5	A			B
Haliplidae* (Crawling water beetles)	5				
Helodidae (Marsh beetles)	12				
Hydraenidae* (Minute moss beetles)	8				
Hydrophilidae* (Water scavenger beetles)	5		1	A	A
Limnichidae (Marsh-Loving Beetles)	10				
Psephenidae (Water Pennies)	10				

Taxon	QV	S	Veg	GSM	TOT
DIPTERA (Flies)					
Athericidae (Snipe flies)	10				
Blepharoceridae (Mountain midges)	15				
Ceratopogonidae (Biting midges)	5			1	1
Chironomidae (Midges)	2	B	1	B	B
Culicidae* (Mosquitoes)	1	1	A	A	A
Dixidae* (Dixid midge)	10				
Empididae (Dance flies)	6				
Ephydridae (Shore flies)	3				
Muscidae (House flies, Stable flies)	1				
Psychodidae (Moth flies)	1				
Simuliidae (Blackflies)	5	B		B	B
Syrphidae* (Rat tailed maggots)	1				
Tabanidae (Horse flies)	5				
Tipulidae (Crane flies)	5				
GASTROPODA (Snails)					
Ancylidae (Limpets)	6		1	1	A
Bulininae*	3				
Hydrobiidae*	3				
Lymnaeidae* (Pond snails)	3				
Physidae* (Pouch snails)	3				
Planorbinae* (Orb snails)	3				
Thiaridae* (=Melanidae)	3				
Viviparidae* ST	5				
PELECYPODA (Bivalvles)					
Corbiculidae (Clams)	5				
Sphaeriidae (Pill clams)	3				
Unionidae (Perly mussels)	6				
SASS Score					89
No. of Taxa					18
ASPT					4.9

Other biota:

Comments/Observations:

Mtentu River

Date (dd-mm-yr):	06-Sep-22				(dd.ddddd)
Site Code:	Mten01_R	Grid reference (dd mm ss.s) Lat:	S	-31.130483°	
Collector/Sampler:	Kylie Farrell	Long:	E	29.757179°	
River:	Mtentu	Datum (WGS84/Cape):			
Level 1 Ecoregion:	17: NORTH EASTERN COASTAL BELT	Altitude (m):			
Quaternary Catchment:	T60C	Zonation:			
Site Description: 52	Temp (°C):	Routine or Project? (circle one)	Flow		
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	pH:	Project Name:	Clarity (cm):		
	DO (mg/L):	WP11354	Turbidity:		
	Conductivity:		Colour:		
	Riparian Disturbance:				
	Instream Disturbance:				

Biotopes Sampled (tick & rate)	Rating (1-5)	Time (min)
	5	
Stones Out Of Current (SOOC)	2	
Bedrock	0	
Aquatic Veg	0	
MargVeg In Current	2	
MargVeg Out Of Current	2	
Gravel	3	
Sand	1	
Mud	1	
Hand picking/Visual observation	5	
Biotope Score (%)	36	

Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				
COELENTERATA (Cnidaria)	1				
TURBELLARIA (Flatworms)	3				
ANNELIDA					
Oligochaeta (Earthworms)	1			A	A
Hirudinea (Leeches)	3				
CRUSTACEA					
Amphipoda (Scuds)	13				
Potamonautidae* (Crabs)	3		1	A	A
Atyidae (Freshwater Shrimps)	8				
Palaemonidae (Freshwater Prawns)	10				
HYDRACARINA (Mites)	8				
PLECOPTERA (Stoneflies)					
Notonemouridae	14				
Perlidae	12	A		A	B
EPHEMEROPTERA (Mayflies)					
Baetidae 1sp	4				
Baetidae 2 sp	6			B	
Baetidae > 2 sp	12	A	B		B
Caenidae (Squaregills/Cainfles)	6	B	1	A	B
Ephemeridae	15				
Heptageniidae (Flatheaded mayflies)	13	B		A	B
Leptophlebiidae (Prongills)	9	B	A	B	B
Oligoneuridae (Brushlegged mayflies)	15				
Polymitarcyidae (Pale Burrowers)	10				
Prosopistomatidae (Water specs)	15				
Teloganodidae SWC (Spiny Crawlers)	12				
Tricorythidae (Stout Crawlers)	9			1	1
ODONATA (Dragonflies & Damselflies)					
Calopterygidae ST,T (Demoiselles)	10				
Chlorocyphidae (Jewels)	10		A		A
Synlestidae (Chlorolestidae)(Sylphs)	8				
Coenagrionidae (Sprites and blues)	4		A		A
Lestidae (Emerald Damselflies/Spreadwings)	8				
Platycnemidae (Stream Damselflies)	10				
Protoneuridae (Threadwings)	8				
Aeshnidae (Hawkers & Emperors)	8				
Corduliidae (Cruisers)	8				
Gomphidae (Clubtails)	6			A	A
Libellulidae (Darters/Skimmers)	4	A			A
LEPIDOPTERA (Aquatic Caterpillars/Moths)					
Crambidae (Pyralidae)	12				

Taxon	QV	S	Veg	GSM	TOT
HEMIPTERA (Bugs)					
Belostomatidae* (Giant water bugs)	3				
Corixidae* (Water boatmen)	3			1	1
Gerridae* (Pond skaters/Water striders)	5				
Hydrometridae* (Water measurers)	6				
Naucoridae* (Creeping water bugs)	7				
Nepidae* (Water scorpions)	3				
Notonectidae* (Backswimmers)	3				
Pleidae* (Pygmy backswimmers)	4		1		1
Veliidae/M...veliidae* (Ripple bugs)	5		A	A	B
MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
Corydalidae (Fishflies & Dobsonflies)	8				
Sialidae (Alderflies)	6				
TRICHOPTERA (Caddisflies)					
Dipseudopsidae	10				
Ecnomidae	8				
Hydropsychidae 1 sp	4				
Hydropsychidae 2 sp	6				B
Hydropsychidae > 2 sp	12				
Philopotamidae	10	1			1
Polycentropodidae	12				
Psychomyiidae/Xiphocentronidae	8				
Cased caddis:					
Barbarochthonidae SWC	13				
Calamoceratidae ST	11				
Glossosomatidae SWC	11				
Hydroptilidae	6				
Hydrosalpingidae SWC	15				
Lepidostomatidae	10				
Leptoceridae	6				
Petrothrincidae SWC	11				
Pisuliidae	10				
Sericostomatidae SWC	13				
COLEOPTERA (Beetles)					
Dytiscidae/Noteridae* (Diving beetles)	5		1	1	A
Elmidae/Dryopidae* (Riffle beetles)	8	1			1
Gyrinidae* (Whirligig beetles)	5		B		B
Haliplidae* (Crawling water beetles)	5				
Helodidae (Marsh beetles)	12				
Hydraenidae* (Minute moss beetles)	8				
Hydrophilidae* (Water scavenger beetles)	5				
Limnichidae (Marsh-Loving Beetles)	10				
Psephenidae (Water Pennies)	10	1	1		A

Taxon	QV	S	Veg	GSM	TOT
DIPTERA (Flies)					
Athericidae (Snipe flies)	10	A		1	A
Blepharoceridae (Mountain midges)	15				
Ceratopogonidae (Biting midges)	5			1	1
Chironomidae (Midges)	2	A			A
Culicidae* (Mosquitoes)	1				
Dixidae* (Dixid midge)	10				
Empididae (Dance flies)	6				
Ephydridae (Shore flies)	3				
Muscidae (House flies, Stable flies)	1				
Psychodidae (Moth flies)	1				
Simuliidae (Blackflies)	5	C			C
Syrphidae* (Rat tailed maggots)	1				
Tabanidae (Horse flies)	5				
Tipulidae (Crane flies)	5				
GASTROPODA (Snails)					
Ancylidae (Limpets)	6	1			1
Bulininae*	3				
Hydrobiidae*	3				
Lymnaeidae* (Pond snails)	3				
Physidae* (Pouch snails)	3				
Planorbinae* (Orb snails)	3		A		A
Thiaridae* (=Melanidae)	3				
Viviparidae* ST	5				
PELECYPODA (Bivalvles)					
Corbiculidae (Clams)	5				
Sphaeriidae (Pill clams)	3				
Unionidae (Perly mussels)	6				
SASS Score					176
No. of Taxa					27
ASPT					6.5

Other biota:

Comments/Observations:

Mbashe River (Upper)

Date (dd-mm-yr):	09-Sep-22																			
Site Code:	Mbas02_R					**Grid reference (dd mm ss.s) Lat:**	**S**	-31.807857												
Collector/Sampler:	Kylie Farrell					**Long:**	**E**	28.346994												
River:	Upper Mbashe					**Datum (WGS84/Cape):**														
Level 1 Ecoregion:	16: SOUTH EASTERN UPLANDS					**Altitude (m):**														
Quaternary Catchment:	T11H					**Zonation:**														
	Temp (°C):					**Routine or Project? (circle one)**		**Flow**												
Site Description: 52	**pH:**					**Project Name:**		**Clarity (cm):**												
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	**DO (mg/L):**					WP11354		**Turbidity:**												
	Conductivity:							**Colour:**												
	Riparian Disturbance:																			
	Instream Disturbance:																			

Biotopes Sampled (tick & rate)	**Rating (1-5)**		**Time (min)**
	2		
Stones Out Of Current (SOOC)	2		
Bedrock	5		
Aquatic Veg	0		
MargVeg In Current	2		
MargVeg Out Of Current	1		
Gravel	1		
Sand	2		
Mud	3		
Hand picking/Visual observation	x		
Biotope Score (%)	40		

Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5					**HEMIPTERA (Bugs)**						**DIPTERA (Flies)**					
COELENTERATA (Cnidaria)	1					Belostomatidae* (Giant water bugs)	3		1	1	A	Athericidae (Snipe flies)	10		1		1
TURBELLARIA (Flatworms)	3				A	Corixidae* (Water boatmen)	3			A	A	Blepharoceridae (Mountain midges)	15				
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5					Ceratopogonidae (Biting midges)	5				
Oligochaeta (Earthworms)	1			A	A	Hydrometridae* (Water measurers)	6					Chironomidae (Midges)	2	1			1
Hirudinea (Leeches)	3					Naucoridae* (Creeping water bugs)	7					Culicidae* (Mosquitoes)	1			B	B
CRUSTACEA						Nepidae* (Water scorpions)	3					Dixidae* (Dixid midge)	10				
Amphipoda (Scuds)	13					Notonectidae* (Backswimmers)	3					Empididae (Dance flies)	6				
Potamonautidae* (Crabs)	3					Pleidae* (Pygmy backswimmers)	4					Ephydridae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Veliidae/M...veliidae* (Ripple bugs)	5					Muscidae (House flies, Stable flies)	1				
Palaemonidae (Freshwater Prawns)	10					**MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)**						Psychodidae (Moth flies)	1				
HYDRACARINA (Mites)	8	A			A	Corydalidae (Fishflies & Dobsonflies)	8					Simuliidae (Blackflies)	5	C			D
PLECOPTERA (Stoneflies)						Sialidae (Alderflies)	6					Syrphidae* (Rat tailed maggots)	1				
Notonemouridae	14					**TRICHOPTERA (Caddisflies)**						Tabanidae (Horse flies)	5				
Perlidae	12					Dipseudopsidae	10					Tipulidae (Crane flies)	5				
EPHEMEROPTERA (Mayflies)						Ecnomidae	8					**GASTROPODA (Snails)**					
Baetidae 1sp	4					Hydropsychidae 1 sp	4					Ancylidae (Limpets)	6				1
Baetidae 2 sp	6			A		Hydropsychidae 2 sp	6	B			B	Bulininae*	3				
Baetidae > 2 sp	12	B	B		B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3				
Caenidae (Squaregills/Cainfles)	6		A		A	Philopotamidae	10					Lymnaeidae* (Pond snails)	3				
Ephemeridae	15					Polycentropodidae	12					Physidae* (Pouch snails)	3				
Heptageniidae (Flatheaded mayflies)	13	A			A	Psychomyiidae/Xiphocentronidae	8					Planorbinae* (Orb snails)	3				
Leptophlebiidae (Prongills)	9	A			A	**Cased caddis:**						Thiaridae* (=Melanidae)	3				
Oligoneuridae (Brushlegged mayflies)	15					Barbarochthonidae SWC	13					Viviparidae* ST	5				
Polymitarcyidae (Pale Burrowers)	10					Calamoceratidae ST	11					**PELECYPODA (Bivalves)**					
Prosopistomatidae (Water specs)	15	A			A	Glossosomatidae SWC	11					Corbiculidae (Clams)	5				
Teloganodidae SWC (Spiny Crawlers)	12					Hydroptilidae	6					Sphaeriidae (Pill clams)	3				
Tricorythidae (Stout Crawlers)	9					Hydrosalpingidae SWC	15					Unionidae (Perly mussels)	6				
ODONATA (Dragonflies & Damselflies)						Lepidostomatidae	10					**SASS Score**					145
Calopterygidae ST,T (Demoiselles)	10					Leptoceridae	6					**No. of Taxa**					23
Chlorocyphidae (Jewels)	10		A		A	Petrothrincidae SWC	11					**ASPT**					6.3
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisuliidae	10					**Other biota:**					
Coenagrionidae (Sprites and blues)	4		A		A	Sericostomatidae SWC	13										
Lestidae (Emerald Damselflies/Spreadwings)	8					**COLEOPTERA (Beetles)**											
Platycnemidae (Stream Damselflies)	10					Dytiscidae/Noteridae* (Diving beetles)	5			A	A						
Protoneuridae (Threadwings)	8					Elmidae/Dryopidae* (Riffle beetles)	8		A		A						
Aeshnidae (Hawkers & Emperors)	8					Gyrinidae* (Whirligig beetles)	5	A			B						
Corduliidae (Cruisers)	8					Haliplidae* (Crawling water beetles)	5										
Gomphidae (Clubtails)	6			1	1	Helodidae (Marsh beetles)	12										
Libellulidae (Darters/Skimmers)	4	A			A	Hydraenidae* (Minute moss beetles)	8										
LEPIDOPTERA (Aquatic Caterpillars/Moths)						Hydrophilidae* (Water scavenger beetles)	5										
Crambidae (Pyralidae)	12					Limnichidae (Marsh-Loving Beetles)	10										
						Psephenidae (Water Pennies)	10										

Gcuwa River

Date (dd-mm-yr):	11-May-23																					
Site Code:	GCUW01_R						**Grid reference (dd mm ss.s) Lat:**	S	-32.319770°			(dd.ddddd)										
Collector/Sampler:	Kylie Farrell						**Long:**	E	28.136094°													
River:	Gcuwa						**Datum (WGS84/Cape):**															
Level 1 Ecoregion:	16. SOUTH EASTERN UPLANDS						**Altitude (m):**															
Quaternary Catchment:	S70D						**Zonation:**															
	Temp (°C):						**Routine or Project? (circle one)**			**Flow**												
Site Description: 52	**pH:**						**Project Name:**			**Clarity (cm):**												
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	**DO (mg/L):**						WP11354			**Turbidity:**												
	Conductivity:									**Colour:**												
	Riparian Disturbance:																					
	Instream Disturbance:																					

Biotopes Sampled (tick & rate)	Rating (1-5)		Time (min)
	3		
Stones Out Of Current (SOOC)	3		
Bedrock	4		
Aquatic Veg	0		
MargVeg In Current	0		
MargVeg Out Of Current	1		
Gravel	3		
Sand	3		
Mud	3		
Hand picking/Visual observation	x		
Biotope Score (%)	44		

Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5					**HEMIPTERA (Bugs)**						**DIPTERA (Flies)**					
COELENTERATA (Cnidaria)	1					Belostomatidae* (Giant water bugs)	3					Athericidae (Snipe flies)	10				
TURBELLARIA (Flatworms)	3	1			1	Corixidae* (Water boatmen)	3		B	B	B	Blepharoceridae (Mountain midges)	15				
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5					Ceratopogonidae (Biting midges)	5			1	1
Oligochaeta (Earthworms)	1			1	1	Hydrometridae* (Water measurers)	6				1	Chironomidae (Midges)	2				
Hirudinea (Leeches)	3					Naucoridae* (Creeping water bugs)	7					Culicidae* (Mosquitoes)	1				
CRUSTACEA						Nepidae* (Water scorpions)	3					Dixidae* (Dixid midge)	10				
Amphipoda (Scuds)	13					Notonectidae* (Backswimmers)	3			A	A	Empididae (Dance flies)	6				
Potamonautidae* (Crabs)	3	A	1		A	Pleidae* (Pygmy backswimmers)	4					Ephydridae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Veliidae/M...veliidae* (Ripple bugs)	5		A		A	Muscidae (House flies, Stable flies)	1				
Palaemonidae (Freshwater Prawns)	10					**MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)**						Psychodidae (Moth flies)	1				
HYDRACARINA (Mites)	8					Corydalidae (Fishflies & Dobsonflies)	8					Simuliidae (Blackflies)	5			A	A
PLECOPTERA (Stoneflies)						Sialidae (Alderflies)	6					Syrphidae* (Rat tailed maggots)	1				
Notonemouridae	14					**TRICHOPTERA (Caddisflies)**						Tabanidae (Horse flies)	5				
Perlidae	12				A	Dipseudopsidae	10					Tipulidae (Crane flies)	5				
EPHEMEROPTERA (Mayflies)						Ecnomidae	8					**GASTROPODA (Snails)**					
Baetidae 1sp	4					Hydropsychidae 1 sp	4					Ancylidae (Limpets)	6				
Baetidae 2 sp	6	A			A	Hydropsychidae 2 sp	6					Bulininae*	3				
Baetidae > 2 sp	12					Hydropsychidae > 2 sp	12	B			B	Hydrobiidae*	3				
Caenidae (Squaregills/Cainfles)	6					Philopotamidae	10					Lymnaeidae* (Pond snails)	3				
Ephemeridae	15					Polycentropodidae	12					Physidae* (Pouch snails)	3				
Heptageniidae (Flatheaded mayflies)	13					Psychomyiidae/Xiphocentronidae	8					Planorbinae* (Orb snails)	3				
Leptophlebiidae (Prongills)	9					**Cased caddis:**						Thiaridae* (=Melanidae)	3				
Oligoneuridae (Brushlegged mayflies)	15					Barbarochthonidae SWC	13					Viviparidae* ST	5				
Polymitarcyidae (Pale Burrowers)	10					Calamoceratidae ST	11					**PELECYPODA (Bivalves)**					
Prosopistomatidae (Water specs)	15					Glossosomatidae SWC	11					Corbiculidae (Clams)	5				
Teloganodidae SWC (Spiny Crawlers)	12					Hydroptilidae	6					Sphaeriidae (Pill clams)	3				
Tricorythidae (Stout Crawlers)	9					Hydrosalpingidae SWC	15					Unionidae (Perly mussels)	6				
ODONATA (Dragonflies & Damselflies)						Lepidostomatidae	10					**SASS Score**					81
Calopterygidae ST,T (Demoiselles)	10					Leptoceridae	6					**No. of Taxa**					15
Chlorocyphidae (Jewels)	10					Petrothrincidae SWC	11					**ASPT**					5.4
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisuliidae	10					**Other biota:**					
Coenagrionidae (Sprites and blues)	4		A	1	A	Sericostomatidae SWC	13										
Lestidae (Emerald Damselflies/Spreadwings)	8					**COLEOPTERA (Beetles)**											
Platycnemidae (Stream Damselflies)	10					Dytiscidae/Noteridae* (Diving beetles)	5										
Protoneuridae (Threadwings)	8					Elmidae/Dryopidae* (Riffle beetles)	8	1			1						
Aeshnidae (Hawkers & Emperors)	8					Gyrinidae* (Whirligig beetles)	5				B	**Comments/Observations:**					
Corduliidae (Cruisers)	8					Haliplidae* (Crawling water beetles)	5										
Gomphidae (Clubtails)	6					Helodidae (Marsh beetles)	12										
Libellulidae (Darters/Skimmers)	4					Hydraenidae* (Minute moss beetles)	8										
LEPIDOPTERA (Aquatic Caterpillars/Moths)						Hydrophilidae* (Water scavenger beetles)	5										
Crambidae (Pyralidae)	12					Limnichidae (Marsh-Loving Beetles)	10										
						Psephenidae (Water Pennies)	10										

Indwe River

Date (dd-mm-yr):	07-Sep-22																			
Site Code:	Indw01_R					**Grid reference (dd mm ss.s) Lat:**	S	-31.897077			(dd.ddddd)									
Collector/Sampler:	Kylie Farrell					**Long:**	E	27.409825												
River:	Indwe					**Datum (WGS84/Cape):**														
Level 1 Ecoregion:	18: DROUGHT CORRIDOR					**Altitude (m):**														
Quaternary Catchment:	S20D					**Zonation:**														
	Temp (°C):					**Routine or Project? (circle one)**		**Flow**												
Site Description: 52	**pH:**					**Project Name:**		**Clarity (cm):**												
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	**DO (mg/L):**					WP11354		**Turbidity:**												
	Conductivity:							**Colour:**												
	Riparian Disturbance:																			
	Instream Disturbance:																			

Biotopes Sampled (tick & rate)	**Rating (1-5)**		**Time (min)**
	3		
Stones Out Of Current (SOOC)	4		
Bedrock	5		
Aquatic Veg	0		
MargVeg In Current	1		
MargVeg Out Of Current	1		
Gravel	4		
Sand	4		
Mud	5		
Hand picking/Visual observation	x		
Biotope Score (%)	60		

Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5					**HEMIPTERA (Bugs)**						**DIPTERA (Flies)**					
COELENTERATA (Cnidaria)	1					Belostomatidae* (Giant water bugs)	3					Athericidae (Snipe flies)	10				
TURBELLARIA (Flatworms)	3					Corixidae* (Water boatmen)	3					Blepharoceridae (Mountain midges)	15				
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5					Ceratopogonidae (Biting midges)	5			1	1
Oligochaeta (Earthworms)	1			1	1	Hydrometridae* (Water measurers)	6					Chironomidae (Midges)	2			A	A
Hirudinea (Leeches)	3					Naucoridae* (Creeping water bugs)	7					Culicidae* (Mosquitoes)	1				
CRUSTACEA						Nepidae* (Water scorpions)	3					Dixidae* (Dixid midge)	10				
Amphipoda (Scuds)	13					Notonectidae* (Backswimmers)	3					Empididae (Dance flies)	6				
Potamonautidae* (Crabs)	3					Pleidae* (Pygmy backswimmers)	4					Ephydridae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Veliidae/M...veliidae* (Ripple bugs)	5					Muscidae (House flies, Stable flies)	1	1		1	A
Palaemonidae (Freshwater Prawns)	10					**MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)**						Psychodidae (Moth flies)	1				
HYDRACARINA (Mites)	8					Corydalidae (Fishflies & Dobsonflies)	8					Simuliidae (Blackflies)	5	C	B	A	D
PLECOPTERA (Stoneflies)						Sialidae (Alderflies)	6					Syrphidae* (Rat tailed maggots)	1				
Notonemouridae	14					**TRICHOPTERA (Caddisflies)**						Tabanidae (Horse flies)	5				
Perlidae	12					Dipseudopsidae	10					Tipulidae (Crane flies)	5				
EPHEMEROPTERA (Mayflies)						Ecnomidae	8					**GASTROPODA (Snails)**					
Baetidae 1sp	4					Hydropsychidae 1 sp	4		1		1	Ancylidae (Limpets)	6				
Baetidae 2 sp	6		B	A		Hydropsychidae 2 sp	6					Bulininae*	3				
Baetidae > 2 sp	12	A			B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3				
Caenidae (Squaregills/Cainfles)	6			A	A	Philopotamidae	10					Lymnaeidae* (Pond snails)	3				
Ephemeridae	15					Polycentropodidae	12					Physidae* (Pouch snails)	3				
Heptageniidae (Flatheaded mayflies)	13					Psychomyiidae/Xiphocentronidae	8					Planorbinae* (Orb snails)	3				
Leptophlebiidae (Prongills)	9					**Cased caddis:**						Thiaridae* (=Melanidae)	3				
Oligoneuridae (Brushlegged mayflies)	15					Barbarochthonidae SWC	13					Viviparidae* ST	5				
Polymitarcyidae (Pale Burrowers)	10					Calamoceratidae ST	11					**PELECYPODA (Bivalves)**					
Prosopistomatidae (Water specs)	15					Glossosomatidae SWC	11					Corbiculidae (Clams)	5				
Teloganodidae SWC (Spiny Crawlers)	12					Hydroptilidae	6					Sphaeriidae (Pill clams)	3				
Tricorythidae (Stout Crawlers)	9	A			A	Hydrosalpingidae SWC	15					Unionidae (Perly mussels)	6				
ODONATA (Dragonflies & Damselflies)						Lepidostomatidae	10					**SASS Score**					64
Calopterygidae ST,T (Demoiselles)	10					Leptoceridae	6					**No. of Taxa**					12
Chlorocyphidae (Jewels)	10					Petrothrincidae SWC	11					**ASPT**					5.3
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisuliidae	10					**Other biota:**					
Coenagrionidae (Sprites and blues)	4					Sericostomatidae SWC	13										
Lestidae (Emerald Damselflies/Spreadwings)	8					**COLEOPTERA (Beetles)**											
Platycnemidae (Stream Damselflies)	10					Dytiscidae/Noteridae* (Diving beetles)	5										
Protoneuridae (Threadwings)	8					Elmidae/Dryopidae* (Riffle beetles)	8										
Aeshnidae (Hawkers & Emperors)	8					Gyrinidae* (Whirligig beetles)	5		1		1	**Comments/Observations:**					
Corduliidae (Cruisers)	8					Haliplidae* (Crawling water beetles)	5	A	A		B						
Gomphidae (Clubtails)	6		A	A	A	Helodidae (Marsh beetles)	12										
Libellulidae (Darters/Skimmers)	4					Hydraenidae* (Minute moss beetles)	8										
LEPIDOPTERA (Aquatic Caterpillars/Moths)						Hydrophilidae* (Water scavenger beetles)	5										
Crambidae (Pyralidae)	12					Limnichidae (Marsh-Loving Beetles)	10										
						Psephenidae (Water Pennies)	10										

White Kei River

Date (dd-mm-yr):	07-Sep-22	(dd.ddddd)	
Site Code:	Wkei01_R	**Grid reference (dd mm ss.s) Lat: S**	-32.003057
Collector/Sampler:	Kylie Farrell	**Long: E**	27.351052
River:	White Kei	**Datum (WGS84/Cape):**	
Level 1 Ecoregion:	18: DROUGHT CORRIDOR	**Altitude (m):**	
Quaternary Catchment:	S10J	**Zonation:**	
	Temp (°C):	**Routine or Project? (circle one)**	**Flow**
Site Description: 52	**pH:**	**Project Name:**	**Clarity (cm):**
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	**DO (mg/L):**	WP11354	**Turbidity:**
	Conductivity:		**Colour:**
	Riparian Disturbance:		
	Instream Disturbance:		

Biotopes Sampled (tick & rate)	Rating (1-5)	Time (min)
	4	
Stones Out Of Current (SOOC)	4	
Bedrock	5	
Aquatic Veg	0	
MargVeg In Current	0	
MargVeg Out Of Current	0	
Gravel	5	
Sand	5	
Mud	5	
Hand picking/Visual observation	x	
Biotope Score (%)	62	

Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				
COELENTERATA (Cnidaria)	1				
TURBELLARIA (Flatworms)	3				A
ANNELIDA					
Oligochaeta (Earthworms)	1				
Hirudinea (Leeches)	3	1			1
CRUSTACEA					
Amphipoda (Scuds)	13				
Potamonautidae* (Crabs)	3				
Atyidae (Freshwater Shrimps)	8				
Palaemonidae (Freshwater Prawns)	10				
HYDRACARINA (Mites)	8				
PLECOPTERA (Stoneflies)					
Notonemouridae	14				
Perlidae	12				
EPHEMEROPTERA (Mayflies)					
Baetidae 1sp	4				
Baetidae 2 sp	6			A	
Baetidae > 2 sp	12	B			B
Caenidae (Squaregills/Cainfles)	6			A	A
Ephemeridae	15				
Heptageniidae (Flatheaded mayflies)	13	B		1	B
Leptophlebiidae (Prongills)	9	B		A	B
Oligoneuridae (Brushlegged mayflies)	15				
Polymitarcyidae (Pale Burrowers)	10				
Prosopistomatidae (Water specs)	15				
Teloganodidae SWC (Spiny Crawlers)	12				
Tricorythidae (Stout Crawlers)	9	B			B
ODONATA (Dragonflies & Damselflies)					
Calopterygidae ST,T (Demoiselles)	10				
Chlorocyphidae (Jewels)	10				
Synlestidae (Chlorolestidae)(Sylphs)	8				
Coenagrionidae (Sprites and blues)	4				
Lestidae (Emerald Damselflies/Spreadwings)	8				
Platycnemidae (Stream Damselflies)	10				
Protoneuridae (Threadwings)	8				
Aeshnidae (Hawkers & Emperors)	8				
Corduliidae (Cruisers)	8				
Gomphidae (Clubtails)	6			A	A
Libellulidae (Darters/Skimmers)	4	A			A
LEPIDOPTERA (Aquatic Caterpillars/Moths)					
Crambidae (Pyralidae)	12				

Taxon	QV	S	Veg	GSM	TOT
HEMIPTERA (Bugs)					
Belostomatidae* (Giant water bugs)	3			1	1
Corixidae* (Water boatmen)	3				
Gerridae* (Pond skaters/Water striders)	5				
Hydrometridae* (Water measurers)	6				
Naucoridae* (Creeping water bugs)	7				
Nepidae* (Water scorpions)	3				
Notonectidae* (Backswimmers)	3				
Pleidae* (Pygmy backswimmers)	4				
Veliidae/M...veliidae* (Ripple bugs)	5				
MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
Corydalidae (Fishflies & Dobsonflies)	8				
Sialidae (Alderflies)	6				
TRICHOPTERA (Caddisflies)					
Dipseudopsidae	10				
Ecnomidae	8				
Hydropsychidae 1 sp	4			1	
Hydropsychidae 2 sp	6	B			B
Hydropsychidae > 2 sp	12				
Philopotamidae	10				
Polycentropodidae	12				
Psychomyiidae/Xiphocentronidae	8				
Cased caddis:					
Barbarochthonidae SWC	13				
Calamoceratidae ST	11				
Glossosomatidae SWC	11				
Hydroptilidae	6			A	A
Hydrosalpingidae SWC	15				
Lepidostomatidae	10				
Leptoceridae	6				
Petrothrincidae SWC	11				
Pisuliidae	10				
Sericostomatidae SWC	13				
COLEOPTERA (Beetles)					
Dytiscidae/Noteridae* (Diving beetles)	5				
Elmidae/Dryopidae* (Riffle beetles)	8	1			A
Gyrinidae* (Whirligig beetles)	5				B
Haliplidae* (Crawling water beetles)	5				
Helodidae (Marsh beetles)	12				
Hydraenidae* (Minute moss beetles)	8				
Hydrophilidae* (Water scavenger beetles)	5				
Limnichidae (Marsh-Loving Beetles)	10				
Psephenidae (Water Pennies)	10				

Taxon	QV	S	Veg	GSM	TOT
DIPTERA (Flies)					
Athericidae (Snipe flies)	10				
Blepharoceridae (Mountain midges)	15				
Ceratopogonidae (Biting midges)	5	A		A	A
Chironomidae (Midges)	2	B			B
Culicidae* (Mosquitoes)	1				
Dixidae* (Dixid midge)	10				
Empididae (Dance flies)	6				
Ephydridae (Shore flies)	3				
Muscidae (House flies, Stable flies)	1				
Psychodidae (Moth flies)	1				
Simuliidae (Blackflies)	5	B			D
Syrphidae* (Rat tailed maggots)	1				
Tabanidae (Horse flies)	5				
Tipulidae (Crane flies)	5				
GASTROPODA (Snails)					
Ancylidae (Limpets)	6				
Bulininae*	3				
Hydrobiidae*	3				
Lymnaeidae* (Pond snails)	3				
Physidae* (Pouch snails)	3				
Planorbinae* (Orb snails)	3				
Thiaridae* (=Melanidae)	3				
Viviparidae* ST	5				
PELECYPODA (Bivalvles)					
Corbiculidae (Clams)	5				
Sphaeriidae (Pill clams)	3				
Unionidae (Perly mussels)	6				
SASS Score					114
No. of Taxa					18
ASPT					6.3
Other biota:					
Comments/Observations:					

Kubusi River

Date (dd-mm-yr):	10-May-23																				
Site Code:	KUBU01_R					Grid reference (dd mm ss.s) Lat:	S	-32.50722		(dd.ddddd)											
Collector/Sampler:	Kylie Farrell					Long:	E	27.731348													
River:	Kubusi					Datum (WGS84/Cape):															
Level 1 Ecoregion:	16. South Eastern Uplands					Altitude (m):															
Quaternary Catchment:	S60B					Zonation:															
	Temp (°C):					Routine or Project? (circle one)															
Site Description: 52	pH:					Project Name:															
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	DO (mg/L):					WP11354															
	Conductivity:																				
	Riparian Disturbance:																				
	Instream Disturbance:																				

Biotopes Sampled (tick & rate)	Rating (1-5)		Time (min)
	4		
Stones Out Of Current (SOOC)	2		
Bedrock	4		
Aquatic Veg	2		
MargVeg In Current	4		
MargVeg Out Of Current	4		
Gravel	3		
Sand	3		
Mud	2		
Hand picking/Visual observation	x		
Biotope Score (%)	62		

Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				A	**HEMIPTERA (Bugs)**						**DIPTERA (Flies)**					
COELENTERATA (Cnidaria)	1					Belostomatidae* (Giant water bugs)	3					Athericidae (Snipe flies)	10	1			1
TURBELLARIA (Flatworms)	3	1		1	A	Corixidae* (Water boatmen)	3			A	A	Blepharoceridae (Mountain midges)	15				
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5				A	Ceratopogonidae (Biting midges)	5				
Oligochaeta (Earthworms)	1	1	A	A	B	Hydrometridae* (Water measurers)	6					Chironomidae (Midges)	2		A		A
Hirudinea (Leeches)	3			A	A	Naucoridae* (Creeping water bugs)	7					Culicidae* (Mosquitoes)	1				
CRUSTACEA						Nepidae* (Water scorpions)	3					Dixidae* (Dixid midge)	10				
Amphipoda (Scuds)	13					Notonectidae* (Backswimmers)	3					Empididae (Dance flies)	6				
Potamonautidae* (Crabs)	3		A		A	Pleidae* (Pygmy backswimmers)	4					Ephydridae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Veliidae/M...veliidae* (Ripple bugs)	5					Muscidae (House flies, Stable flies)	1				
Palaemonidae (Freshwater Prawns)	10					**MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)**						Psychodidae (Moth flies)	1				
HYDRACARINA (Mites)	8					Corydalidae (Fishflies & Dobsonflies)	8					Simuliidae (Blackflies)	5				
PLECOPTERA (Stoneflies)						Sialidae (Alderflies)	6					Syrphidae* (Rat tailed maggots)	1				
Notonemouridae	14					**TRICHOPTERA (Caddisflies)**						Tabanidae (Horse flies)	5	1		A	A
Perlidae	12	A		A	A	Dipseudopsidae	10					Tipulidae (Crane flies)	5				
EPHEMEROPTERA (Mayflies)						Ecnomidae	8					**GASTROPODA (Snails)**					
Baetidae 1sp	4					Hydropsychidae 1 sp	4					Ancylidae (Limpets)	6	A			A
Baetidae 2 sp	6		A	1		Hydropsychidae 2 sp	6	B		A	B	Bulininae*	3				
Baetidae > 2 sp	12	B			B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3				
Caenidae (Squaregills/Cainfles)	6	1			1	Philopotamidae	10					Lymnaeidae* (Pond snails)	3				
Ephemeridae	15					Polycentropodidae	12					Physidae* (Pouch snails)	3				
Heptageniidae (Flatheaded mayflies)	13	A	1	A	B	Psychomyiidae/Xiphocentronidae	8					Planorbinae* (Orb snails)	3		1		1
Leptophlebiidae (Prongills)	9	A		A	B	**Cased caddis:**						Thiaridae* (=Melanidae)	3		1		1
Oligoneuridae (Brushlegged mayflies)	15					Barbarochthonidae SWC	13					Viviparidae* ST	5				
Polymitarcyidae (Pale Burrowers)	10					Calamoceratidae ST	11					**PELECYPODA (Bivalvles)**					
Prosopistomatidae (Water specs)	15					Glossosomatidae SWC	11					Corbiculidae (Clams)	5	1	A		A
Teloganodidae SWC (Spiny Crawlers)	12					Hydroptilidae	6					Sphaeriidae (Pill clams)	3				
Tricorythidae (Stout Crawlers)	9	1			A	Hydrosalpingidae SWC	15					Unionidae (Perly mussels)	6				
ODONATA (Dragonflies & Damselflies)						Lepidostomatidae	10					**SASS Score**					185
Calopterygidae ST,T (Demoiselles)	10					Leptoceridae	6	A	B	A	B	**No. of Taxa**					28
Chlorocyphidae (Jewels)	10	A	A		B	Petrothrincidae SWC	11					**ASPT**					6.6
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisuliidae	10					**Other biota:**					
Coenagrionidae (Sprites and blues)	4		B	A	B	Sericostomatidae SWC	13										
Lestidae (Emerald Damselflies/Spreadwings)	8					**COLEOPTERA (Beetles)**											
Platycnemidae (Stream Damselflies)	10					Dytiscidae/Noteridae* (Diving beetles)	5										
Protoneuridae (Threadwings)	8					Elmidae/Dryopidae* (Riffle beetles)	8	A	1		A						
Aeshnidae (Hawkers & Emperors)	8			A	A	Gyrinidae* (Whirligig beetles)	5	A	A		B	**Comments/Observations:**					
Corduliidae (Cruisers)	8					Haliplidae* (Crawling water beetles)	5										
Gomphidae (Clubtails)	6	1	1	A	B	Helodidae (Marsh beetles)	12										
Libellulidae (Darters/Skimmers)	4	A	1		A	Hydraenidae* (Minute moss beetles)	8										
LEPIDOPTERA (Aquatic Caterpillars/Moths)						Hydrophilidae* (Water scavenger beetles)	5										
Crambidae (Pyralidae)	12					Limnichidae (Marsh-Loving Beetles)	10										
						Psephenidae (Water Pennies)	10	B			B						

Buffalo River (Lower)

Not conducted due to health hazard

Keiskamma River (Lower)

Date (dd-mm-yr):	19-Sep-22								(dd.ddddd)		**Biotopes Sampled (tick & rate)**	**Rating (1-5)**					**Time (min)**	
Site Code:	KEIS02_R					**Grid reference (dd mm ss.s) Lat:**	**S**	-33.075316				5						
Collector/Sampler:	Kylie Farrell					**Long:**	**E**	27.218534			**Stones Out Of Current (SOOC)**	3						
River:	Keiskamma (Lower)					**Datum (WGS84/Cape):**					**Bedrock**	0						
Level 1 Ecoregion:	31: EASTERN COASTAL BELT					**Altitude (m):**					**Aquatic Veg**	2						
Quaternary Catchment:	R10L					**Zonation:**					**MargVeg In Current**	4						
	Temp (°C):					**Routine or Project? (circle one)**	**Flow**				**MargVeg Out Of Current**	3						
Site Description: 52	**pH:**					**Project Name:**	**Clarity (cm):**				**Gravel**	3						
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722	**DO (mg/L):**					WP11354	**Turbidity:**				**Sand**	2						
	Conductivity:						**Colour:**				**Mud**	2						
	Riparian Disturbance:										**Hand picking/Visual observation**	x						
	Instream Disturbance:										**Biotope Score (%)**	53						

Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5					**HEMIPTERA (Bugs)**						**DIPTERA (Flies)**					
COELENTERATA (Cnidaria)	1					Belostomatidae* (Giant water bugs)	3					Athericidae (Snipe flies)	10				
TURBELLARIA (Flatworms)	3	A			A	Corixidae* (Water boatmen)	3					Blepharoceridae (Mountain midges)	15				
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5					Ceratopogonidae (Biting midges)	5				
Oligochaeta (Earthworms)	1					Hydrometridae* (Water measurers)	6					Chironomidae (Midges)	2		B	A	B
Hirudinea (Leeches)	3					Naucoridae* (Creeping water bugs)	7					Culicidae* (Mosquitoes)	1				
CRUSTACEA						Nepidae* (Water scorpions)	3					Dixidae* (Dixid midge)	10				
Amphipoda (Scuds)	13					Notonectidae* (Backswimmers)	3					Empididae (Dance flies)	6				
Potamonautidae* (Crabs)	3					Pleidae* (Pygmy backswimmers)	4					Ephydridae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Veliidae/M...veliidae* (Ripple bugs)	5		A		A	Muscidae (House flies, Stable flies)	1				
Palaemonidae (Freshwater Prawns)	10					**MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)**						Psychodidae (Moth flies)	1				
HYDRACARINA (Mites)	8					Corydalidae (Fishflies & Dobsonflies)	8					Simuliidae (Blackflies)	5	C	C		C
PLECOPTERA (Stoneflies)						Sialidae (Alderflies)	6					Syrphidae* (Rat tailed maggots)	1				
Notonemouridae	14					**TRICHOPTERA (Caddisflies)**						Tabanidae (Horse flies)	5				
Perlidae	12	B			B	Dipseudopsidae	10					Tipulidae (Crane flies)	5				
EPHEMEROPTERA (Mayflies)						Ecnomidae	8					**GASTROPODA (Snails)**					
Baetidae 1sp	4			A		Hydropsychidae 1 sp	4					Ancylidae (Limpets)	6	A			B
Baetidae 2 sp	6		B			Hydropsychidae 2 sp	6	B			B	Bulininae*	3				
Baetidae > 2 sp	12	B			B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3				
Caenidae (Squaregills/Cainfles)	6	A	1		A	Philopotamidae	10					Lymnaeidae* (Pond snails)	3				
Ephemeridae	15					Polycentropodidae	12					Physidae* (Pouch snails)	3		A		A
Heptageniidae (Flatheaded mayflies)	13	B			B	Psychomyiidae/Xiphocentronidae	8					Planorbinae* (Orb snails)	3				
Leptophlebiidae (Prongills)	9	B	1		B	**Cased caddis:**						Thiaridae* (=Melanidae)	3				
Oligoneuridae (Brushlegged mayflies)	15					Barbarochthonidae SWC	13					Viviparidae* ST	5				
Polymitarcyidae (Pale Burrowers)	10					Calamoceratidae ST	11					**PELECYPODA (Bivalves)**					
Prosopistomatidae (Water specs)	15					Glossosomatidae SWC	11					Corbiculidae (Clams)	5		B		B
Teloganodidae SWC (Spiny Crawlers)	12					Hydroptilidae	6					Sphaeriidae (Pill clams)	3				
Tricorythidae (Stout Crawlers)	9					Hydrosalpingidae SWC	15					Unionidae (Perly mussels)	6				
ODONATA (Dragonflies & Damselflies)						Lepidostomatidae	10					**SASS Score**					116
Calopterygidae ST,T (Demoiselles)	10					Leptoceridae	6		A		A	**No. of Taxa**					18
Chlorocyphidae (Jewels)	10		1		1	Petrothrincidae SWC	11					**ASPT**					6.4
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisuliidae	10					**Other biota:**					
Coenagrionidae (Sprites and blues)	4		B	1	B	Sericostomatidae SWC	13										
Lestidae (Emerald Damselflies/Spreadwings)	8					**COLEOPTERA (Beetles)**											
Platycnemidae (Stream Damselflies)	10					Dytiscidae/Noteridae* (Diving beetles)	5										
Protoneuridae (Threadwings)	8					Elmidae/Dryopidae* (Riffle beetles)	8										
Aeshnidae (Hawkers & Emperors)	8					Gyrinidae* (Whirligig beetles)	5	1			1	**Comments/Observations:**					
Corduliidae (Cruisers)	8					Haliplidae* (Crawling water beetles)	5										
Gomphidae (Clubtails)	6					Helodidae (Marsh beetles)	12										
Libellulidae (Darters/Skimmers)	4	A			A	Hydraenidae* (Minute moss beetles)	8										
LEPIDOPTERA (Aquatic Caterpillars/Moths)						Hydrophilidae* (Water scavenger beetles)	5										
Crambidae (Pyralidae)	12					Limnichidae (Marsh-Loving Beetles)	10										
						Psephenidae (Water Pennies)	10										

Tyume River

Date (dd-mm-yr):	14-Sep-22			(dd.ddddd)	**Biotopes Sampled (tick & rate)**	**Rating (1-5)**	**Time (min)**
Site Code:	Tyum01_R	**Grid reference (dd mm ss.s) Lat:**	S	-32.910291		5	
Collector/Sampler:	Kylie Farrell	**Long:**	E	26.932242	**Stones Out Of Current (SOOC)**	3	
River:	Tyume	**Datum (WGS84/Cape):**			**Bedrock**	2	
Level 1 Ecoregion:	18: DROUGHT CORRIDOR	**Altitude (m):**			**Aquatic Veg**	4	
Quaternary Catchment:	R10H	**Zonation:**			**MargVeg In Current**	4	
	Temp (°C):	**Routine or Project? (circle one)**	**Flow**		**MargVeg Out Of Current**	4	
Site Description: 52	**pH:**	**Project Name:**	**Clarity (cm):**		**Gravel**	2	
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	**DO (mg/L):**	WP11354	**Turbidity:**		**Sand**	2	
	Conductivity:		**Colour:**		**Mud**	2	
	Riparian Disturbance:				**Hand picking/Visual observation**	x	
	Instream Disturbance:				**Biotope Score (%)**	62	

Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				B
COELENTERATA (Cnidaria)	1				
TURBELLARIA (Flatworms)	3	A			A
ANNELIDA					
Oligochaeta (Earthworms)	1	A	1		A
Hirudinea (Leeches)	3				
CRUSTACEA					
Amphipoda (Scuds)	13				
Potamonautidae* (Crabs)	3	A			A
Atyidae (Freshwater Shrimps)	8				
Palaemonidae (Freshwater Prawns)	10				
HYDRACARINA (Mites)	8				
PLECOPTERA (Stoneflies)					
Notonemouridae	14				
Perlidae	12				
EPHEMEROPTERA (Mayflies)					
Baetidae 1sp	4				
Baetidae 2 sp	6				
Baetidae > 2 sp	12	B	B	B	B
Caenidae (Squaregills/Cainfles)	6	B		A	B
Ephemeridae	15				
Heptageniidae (Flatheaded mayflies)	13	B	A	A	B
Leptophlebiidae (Prongills)	9	B		A	B
Oligoneuridae (Brushlegged mayflies)	15				
Polymitarcyidae (Pale Burrowers)	10				
Prosopistomatidae (Water specs)	15				
Teloganodidae SWC (Spiny Crawlers)	12				
Tricorythidae (Stout Crawlers)	9	B	A		B
ODONATA (Dragonflies & Damselflies)					
Calopterygidae ST,T (Demoiselles)	10				
Chlorocyphidae (Jewels)	10	1	A		A
Synlestidae (Chlorolestidae)(Sylphs)	8				
Coenagrionidae (Sprites and blues)	4		B	A	B
Lestidae (Emerald Damselflies/Spreadwings)	8		1		1
Platycnemidae (Stream Damselflies)	10				
Protoneuridae (Threadwings)	8				
Aeshnidae (Hawkers & Emperors)	8				
Corduliidae (Cruisers)	8				
Gomphidae (Clubtails)	6				
Libellulidae (Darters/Skimmers)	4			A	A
LEPIDOPTERA (Aquatic Caterpillars/Moths)					
Crambidae (Pyralidae)	12				

Taxon	QV	S	Veg	GSM	TOT
HEMIPTERA (Bugs)					
Belostomatidae* (Giant water bugs)	3		1		1
Corixidae* (Water boatmen)	3			B	B
Gerridae* (Pond skaters/Water striders)	5				
Hydrometridae* (Water measurers)	6				
Naucoridae* (Creeping water bugs)	7				
Nepidae* (Water scorpions)	3				
Notonectidae* (Backswimmers)	3		1	A	A
Pleidae* (Pygmy backswimmers)	4				
Veliidae/M...veliidae* (Ripple bugs)	5		A		A
MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
Corydalidae (Fishflies & Dobsonflies)	8				
Sialidae (Alderflies)	6				
TRICHOPTERA (Caddisflies)					
Dipseudopsidae	10				
Ecnomidae	8				
Hydropsychidae 1 sp	4			1	
Hydropsychidae 2 sp	6	A			A
Hydropsychidae > 2 sp	12				
Philopotamidae	10				
Polycentropodidae	12				
Psychomyiidae/Xiphocentronidae	8				
Cased caddis:					
Barbarochthonidae SWC	13				
Calamoceratidae ST	11				
Glossosomatidae SWC	11				
Hydroptilidae	6				
Hydrosalpingidae SWC	15				
Lepidostomatidae	10				
Leptoceridae	6		B		B
Petrothrincidae SWC	11				
Pisuliidae	10				
Sericostomatidae SWC	13				
COLEOPTERA (Beetles)					
Dytiscidae/Noteridae* (Diving beetles)	5				
Elmidae/Dryopidae* (Riffle beetles)	8				
Gyrinidae* (Whirligig beetles)	5				B
Haliplidae* (Crawling water beetles)	5				
Helodidae (Marsh beetles)	12				
Hydraenidae* (Minute moss beetles)	8				
Hydrophilidae* (Water scavenger beetles)	5				
Limnichidae (Marsh-Loving Beetles)	10				
Psephenidae (Water Pennies)	10	1			1

Taxon	QV	S	Veg	GSM	TOT
DIPTERA (Flies)					
Athericidae (Snipe flies)	10				
Blepharoceridae (Mountain midges)	15				
Ceratopogonidae (Biting midges)	5			A	A
Chironomidae (Midges)	2	B	A	A	B
Culicidae* (Mosquitoes)	1				
Dixidae* (Dixid midge)	10				
Empididae (Dance flies)	6				
Ephydridae (Shore flies)	3				
Muscidae (House flies, Stable flies)	1				
Psychodidae (Moth flies)	1				
Simuliidae (Blackflies)	5	B		B	B
Syrphidae* (Rat tailed maggots)	1				
Tabanidae (Horse flies)	5	1			
Tipulidae (Crane flies)	5				
GASTROPODA (Snails)					
Ancylidae (Limpets)	6	B	A		B
Bulininae*	3				
Hydrobiidae*	3				
Lymnaeidae* (Pond snails)	3				
Physidae* (Pouch snails)	3				
Planorbinae* (Orb snails)	3				
Thiaridae* (=Melanidae)	3				
Viviparidae* ST	5				
PELECYPODA (Bivalvles)					
Corbiculidae (Clams)	5	A	A		B
Sphaeriidae (Pill clams)	3				
Unionidae (Perly mussels)	6				
SASS Score					156
No. of Taxa					26
ASPT					6.0
Other biota:					
Comments/Observations:					

Koonap River

SASS Version 5 Score Sheet

Time : | Version date: Sep 2005

Date (dd-mm-yr):	07-Sep-22				
Site Code:	Koon01_R	Grid reference (dd mm ss.s) Lat: S	-33.042856	(dd.ddddd)	
Collector/Sampler:	Kylie Farrell	Long: E	26.658506		
River:	Koonap	Datum (WGS84/Cape):			
Level 1 Ecoregion:	18: DROUGHT CORRIDOR	Altitude (m):			
Quaternary Catchment:	S32K	Zonation:			
Site Description: 52	Temp (°C):	Routine or Project? (circle one)	Flow		
	pH:	Project Name:	Clarity (cm):		
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	DO (mg/L):	WP11354	Turbidity:		
	Conductivity:		Colour:		
	Riparian Disturbance:				
	Instream Disturbance:				

Biotopes Sampled (tick & rate)	Rating (1-5)		Time (min)
	5		
Stones Out Of Current (SOOC)	4		
Bedrock	3		
Aquatic Veg	4		
MargVeg In Current	3		
MargVeg Out Of Current	1		
Gravel	2		
Sand	3		
Mud	3		
Hand picking/Visual observation	x		
Biotope Score (%)	62		

Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				
COELENTERATA (Cnidaria)	1				
TURBELLARIA (Flatworms)	3	1	A		A
ANNELIDA					
Oligochaeta (Earthworms)	1			1	1
Hirudinea (Leeches)	3	1	1	A	A
CRUSTACEA					
Amphipoda (Scuds)	13				
Potamonautidae* (Crabs)	3				
Atyidae (Freshwater Shrimps)	8				
Palaemonidae (Freshwater Prawns)	10				
HYDRACARINA (Mites)	8				
PLECOPTERA (Stoneflies)					
Notonemouridae	14				
Perlidae	12				
EPHEMEROPTERA (Mayflies)					
Baetidae 1sp	4				
Baetidae 2 sp	6				
Baetidae > 2 sp	12	B	B	A	B
Caenidae (Squaregills/Cainfles)	6				
Ephemeridae	15				
Heptageniidae (Flatheaded mayflies)	13				
Leptophlebiidae (Prongills)	9	1			A
Oligoneuridae (Brushlegged mayflies)	15				
Polymitarcyidae (Pale Burrowers)	10				
Prosopistomatidae (Water specs)	15				
Teloganodidae SWC (Spiny Crawlers)	12				
Tricorythidae (Stout Crawlers)	9				
ODONATA (Dragonflies & Damselflies)					
Calopterygidae ST,T (Demoiselles)	10				
Chlorocyphidae (Jewels)	10				
Synlestidae (Chlorolestidae)(Sylphs)	8				
Coenagrionidae (Sprites and blues)	4		A	A	B
Lestidae (Emerald Damselflies/Spreadwings)	8				
Platycnemidae (Stream Damselflies)	10				
Protoneuridae (Threadwings)	8				
Aeshnidae (Hawkers & Emperors)	8				
Corduliidae (Cruisers)	8				
Gomphidae (Clubtails)	6				
Libellulidae (Darters/Skimmers)	4	A	A	1	A
LEPIDOPTERA (Aquatic Caterpillars/Moths)					
Crambidae (Pyralidae)	12				

Taxon	QV	S	Veg	GSM	TOT
HEMIPTERA (Bugs)					
Belostomatidae* (Giant water bugs)	3		A		A
Corixidae* (Water boatmen)	3			A	A
Gerridae* (Pond skaters/Water striders)	5				A
Hydrometridae* (Water measurers)	6				
Naucoridae* (Creeping water bugs)	7				
Nepidae* (Water scorpions)	3				
Notonectidae* (Backswimmers)	3				
Pleidae* (Pygmy backswimmers)	4			1	1
Veliidae/M...veliidae* (Ripple bugs)	5				
MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
Corydalidae (Fishflies & Dobsonflies)	8				
Sialidae (Alderflies)	6				
TRICHOPTERA (Caddisflies)					
Dipseudopsidae	10				
Ecnomidae	8				
Hydropsychidae 1 sp	4	A		1	A
Hydropsychidae 2 sp	6				
Hydropsychidae > 2 sp	12				
Philopotamidae	10				
Polycentropodidae	12				
Psychomyiidae/Xiphocentronidae	8				
Cased caddis:					
Barbarochthonidae SWC	13				
Calamoceratidae ST	11				
Glossosomatidae SWC	11				
Hydroptilidae	6				
Hydrosalpingidae SWC	15				
Lepidostomatidae	10				
Leptoceridae	6				
Petrothrincidae SWC	11				
Pisuliidae	10				
Sericostomatidae SWC	13				
COLEOPTERA (Beetles)					
Dytiscidae/Noteridae* (Diving beetles)	5	1			1
Elmidae/Dryopidae* (Riffle beetles)	8				
Gyrinidae* (Whirligig beetles)	5	B			B
Haliplidae* (Crawling water beetles)	5				
Helodidae (Marsh beetles)	12				
Hydraenidae* (Minute moss beetles)	8				
Hydrophilidae* (Water scavenger beetles)	5				
Limnichidae (Marsh-Loving Beetles)	10				
Psephenidae (Water Pennies)	10				

Taxon	QV	S	Veg	GSM	TOT
DIPTERA (Flies)					
Athericidae (Snipe flies)	10				
Blepharoceridae (Mountain midges)	15				
Ceratopogonidae (Biting midges)	5	1	A		A
Chironomidae (Midges)	2	A		A	A
Culicidae* (Mosquitoes)	1		B		B
Dixidae* (Dixid midge)	10				
Empididae (Dance flies)	6				
Ephydridae (Shore flies)	3				
Muscidae (House flies, Stable flies)	1	1			1
Psychodidae (Moth flies)	1				
Simuliidae (Blackflies)	5	D	B		D
Syrphidae* (Rat tailed maggots)	1				
Tabanidae (Horse flies)	5				
Tipulidae (Crane flies)	5				
GASTROPODA (Snails)					
Ancylidae (Limpets)	6				
Bulininae*	3				
Hydrobiidae*	3				
Lymnaeidae* (Pond snails)	3				
Physidae* (Pouch snails)	3	B	1		B
Planorbinae* (Orb snails)	3				
Thiaridae* (=Melanidae)	3				
Viviparidae* ST	5				
PELECYPODA (Bivalvles)					
Corbiculidae (Clams)	5				
Sphaeriidae (Pill clams)	3				
Unionidae (Perly mussels)	6				
SASS Score					78
No. of Taxa					20
ASPT					3.9
Other biota:					
Comments/Observations:					

Kat River (Lower)

Date (dd-mm-yr):	07-Sep-22			(dd.ddddd)	
Site Code:	kat01_R	Grid reference (dd mm ss.s) Lat:	S	-32.890965	
Collector/Sampler:	Kylie Farrell	Long:	E	26.68407	
River:	Lower Kat	Datum (WGS84/Cape):			
Level 1 Ecoregion:	18: DROUGHT CORRIDOR	Altitude (m):			
Quaternary Catchment:	Q94F	Zonation:			
	Temp (°C):	Routine or Project? (circle one)	Flow		
Site Description: 52	pH:	Project Name:	Clarity (cm):		
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	DO (mg/L):	WP11354	Turbidity:		
	Conductivity:		Colour:		
	Riparian Disturbance:				
	Instream Disturbance:				

Biotopes Sampled (tick & rate)	Rating (1-5)		Time (min)
	4		
Stones Out Of Current (SOOC)	5		
Bedrock	0		
Aquatic Veg	0		
MargVeg In Current	3		
MargVeg Out Of Current	2		
Gravel	2		
Sand	3		
Mud	3		
Hand picking/Visual observation	x		
Biotope Score (%)	49		

Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				
COELENTERATA (Cnidaria)	1				
TURBELLARIA (Flatworms)	3				
ANNELIDA					
Oligochaeta (Earthworms)	1			B	B
Hirudinea (Leeches)	3			1	1
CRUSTACEA					
Amphipoda (Scuds)	13				
Potamonautidae* (Crabs)	3				1
Atyidae (Freshwater Shrimps)	8				
Palaemonidae (Freshwater Prawns)	10				
HYDRACARINA (Mites)	8			1	1
PLECOPTERA (Stoneflies)					
Notonemouridae	14				
Perlidae	12				
EPHEMEROPTERA (Mayflies)					
Baetidae 1sp	4			1	
Baetidae 2 sp	6				
Baetidae > 2 sp	12	B	B		B
Caenidae (Squaregills/Cainfles)	6			A	A
Ephemeridae	15				
Heptageniidae (Flatheaded mayflies)	13				
Leptophlebiidae (Prongills)	9	A			A
Oligoneuridae (Brushlegged mayflies)	15				
Polymitarcyidae (Pale Burrowers)	10			1	1
Prosopistomatidae (Water specs)	15				
Teloganodidae SWC (Spiny Crawlers)	12				
Tricorythidae (Stout Crawlers)	9				
ODONATA (Dragonflies & Damselflies)					
Calopterygidae ST,T (Demoiselles)	10				
Chlorocyphidae (Jewels)	10				
Synlestidae (Chlorolestidae)(Sylphs)	8				
Coenagrionidae (Sprites and blues)	4		B		B
Lestidae (Emerald Damselflies/Spreadwings)	8				
Platycnemidae (Stream Damselflies)	10				
Protoneuridae (Threadwings)	8				
Aeshnidae (Hawkers & Emperors)	8				
Corduliidae (Cruisers)	8				
Gomphidae (Clubtails)	6				
Libellulidae (Darters/Skimmers)	4				
LEPIDOPTERA (Aquatic Caterpillars/Moths)					
Crambidae (Pyralidae)	12				

Taxon	QV	S	Veg	GSM	TOT
HEMIPTERA (Bugs)					
Belostomatidae* (Giant water bugs)	3				
Corixidae* (Water boatmen)	3			A	A
Gerridae* (Pond skaters/Water striders)	5		1		A
Hydrometridae* (Water measurers)	6				
Naucoridae* (Creeping water bugs)	7				
Nepidae* (Water scorpions)	3				
Notonectidae* (Backswimmers)	3		1		1
Pleidae* (Pygmy backswimmers)	4				
Veliidae/M...veliidae* (Ripple bugs)	5		A		A
MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
Corydalidae (Fishflies & Dobsonflies)	8				
Sialidae (Alderflies)	6				
TRICHOPTERA (Caddisflies)					
Dipseudopsidae	10				
Ecnomidae	8			1	1
Hydropsychidae 1 sp	4				
Hydropsychidae 2 sp	6	B			B
Hydropsychidae > 2 sp	12				
Philopotamidae	10				
Polycentropodidae	12				
Psychomyiidae/Xiphocentronidae	8				
Cased caddis:					
Barbarochthonidae SWC	13				
Calamoceratidae ST	11				
Glossosomatidae SWC	11				
Hydroptilidae	6				
Hydrosalpingidae SWC	15				
Lepidostomatidae	10				
Leptoceridae	6		B		B
Petrothrincidae SWC	11				
Pisuliidae	10				
Sericostomatidae SWC	13				
COLEOPTERA (Beetles)					
Dytiscidae/Noteridae* (Diving beetles)	5				
Elmidae/Dryopidae* (Riffle beetles)	8				
Gyrinidae* (Whirligig beetles)	5				B
Haliplidae* (Crawling water beetles)	5				
Helodidae (Marsh beetles)	12				
Hydraenidae* (Minute moss beetles)	8				
Hydrophilidae* (Water scavenger beetles)	5				
Limnichidae (Marsh-Loving Beetles)	10				
Psephenidae (Water Pennies)	10				

Taxon	QV	S	Veg	GSM	TOT
DIPTERA (Flies)					
Athericidae (Snipe flies)	10				
Blepharoceridae (Mountain midges)	15				
Ceratopogonidae (Biting midges)	5			A	A
Chironomidae (Midges)	2	A	A		B
Culicidae* (Mosquitoes)	1	A	A		A
Dixidae* (Dixid midge)	10				
Empididae (Dance flies)	6				
Ephydridae (Shore flies)	3				
Muscidae (House flies, Stable flies)	1				
Psychodidae (Moth flies)	1				
Simuliidae (Blackflies)	5	D	C		D
Syrphidae* (Rat tailed maggots)	1				
Tabanidae (Horse flies)	5				
Tipulidae (Crane flies)	5				
GASTROPODA (Snails)					
Ancylidae (Limpets)	6		1		1
Bulininae*	3				
Hydrobiidae*	3				
Lymnaeidae* (Pond snails)	3				
Physidae* (Pouch snails)	3				
Planorbinae* (Orb snails)	3				
Thiaridae* (=Melanidae)	3				
Viviparidae* ST	5				
PELECYPODA (Bivalvles)					
Corbiculidae (Clams)	5				
Sphaeriidae (Pill clams)	3				
Unionidae (Perly mussels)	6				
SASS Score					120
No. of Taxa					22
ASPT					5.5

Other biota:

Comments/Observations:

Great Fish River (Middle)

Not conducted due to too high flows from IBT

Great Fish River (Upper)

Date (dd-mm-yr):	22-Sep-22				
Site Code:	GFIS01_R	**Grid reference (dd mm ss.s) Lat:**	**S**	-31.919527	(dd.ddddd)
Collector/Sampler:	Kylie Farrell	**Long:**	**E**	25.390974	
River:	Upper Great Fish	**Datum (WGS84/Cape):**			
Level 1 Ecoregion:	18: DROUGHT CORRIDOR	**Altitude (m):**			
Quaternary Catchment:	Q30B	**Zonation:**			
Site Description: 52	**Temp (°C):**	**Routine or Project? (circle one)**	**Flow**		
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722	**pH:**	**Project Name:**	**Clarity (cm):**		
	DO (mg/L):	WP11354	**Turbidity:**		
	Conductivity:		**Colour:**		
	Riparian Disturbance:				
	Instream Disturbance:				

Biotopes Sampled (tick & rate)	Rating (1-5)		Time (min)
	1		
Stones Out Of Current (SOOC)	2		
Bedrock	0		
Aquatic Veg	5		
MargVeg In Current	1		
MargVeg Out Of Current	5		
Gravel	0		
Sand	2		
Mud	5		
Hand picking/Visual observation	x		
Biotope Score (%)	47		

Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				
COELENTERATA (Cnidaria)	1				
TURBELLARIA (Flatworms)	3				
ANNELIDA					
Oligochaeta (Earthworms)	1				
Hirudinea (Leeches)	3	A	A		B
CRUSTACEA					
Amphipoda (Scuds)	13				
Potamonautidae* (Crabs)	3				
Atyidae (Freshwater Shrimps)	8				
Palaemonidae (Freshwater Prawns)	10				
HYDRACARINA (Mites)	8	1			1
PLECOPTERA (Stoneflies)					
Notonemouridae	14				
Perlidae	12				
EPHEMEROPTERA (Mayflies)					
Baetidae 1sp	4				
Baetidae 2 sp	6		B		
Baetidae > 2 sp	12	B			B
Caenidae (Squaregills/Cainfles)	6	B			B
Ephemeridae	15				
Heptageniidae (Flatheaded mayflies)	13				
Leptophlebiidae (Prongills)	9				
Oligoneuridae (Brushlegged mayflies)	15				
Polymitarcyidae (Pale Burrowers)	10				
Prosopistomatidae (Water specs)	15				
Teloganodidae SWC (Spiny Crawlers)	12				
Tricorythidae (Stout Crawlers)	9				
ODONATA (Dragonflies & Damselflies)					
Calopterygidae ST,T (Demoiselles)	10				
Chlorocyphidae (Jewels)	10				
Synlestidae (Chlorolestidae)(Sylphs)	8				
Coenagrionidae (Sprites and blues)	4	A	A		B
Lestidae (Emerald Damselflies/Spreadwings)	8				
Platycnemidae (Stream Damselflies)	10				
Protoneuridae (Threadwings)	8				
Aeshnidae (Hawkers & Emperors)	8				
Corduliidae (Cruisers)	8				
Gomphidae (Clubtails)	6				
Libellulidae (Darters/Skimmers)	4		A		A
LEPIDOPTERA (Aquatic Caterpillars/Moths)					
Crambidae (Pyralidae)	12				

Taxon	QV	S	Veg	GSM	TOT
HEMIPTERA (Bugs)					
Belostomatidae* (Giant water bugs)	3		1		A
Corixidae* (Water boatmen)	3				
Gerridae* (Pond skaters/Water striders)	5				
Hydrometridae* (Water measurers)	6				
Naucoridae* (Creeping water bugs)	7				
Nepidae* (Water scorpions)	3				
Notonectidae* (Backswimmers)	3	1			A
Pleidae* (Pygmy backswimmers)	4				
Veliidae/M...veliidae* (Ripple bugs)	5	1			1
MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
Corydalidae (Fishflies & Dobsonflies)	8				
Sialidae (Alderflies)	6				
TRICHOPTERA (Caddisflies)					
Dipseudopsidae	10				
Ecnomidae	8				
Hydropsychidae 1 sp	4				
Hydropsychidae 2 sp	6				
Hydropsychidae > 2 sp	12				
Philopotamidae	10				
Polycentropodidae	12				
Psychomyiidae/Xiphocentronidae	8				
Cased caddis:					
Barbarochthonidae SWC	13				
Calamoceratidae ST	11				
Glossosomatidae SWC	11				
Hydroptilidae	6				
Hydrosalpingidae SWC	15				
Lepidostomatidae	10				
Leptoceridae	6				
Petrothrincidae SWC	11				
Pisuliidae	10				
Sericostomatidae SWC	13				
COLEOPTERA (Beetles)					
Dytiscidae/Noteridae* (Diving beetles)	5	A	A		A
Elmidae/Dryopidae* (Riffle beetles)	8				
Gyrinidae* (Whirligig beetles)	5				
Haliplidae* (Crawling water beetles)	5				
Helodidae (Marsh beetles)	12				
Hydraenidae* (Minute moss beetles)	8		A		A
Hydrophilidae* (Water scavenger beetles)	5		1		1
Limnichidae (Marsh-Loving Beetles)	10				
Psephenidae (Water Pennies)	10				

Taxon	QV	S	Veg	GSM	TOT
DIPTERA (Flies)					
Athericidae (Snipe flies)	10				
Blepharoceridae (Mountain midges)	15				
Ceratopogonidae (Biting midges)	5	A	A		B
Chironomidae (Midges)	2	C	B		C
Culicidae* (Mosquitoes)	1	A	A		A
Dixidae* (Dixid midge)	10				
Empididae (Dance flies)	6				
Ephydridae (Shore flies)	3				
Muscidae (House flies, Stable flies)	1				
Psychodidae (Moth flies)	1				
Simuliidae (Blackflies)	5	B			A
Syrphidae* (Rat tailed maggots)	1				
Tabanidae (Horse flies)	5	1			1
Tipulidae (Crane flies)	5		A		A
GASTROPODA (Snails)					
Ancylidae (Limpets)	6				
Bulininae*	3				
Hydrobiidae*	3				
Lymnaeidae* (Pond snails)	3		A		A
Physidae* (Pouch snails)	3				
Planorbinae* (Orb snails)	3				
Thiaridae* (=Melanidae)	3				
Viviparidae* ST	5				
PELECYPODA (Bivalves)					
Corbiculidae (Clams)	5				
Sphaeriidae (Pill clams)	3				
Unionidae (Perly mussels)	6				
SASS Score					92
No. of Taxa					19
ASPT					4.8
Other biota:					
Comments/Observations:					

Tarka River

SASS Version 5 Score Sheet — Version date: Sep 2005

Time :					
Date (dd-mm-yr):	21-Sep-22				
Site Code:	TARK01_R	Grid reference (dd mm ss.s)	Lat: S	-32.283315	(dd.ddddd)
Collector/Sampler:	Kylie Farrell		Long: E	25.75928	
River:	TARKA		Datum (WGS84/Cape):		
Level 1 Ecoregion:	18: DROUGHT CORRIDOR		Altitude (m):		
Quaternary Catchment:	Q44C		Zonation:		
Site Description: 52	Temp (°C):	Routine or Project? (circle one)	Flow		
	pH:	Project Name:	Clarity (cm):		
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722	DO (mg/L):	WP11354	Turbidity:		
	Conductivity:		Colour:		
	Riparian Disturbance:				
	Instream Disturbance:				

Biotopes Sampled (tick & rate)	Rating (1-5)		Time (min)
	1		
Stones Out Of Current (SOOC)	3		
Bedrock	0		
Aquatic Veg	1		
MargVeg In Current	1		
MargVeg Out Of Current	1		
Gravel	2		
Sand	1		
Mud	4		
Hand picking/Visual observation	x		
Biotope Score (%)	31		

Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				
COELENTERATA (Cnidaria)	1				
TURBELLARIA (Flatworms)	3				
ANNELIDA					
Oligochaeta (Earthworms)	1				
Hirudinea (Leeches)	3				
CRUSTACEA					
Amphipoda (Scuds)	13				
Potamonautidae* (Crabs)	3	A	1		A
Atyidae (Freshwater Shrimps)	8				
Palaemonidae (Freshwater Prawns)	10				
HYDRACARINA (Mites)	8				
PLECOPTERA (Stoneflies)					
Notonemouridae	14				
Perlidae	12	1			1
EPHEMEROPTERA (Mayflies)					
Baetidae 1sp	4	1			
Baetidae 2 sp	6				
Baetidae > 2 sp	12		B		B
Caenidae (Squaregills/Cainfles)	6		A		A
Ephemeridae	15				
Heptageniidae (Flatheaded mayflies)	13	1			1
Leptophlebiidae (Prongills)	9				
Oligoneuridae (Brushlegged mayflies)	15				
Polymitarcyidae (Pale Burrowers)	10				
Prosopistomatidae (Water specs)	15				
Teloganodidae SWC (Spiny Crawlers)	12				
Tricorythidae (Stout Crawlers)	9				
ODONATA (Dragonflies & Damselflies)					
Calopterygidae ST,T (Demoiselles)	10				
Chlorocyphidae (Jewels)	10				
Synlestidae (Chlorolestidae)(Sylphs)	8				
Coenagrionidae (Sprites and blues)	4		A		A
Lestidae (Emerald Damselflies/Spreadwings)	8				
Platycnemidae (Stream Damselflies)	10				
Protoneuridae (Threadwings)	8				
Aeshnidae (Hawkers & Emperors)	8				
Corduliidae (Cruisers)	8				
Gomphidae (Clubtails)	6				
Libellulidae (Darters/Skimmers)	4				
LEPIDOPTERA (Aquatic Caterpillars/Moths)					
Crambidae (Pyralidae)	12				

Taxon	QV	S	Veg	GSM	TOT
HEMIPTERA (Bugs)					
Belostomatidae* (Giant water bugs)	3				
Corixidae* (Water boatmen)	3	A	A		B
Gerridae* (Pond skaters/Water striders)	5				
Hydrometridae* (Water measurers)	6				
Naucoridae* (Creeping water bugs)	7				
Nepidae* (Water scorpions)	3				
Notonectidae* (Backswimmers)	3		A		A
Pleidae* (Pygmy backswimmers)	4				
Veliidae/M...veliidae* (Ripple bugs)	5				
MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
Corydalidae (Fishflies & Dobsonflies)	8				
Sialidae (Alderflies)	6				
TRICHOPTERA (Caddisflies)					
Dipseudopsidae	10				
Ecnomidae	8				
Hydropsychidae 1 sp	4	1			1
Hydropsychidae 2 sp	6				
Hydropsychidae > 2 sp	12				
Philopotamidae	10				
Polycentropodidae	12				
Psychomyiidae/Xiphocentronidae	8				
Cased caddis:					
Barbarochthonidae SWC	13				
Calamoceratidae ST	11				
Glossosomatidae SWC	11				
Hydroptilidae	6				
Hydrosalpingidae SWC	15				
Lepidostomatidae	10				
Leptoceridae	6				
Petrothrincidae SWC	11				
Pisuliidae	10				
Sericostomatidae SWC	13				
COLEOPTERA (Beetles)					
Dytiscidae/Noteridae* (Diving beetles)	5				
Elmidae/Dryopidae* (Riffle beetles)	8				
Gyrinidae* (Whirligig beetles)	5				
Haliplidae* (Crawling water beetles)	5				
Helodidae (Marsh beetles)	12				
Hydraenidae* (Minute moss beetles)	8	A	1		A
Hydrophilidae* (Water scavenger beetles)	5		A		A
Limnichidae (Marsh-Loving Beetles)	10				
Psephenidae (Water Pennies)	10				

Taxon	QV	S	Veg	GSM	TOT
DIPTERA (Flies)					
Athericidae (Snipe flies)	10				
Blepharoceridae (Mountain midges)	15				
Ceratopogonidae (Biting midges)	5	A	A		B
Chironomidae (Midges)	2	C	B		C
Culicidae* (Mosquitoes)	1		1		1
Dixidae* (Dixid midge)	10				
Empididae (Dance flies)	6				
Ephydridae (Shore flies)	3				
Muscidae (House flies, Stable flies)	1		A		A
Psychodidae (Moth flies)	1				
Simuliidae (Blackflies)	5	B	B		B
Syrphidae* (Rat tailed maggots)	1				
Tabanidae (Horse flies)	5				
Tipulidae (Crane flies)	5				
GASTROPODA (Snails)					
Ancylidae (Limpets)	6				
Bulininae*	3				
Hydrobiidae*	3				
Lymnaeidae* (Pond snails)	3				
Physidae* (Pouch snails)	3				
Planorbinae* (Orb snails)	3				
Thiaridae* (=Melanidae)	3				
Viviparidae* ST	5				
PELECYPODA (Bivalves)					
Corbiculidae (Clams)	5				
Sphaeriidae (Pill clams)	3				
Unionidae (Perly mussels)	6				
SASS Score					87
No. of Taxa					16
ASPT					5.4
Other biota:					

Comments/Observations:

Sundays River (Lower)

Date (dd-mm-yr):	23-Sep-22																					
Site Code:	SUND02_R					**Grid reference (dd mm ss.s)**	**Lat:**	**S**	-33.404384		(dd.ddddd)		**Biotopes Sampled (tick & rate)**	**Rating (1-5)**							**Time (min)**	
Collector/Sampler:	Kylie Farrell						**Long:**	**E**	25.407919													
River:	Sundays (Lower)						**Datum (WGS84/Cape):**						**Stones Out Of Current (SOOC)**	5								
Level 1 Ecoregion:	20: SOUTH EASTERN COASTAL BELT						**Altitude (m):**						**Bedrock**	0								
Quaternary Catchment:	N40C						**Zonation:**						**Aquatic Veg**	0								
													MargVeg In Current	1								
Site Description: 52	**Temp (°C):**					**Routine or Project? (circle one)**		**Flow**					**MargVeg Out Of Current**	1								
	pH:					**Project Name:**		**Clarity (cm):**					**Gravel**	4								
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	**DO (mg/L):**					WP11354		**Turbidity:**					**Sand**	3								
	Conductivity:							**Colour:**					**Mud**	2								
	Riparian Disturbance:												**Hand picking/Visual observation**	x								
	Instream Disturbance:												**Biotope Score (%)**	47								

Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				B	**HEMIPTERA (Bugs)**						**DIPTERA (Flies)**					
COELENTERATA (Cnidaria)	1					Belostomatidae* (Giant water bugs)	3					Athericidae (Snipe flies)	10				
TURBELLARIA (Flatworms)	3	1		1	A	Corixidae* (Water boatmen)	3					Blepharoceridae (Mountain midges)	15				
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5					Ceratopogonidae (Biting midges)	5				
Oligochaeta (Earthworms)	1					Hydrometridae* (Water measurers)	6					Chironomidae (Midges)	2	A	B		B
Hirudinea (Leeches)	3					Naucoridae* (Creeping water bugs)	7					Culicidae* (Mosquitoes)	1		1		1
CRUSTACEA						Nepidae* (Water scorpions)	3					Dixidae* (Dixid midge)	10				
Amphipoda (Scuds)	13					Notonectidae* (Backswimmers)	3					Empididae (Dance flies)	6				
Potamonautidae* (Crabs)	3	A	A		A	Pleidae* (Pygmy backswimmers)	4					Ephydridae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Veliidae/M...veliidae* (Ripple bugs)	5					Muscidae (House flies, Stable flies)	1	A			A
Palaemonidae (Freshwater Prawns)	10					**MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)**						Psychodidae (Moth flies)	1				
HYDRACARINA (Mites)	8					Corydalidae (Fishflies & Dobsonflies)	8					Simuliidae (Blackflies)	5	C	B	B	D
PLECOPTERA (Stoneflies)						Sialidae (Alderflies)	6					Syrphidae* (Rat tailed maggots)	1				
Notonemouridae	14					**TRICHOPTERA (Caddisflies)**						Tabanidae (Horse flies)	5				
Perlidae	12					Dipseudopsidae	10					Tipulidae (Crane flies)	5				
EPHEMEROPTERA (Mayflies)						Ecnomidae	8					**GASTROPODA (Snails)**					
Baetidae 1sp	4					Hydropsychidae 1 sp	4			1		Ancylidae (Limpets)	6	A			B
Baetidae 2 sp	6		A	A		Hydropsychidae 2 sp	6	A			A	Bulininae*	3				
Baetidae > 2 sp	12	B			B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3				
Caenidae (Squaregills/Cainfles)	6		1		1	Philopotamidae	10					Lymnaeidae* (Pond snails)	3				
Ephemeridae	15					Polycentropodidae	12					Physidae* (Pouch snails)	3				
Heptageniidae (Flatheaded mayflies)	13					Psychomyiidae/Xiphocentronidae	8					Planorbinae* (Orb snails)	3				
Leptophlebiidae (Prongills)	9	1			1	**Cased caddis:**						Thiaridae* (=Melanidae)	3				
Oligoneuridae (Brushlegged mayflies)	15					Barbarochthonidae SWC	13					Viviparidae* ST	5				
Polymitarcyidae (Pale Burrowers)	10					Calamoceratidae ST	11					**PELECYPODA (Bivalves)**					
Prosopistomatidae (Water specs)	15					Glossosomatidae SWC	11					Corbiculidae (Clams)	5	A		A	A
Teloganodidae SWC (Spiny Crawlers)	12					Hydroptilidae	6					Sphaeriidae (Pill clams)	3				
Tricorythidae (Stout Crawlers)	9					Hydrosalpingidae SWC	15					Unionidae (Perly mussels)	6				
ODONATA (Dragonflies & Damselflies)						Lepidostomatidae	10					**SASS Score**					87
Calopterygidae ST,T (Demoiselles)	10					Leptoceridae	6					**No. of Taxa**					17
Chlorocyphidae (Jewels)	10		1		1	Petrothrincidae SWC	11					**ASPT**					5.1
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisuliidae	10					**Other biota:**					
Coenagrionidae (Sprites and blues)	4		A		A	Sericostomatidae SWC	13										
Lestidae (Emerald Damselflies/Spreadwings)	8					**COLEOPTERA (Beetles)**											
Platycnemidae (Stream Damselflies)	10					Dytiscidae/Noteridae* (Diving beetles)	5										
Protoneuridae (Threadwings)	8					Elmidae/Dryopidae* (Riffle beetles)	8										
Aeshnidae (Hawkers & Emperors)	8					Gyrinidae* (Whirligig beetles)	5					**Comments/Observations:**					
Corduliidae (Cruisers)	8					Haliplidae* (Crawling water beetles)	5										
Gomphidae (Clubtails)	6					Helodidae (Marsh beetles)	12										
Libellulidae (Darters/Skimmers)	4					Hydraenidae* (Minute moss beetles)	8		1		1						
LEPIDOPTERA (Aquatic Caterpillars/Moths)						Hydrophilidae* (Water scavenger beetles)	5										
Crambidae (Pyralidae)	12					Limnichidae (Marsh-Loving Beetles)	10										
						Psephenidae (Water Pennies)	10										

Kouga River

Date (dd-mm-yr):	07-Sep-22								(dd.ddddd)				**Biotopes Sampled (tick & rate)**	**Rating (1-5)**						**Time (min)**	
Site Code:	KOUG01_R					**Grid reference (dd mm ss.s) Lat:**	**S**	-33.788449						5							
Collector/Sampler:	KYLIE FARRELL					**Long:**	**E**	24.025821					**Stones Out Of Current (SOOC)**	5							
River:	KOUGA					**Datum (WGS84/Cape):**							**Bedrock**	1							
Level 1 Ecoregion:	19.Southern Folded Mountains					**Altitude (m):**							**Aquatic Veg**	5							
Quaternary Catchment:	L82E					**Zonation:**							**MargVeg In Current**	5							
	Temp (°C):					**Routine or Project? (circle one)**	**Flow**						**MargVeg Out Of Current**	3							
Site Description: 52	**pH:**					**Project Name:**	**Clarity (cm):**						**Gravel**	4							
Refer to Report Number:	**DO (mg/L):**					**WP11354**	**Turbidity:**						**Sand**	1							
WEM/WMA7/00/CON/RDM/0722	**Conductivity:**						**Colour:**						**Mud**	1							
	Riparian Disturbance:												**Hand picking/Visual observation**	x							
	Instream Disturbance:												**Biotope Score (%)**	67							

Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5					**HEMIPTERA (Bugs)**						**DIPTERA (Flies)**					
COELENTERATA (Cnidaria)	1					Belostomatidae* (Giant water bugs)	3					Athericidae (Snipe flies)	10	1			1
TURBELLARIA (Flatworms)	3					Corixidae* (Water boatmen)	3					Blepharoceridae (Mountain midges)	15				
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5					Ceratopogonidae (Biting midges)	5	1			1
Oligochaeta (Earthworms)	1	A			A	Hydrometridae* (Water measurers)	6					Chironomidae (Midges)	2	B	1		B
Hirudinea (Leeches)	3	1			1	Naucoridae* (Creeping water bugs)	7					Culicidae* (Mosquitoes)	1				
CRUSTACEA						Nepidae* (Water scorpions)	3					Dixidae* (Dixid midge)	10				
Amphipoda (Scuds)	13					Notonectidae* (Backswimmers)	3					Empididae (Dance flies)	6				
Potamonautidae* (Crabs)	3					Pleidae* (Pygmy backswimmers)	4					Ephydridae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Veliidae/M...veliidae* (Ripple bugs)	5					Muscidae (House flies, Stable flies)	1				
Palaemonidae (Freshwater Prawns)	10					**MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)**						Psychodidae (Moth flies)	1				
HYDRACARINA (Mites)	8					Corydalidae (Fishflies & Dobsonflies)	8					Simuliidae (Blackflies)	5	B	A		C
PLECOPTERA (Stoneflies)						Sialidae (Alderflies)	6					Syrphidae* (Rat tailed maggots)	1				
Notonemouridae	14					**TRICHOPTERA (Caddisflies)**						Tabanidae (Horse flies)	5	A			A
Perlidae	12					Dipseudopsidae	10					Tipulidae (Crane flies)	5				
EPHEMEROPTERA (Mayflies)						Ecnomidae	8					**GASTROPODA (Snails)**					
Baetidae 1sp	4					Hydropsychidae 1 sp	4	B			B	Ancylidae (Limpets)	6				
Baetidae 2 sp	6		B			Hydropsychidae 2 sp	6					Bulininae*	3		1		1
Baetidae > 2 sp	12	B			B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3				
Caenidae (Squaregills/Cainfles)	6	B			B	Philopotamidae	10					Lymnaeidae* (Pond snails)	3	A			A
Ephemeridae	15					Polycentropodidae	12					Physidae* (Pouch snails)	3	A			A
Heptageniidae (Flatheaded mayflies)	13	A			A	Psychomyiidae/Xiphocentronidae	8					Planorbinae* (Orb snails)	3				
Leptophlebiidae (Prongills)	9	B			B	**Cased caddis:**						Thiaridae* (=Melanidae)	3				
Oligoneuridae (Brushlegged mayflies)	15					Barbarochthonidae SWC	13					Viviparidae* ST	5				
Polymitarcyidae (Pale Burrowers)	10					Calamoceratidae ST	11					**PELECYPODA (Bivalvles)**					
Prosopistomatidae (Water specs)	15					Glossosomatidae SWC	11					Corbiculidae (Clams)	5	A			A
Teloganodidae SWC (Spiny Crawlers)	12					Hydroptilidae	6					Sphaeriidae (Pill clams)	3				
Tricorythidae (Stout Crawlers)	9					Hydrosalpingidae SWC	15					Unionidae (Perly mussels)	6				
ODONATA (Dragonflies & Damselflies)						Lepidostomatidae	10					**SASS Score**					145
Calopterygidae ST,T (Demoiselles)	10					Leptoceridae	6	B	B		B	**No. of Taxa**					24
Chlorocyphidae (Jewels)	10	1			1	Petrothrincidae SWC	11					**ASPT**					6.0
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisuliidae	10					**Other biota:**					
Coenagrionidae (Sprites and blues)	4		B		B	Sericostomatidae SWC	13										
Lestidae (Emerald Damselflies/Spreadwings)	8					**COLEOPTERA (Beetles)**											
Platycnemidae (Stream Damselflies)	10					Dytiscidae/Noteridae* (Diving beetles)	5										
Protoneuridae (Threadwings)	8					Elmidae/Dryopidae* (Riffle beetles)	8										
Aeshnidae (Hawkers & Emperors)	8	A			A	Gyrinidae* (Whirligig beetles)	5					**Comments/Observations:**					
Corduliidae (Cruisers)	8	A			A	Haliplidae* (Crawling water beetles)	5										
Gomphidae (Clubtails)	6	1			1	Helodidae (Marsh beetles)	12										
Libellulidae (Darters/Skimmers)	4		A		A	Hydraenidae* (Minute moss beetles)	8										
LEPIDOPTERA (Aquatic Caterpillars/Moths)						Hydrophilidae* (Water scavenger beetles)	5										
Crambidae (Pyralidae)	12					Limnichidae (Marsh-Loving Beetles)	10										
						Psephenidae (Water Pennies)	10	1			1						

INTERMEDIATE SITES

Mthatha River (Lower): July 2022

Date (dd-mm-yr):	07-Sep-22			(dd.ddddd)	
Site Code:	Mtat01_I	Grid reference (dd mm ss.s) Lat:	S	-31.925698	
Collector/Sampler:	Kylie Farrell	Long:	E	29.136048	
River:	Lower Mthatha	Datum (WGS84/Cape):			
Level 1 Ecoregion:	31: EASTERN COASTAL BELT	Altitude (m):			
Quaternary Catchment:	T20G	Zonation:			
	Temp (°C):		Routine or Project? (circle one)	Flow	
Site Description: 52	pH:		Project Name:	Clarity (cm):	
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	DO (mg/L):		WP11354	Turbidity:	
	Conductivity:			Colour:	
	Riparian Disturbance:				
	Instream Disturbance:				

Biotopes Sampled (tick & rate)	Rating (1-5)		Time (min)
Stones Out Of Current (SOOC)			
Bedrock			
Aquatic Veg			
MargVeg In Current			
MargVeg Out Of Current			
Gravel			
Sand			
Mud			
Hand picking/Visual observation			
Biotope Score (%)	-		

Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				
COELENTERATA (Cnidaria)	1				
TURBELLARIA (Flatworms)	3				
ANNELIDA					
Oligochaeta (Earthworms)	1				
Hirudinea (Leeches)	3				
CRUSTACEA					
Amphipoda (Scuds)	13				
Potamonautidae* (Crabs)	3			A	A
Atyidae (Freshwater Shrimps)	8			A	B
Palaemonidae (Freshwater Prawns)	10				B
HYDRACARINA (Mites)	8				
PLECOPTERA (Stoneflies)					
Notonemouridae	14				
Perlidae	12				B
EPHEMEROPTERA (Mayflies)					
Baetidae 1sp	4	A		1	A
Baetidae 2 sp	6				
Baetidae > 2 sp	12				
Caenidae (Squaregills/Cainfles)	6				
Ephemeridae	15				
Heptageniidae (Flatheaded mayflies)	13	A			B
Leptophlebiidae (Prongills)	9	A			A
Oligoneuridae (Brushlegged mayflies)	15				
Polymitarcyidae (Pale Burrowers)	10				
Prosopistomatidae (Water specs)	15				
Teloganodidae SWC (Spiny Crawlers)	12				
Tricorythidae (Stout Crawlers)	9				
ODONATA (Dragonflies & Damselflies)					
Calopterygidae ST,T (Demoiselles)	10				
Chlorocyphidae (Jewels)	10				
Synlestidae (Chlorolestidae)(Sylphs)	8				
Coenagrionidae (Sprites and blues)	4				
Lestidae (Emerald Damselflies/Spreadwings)	8				
Platycnemidae (Stream Damselflies)	10				
Protoneuridae (Threadwings)	8				
Aeshnidae (Hawkers & Emperors)	8				
Corduliidae (Cruisers)	8				
Gomphidae (Clubtails)	6				
Libellulidae (Darters/Skimmers)	4	A			A
LEPIDOPTERA (Aquatic Caterpillars/Moths)					
Crambidae (Pyralidae)	12				

Taxon	QV	S	Veg	GSM	TOT
HEMIPTERA (Bugs)					
Belostomatidae* (Giant water bugs)	3				
Corixidae* (Water boatmen)	3				
Gerridae* (Pond skaters/Water striders)	5				
Hydrometridae* (Water measurers)	6				
Naucoridae* (Creeping water bugs)	7				
Nepidae* (Water scorpions)	3				
Notonectidae* (Backswimmers)	3				
Pleidae* (Pygmy backswimmers)	4				
Veliidae/M...veliidae* (Ripple bugs)	5				
MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
Corydalidae (Fishflies & Dobsonflies)	8				
Sialidae (Alderflies)	6				
TRICHOPTERA (Caddisflies)					
Dipseudopsidae	10				
Ecnomidae	8				
Hydropsychidae 1 sp	4				A
Hydropsychidae 2 sp	6				
Hydropsychidae > 2 sp	12				
Philopotamidae	10	1			1
Polycentropodidae	12				
Psychomyiidae/Xiphocentronidae	8				
Cased caddis:					
Barbarochthonidae SWC	13				
Calamoceratidae ST	11				
Glossosomatidae SWC	11				
Hydroptilidae	6				
Hydrosalpingidae SWC	15				
Lepidostomatidae	10				
Leptoceridae	6				
Petrothrincidae SWC	11				
Pisuliidae	10				
Sericostomatidae SWC	13				
COLEOPTERA (Beetles)					
Dytiscidae/Noteridae* (Diving beetles)	5				
Elmidae/Dryopidae* (Riffle beetles)	8				
Gyrinidae* (Whirligig beetles)	5	A			B
Haliplidae* (Crawling water beetles)	5				
Helodidae (Marsh beetles)	12				
Hydraenidae* (Minute moss beetles)	8				
Hydrophilidae* (Water scavenger beetles)	5				
Limnichidae (Marsh-Loving Beetles)	10				
Psephenidae (Water Pennies)	10				

Taxon	QV	S	Veg	GSM	TOT
DIPTERA (Flies)					
Athericidae (Snipe flies)	10				
Blepharoceridae (Mountain midges)	15				
Ceratopogonidae (Biting midges)	5				
Chironomidae (Midges)	2			A	B
Culicidae* (Mosquitoes)	1				
Dixidae* (Dixid midge)	10				
Empididae (Dance flies)	6				
Ephydridae (Shore flies)	3				
Muscidae (House flies, Stable flies)	1				
Psychodidae (Moth flies)	1				
Simuliidae (Blackflies)	5	C		B	D
Syrphidae* (Rat tailed maggots)	1				
Tabanidae (Horse flies)	5				
Tipulidae (Crane flies)	5				
GASTROPODA (Snails)					
Ancylidae (Limpets)	6				B
Bulininae*	3				
Hydrobiidae*	3				
Lymnaeidae* (Pond snails)	3				
Physidae* (Pouch snails)	3				
Planorbinae* (Orb snails)	3				
Thiaridae* (=Melanidae)	3				
Viviparidae* ST	5				
PELECYPODA (Bivalvles)					
Corbiculidae (Clams)	5				
Sphaeriidae (Pill clams)	3				
Unionidae (Perly mussels)	6				
SASS Score					83
No. of Taxa					14
ASPT					5.9

Other biota:

Comments/Observations:

Mthatha River (Lower): May 2023

Not conducted due to floods

Mbhashe River (Middle): July 2022

Date (dd-mm-yr):	08-Sep-22				
Site Code:	Mbas01_I	**Grid reference (dd mm ss.s) Lat:**	**S**	-31.958131	(dd.ddddd)
Collector/Sampler:	Kylie Farrell	**Long:**	**E**	28.472236	
River:	Middle Mabashe	**Datum (WGS84/Cape):**			
Level 1 Ecoregion:	31: EASTERN COASTAL BELT	**Altitude (m):**			
Quaternary Catchment:	T13E	**Zonation:**			
Site Description: 52	**Temp (°C):**	**Routine or Project? (circle one)**	**Flow**		
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	**pH:**	**Project Name:**	**Clarity (cm):**		
	DO (mg/L):	WP11354	**Turbidity:**		
	Conductivity:		**Colour:**		
	Riparian Disturbance:				
	Instream Disturbance:				

Biotopes Sampled (tick & rate)	**Rating (1-5)**		**Time (min)**
	5		
Stones Out Of Current (SOOC)	5		
Bedrock	0		
Aquatic Veg	0		
MargVeg In Current	0		
MargVeg Out Of Current	1		
Gravel	4		
Sand	3		
Mud	3		
Hand picking/Visual observation	x		
Biotope Score (%)	47		

Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				
COELENTERATA (Cnidaria)	1				
TURBELLARIA (Flatworms)	3				
ANNELIDA					
Oligochaeta (Earthworms)	1				
Hirudinea (Leeches)	3				
CRUSTACEA					
Amphipoda (Scuds)	13				
Potamonautidae* (Crabs)	3		1		A
Atyidae (Freshwater Shrimps)	8				
Palaemonidae (Freshwater Prawns)	10				
HYDRACARINA (Mites)	8				
PLECOPTERA (Stoneflies)					
Notonemouridae	14				
Perlidae	12				
EPHEMEROPTERA (Mayflies)					
Baetidae 1sp	4				
Baetidae 2 sp	6	B	A	A	
Baetidae > 2 sp	12	B		A	B
Caenidae (Squaregills/Cainfles)	6		A		A
Ephemeridae	15				
Heptageniidae (Flatheaded mayflies)	13				
Leptophlebiidae (Prongills)	9	B		A	B
Oligoneuridae (Brushlegged mayflies)	15				
Polymitarcyidae (Pale Burrowers)	10				
Prosopistomatidae (Water specs)	15				
Teloganodidae SWC (Spiny Crawlers)	12				
Tricorythidae (Stout Crawlers)	9				
ODONATA (Dragonflies & Damselflies)					
Calopterygidae ST,T (Demoiselles)	10				
Chlorocyphidae (Jewels)	10				
Synlestidae (Chlorolestidae)(Sylphs)	8				
Coenagrionidae (Sprites and blues)	4		A		A
Lestidae (Emerald Damselflies/Spreadwings)	8				
Platycnemidae (Stream Damselflies)	10				
Protoneuridae (Threadwings)	8				
Aeshnidae (Hawkers & Emperors)	8				
Corduliidae (Cruisers)	8				
Gomphidae (Clubtails)	6			A	A
Libellulidae (Darters/Skimmers)	4	A			A
LEPIDOPTERA (Aquatic Caterpillars/Moths)					
Crambidae (Pyralidae)	12				

Taxon	QV	S	Veg	GSM	TOT
HEMIPTERA (Bugs)					
Belostomatidae* (Giant water bugs)	3		A		A
Corixidae* (Water boatmen)	3				
Gerridae* (Pond skaters/Water striders)	5				
Hydrometridae* (Water measurers)	6				
Naucoridae* (Creeping water bugs)	7				
Nepidae* (Water scorpions)	3				
Notonectidae* (Backswimmers)	3				
Pleidae* (Pygmy backswimmers)	4				
Veliidae/M...veliidae* (Ripple bugs)	5				
MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
Corydalidae (Fishflies & Dobsonflies)	8				
Sialidae (Alderflies)	6				
TRICHOPTERA (Caddisflies)					
Dipseudopsidae	10				
Ecnomidae	8				
Hydropsychidae 1 sp	4				
Hydropsychidae 2 sp	6	B			B
Hydropsychidae > 2 sp	12				
Philopotamidae	10				
Polycentropodidae	12				
Psychomyiidae/Xiphocentronidae	8				
Cased caddis:					
Barbarochthonidae SWC	13				
Calamoceratidae ST	11				
Glossosomatidae SWC	11				
Hydroptilidae	6				
Hydrosalpingidae SWC	15				
Lepidostomatidae	10				
Leptoceridae	6		A		A
Petrothrincidae SWC	11				
Pisuliidae	10				
Sericostomatidae SWC	13				
COLEOPTERA (Beetles)					
Dytiscidae/Noteridae* (Diving beetles)	5				
Elmidae/Dryopidae* (Riffle beetles)	8				
Gyrinidae* (Whirligig beetles)	5	1	1		A
Haliplidae* (Crawling water beetles)	5	A	A		B
Helodidae (Marsh beetles)	12				
Hydraenidae* (Minute moss beetles)	8				
Hydrophilidae* (Water scavenger beetles)	5		A		A
Limnichidae (Marsh-Loving Beetles)	10				
Psephenidae (Water Pennies)	10				

Taxon	QV	S	Veg	GSM	TOT
DIPTERA (Flies)					
Athericidae (Snipe flies)	10				
Blepharoceridae (Mountain midges)	15				
Ceratopogonidae (Biting midges)	5				
Chironomidae (Midges)	2				
Culicidae* (Mosquitoes)	1				
Dixidae* (Dixid midge)	10				
Empididae (Dance flies)	6				
Ephydridae (Shore flies)	3				
Muscidae (House flies, Stable flies)	1				
Psychodidae (Moth flies)	1				
Simuliidae (Blackflies)	5	B			B
Syrphidae* (Rat tailed maggots)	1				
Tabanidae (Horse flies)	5				
Tipulidae (Crane flies)	5				
GASTROPODA (Snails)					
Ancylidae (Limpets)	6				
Bulininae*	3				
Hydrobiidae*	3				
Lymnaeidae* (Pond snails)	3				
Physidae* (Pouch snails)	3		A		A
Planorbinae* (Orb snails)	3				
Thiaridae* (=Melanidae)	3				
Viviparidae* ST	5				
PELECYPODA (Bivalvles)					
Corbiculidae (Clams)	5				
Sphaeriidae (Pill clams)	3				
Unionidae (Perly mussels)	6				
SASS Score					85
No. of Taxa					15
ASPT					5.7
Other biota:					
Comments/Observations:					

Mbhashe River (Middle): May 2023

Date (dd-mm-yr):	08-Sep-22										(dd.ddddd)		**Biotopes Sampled (tick & rate)**	**Rating (1-5)**				**Time (min)**			
Site Code:	Mbas01_I					**Grid reference (dd mm ss.s) Lat:**	**S**	-31.958131						2							
Collector/Sampler:	Kylie Farrell					**Long:**	**E**	28.472236					**Stones Out Of Current (SOOC)**	3							
River:	Middle Mabashe					**Datum (WGS84/Cape):**							**Bedrock**	5							
Level 1 Ecoregion:	31: EASTERN COASTAL BELT					**Altitude (m):**							**Aquatic Veg**	0							
Quaternary Catchment:	T13E					**Zonation:**							**MargVeg In Current**	0							
	Temp (°C):					**Routine or Project? (circle one)**		**Flow**					**MargVeg Out Of Current**	1							
Site Description: 52	**pH:**					**Project Name:**		**Clarity (cm):**					**Gravel**	3							
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	**DO (mg/L):**					WP11354		**Turbidity:**					**Sand**	4							
	Conductivity:							**Colour:**					**Mud**	4							
	Riparian Disturbance:												**Hand picking/Visual observation**	x							
	Instream Disturbance:												**Biotope Score (%)**	49							

Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5					**HEMIPTERA (Bugs)**						**DIPTERA (Flies)**					
COELENTERATA (Cnidaria)	1					Belostomatidae* (Giant water bugs)	3		1		1	Athericidae (Snipe flies)	10				
TURBELLARIA (Flatworms)	3					Corixidae* (Water boatmen)	3	A	A	1	B	Blepharoceridae (Mountain midges)	15				
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5					Ceratopogonidae (Biting midges)	5				
Oligochaeta (Earthworms)	1					Hydrometridae* (Water measurers)	6					Chironomidae (Midges)	2	1		A	A
Hirudinea (Leeches)	3					Naucoridae* (Creeping water bugs)	7					Culicidae* (Mosquitoes)	1				
CRUSTACEA						Nepidae* (Water scorpions)	3					Dixidae* (Dixid midge)	10				
Amphipoda (Scuds)	13					Notonectidae* (Backswimmers)	3		A		A	Empididae (Dance flies)	6				
Potamonautidae* (Crabs)	3					Pleidae* (Pygmy backswimmers)	4		B		B	Ephydridae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Veliidae/M...veliidae* (Ripple bugs)	5		A		A	Muscidae (House flies, Stable flies)	1				
Palaemonidae (Freshwater Prawns)	10					**MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)**						Psychodidae (Moth flies)	1				
HYDRACARINA (Mites)	8					Corydalidae (Fishflies & Dobsonflies)	8					Simuliidae (Blackflies)	5				
PLECOPTERA (Stoneflies)						Sialidae (Alderflies)	6					Syrphidae* (Rat tailed maggots)	1				
Notonemouridae	14					**TRICHOPTERA (Caddisflies)**						Tabanidae (Horse flies)	5				
Perlidae	12	1			A	Dipseudopsidae	10					Tipulidae (Crane flies)	5				
EPHEMEROPTERA (Mayflies)						Ecnomidae	8					**GASTROPODA (Snails)**					
Baetidae 1sp	4		1	1		Hydropsychidae 1 sp	4					Ancylidae (Limpets)	6				A
Baetidae 2 sp	6					Hydropsychidae 2 sp	6	B			B	Bulininae*	3				
Baetidae > 2 sp	12	B			B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3				
Caenidae (Squaregills/Cainfles)	6					Philopotamidae	10					Lymnaeidae* (Pond snails)	3				
Ephemeridae	15					Polycentropodidae	12					Physidae* (Pouch snails)	3			B	B
Heptageniidae (Flatheaded mayflies)	13	A			B	Psychomyiidae/Xiphocentronidae	8					Planorbinae* (Orb snails)	3				
Leptophlebiidae (Prongills)	9	A			B	**Cased caddis:**						Thiaridae* (=Melanidae)	3				
Oligoneuridae (Brushlegged mayflies)	15	1			1	Barbarochthonidae SWC	13					Viviparidae* ST	5				
Polymitarcyidae (Pale Burrowers)	10					Calamoceratidae ST	11					**PELECYPODA (Bivalvles)**					
Prosopistomatidae (Water specs)	15					Glossosomatidae SWC	11					Corbiculidae (Clams)	5				
Teloganodidae SWC (Spiny Crawlers)	12					Hydroptilidae	6					Sphaeriidae (Pill clams)	3				
Tricorythidae (Stout Crawlers)	9	A			B	Hydrosalpingidae SWC	15					Unionidae (Perly mussels)	6				
ODONATA (Dragonflies & Damselflies)						Lepidostomatidae	10					**SASS Score**					124
Calopterygidae ST,T (Demoiselles)	10					Leptoceridae	6					**No. of Taxa**					19
Chlorocyphidae (Jewels)	10					Petrothrincidae SWC	11					**ASPT**					6.5
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisuliidae	10					**Other biota:**					
Coenagrionidae (Sprites and blues)	4		A		A	Sericostomatidae SWC	13										
Lestidae (Emerald Damselflies/Spreadwings)	8					**COLEOPTERA (Beetles)**											
Platycnemidae (Stream Damselflies)	10					Dytiscidae/Noteridae* (Diving beetles)	5		A		A						
Protoneuridae (Threadwings)	8					Elmidae/Dryopidae* (Riffle beetles)	8										
Aeshnidae (Hawkers & Emperors)	8					Gyrinidae* (Whirligig beetles)	5					**Comments/Observations:**					
Corduliidae (Cruisers)	8					Haliplidae* (Crawling water beetles)	5										
Gomphidae (Clubtails)	6		1	B	B	Helodidae (Marsh beetles)	12										
Libellulidae (Darters/Skimmers)	4	A			A	Hydraenidae* (Minute moss beetles)	8										
LEPIDOPTERA (Aquatic Caterpillars/Moths)						Hydrophilidae* (Water scavenger beetles)	5										
Crambidae (Pyralidae)	12					Limnichidae (Marsh-Loving Beetles)	10										
						Psephenidae (Water Pennies)	10										

Black Kei River: July 2022

Date (dd-mm-yr):	07-Sep-22																				
Site Code:	BKEI01_I					**Grid reference (dd mm ss.s) Lat:**	**S**	-32.118266													
Collector/Sampler:	Kylie Farrell					**Long:**	**E**	27.068903													
River:	Black Kei					**Datum (WGS84/Cape):**															
Level 1 Ecoregion:	18: DROUGHT CORRIDOR					**Altitude (m):**															
Quaternary Catchment:	S32K					**Zonation:**															
	Temp (°C):					**Routine or Project? (circle one)**		**Flow**													
Site Description: 52	**pH:**					**Project Name:**		**Clarity (cm):**													
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	**DO (mg/L):**					WP11354		**Turbidity:**													
	Conductivity:							**Colour:**													
	Riparian Disturbance:																				
	Instream Disturbance:																				

Biotopes Sampled (tick & rate)	**Rating (1-5)**		**Time (min)**
	5		
Stones Out Of Current (SOOC)	3		
Bedrock	5		
Aquatic Veg	1		
MargVeg In Current	2		
MargVeg Out Of Current	2		
Gravel	3		
Sand	2		
Mud	2		
Hand picking/Visual observation	x		
Biotope Score (%)	56		

Taxon	**QV**	**S**	**Veg**	**GSM**	**TOT**	**Taxon**	**QV**	**S**	**Veg**	**GSM**	**TOT**	**Taxon**	**QV**	**S**	**Veg**	**GSM**	**TOT**
PORIFERA (Sponge)	5					**HEMIPTERA (Bugs)**						**DIPTERA (Flies)**					
COELENTERATA (Cnidaria)	1					Belostomatidae* (Giant water bugs)	3					Athericidae (Snipe flies)	10				
TURBELLARIA (Flatworms)	3					Corixidae* (Water boatmen)	3					Blepharoceridae (Mountain midges)	15				
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5					Ceratopogonidae (Biting midges)	5			1	1
Oligochaeta (Earthworms)	1					Hydrometridae* (Water measurers)	6					Chironomidae (Midges)	2	A		A	A
Hirudinea (Leeches)	3					Naucoridae* (Creeping water bugs)	7					Culicidae* (Mosquitoes)	1				
CRUSTACEA						Nepidae* (Water scorpions)	3				1	Dixidae* (Dixid midge)	10				
Amphipoda (Scuds)	13					Notonectidae* (Backswimmers)	3					Empididae (Dance flies)	6				
Potamonautidae* (Crabs)	3					Pleidae* (Pygmy backswimmers)	4					Ephydridae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Veliidae/M...veliidae* (Ripple bugs)	5					Muscidae (House flies, Stable flies)	1				
Palaemonidae (Freshwater Prawns)	10					**MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)**						Psychodidae (Moth flies)	1				
HYDRACARINA (Mites)	8					Corydalidae (Fishflies & Dobsonflies)	8					Simuliidae (Blackflies)	5	B	B		D
PLECOPTERA (Stoneflies)						Sialidae (Alderflies)	6					Syrphidae* (Rat tailed maggots)	1				
Notonemouridae	14					**TRICHOPTERA (Caddisflies)**						Tabanidae (Horse flies)	5				
Perlidae	12					Dipseudopsidae	10					Tipulidae (Crane flies)	5				
EPHEMEROPTERA (Mayflies)						Ecnomidae	8					**GASTROPODA (Snails)**					
Baetidae 1sp	4					Hydropsychidae 1 sp	4					Ancylidae (Limpets)	6		A		A
Baetidae 2 sp	6		B	A		Hydropsychidae 2 sp	6	A			A	Bulininae*	3				
Baetidae > 2 sp	12	B	B		B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3				
Caenidae (Squaregills/Cainfles)	6					Philopotamidae	10					Lymnaeidae* (Pond snails)	3				
Ephemeridae	15					Polycentropodidae	12					Physidae* (Pouch snails)	3		A		A
Heptageniidae (Flatheaded mayflies)	13					Psychomyiidae/Xiphocentronidae	8					Planorbinae* (Orb snails)	3				
Leptophlebiidae (Prongills)	9					**Cased caddis:**						Thiaridae* (=Melanidae)	3				
Oligoneuridae (Brushlegged mayflies)	15					Barbarochthonidae SWC	13					Viviparidae* ST	5				
Polymitarcyidae (Pale Burrowers)	10					Calamoceratidae ST	11					**PELECYPODA (Bivalvles)**					
Prosopistomatidae (Water specs)	15					Glossosomatidae SWC	11					Corbiculidae (Clams)	5				
Teloganodidae SWC (Spiny Crawlers)	12					Hydroptilidae	6					Sphaeriidae (Pill clams)	3				
Tricorythidae (Stout Crawlers)	9					Hydrosalpingidae SWC	15					Unionidae (Perly mussels)	6				
ODONATA (Dragonflies & Damselflies)						Lepidostomatidae	10					**SASS Score**					59
Calopterygidae ST,T (Demoiselles)	10					Leptoceridae	6					**No. of Taxa**					12
Chlorocyphidae (Jewels)	10					Petrothrincidae SWC	11					**ASPT**					4.9
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisuliidae	10					**Other biota:**					
Coenagrionidae (Sprites and blues)	4		B		B	Sericostomatidae SWC	13										
Lestidae (Emerald Damselflies/Spreadwings)	8					**COLEOPTERA (Beetles)**											
Platycnemidae (Stream Damselflies)	10					Dytiscidae/Noteridae* (Diving beetles)	5										
Protoneuridae (Threadwings)	8					Elmidae/Dryopidae* (Riffle beetles)	8										
Aeshnidae (Hawkers & Emperors)	8					Gyrinidae* (Whirligig beetles)	5		A	A	B	**Comments/Observations:**					
Corduliidae (Cruisers)	8					Haliplidae* (Crawling water beetles)	5										
Gomphidae (Clubtails)	6			A	A	Helodidae (Marsh beetles)	12										
Libellulidae (Darters/Skimmers)	4	1			1	Hydraenidae* (Minute moss beetles)	8										
LEPIDOPTERA (Aquatic Caterpillars/Moths)						Hydrophilidae* (Water scavenger beetles)	5										
Crambidae (Pyralidae)	12					Limnichidae (Marsh-Loving Beetles)	10										
						Psephenidae (Water Pennies)	10										

Black Kei River: May 2023

Date (dd-mm-yr):	10-May-23		(dd.ddddd)	Biotopes Sampled (tick & rate)	Rating (1-5) / Time (min)
Site Code:	BKEI01_I	Grid reference (dd mm ss.s) Lat: S	-32.118266		5
Collector/Sampler:	Kylie Farrell	Long: E	27.068903	Stones Out Of Current (SOOC)	3
River:	Black Kei	Datum (WGS84/Cape):		Bedrock	5
Level 1 Ecoregion:	18: DROUGHT CORRIDOR	Altitude (m):		Aquatic Veg	1
Quaternary Catchment:	S32K	Zonation:		MargVeg In Current	2
	Temp (°C):	Routine or Project? (circle one)	Flow	MargVeg Out Of Current	2
Site Description: 52	pH:	Project Name:	Clarity (cm):	Gravel	3
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	DO (mg/L):	WP11354	Turbidity:	Sand	2
	Conductivity:		Colour:	Mud	2
	Riparian Disturbance:			Hand picking/Visual observation	x
	Instream Disturbance:			Biotope Score (%)	56

Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				
COELENTERATA (Cnidaria)	1				
TURBELLARIA (Flatworms)	3				
ANNELIDA					
Oligochaeta (Earthworms)	1				
Hirudinea (Leeches)	3				
CRUSTACEA					
Amphipoda (Scuds)	13				
Potamonautidae* (Crabs)	3				
Atyidae (Freshwater Shrimps)	8				
Palaemonidae (Freshwater Prawns)	10				
HYDRACARINA (Mites)	8				
PLECOPTERA (Stoneflies)					
Notonemouridae	14				
Perlidae	12				
EPHEMEROPTERA (Mayflies)					
Baetidae 1sp	4				
Baetidae 2 sp	6	B			B
Baetidae > 2 sp	12				
Caenidae (Squaregills/Cainfles)	6				
Ephemeridae	15				
Heptageniidae (Flatheaded mayflies)	13				
Leptophlebiidae (Prongills)	9	1			1
Oligoneuridae (Brushlegged mayflies)	15				
Polymitarcyidae (Pale Burrowers)	10				
Prosopistomatidae (Water specs)	15				
Teloganodidae SWC (Spiny Crawlers)	12				
Tricorythidae (Stout Crawlers)	9	1			1
ODONATA (Dragonflies & Damselflies)					
Calopterygidae ST,T (Demoiselles)	10				
Chlorocyphidae (Jewels)	10				
Synlestidae (Chlorolestidae)(Sylphs)	8				
Coenagrionidae (Sprites and blues)	4				
Lestidae (Emerald Damselflies/Spreadwings)	8				
Platycnemidae (Stream Damselflies)	10				
Protoneuridae (Threadwings)	8				
Aeshnidae (Hawkers & Emperors)	8				
Corduliidae (Cruisers)	8				
Gomphidae (Clubtails)	6			A	A
Libellulidae (Darters/Skimmers)	4	A			A
LEPIDOPTERA (Aquatic Caterpillars/Moths)					
Crambidae (Pyralidae)	12				

Taxon	QV	S	Veg	GSM	TOT
HEMIPTERA (Bugs)					
Belostomatidae* (Giant water bugs)	3				
Corixidae* (Water boatmen)	3	A			A
Gerridae* (Pond skaters/Water striders)	5				
Hydrometridae* (Water measurers)	6				
Naucoridae* (Creeping water bugs)	7				
Nepidae* (Water scorpions)	3				
Notonectidae* (Backswimmers)	3				
Pleidae* (Pygmy backswimmers)	4				
Veliidae/M...veliidae* (Ripple bugs)	5				
MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
Corydalidae (Fishflies & Dobsonflies)	8				
Sialidae (Alderflies)	6				
TRICHOPTERA (Caddisflies)					
Dipseudopsidae	10				
Ecnomidae	8				
Hydropsychidae 1 sp	4	1			A
Hydropsychidae 2 sp	6				
Hydropsychidae > 2 sp	12				
Philopotamidae	10				
Polycentropodidae	12				
Psychomyiidae/Xiphocentronidae	8				
Cased caddis:					
Barbarochthonidae SWC	13				
Calamoceratidae ST	11				
Glossosomatidae SWC	11				
Hydroptilidae	6				
Hydrosalpingidae SWC	15				
Lepidostomatidae	10				
Leptoceridae	6				
Petrothrincidae SWC	11				
Pisuliidae	10				
Sericostomatidae SWC	13				
COLEOPTERA (Beetles)					
Dytiscidae/Noteridae* (Diving beetles)	5				
Elmidae/Dryopidae* (Riffle beetles)	8				
Gyrinidae* (Whirligig beetles)	5	1			A
Haliplidae* (Crawling water beetles)	5				
Helodidae (Marsh beetles)	12				
Hydraenidae* (Minute moss beetles)	8				
Hydrophilidae* (Water scavenger beetles)	5			A	A
Limnichidae (Marsh-Loving Beetles)	10				
Psephenidae (Water Pennies)	10				

Taxon	QV	S	Veg	GSM	TOT
DIPTERA (Flies)					
Athericidae (Snipe flies)	10				
Blepharoceridae (Mountain midges)	15				
Ceratopogonidae (Biting midges)	5				
Chironomidae (Midges)	2	A		B	B
Culicidae* (Mosquitoes)	1				
Dixidae* (Dixid midge)	10				
Empididae (Dance flies)	6				
Ephydridae (Shore flies)	3				
Muscidae (House flies, Stable flies)	1				
Psychodidae (Moth flies)	1				
Simuliidae (Blackflies)	5	C		B	D
Syrphidae* (Rat tailed maggots)	1				
Tabanidae (Horse flies)	5				
Tipulidae (Crane flies)	5				
GASTROPODA (Snails)					
Ancylidae (Limpets)	6				
Bulininae*	3				
Hydrobiidae*	3				
Lymnaeidae* (Pond snails)	3				
Physidae* (Pouch snails)	3				
Planorbinae* (Orb snails)	3				
Thiaridae* (=Melanidae)	3				
Viviparidae* ST	5				
PELECYPODA (Bivalvles)					
Corbiculidae (Clams)	5				
Sphaeriidae (Pill clams)	3				
Unionidae (Perly mussels)	6				
SASS Score					58
No. of Taxa					11
ASPT					5.3
Other biota:					
Comments/Observations:					

Tsomo River: July 2022

Date (dd-mm-yr):	07-Sep-22		(dd.ddddd)	Biotopes Sampled (tick & rate)	Rating (1-5) / Time (min)
Site Code:	Tsom_01_I	Grid reference (dd mm ss.s) Lat: S	-32.04492		3
Collector/Sampler:	Kylie Farrell	Long: E	27.821557	Stones Out Of Current (SOOC)	4
River:	Tsomo	Datum (WGS84/Cape):		Bedrock	5
Level 1 Ecoregion:	16: SOUTH EASTERN UPLANDS	Altitude (m):		Aquatic Veg	1
Quaternary Catchment:	S50G	Zonation:		MargVeg In Current	1
	Temp (°C):	Routine or Project? (circle one)	Flow	MargVeg Out Of Current	0
Site Description: 52	pH:	Project Name:	Clarity (cm):	Gravel	4
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	DO (mg/L):	WP11354	Turbidity:	Sand	5
	Conductivity:		Colour:	Mud	5
	Riparian Disturbance:			Hand picking/Visual observation	x
	Instream Disturbance:			Biotope Score (%)	62

Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				
COELENTERATA (Cnidaria)	1				
TURBELLARIA (Flatworms)	3				
ANNELIDA					
Oligochaeta (Earthworms)	1				
Hirudinea (Leeches)	3				
CRUSTACEA					
Amphipoda (Scuds)	13				
Potamonautidae* (Crabs)	3		1		1
Atyidae (Freshwater Shrimps)	8				
Palaemonidae (Freshwater Prawns)	10				
HYDRACARINA (Mites)	8	A			A
PLECOPTERA (Stoneflies)					
Notonemouridae	14				
Perlidae	12				
EPHEMEROPTERA (Mayflies)					
Baetidae 1sp	4				
Baetidae 2 sp	6		B		
Baetidae > 2 sp	12	B			B
Caenidae (Squaregills/Cainfles)	6		1		1
Ephemeridae	15				
Heptageniidae (Flatheaded mayflies)	13	A			A
Leptophlebiidae (Prongills)	9	A			A
Oligoneuridae (Brushlegged mayflies)	15				
Polymitarcyidae (Pale Burrowers)	10				
Prosopistomatidae (Water specs)	15				
Teloganodidae SWC (Spiny Crawlers)	12				
Tricorythidae (Stout Crawlers)	9				
ODONATA (Dragonflies & Damselflies)					
Calopterygidae ST,T (Demoiselles)	10				
Chlorocyphidae (Jewels)	10				
Synlestidae (Chlorolestidae)(Sylphs)	8				
Coenagrionidae (Sprites and blues)	4				
Lestidae (Emerald Damselflies/Spreadwings)	8				
Platycnemidae (Stream Damselflies)	10				
Protoneuridae (Threadwings)	8				
Aeshnidae (Hawkers & Emperors)	8				
Corduliidae (Cruisers)	8				
Gomphidae (Clubtails)	6			1	1
Libellulidae (Darters/Skimmers)	4				
LEPIDOPTERA (Aquatic Caterpillars/Moths)					
Crambidae (Pyralidae)	12				

Taxon	QV	S	Veg	GSM	TOT
HEMIPTERA (Bugs)					
Belostomatidae* (Giant water bugs)	3				
Corixidae* (Water boatmen)	3			A	A
Gerridae* (Pond skaters/Water striders)	5				
Hydrometridae* (Water measurers)	6				
Naucoridae* (Creeping water bugs)	7				
Nepidae* (Water scorpions)	3				
Notonectidae* (Backswimmers)	3				
Pleidae* (Pygmy backswimmers)	4				
Veliidae/M...veliidae* (Ripple bugs)	5				
MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
Corydalidae (Fishflies & Dobsonflies)	8				
Sialidae (Alderflies)	6				
TRICHOPTERA (Caddisflies)					
Dipseudopsidae	10				
Ecnomidae	8				
Hydropsychidae 1 sp	4				
Hydropsychidae 2 sp	6	B			B
Hydropsychidae > 2 sp	12				
Philopotamidae	10				
Polycentropodidae	12				
Psychomyiidae/Xiphocentronidae	8				
Cased caddis:					
Barbarochthonidae SWC	13				
Calamoceratidae ST	11				
Glossosomatidae SWC	11				
Hydroptilidae	6				
Hydrosalpingidae SWC	15				
Lepidostomatidae	10				
Leptoceridae	6				
Petrothrincidae SWC	11				
Pisuliidae	10				
Sericostomatidae SWC	13				
COLEOPTERA (Beetles)					
Dytiscidae/Noteridae* (Diving beetles)	5				
Elmidae/Dryopidae* (Riffle beetles)	8				
Gyrinidae* (Whirligig beetles)	5	A			A
Haliplidae* (Crawling water beetles)	5				
Helodidae (Marsh beetles)	12				
Hydraenidae* (Minute moss beetles)	8				
Hydrophilidae* (Water scavenger beetles)	5				
Limnichidae (Marsh-Loving Beetles)	10				
Psephenidae (Water Pennies)	10				

Taxon	QV	S	Veg	GSM	TOT
DIPTERA (Flies)					
Athericidae (Snipe flies)	10				
Blepharoceridae (Mountain midges)	15				
Ceratopogonidae (Biting midges)	5		1	1	A
Chironomidae (Midges)	2	B	A		B
Culicidae* (Mosquitoes)	1				
Dixidae* (Dixid midge)	10				
Empididae (Dance flies)	6				
Ephydridae (Shore flies)	3				
Muscidae (House flies, Stable flies)	1		1		1
Psychodidae (Moth flies)	1				
Simuliidae (Blackflies)	5	C			D
Syrphidae* (Rat tailed maggots)	1				
Tabanidae (Horse flies)	5				
Tipulidae (Crane flies)	5				
GASTROPODA (Snails)					
Ancylidae (Limpets)	6				
Bulininae*	3				
Hydrobiidae*	3				
Lymnaeidae* (Pond snails)	3				
Physidae* (Pouch snails)	3		A		A
Planorbinae* (Orb snails)	3				
Thiaridae* (=Melanidae)	3				
Viviparidae* ST	5				
PELECYPODA (Bivalvles)					
Corbiculidae (Clams)	5				
Sphaeriidae (Pill clams)	3				
Unionidae (Perly mussels)	6				
SASS Score					87
No. of Taxa					15
ASPT					5.8
Other biota:					
Comments/Observations:					

Tsomo River: May 2023

Date (dd-mm-yr):	11-May-23			(dd.ddddd)	Biotopes Sampled (tick & rate)	Rating (1-5)	Time (min)
Site Code:	Tsom_01_I	Grid reference (dd mm ss.s) Lat:	S	-32.04492		3	
Collector/Sampler:	Kylie Farrell	Long:	E	27.821557	Stones Out Of Current (SOOC)	3	
River:	Tsomo	Datum (WGS84/Cape):			Bedrock	5	
Level 1 Ecoregion:	16: SOUTH EASTERN UPLANDS	Altitude (m):			Aquatic Veg	0	
Quaternary Catchment:	S50G	Zonation:			MargVeg In Current	0	
	Temp (°C):	Routine or Project? (circle one)	Flow		MargVeg Out Of Current	0	
Site Description: 52	pH:	Project Name:	Clarity (cm):		Gravel	2	
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	DO (mg/L):	WP11354	Turbidity:		Sand	5	
	Conductivity:		Colour:		Mud	5	
	Riparian Disturbance:				Hand picking/Visual observation	x	
	Instream Disturbance:				Biotope Score (%)	51	

Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5					**HEMIPTERA (Bugs)**						**DIPTERA (Flies)**					
COELENTERATA (Cnidaria)	1					Belostomatidae* (Giant water bugs)	3					Athericidae (Snipe flies)	10				
TURBELLARIA (Flatworms)	3					Corixidae* (Water boatmen)	3	A		A	B	Blepharoceridae (Mountain midges)	15				
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5					Ceratopogonidae (Biting midges)	5				
Oligochaeta (Earthworms)	1					Hydrometridae* (Water measurers)	6					Chironomidae (Midges)	2	A		A	A
Hirudinea (Leeches)	3					Naucoridae* (Creeping water bugs)	7	1		A	A	Culicidae* (Mosquitoes)	1				
CRUSTACEA						Nepidae* (Water scorpions)	3					Dixidae* (Dixid midge)	10				
Amphipoda (Scuds)	13					Notonectidae* (Backswimmers)	3					Empididae (Dance flies)	6				
Potamonautidae* (Crabs)	3					Pleidae* (Pygmy backswimmers)	4					Ephydridae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Veliidae/M...veliidae* (Ripple bugs)	5				A	Muscidae (House flies, Stable flies)	1				
Palaemonidae (Freshwater Prawns)	10					**MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)**						Psychodidae (Moth flies)	1				
HYDRACARINA (Mites)	8					Corydalidae (Fishflies & Dobsonflies)	8					Simuliidae (Blackflies)	5	A			B
PLECOPTERA (Stoneflies)						Sialidae (Alderflies)	6					Syrphidae* (Rat tailed maggots)	1				
Notonemouridae	14					**TRICHOPTERA (Caddisflies)**						Tabanidae (Horse flies)	5				
Perlidae	12	1			A	Dipseudopsidae	10					Tipulidae (Crane flies)	5				
EPHEMEROPTERA (Mayflies)						Ecnomidae	8					**GASTROPODA (Snails)**					
Baetidae 1sp	4					Hydropsychidae 1 sp	4					Ancylidae (Limpets)	6				
Baetidae 2 sp	6			A		Hydropsychidae 2 sp	6				A	Bulininae*	3				
Baetidae > 2 sp	12	B			B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3				
Caenidae (Squaregills/Cainfles)	6					Philopotamidae	10					Lymnaeidae* (Pond snails)	3				
Ephemeridae	15					Polycentropodidae	12					Physidae* (Pouch snails)	3				
Heptageniidae (Flatheaded mayflies)	13					Psychomyiidae/Xiphocentronidae	8					Planorbinae* (Orb snails)	3				
Leptophlebiidae (Prongills)	9	A			A	**Cased caddis:**						Thiaridae* (=Melanidae)	3				
Oligoneuridae (Brushlegged mayflies)	15					Barbarochthonidae SWC	13					Viviparidae* ST	5				
Polymitarcyidae (Pale Burrowers)	10					Calamoceratidae ST	11					**PELECYPODA (Bivalvles)**					
Prosopistomatidae (Water specs)	15	A			A	Glossosomatidae SWC	11					Corbiculidae (Clams)	5				
Teloganodidae SWC (Spiny Crawlers)	12					Hydroptilidae	6					Sphaeriidae (Pill clams)	3				
Tricorythidae (Stout Crawlers)	9				A	Hydrosalpingidae SWC	15					Unionidae (Perly mussels)	6				
ODONATA (Dragonflies & Damselflies)						Lepidostomatidae	10					**SASS Score**					106
Calopterygidae ST,T (Demoiselles)	10					Leptoceridae	6					**No. of Taxa**					15
Chlorocyphidae (Jewels)	10					Petrothrincidae SWC	11					**ASPT**					7.1
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisuliidae	10					**Other biota:**					
Coenagrionidae (Sprites and blues)	4					Sericostomatidae SWC	13										
Lestidae (Emerald Damselflies/Spreadwings)	8					**COLEOPTERA (Beetles)**											
Platycnemidae (Stream Damselflies)	10					Dytiscidae/Noteridae* (Diving beetles)	5										
Protoneuridae (Threadwings)	8					Elmidae/Dryopidae* (Riffle beetles)	8	A			A						
Aeshnidae (Hawkers & Emperors)	8					Gyrinidae* (Whirligig beetles)	5	1			1	**Comments/Observations:**					
Corduliidae (Cruisers)	8					Haliplidae* (Crawling water beetles)	5										
Gomphidae (Clubtails)	6	A		A	A	Helodidae (Marsh beetles)	12										
Libellulidae (Darters/Skimmers)	4	A			A	Hydraenidae* (Minute moss beetles)	8										
LEPIDOPTERA (Aquatic Caterpillars/Moths)						Hydrophilidae* (Water scavenger beetles)	5										
Crambidae (Pyralidae)	12					Limnichidae (Marsh-Loving Beetles)	10										
						Psephenidae (Water Pennies)	10										

Buffalo River (Middle): July 2022

Date (dd-mm-yr):	16-Sep-22																							
Site Code:	BUFF01_I																							
Collector/Sampler:	Kylie Farrell																							
River:	Middle Buffalo																							
Level 1 Ecoregion:	31: EASTERN COASTAL BELT																							
Quaternary Catchment:	R20F																							
Site Description: 52	**Temp (°C):**																							
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	**pH:**																							
	DO (mg/L):																							
	Conductivity:																							
	Riparian Disturbance:																							
	Instream Disturbance:																							

		(dd.ddddd)
Grid reference (dd mm ss.s) Lat:	S	-32.991584
Long:	E	27.64055
Datum (WGS84/Cape):		
Altitude (m):		
Zonation:		

Routine or Project? (circle one)			
Project Name:	WP11354	**Clarity (cm):**	
		Turbidity:	
		Colour:	

Biotopes Sampled (tick & rate)	**Rating (1-5)**			**Time (min)**
	4			
Stones Out Of Current (SOOC)	4			
Bedrock	0			
Aquatic Veg	1			
MargVeg In Current	2			
MargVeg Out Of Current	2			
Gravel	3			
Sand	3			
Mud	2			
Hand picking/Visual observation	x			
Biotope Score (%)	47			

Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				A
COELENTERATA (Cnidaria)	1				
TURBELLARIA (Flatworms)	3	B	1	A	B
ANNELIDA					
Oligochaeta (Earthworms)	1		1	1	A
Hirudinea (Leeches)	3	1	1		A
CRUSTACEA					
Amphipoda (Scuds)	13				
Potamonautidae* (Crabs)	3				
Atyidae (Freshwater Shrimps)	8				
Palaemonidae (Freshwater Prawns)	10				
HYDRACARINA (Mites)	8				
PLECOPTERA (Stoneflies)					
Notonemouridae	14				
Perlidae	12	1			A
EPHEMEROPTERA (Mayflies)					
Baetidae 1sp	4				
Baetidae 2 sp	6				
Baetidae > 2 sp	12	B	B	B	B
Caenidae (Squaregills/Cainfles)	6	A	1	A	B
Ephemeridae	15				
Heptageniidae (Flatheaded mayflies)	13	A	1		B
Leptophlebiidae (Prongills)	9	B		A	B
Oligoneuridae (Brushlegged mayflies)	15				
Polymitarcyidae (Pale Burrowers)	10				
Prosopistomatidae (Water specs)	15				
Teloganodidae SWC (Spiny Crawlers)	12				
Tricorythidae (Stout Crawlers)	9				
ODONATA (Dragonflies & Damselflies)					
Calopterygidae ST,T (Demoiselles)	10				
Chlorocyphidae (Jewels)	10		A		A
Synlestidae (Chlorolestidae)(Sylphs)	8				
Coenagrionidae (Sprites and blues)	4		B		B
Lestidae (Emerald Damselflies/Spreadwings)	8				
Platycnemidae (Stream Damselflies)	10				
Protoneuridae (Threadwings)	8				
Aeshnidae (Hawkers & Emperors)	8				1
Corduliidae (Cruisers)	8				
Gomphidae (Clubtails)	6				
Libellulidae (Darters/Skimmers)	4	A			A
LEPIDOPTERA (Aquatic Caterpillars/Moths)					
Crambidae (Pyralidae)	12				

Taxon	QV	S	Veg	GSM	TOT
HEMIPTERA (Bugs)					
Belostomatidae* (Giant water bugs)	3				
Corixidae* (Water boatmen)	3			1	1
Gerridae* (Pond skaters/Water striders)	5				
Hydrometridae* (Water measurers)	6				
Naucoridae* (Creeping water bugs)	7				
Nepidae* (Water scorpions)	3				
Notonectidae* (Backswimmers)	3			1	1
Pleidae* (Pygmy backswimmers)	4				
Veliidae/M...veliidae* (Ripple bugs)	5	A	A		A
MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
Corydalidae (Fishflies & Dobsonflies)	8				
Sialidae (Alderflies)	6				
TRICHOPTERA (Caddisflies)					
Dipseudopsidae	10				
Ecnomidae	8				
Hydropsychidae 1 sp	4				
Hydropsychidae 2 sp	6	B			B
Hydropsychidae > 2 sp	12				
Philopotamidae	10				
Polycentropodidae	12				
Psychomyiidae/Xiphocentronidae	8				
Cased caddis:					
Barbarochthonidae SWC	13				
Calamoceratidae ST	11				
Glossosomatidae SWC	11				
Hydroptilidae	6				
Hydrosalpingidae SWC	15				
Lepidostomatidae	10				
Leptoceridae	6		1		1
Petrothrincidae SWC	11				
Pisuliidae	10				
Sericostomatidae SWC	13				
COLEOPTERA (Beetles)					
Dytiscidae/Noteridae* (Diving beetles)	5				
Elmidae/Dryopidae* (Riffle beetles)	8	1			1
Gyrinidae* (Whirligig beetles)	5				
Haliplidae* (Crawling water beetles)	5				
Helodidae (Marsh beetles)	12				
Hydraenidae* (Minute moss beetles)	8				
Hydrophilidae* (Water scavenger beetles)	5				
Limnichidae (Marsh-Loving Beetles)	10				
Psephenidae (Water Pennies)	10				

Taxon	QV	S	Veg	GSM	TOT
DIPTERA (Flies)					
Athericidae (Snipe flies)	10				
Blepharoceridae (Mountain midges)	15				
Ceratopogonidae (Biting midges)	5			1	1
Chironomidae (Midges)	2	B	A	1	B
Culicidae* (Mosquitoes)	1				
Dixidae* (Dixid midge)	10				
Empididae (Dance flies)	6				
Ephydridae (Shore flies)	3				
Muscidae (House flies, Stable flies)	1				
Psychodidae (Moth flies)	1				
Simuliidae (Blackflies)	5	C	B		D
Syrphidae* (Rat tailed maggots)	1				
Tabanidae (Horse flies)	5				
Tipulidae (Crane flies)	5				
GASTROPODA (Snails)					
Ancylidae (Limpets)	6	A			A
Bulininae*	3				
Hydrobiidae*	3				
Lymnaeidae* (Pond snails)	3				
Physidae* (Pouch snails)	3		A		A
Planorbinae* (Orb snails)	3				
Thiaridae* (=Melanidae)	3				
Viviparidae* ST	5				
PELECYPODA (Bivalves)					
Corbiculidae (Clams)	5				
Sphaeriidae (Pill clams)	3				
Unionidae (Perly mussels)	6				
SASS Score					142
No. of Taxa					24
ASPT					5.9
Other biota:					
Comments/Observations:					

Buffalo River (Middle): May 2023

Date (dd-mm-yr):	10-May-23		(dd.ddddd)	Biotopes Sampled (tick & rate)	Rating (1-5) / Time (min)
Site Code:	BUFF01_I	Grid reference (dd mm ss.s) Lat: S	-32.991584		4
Collector/Sampler:	Kylie Farrell	Long: E	27.64055	Stones Out Of Current (SOOC)	4
River:	Middle Buffalo	Datum (WGS84/Cape):		Bedrock	0
Level 1 Ecoregion:	31: EASTERN COASTAL BELT	Altitude (m):		Aquatic Veg	1
Quaternary Catchment:	R20F	Zonation:		MargVeg In Current	2
	Temp (°C):	Routine or Project? (circle one)	Flow	MargVeg Out Of Current	2
Site Description: 52	pH:	Project Name:	Clarity (cm):	Gravel	3
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	DO (mg/L):	WP11354	Turbidity:	Sand	3
	Conductivity:		Colour:	Mud	2
	Riparian Disturbance:			Hand picking/Visual observation	x
	Instream Disturbance:			Biotope Score (%)	47

Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				A
COELENTERATA (Cnidaria)	1				
TURBELLARIA (Flatworms)	3				
ANNELIDA					
Oligochaeta (Earthworms)	1	1			1
Hirudinea (Leeches)	3			1	1
CRUSTACEA					
Amphipoda (Scuds)	13				
Potamonautidae* (Crabs)	3				
Atyidae (Freshwater Shrimps)	8				
Palaemonidae (Freshwater Prawns)	10				
HYDRACARINA (Mites)	8				
PLECOPTERA (Stoneflies)					
Notonemouridae	14				
Perlidae	12				
EPHEMEROPTERA (Mayflies)					
Baetidae 1sp	4				
Baetidae 2 sp	6	B	B	A	B
Baetidae > 2 sp	12				
Caenidae (Squaregills/Cainfles)	6	1			1
Ephemeridae	15				
Heptageniidae (Flatheaded mayflies)	13	A			A
Leptophlebiidae (Prongills)	9	A			A
Oligoneuridae (Brushlegged mayflies)	15				
Polymitarcyidae (Pale Burrowers)	10				
Prosopistomatidae (Water specs)	15				
Teloganodidae SWC (Spiny Crawlers)	12				
Tricorythidae (Stout Crawlers)	9				
ODONATA (Dragonflies & Damselflies)					
Calopterygidae ST,T (Demoiselles)	10				
Chlorocyphidae (Jewels)	10	1			1
Synlestidae (Chlorolestidae)(Sylphs)	8				
Coenagrionidae (Sprites and blues)	4	1	B		B
Lestidae (Emerald Damselflies/Spreadwings)	8				
Platycnemidae (Stream Damselflies)	10				
Protoneuridae (Threadwings)	8				
Aeshnidae (Hawkers & Emperors)	8				
Corduliidae (Cruisers)	8		1	A	A
Gomphidae (Clubtails)	6				
Libellulidae (Darters/Skimmers)	4	A			A
LEPIDOPTERA (Aquatic Caterpillars/Moths)					
Crambidae (Pyralidae)	12				

Taxon	QV	S	Veg	GSM	TOT
HEMIPTERA (Bugs)					
Belostomatidae* (Giant water bugs)	3		A		A
Corixidae* (Water boatmen)	3			A	A
Gerridae* (Pond skaters/Water striders)	5				
Hydrometridae* (Water measurers)	6				
Naucoridae* (Creeping water bugs)	7				
Nepidae* (Water scorpions)	3				
Notonectidae* (Backswimmers)	3	1	A		A
Pleidae* (Pygmy backswimmers)	4	1			1
Veliidae/M...veliidae* (Ripple bugs)	5		A		A
MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
Corydalidae (Fishflies & Dobsonflies)	8				
Sialidae (Alderflies)	6				
TRICHOPTERA (Caddisflies)					
Dipseudopsidae	10				
Ecnomidae	8				
Hydropsychidae 1 sp	4				
Hydropsychidae 2 sp	6	B			B
Hydropsychidae > 2 sp	12				
Philopotamidae	10				
Polycentropodidae	12				
Psychomyiidae/Xiphocentronidae	8				
Cased caddis:					
Barbarochthonidae SWC	13				
Calamoceratidae ST	11				
Glossosomatidae SWC	11				
Hydroptilidae	6				
Hydrosalpingidae SWC	15				
Lepidostomatidae	10				
Leptoceridae	6	1	B		B
Petrothrincidae SWC	11				
Pisuliidae	10				
Sericostomatidae SWC	13				
COLEOPTERA (Beetles)					
Dytiscidae/Noteridae* (Diving beetles)	5				
Elmidae/Dryopidae* (Riffle beetles)	8		1		1
Gyrinidae* (Whirligig beetles)	5		A		B
Haliplidae* (Crawling water beetles)	5				
Helodidae (Marsh beetles)	12				
Hydraenidae* (Minute moss beetles)	8				
Hydrophilidae* (Water scavenger beetles)	5			1	1
Limnichidae (Marsh-Loving Beetles)	10				
Psephenidae (Water Pennies)	10				

Taxon	QV	S	Veg	GSM	TOT
DIPTERA (Flies)					
Athericidae (Snipe flies)	10				
Blepharoceridae (Mountain midges)	15				
Ceratopogonidae (Biting midges)	5			A	A
Chironomidae (Midges)	2	B	B	B	B
Culicidae* (Mosquitoes)	1				
Dixidae* (Dixid midge)	10				
Empididae (Dance flies)	6				
Ephydridae (Shore flies)	3				
Muscidae (House flies, Stable flies)	1	A			A
Psychodidae (Moth flies)	1				
Simuliidae (Blackflies)	5	B	B		C
Syrphidae* (Rat tailed maggots)	1				
Tabanidae (Horse flies)	5				
Tipulidae (Crane flies)	5				
GASTROPODA (Snails)					
Ancylidae (Limpets)	6				
Bulininae*	3				
Hydrobiidae*	3				
Lymnaeidae* (Pond snails)	3		A		A
Physidae* (Pouch snails)	3		A		A
Planorbinae* (Orb snails)	3				
Thiaridae* (=Melanidae)	3				
Viviparidae* ST	5				
PELECYPODA (Bivalves)					
Corbiculidae (Clams)	5				1
Sphaeriidae (Pill clams)	3				
Unionidae (Perly mussels)	6				
SASS Score					141
No. of Taxa					28
ASPT					5.0
Other biota:					
Comments/Observations:					

Keiskamma (Upper): July 2022

Date (dd-mm-yr):	07-Sep-22																				
Site Code:	Keis01_I					Grid reference (dd mm ss.s) Lat:	S	-32.802217		(dd.ddddd)											
Collector/Sampler:	Kylie Farrell					Long:	E	27.024092													
River:	Keiskamma (upper)					Datum (WGS84/Cape):															
Level 1 Ecoregion:	18: DROUGHT CORRIDOR					Altitude (m):															
Quaternary Catchment:	R10E					Zonation:															
	Temp (°C):					Routine or Project? (circle one)		Flow													
Site Description: 52	pH:					Project Name:		Clarity (cm):													
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	DO (mg/L):					WP11354		Turbidity:													
	Conductivity:							Colour:													
	Riparian Disturbance:																				
	Instream Disturbance:																				

Biotopes Sampled (tick & rate)	Rating (1-5)		Time (min)
	5		
Stones Out Of Current (SOOC)	5		
Bedrock	0		
Aquatic Veg	0		
MargVeg In Current	2		
MargVeg Out Of Current	2		
Gravel	4		
Sand	4		
Mud	5		
Hand picking/Visual observation	x		
Biotope Score (%)	60		

Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				A
COELENTERATA (Cnidaria)	1				
TURBELLARIA (Flatworms)	3	A	A	A	B
ANNELIDA					
Oligochaeta (Earthworms)	1	A	1	B	B
Hirudinea (Leeches)	3				
CRUSTACEA					
Amphipoda (Scuds)	13				
Potamonautidae* (Crabs)	3	A			A
Atyidae (Freshwater Shrimps)	8				
Palaemonidae (Freshwater Prawns)	10				
HYDRACARINA (Mites)	8			1	1
PLECOPTERA (Stoneflies)					
Notonemouridae	14				
Perlidae	12				
EPHEMEROPTERA (Mayflies)					
Baetidae 1sp	4				
Baetidae 2 sp	6				
Baetidae > 2 sp	12	B	B	A	B
Caenidae (Squaregills/Cainfles)	6	A	A	B	B
Ephemeridae	15				
Heptageniidae (Flatheaded mayflies)	13				
Leptophlebiidae (Prongills)	9	B		A	B
Oligoneuridae (Brushlegged mayflies)	15				
Polymitarcyidae (Pale Burrowers)	10				
Prosopistomatidae (Water specs)	15				
Teloganodidae SWC (Spiny Crawlers)	12				
Tricorythidae (Stout Crawlers)	9	B		A	B
ODONATA (Dragonflies & Damselflies)					
Calopterygidae ST,T (Demoiselles)	10				
Chlorocyphidae (Jewels)	10		1		1
Synlestidae (Chlorolestidae)(Sylphs)	8				
Coenagrionidae (Sprites and blues)	4		B		B
Lestidae (Emerald Damselflies/Spreadwings)	8				
Platycnemidae (Stream Damselflies)	10				
Protoneuridae (Threadwings)	8				
Aeshnidae (Hawkers & Emperors)	8				A
Corduliidae (Cruisers)	8				
Gomphidae (Clubtails)	6	A		1	A
Libellulidae (Darters/Skimmers)	4	1	1		A
LEPIDOPTERA (Aquatic Caterpillars/Moths)					
Crambidae (Pyralidae)	12				

Taxon	QV	S	Veg	GSM	TOT
HEMIPTERA (Bugs)					
Belostomatidae* (Giant water bugs)	3		A		A
Corixidae* (Water boatmen)	3	A	A		B
Gerridae* (Pond skaters/Water striders)	5				A
Hydrometridae* (Water measurers)	6		1		1
Naucoridae* (Creeping water bugs)	7				
Nepidae* (Water scorpions)	3				
Notonectidae* (Backswimmers)	3	1	A		A
Pleidae* (Pygmy backswimmers)	4				
Veliidae/M...veliidae* (Ripple bugs)	5		A		A
MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
Corydalidae (Fishflies & Dobsonflies)	8				
Sialidae (Alderflies)	6				
TRICHOPTERA (Caddisflies)					
Dipseudopsidae	10				
Ecnomidae	8				
Hydropsychidae 1 sp	4	A			A
Hydropsychidae 2 sp	6				
Hydropsychidae > 2 sp	12				
Philopotamidae	10				
Polycentropodidae	12				
Psychomyiidae/Xiphocentronidae	8				
Cased caddis:					
Barbarochthonidae SWC	13				
Calamoceratidae ST	11				
Glossosomatidae SWC	11				
Hydroptilidae	6				
Hydrosalpingidae SWC	15				
Lepidostomatidae	10				
Leptoceridae	6		B		B
Petrothrincidae SWC	11				
Pisuliidae	10				
Sericostomatidae SWC	13				
COLEOPTERA (Beetles)					
Dytiscidae/Noteridae* (Diving beetles)	5		A		A
Elmidae/Dryopidae* (Riffle beetles)	8				
Gyrinidae* (Whirligig beetles)	5	B	A	A	B
Haliplidae* (Crawling water beetles)	5				
Helodidae (Marsh beetles)	12				
Hydraenidae* (Minute moss beetles)	8				
Hydrophilidae* (Water scavenger beetles)	5				
Limnichidae (Marsh-Loving Beetles)	10				
Psephenidae (Water Pennies)	10				

Taxon	QV	S	Veg	GSM	TOT
DIPTERA (Flies)					
Athericidae (Snipe flies)	10				
Blepharoceridae (Mountain midges)	15				
Ceratopogonidae (Biting midges)	5	1	A	A	B
Chironomidae (Midges)	2	A	B	B	B
Culicidae* (Mosquitoes)	1		A	1	A
Dixidae* (Dixid midge)	10				
Empididae (Dance flies)	6				
Ephydridae (Shore flies)	3				
Muscidae (House flies, Stable flies)	1	1			1
Psychodidae (Moth flies)	1				
Simuliidae (Blackflies)	5	B	A	A	B
Syrphidae* (Rat tailed maggots)	1				
Tabanidae (Horse flies)	5	A	1	1	A
Tipulidae (Crane flies)	5				
GASTROPODA (Snails)					
Ancylidae (Limpets)	6				B
Bulininae*	3				
Hydrobiidae*	3				
Lymnaeidae* (Pond snails)	3				
Physidae* (Pouch snails)	3				
Planorbinae* (Orb snails)	3				
Thiaridae* (=Melanidae)	3				
Viviparidae* ST	5				
PELECYPODA (Bivalvles)					
Corbiculidae (Clams)	5				B
Sphaeriidae (Pill clams)	3				
Unionidae (Perly mussels)	6				
SASS Score					163
No. of Taxa					32
ASPT					5.1
Other biota:					
Comments/Observations:					

Keiskamma (Upper): May 2023

Date (dd-mm-yr):	08-May-23		(dd.ddddd)		Biotopes Sampled (tick & rate)	Rating (1-5)	Time (min)
Site Code:	Keis01_I	Grid reference (dd mm ss.s) Lat:	S	-32.802217		5	
Collector/Sampler:	Kylie Farrell	Long:	E	27.024092	Stones Out Of Current (SOOC)	5	
River:	Keiskamma (upper)	Datum (WGS84/Cape):			Bedrock	0	
Level 1 Ecoregion:	18: DROUGHT CORRIDOR	Altitude (m):			Aquatic Veg	0	
Quaternary Catchment:	R10E	Zonation:			MargVeg In Current	2	
	Temp (°C):	Routine or Project? (circle one)	Flow		MargVeg Out Of Current	2	
Site Description: 52	pH:	Project Name:	Clarity (cm):		Gravel	4	
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	DO (mg/L):	WP11354	Turbidity:		Sand	4	
	Conductivity:		Colour:		Mud	5	
	Riparian Disturbance:				Hand picking/Visual observation	x	
	Instream Disturbance:				Biotope Score (%)	60	

Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5					**HEMIPTERA (Bugs)**						**DIPTERA (Flies)**					
COELENTERATA (Cnidaria)	1					Belostomatidae* (Giant water bugs)	3		A		A	Athericidae (Snipe flies)	10			A	A
TURBELLARIA (Flatworms)	3	1			1	Corixidae* (Water boatmen)	3		1	A	A	Blepharoceridae (Mountain midges)	15				
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5				A	Ceratopogonidae (Biting midges)	5	1		A	A
Oligochaeta (Earthworms)	1	A			A	Hydrometridae* (Water measurers)	6		B		B	Chironomidae (Midges)	2	B		A	B
Hirudinea (Leeches)	3					Naucoridae* (Creeping water bugs)	7					Culicidae* (Mosquitoes)	1				
CRUSTACEA						Nepidae* (Water scorpions)	3		1		1	Dixidae* (Dixid midge)	10				
Amphipoda (Scuds)	13					Notonectidae* (Backswimmers)	3		B		B	Empididae (Dance flies)	6				
Potamonautidae* (Crabs)	3		A	1	A	Pleidae* (Pygmy backswimmers)	4					Ephydridae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Veliidae/M...veliidae* (Ripple bugs)	5		1		1	Muscidae (House flies, Stable flies)	1				
Palaemonidae (Freshwater Prawns)	10					**MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)**						Psychodidae (Moth flies)	1				
HYDRACARINA (Mites)	8					Corydalidae (Fishflies & Dobsonflies)	8					Simuliidae (Blackflies)	5	A		1	A
PLECOPTERA (Stoneflies)						Sialidae (Alderflies)	6					Syrphidae* (Rat tailed maggots)	1				
Notonemouridae	14					**TRICHOPTERA (Caddisflies)**						Tabanidae (Horse flies)	5	1			1
Perlidae	12					Dipseudopsidae	10					Tipulidae (Crane flies)	5				
EPHEMEROPTERA (Mayflies)						Ecnomidae	8			A	A	**GASTROPODA (Snails)**					
Baetidae 1sp	4					Hydropsychidae 1 sp	4			A		Ancylidae (Limpets)	6			A	B
Baetidae 2 sp	6		B	B		Hydropsychidae 2 sp	6	B			B	Bulininae*	3				
Baetidae > 2 sp	12	B			B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3				
Caenidae (Squaregills/Cainfles)	6			A	A	Philopotamidae	10					Lymnaeidae* (Pond snails)	3				
Ephemeridae	15					Polycentropodidae	12					Physidae* (Pouch snails)	3				
Heptageniidae (Flatheaded mayflies)	13	A		A	B	Psychomyiidae/Xiphocentronidae	8					Planorbinae* (Orb snails)	3				
Leptophlebiidae (Prongills)	9	B		B	B	**Cased caddis:**						Thiaridae* (=Melanidae)	3				
Oligoneuridae (Brushlegged mayflies)	15					Barbarochthonidae SWC	13					Viviparidae* ST	5				
Polymitarcyidae (Pale Burrowers)	10					Calamoceratidae ST	11					**PELECYPODA (Bivalvles)**					
Prosopistomatidae (Water specs)	15					Glossosomatidae SWC	11					Corbiculidae (Clams)	5				
Teloganodidae SWC (Spiny Crawlers)	12					Hydroptilidae	6					Sphaeriidae (Pill clams)	3				
Tricorythidae (Stout Crawlers)	9	B		B	C	Hydrosalpingidae SWC	15					Unionidae (Perly mussels)	6				
ODONATA (Dragonflies & Damselflies)						Lepidostomatidae	10					**SASS Score**					206
Calopterygidae ST,T (Demoiselles)	10					Leptoceridae	6		B	A	B	**No. of Taxa**					34
Chlorocyphidae (Jewels)	10		1	A	A	Petrothrincidae SWC	11					**ASPT**					6.1
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisuliidae	10					**Other biota:**					
Coenagrionidae (Sprites and blues)	4		B		B	Sericostomatidae SWC	13										
Lestidae (Emerald Damselflies/Spreadwings)	8					**COLEOPTERA (Beetles)**											
Platycnemidae (Stream Damselflies)	10					Dytiscidae/Noteridae* (Diving beetles)	5		1		1						
Protoneuridae (Threadwings)	8					Elmidae/Dryopidae* (Riffle beetles)	8										
Aeshnidae (Hawkers & Emperors)	8	A			A	Gyrinidae* (Whirligig beetles)	5	A	1		B	**Comments/Observations:**					
Corduliidae (Cruisers)	8					Haliplidae* (Crawling water beetles)	5										
Gomphidae (Clubtails)	6			B	B	Helodidae (Marsh beetles)	12										
Libellulidae (Darters/Skimmers)	4	A		A	B	Hydraenidae* (Minute moss beetles)	8										
LEPIDOPTERA (Aquatic Caterpillars/Moths)						Hydrophilidae* (Water scavenger beetles)	5		1		1						
Crambidae (Pyralidae)	12	1			1	Limnichidae (Marsh-Loving Beetles)	10										
						Psephenidae (Water Pennies)	10	A			A						

Kat River (Upper): July 2022

Date (dd-mm-yr):	07-Sep-22		(dd.ddddd)	Biotopes Sampled (tick & rate)	Rating (1-5) / Time (min)
Site Code:	Ukat02_I	Grid reference (dd mm ss.s) Lat: S	-32.569705		5
Collector/Sampler:	Kylie Farrell	Long: E	26.722041	Stones Out Of Current (SOOC)	4
River:	Upper Kat	Datum (WGS84/Cape):		Bedrock	1
Level 1 Ecoregion:	18: DROUGHT CORRIDOR	Altitude (m):		Aquatic Veg	1
Quaternary Catchment:	Q94B	Zonation:		MargVeg In Current	4
	Temp (°C):	Routine or Project? (circle one)	Flow	MargVeg Out Of Current	3
Site Description: 52	pH:	Project Name:	Clarity (cm):	Gravel	2
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	DO (mg/L):	WP11354	Turbidity:	Sand	2
	Conductivity:		Colour:	Mud	3
	Riparian Disturbance:			Hand picking/Visual observation	x
	Instream Disturbance:			Biotope Score (%)	56

Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				B	HEMIPTERA (Bugs)						DIPTERA (Flies)					
COELENTERATA (Cnidaria)	1					Belostomatidae* (Giant water bugs)	3		A		A	Athericidae (Snipe flies)	10				
TURBELLARIA (Flatworms)	3		1		1	Corixidae* (Water boatmen)	3			1	1	Blepharoceridae (Mountain midges)	15				
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5				A	Ceratopogonidae (Biting midges)	5	1	1	A	A
Oligochaeta (Earthworms)	1					Hydrometridae* (Water measurers)	6	1	A		A	Chironomidae (Midges)	2		B	A	B
Hirudinea (Leeches)	3					Naucoridae* (Creeping water bugs)	7					Culicidae* (Mosquitoes)	1	A	A		B
CRUSTACEA						Nepidae* (Water scorpions)	3					Dixidae* (Dixid midge)	10				
Amphipoda (Scuds)	13					Notonectidae* (Backswimmers)	3					Empididae (Dance flies)	6				
Potamonautidae* (Crabs)	3		1		A	Pleidae* (Pygmy backswimmers)	4		A		A	Ephydridae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Veliidae/M...veliidae* (Ripple bugs)	5		A		A	Muscidae (House flies, Stable flies)	1				
Palaemonidae (Freshwater Prawns)	10					MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)						Psychodidae (Moth flies)	1				
HYDRACARINA (Mites)	1	1	A		A	Corydalidae (Fishflies & Dobsonflies)	8					Simuliidae (Blackflies)	5	A		A	C
PLECOPTERA (Stoneflies)						Sialidae (Alderflies)	6					Syrphidae* (Rat tailed maggots)	1				
Notonemouridae	14					TRICHOPTERA (Caddisflies)						Tabanidae (Horse flies)	5	1		A	A
Perlidae	12					Dipseudopsidae	10					Tipulidae (Crane flies)	5				
EPHEMEROPTERA (Mayflies)						Ecnomidae	8					GASTROPODA (Snails)					
Baetidae 1sp	4					Hydropsychidae 1 sp	4		1		1	Ancylidae (Limpets)	6		A		B
Baetidae 2 sp	6			A		Hydropsychidae 2 sp	6					Bulininae*	3				
Baetidae > 2 sp	12	B	B		B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3				
Caenidae (Squaregills/Cainfles)	6	A	B	A	B	Philopotamidae	10					Lymnaeidae* (Pond snails)	3				
Ephemeridae	15					Polycentropodidae	12					Physidae* (Pouch snails)	3				
Heptageniidae (Flatheaded mayflies)	13	A	1		B	Psychomyiidae/Xiphocentronidae	8					Planorbinae* (Orb snails)	3		A		A
Leptophlebiidae (Prongills)	9	A	A		B	Cased caddis:						Thiaridae* (=Melanidae)	3				
Oligoneuridae (Brushlegged mayflies)	15					Barbarochthonidae SWC	13					Viviparidae* ST	5				
Polymitarcyidae (Pale Burrowers)	10		1		1	Calamoceratidae ST	11					PELECYPODA (Bivalvles)					
Prosopistomatidae (Water specs)	15					Glossosomatidae SWC	11					Corbiculidae (Clams)	5		1		1
Teloganodidae SWC (Spiny Crawlers)	12					Hydroptilidae	6					Sphaeriidae (Pill clams)	3				
Tricorythidae (Stout Crawlers)	9	A			B	Hydrosalpingidae SWC	15					Unionidae (Perly mussels)	6				
ODONATA (Dragonflies & Damselflies)						Lepidostomatidae	10					SASS Score					172
Calopterygidae ST,T (Demoiselles)	10					Leptoceridae	6	1	B		B	No. of Taxa					33
Chlorocyphidae (Jewels)	10		1		1	Petrothrincidae SWC	11					ASPT					5.2
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisuliidae	10					Other biota:					
Coenagrionidae (Sprites and blues)	4		B		B	Sericostomatidae SWC	13					Sciomyzidae (Marsh Fly)					
Lestidae (Emerald Damselflies/Spreadwings)	8		1		1	COLEOPTERA (Beetles)											
Platycnemidae (Stream Damselflies)	10	1			1	Dytiscidae/Noteridae* (Diving beetles)	5		A		A						
Protoneuridae (Threadwings)	8					Elmidae/Dryopidae* (Riffle beetles)	8										
Aeshnidae (Hawkers & Emperors)	8					Gyrinidae* (Whirligig beetles)	5		A		A	Comments/Observations:					
Corduliidae (Cruisers)	8					Haliplidae* (Crawling water beetles)	5										
Gomphidae (Clubtails)	6					Helodidae (Marsh beetles)	12										
Libellulidae (Darters/Skimmers)	4		A		A	Hydraenidae* (Minute moss beetles)	8										
LEPIDOPTERA (Aquatic Caterpillars/Moths)						Hydrophilidae* (Water scavenger beetles)	5										
Crambidae (Pyralidae)	12					Limnichidae (Marsh-Loving Beetles)	10										
						Psephenidae (Water Pennies)	10										

Kat River (Upper): May 2023

Date (dd-mm-yr):	07-May-23			(dd.ddddd)	
Site Code:	Ukat02_I	**Grid reference (dd mm ss.s) Lat:**	**S**	-32.569705	
Collector/Sampler:	Kylie Farrell	**Long:**	**E**	26.722041	
River:	Upper Kat	**Datum (WGS84/Cape):**			
Level 1 Ecoregion:	18: DROUGHT CORRIDOR	**Altitude (m):**			
Quaternary Catchment:	Q94B	**Zonation:**			
Site Description: 52	**Temp (°C):**	**Routine or Project? (circle one)**	**Flow**		
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	**pH:**	**Project Name:**	**Clarity (cm):**		
	DO (mg/L):	WP11354	**Turbidity:**		
	Conductivity:		**Colour:**		
	Riparian Disturbance:				
	Instream Disturbance:				

Biotopes Sampled (tick & rate)	Rating (1-5)		Time (min)
	5		
Stones Out Of Current (SOOC)	4		
Bedrock	5		
Aquatic Veg	2		
MargVeg In Current	1		
MargVeg Out Of Current	3		
Gravel	3		
Sand	3		
Mud	3		
Hand picking/Visual observation	x		
Biotope Score (%)	64		

Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				B
COELENTERATA (Cnidaria)	1				
TURBELLARIA (Flatworms)	3	1			1
ANNELIDA					
Oligochaeta (Earthworms)	1				
Hirudinea (Leeches)	3				
CRUSTACEA					
Amphipoda (Scuds)	13				
Potamonautidae* (Crabs)	3	*1*			A
Atyidae (Freshwater Shrimps)	8				
Palaemonidae (Freshwater Prawns)	10				
HYDRACARINA (Mites)	1				
PLECOPTERA (Stoneflies)					
Notonemouridae	14				
Perlidae	12				
EPHEMEROPTERA (Mayflies)					
Baetidae 1sp	4		1	1	
Baetidae 2 sp	6			A	
Baetidae > 2 sp	12	A			B
Caenidae (Squaregills/Cainfles)	6		1	1	A
Ephemeridae	15				
Heptageniidae (Flatheaded mayflies)	13	B	1	1	B
Leptophlebiidae (Prongills)	9	A		1	B
Oligoneuridae (Brushlegged mayflies)	15				
Polymitarcyidae (Pale Burrowers)	10				
Prosopistomatidae (Water specs)	15				
Teloganodidae SWC (Spiny Crawlers)	12				
Tricorythidae (Stout Crawlers)	9	*B*		1	C
ODONATA (Dragonflies & Damselflies)					
Calopterygidae ST,T (Demoiselles)	10				
Chlorocyphidae (Jewels)	10			A	A
Synlestidae (Chlorolestidae)(Sylphs)	8				
Coenagrionidae (Sprites and blues)	4			1	B
Lestidae (Emerald Damselflies/Spreadwings)	8				
Platycnemidae (Stream Damselflies)	10				
Protoneuridae (Threadwings)	8				
Aeshnidae (Hawkers & Emperors)	8	1			1
Corduliidae (Cruisers)	8				
Gomphidae (Clubtails)	6			A	A
Libellulidae (Darters/Skimmers)	4		1	A	A
LEPIDOPTERA (Aquatic Caterpillars/Moths)					
Crambidae (Pyralidae)	12				

Taxon	QV	S	Veg	GSM	TOT
HEMIPTERA (Bugs)					
Belostomatidae* (Giant water bugs)	3		A		A
Corixidae* (Water boatmen)	3		1	A	A
Gerridae* (Pond skaters/Water striders)	5				
Hydrometridae* (Water measurers)	6				
Naucoridae* (Creeping water bugs)	7				
Nepidae* (Water scorpions)	3				
Notonectidae* (Backswimmers)	3		A		A
Pleidae* (Pygmy backswimmers)	4		1	A	A
Veliidae/M...veliidae* (Ripple bugs)	5			A	A
MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
Corydalidae (Fishflies & Dobsonflies)	8				
Sialidae (Alderflies)	6				
TRICHOPTERA (Caddisflies)					
Dipseudopsidae	10				
Ecnomidae	8				
Hydropsychidae 1 sp	4	1			1
Hydropsychidae 2 sp	6				
Hydropsychidae > 2 sp	12				
Philopotamidae	10				
Polycentropodidae	12				
Psychomyiidae/Xiphocentronidae	8				
Cased caddis:					
Barbarochthonidae SWC	13				
Calamoceratidae ST	11				
Glossosomatidae SWC	11				
Hydroptilidae	6				
Hydrosalpingidae SWC	15				
Lepidostomatidae	10				
Leptoceridae	6		B	B	B
Petrothrincidae SWC	11				
Pisuliidae	10				
Sericostomatidae SWC	13				
COLEOPTERA (Beetles)					
Dytiscidae/Noteridae* (Diving beetles)	5		1		1
Elmidae/Dryopidae* (Riffle beetles)	8				
Gyrinidae* (Whirligig beetles)	5				B
Haliplidae* (Crawling water beetles)	5				
Helodidae (Marsh beetles)	12				
Hydraenidae* (Minute moss beetles)	8				
Hydrophilidae* (Water scavenger beetles)	5				
Limnichidae (Marsh-Loving Beetles)	10				
Psephenidae (Water Pennies)	10	1			1

Taxon	QV	S	Veg	GSM	TOT
DIPTERA (Flies)					
Athericidae (Snipe flies)	10				
Blepharoceridae (Mountain midges)	15				
Ceratopogonidae (Biting midges)	5		1	A	A
Chironomidae (Midges)	2	1	A	A	B
Culicidae* (Mosquitoes)	1		1		1
Dixidae* (Dixid midge)	10				
Empididae (Dance flies)	6				
Ephydridae (Shore flies)	3				
Muscidae (House flies, Stable flies)	1				
Psychodidae (Moth flies)	1				
Simuliidae (Blackflies)	5				
Syrphidae* (Rat tailed maggots)	1				
Tabanidae (Horse flies)	5		1		1
Tipulidae (Crane flies)	5				
GASTROPODA (Snails)					
Ancylidae (Limpets)	6	*B*		1	B
Bulininae*	3				
Hydrobiidae*	3				
Lymnaeidae* (Pond snails)	3				
Physidae* (Pouch snails)	3				
Planorbinae* (Orb snails)	3		1		1
Thiaridae* (=Melanidae)	3				
Viviparidae* ST	5				
PELECYPODA (Bivalves)					
Corbiculidae (Clams)	5				
Sphaeriidae (Pill clams)	3				
Unionidae (Perly mussels)	6				
SASS Score					167
No. of Taxa					30
ASPT					5.6
Other biota:					
Sciomyzidae (Marsh Fly)					
Comments/Observations:					

Great Fish River (Lower): July 2022

Date (dd-mm-yr):	20-Sep-22																							
Site Code:	GFIS03_i					**Grid reference (dd mm ss.s) Lat:**	**S**	-33.083607				(dd.ddddd)												
Collector/Sampler:	Kylie Farrell					**Long:**	**E**	26.225285																
River:	Great Fish (Lower)					**Datum (WGS84/Cape):**																		
Level 1 Ecoregion:	18: DROUGHT CORRIDOR					**Altitude (m):**																		
Quaternary Catchment:	Q91B					**Zonation:**																		
	Temp (°C):					**Routine or Project? (circle one)**		**Flow**																
Site Description: 52	**pH:**					**Project Name:**		**Clarity (cm):**																
Refer to Report Number:	**DO (mg/L):**					**WP11354**		**Turbidity:**																
WEM/WMA7/00/CON/RDM/0722	**Conductivity:**							**Colour:**																
	Riparian Disturbance:																							
	Instream Disturbance:																							

Biotopes Sampled (tick & rate)	**Rating (1-5)**		**Time (min)**
	5		
Stones Out Of Current (SOOC)	2		
Bedrock	4		
Aquatic Veg	0		
MargVeg In Current	4		
MargVeg Out Of Current	2		
Gravel	2		
Sand	2		
Mud	3		
Hand picking/Visual observation	x		
Biotope Score (%)	53		

Taxon	**QV**	**S**	**Veg**	**GSM**	**TOT**
PORIFERA (Sponge)	5				
COELENTERATA (Cnidaria)	1				
TURBELLARIA (Flatworms)	3	A			A
ANNELIDA					
Oligochaeta (Earthworms)	1	A		B	B
Hirudinea (Leeches)	3				A
CRUSTACEA					
Amphipoda (Scuds)	13				
Potamonautidae* (Crabs)	3				
Atyidae (Freshwater Shrimps)	8				
Palaemonidae (Freshwater Prawns)	10				
HYDRACARINA (Mites)	8				
PLECOPTERA (Stoneflies)					
Notonemouridae	14				
Perlidae	12				
EPHEMEROPTERA (Mayflies)					
Baetidae 1sp	4				
Baetidae 2 sp	6		B	A	
Baetidae > 2 sp	12	B			B
Caenidae (Squaregills/Cainfles)	6				
Ephemeridae	15				
Heptageniidae (Flatheaded mayflies)	13				
Leptophlebiidae (Prongills)	9	1			1
Oligoneuridae (Brushlegged mayflies)	15				
Polymitarcyidae (Pale Burrowers)	10				
Prosopistomatidae (Water specs)	15				
Teloganodidae SWC (Spiny Crawlers)	12				
Tricorythidae (Stout Crawlers)	9				
ODONATA (Dragonflies & Damselflies)					
Calopterygidae ST,T (Demoiselles)	10				
Chlorocyphidae (Jewels)	10				
Synlestidae (Chlorolestidae)(Sylphs)	8				
Coenagrionidae (Sprites and blues)	4		A		A
Lestidae (Emerald Damselflies/Spreadwings)	8				
Platycnemidae (Stream Damselflies)	10				
Protoneuridae (Threadwings)	8				
Aeshnidae (Hawkers & Emperors)	8				
Cordulliidae (Cruisers)	8				
Gomphidae (Clubtails)	6	A		A	A
Libellulidae (Darters/Skimmers)	4				
LEPIDOPTERA (Aquatic Caterpillars/Moths)					
Crambidae (Pyralidae)	12				

Taxon	**QV**	**S**	**Veg**	**GSM**	**TOT**
HEMIPTERA (Bugs)					
Belostomatidae* (Giant water bugs)	3				
Corixidae* (Water boatmen)	3				
Gerridae* (Pond skaters/Water striders)	5				
Hydrometridae* (Water measurers)	6				
Naucoridae* (Creeping water bugs)	7				
Nepidae* (Water scorpions)	3				
Notonectidae* (Backswimmers)	3				
Pleidae* (Pygmy backswimmers)	4				
Veliidae/M...veliidae* (Ripple bugs)	5				
MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
Corydalidae (Fishflies & Dobsonflies)	8				
Sialidae (Alderflies)	6				
TRICHOPTERA (Caddisflies)					
Dipseudopsidae	10				
Ecnomidae	8				
Hydropsychidae 1 sp	4				
Hydropsychidae 2 sp	6	B			B
Hydropsychidae > 2 sp	12				
Philopotamidae	10				
Polycentropodidae	12				
Psychomyiidae/Xiphocentronidae	8				
Cased caddis:					
Barbarochthonidae SWC	13				
Calamoceratidae ST	11				
Glossosomatidae SWC	11				
Hydroptilidae	6				
Hydrosalpingidae SWC	15				
Lepidostomatidae	10				
Leptoceridae	6		1		1
Petrothrincidae SWC	11				
Pisuliidae	10				
Sericostomatidae SWC	13				
COLEOPTERA (Beetles)					
Dytiscidae/Noteridae* (Diving beetles)	5				
Elmidae/Dryopidae* (Riffle beetles)	8				
Gyrinidae* (Whirligig beetles)	5	B	A		B
Haliplidae* (Crawling water beetles)	5				
Helodidae (Marsh beetles)	12				
Hydraenidae* (Minute moss beetles)	8				
Hydrophilidae* (Water scavenger beetles)	5				
Limnichidae (Marsh-Loving Beetles)	10				
Psephenidae (Water Pennies)	10				

Taxon	**QV**	**S**	**Veg**	**GSM**	**TOT**
DIPTERA (Flies)					
Athericidae (Snipe flies)	10				
Blepharoceridae (Mountain midges)	15				
Ceratopogonidae (Biting midges)	5	B	1		B
Chironomidae (Midges)	2	B	B	A	B
Culicidae* (Mosquitoes)	1				
Dixidae* (Dixid midge)	10				
Empididae (Dance flies)	6				
Ephydridae (Shore flies)	3				
Muscidae (House flies, Stable flies)	1				
Psychodidae (Moth flies)	1				
Simuliidae (Blackflies)	5	B			B
Syrphidae* (Rat tailed maggots)	1				
Tabanidae (Horse flies)	5	A			A
Tipulidae (Crane flies)	5				
GASTROPODA (Snails)					
Ancylidae (Limpets)	6	A	1		B
Bulininae*	3				
Hydrobiidae*	3				
Lymnaeidae* (Pond snails)	3				
Physidae* (Pouch snails)	3	A	B		B
Planorbinae* (Orb snails)	3				
Thiaridae* (=Melanidae)	3				
Viviparidae* ST	5				
PELECYPODA (Bivalvles)					
Corbiculidae (Clams)	5			1	1
Sphaeriidae (Pill clams)	3				
Unionidae (Perly mussels)	6				
SASS Score					86
No. of Taxa					17
ASPT					5.1
Other biota:					
Comments/Observations:					

Great Fish River (Lower): May 2023

Date (dd-mm-yr):	04-May-23		(dd.ddddd)	
Site Code:	GFIS03_I	Grid reference (dd mm ss.s) Lat: S	-33.083607	
Collector/Sampler:	Kylie Farrell	Long: E	26.225285	
River:	Great Fish (Lower)	Datum (WGS84/Cape):		
Level 1 Ecoregion:	18: DROUGHT CORRIDOR	Altitude (m):		
Quaternary Catchment:	Q91B	Zonation:		
	Temp (°C):	Routine or Project? (circle one)	Flow	
Site Description: 52	pH:	Project Name:	Clarity (cm):	
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722	DO (mg/L):	WP11354	Turbidity:	
	Conductivity:		Colour:	
	Riparian Disturbance:			
	Instream Disturbance:			

Biotopes Sampled (tick & rate)	Rating (1-5)		Time (min)
	5		
Stones Out Of Current (SOOC)	0		
Bedrock	2		
Aquatic Veg	0		
MargVeg In Current	4		
MargVeg Out Of Current	1		
Gravel	2		
Sand	3		
Mud	1		
Hand picking/Visual observation	x		
Biotope Score (%)	40		

Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				
COELENTERATA (Cnidaria)	1				
TURBELLARIA (Flatworms)	3				
ANNELIDA					
Oligochaeta (Earthworms)	1				
Hirudinea (Leeches)	3				1
CRUSTACEA					
Amphipoda (Scuds)	13				
Potamonautidae* (Crabs)	3				
Atyidae (Freshwater Shrimps)	8				
Palaemonidae (Freshwater Prawns)	10				
HYDRACARINA (Mites)	8				
PLECOPTERA (Stoneflies)					
Notonemouridae	14				
Perlidae	12	A			A
EPHEMEROPTERA (Mayflies)					
Baetidae 1sp	4	A			
Baetidae 2 sp	6		A		A
Baetidae > 2 sp	12				
Caenidae (Squaregills/Cainfles)	6		A	1	A
Ephemeridae	15				
Heptageniidae (Flatheaded mayflies)	13				
Leptophlebiidae (Prongills)	9	A			A
Oligoneuridae (Brushlegged mayflies)	15				
Polymitarcyidae (Pale Burrowers)	10				
Prosopistomatidae (Water specs)	15				
Teloganodidae SWC (Spiny Crawlers)	12				
Tricorythidae (Stout Crawlers)	9				
ODONATA (Dragonflies & Damselflies)					
Calopterygidae ST,T (Demoiselles)	10				
Chlorocyphidae (Jewels)	10				
Synlestidae (Chlorolestidae)(Sylphs)	8				
Coenagrionidae (Sprites and blues)	4		B	1	B
Lestidae (Emerald Damselflies/Spreadwings)	8				
Platycnemidae (Stream Damselflies)	10				
Protoneuridae (Threadwings)	8				
Aeshnidae (Hawkers & Emperors)	8				
Corduliidae (Cruisers)	8				
Gomphidae (Clubtails)	6	B	A	A	B
Libellulidae (Darters/Skimmers)	4				
LEPIDOPTERA (Aquatic Caterpillars/Moths)					
Crambidae (Pyralidae)	12				

Taxon	QV	S	Veg	GSM	TOT
HEMIPTERA (Bugs)					
Belostomatidae* (Giant water bugs)	3	A			A
Corixidae* (Water boatmen)	3		A		A
Gerridae* (Pond skaters/Water striders)	5				
Hydrometridae* (Water measurers)	6				
Naucoridae* (Creeping water bugs)	7				
Nepidae* (Water scorpions)	3				
Notonectidae* (Backswimmers)	3				
Pleidae* (Pygmy backswimmers)	4				
Veliidae/M...veliidae* (Ripple bugs)	5		A		A
MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
Corydalidae (Fishflies & Dobsonflies)	8				
Sialidae (Alderflies)	6				
TRICHOPTERA (Caddisflies)					
Dipseudopsidae	10				
Ecnomidae	8				
Hydropsychidae 1 sp	4	1			A
Hydropsychidae 2 sp	6				
Hydropsychidae > 2 sp	12				
Philopotamidae	10				
Polycentropodidae	12				
Psychomyiidae/Xiphocentronidae	8				
Cased caddis:					
Barbarochthonidae SWC	13				
Calamoceratidae ST	11				
Glossosomatidae SWC	11				
Hydroptilidae	6				
Hydrosalpingidae SWC	15				
Lepidostomatidae	10				
Leptoceridae	6		1		1
Petrothrincidae SWC	11				
Pisuliidae	10				
Sericostomatidae SWC	13				
COLEOPTERA (Beetles)					
Dytiscidae/Noteridae* (Diving beetles)	5	A			A
Elmidae/Dryopidae* (Riffle beetles)	8	A			A
Gyrinidae* (Whirligig beetles)	5				B
Haliplidae* (Crawling water beetles)	5				
Helodidae (Marsh beetles)	12				
Hydraenidae* (Minute moss beetles)	8				
Hydrophilidae* (Water scavenger beetles)	5				
Limnichidae (Marsh-Loving Beetles)	10				
Psephenidae (Water Pennies)	10				

Taxon	QV	S	Veg	GSM	TOT
DIPTERA (Flies)					
Athericidae (Snipe flies)	10				
Blepharoceridae (Mountain midges)	15				
Ceratopogonidae (Biting midges)	5				
Chironomidae (Midges)	2		A		A
Culicidae* (Mosquitoes)	1				
Dixidae* (Dixid midge)	10				
Empididae (Dance flies)	6				
Ephydridae (Shore flies)	3				
Muscidae (House flies, Stable flies)	1				
Psychodidae (Moth flies)	1				
Simuliidae (Blackflies)	5	A			A
Syrphidae* (Rat tailed maggots)	1				
Tabanidae (Horse flies)	5	1			1
Tipulidae (Crane flies)	5				
GASTROPODA (Snails)					
Ancylidae (Limpets)	6				
Bulininae*	3				
Hydrobiidae*	3				
Lymnaeidae* (Pond snails)	3				
Physidae* (Pouch snails)	3				
Planorbinae* (Orb snails)	3				
Thiaridae* (=Melanidae)	3				
Viviparidae* ST	5				
PELECYPODA (Bivalvles)					
Corbiculidae (Clams)	5			1	1
Sphaeriidae (Pill clams)	3				
Unionidae (Perly mussels)	6				
SASS Score					106
No. of Taxa					20
ASPT					5.3
Other biota:					
Comments/Observations:					

KwaZungu/Swartkops River: July 2022

Date (dd-mm-yr):	24 Septemer 2022			(dd.ddddd)	
Site Code:	SWAR01_I	Grid reference (dd mm ss.s) Lat:	S	-33.722183	
Collector/Sampler:	Kylie Farrell	Long:	E	25.300816	
River:	SWARTKOPS	Datum (WGS84/Cape):			
Level 1 Ecoregion:	19.Southern Folded Mountains	Altitude (m):			
Quaternary Catchment:	M10C	Zonation:			
	Temp (°C):	Routine or Project? (circle one)	Flow		
Site Description: 52	pH:	Project Name:	Clarity (cm):		
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722	DO (mg/L):	WP11354	Turbidity:		
	Conductivity:		Colour:		
	Riparian Disturbance:				
	Instream Disturbance:				

Biotopes Sampled (tick & rate)	Rating (1-5)	Time (min)
	5	
Stones Out Of Current (SOOC)	5	
Bedrock	0	
Aquatic Veg	3	
MargVeg In Current	4	
MargVeg Out Of Current	4	
Gravel	5	
Sand	5	
Mud	1	
Hand picking/Visual observation	x	
Biotope Score (%)	71	

Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				
COELENTERATA (Cnidaria)	1				
TURBELLARIA (Flatworms)	3				
ANNELIDA					
Oligochaeta (Earthworms)	1			1	1
Hirudinea (Leeches)	3				
CRUSTACEA					
Amphipoda (Scuds)	13				
Potamonautidae* (Crabs)	3	A			A
Atyidae (Freshwater Shrimps)	8				
Palaemonidae (Freshwater Prawns)	10				
HYDRACARINA (Mites)	8			1	1
PLECOPTERA (Stoneflies)					
Notonemouridae	14				
Perlidae	12				
EPHEMEROPTERA (Mayflies)					
Baetidae 1sp	4				
Baetidae 2 sp	6		B	B	
Baetidae > 2 sp	12	A			B
Caenidae (Squaregills/Cainfles)	6				
Ephemeridae	15				
Heptageniidae (Flatheaded mayflies)	13				
Leptophlebiidae (Prongills)	9				
Oligoneuridae (Brushlegged mayflies)	15				
Polymitarcyidae (Pale Burrowers)	10				
Prosopistomatidae (Water specs)	15				
Teloganodidae SWC (Spiny Crawlers)	12				
Tricorythidae (Stout Crawlers)	9				
ODONATA (Dragonflies & Damselflies)					
Calopterygidae ST,T (Demoiselles)	10				
Chlorocyphidae (Jewels)	10	A		1	A
Synlestidae (Chlorolestidae)(Sylphs)	8				
Coenagrionidae (Sprites and blues)	4		B		B
Lestidae (Emerald Damselflies/Spreadwings)	8				
Platycnemidae (Stream Damselflies)	10				
Protoneuridae (Threadwings)	8				
Aeshnidae (Hawkers & Emperors)	8	A			A
Corduliidae (Cruisers)	8				
Gomphidae (Clubtails)	6				
Libellulidae (Darters/Skimmers)	4	A	A		B
LEPIDOPTERA (Aquatic Caterpillars/Moths)					
Crambidae (Pyralidae)	12				

Taxon	QV	S	Veg	GSM	TOT
HEMIPTERA (Bugs)					
Belostomatidae* (Giant water bugs)	3				
Corixidae* (Water boatmen)	3				
Gerridae* (Pond skaters/Water striders)	5		A		A
Hydrometridae* (Water measurers)	6				
Naucoridae* (Creeping water bugs)	7		1		A
Nepidae* (Water scorpions)	3				
Notonectidae* (Backswimmers)	3				
Pleidae* (Pygmy backswimmers)	4				
Veliidae/M...veliidae* (Ripple bugs)	5		A		A
MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
Corydalidae (Fishflies & Dobsonflies)	8				
Sialidae (Alderflies)	6				
TRICHOPTERA (Caddisflies)					
Dipseudopsidae	10				
Ecnomidae	8				
Hydropsychidae 1 sp	4			1	
Hydropsychidae 2 sp	6				
Hydropsychidae > 2 sp	12	A			A
Philopotamidae	10	A		1	B
Polycentropodidae	12				
Psychomyiidae/Xiphocentronidae	8				
Cased caddis:					
Barbarochthonidae SWC	13				
Calamoceratidae ST	11				
Glossosomatidae SWC	11				
Hydroptilidae	6				
Hydrosalpingidae SWC	15				
Lepidostomatidae	10				
Leptoceridae	6		A	B	B
Petrothrincidae SWC	11				
Pisuliidae	10				
Sericostomatidae SWC	13				
COLEOPTERA (Beetles)					
Dytiscidae/Noteridae* (Diving beetles)	5		A		A
Elmidae/Dryopidae* (Riffle beetles)	8				
Gyrinidae* (Whirligig beetles)	5	A	B	1	B
Haliplidae* (Crawling water beetles)	5				
Helodidae (Marsh beetles)	12				
Hydraenidae* (Minute moss beetles)	8				
Hydrophilidae* (Water scavenger beetles)	5				
Limnichidae (Marsh-Loving Beetles)	10				
Psephenidae (Water Pennies)	10				

Taxon	QV	S	Veg	GSM	TOT
DIPTERA (Flies)					
Athericidae (Snipe flies)	10	1			1
Blepharoceridae (Mountain midges)	15				
Ceratopogonidae (Biting midges)	5				
Chironomidae (Midges)	2	A	B	A	B
Culicidae* (Mosquitoes)	1				
Dixidae* (Dixid midge)	10				
Empididae (Dance flies)	6				
Ephydridae (Shore flies)	3				
Muscidae (House flies, Stable flies)	1				
Psychodidae (Moth flies)	1				
Simuliidae (Blackflies)	5	A			A
Syrphidae* (Rat tailed maggots)	1				
Tabanidae (Horse flies)	5				
Tipulidae (Crane flies)	5				
GASTROPODA (Snails)					
Ancylidae (Limpets)	6				
Bulininae*	3				
Hydrobiidae*	3				
Lymnaeidae* (Pond snails)	3				
Physidae* (Pouch snails)	3				
Planorbinae* (Orb snails)	3				
Thiaridae* (=Melanidae)	3				
Viviparidae* ST	5				
PELECYPODA (Bivalvles)					
Corbiculidae (Clams)	5				
Sphaeriidae (Pill clams)	3				
Unionidae (Perly mussels)	6				
SASS Score					122
No. of Taxa					21
ASPT					5.8

Other biota:

Ptilodactylidae (Toed-winged beetle) - not part of the SASS5 - 2 individuals recorded

Comments/Observations:

KwaZungu/Swartkops River: May 2023

Date (dd-mm-yr):	06-May-23		(dd.ddddd)
Site Code:	SWAR01_I	**Grid reference (dd mm ss.s) Lat: S**	-33.722183
Collector/Sampler:	Kylie Farrell	**Long: E**	25.300816
River:	SWARTKOPS	**Datum (WGS84/Cape):**	
Level 1 Ecoregion:	19.Southern Folded Mountains	**Altitude (m):**	
Quaternary Catchment:	M10C	**Zonation:**	
	Temp (°C):	**Routine or Project? (circle one)**	**Flow**
Site Description: 52	**pH:**	**Project Name:**	**Clarity (cm):**
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722	**DO (mg/L):**	WP11354	**Turbidity:**
	Conductivity:		**Colour:**
	Riparian Disturbance:		
	Instream Disturbance:		

Biotopes Sampled (tick & rate)	Rating (1-5)	Time (min)
	5	
Stones Out Of Current (SOOC)	5	
Bedrock	0	
Aquatic Veg	3	
MargVeg In Current	4	
MargVeg Out Of Current	4	
Gravel	5	
Sand	5	
Mud	1	
Hand picking/Visual observation	x	
Biotope Score (%)	71	

Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				1
COELENTERATA (Cnidaria)	1				
TURBELLARIA (Flatworms)	3				
ANNELIDA					
Oligochaeta (Earthworms)	1	1			1
Hirudinea (Leeches)	3				
CRUSTACEA					
Amphipoda (Scuds)	13				
Potamonautidae* (Crabs)	3	A	1	1	A
Atyidae (Freshwater Shrimps)	8				
Palaemonidae (Freshwater Prawns)	10				
HYDRACARINA (Mites)	8				
PLECOPTERA (Stoneflies)					
Notonemouridae	14				
Perlidae	12				
EPHEMEROPTERA (Mayflies)					
Baetidae 1sp	4		1		
Baetidae 2 sp	6			A	
Baetidae > 2 sp	12	B			B
Caenidae (Squaregills/Cainfles)	6	1		1	A
Ephemeridae	15				
Heptageniidae (Flatheaded mayflies)	13				
Leptophlebiidae (Prongills)	9				
Oligoneuridae (Brushlegged mayflies)	15				
Polymitarcyidae (Pale Burrowers)	10				
Prosopistomatidae (Water specs)	15				
Teloganodidae SWC (Spiny Crawlers)	12				
Tricorythidae (Stout Crawlers)	9				
ODONATA (Dragonflies & Damselflies)					
Calopterygidae ST,T (Demoiselles)	10		1		1
Chlorocyphidae (Jewels)	10	A	1	A	B
Synlestidae (Chlorolestidae)(Sylphs)	8				
Coenagrionidae (Sprites and blues)	4	1	B		B
Lestidae (Emerald Damselflies/Spreadwings)	8				
Platycnemidae (Stream Damselflies)	10				
Protoneuridae (Threadwings)	8				
Aeshnidae (Hawkers & Emperors)	8	A			A
Corduliidae (Cruisers)	8				
Gomphidae (Clubtails)	6				
Libellulidae (Darters/Skimmers)	4	A	A	A	B
LEPIDOPTERA (Aquatic Caterpillars/Moths)					
Crambidae (Pyralidae)	12				

Taxon	QV	S	Veg	GSM	TOT
HEMIPTERA (Bugs)					
Belostomatidae* (Giant water bugs)	3				
Corixidae* (Water boatmen)	3				
Gerridae* (Pond skaters/Water striders)	5			1	A
Hydrometridae* (Water measurers)	6				
Naucoridae* (Creeping water bugs)	7				
Nepidae* (Water scorpions)	3				
Notonectidae* (Backswimmers)	3				
Pleidae* (Pygmy backswimmers)	4				
Veliidae/M...veliidae* (Ripple bugs)	5	1	1	A	B
MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
Corydalidae (Fishflies & Dobsonflies)	8				
Sialidae (Alderflies)	6				
TRICHOPTERA (Caddisflies)					
Dipseudopsidae	10				
Ecnomidae	8				
Hydropsychidae 1 sp	4				
Hydropsychidae 2 sp	6	A			A
Hydropsychidae > 2 sp	12				
Philopotamidae	10				
Polycentropodidae	12				
Psychomyiidae/Xiphocentronidae	8				
Cased caddis:					
Barbarochthonidae SWC	13				
Calamoceratidae ST	11				
Glossosomatidae SWC	11				
Hydroptilidae	6				
Hydrosalpingidae SWC	15				
Lepidostomatidae	10				
Leptoceridae	6	1	1	1	A
Petrothrincidae SWC	11				
Pisuliidae	10				
Sericostomatidae SWC	13				
COLEOPTERA (Beetles)					
Dytiscidae/Noteridae* (Diving beetles)	5				
Elmidae/Dryopidae* (Riffle beetles)	8				
Gyrinidae* (Whirligig beetles)	5		A	1	B
Haliplidae* (Crawling water beetles)	5				
Helodidae (Marsh beetles)	12				
Hydraenidae* (Minute moss beetles)	8				
Hydrophilidae* (Water scavenger beetles)	5				
Limnichidae (Marsh-Loving Beetles)	10				
Psephenidae (Water Pennies)	10				

Taxon	QV	S	Veg	GSM	TOT
DIPTERA (Flies)					
Athericidae (Snipe flies)	10				
Blepharoceridae (Mountain midges)	15				
Ceratopogonidae (Biting midges)	5	A			A
Chironomidae (Midges)	2	1	1		A
Culicidae* (Mosquitoes)	1				
Dixidae* (Dixid midge)	10				
Empididae (Dance flies)	6				
Ephydridae (Shore flies)	3				
Muscidae (House flies, Stable flies)	1				
Psychodidae (Moth flies)	1				
Simuliidae (Blackflies)	5				
Syrphidae* (Rat tailed maggots)	1				
Tabanidae (Horse flies)	5				
Tipulidae (Crane flies)	5				
GASTROPODA (Snails)					
Ancylidae (Limpets)	6	A			A
Bulininae*	3				
Hydrobiidae*	3				
Lymnaeidae* (Pond snails)	3				
Physidae* (Pouch snails)	3				
Planorbinae* (Orb snails)	3				
Thiaridae* (=Melanidae)	3				
Viviparidae* ST	5				
PELECYPODA (Bivalvles)					
Corbiculidae (Clams)	5				
Sphaeriidae (Pill clams)	3				
Unionidae (Perly mussels)	6				
SASS Score					103
No. of Taxa					18
ASPT					5.7

Other biota:

Ptilodactylidae (Toed-winged beetle) - not part of the SASS5 - A abundance

SIC and GSM

Comments/Observations:

Gamtoos River: July 2022

Date (dd-mm-yr):	07-Sep-22		(dd.ddddd)	**Biotopes Sampled (tick & rate)**	Rating (1-5) / Time (min)
Site Code:	GAMT01_I	Grid reference (dd mm ss.s) Lat: S	-33.760983		3
Collector/Sampler:	Kylie Farrell	Long: E	24.693677	Stones Out Of Current (SOOC)	5
River:	GAMTOOS	Datum (WGS84/Cape):		Bedrock	0
Level 1 Ecoregion:	19.Southern Folded Mountains	Altitude (m):		Aquatic Veg	4
Quaternary Catchment:	L90A	Zonation:		MargVeg In Current	4
	Temp (°C):	Routine or Project? (circle one)	Flow	MargVeg Out Of Current	4
Site Description: 52	pH:	Project Name:	Clarity (cm):	Gravel	4
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722	DO (mg/L):	WP11354	Turbidity:	Sand	3
	Conductivity:		Colour:	Mud	2
	Riparian Disturbance:			Hand picking/Visual observation	x
	Instream Disturbance:			Biotope Score (%)	64

Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				
COELENTERATA (Cnidaria)	1				
TURBELLARIA (Flatworms)	3		A	1	A
ANNELIDA					
Oligochaeta (Earthworms)	1			A	A
Hirudinea (Leeches)	3				
CRUSTACEA					
Amphipoda (Scuds)	13				
Potamonautidae* (Crabs)	3				
Atyidae (Freshwater Shrimps)	8				
Palaemonidae (Freshwater Prawns)	10				
HYDRACARINA (Mites)	8				
PLECOPTERA (Stoneflies)					
Notonemouridae	14				
Perlidae	12				
EPHEMEROPTERA (Mayflies)					
Baetidae 1sp	4	A			
Baetidae 2 sp	6		B	A	B
Baetidae > 2 sp	12				
Caenidae (Squaregills/Cainfles)	6				
Ephemeridae	15				
Heptageniidae (Flatheaded mayflies)	13				
Leptophlebiidae (Prongills)	9				
Oligoneuridae (Brushlegged mayflies)	15				
Polymitarcyidae (Pale Burrowers)	10				
Prosopistomatidae (Water specs)	15				
Teloganodidae SWC (Spiny Crawlers)	12				
Tricorythidae (Stout Crawlers)	9				
ODONATA (Dragonflies & Damselflies)					
Calopterygidae ST,T (Demoiselles)	10				
Chlorocyphidae (Jewels)	10				
Synlestidae (Chlorolestidae)(Sylphs)	8				
Coenagrionidae (Sprites and blues)	4		B	A	B
Lestidae (Emerald Damselflies/Spreadwings)	8				
Platycnemidae (Stream Damselflies)	10				
Protoneuridae (Threadwings)	8				
Aeshnidae (Hawkers & Emperors)	8				
Corduliidae (Cruisers)	8				
Gomphidae (Clubtails)	6				
Libellulidae (Darters/Skimmers)	4		A	A	A
LEPIDOPTERA (Aquatic Caterpillars/Moths)					
Crambidae (Pyralidae)	12				

Taxon	QV	S	Veg	GSM	TOT
HEMIPTERA (Bugs)					
Belostomatidae* (Giant water bugs)	3				
Corixidae* (Water boatmen)	3	A		B	B
Gerridae* (Pond skaters/Water striders)	5				A
Hydrometridae* (Water measurers)	6				
Naucoridae* (Creeping water bugs)	7				
Nepidae* (Water scorpions)	3				
Notonectidae* (Backswimmers)	3				
Pleidae* (Pygmy backswimmers)	4				
Veliidae/M...veliidae* (Ripple bugs)	5				
MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
Corydalidae (Fishflies & Dobsonflies)	8				
Sialidae (Alderflies)	6				
TRICHOPTERA (Caddisflies)					
Dipseudopsidae	10				
Ecnomidae	8				
Hydropsychidae 1 sp	4				
Hydropsychidae 2 sp	6				
Hydropsychidae > 2 sp	12				
Philopotamidae	10				
Polycentropodidae	12				
Psychomyiidae/Xiphocentronidae	8				
Cased caddis:					
Barbarochthonidae SWC	13				
Calamoceratidae ST	11				
Glossosomatidae SWC	11				
Hydroptilidae	6				
Hydrosalpingidae SWC	15				
Lepidostomatidae	10				
Leptoceridae	6				
Petrothrincidae SWC	11				
Pisuliidae	10				
Sericostomatidae SWC	13				
COLEOPTERA (Beetles)					
Dytiscidae/Noteridae* (Diving beetles)	5				
Elmidae/Dryopidae* (Riffle beetles)	8				
Gyrinidae* (Whirligig beetles)	5		A	A	B
Haliplidae* (Crawling water beetles)	5				
Helodidae (Marsh beetles)	12				
Hydraenidae* (Minute moss beetles)	8		1		1
Hydrophilidae* (Water scavenger beetles)	5				
Limnichidae (Marsh-Loving Beetles)	10				
Psephenidae (Water Pennies)	10				

Taxon	QV	S	Veg	GSM	TOT
DIPTERA (Flies)					
Athericidae (Snipe flies)	10				
Blepharoceridae (Mountain midges)	15				
Ceratopogonidae (Biting midges)	5		1		1
Chironomidae (Midges)	2	A	A	B	B
Culicidae* (Mosquitoes)	1			1	1
Dixidae* (Dixid midge)	10				
Empididae (Dance flies)	6				
Ephydridae (Shore flies)	3				
Muscidae (House flies, Stable flies)	1	1	A	1	A
Psychodidae (Moth flies)	1				
Simuliidae (Blackflies)	5	C	B	B	D
Syrphidae* (Rat tailed maggots)	1				
Tabanidae (Horse flies)	5				
Tipulidae (Crane flies)	5				
GASTROPODA (Snails)					
Ancylidae (Limpets)	6			A	A
Bulininae*	3				
Hydrobiidae*	3				
Lymnaeidae* (Pond snails)	3	A	1	A	A
Physidae* (Pouch snails)	3	B	B	B	B
Planorbinae* (Orb snails)	3				
Thiaridae* (=Melanidae)	3				
Viviparidae* ST	5				
PELECYPODA (Bivalvles)					
Corbiculidae (Clams)	5				
Sphaeriidae (Pill clams)	3				
Unionidae (Perly mussels)	6				
SASS Score					65
No. of Taxa					17
ASPT					3.8
Other biota:					
Comments/Observations:					

Gamtoos River: May 2023

Not conducted due to dry downstream of low water bridge

5. Appendix D: Riparian vegetation inventory and VEGRAI Models

This section outlines information and details of Intermediate sites not shown in volume 1 and Table 5-1 shows species observed in the field. The full VEGRAI Excel sheets will be submitted to DWS as separate electronic folders.

Table 5-1. Observed plant species per site

							Presence on sites										
Species	**Family**	**Common Name/s**	**Alien**	**Threat status**	**Protection Level**	**SA Endemic**	**GKEI01_I (Great Kei)**	**TSOMO01_I (Tsomo)**	**BKEI01_I (Black Kei)**	**BUFF01_I (Mid Buffalo)**	**KEIS01_I (Upper**	**GAMT01_I (Gamtoos)**	**FISH03_I (Middle Great Fish)**	**SWART01_I (Swartkops)**	**KAT01_I (Upper Kat)**	**MTHA01_I (Mthatha)**	**MBSA01_I (Middle Mbhashe)**
Acacia dealbata	FABACEAE	Silver Wattle	*	Not Evaluated				y		y							
Acacia mearnsii	FABACEAE	Black Wattle	*	Not Evaluated				y		y		y					
Achyranthes aspera var. aspera	AMARANTHACEAE	Burweed	*	Not Evaluated					y								
Afrocarpus falcatus	PODOCARPACEAE	Outeniqua yellowwood		LC	National					y				y	y		
Agrostis lachnantha var. lachnantha	POACEAE	Bent grass		LC						y							y
Aloe ferox	ASPHODELACEAE			LC				y									
Araujia sericifera	ASCLEPIADACEAE	Moth catcher	*	Not Evaluated					y								

							Presence on sites										
Species	**Family**	**Common Name/s**	**Alien**	**Threat status**	**Protection Level**	**SA Endemic**	**GKEI01_I (Great Kei)**	**TSOMO01_I (Tsomo)**	**BKEI01_I (Black Kei)**	**BUFF01_I (Mid Buffalo)**	**KEIS01_I (Upper**	**GAMT01_I (Gamtoos)**	**FISH03_I (Middle Great Fish)**	**SWART01_I (Swartkops)**	**KAT01_I (Upper Kat)**	**MTHA01_I (Mthatha)**	**MBSA01_I (Middle Mbhashe)**
Argemone ochroleuca	PAPAVERACEAE	White Mexican Poppy	*	Not Evaluated			y	y	y			y					y
Arundinella nepalensis	POACEAE	River Grass		LC				y								y	y
Arundo donax	POACEAE	Spanish Reed	*	Not Evaluated					y			y					
Asparagus suaveolens	ASPARAGACEAE	Wild Asparagus		LC			y		y		y						
Berula thunbergii	APIACEAE	Toothache Root		LC							y				y		
Bidens pilosa	ASTERACEAE	Black Jack	*	Not Evaluated			y	y	y	y	y	y	y		y		y
Celtis africana	CELTIDACEAE	White Stinkwood		LC				y	y		y				y		
Centella asiatica	APIACEAE	Pennywort		LC						y					y		
Cestrum laevigatum	SOLANACEAE	Inkberry	*	Not Evaluated												y	
Cliffortia strobilifera	ROSACEAE	Cone Rice Bush		LC					y	y				y	y		
Combretum caffrum	COMBRETACEAE	Cape bushwillow		LC		Yes	y	y		y	y		y		y	y	y
Commelina diffusa subsp. diffusa	COMMELINACEAE			LC						y							
Conyza bonariensis	ASTERACEAE	Horseweed	*	Not Evaluated			y	y	y	y	y	y	y		y	y	y

							Presence on sites										
Species	**Family**	**Common Name/s**	**Alien**	**Threat status**	**Protection Level**	**SA Endemic**	**GKEI01_I (Great Kei)**	**TSOMO01_I (Tsomo)**	**BKEI01_I (Black Kei)**	**BUFF01_I (Mid Buffalo)**	**KEIS01_I (Upper**	**GAMT01_I (Gamtoos)**	**FISH03_I (Middle Great Fish)**	**SWART01_I (Swartkops)**	**KAT01_I (Upper Kat)**	**MTHA01_I (Mthatha)**	**MBSA01_I (Middle Mbhashe)**
Cotula nigellifolia var. nigellifolia	ASTERACEAE			LC		Yes				y	y	y			y		
Cyclosorus interruptus	THELYPTERIDACEAE	Water fern		LC										y	y		
Cynodon dactylon	POACEAE	Coach grass		LC			y	y	y	y	y	y				y	y
Cyperus dives	CYPERACEAE	Giant sedge		LC						y	y						
Cyperus laevigatus	CYPERACEAE			LC													y
Cyperus longus	CYPERACEAE	Sweet Cyperus		LC			y	y	y		y						
Cyperus sexangularis	CYPERACEAE			LC					y				y				
Cyperus textilis	CYPERACEAE	Tall star sedge		LC		Yes	y			y	y	y	y	y	y		
Dais cotinifolia	THYMELAEACEAE	Pompom Tree		LC						y							y
Dietes butcheriana	IRIDACEAE	Forest Iris		LC						y				y			
Eichhornia crassipes	PONTEDERIACEAE	Water Hyacinth	*	Not Evaluated						y							
Equisetum ramosissimum	EQUISETACEAE			LC					y								y
Erica caffra var. caffra	ERICACEAE	Water Tree Erica		LC						y				y			

							Presence on sites										
Species	**Family**	**Common Name/s**	**Alien**	**Threat status**	**Protection Level**	**SA Endemic**	**GKEI01_I (Great Kei)**	**TSOM01_I (Tsomo)**	**BKEI01_I (Black Kei)**	**BUFF01_I (Mid Buffalo)**	**KEIS01_I (Upper**	**GAMT01_I (Gamtoos)**	**FISH03_I (Middle Great Fish)**	**SWART01_I (Swartkops)**	**KAT01_I (Upper Kat)**	**MTHA01_I (Mthatha)**	**MBSA01_I (Middle Mbhashe)**
Euclea divinorum	EBENACEAE			LC										y			
Ficus ingens	MORACEAE	Red-leaved fig		LC							y						
Ficus sur	MORACEAE	Broomcluster Fig		LC			y									y	
Fraxinus americana	OLEACEAE	American Ash	*	Not Evaluated					y								
Fuirena hirsuta	CYPERACEAE			LC							y						
Gleditsia tracanthos	FABACEAE	Honey Locust	*	Not Evaluated					y								
Gomphocarpus fruticosus	APOCYNACEAE	Milkweed		LC									y				
Gomphostigma virgatum	BUDDLEJACEAE	River stars		LC			y	y			y				y		y
Grevillea robusta	PROTEACEAE	Australian silky oak	*	Not Evaluated										y			
Gymnosporia buxifolia	CELASTRACEAE	Common Spike-thorn		LC			y			y	y	y			y		y
Hemarthria altissima	POACEAE	Swamp Couch		LC						y						y	
Ischaemum fasciculatum	POACEAE	Hippo Grass		LC						y	y	y					
Juncus effusus	JUNCACEAE	Soft rush		LC													y

							Presence on sites										
Species	**Family**	**Common Name/s**	**Alien**	**Threat status**	**Protection Level**	**SA Endemic**	**GKEI01_I (Great Kei)**	**TSOMO01_I (Tsomo)**	**BKEI01_I (Black Kei)**	**BUFF01_I (Mid Buffalo)**	**KEIS01_I (Upper**	**GAMT01_I (Gamtoos)**	**FISH03_I (Middle Great Fish)**	**SWART01_I (Swartkops)**	**KAT01_I (Upper Kat)**	**MTHA01_I (Mthatha)**	**MBSA01_I (Middle Mbhashe)**
Kyllinga elatior	CYPERACEAE			LC											y		
Lantana camara	VERBENACEAE	Bird's Brandy	*	Not Evaluated			y			y							y
Leersia hexandra	POACEAE	Rice Grass		LC										y			
Lemna gibba	LEMNACEAE	Duckweed		LC						y							
Leonotis intermedia	LAMIACEAE			LC				y		y						y	
Leucaena leucocephala	FABACEAE	Leucaena	*	Not Evaluated					y								
Lippia javanica	VERBENACEAE	Fever Tea										y					
Melia azedarach	MELIACEAE	Syringa	*	Not Evaluated			y		y	y	y				y		
Mentha aquatica	LAMIACEAE	Water Mint		LC								y			y		
Miscanthus ecklonii	POACEAE	Daba grass		LC			y		y	y	y			y	y	y	y
Nicotiana glaucea	SOLANACEAE	Wild tobacco	*	Not Evaluated													y
Nymphaea nouchali	NYMPHAEACEAE	Blue Water Lily		LC										y			
Olea europaea subsp. africana	OLEACEAE	Wild Olive		LC										y	y		y

							Presence on sites										
Species	**Family**	**Common Name/s**	**Alien**	**Threat status**	**Protection Level**	**SA Endemic**	**GKEI01_I (Great Kei)**	**TSOMO01_I (Tsomo)**	**BKEI01_I (Black Kei)**	**BUFF01_I (Mid Buffalo)**	**KEIS01_I (Upper**	**GAMT01_I (Gamtoos)**	**FISH03_I (Middle Great Fish)**	**SWART01_I (Swartkops)**	**KAT01_I (Upper Kat)**	**MTHA01_I (Mthatha)**	**MBSA01_I (Middle Mbhashe)**
Opuntia ficus-indica	CACTACEAE	Prickly pear	*	Not Evaluated			**y**			**y**	**y**		**y**		**y**		
Panicum maximum	POACEAE	Guinea Grass		LC							y		y				
Paspalum distichum	POACEAE	Water Couch		LC									y				
Pennisetum clandestinum	POCEAE	Kikuyu Grass	*	Not Evaluated								y					
Pennisetum macrourum	POCEAE	Riverbed grass		LC									y				
Persicaria decipiens	POLYGONACEAE			LC			y		y								
Persicaria lapathifolia	POLYGONACEAE	Spotted Knotweed	*	Not Evaluated						y					y		
Persicaria madagascariensis	POLYGONACEAE			LC			y				y			y			
Phoenix reclinata	ARECACEAE	Wild date palm		LC						y						y	
Phragmites australis	POACEAE	Common Reed		LC								y	y				
Phragmites mauritianus	POACEAE			LC													y
Plectranthus ecklonii	LAMIACEAE	Large Spur-flower bush		LC			y				y						
Pluchea dioscoridis	ASTERACEAE			LC							y	y		y	y		

							Presence on sites										
Species	**Family**	**Common Name/s**	**Alien**	**Threat status**	**Protection Level**	**SA Endemic**	**GKEI01_I (Great Kei)**	**TSOMO01_I (Tsomo)**	**BKEI01_I (Black Kei)**	**BUFF01_I (Mid Buffalo)**	**KEIS01_I (Upper**	**GAMT01_I (Gamtoos)**	**FISH03_I (Middle Great Fish)**	**SWART01_I (Swartkops)**	**KAT01_I (Upper Kat)**	**MTHA01_I (Mthatha)**	**MBSA01_I (Middle Mbhashe)**
Plumbago auriculata	PLUMBAGINACEAE										y		y				
Populus X canescens	SALICACEAE	Grey Poplar	*	Not Evaluated					y								
Potamogeton schweinfurthii	POTAMOGETONACEAE	Broad-leaved Pondweed		LC								y					
Prionium serratum	**PRIONIACEAE**			**Declining**		Yes								y			
Pycreus intactus	CYPERACEAE			LC			y										
Pycreus polystachyos var. polystachyos	CYPERACEAE			LC				y	y	y				y			
Ranunculus baurii	RANUNCULACEAE			LC								y					
Ricinus communis	EUPHORBIACEAE	Cateroil Bush	*	Not Evaluated							y	y	y				
Rubus fruticosus	ROSACEAE	European Blackberry	*	Not Evaluated										y			
Salix babylonica var. babylonica	SALICACEAE	Weeping Willow	*	Not Evaluated				y	y								
Salix fragilis var. fragilis	SALICACEAE	Crack Willow	*	Not Evaluated					y								
Salix mucronata subsp. mucronata	SALICACEAE	Cape willow		LC			y	y	y		y		y		y		
Sansevieria hyacinthoides	DRACAENACEAE	Mother-in-law's-tongue		LC			y										

							Presence on sites										
Species	**Family**	**Common Name/s**	**Alien**	**Threat status**	**Protection Level**	**SA Endemic**	**GKEI01_I (Great Kei)**	**TSOMO01_I (Tsomo)**	**BKEI01_I (Black Kei)**	**BUFF01_I (Mid Buffalo)**	**KEIS01_I (Upper**	**GAMT01_I (Gamtoos)**	**FISH03_I (Middle Great Fish)**	**SWART01_I (Swartkops)**	**KAT01_I (Upper Kat)**	**MTHA01_I (Mthatha)**	**MBSA01_I (Middle Mbhashe)**
Schkuhria pinnata	ASTERACEAE	Dwarf Marigold	*	Not Evaluated					y								
Schoenoplectus corymbosus	CYPERACEAE			LC				y	y								
Schoenoplectus decipiens	CYPERACEAE			LC										y			y
Schoenoplectus paludicola	CYPERACEAE			LC		Yes	y										
Searsia dentata	ANACARDIACEAE			LC								y					
Searsia lancea	ANACARDIACEAE	Karee tree		LC										y			
Searsia lepidictya	ANACARDIACEAE								y								
Searsia lucida	ANACARDIACEAE	Glossy Currant		LC		Yes								y			
Searsia pyroides var. pyroides	ANACARDIACEAE			LC				y	y						y		
Senegalia ataxacantha	FABACEAE	Flame thorn		LC			y										
Senegalia caffra	FABACEAE	Common hook thorn		LC		Yes		y		y	y				y		y
Senegalia schweinfurthii var. schweinfurthii	FABACEAE	River climbing thorn		LC											y		
Senna didymobotrya	FABACEAE	Peanut butter cassia	*	Not Evaluated						y		y				y	

							Presence on sites										
Species	**Family**	**Common Name/s**	**Alien**	**Threat status**	**Protection Level**	**SA Endemic**	**GKEI01_I (Great Kei)**	**TSOMO01_I (Tsomo)**	**BKEI01_I (Black Kei)**	**BUFF01_I (Mid Buffalo)**	**KEIS01_I (Upper**	**GAMT01_I (Gamtoos)**	**FISH03_I (Middle Great Fish)**	**SWART01_I (Swartkops)**	**KAT01_I (Upper Kat)**	**MTHA01_I (Mthatha)**	**MBSA01_I (Middle Mbhashe)**
Sesbania punicea	FABACEAE	Red Sesbania	*	Not Evaluated			y		y	y	y	y				y	y
Setaria megaphylla	POACEAE	Broad-leaved bristle grass		LC											y		
Setaria sphacelata var. sericea	POACEAE	Golden Bristle Grass		LC									y				
Sida dregei	MALVACEAE	Fanpetals		LC			y			y	y				y		y
Solanum mauritianum	SOLANACEAE	Bugweed	*	Not Evaluated				y		y							y
Solanum torvum	SOLANACEAE	Turkey berry	*	Not Evaluated						y						y	y
Sporobolus fimbriatus	POACEAE	Dropseed Grass		LC				y		y						y	
Sporobolus ioclados	POACEAE	Pan Dropseed		LC							y		y				y
Stuckenia pectinatus	POTAMOGETONACEAE	Fennel-leaved Pondweed		LC								y					
Tagetes minuta	ASTERACEAE	Khaki Weed	*	Not Evaluated				y	y	y			y				y
Tithonia diversifolia	ASTERACEAE	Mexican sunflower	*	Not Evaluated									y				
Tithonia rotundifolia	ASTERACEAE	Red sunflower	*	Not Evaluated					y								y
Typha capensis	TYPHACEAE	Bulrush		LC								y					

							Presence on sites										
Species	**Family**	**Common Name/s**	**Alien**	**Threat status**	**Protection Level**	**SA Endemic**	**GKEI01_I (Great Kei)**	**TSOMO01_I (Tsomo)**	**BKEI01_I (Black Kei)**	**BUFF01_I (Mid Buffalo)**	**KEIS01_I (Upper**	**GAMT01_I (Gamtoos)**	**FISH03_I (Middle Great Fish)**	**SWART01_I (Swartkops)**	**KAT01_I (Upper Kat)**	**MTHA01_I (Mthatha)**	**MBSA01_I (Middle Mbhashe)**
Vachellia karroo	FABACEAE	Sweet Thorn		LC			y	y	y	y	y	y	y	y	y	y	y
Vachellia robusta	FABACEAE			LC			y										
Verbena bonariensis	VERBENACEAE	Wild Verbena	*	*				y	y	y	y	y	y				y
Vinca minor	APOCYNACEAE	Periwinkle	*	Not Evaluated								y					y
Xanthium strumarium	ASTERACEAE	Large Cocklebur	*	Not Evaluated			y		y	y	y	y			y		
Zinnia peruviana	ASTERACEAE	Peruvian zinnia	*				y										
Ziziphus mucronata	RHAMNACEAE	Buffalo thorn		LC			y	y	y						y		
No Species observed from pool of 118:							**30**	**25**	**35**	**41**	**33**	**27**	**20**	**21**	**30**	**15**	**30**

6. Appendix E: Summary of IHI Models

RAPID 3 SITES ONLY

Mngazi River: MNGA01_R

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	4	
Flow modification	3	Mhlangu Dam in upper reaches
Bed modification	7	Gravel mining, bridges
Channel modification	6	Bridges approaches, gravel mining approaches, trampling
Physical-chemical modification	4	
Inundation	0	
Alien macrophytes	0	
Introduced aquatic fauna	2	TSPA
Rubbish dumping	5	
Instream PES	**60**	
Riparian		
Vegetation removal	6	Road access, firewood collection
Exotic vegetation	18	Solanum spp, lantana, peanut cassia (senna)
Bank erosion	8	Trampling, river access, recent floods
Channel modification	5	River access, bridge approaches, gullying
Water abstraction	0	
Inundation	0	
Flow modification	0	
Physical-chemical modification	2	
Riparian PES	**74**	

Nqabarha River: NQAB01_R

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	5	Towns, villages along river
Flow modification	5	Degradation of wetlands in upper catchment – baseflow reduction
Bed modification	10	Bridges, cattle/ sheep crossings, sedimentation
Channel modification	15	Bank erosion, incision, animal trampling
Physical-chemical modification	7	Villages and towns upstream, WWTW, wetlands filtering
Inundation	0	
Alien macrophytes	0	
Introduced aquatic fauna	2	Bass
Rubbish dumping	2	
Instream PES	**73**	
Riparian		
Vegetation removal	5	Grazing along riparian zone
Exotic vegetation	7	Wattle
Bank erosion	18	Bank erosion due to trampling, recent floods impacts larger due to catchment degradation
Channel modification	8	Trampling, animal access
Water abstraction	1	
Inundation	0	
Flow modification	1	
Physical-chemical modification	5	WWTW
Riparian PES	**62**	

Mtentu River: MTEN01_R

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	3	Domestic, stock
Flow modification	1	
Bed modification	5	
Channel modification	4	Bridge, some gravel mining
Physical-chemical modification	3	
Inundation	0	
Alien macrophytes	0	
Introduced aquatic fauna	2	Bass (MSAL)
Rubbish dumping	2	
Instream PES	**90**	
Riparian		
Vegetation removal	2	
Exotic vegetation	15	Lantana, peanut cassia (senna)
Bank erosion	4	Trampling, bridge
Channel modification	6	Roads, gravel mining up- and downstream, livestock tracks
Water abstraction	9	
Inundation	9	
Flow modification	9	
Physical-chemical modification	9	
Riparian PES	**61**	

Mbhashe River: MBHA02_R

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	5	
Flow modification	6	Check water transfer from Tsomo
Bed modification	7	Bridges and weirs, cattle crossing
Channel modification	1	
Physical-chemical modification	3	
Inundation	0	
Alien macrophytes	0	
Introduced aquatic fauna	3	Small mouth yellow fish
Rubbish dumping	1	
Instream PES	**87**	
Riparian		
Vegetation removal	6	Localised wood collection, overgrazing
Exotic vegetation	3	Wattles at bridges and weirs
Bank erosion	8	Cattle trampling
Channel modification	2	Localised sand mining in catchment
Water abstraction	0	
Inundation	1	
Flow modification	1	
Physical-chemical modification	1	
Riparian PES	**89**	

Gcuwa River: GCUW01_R *(although a VEGRAI was also run for this site to aid in higher confidence)*

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	7	Golf course, irrigation
Flow modification	15	Xilinxa and Gcuwa Dams, weirs
Bed modification	7	Several weirs, dam, low water crossings
Channel modification	5	Engineering works, weirs, localised scour around bridges and weirs
Physical-chemical modification	18	Dysfunctional sewage works, informal settlements, poor waste management
Inundation	4	
Alien macrophytes	1	
Introduced aquatic fauna	1	
Rubbish dumping	16	Extensive along reaches in town
Instream PES	**60**	
Riparian		
Vegetation removal	8	Fire wood collection, urbanisation – clearing of riparian zone
Exotic vegetation	10	Wattle, lantana, eucalyptus
Bank erosion	9	Access and bridges, trampling, grazing
Channel modification	7	Erosion, engineering works, dumping of rubble on banks
Water abstraction	3	
Inundation	4	For reach – weirs, dam
Flow modification	8	Baseflows, freshets in dam, weirs
Physical-chemical modification	3	
Riparian PES	**74**	

Indwe River: INDW01_R

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	4	Check if any
Flow modification	10	Indwe Dam upstream
Bed modification	15	Sand mining, erosion
Channel modification	6	Sand mining, trampling, bank erosion
Physical-chemical modification	3	
Inundation	1	
Alien macrophytes	0	
Introduced aquatic fauna	3	Barbel, small mouth yellow fish
Rubbish dumping	2	Localised
Instream PES	**75**	
Riparian		
Vegetation removal	7	Fire wood harvesting, sand mining, grazing
Exotic vegetation	3	
Bank erosion	10	Cattle trampling and grazing
Channel modification	5	
Water abstraction	1	
Inundation	4	
Flow modification	13	Loss of baseflows, freshets, annual floods due to dam upstream
Physical-chemical modification	1	
Riparian PES	**71**	

White Kei River: WKEI01_R

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	5	Possible irrigation
Flow modification	13	Indwe and Xonxa Dams upstream
Bed modification	8	Sand mining, erosion
Channel modification	10	Sand mining, trampling, bank erosion
Physical-chemical modification	8	Algae
Inundation	0	
Alien macrophytes	0	
Introduced aquatic fauna	3	Barbel, small mouth yellow fish
Rubbish dumping	6	Instream rubbish
Instream PES	**74**	
Riparian		
Vegetation removal	10	Fire wood harvesting, sand mining, grazing
Exotic vegetation	3	
Bank erosion	12	Trampling, sand mining
Channel modification	4	
Water abstraction	2	
Inundation	0	
Flow modification	10	Loss of baseflows, freshets, annual floods due to dams upstream
Physical-chemical modification	3	
Riparian PES	**68**	

Kubusi (Middle) River: KUBU01_R *(although a VEGRAI was also run for this site to aid in higher confidence)*

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	3	
Flow modification	13	
Bed modification	7	
Channel modification	7	
Physical-chemical modification	8	
Inundation	0	
Alien macrophytes	0	
Introduced aquatic fauna	4	
Rubbish dumping	7	
Instream PES	**77**	
Riparian		
Vegetation removal	6	
Exotic vegetation	14	
Bank erosion	8	
Channel modification	4	
Water abstraction	0	
Inundation	0	
Flow modification	4	
Physical-chemical modification	2	
Riparian PES	**72**	

Buffalo (Lower) River: BUFF02_R

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	20	Water released from Bridle Drift Dam is abstracted at weir just upstream of the site to the water works
Flow modification	18	Limited baseflows and freshets, only large floods overtopping Bridle Drift Dam
Bed modification	15	Sediment starvation due to Bridle Drift Dam and abstraction weir downstream
Channel modification	4	
Physical-chemical modification	12	Nutrient enrichment from leakage of sewage pipeline and surrounding villages and town
Inundation	0	
Alien macrophytes	15	Hyacinths, persicaria
Introduced aquatic fauna	5	CCAR, CGAR, LUMB
Rubbish dumping	14	Mainly from local villages and town
Instream PES	**38**	
Riparian		
Vegetation removal	3	Localised wood harvesting
Exotic vegetation	5	*Caesalpinia pulcherrima* (pride of Bardados)
Bank erosion	3	
Channel modification	4	
Water abstraction	8	Loss of baseflows
Inundation	8	Upstream weir
Flow modification	9	Encroachment due to loss of floods
Physical-chemical modification	3	
Riparian PES	**79**	

Keiskamma (Lower) River: KEIS02_R

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	5	Some for irrigation, towns and villages upstream
Flow modification	7	Dams upstream (Sandile, Tyume), loss of some floods
Bed modification	4	Low water bridge, some siltation
Channel modification	4	River crossings, cattle access
Physical-chemical modification	12	Extensive algae Diatoms indicative of poorly modified water quality
Inundation	2	Localised
Alien macrophytes	0	
Introduced aquatic fauna	4	CCAR, CGAR, LUMB
Rubbish dumping	1	
Instream PES	**76**	
Riparian		
Vegetation removal	6	Cattle grazing and trampling
Exotic vegetation	2	
Bank erosion	5	Localised at bridge and cattle crossings
Channel modification	6	Bridge approach, river crossings
Water abstraction	1	
Inundation	1	
Flow modification	3	
Physical-chemical modification	1	
Riparian PES	**87**	

Tyume River: TYUM01_R

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	5	Irrigation, domestic
Flow modification	9	Reduced floods
Bed modification	8	Low water and cattle crossings, filamentous algae
Channel modification	4	
Physical-chemical modification	12	Nutrients from irrigation and WWTW
Inundation	0	
Alien macrophytes		Check if invasive 'parsley'
Introduced aquatic fauna	2	LMAC, TSPA, CGAR present
Rubbish dumping	1	
Instream PES	**74**	
Riparian		
Vegetation removal	3	Limited wood harvesting, clearing for sand mining
Exotic vegetation	3	Salix
Bank erosion	6	Around crossings and cattle access points
Channel modification	3	
Water abstraction	2	
Inundation	1	
Flow modification	6	Reduced floods due to dam upstream
Physical-chemical modification	3	
Riparian PES	**86**	

Koonap River: KOON01_R

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	8	Mainly irrigation
Flow modification	5	Weir upstream, not changing flows
Bed modification	5	Limited embeddedness, fine sediments trapped at weirs
Channel modification	7	Localised scouring, trampling, bridges
Physical-chemical modification	12	Extensive algae
Inundation	1	
Alien macrophytes	3	Cloverleaf???
Introduced aquatic fauna	7	CCAR (Carp), LCAP
Rubbish dumping	1	
Instream PES	**72**	
Riparian		
Vegetation removal	15	Wood harvesting, overgrazing
Exotic vegetation	3	Willow (salix)
Bank erosion	9	Bank collapse due to trampling, overgrazing, vegetation removal, downstream of bridges and weirs
Channel modification	6	Bridges, trampling, vegetation removal
Water abstraction	2	
Inundation	0	
Flow modification	1	
Physical-chemical modification	3	
Riparian PES	**70**	

Kat River: KAT02_R

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	17	Extensive irrigation
Flow modification	12	Release pattern from dam, loss of floods
Bed modification	15	Large number of weirs – changes in habitat type from riffle to pool
Channel modification	5	Crossings, weirs
Physical-chemical modification	10	High nutrients
Inundation	12	Large number of weirs
Alien macrophytes	5	Lemnae sp???
Introduced aquatic fauna	2	Small mouth yellow fish, barbel
Rubbish dumping	1	
Instream PES	**51**	
Riparian		
Vegetation removal	4	
Exotic vegetation	6	Eucalyptus, salix
Bank erosion	7	Cattle trampling, scouring downstream of weirs
Channel modification	7	Weirs, bridges
Water abstraction	2	
Inundation	7	Weirs in reach
Flow modification	12	Loss of floods
Physical-chemical modification	4	
Riparian PES	**68**	

Great Fish (Upper) River: FISH01_R

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	4	Water taken out via canal upstream of site
Flow modification	10	Low water bridge, upstream canal diverting flow
Bed modification	16	Siltation due to reduced flows
Channel modification	6	Narrowing due to reduced flows and siltation
Physical-chemical modification	7	Algae
Inundation	8	
Alien macrophytes	2	Azolla (red water fern)
Introduced aquatic fauna	2	
Rubbish dumping	1	
Instream PES	**66**	
Riparian		
Vegetation removal	14	Cattle crazing and trampling
Exotic vegetation	9	
Bank erosion	12	On macro channel due to trampling and low vegetation cover
Channel modification	7	
Water abstraction	1	
Inundation	15	Low water bridge, upstream weir
Flow modification	3	
Physical-chemical modification	2	
Riparian PES		

Tarka River: TARK01_R

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	5	Mostly from canals from upstream dam
Flow modification	20	Lake Arthur and Kommandodrift Dams upstream – no releases into river
Bed modification	18	Silted (bed built-up more than 2m over time), reeds
Channel modification	8	Channel manipulation due to silting of canal
Physical-chemical modification	15	High salinity (natural and from irrigation return flows), anoxic sediments
Inundation	1	
Alien macrophytes	0	
Introduced aquatic fauna	3	
Rubbish dumping	1	
Instream PES	**49**	
Riparian		
Vegetation removal	2	
Exotic vegetation	1	
Bank erosion	4	Cattle trampling in areas
Channel modification	3	Crossings
Water abstraction	2	
Inundation	0	
Flow modification	15	Encroachment due to no floods
Physical-chemical modification	1	
Riparian PES	**76**	

Sundays (Lower) River: SUND02_R

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	6	Mostly from irrigation canal from Korhaansdrift
Flow modification	20	Limited flows due to upstream Darlington Dam and Korhaansdrift weir
Bed modification	17	Armoured, increased reeds, narrowing of bed, crossings
Channel modification	4	
Physical-chemical modification	14	Conductivity high, algae
Inundation	2	
Alien macrophytes	0	
Introduced aquatic fauna	3	CCAR, CGAR, MSAL, TSPA, GAFF
Rubbish dumping	4	
Instream PES	**50**	
Riparian		
Vegetation removal	3	
Exotic vegetation	15	Spanish reeds, gums, seringa
Bank erosion	4	
Channel modification	6	Crossings, landscaping around orchards
Water abstraction	4	
Inundation	1	
Flow modification	17	Loss of most floods
Physical-chemical modification	8	Increased nutrients from return flows
Riparian PES	**52**	

Kouga River: KOUG01_R

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	8	Mostly for irrigation in upper catchment (fruit)
Flow modification	14	Loss of baseflows due to groundwater abstractions for irrigation
Bed modification	2	
Channel modification	3	
Physical-chemical modification	5	Nutrients from return flows
Inundation	2	
Alien macrophytes	0	
Introduced aquatic fauna	1	MDOL, CGAR
Rubbish dumping	1	
Instream PES	**81**	
Riparian		
Vegetation removal	3	
Exotic vegetation	15	Wattle, Spanish reed
Bank erosion	4	
Channel modification	1	
Water abstraction	2	
Inundation	1	
Flow modification	4	Possibly lower baseflows due to water abstraction in upper catchment
Physical-chemical modification	2	
Riparian PES	**75**	

Field Verifications

Mtakatye River: MTAK01_FV

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	4	
Flow modification	3	
Bed modification	8	Localised at bridges
Channel modification	10	Localised at road crossings, bank erosion due to cattle grazing, grazing and crossings
Physical-chemical modification	7	Communities (Libode) upstream
Inundation	1	
Alien macrophytes	0	
Introduced aquatic fauna	1	
Rubbish dumping	4	
Instream PES	**81**	
Riparian		
Vegetation removal	2	
Exotic vegetation	3	
Bank erosion	10	River crossings, cattle trampling and grazing
Channel modification	4	Bridges, erosion, washing, cattle paths
Water abstraction	1	
Inundation	0	
Flow modification	1	
Physical-chemical modification	1	
Riparian PES	**87**	

Klipplaats River: KLIP01_FV

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	5	
Flow modification	9	Changes to the flow component due to the upstream dam Possible releases during dry or low flow months
Bed modification	5	
Channel modification	10	Upstream Waterdown Dam, bridges
Physical-chemical modification	7	
Inundation	3	
Alien macrophytes	2	
Introduced aquatic fauna	3	
Rubbish dumping	1	
Instream PES	**78**	
Riparian		
Vegetation removal	3	
Exotic vegetation	7	
Bank erosion	5	
Channel modification	12	Confinement of floodplain
Water abstraction	4	
Inundation	1	
Flow modification	7	Lots more floods/freshets due to the upstream Waterdown Dam
Physical-chemical modification	2	
Riparian PES	**71**	

Klaas Smits River: KSMI01_FV

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	15	Extensive irrigation in lower Komani and Klaas Smits, domestic and industrial (Komani)
Flow modification	8	Small dams in upper catchments, reduced freshets and low flows
Bed modification	6	Weirs, bridges, low water crossings
Channel modification	5	Engineering works
Physical-chemical modification	18	Irrigation return flows, WWTWs
Inundation	4	Low water bridges
Alien macrophytes	0	
Introduced aquatic fauna	2	
Rubbish dumping	1	
Instream PES	**59**	
Riparian		
Vegetation removal	3	
Exotic vegetation	4	Eucalyptus, salix – low numbers
Bank erosion	3	
Channel modification	3	
Water abstraction	6	Very low baseflows
Inundation	3	
Flow modification	10	Number of off-channel dams – reduced freshets and low flows
Physical-chemical modification	7	
Riparian PES	**81**	

Buffalo (Upper) River: BUFF03_FV

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	3	
Flow modification	10	Dams, forestry upstream
Bed modification	7	Bridge, weirs
Channel modification	6	Crossings, bridge approaches, trampling, overgrazing
Physical-chemical modification	8	Upstream villages/rural areas, diatoms indicative of moderately modified condition s(eutrophication), forestry
Inundation	0	
Alien macrophytes	0	
Introduced aquatic fauna	3	
Rubbish dumping	4	Localised at site
Instream PES	**80**	
Riparian		
Vegetation removal	9	Wood harvesting, grazing, cultivation on terraces
Exotic vegetation	8	Melia, limited wattle
Bank erosion	9	Crossings, scour around bridges, weirs
Channel modification	6	Cattle trampling, erosion around alien plants, weir and bridge structures
Water abstraction	1	
Inundation	0	
Flow modification	6	Reduced baseflows
Physical-chemical modification	2	
Riparian PES	**79**	

Kubusi (Upper) River: KUBU02_FV

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	3	Possibly for Stutterheim
Flow modification	13	Forestry, Gubu Dam - reduced baseflows
Bed modification	7	Weirs, bridges
Channel modification	7	Alien vegetation resulting in bank collapse, scouring
Physical-chemical modification	8	Algae – nutrient enrichment
Inundation	0	
Alien macrophytes	0	
Introduced aquatic fauna	4	CCAR, CGAR, BAEN
Rubbish dumping	7	
Instream PES	**77**	
Riparian		
Vegetation removal	6	Wood harvesting, cultivation in riparian zone
Exotic vegetation	14	Gums, wattle, syringa
Bank erosion	8	Undercutting of banks, mainly due to alien trees
Channel modification	4	
Water abstraction	0	
Inundation	0	
Flow modification	4	
Physical-chemical modification	2	
Riparian PES	**72**	

Great Fish River (Upstream from Craddock): GFIS04_FV

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	4	Irrigation abstraction upstream
Flow modification	10	Increased flows due to transfer of water
Bed modification	16	Scour, bed armouring due to increased flows
Channel modification	6	Crossings, weirs
Physical-chemical modification	7	Increased TSS
Inundation	8	Invert habitat inundated
Alien macrophytes	2	
Introduced aquatic fauna	2	CCAR, CGAR, LAEN
Rubbish dumping	1	
Instream PES	**66**	
Riparian		
Vegetation removal	14	Removal for picnic area, sport area, burning of riparian vegetation
Exotic vegetation	9	Spanish reeds, gums
Bank erosion	12	Inset bench erosion
Channel modification	7	Bridges
Water abstraction	1	
Inundation	15	Increased flows
Flow modification	3	
Physical-chemical modification	2	
Riparian PES	**46**	

Great Brak River: GBRA01_FV

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	2	
Flow modification	15	Increased flows due to transfer
Bed modification	15	Incision and armouring due to increased flows
Channel modification	7	Bank erosion at bridges
Physical-chemical modification	9	High turbidity, water temperature lower
Inundation	13	Habitats inundated due to transfer
Alien macrophytes	0	
Introduced aquatic fauna	4	CCAR, CGAR, TSPA, BAEN, LCAP
Rubbish dumping	1	
Instream PES	**63**	
Riparian		
Vegetation removal	2	
Exotic vegetation	5	Limited salix
Bank erosion	14	Increased flows
Channel modification	7	Bank erosion due to increased flows
Water abstraction	0	
Inundation	18	Increased flows inundate riparian zone
Flow modification	2	
Physical-chemical modification	1	
Riparian PES	**55**	

Little Fish (Upper) River: LFIS01_FV

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	18	Most flows abstracted for irrigation
Flow modification	2	
Bed modification	3	
Channel modification	4	
Physical-chemical modification	5	
Inundation	1	
Alien macrophytes	0	
Introduced aquatic fauna	0	
Rubbish dumping	1	
Instream PES	**74**	
Riparian		
Vegetation removal	6	Grazing
Exotic vegetation	5	
Bank erosion	8	Trampling, bridges
Channel modification	4	
Water abstraction	1	
Inundation	0	
Flow modification	1	
Physical-chemical modification	1	
Riparian PES	**87**	

Little Fish (Lower) River: LFIS02_FV

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	6	Most water use from canal system, release from the De Mistkraal Dam
Flow modification	12	Increased flows from Great Fish
Bed modification	7	Increased flows washes out fine sediments
Channel modification	8	Incision of channel
Physical-chemical modification	8	Return flows from irrigation
Inundation	0	
Alien macrophytes	0	
Introduced aquatic fauna	4	CCAR, CGAR
Rubbish dumping	1	
Instream PES	**77**	
Riparian		
Vegetation removal	5	
Exotic vegetation	4	
Bank erosion	8	Constant high flows
Channel modification	3	
Water abstraction	0	
Inundation	8	Increased flows
Flow modification	2	
Physical-chemical modification	1	
Riparian PES	**85**	

Sundays (Upper) River: SUND01_FV

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	4	
Flow modification	3	Limited impact from Van Ryneveld Dam
Bed modification	4	Bridge, weirs
Channel modification	4	
Physical-chemical modification	4	
Inundation	3	
Alien macrophytes	0	
Introduced aquatic fauna	0	
Rubbish dumping	1	
Instream PES	**75**	
Riparian		
Vegetation removal	7	Grazing
Exotic vegetation	8	Tamarisk parviflora, nicotiana glauca, eucalyptus, thistle bush, terminalia australis
Bank erosion	8	Trampling, overgrazing
Channel modification	3	Bridge, weirs
Water abstraction	1	
Inundation	0	
Flow modification	1	
Physical-chemical modification	0	
Riparian PES	**73**	

Kabeljous (Lower) River: KABE01_FV

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	6	Mostly for irrigation
Flow modification	14	Numerous dams on Kabeljous and tributaries
Bed modification	3	
Channel modification	4	
Physical-chemical modification	14	Possible acidic return flows
Inundation	5	
Alien macrophytes	2	
Introduced aquatic fauna	1	MSAL
Rubbish dumping	2	
Instream PES	**71**	
Riparian		
Vegetation removal	5	Grazing in upper catchment
Exotic vegetation	3	
Bank erosion	2	
Channel modification	3	
Water abstraction	3	Loss of baseflows
Inundation	7	Dams in catchment
Flow modification	5	Loss of baseflows
Physical-chemical modification	4	
Riparian PES	**84**	

Groot (Upper) River: GROO01_FV

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	6	Mostly for irrigation
Flow modification	15	Forestry and farm dams
Bed modification	5	Weir and crossings
Channel modification	3	
Physical-chemical modification	4	Return flows from irrigation
Inundation	1	
Alien macrophytes	0	
Introduced aquatic fauna	1	
Rubbish dumping	1	
Instream PES	**81**	
Riparian		
Vegetation removal	3	
Exotic vegetation	20	Bugweed, bramble, black wattle, pine plantation
Bank erosion	5	
Channel modification	3	
Water abstraction	1	
Inundation	1	
Flow modification	5	Changes to baseflows due to forestry
Physical-chemical modification	3	
Riparian PES	**66**	

Twee Riviere River: TWEE01_FV

Instream		
Criteria	**Score**	**Rationale**
Water abstraction	6	Limited for town and irrigation
Flow modification	2	
Bed modification	7	Bridges, crossings
Channel modification	4	Localised
Physical-chemical modification	18	WWTW upstream
Inundation	1	
Alien macrophytes	0	
Introduced aquatic fauna	1	
Rubbish dumping	5	
Instream PES	**71**	
Riparian		
Vegetation removal	7	Wood harvesting, grazing
Exotic vegetation	8	Gum trees, wattle
Bank erosion	6	River crossings, alien plants, trampling
Channel modification	3	
Water abstraction	1	
Inundation	0	
Flow modification	1	
Physical-chemical modification	3	
Riparian PES	**85**	

7. Appendix F: EcoStatus Models

RAPID 3 SITES

Mngazi River

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON &	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	3.00	60.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	4.00	85.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	5.00	100.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	2.00	30.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	14.00	275.00	**68.90**	**C**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	4.00	90.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	5.00	100.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	3.00	70.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	12.00	260.00	**84.73**	**B**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		535.00	**78.13**	**C/B**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	2.00	
Confidence rating for **macro-invertebrate** information	3.00	
INSTREAM ECOLOGICAL CATEGORY (%)	5.00	**78.26**
INSTREAM ECOLOGICAL CATEOGORY		**C/B**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	74.00	**C**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	**CONFIDENCE RATING**
Confidence rating for instream biological information	2.59
Confidence rating for riparian vegetation zone information	2.00
INTEGRATED ECOLOGICAL CATEGORY (%)	4.59
INTEGRATED ECOSTATUS CATEGORY	

	76.41
	C

Ngabarha River

INSTREAM BIOTA FISH	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON &	FRAI/FISHCON & MIRAI/INCON EC
1.What is the natural diversity of **fish** species with different flow requirements	2.00	95.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	2.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	1.00	35.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	1.00	35.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	6.00	265.00	**17.60**	**F**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	2.00	75.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	2.00	60.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	3.00	100.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	7.00	235.00	**69.03**	**C**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		500.00	**51.07**	**D**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	1.00	
Confidence rating for **macro-invertebrate** information	2.00	
INSTREAM ECOLOGICAL CATEGORY (%)	3.00	**51.48**
INSTREAM ECOLOGICAL CATEOGORY		**D**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	62.00	**C/D**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	1.66	
Confidence rating for riparian vegetation zone information	2.00	
INTEGRATED ECOLOGICAL CATEGORY (%)	3.66	**57.23**
INTEGRATED ECOSTATUS CATEGORY		**D**

Mtentu River

INSTREAM BIOTA FISH	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON &	FRAI/FISHCON & MIRAI/INCON EC
1.What is the natural diversity of **fish** species with different flow requirements	3.00	60.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	4.00	95.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	5.00	100.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	2.00	35.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	14.00	290.00	**67.00**	**C**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	4.00	90.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	5.00	100.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	3.00	70.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	12.00	260.00	**78.10**	**C/B**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		550.00	**73.49**	**C**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	2.00	
Confidence rating for **macro-invertebrate** information	4.00	
INSTREAM ECOLOGICAL CATEGORY (%)	6.00	**73.95**
INSTREAM ECOLOGICAL CATEOGORY		**C**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	61.00	C/D

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	3.25	
Confidence rating for riparian vegetation zone information	2.00	
INTEGRATED ECOLOGICAL CATEGORY (%)	5.25	**69.02**
INTEGRATED ECOSTATUS CATEGORY		**C**

Mbashe River (Upper)

INSTREAM BIOTA FISH	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
1.What is the natural diversity of **fish** species with different flow requirements	2.00	40.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	4.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	4.00	100.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	2.00	30.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	12.00	270.00	**63.50**	**C**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	5.00	100.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	4.00	90.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	4.00	85.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	13.00	275.00	**78.14**	**C/B**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		545.00	**72.66**	**C**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	3.00	
Confidence rating for **macro-invertebrate** information	4.00	
INSTREAM ECOLOGICAL CATEGORY (%)	7.00	**72.26**
INSTREAM ECOLOGICAL CATEOGORY		**C**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	58.90	**C/D**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	**CONFIDENCE RATING**
Confidence rating for instream biological information	3.60
Confidence rating for riparian vegetation zone information	3.20
INTEGRATED ECOLOGICAL CATEGORY (%)	6.80
INTEGRATED ECOSTATUS CATEGORY	

Gcuwa River

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	2.00	50.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	3.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	3.00	95.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	1.00	30.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	9.00	275.00	**51.50**	**D**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	2.00	50.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	2.00	55.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	3.00	100.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	7.00	205.00	**47.26**	**D**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		480.00	**49.12**	**D**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	2.00	
Confidence rating for **macro-invertebrate** information	2.00	
INSTREAM ECOLOGICAL CATEGORY (%)	4.00	**49.25**
INSTREAM ECOLOGICAL CATEOGORY		**D**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	58.00	**D**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	**CONFIDENCE RATING**	
Confidence rating for instream biological information	2.00	
Confidence rating for riparian vegetation zone information	3.00	
INTEGRATED ECOLOGICAL CATEGORY (%)	5.00	**54.50**
INTEGRATED ECOSTATUS CATEGORY		**D**

Indwe River

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	1.00	35.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	2.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	2.00	100.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	1.00	35.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	6.00	270.00	**16.30**	**F**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	3.00	80.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	4.00	100.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	2.00	70.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	9.00	250.00	**59.03**	**C/D**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		520.00	**46.42**	**D**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	1.00	
Confidence rating for **macro-invertebrate** information	3.00	
INSTREAM ECOLOGICAL CATEGORY (%)	4.00	**47.39**
INSTREAM ECOLOGICAL CATEOGORY		**D**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	71.00	**C**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	2.45	
Confidence rating for riparian vegetation zone information	3.00	
INTEGRATED ECOLOGICAL CATEGORY (%)	5.45	**60.37**
INTEGRATED ECOSTATUS CATEGORY		**C/D**

White Kei River

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	1.00	35.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	2.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	2.00	100.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	1.00	35.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	6.00	270.00	**25.10**	**E**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	3.00	90.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	4.00	100.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	2.00	70.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	9.00	260.00	**64.36**	**C**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		530.00	**52.77**	**D**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	4.00	
Confidence rating for **macro-invertebrate** information	4.00	
INSTREAM ECOLOGICAL CATEGORY (%)	8.00	**48.75**
INSTREAM ECOLOGICAL CATEOGORY		**D**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	68.00	**C**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	4.00	
Confidence rating for riparian vegetation zone information	3.00	
INTEGRATED ECOLOGICAL CATEGORY (%)	7.00	**57.00**
INTEGRATED ECOSTATUS CATEGORY		**D**

Kubusi River

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	2.00	50.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	4.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	3.00	90.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	1.00	20.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	10.00	260.00	**39.40**	**D/E**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	5.00	100.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	4.00	90.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	3.00	85.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	12.00	275.00	**78.01**	**C/B**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		535.00	**64.12**	**C**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	4.00	
Confidence rating for **macro-invertebrate** information	4.00	
INSTREAM ECOLOGICAL CATEGORY (%)	8.00	**61.41**
INSTREAM ECOLOGICAL CATEOGORY		**C/D**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	72.00	**C**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	4.00	
Confidence rating for riparian vegetation zone information	3.00	
INTEGRATED ECOLOGICAL CATEGORY (%)	7.00	**65.95**
INTEGRATED ECOSTATUS CATEGORY		**C**

Keiskamma River (Lower)

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	2.00	40.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	5.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	4.00	95.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	3.00	70.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	14.00	305.00	**36.60**	**E**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	5.00	100.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	3.00	70.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	4.00	85.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	12.00	255.00	**77.06**	**C**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		560.00	**60.42**	**C/D**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	3.00	
Confidence rating for **macro-invertebrate** information	4.00	
INSTREAM ECOLOGICAL CATEGORY (%)	7.00	**60.07**
INSTREAM ECOLOGICAL CATEOGORY		**C/D**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	87.00	**B**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	3.58	
Confidence rating for riparian vegetation zone information	3.00	
INTEGRATED ECOLOGICAL CATEGORY (%)	6.58	**72.35**
INTEGRATED ECOSTATUS CATEGORY		**C**

Tyume River

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	2.00	35.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	4.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	4.00	100.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	3.00	70.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	13.00	305.00	**41.00**	**D/E**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	4.00	85.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	5.00	100.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	3.00	75.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	12.00	260.00	**79.34**	**C/B**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		565.00	**64.26**	**C**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	2.00	
Confidence rating for **macro-invertebrate** information	4.00	
INSTREAM ECOLOGICAL CATEGORY (%)	6.00	**65.41**
INSTREAM ECOLOGICAL CATEOGORY		**C**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	86.00	**B**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	3.27	
Confidence rating for riparian vegetation zone information	3.00	
INTEGRATED ECOLOGICAL CATEGORY (%)	6.27	**75.26**
INTEGRATED ECOSTATUS CATEGORY		**C**

Koonap River

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	2.00	35.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	4.00	95.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	5.00	100.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	3.00	75.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	14.00	305.00	**27.50**	**E**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	3.00	75.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	4.00	100.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	2.00	40.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	9.00	215.00	**55.24**	**D**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		520.00	**42.25**	**D**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	2.00	
Confidence rating for **macro-invertebrate** information	4.00	
INSTREAM ECOLOGICAL CATEGORY (%)	6.00	**44.12**
INSTREAM ECOLOGICAL CATEOGORY		**D**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	70.00	**C**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	3.20	
Confidence rating for riparian vegetation zone information	2.00	
INTEGRATED ECOLOGICAL CATEGORY (%)	5.20	**54.08**
INTEGRATED ECOSTATUS CATEGORY		**D**

Kat River (Lower)

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	1.00	35.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	4.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	3.00	80.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	3.00	80.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	11.00	295.00	**26.30**	**E**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	4.00	100.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	2.00	60.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	3.00	80.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	9.00	240.00	**67.49**	**C**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		535.00	**50.05**	**D**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	2.00	
Confidence rating for **macro-invertebrate** information	4.00	
INSTREAM ECOLOGICAL CATEGORY (%)	6.00	**51.90**
INSTREAM ECOLOGICAL CATEOGORY		**D**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	68.00	**C**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	3.24	
Confidence rating for riparian vegetation zone information	3.00	
INTEGRATED ECOLOGICAL CATEGORY (%)	6.24	**59.64**
INTEGRATED ECOSTATUS CATEGORY		**C/D**

Great Fish River (Upper)

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	1.00	50.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	2.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	2.00	100.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	1.00	50.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	6.00	300.00	**17.50**	**F**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	1.00	25.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	2.00	55.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	3.00	100.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	6.00	180.00	**60.63**	**C/D**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		480.00	**45.93**	**D**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	2.00	
Confidence rating for **macro-invertebrate** information	2.00	
INSTREAM ECOLOGICAL CATEGORY (%)	4.00	**42.50**
INSTREAM ECOLOGICAL CATEOGORY		**D**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	46.00	**D**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	2.00	
Confidence rating for riparian vegetation zone information	2.00	
INTEGRATED ECOLOGICAL CATEGORY (%)	4.00	**44.25**
INTEGRATED ECOSTATUS CATEGORY		**D**

Tarka River

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	1.00	30.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	3.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	3.00	100.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	2.00	50.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	9.00	280.00	**10.30**	**F**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	3.00	100.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	1.00	35.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	2.00	50.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	6.00	185.00	**47.29**	**D**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		465.00	**30.50**	**E**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	1.00	
Confidence rating for **macro-invertebrate** information	2.00	
INSTREAM ECOLOGICAL CATEGORY (%)	3.00	**32.73**
INSTREAM ECOLOGICAL CATEOGORY		**E**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	76.00	**C**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	1.61	
Confidence rating for riparian vegetation zone information	2.00	
INTEGRATED ECOLOGICAL CATEGORY (%)	3.61	**56.73**
INTEGRATED ECOSTATUS CATEGORY		**D**

Sundays River (Lower)

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	2.00	35.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	5.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	4.00	90.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	3.00	60.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	14.00	285.00	**50.40**	**D**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	5.00	100.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	2.00	45.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	3.00	75.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	10.00	220.00	**58.63**	**C/D**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		505.00	**55.00**	**D**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	2.00	
Confidence rating for **macro-invertebrate** information	2.00	
INSTREAM ECOLOGICAL CATEGORY (%)	4.00	**54.76**
INSTREAM ECOLOGICAL CATEOGORY		**D**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	52.00	**D**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	2.00	
Confidence rating for riparian vegetation zone information	2.00	
INTEGRATED ECOLOGICAL CATEGORY (%)	4.00	**53.38**
INTEGRATED ECOSTATUS CATEGORY		**D**

Kouga River

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	2.00	70.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	3.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	2.00	70.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	1.00	45.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	8.00	285.00	**7.10**	**F**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	4.00	95.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	5.00	100.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	3.00	85.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	12.00	280.00	**78.93**	**C/B**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		565.00	**58.20**	**C/D**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	2.00	
Confidence rating for **macro-invertebrate** information	4.00	
INSTREAM ECOLOGICAL CATEGORY (%)	6.00	**56.59**
INSTREAM ECOLOGICAL CATEOGORY		**D**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	75.00	**C**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	3.38	
Confidence rating for riparian vegetation zone information	3.00	
INTEGRATED ECOLOGICAL CATEGORY (%)	6.38	**65.25**
INTEGRATED ECOSTATUS CATEGORY		**C**

Kromme River

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	1.00	70.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	3.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	2.00	90.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	1.00	70.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	7.00	330.00	**9.20**	**F**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	4.00	100.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	3.00	90.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	2.00	85.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	9.00	275.00	**70.00**	**C**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		605.00	**50.81**	**D**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	2.00	
Confidence rating for **macro-invertebrate** information	5.00	
INSTREAM ECOLOGICAL CATEGORY (%)	7.00	**51.72**
INSTREAM ECOLOGICAL CATEOGORY		**D**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	65.00	**C**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	4.10	
Confidence rating for riparian vegetation zone information	3.00	
INTEGRATED ECOLOGICAL CATEGORY (%)	7.10	**57.33**
INTEGRATED ECOSTATUS CATEGORY		**D**

INTERMEDIATE SITES

Mthatha River (Lower)

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	4.00	70.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	5.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	5.00	100.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	3.00	50.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	17.00	320.00	**70.00**	**C**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	4.00	95.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	5.00	100.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	3.00	85.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	12.00	280.00	**66.04**	**C**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		600.00	**67.83**	**C**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	3.00	
Confidence rating for **macro-invertebrate** information	4.00	
INSTREAM ECOLOGICAL CATEGORY (%)	7.00	**67.78**
INSTREAM ECOLOGICAL CATEOGORY		**C**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	53.70	**D**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	3.56	
Confidence rating for riparian vegetation zone information	2.00	
INTEGRATED ECOLOGICAL CATEGORY (%)	5.56	**62.72**
INTEGRATED ECOSTATUS CATEGORY		**C**

Mbhashe River (Middle)

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	3.00	50.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	4.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	4.00	100.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	2.00	45.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	13.00	295.00	**46.20**	**D**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	4.00	95.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	5.00	100.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	3.00	80.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	12.00	275.00	**67.17**	**C**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		570.00	**58.92**	**C/D**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	3.00	
Confidence rating for **macro-invertebrate** information	4.00	
INSTREAM ECOLOGICAL CATEGORY (%)	7.00	**58.55**
INSTREAM ECOLOGICAL CATEOGORY		**C/D**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	58.90	**C/D**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	3.59	
Confidence rating for riparian vegetation zone information	3.20	
INTEGRATED ECOLOGICAL CATEGORY (%)	6.79	**58.71**
INTEGRATED ECOSTATUS CATEGORY		**C/D**

Black Kei River

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	1.00	50.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	2.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	2.00	100.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	1.00	50.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	6.00	300.00	**23.50**	**E**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	3.00	100.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	3.00	90.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	2.00	85.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	8.00	275.00	**40.65**	**D/E**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		575.00	**35.21**	**E**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	4.00	
Confidence rating for **macro-invertebrate** information	4.00	
INSTREAM ECOLOGICAL CATEGORY (%)	8.00	**33.64**
INSTREAM ECOLOGICAL CATEOGORY		**E**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	48.60	**D**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	4.00	
Confidence rating for riparian vegetation zone information	3.10	
INTEGRATED ECOLOGICAL CATEGORY (%)	7.10	**40.17**
INTEGRATED ECOSTATUS CATEGORY		**D/E**

Great Kei River

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	3.00	65.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	5.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	4.00	90.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	2.00	30.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	14.00	285.00	**47.50**	**D**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	4.00	95.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	5.00	100.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	3.00	80.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	12.00	275.00	**65.10**	**C**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		560.00	**57.73**	**D**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	2.00	
Confidence rating for **macro-invertebrate** information	4.00	
INSTREAM ECOLOGICAL CATEGORY (%)	6.00	**58.48**
INSTREAM ECOLOGICAL CATEOGORY		**C/D**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	58.20	**C/D**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	**CONFIDENCE RATING**	
Confidence rating for instream biological information	3.25	
Confidence rating for riparian vegetation zone information	3.20	
INTEGRATED ECOLOGICAL CATEGORY (%)	6.45	**58.34**
INTEGRATED ECOSTATUS CATEGORY		**C/D**

Tsomo River

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	1.00	50.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	2.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	2.00	100.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	1.00	50.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	6.00	300.00	**33.90**	**E**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	2.00	80.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	3.00	90.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	4.00	100.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	9.00	270.00	**63.66**	**C**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		570.00	**55.06**	**D**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	2.00	
Confidence rating for **macro-invertebrate** information	2.00	
INSTREAM ECOLOGICAL CATEGORY (%)	4.00	**51.92**
INSTREAM ECOLOGICAL CATEOGORY		**D**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	61.60	**C/D**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	2.00	
Confidence rating for riparian vegetation zone information	3.10	
INTEGRATED ECOLOGICAL CATEGORY (%)	5.10	**57.80**
INTEGRATED ECOSTATUS CATEGORY		**D**

Buffalo River (Middle)

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	3.00	60.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	5.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	4.00	90.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	3.00	60.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	15.00	310.00	**28.50**	**E**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	4.00	85.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	3.00	75.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	5.00	100.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	12.00	260.00	**61.62**	**C/D**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		570.00	**47.75**	**D**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	3.00	
Confidence rating for **macro-invertebrate** information	3.00	
INSTREAM ECOLOGICAL CATEGORY (%)	6.00	**46.40**
INSTREAM ECOLOGICAL CATEOGORY		**D**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	51.20	**D**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	3.00	
Confidence rating for riparian vegetation zone information	3.10	
INTEGRATED ECOLOGICAL CATEGORY (%)	6.10	**48.84**
INTEGRATED ECOSTATUS CATEGORY		**D**

Keiskamma (Upper)

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	2.00	50.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	4.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	3.00	80.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	3.00	80.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	12.00	310.00	**28.80**	**E**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	2.00	75.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	3.00	80.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	4.00	100.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	9.00	255.00	**74.60**	**C**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		565.00	**54.74**	**D**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	2.00	
Confidence rating for **macro-invertebrate** information	4.00	
INSTREAM ECOLOGICAL CATEGORY (%)	6.00	**57.04**
INSTREAM ECOLOGICAL CATEOGORY		**D**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	46.60	**D**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	3.23	
Confidence rating for riparian vegetation zone information	3.00	
INTEGRATED ECOLOGICAL CATEGORY (%)	6.23	**52.01**
INTEGRATED ECOSTATUS CATEGORY		**D**

Kat River (Upper)

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	1.00	40.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	3.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	3.00	100.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	2.00	80.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	9.00	320.00	**62.90**	**C**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	2.00	80.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	3.00	90.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	4.00	100.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	9.00	270.00	**68.64**	**C**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		590.00	**66.47**	**C**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	3.00	
Confidence rating for **macro-invertebrate** information	4.00	
INSTREAM ECOLOGICAL CATEGORY (%)	7.00	**66.32**
INSTREAM ECOLOGICAL CATEOGORY		**C**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	73.90	**C**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	3.60	
Confidence rating for riparian vegetation zone information	3.60	
INTEGRATED ECOLOGICAL CATEGORY (%)	7.20	**70.11**
INTEGRATED ECOSTATUS CATEGORY		**C**

Great Fish River (Lower)

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	2.00	50.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	4.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	3.00	90.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	2.00	50.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	11.00	290.00	**27.60**	**E**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	2.00	50.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	2.00	65.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	3.00	100.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	7.00	215.00	**67.04**	**C**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		505.00	**48.22**	**D**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	2.00	
Confidence rating for **macro-invertebrate** information	2.00	
INSTREAM ECOLOGICAL CATEGORY (%)	4.00	**47.77**
INSTREAM ECOLOGICAL CATEOGORY		**D**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	71.50	**C**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	2.00	
Confidence rating for riparian vegetation zone information	3.00	
INTEGRATED ECOLOGICAL CATEGORY (%)	5.00	**62.01**
INTEGRATED ECOSTATUS CATEGORY		**C**

KwaZungu/Swartkops River

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	2.00	70.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	3.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	3.00	100.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	2.00	70.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	10.00	340.00	**41.60**	**D/E**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	2.00	80.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	3.00	85.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	4.00	100.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	9.00	265.00	**73.77**	**C**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		605.00	**61.32**	**C/D**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	4.00	
Confidence rating for **macro-invertebrate** information	5.00	
INSTREAM ECOLOGICAL CATEGORY (%)	9.00	**60.40**
INSTREAM ECOLOGICAL CATEOGORY		**C/D**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	82.40	**B**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	4.58	
Confidence rating for riparian vegetation zone information	3.00	
INTEGRATED ECOLOGICAL CATEGORY (%)	7.58	**69.10**
INTEGRATED ECOSTATUS CATEGORY		**C**

Gamtoos River

INSTREAM BIOTA	IMPORTANCE SCORE	WEIGHT	FRAI/FISHCON & MIRAI/INCON EC %	FRAI/FISHCON & MIRAI/INCON EC
FISH				
1.What is the natural diversity of **fish** species with different flow requirements	2.00	60.00		
2.What is the natural diversity of **fish** species with a preference for different cover types	4.00	100.00		
3.What is the natural diversity of **fish** species with a preference for different flow depth classes	4.00	100.00		
4. What is the natural diversity of **fish** species with various tolerances to modified water quality	2.00	60.00		
FISH ECOLOGICAL CATEGORY (FRAI/FISHCON %)	12.00	320.00	**45.50**	**D**
AQUATIC INVERTEBRATES				
1. What is the natural diversity of **invertebrate** biotopes	2.00	70.00		
2. What is the natural diversity of **invertebrate** taxa with different velocity requirements	3.00	100.00		
3. What is the natural diversity of **invertebrate** taxa with different tolerances to modified water quality	2.00	80.00		
AQUATIC INVERTEBRATE ECOLOGICAL CATEGORY (MIRAI/INCON %)	7.00	250.00	**42.13**	**D**
INSTREAM ECOLOGICAL CATEGORY (EC AND %): NOT CONFIDENCE RATED, ONLY FISH IN INVERTEBRATE INDICATOR RATINGS FOR WEIGHTING OF FRAI/FISHCON AND MIRAI/INCON CONSIDERED		570.00	**43.83**	**D**

INSTREAM ECOLOGICAL CATEGORY: CONFIDENCE RATED	FRAI/FISHCON & MIRAI/INCON CONFIDENCE RATINGS	
Confidence rating for **fish** information	3.00	
Confidence rating for **macro-invertebrate** information	4.00	
INSTREAM ECOLOGICAL CATEGORY (%)	7.00	**43.70**
INSTREAM ECOLOGICAL CATEOGORY		**D**

RIPARIAN VEGETATION	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
RIPARIAN VEGETATION ECOLOGICAL CATEGORY	54.40	**D**

INTEGRATED (INSTREAM & RIPARIAN VEGETATION) ECOSTATUS	CONFIDENCE RATING	
Confidence rating for instream biological information	3.53	
Confidence rating for riparian vegetation zone information	3.00	
INTEGRATED ECOLOGICAL CATEGORY (%)	6.53	**48.61**
INTEGRATED ECOSTATUS CATEGORY		**D**

8. Appendix G: Summary of HAI Models

Please refer to the excel spreadsheets as per Chapter 1.

9. Appendix H: Summary of GAI Models

Please refer to the excel spreadsheets as per Chapter 1.

10. Appendix I: Summary of EI-ES Results

Important to note all areas under the Rapid/Intermediate column (this Study) which are not highlighted in green reflect that criteria whereby there was no available information or obtained data collected to re-evaluate this criterion. Consequently, it was retained as per the DWS (2014).

RAPID 3 SITES

Mngazi River

EI METRIC	DESKTOP (2014)	RAPID	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	Moderate	Moderate	
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Low	
HABITAT DIVERSITY CLASS	Low	Moderate	• Limited marginal vegetation and no instream aquatic vegetation • Undercut banks
HABITAT SIZE (LENGTH) CLASS	High	High	
INSTREAM MIGRATION LINK CLASS	Very high	Very high	
RIPARIAN-WETLAND ZONE MIGRATION LINK	Very high	Very high	
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	Very high	Moderate	• Exotic vegetation encroachment • Cattle trampling and grazing (erosion)
INSTREAM HABITAT INTEGRITY CLASS	Very high	Moderate	• Mhlangu Dam in upper reaches (flow modification) • Localised gravel mining • Cattle trampling and grazing (erosion)
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**High**	***High***	• Remains high
ES METRIC	**DESKTOP**	**RAPID**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	High	Moderate	• All fish species expected and occuring regarded as moderately tolerant to modified water quality
FISH NO-FLOW SENSITIVITY	High	Moderate	Most fish species expected and occuring are considered to be tolerant to no-flow conditions, with several considered to be moderately tolerant and only one species expected to be moderately intolerant
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Very high	High	• 3 out of 4 expected taxa and 6 out of 14 expected taxa (with high FROCs) recorded for unmodified and moderately unmodified physico-chemical conditions changed
INVERTS VELOCITY SENSITIVITY	Very high	High	• 4 out of 5 and 4 out of 9 expected taxa (with high FROCs) recorded with a preference for very fast and moderately fast flowing water respectively
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Low	
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	High	• Small to moderate sized river • Modified flows will have an impact on the current existing riffle habitats and longitudinal connectivity
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**Moderate**	***High***	• Stream size sensitivty is the driving factor

Nqabarha River

EI METRIC	DESKTOP (2014)	RAPID	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	High	High	
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Low	
HABITAT DIVERSITY CLASS	Moderate	Low	• Stream reminiscent of incised valley-bottom wetland with limited fow sensitive habitat classes
HABITAT SIZE (LENGTH) CLASS	High	High	
INSTREAM MIGRATION LINK CLASS	Very high	Low	• Site located high in the catchment, with only one eel species (AMOS) expected, and at a low FROC. However, not sampled or expected under present state.
RIPARIAN-WETLAND ZONE MIGRATION LINK	Very high	Very high	
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	Very high	Moderate	• Macroplastics • Cattle trampling and grazing (bank erosion) • Recent floods impact largely due to catchment degradation
INSTREAM HABITAT INTEGRITY CLASS	High	Moderate	• Reduced baseflows owing to degradation of wetlands in upper catchment • Bank erosion, incision • Cattle trampling and grazing
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**Moderate**	***Moderate***	• Remains Moderate
ES METRIC	**DESKTOP**	**RAPID**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	Moderate	Low	Limited fish diversity expected, with system currently dominated by non-native MSAL which is considered moderately tolerant to modified water quality
FISH NO-FLOW SENSITIVITY	Moderate	Low	• Limited fish diversity expected, with system currently dominated by non-native MSAL which is tolerant to no-flow conditions
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Very high	Low	• 1 out of 2 expected taxa and 3 out of 14 expected taxa (with high FROCs) recorded for unmodified and moderately unmodified physico-chemical conditions changed
INVERTS VELOCITY SENSITIVITY	Very high	Moderate	• 2 out of 4 and 3 out of 7 expected taxa (with high FROCs) recorded with a preference for very fast and moderately fast flowing water respectively
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	High	High	
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	High	Small stream size, moderate extent of riffle type habitats and several wetlands upstream
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**Moderate**	***Moderate***	• Remains Moderate

Mtentu River

EI METRIC	DESKTOP (2014)	RAPID	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	High	High	
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Low	
HABITAT DIVERSITY CLASS	Low	Moderate	• Limited cover features (limited marginal vegetation and no aquatic macrophytes)
HABITAT SIZE (LENGTH) CLASS	Moderate	Moderate	
INSTREAM MIGRATION LINK CLASS	Very high		
RIPARIAN-WETLAND ZONE MIGRATION LINK	Very high	Very high	
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	Very high	Moderate	• Exotic vegetation encroachment
INSTREAM HABITAT INTEGRITY CLASS	Very high	Very high	
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**High**	***High***	• Remains High
ES METRIC	**DESKTOP**	**RAPID**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	High	Moderate	• Majority of species expected and occuring are considered to be moderately tolerant to modified water quality, with remainder considered to be tolerant
FISH NO-FLOW SENSITIVITY	High	Moderate	• Majority of species expected and occuring are considered to be moderately tolerant to tolerant of no-flow conditions, with only one species (MCAP) considered to be moderately intolerant and occurring at a low FROC
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Very high	High	• 3 out of 6 expected taxa and 7 out of 13 expected taxa (with high FROCs) recorded for unmodified and moderately unmodified physico-chemical conditions changed
INVERTS VELOCITY SENSITIVITY	Very high	Very high	• 7 out of 7 and 6 out of 9 expected taxa (with high FROCs) recorded with a preference for very fast and moderately fast flowing water respectively
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Low	
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	Moderate	• Small to moderate sized river • Seasonal limited flows will have an impact on the current existing riffle habitats
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**Moderate**	***High***	• Stream size sensitivty is the driving factor

Mbhashe Rive (Upper)

EI METRIC	DESKTOP (2014)	RAPID	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	Very high	Very high	
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Low	
HABITAT DIVERSITY CLASS	Very Low	Moderate	• Limited cover features present • Bedrock, large boulders dominated
HABITAT SIZE (LENGTH) CLASS	Low	Low	
INSTREAM MIGRATION LINK CLASS	Very high	High	• Decreased FROC of species with a catchment-scale migrations requirements (ABIC, AMAR, AMOS), but non-native species present (BAEN) also undertaking upstream migration
RIPARIAN-WETLAND ZONE MIGRATION LINK	High	High	
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	High	Very high	
INSTREAM HABITAT INTEGRITY CLASS	High	Very high	
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**Moderate**	***High***	• The driver being the habitat diversity class
ES METRIC	**DESKTOP**	**RAPID**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	Moderate	Moderate	
FISH NO-FLOW SENSITIVITY	Moderate	Moderate	
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Very high	Moderate	• 3 out of 9 expected taxa and 5 out of 19 expected taxa (several with high FROCs) recorded for unmodified and moderately unmodified physico-chemical conditions changed
INVERTS VELOCITY SENSITIVITY	Very high	Very high	• 4 out of 7 and 5 out of 9 expected taxa (with high FROCs) recorded with a preference for very fast and moderately fast flowing water respectively
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Low	
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	Moderate	Moderate size river and will loose habitat/riffles if flows are altered
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**Moderate**	***Moderate***	• Remained Moderate

Gcuwa River

EI METRIC	DESKTOP (2014)	RAPID	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	Very high	Very high	
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Low	
HABITAT DIVERSITY CLASS	Low	Low	
HABITAT SIZE (LENGTH) CLASS	High	High	
INSTREAM MIGRATION LINK CLASS	Moderate	Low	• Gcuwa Dam wall impeding any further migration upstream
RIPARIAN-WETLAND ZONE MIGRATION LINK	Moderate	Moderate	
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	Moderate	Moderate	
INSTREAM HABITAT INTEGRITY CLASS	High	Low	• Bed and flow modification as the site is located directly downstream of the Gcuwa Dam wall
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**Moderate**	***Moderate***	
ES METRIC	**DESKTOP**	**RAPID**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	Moderate	Moderate	
FISH NO-FLOW SENSITIVITY	Moderate	Moderate	
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Moderate	Moderate	• 1 out of 5 and 1 out of 12 expected taxa (majority of the absent taxa have high frocs) recorded for unmodified and moderately unmodified physico-chemical conditions changed respectively.
INVERTS VELOCITY SENSITIVITY	Very high	Moderate	• 3 out of 6 and 2 out of 9 expected taxa (majority of the absent taxa have high frocs) recorded with a preference for very fast and moderately fast flowing water respectively
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Low	
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	Moderate	Small stream and largely pool type habitat
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**Moderate**	***Moderate***	

Indwe River

EI METRIC	DESKTOP (2014)	RAPID	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	Moderate	Moderate	
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Low	
HABITAT DIVERSITY CLASS	Low	Low	
HABITAT SIZE (LENGTH) CLASS	High	High	
INSTREAM MIGRATION LINK CLASS	Very high	Moderate	• Although one species with a requirment for catchment-scale migration is expected (AMOS), this is expected at a low FROC and was not expected under present conditions. Migration is however required for non-native species identified to be present (BAEN)
RIPARIAN-WETLAND ZONE MIGRATION LINK	Moderate	Moderate	
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	Moderate	High	
INSTREAM HABITAT INTEGRITY CLASS	Moderate	Moderate	
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**Moderate**	***Moderate***	• Remains Moderate
ES METRIC	**DESKTOP**	**RAPID**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	Moderate	Low	Limited fish diversity expected, with system currently dominated by non-native species (BAEN and CGAR) which are considered moderately tolerant to modified water quality
FISH NO-FLOW SENSITIVITY	Moderate	Moderate	Limited fish diversity expected, with assemblage currently dominated by non-native BAEN which is considered moderately intolerant to no-flow conditions
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Moderate	Low	• 1 out of 4 expected taxa (mostly with high FROCs) recorded for unmodified physico-chemical conditions changed
INVERTS VELOCITY SENSITIVITY	Very high	Moderate	• 3 out of 5 and 0 out of 9 expected taxa (mostely with high FROCs) recorded with a preference for very fast and moderately fast flowing water respectively
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Low	
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	High	• Small to moderate sized river • Modified flows will have an impact on the current existing riffle habitats
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**Moderate**	***Moderate***	• Remains Moderate

White Kei River

EI METRIC	DESKTOP (2014)	RAPID	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	Very high	Very high	
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Low	
HABITAT DIVERSITY CLASS	Very Low	Low	
HABITAT SIZE (LENGTH) CLASS	Low	Low	
INSTREAM MIGRATION LINK CLASS	High	High	• Although one species with a requirment for catchment-scale migration is expected (AMOS), this is expected at a moderate FROC under reference and and was likely to occur at a low FROC under present conditions.Reach-scale migration is however considered for non-native species identified to be present (BAEN)
RIPARIAN-WETLAND ZONE MIGRATION LINK	Moderate	Moderate	
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	Moderate	Moderate	
INSTREAM HABITAT INTEGRITY CLASS	High	Moderate	• Indwe and Xonxa Dams upstream • Sand mining • Cattle trampling and grazing (bank erosion)
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**Moderate**	***Moderate***	• Remains Moderate
ES METRIC	**DESKTOP**	**RAPID**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	Moderate	Low	Limited fish diversity expected, with system currently dominated by non-native species (BAEN and CGAR) which are considered moderately tolerant to modified water quality
FISH NO-FLOW SENSITIVITY	Moderate	Moderate	Limited fish diversity expected, with assemblage currently dominated by non-native BAEN which is considered moderately intolerant to no-flow conditions
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Moderate	Moderate	• 2 out of 5 and 4 out of 14 expected taxa (several with high FROCs) recorded for unmodified and moderately unmodified physico-chemical conditions changed respectively
INVERTS VELOCITY SENSITIVITY	Very high	Very high	• 4 out of 7 and 6 out of 10 expected taxa (several with high FROCs) recorded with a preference for very fast and moderately fast flowing water respectively
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Low	
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	Moderate	• Moderate sized river • Modified flows will have an impact on the current existing riffle habitats
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**Moderate**	***Moderate***	• Remains Moderate

Kubusi River (Lower)

EI METRIC	DESKTOP (2014)	RAPID	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	Very high	Very high	
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Low	
HABITAT DIVERSITY CLASS	High	High	
HABITAT SIZE (LENGTH) CLASS	Very high	Very high	
INSTREAM MIGRATION LINK CLASS	Very high	High	
RIPARIAN-WETLAND ZONE MIGRATION LINK	Moderate	Moderate	
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	Moderate	Moderate	
INSTREAM HABITAT INTEGRITY CLASS	High	High	
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**High**	***High***	
ES METRIC	**DESKTOP**	**RAPID**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	High	Moderate	
FISH NO-FLOW SENSITIVITY	High	Moderate	
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Very high	Moderate	• 3 out of 9 (Hydropsychidae >2spp (froc5) absent) and 8 out of 20 expected taxa (majority of the absent taxa have low frocs) recorded for unmodified and moderately unmodified physico-chemical conditions changed respectively.
INVERTS VELOCITY SENSITIVITY	Very high	Very high	• 4 out of 8 and 8 out of 9 expected taxa recorded with a preference for very fast and moderately fast flowing water respectively
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Low	
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	High	High	
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**High**	***High***	

Buffalo River (Lower)
Did not sample

Keiskamma River (Lower)

EI METRIC	DESKTOP (2014)	RAPID	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	Very high	Very high	
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Low	
HABITAT DIVERSITY CLASS	Low	High	• All aquatic biotopes except aquatic macrophytes, varying velocity-depth classes
HABITAT SIZE (LENGTH) CLASS	Very high	Very high	
INSTREAM MIGRATION LINK CLASS	Moderate	Moderate	
RIPARIAN-WETLAND ZONE MIGRATION LINK	High	High	
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	High	High	
INSTREAM HABITAT INTEGRITY CLASS	High	High	
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**High**	***High***	• Remains High
ES METRIC	**DESKTOP**	**RAPID**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	Very high	Moderate	• Fish assemblage under reference conditions and under present conditions is expected to be dominated by species considered moderately tolerant of modified water quality, wth no species under present conditions expected to be moderately intolerant or intolerant to modified water quality.
FISH NO-FLOW SENSITIVITY	High	Moderate	• Fish assemblage under reference conditions and under present conditions dominated by species considered moderately tolerant of no-flow conditions
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Very high	High	• 5 out of 11 and 8 out of 15 expected taxa (several with high FROCs) recorded for unmodified and moderately unmodified physico-chemical conditions changed respectively
INVERTS VELOCITY SENSITIVITY	Very high	Very high	• 4 out of 9 and 8 out of 9 expected taxa (several with high FROCs) recorded with a preference for very fast and moderately fast flowing water respectively
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Low	
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	Moderate	• Small to moderate sized river • Although mostly pool habitat along the reach, any modified flows will have an impact on some of the current existing riffle habitats
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**High**	***High***	• Remains High

Tyume River

EI METRIC	DESKTOP (2014)	RAPID	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	Very high	Very high	
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Low	
HABITAT DIVERSITY CLASS	Low	High	• All aquatic biotopes except aquatic macrophytes, varying velocity-depth classes
HABITAT SIZE (LENGTH) CLASS	Moderate	Moderate	
INSTREAM MIGRATION LINK CLASS	High	High	
RIPARIAN-WETLAND ZONE MIGRATION LINK	High	High	
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	High	High	
INSTREAM HABITAT INTEGRITY CLASS	High	Moderate	• Water quality (nutrients from irrigation and WWTW
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**Moderate**	***High***	• Driver being the habitat diversity class
ES METRIC	**DESKTOP**	**RAPID**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	Very high	High	Fish assemblage under reference and present conditions is expected to be domnated by species considered to be moderately tolerant to modified water quality, with one species (SBAI) considered to be intolerant to modified water quality and occuring at a low FROC under present conditions
FISH NO-FLOW SENSITIVITY	High	Moderate	• Fish assemblage under reference conditions and under present conditions dominated by species considered moderately tolerant of no-flow conditions
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Very high	High	• 2 out of 6 and 8 out of 10 expected taxa (several with high FROCs) recorded for unmodified and moderately unmodified physico-chemical conditions changed respectively
INVERTS VELOCITY SENSITIVITY	Very high	High	• 4 out of 6 and 7 out of 10 expected taxa (several with high FROCs) recorded with a preference for very fast and moderately fast flowing water respectively
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	High	High	
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	High	• Small sized river • Modified flows will have an impact on the widespread riffle habitats and longitudinal connectivity
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**High**	***High***	•Remains High

Koonap River

EI METRIC	DESKTOP (2014)	RAPID	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	High	High	
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Low	
HABITAT DIVERSITY CLASS	Low	Moderate	• All aquatic biotopes present, although SIC smothered by filamentous algae
HABITAT SIZE (LENGTH) CLASS	Very Low	Very Low	
INSTREAM MIGRATION LINK CLASS	Very high	Very high	
RIPARIAN-WETLAND ZONE MIGRATION LINK	High	High	
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	High	Moderate	• Cattle trampling and grazing (causing bank collapse) • Vegetation removal • Several weirs
INSTREAM HABITAT INTEGRITY CLASS	Very high	Moderate	• Water quality (extensive algae) • Irrigation
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**Moderate**	***Moderate***	•Remains Moderate
ES METRIC	**DESKTOP**	**RAPID**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	Very high	Moderate	• Fish assemblage under reference and present conditions is expected to be domnated by species considered to be moderately tolerant to modified water quality, with no species considered to be intolerant to modified water quality occuring under present conditions
FISH NO-FLOW SENSITIVITY	Moderate	High	• Fish assemblage under reference conditions dominated by species considered moderately tolerant of no-flow conditions. However, the presence of non-native BAEN and LCAP which are considered to be moderately intolerant of no-flow conditions does elevate the value to High
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Very high	Low	• 1 out of 6 and 1 out of 13 expected taxa (all with high FROCs) recorded for unmodified and moderately unmodified physico-chemical conditions changed respectively
INVERTS VELOCITY SENSITIVITY	Very high	Moderate	• 2 out of 6 and 3 out of 9 expected taxa (all with high FROCs) recorded with a preference for very fast and moderately fast flowing water respectively
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Low	
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	Moderate	• Small to moderate sized river • Modified flows will have an impact on the current existing riffle habitats • Owing to compromised water quality in the system (upstream unmaintained WWTW), lower flows may increase further algal stimulation
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**Moderate**	***Moderate***	•Remains Moderate

Kat River (Lower)

EI METRIC	DESKTOP (2014)	RAPID	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	Very high	Very high	
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Low	
HABITAT DIVERSITY CLASS	Very Low	Low	Limited velocity-depth classess, no aquatic macrophyt
HABITAT SIZE (LENGTH) CLASS	Moderate	Moderate	
INSTREAM MIGRATION LINK CLASS	Moderate	Low	Although some species with a reach-scale migration w
RIPARIAN-WETLAND ZONE MIGRATION LINK	High	High	
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	High	Moderate	• Flow modification (loss of floods)
INSTREAM HABITAT INTEGRITY CLASS	High	Low	• Extensive irrigation • Release pattern from dam and loss of floods • Large number of weirs along reach (resulting in changes in instream habitat availability)
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**Moderate**	***Moderate***	• Remains Moderate
ES METRIC	**DESKTOP**	**RAPID**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	Very high	Moderate	• Fish assemblage under reference and present conditions is expected to be dominated by species considered to be moderately tolerant and tolerant to modified water quality, with no species considered to be intolerant to modified water quality occuring under present conditions
FISH NO-FLOW SENSITIVITY	Moderate	Moderate	
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Moderate	Moderate	• 2 out of 7 and 9 out of 15 expected taxa (all with high FROCs) recorded for unmodified and moderately unmodified physico-chemical conditions changed respectively
INVERTS VELOCITY SENSITIVITY	Very high	Moderate	• 4 out of 6 and 4 out of 11 expected taxa (all with high FROCs) recorded with a preference for very fast and moderately fast flowing water respectively
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Low	
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	Moderate	• Small sized river • Modified flows (loss of floods due to Kat River dam) will have an impact on the current existing riffle habitats • High density of weirs upstream changed river to a pool dominated system with less riffle habitats
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**Moderate**	***Moderate***	• Remains Moderate

Great Fish River (Upper)

EI METRIC	DESKTOP (2014)	RAPID	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	Moderate	Moderate	
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Low	
HABITAT DIVERSITY CLASS	Very Low	Very Low	
HABITAT SIZE (LENGTH) CLASS	Moderate	Moderate	
INSTREAM MIGRATION LINK CLASS	High	Low	• Limited species expected under natural conditions, with lack of sufficient flow limiting possible upstream migration (attraction for upstream migration associated with Groot Brak River and increased flows due to IBT)
RIPARIAN-WETLAND ZONE MIGRATION LINK	Low	Low	
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	Low	Low	
INSTREAM HABITAT INTEGRITY CLASS	Very high	Moderate	• Increased flows due to IBT • Scoring and bed armouring due to increased flows
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**Moderate**	***Moderate***	• Remains Moderate
ES METRIC	**DESKTOP**	**RAPID**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	Moderate	Low	• Limited species expected under natural conditions, with lack of sufficient flow limiting occurrence of species with a moderate tolerannce to unmodified water quality
FISH NO-FLOW SENSITIVITY	Moderate	Moderate	
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Very high	Low	• 1 out of 5 and 2 out of 10 expected taxa (mostly with high FROCs) recorded for unmodified and moderately unmodified physico-chemical conditions changed respectively
INVERTS VELOCITY SENSITIVITY	Very high	Low	• 2 out of 5 and 1 out of 9 expected taxa (mostly with high FROCs) recorded with a preference for very fast and moderately fast flowing water respectively
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Low	
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	High	• Small sized river • Riffle habitats sensitive to changes in flow and sedimentation
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**Moderate**	***Moderate***	

Tarka River

EI METRIC	DESKTOP (2014)	RAPID	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Low	
HABITAT DIVERSITY CLASS	Moderate	Low	• Upstream abstraction reducing flows and habitat availability • High sedimentation thus resulting in Spanish Reed encroachment into instream channel
HABITAT SIZE (LENGTH) CLASS	Low	Low	
INSTREAM MIGRATION LINK CLASS	Moderate	Low	• Upstream abstraction and offtake severely impacts occurrence of fish species and possible use of reach for upstream migration
RIPARIAN-WETLAND ZONE MIGRATION LINK	Moderate	Moderate	
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	Moderate	Moderate	
INSTREAM HABITAT INTEGRITY CLASS	Moderate	Low	• Lake Arthur and Kommandodrift Dams upstream – no releases into river • Silted (bed built-up more than 2m over time) • High salinity (natural and from irrigation return flows) • Anoxic sediments
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**Moderate**	***Moderate***	• Remains Moderate
ES METRIC	**DESKTOP**	**RAPID**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	Moderate	Low	• Although fish diversity is expected to naturally be low, upstream abstraction has resulted in loss of most fish species from the system, with only one species (BANO) expected to occur at a very low FROC
FISH NO-FLOW SENSITIVITY	Moderate	Low	• Although fish diversity is expected to naturally be low, upstream abstraction has resulted in loss of most fish species from the system, with only one species (BANO) expected to occur at a very low FROC
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	High	Low	• 3 out of 5 and 1 out of 11 expected taxa (mostly with high FROCs) recorded for unmodified and moderately unmodified physico-chemical conditions changed respectively
INVERTS VELOCITY SENSITIVITY	Very high	Moderate	• 3 out of 5 and 2 out of 9 expected taxa (mostly with high FROCs) recorded with a preference for very fast and moderately fast flowing water respectively
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Low	
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	Moderate	• Small sized river • System is largely silted with slow flow through reeds • Major offtake from upstream / large dams upstream for small system - Lake Arthur and Kommandodrift Dams not releasing into downstream system • As a result of loss of flow, bed has built up with silt more than 2m in places
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**Moderate**	***Moderate***	• Remains Moderate

Sundays River (Lower)

EI METRIC	DESKTOP (2014)	RAPID	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	Very Low	Very Low	
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Very Low	Very Low	
HABITAT DIVERSITY CLASS	Very Low	Low	• Marginal vegetatation primarily Spanish Reeds, no aquatic macrophytes, limited GSM and various velocity-depth classes
HABITAT SIZE (LENGTH) CLASS	Low	Low	
INSTREAM MIGRATION LINK CLASS	High	Moderate	• Limited flows due to upstream Darlington Dam and Korhaansdrift weir which also create a migration barrier
RIPARIAN-WETLAND ZONE MIGRATION LINK	Moderate	Moderate	
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	Moderate	Low	• Exotic vegetation encroachment • Loss of floods and/or freshetts
INSTREAM HABITAT INTEGRITY CLASS	Moderate	Low	• Darlington Dam and Korhaansdrift weir (limited flows) • Armoured bed and narrowing of bed • River crossings • Extensive irrigation from abstraction from upstream Korhaansdrift weir
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**Moderate**	***Low***	• Driver being the instream migration link class (Darlington Dam and Korhaansdrift weir which also create a migration barrier), coupled with both riparian and instream habitat integrity loss
ES METRIC	**DESKTOP**	**RAPID**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	High	High	• Although only one species of fish considered moderately intolerant of modified water quality was expected and present, it occurred at a high FROC
FISH NO-FLOW SENSITIVITY	Moderate	Moderate	
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	High	Low	• 1 out of 6 and 3 out of 12 expected taxa (several with high FROCs) recorded for unmodified and moderately unmodified physico-chemical conditions changed respectively
INVERTS VELOCITY SENSITIVITY	High	Moderate	• 3 out of 5 and 2 out of 6 expected taxa (several with high FROCs) recorded with a preference for very fast and moderately fast flowing water respectively
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Low	
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	Moderate	modification (upstream weir offtake and canal system) • System is largely pool habitats and already so modified
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**Moderate**	***Moderate***	• Remains Moderate

Kouga River

EI METRIC	DESKTOP (2014)	RAPID	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	Very high	Very high	
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Low	
HABITAT DIVERSITY CLASS	Very Low	High	• All aquatic biotopes presenting, including a range of velocity-depth classes
HABITAT SIZE (LENGTH) CLASS	Low	Low	
INSTREAM MIGRATION LINK CLASS	Moderate	Low	Large weir downstream limiting upstream migration
RIPARIAN-WETLAND ZONE MIGRATION LINK	Very high	Very high	
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	Very high	Moderate	• Exotic vegetation encroachment (Black Wattle within riparian zone)
INSTREAM HABITAT INTEGRITY CLASS	Very high	High	• Loss of baseflows due to groundwater abstractions for irrigation • High irrigation in upper catchment (fruit)
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**Moderate**	***High***	• Driver being high habitat diversity class
ES METRIC	**DESKTOP**	**RAPID**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	High	Moderate	• Although species with a moderate intolerance for modified water quality were expected under reference conditions, these species were unlikely to occur as a result of dominance of predatory non-native fish species (MDOL, MSAL, CGAR). Nevertheless, the non-native species were considered to be moderately tolerant to water quality impairment
FISH NO-FLOW SENSITIVITY	Very high	Low	• Although one species (PAFE) regarded as moderately intolerant of no-flow conditions was expected under reference conditions, under present conditions the species was expected to occur at very low FROC (if any). Similarly, one species (LUMB) regarded as moderately tolerant of no-flow conditions was expected under reference conditions, but under present conditions the species was expected to occur at very low FROC (if any). Non-native species confirmed to be present and dominant were considered to be tolerant of no-flow conditions.
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Very high	Very high	• 2 out of 8 and 13 out of 19 expected taxa (several with high FROCs) recorded for unmodified and moderately unmodified physico-chemical conditions changed respectively
INVERTS VELOCITY SENSITIVITY	Very high	Very high	• 5 out of 6 and 8 out of 13 expected taxa (several with high FROCs) recorded with a preference for very fast and moderately fast flowing water respectively
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Low	
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	High	• Moderate sized river • Modified flows will have an impact on the current existing riffle habitats
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**Moderate**	***High***	•Driver being stream size sensitivity to modified flow/water level changes being high

INTERMEDIATE SITES

Mthatha River (Lower)

EI METRIC	DESKTOP (2014) (for reach)	INTERMEDIATE (2023) (for site)	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	Very high	Very high	• Natural vegetation in a 500m buffer is very high for most of SQ in the gorge, but very low at the site due to vegetation removal and agriculture
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Low	
HABITAT DIVERSITY CLASS	Moderate	Moderate	
HABITAT SIZE (LENGTH) CLASS	Very high	Very high	
INSTREAM MIGRATION LINK CLASS	Very high	Very high	
RIPARIAN-WETLAND ZONE MIGRATION LINK	Moderate	Moderate	• Corridor highly fragmented downstream of the site, more intact upstream but has a high degree of AIP, funtionality maintained in upstream gorge.
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	Moderate	Low	• Flood features and banks have high degree of AIP.
INSTREAM HABITAT INTEGRITY CLASS	Very high	High	• Some bed modification (algae over stones biotope, marginal vegetation limited)
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**High**	***High***	
ES METRIC	**DESKTOP**	**INTERMEDIATE (2023) (for site)**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	Very high	High	•Only two species with moderate intolerance to modified water quality expected (MFLU, RDEW), but at a low FROC
FISH NO-FLOW SENSITIVITY	High	High	
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Very high	Very high	• 4 out of 8 (Taxa with low frocs absent) and 6 out of 19 expected taxa (Taxa with low frocs absent) recorded for unmodified and moderately unmodified physico-chemical conditions changed respectively.
INVERTS VELOCITY SENSITIVITY	Very high	Very high	• 4 out of 7 (Trichorythidae (froc4) absent) and 6 out of 9 expected taxa (Turbellaria (Froc3) absent) recorded with a preference for very fast and moderately fast flowing water respectively. Mostly low frocs absent.
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Low	
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	Low	• Large size river and will loose habitat/riffles if flows are altered
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**High**	***High***	

Mbhashe River (Middle)

EI METRIC	DESKTOP (2014)	INTERMEDIATE (2023) (for site)	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	High	Moderate	• The majority of the reach has high levels of vegetation clearing, mainly for agricultural activities.
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Moderate	2 SA endemic species (Combretum caffra, Senegalia caffrum). 18 species observed at site. Rip habitats includeAlluvial banks, mud slides, sandy bars, pools, riffles, cobble / boulder / bedrock
HABITAT DIVERSITY CLASS	Low	Low	
HABITAT SIZE (LENGTH) CLASS	Very Low	Very Low	
INSTREAM MIGRATION LINK CLASS	Very high	Very high	
RIPARIAN-WETLAND ZONE MIGRATION LINK	Moderate	Moderate	Mostly fragmented but more important in the gorge
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	Moderate	Moderate	
INSTREAM HABITAT INTEGRITY CLASS	Very high	High	• Flow modification from upstream water transfer from Ncora Dam
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**Moderate**	***Moderate***	
ES METRIC	**DESKTOP**	**INTERMEDIATE (2023) (for site)**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	Moderate	Moderate	
FISH NO-FLOW SENSITIVITY	Moderate	Moderate	
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Very high	High	• 4 out of 11 and 4 out of 20 expected taxa recorded for unmodified and moderately unmodified physico-chemical conditions changed respectively. Oligoneuridae recorded although just one individual
INVERTS VELOCITY SENSITIVITY	Very high	Very high	• 5 out of 9 (Prosopistomatidae, Hydropsychidae >2spp (froc4) absent) and 7 out of 9 expected taxa (Ashnidae (froc3) absent) recorded with a preference for very fast and moderately fast flowing water respectively. Mostly low frocs absent.
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Low	• Marginal zone grasses and sedges and the rheophyte Gomphostigma virgatum; riffle rhephyte habitats
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	Low	• Large size river. Although will loose habitat/riffles if flows are altered at the site. Upstream of the site is a pool and downstream bedrock. The riparian zone is also dominated by grasss banks, bedrock and cobbles thus will not deactive or active habitat.
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**Moderate**	***Moderate***	

Black Kei River

EI METRIC	DESKTOP (2014)	INTERMEDIATE (2023) (for site)	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	Very high	Low	• The 500m buffer within the reach has high levels of vegetation clearing for agricultural activities.
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Moderate	• Falls within the Maputaland Pondoland Region of Plant Endemism with 16 species observed at site. Rip habitats include floodplain, alluvial vegetated banks, alluvial marginal zone, mixed bedrock alluvial bar with Salix mucronata
HABITAT DIVERSITY CLASS	Low	Low	
HABITAT SIZE (LENGTH) CLASS	Moderate	Moderate	
INSTREAM MIGRATION LINK CLASS	Very high	Moderate	• Only AMOS likel to use the system as a migratory corridor, but the species has not been recorded at the site for a number of years. BAEN (alien) present and will utilise the reach for migration
RIPARIAN-WETLAND ZONE MIGRATION LINK	Moderate	Low	• Low, fragmented
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	Moderate	Low	• High levels of grazing and trampling pressure have denatured habitats and AIP have altered species composition.
INSTREAM HABITAT INTEGRITY CLASS	High	Moderate	• Irrigation and abstraction. Dams on the tributaries
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**Moderate**	***Moderate***	
ES METRIC	**DESKTOP**	**INTERMEDIATE (2023) (for site)**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	Moderate	Moderate	
FISH NO-FLOW SENSITIVITY	Moderate	Moderate	
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Moderate	Low	• 1 out of 7 (3 taxa with high frocs absent) and 2 out of 13 expected taxa (Taxa with froc3 absent and 1 taxa with a froc5 absent) recorded for unmodified and moderately unmodified physico-chemical conditions changed respectively.
INVERTS VELOCITY SENSITIVITY	Very high	Moderate	• 3 out of 7 (2 taxa with a froc 5 were absent. Simuliidae in D abundances) and 3 out of 10 expected taxa (Several high froc taxa absent) recorded with a preference for very fast and moderately fast flowing water respectively. Mostly low frocs absent.
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Low	Marginal zone grasses and sedges
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	Moderate	• Moderate sized river • Modified flows will have an impact on the current existing riffle habitats
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**Moderate**	***Moderate***	

Tsomo River

EI METRIC	DESKTOP (2014)	INTERMEDIATE (2023) (for site)	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	Very high	Very high	• Most of the reach has intact buffer vegetation but does deteriorate around the site area due to the bridge and nearby development and settlement.
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Moderate	• Two SA endemic species (Combretum caffrum, Senegalia caffra) and 17 indigenous species observed at site. Riparian habitats include mid-channel bar (protection against floods), alluvial flood bench, alluvuial woody banks, lateral bars sedges, grasses.
HABITAT DIVERSITY CLASS	Low	Low	
HABITAT SIZE (LENGTH) CLASS	Low	Low	
INSTREAM MIGRATION LINK CLASS	High	Low	• Only a single species of eel (AMOS) expected to be present, but at reduced FROC relative to reference • Weir immediately upstream of site creating significant movement barrier
RIPARIAN-WETLAND ZONE MIGRATION LINK	Moderate	Moderate	• Corridor mostly intact and maintains functionality upstream and downstream of the site but deterioraates in the vicinity of the bridge and site.
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	Moderate	Moderate	• Moderate levels of AIP (mainly Wattle), with high grazing pressure and selec wwod removal.
INSTREAM HABITAT INTEGRITY CLASS	High	Moderate	•Upstream weir and bridge crossing (bed and channel modification). Localised water abstraction, macroplastics (nappies) and cattle trampling and grazing
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**Moderate**	***Moderate***	
ES METRIC	**DESKTOP**	**INTERMEDIATE (2023) (for site)**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	Moderate	Moderate	
FISH NO-FLOW SENSITIVITY	Moderate	Moderate	
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Very high	Moderate	• 4 out of 8 (Hydropsychidae >2spp (froc4) absent, rest low frocs. Prosopistomatidae recorded in A abundance) and 4 out of 17 expected taxa (Several taxa with froc 3,4 absent) recorded for unmodified and moderately unmodified physico-chemical conditions changed respectively.
INVERTS VELOCITY SENSITIVITY	Very high	High	• 5 out of 8 (Hydropsychidae >2spp (froc 4) absent. Rest are froc 1 absent. Prosopistomatidae recorded in A abundance) and 4 out of 9 expected taxa (Several froc 3,4 absent) recorded with a preference for very fast and moderately fast flowing water respectively. Mostly low frocs absent.
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Moderate	Marginal zone grasses, sedges, and the rheophyte Gomphostigma virgatum, as well as Salix mucronata riffle habitats
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	Moderate	• Moderate sized river • Modified flows will have an impact on the current existing riffle habitats
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**Moderate**	***Moderate***	

Buffalo River (Middle)

EI METRIC	DESKTOP (2014)	INTERMEDIATE (2023) (for site)	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	High	High	• Mostly intact besides dams and weirs, also high levels of AIP for the site
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Moderate	• Outeniqua Yellowwood (Afrocarpus falcatus) protected in SA; 4 SA endemic species (Combretum caffrum, Cotula nigellifolia var. nigellifolia, Cyperus textilis, Senegalia caffra) and 28 indigenous species observed on site. Riparian habitats include pools, rapids, flood bench, banks
HABITAT DIVERSITY CLASS	Moderate	Moderate	
HABITAT SIZE (LENGTH) CLASS	Very high	Very high	
INSTREAM MIGRATION LINK CLASS	Low	Low	
RIPARIAN-WETLAND ZONE MIGRATION LINK	Moderate	Moderate	• Corridor mostly intact but fragmented by weirs and upstream and downstream dams.
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	Low	Moderate	Main causes are AIP and scour from the weir.
INSTREAM HABITAT INTEGRITY CLASS	High	Low	• Weir, water quality impairment (nutrients), alien invasive aquatic macrophytes (Eichhornia crassipes - Hyacinth)
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**High**	***Moderate***	
ES METRIC	**DESKTOP**	**INTERMEDIATE (2023) (for site)**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	Very high	Moderate	Only 3 of the expected 12 species present (AMOS, GCAL, OMOS), all of which are moderately tolerant to water quality impairment. High prevelance of Anchor Worm (external parasite) on GCAL and LUMB (translocated)
FISH NO-FLOW SENSITIVITY	High	Moderate	Only 3 of the expected 12 species present (AMOS, GCAL, OMOS), all of which are moderately tolerant to no-flow conditions. High prevelance of alien/translocated fish species, all of which are tolerant of low flow conditions. Site located immediately upstream of Bridle Drift Dam, and below a weir. More impoundments located upstream
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Very high	Moderate	• 3 out of 4 (only Hydrophysidae >2spp absent) and 5 out of 10 expected taxa (Only 2 taxa with high frocs absent,rest low frocs) recorded for unmodified and moderately unmodified physico-chemical conditions changed respectively.
INVERTS VELOCITY SENSITIVITY	Very high	Moderate	• 3 out of 6 (1 taxa with high froc taxa absent. Simuliidae abundance exceeding reference state at a C) and 7 out of 9 expected taxa (low froc taxa absent) recorded with a preference for very fast and moderately fast flowing water respectively. Mostly low frocs absent.
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Low	Marginal zone sedges and grasses, but sparse and scattered
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	Low	• Moderate sized river • The site is located just upstream of the Bridledrift dam • Modified flows will have an impact on the current existing riffle habitats
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**Moderate**	***Moderate***	

Keiskamma (Upper)

EI METRIC	DESKTOP (2014)	INTERMEDIATE (2023) (for site)	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	High	High	• Mostly intact but generally less than 500m.
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Moderate	• Within the Maputaland-Pondoland region of plant endemism, with 4 SA endemic species (Combretum caffra, Senegalia caffrum, Cotula nigellifolia var. nigellifolia, Cyperus textilis) and 26 species observed at site. Riparian habitats include alluvial banks, mud slides, gravel bars, pools, riffles, cobble / boulder / bedrock, alluvial side channel
HABITAT DIVERSITY CLASS	Moderate	Moderate	
HABITAT SIZE (LENGTH) CLASS	Moderate	Moderate	
INSTREAM MIGRATION LINK CLASS	High	Low	• Greatly reduced fish diversity, with only only 3 fish species confirmed, including AMOS. Raw sewage entering system from Middledrift (downstream) presents a water quality barrier for migration. Upstream is Sandile Dam which prevents further upstream migration
RIPARIAN-WETLAND ZONE MIGRATION LINK	Moderate	High	• Corridor mostly intact and maintains functionality.
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	Moderate	Moderate	• Mainly affected by vegetation removal, clearing, AIP and changes to water quantity.
INSTREAM HABITAT INTEGRITY CLASS	High	Moderate	• Low water bridge (bed modification), some nutrients (algae), cattlle trampling and grazing
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**Moderate**	***Moderate***	
ES METRIC	**DESKTOP**	**INTERMEDIATE (2023) (for site)**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	Very high	Moderate	Greatly reduced fish diversity, with only only 3 fish species confirmed, including AMOS. Only species expected to be sensitive (SBAI) not sampled, and highly unlikely to be present.
FISH NO-FLOW SENSITIVITY	Moderate	Moderate	
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Very high	Moderate	• 3 out of 9 (Perlidae absent (froc5), rest low frocs) and 9 out of 12 expected taxa (taxa with low frocs absesnt) recorded for unmodified and moderately unmodified physico-chemical conditions changed respectively.
INVERTS VELOCITY SENSITIVITY	Very high	Moderate	• 4 out of 11 (1 taxon with froc 3 absent, rest have low frocs) and 7 out of 11 expected taxa ((Perlidae absent which was a froc 5, the rest of the absent taxa have low frocs) recorded with a preference for very fast and moderately fast flowing water respectively. Mostly low frocs absent.
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Moderate	Marginal zone grasses and sedges and the rheophyte Gomphostigma virgatum in riffle habitats.
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	Moderate	• Small to moderate sized river • Although mostly pool habitat upstream of bridge - there is the critical zone of riffle and stone habitat downstream of the bridge. Any modified flows will have an impact on some of the current existing riffle habitats
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**Moderate**	**Moderate**	

Kat River (Upper):

EI METRIC	DESKTOP (2014)	INTERMEDIATE (2023) (for site)	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	High	High	• Mostly intact but has become fragmented in places by encroaching agriculture, generally less than 500m
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	High	• Afrocarpus falcatus (Outeniqua yellowwood) protected in SA, with 4 SA endemic species (Combretum caffra, Senegalia caffrum, Cotula nigellifolia var. nigellifolia, Cyperus textilis) and 25 species observed at site. Riparian habitats include alluvial banks, mud slides, gravel & boulder bars, pools, riffles, cobble / boulder / bedrock, flood bench and channel, boulder in-channel with tufted grasses.
HABITAT DIVERSITY CLASS	Low	Low	
HABITAT SIZE (LENGTH) CLASS	Very Low	Very Low	
INSTREAM MIGRATION LINK CLASS	High	Low	• Large number of weirs located upstream and downstream of the site. Only a single species requirig reach-scale migration present (AMOS) but in low FROC. Species assemblage dominated by species with requirement for movement within the reach.
RIPARIAN-WETLAND ZONE MIGRATION LINK	High	High	• Corridor mostly intact and maintains functionality below the Kat River Dam.
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	High	High	• AIP present but low, vegetation removal also low, main impacts are related to potential altered flow regime.
INSTREAM HABITAT INTEGRITY CLASS	High	High	• Upstream Kat River Dam (flow modification), cattle trampling, grazing, crossing (bed modification)
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**Moderate**	***Moderate***	
ES METRIC	**DESKTOP**	**INTERMEDIATE (2023) (for site)**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	Very high	Very high	
FISH NO-FLOW SENSITIVITY	Moderate	Moderate	
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Very high	High	• 2 out of 7 (Several taxa with high frocs absent) and 12 out of 16 expected taxa (Several taxa with high frocs absent) recorded for unmodified and moderately unmodified physico-chemical conditions respectively.
INVERTS VELOCITY SENSITIVITY	Very high	High	• 4 out of 6 (2 taxa with froc 3 absent) and 7 out of 11 expected taxa (3 taxa with froc 3 and 5 absent) recorded with a preference for very fast and moderately fast flowing water respectively. Mostly low frocs absent.
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Moderate	• Marginal zone grasses and sedges and the rheophyte Gomphostigma virgatum in riffle habitats.
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	High	High	• Small river system • Channel is relatively narrow where there is critical habitat, thus should flow/water level changes take place, this zone will be compromised from a biotic perspective. The pushback from the downstream weir is not sensitive to flow/water level changes.
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**High**	***High***	

Great Fish River (Lower)

EI METRIC	DESKTOP (2014)	INTERMEDIATE (2023) (for site)	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	Very high	High	• Some agricultural encroachment has occurred.
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Moderate	• 2 SA endemic species (Cyperus textilis, Combretum caffrum) and 14 indigenous species observed at. Riparian habitats include bedrock controlled channel, reeds, woody alluvial banks, grass, sedge inset bench.
HABITAT DIVERSITY CLASS	Low	Low	
HABITAT SIZE (LENGTH) CLASS	Low	Low	
INSTREAM MIGRATION LINK CLASS	Very high	Moderate	• Species assemblage dominated by alien fish species. However, some indigenous species with catchment-scale or between reach migration requirements likely to be present but at lower FROC • Reduced flows due to interbasin transfer and significant abstraction likely to be impacting migration cues
RIPARIAN-WETLAND ZONE MIGRATION LINK	High	High	• Corridor mostly intact and maintains functionality.
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	High	Moderate	• Marginal zone has shifted due to transfer with elevated flows, which has also scoured the site.
INSTREAM HABITAT INTEGRITY CLASS	High	Low	• Interbasin Transfer scheme (extensive flow modification), water quality compromised (upstream Craddock town, high sedimentation loads)
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**Moderate**	***Moderate***	
ES METRIC	**DESKTOP**	**INTERMEDIATE (2023) (for site)**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	Moderate	Moderate	
FISH NO-FLOW SENSITIVITY	Moderate	Moderate	
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Moderate	Moderate	• 2 out of 5 (Taxa with a froc 5 and 3 absent) and 2 out of 11 expected taxa (Taxa with a froc 5, 4 and 3 absent) recorded for unmodified and moderately unmodified physico-chemical conditions changes respectively.
INVERTS VELOCITY SENSITIVITY	Very high	High	• 3 out of 5 (Trichorythidae (Froc5) absent) and 5 out of 9 expected taxa (froc 5,4 and 3 absent) recorded with a preference for very fast and moderately fast flowing water respectively. Mostly low frocs absent.
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Low	• Marginal zone grasses, sedges, and Salix mucronata, but flows have been regulated.
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	Low	• IBT thus the system is under stress from flow modification and regulation (lost seasonal variation) however it's a large system
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**Moderate**	***Moderate***	

KwaZungu/Swartkops River

EI METRIC	DESKTOP (2014)	INTERMEDIATE (2023) (for site)	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	Moderate	Low	The buffer is mostly natural at the site and upstream through the Groendal Reserve, but is fragmented downstream where the sand mining starts (most of the SQ)
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	High	• Afrocarpus falcatus (Outeniqua yellowwood) protected in SA; Prionium serratum (Palmiet) has a threat status of "Declining"; 3 SA endemic species (Cyperus textilis, Prionium serratum, Searsia lucida) and 19 indigenous species observed at site excluding Fynbos elements. Riparian habitats include confined channel with boulder floodplain (terrestrial species), cobble / buolder / bedrock riffle / runs, pools with aqautic vegetation, alluvial banks with tall tree and forest elements, alluvial narrow inset benches.
HABITAT DIVERSITY CLASS	Low	Low	
HABITAT SIZE (LENGTH) CLASS	Very Low	Very Low	
INSTREAM MIGRATION LINK CLASS	High	Low	(AMOS & AMAR) due to sand mining immediately downstream (manipulation of channel) as well as water quality impacts from Uitenhage • Remainder of fish species have requirement for within-reach movement
RIPARIAN-WETLAND ZONE MIGRATION LINK	Moderate	Low	•Corridor mostly intact and maintains functionality between the Groendal Dam (upstream) and the Albany Alluvial Vegetation (downstream), but downstream of this (most of the SQ) the corridor is severely fragmented or removed.
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	Low	High	Integrity is high at the site with only a few alien plants and remains high in the Groendal Reserve, but deteriorates severly downstream from where the sand mining starts.
INSTREAM HABITAT INTEGRITY CLASS	Moderate	High	• Limited impacts as the site is located within the Groendal Nature Reserve - Groendal Dam (channel modification)
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**Moderate**	**Moderate**	
ES METRIC	**DESKTOP**	**INTERMEDIATE (2023) (for site)**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	High	High	
FISH NO-FLOW SENSITIVITY	Very high	Moderate	• Species present regarded as having moderate tolerance to no-flow conditions. • Only species likely to be present with intolerance to no-flow conditions (PAFE) not recorded within mainstem - only present in
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Moderate	High	• 4 out of 9 (Hydropsychidae >2spp (froc5) absent) and 10 out of 19 expected taxa (low frocs mostly absent) recorded for unmodified and moderately unmodified physico-chemical conditions changed respectively.
INVERTS VELOCITY SENSITIVITY	Very high	Very high	• 5 out of 7 (1 FROC 5 absent) and 6 out of 9 expected taxa ((low frocs mostly absent) recorded with a preference for very fast and moderately fast flowing water respectively.
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Moderate	• Marginal zone grasses, sedges, shrubs and Palmiet. Also aquatic vegetation, Nymphae nouchali - Pool with aquatic vegetation, riffle rheophyte habitats
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	High	• Small river system • Channel is relatively narrow where there is critical habitat, thus should flow/water level changes take place, this zone will be compromised from a biotic perspective.
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**Moderate**	***High***	

Gamtoos River

EI METRIC	DESKTOP (2014)	INTERMEDIATE (2023) (for site)	Motivation
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH)	Low	Low	
RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL VEG IN 500m (100%=5)	Moderate	Low	Fragmentation by agriculture.
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Moderate	• EN Albany Alluvial Vegetation & Kouga - Baviaanskloof Complex IBA; 2 SA endemic species (Cotula nigellifolia var. nigellifolia, Cyperus textilis) and 18 indigenous species observed at site. Riparian habitats include deep pools, mixed bedrock alluvial shallow channel with aqautic and emergent vegetation, sedge and reed beds
HABITAT DIVERSITY CLASS	Very Low	Very Low	
HABITAT SIZE (LENGTH) CLASS	High	High	
INSTREAM MIGRATION LINK CLASS	High	Moderate	• Species with a requirement for catchment-scale and between reach scale migration requirements occuring at a lower FROC than expected • Site often dry
RIPARIAN-WETLAND ZONE MIGRATION LINK	Very high	Moderate	• Corridor fragmentation is high but the upland is mainly agriculture, so functionality persists.
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	Very high	Moderate	• AIP high
INSTREAM HABITAT INTEGRITY CLASS	High	Low	• Upstream Kouga Dam, low water bridge (channel and bed modification), extensive citrus farming, irrigation, abstraction and return flows (nutrients), high algae over biotopes
FINAL ECOLOGICAL IMPORTANCE FOR SITE	**High**	***Moderate***	
ES METRIC	**DESKTOP**	**INTERMEDIATE (2023) (for site)**	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	High	High	
FISH NO-FLOW SENSITIVITY	Very high	Moderate	• Only a single species regarded as moderately intolerant to no-flow conditions likely present at very low FROC. Remainder of fish moderately tolerant or tolerant.
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Moderate	Low	• 1 out of 11 (1 taxa with FROC5 absent) and 1 out of 22 expected taxa (several taxa with FROC 5,4,3 absent) recorded for unmodified and moderately unmodified physico-chemical conditions changed respectively.
INVERTS VELOCITY SENSITIVITY	Very high	Moderate	• 3 out of 7 (Key expected taxa with high FROCs expected but absent) and 3 out of 4 expected taxa (Key expected taxa with high FROCs expected but absent) recorded with a preference for very fast and moderately fast flowing water respectively.
RIPARIAN-WETLAND VERTEBRATES (NON-FISH)			
RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE TO WATER LEVEL/FLOW CHANGES	Low	Low	
RIPARIAN-WETLAND VEGETATION			
RIPARIAN-WETLAND VEGETATION INTOLERANCE TO WATER LEVEL CHANGES	Low	Moderate	• Marginal zone grasses, sedges, and the aqautic species Stuckenia pectinatus.
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	Moderate	• Small river system • Inundation upstream of the low water bridge • During times of high abstraction, and flows/water levels are zero, compromising aquatic biotopes downstream of the low water bridge
FINAL ECOLOGICAL SENSITIVITY FOR SITE	**Moderate**	***Moderate***	