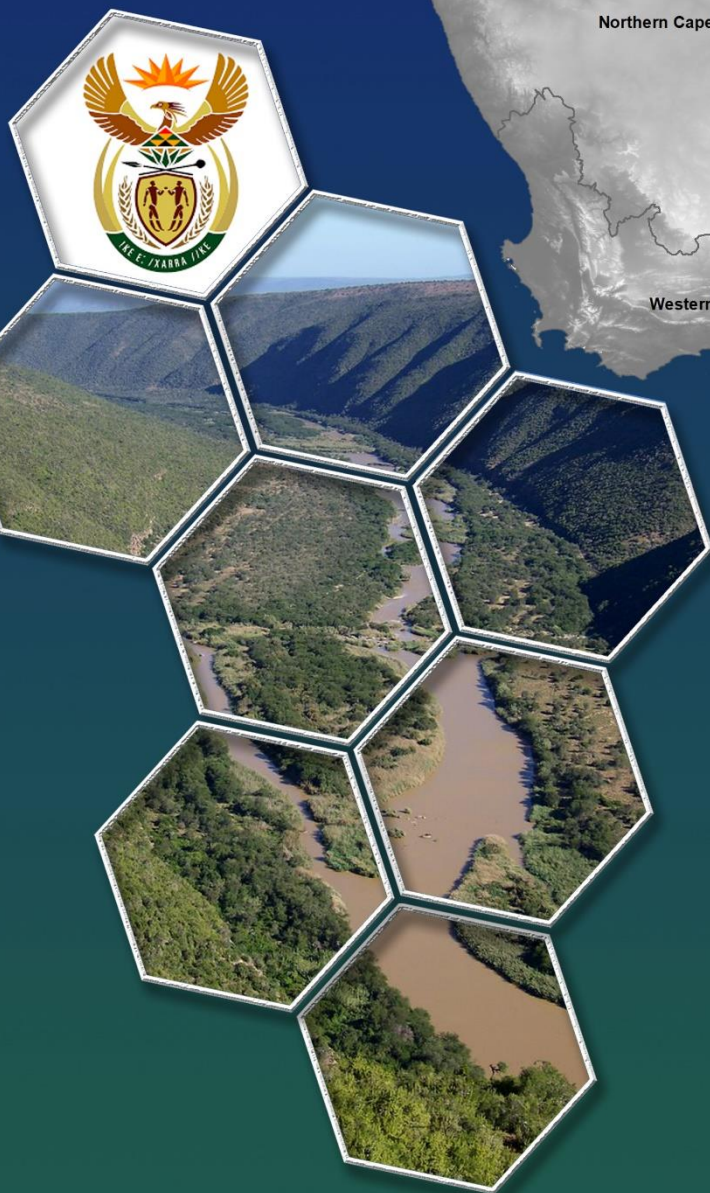
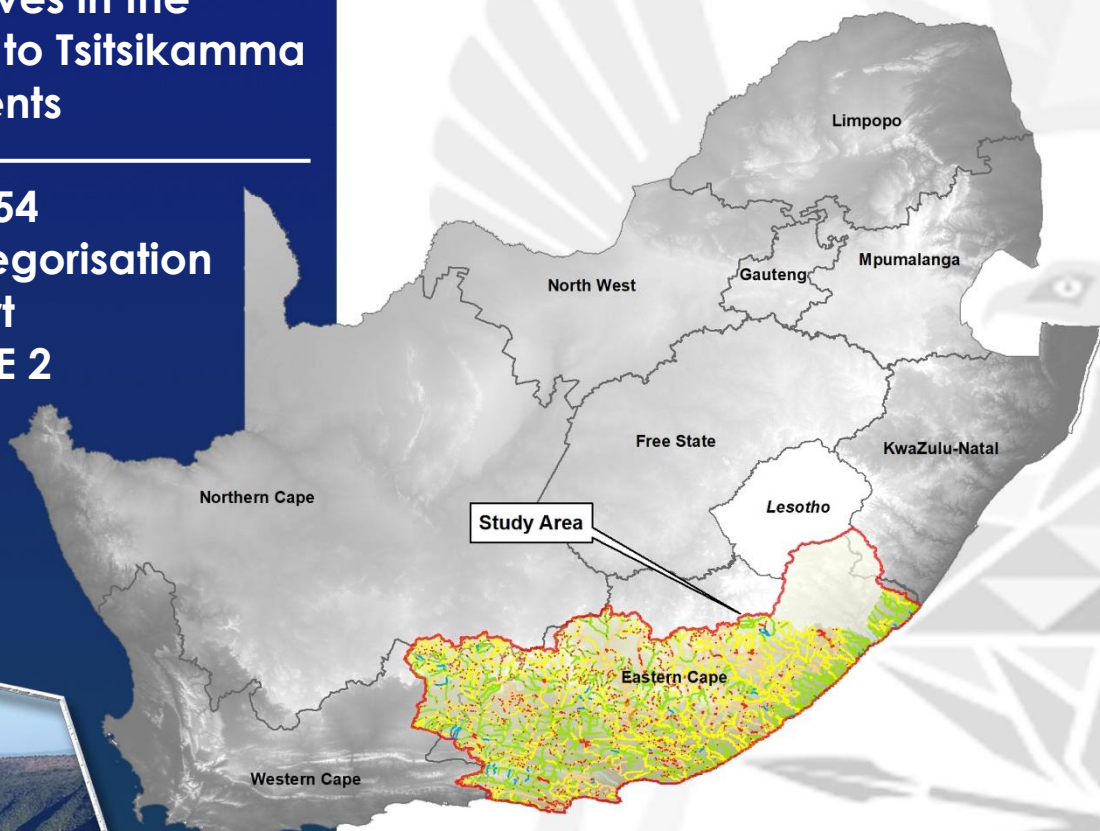


DEPARTMENT OF WATER AND SANITATION

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

WP11354 Rivers Eco-Categorisation Report VOLUME 2



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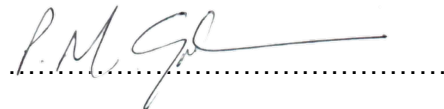
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Reports as part of this project:

Bold type indicates this report

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3.0	WEM/WMA7/00/CON/RDM/0322	Status quo and delineation of Integrated Units of Analysis Report
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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 SP	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	<i>Achnanthydium spp.</i>	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	<i>Achnanthes thienemanni</i> Hustedt <i>Achnanthydium spp.</i>	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) 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	<i>Eolimna subminuscula</i> (Manguin) Moser, Lange-Bertalot & Metzeltin <i>Nitzschia dissipata</i> (Kützing) Grunow	A cosmopolitan species common in electrolyte-rich, strongly polluted rivers and flowing waters. 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	<i>Cocconeis placentula</i> var. <i>euglypta</i> (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	<i>Achnanthes thienemanni</i> Hustedt <i>Achnanthydium spp.</i>	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) 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	<i>Cocconeis placentula</i> var. <i>euglypta</i> (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	<i>Cocconeis placentula</i> var. <i>euglypta</i> (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	<i>Achnanthydium spp.</i> <i>Cocconeis placentula</i> var. <i>euglypta</i> (Ehrenberg) Grunow	Moderate to good quality waters 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	<i>Cyclostephanos invisitatus</i> (Hohn & Hellerman) Theriot, Stoermer & H à 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	<i>Psammothidium oblongellum</i> (Oestrup) Van de Vijver	Tolerant of mild pollution only and also pollution sensitive. This was the only site with endemic species: <i>Achnanthes subaffinis</i> Cholnok. Its preference is slow flowing water and oligotrophic streams
Upper Gamtoos	GAMT01_I	405	15	17.6	A	High	100	18.9	67	0	Site free from organic pollution	1.25	<i>Achnanthydium minutissimum</i> (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 SP	BDI	%incl. in BC	%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	<i>Nitzschia frustulum</i> (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	<i>Eolimna subminuscula</i> (Manguin) Moser. Lange-Bertalot & Metzeltin	A cosmopolitan species common in electrolyte-rich, strongly polluted rivers and flowing waters.
													<i>Nitzschia frustulum</i> (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	<i>Achnanthydium</i> sp.	Moderate to good water quality conditions
													<i>Gomphonema pumilum</i> (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	<i>Achnanthydium</i> 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	<i>Cocconeis placentula</i> var. <i>euglypta</i> (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	<i>Achnanthes thienemannii</i> 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	<i>Achnanthydium</i> sp.	Moderate to good water quality conditions
													<i>Cocconeis placentula</i> var. <i>euglypta</i> (Ehrenberg) Grunow	Nutrient and salinity increases (eutrophication)
													<i>Encyonopsis minuta</i> 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	<i>Psammothidium oblongellum</i> (Oestrup) Van de Vijver	Tolerant of mild pollution only and also pollution sensitive. This was the only site with endemic species: <i>Achnanthes subaffinis</i> Chohnok. Its preference is slow flowing water and oligotrophic streams
Gamtoos	GAMT01_I	400	34	9.1	C	Moderate	97	10.1	74	9.5	Site free from organic pollution	0	<i>Navicula recens</i> (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.
													<i>Nitzschia forfica</i> Chohnoky	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	<i>Achnanthydium</i> sp.	Moderate to good water quality conditions

Site	EWR site	Count	No. spec.	SPI	Category	Water Quality	%incl. in SP	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	<i>Achnanthes thienemannii</i> 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	<i>Achnantheidium</i> spp. <i>Cocconeis placentula</i> var. <i>euglypta</i> (Ehrenberg) Grunow	Moderate to good quality waters 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	<i>Cocconeis placentula</i> var. <i>euglypta</i> (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	<i>Achnanthes thienemannii</i> 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	<i>Fragilaria ulna</i> var. <i>acus</i> (Kützing) Lange-Bertalot <i>Gomphonema parvulum</i> (Kützing) Kützing <i>Navicula veneta</i> Kützing	tolerates slightly saline water, alkalibontic (only in water pH>7), tolerates moderate organic pollution. Found in standing and flowing water. 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 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	<i>Achnanthes thienemannii</i> Hustedt <i>Achnantheidium</i> spp.	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) 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	<i>Achnantheidium eutrophilum</i> (Lange-Bertalot) Lange-Bertalot <i>Achnantheidium</i> spp. <i>Encyonopsis minuta</i> Krammer & Reichardt	Found in well-oxygenated eutrophic fresh water. Tolerant only to slight or moderate pollution Moderate to good quality waters 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	<i>Eolimna minima</i> (Grunow) Lange-Bertalot <i>Nitzschia</i> sp.	Cosmopolitan, found in a wide range of waters including heavily polluted biotopes. May possibly be associated with organic detritus Generally, siltation 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	<i>Eolimna subminuscula</i> (Manguin) Moser, Lange-Bertalot & Metzeltin <i>Nitzschia frustulum</i> (Kützing) Grunow <i>Planothidium engelbrechtii</i> (Cholnoky) Round & Bukhtiyarova	A cosmopolitan species common in electrolyte-rich, strongly polluted rivers and flowing waters. A cosmopolitan species found in electrolyte-rich and brackish waters. Tolerant of fluctuations in osmotic pressure and of critical levels of pollution. 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 SP	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 pollution	0	<i>Cocconeis placentula</i> var. <i>euglypta</i> (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	<i>Cocconeis placentula</i> var. <i>euglypta</i> (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	<i>Cocconeis placentula</i> var. <i>euglypta</i> (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	<i>Achnanthydium minutissimum</i> (Kützing) Czarnecki <i>Achnanthydium</i> spp.	Found in well-oxygenated, clean, fresh waters. Usually attached to a substratum by a short mucilage stalk. 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	<i>Cyclostephanos invisitatus</i> (Hohn & Hellerman) Theriot, Stoermer & H å kansson <i>Nitzschia dissipata</i> (Kützing) Grunow	Cosmopolitan, common in summer plankton nutrient-rich streams. These species when in abundance is a good indicator of eutrophication. 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	<i>Amphora pediculus</i> (Kützing) Grunow <i>Planothidium frequentissimum</i> (Lange-Bertalot) Lange-Bertalot	A cosmopolitan species found in waters with moderate electrolyte content (Increased salts and cultivated areas) and tolerating critical levels of pollution. pH>7 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	<i>Craticula buderi</i> (Hustedt) Lange-Bertalot <i>Planothidium</i> sp.	Nutrient and salinity increases (eutrophication) First time our Diatom specialists have identified <i>Planothidium</i> 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	<i>Cocconeis placentula</i> var. <i>euglypta</i> (Ehrenberg) Grunow <i>Cyclotella atomus</i> Hustedt	Nutrient and salinity increases (eutrophication) 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	<i>Achnanthydium minutissimum</i> (Kützing) Czarnecki <i>Achnanthydium</i> spp. <i>Cocconeis placentula</i> Ehrenberg	Found in well-oxygenated, clean, fresh waters. Usually attached to a substratum by a short mucilage stalk. Moderate to good quality waters 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 SP	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	<i>Achnanthydium sp.</i>	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	<i>Achnanthydium sp.</i> <i>Psammothidium oblongellum (Oestrup) Van de Vijver</i>	Moderate to good water quality conditions Tolerant of mild pollution only and also pollution sensitive. This was the only site with endemic species: <i>Achanthes subaffinis</i> 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	<i>Achnanthydium sp.</i> <i>Fragilaria capucina Desmazieres</i>	Moderate to good water quality conditions 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 SP	BDI in BD	%incl. in BD	%PTV	Evidence of organic pollution	% Deformed cells (>2)	Dominant species	Preference
FIELD VERIFICATION SITES (SEPTEMBER 2022)														
Mtakatye	MTAK01_FV	404	21	15.5	B	Good	95	16.1	71	1.5	Site free from organic pollution	1	<i>Achnanthes thienemannii</i> 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)
													<i>Achnanthisidium</i> 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	<i>Cocconeis placentula</i> var. <i>euglypta</i> (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	<i>Navicula veneta</i> Kützing	Cosmopolitan, common in heavily eutrophied, electrolyte-rich to brackish water. Very pollution tolerant, often the dominant species in industrially impacted waters.
													<i>Nitzschia palea</i> (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	<i>Cocconeis placentula</i> var. <i>euglypta</i> (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	<i>Achnanthisidium crassum</i> (Hustedt) Potapova & Ponader	Alkaline and slow flowing water
													<i>Achnanthisidium</i> spp.	Moderate to good quality waters
													<i>Nitzschia</i> sp.	Generally, siltation 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	<i>Cyclostephanos dubius</i> (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 disappear).
													<i>Cyclostephanos invisitatus</i> (Hohn & Hellerman) Theriot, Stoermer & Hå kansson	Cosmopolitan, common in summer plankton nutrient-rich streams. These species when in abundance is a good indicator of eutrophication.
													<i>Gomphonema pumilum</i> var. <i>rigidum</i> 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	<i>Cyclostephanos invisitatus</i> (Hohn & Hellerman) Theriot, Stoermer & Hå kansson	Cosmopolitan, common in summer plankton nutrient-rich streams. These species when in abundance is a good indicator of eutrophication.
													<i>Gomphonema pumilum</i> (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	<i>Gomphonema pumilum</i> (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	<i>Cocconeis placentula</i> var. <i>euglypta</i> (Ehrenberg) Grunow	Nutrient and salinity increases (eutrophication)
													<i>Cyclostephanos dubius</i> (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 disappear).
													<i>Cyclostephanos invisitatus</i> (Hohn & Hellerman) Theriot, Stoermer & Hå kansson	Cosmopolitan, common in summer plankton nutrient-rich streams. These species when in abundance is a good indicator of eutrophication.

Site	EWR site	Count	No. spec.	SPI	Category	Water Quality	%incl. in SP	BDI	%incl. in BD	%PTV	Evidence of organic pollution	% Deformed cells (>2)	Dominant species	Preference
FIELD VERIFICATION SITES (SEPTEMBER 2022)														
Upper Sundays	SUND01_R	100	14	15.1	B	Good	100	11.2	93	14	Site free from organic pollution	0	<i>Gomphonema minutum (Agardh) Agardh</i> <i>Rhopalodia gibba (Ehrenberg) O.M ü ller</i>	A cosmopolitan species found in eutrophic waters but not tolerant to more than moderate levels of pollution. A cosmopolitan species found in standing and slow flowing waters, especially springs, of moderate to high electrolyte content
Kabeljous Upper	KABE01_R	100	29	11.4	C	Moderate	100	11.9	69	16	Site free from organic pollution	0	<i>Fragilaria biceps (Kützing) Lange-Bertalot</i> <i>Frgilaria spp.</i>	This cosmopolitan taxon is found in the benthos of rivers and lakes and is easily suspended in the plankton due to its relatively large surface area. Often found in mesotrophic to eutrophic waters. Limited research on this diatom genus, and thus not identified to species level. However, this genus does not occur in heavily polluted waters, thus has a preference to moderate water quality conditions.
Kabeljous Lower	KABE02_FV	400	12	11.6	C	Moderate	100	14.8	75	4	Site free from organic pollution	0	<i>Fragilaria biceps (Kützing) Lange-Bertalot</i>	This cosmopolitan taxon is found in the benthos of rivers
Gamtoos Lower	GAMT02_FV	425	19	7.4	D	Poor	100	6.5	84	47.5	Organic pollution likely to	6.25	<i>Nitzschia frustulum (Kützing) Grunow</i> <i>Planothidium frequentissimum (Lange-Bertalot)</i>	A cosmopolitan species found in electrolyte-rich and A common species in standing and flowing, circumneutral to
Groot	GROO02_FV	100	19	15.3	B	Good	100	19.4	68	13	Site free from organic pollution	0	<i>Psammothidium oblongellum (Oestrup) Van de Vijver</i>	Tolerant of mild pollution only and also pollution sensitive
Twee Riviere	TWEE01_FV	404	10	4.9	E	Critical	100	9.1	90	54.2	Organic pollution likely to contribute significantly to eutrophication	1	<i>Achnanthydium saphophilum (Kaboyasi & Mayama) Round & Bukhtiyarova</i> <i>Gomphonema parvulum (Kützing) Kützing</i> <i>Nitzschia palea (Kützing) W.Smith</i>	Tolerant of poor oxygenation and hypereutrophication caused by nutrient inflows 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 A cosmopolitan and very commonly occurring species found in eutrophic and very heavily polluted to extremely polluted waters with moderate to high electrolyte content
Kwenxura	KWEN01_FV (400	30	16.5	B	Good	96	19.1	70	4	Site free from organic pollution	0	<i>Achnanthydium sp.</i>	Moderate to good water quality conditions	
Kwenxura	KWEN02_FV (100	28	10.8	C	Moderate	96	11.5	72	33	Organic pollution likely to contribute significantly to eutrophication	0	<i>Gomphonema parvulum (Kützing) Kützing</i> <i>Achnanthydium sp.</i>	tolerance to extreme pollution, sediment increaser taxa Moderate to good water quality conditions	
Nahoon	NAHO01_FV	400	41	7.5	D	Poor	92	9.7	78	33.7	Organic pollution likely to contribute significantly to eutrophication	1	<i>Nitzschia frustulum (Kützing) Grunow</i> <i>Staurosirella pinnata (Ehrenberg) Williams & Round</i>	High conductivity, heavy agriculture, tolerant of fluctuations in osmotic pressure and of critical levels of pollution Often occurs attached to sand grains, Found in clean waters (mild pollution and only slight organic pollution), with moderate to high electrolyte content. pH>7

3. Appendix B: Fish inventory and FRAI Models

Intermediate Sites

Species	Abbreviation	MTHA01_I: Mthatha River (Lower)		MBAS01_I: Mbashe 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
Indigenous															
<i>Anguilla marmorata</i>	AMAR	14													
<i>Anguilla mossambica</i>	AMOS	4		3								4	3		1
<i>Enteromius anoplus sl.</i>	BANO						1			1					
<i>Enteromius mandelai</i>	BANO														
<i>Enteromius pallidus</i>	BPAL														
<i>Enteromius viviparus</i>	BVIV														
<i>Gilchristella aestuaria</i>	GAES	4													
<i>Glossogobius callidus</i>	GCAL	15										3	100	1	7
<i>Labeo umbratus</i>	LUMB														
<i>Monodactylus falciformis</i>	MFAL	14													
<i>Oreochromis mossambicus</i>	OMOS												6		
<i>Pseudomyxus capensis</i>	MCAP	2													
<i>Sandelia bainsii</i>	SBAI														
<i>Sandelia capensis</i>	SCAP														
Non-native															
<i>Clarias gariepinus</i>	CGAR	5						5	3	5		7	5		
<i>Cyprinus carpio</i>	CCAR						1			1			1		
<i>Gambusia affinis</i>	GAFF														
<i>Labeo capensis</i>	LCAP														
<i>Labeo umbratus</i>	LUMB												3		
<i>Labeobarbus aeneus</i>	BAEN					1	6	4	13	50	33				
<i>Lepomis macrochirus</i>	LMAC														
<i>Micropterus dolomieu</i>	MDOL														
<i>Micropterus salmoides</i>	MSAL														
<i>Oreochromis mossambicus</i>	OMOS														
<i>Pseudocrenilabrus philander</i>	PPHI														
<i>Tilapia sparrmanii</i>	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

Species	Abbreviation	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
Indigenous									
<i>Anguilla marmorata</i>	AMAR								
<i>Anguilla mossambica</i>	AMOS	1						1	
<i>Enteromius anoplus sl.</i>	BANO								
<i>Enteromius mandelai</i>	BANO	27	45						
<i>Enteromius pallidus</i>	BPAL					15	51	23	23
<i>Enteromius viviparus</i>	BVIV								
<i>Gilchristella aestuaria</i>	GAES								1
<i>Glossogobius callidus</i>	GCAL	6	15			5	5	1	5
<i>Labeo umbratus</i>	LUMB								
<i>Monodactylus falciformis</i>	MFAL								
<i>Oreochromis mossambicus</i>	OMOS								
<i>Pseudomyxus capensis</i>	MCAP								
<i>Sandelia bainsii</i>	SBAI	5	5						
<i>Sandelia capensis</i>	SCAP					2	2		
Non-native									
<i>Clarias gariepinus</i>	CGAR				1		1		
<i>Cyprinus carpio</i>	CCAR								
<i>Gambusia affinis</i>	GAFF								
<i>Labeo capensis</i>	LCAP								
<i>Labeo umbratus</i>	LUMB								
<i>Labeobarbus aeneus</i>	BAEN			8	20				
<i>Lepomis macrochirus</i>	LMAC								
<i>Micropterus dolomieu</i>	MDOL								
<i>Micropterus salmoides</i>	MSAL								
<i>Oreochromis mossambicus</i>	OMOS						2		105
<i>Pseudocrenilabrus philander</i>	PPHI							23	137
<i>Tilapia sparrmanii</i>	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										
<i>Anguilla mossambica</i>	AMOS			5	1					1
<i>Enteromius anoplus sl.</i>	BANO					2				
<i>Enteromius pallidus</i>	BPAL									
<i>Enteromius viviparus</i>	BVIV			10						
<i>Glossogobius callidus</i>	GCAL	24							1	
<i>Labeo umbratus</i>	LUMB									
<i>Oreochromis mossambicus</i>	OMOS	35		26						2
<i>Pseudomyxus capensis</i>	MCAP	10								2
Non-native										
<i>Clarias gariepinus</i>	CGAR						1	1	3	
<i>Cyprinus carpio</i>	CCAR					4				
<i>Gambusia affinis</i>	GAFF									
<i>Labeo capensis</i>	LCAP									
<i>Labeo umbratus</i>	LUMB									7
<i>Labeobarbus aeneus</i>	BAEN				13		31	23	8	
<i>Lepomis macrochirus</i>	LMAC									
<i>Micropterus dolomieu</i>	MDOL									
<i>Micropterus salmoides</i>	MSAL		2	5					3	
<i>Tilapia sparrmanii</i>	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							
<i>Anguilla mossambica</i>	AMOS	2					
<i>Enteromius anoplus sl.</i>	BANO						
<i>Enteromius pallidus</i>	BPAL				8		
<i>Enteromius viviparus</i>	BVIV						
<i>Glossogobius callidus</i>	GCAL	3			14		
<i>Labeo umbratus</i>	LUMB		3	7			
<i>Oreochromis mossambicus</i>	OMOS				8		
<i>Pseudomyxus capensis</i>	MCAP						
Non-native							
<i>Clarias gariepinus</i>	CGAR	2	4	2		1	
<i>Cyprinus carpio</i>	CCAR						
<i>Gambusia affinis</i>	GAFF				1		
<i>Labeo capensis</i>	LCAP		4				
<i>Labeo umbratus</i>	LUMB						
<i>Labeobarbus aeneus</i>	BAEN		28	7			
<i>Lepomis macrochirus</i>	LMAC						74
<i>Micropterus dolomieu</i>	MDOL					3	
<i>Micropterus salmoides</i>	MSAL						41
<i>Tilapia sparrmanii</i>	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										Version date: Sep 2005							
Date (dd-mm-yr):		07-Sep-22		Grid reference (dd mm ss.s) Lat:		S -31.608958		Biotopes Sampled (tick & rate)		Rating (1-5)		Time (min)					
Site Code:		Mnga01 R		Long:		E 29.405132		Stones Out Of Current (SOOC)		5							
Collector/Sampler:		Kyle Farrell		Datum (WGS84/Cape):				Bedrock		0							
River:		Mngazi		Altitude (m):				Aquatic Veg		0							
Level 1 Ecoregion:		31: EASTERN COASTAL BELT		Zonation:				MargVeg In Current		1							
Quaternary Catchment:		T70B		Routine or Project? (circle one)		Flow		MargVeg Out Of Current		1							
Site Description: 52		Temp (°C):		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		pH:		WP11354		Turbidity:		Sand		3							
		DO (mg/L):				Colour:		Mud		2							
		Conductivity:						Hand picking/Visual observation		x							
		Riparian Disturbance:						Biotope Score (%)		47							
		Instream Disturbance:															
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	1		A
TURBELLARIA (Flatworms)	3					Corixidae* (Water boatmen)	3		A		A	Blepharoceridae (Mountain midges)	15				
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5					Ceratopogonidae (Biting midges)	5	1			1
Oligochaeta (Earthworms)	1	A	A		A	Hydrometridae* (Water measurers)	6		1		1	Chironomidae (Midges)	2	A		1	A
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				A	Empididae (Dance flies)	6				
Potamonautidae* (Crabs)	3	A	A		B	Pleidae* (Pygmy backswimmers)	4		1		1	Ephydriidae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8		A		A	Velidae/M...velidae* (Ripple bugs)	5					Muscidae (House flies, Stable flies)	1				
Palaemonidae (Freshwater Prawns)	10				A	MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)						Psychodidae (Moth flies)	1				
HYDRACARINA (Mites)	8					Corydalidae (Fishflies & Dobsonflies)	8					Simuliidae (Blackflies)	5	1		1	A
PLECOPTERA (Stoneflies)						Sialidae (Alderflies)	6					Syrphidae* (Rat tailed maggots)	1				
Notonemouridae	14					TRICHOPTERA (Caddisflies)						Tabanidae (Horse flies)	5	1		1	A
Perlidae	12	B	1	1	B	Dipseuopsidae	10					Tipulidae (Crane flies)	5	1			1
EPHEMEROPTERA (Mayflies)						Ecmonidae	8					GASTROPODA (Snails)					
Baetidae 1sp	4					Hydropsychidae 1 sp	4	A			A	Ancylidae (Limpets)	6		1		1
Baetidae 2 sp	6					Hydropsychidae 2 sp	6					Bulininae*	3				
Baetidae > 2 sp	12	B	B	A	B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3				
Caenidae (Squaregills/Cairnflies)	6	B		A	B	Philopotamidae	10					Lymnaeidae* (Pond snails)	3				
Ephemeridae	15					Polycentropodidae	12					Physidae* (Pouch snails)	3				
Heptageniidae (Flatheaded mayflies)	13	B			B	Psychomyiidae/Xiphocentronidae	8					Planorbinae* (Orb snails)	3				
Leptophlebiidae (Pronghills)	9	B		A	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				
Teloganodidae SWC (Spiny Crawlers)	12					Hydroptilidae	6					Sphaeriidae (Pill clams)	3				
Tricorythidae (Stout Crawlers)	9	A		1	A	Hydrosalpingidae SWC	15					Unionidae (Pearly mussels)	6				
ODONATA (Dragonflies & Damselflies)						Lepidostomatidae	10					SASS Score					190
Calopterygidae ST,T (Demoiselles)	10					Leptoceridae	6		A		A	No. of Taxa					32
Chlorocyphidae (Jewels)	10					Petrothrincidae SWC	11					ASPT					5.9
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisuliidae	10					Other biota:					
Coenagrionidae (Sprites and blues)	4		A		A	Sericostomatidae SWC	13					Comments/Observations:					
Lestidae (Emerald Damselflies/Spreadwings)	8					COLEOPTERA (Beetles)											
Platycnemidae (Stream Damselflies)	10					Dytiscidae/Noteridae* (Diving beetles)	5		1	A	A						
Protoneuridae (Threadwings)	8					Elmidae/Dryopidae* (Riffle beetles)	8		1		1						
Aeshnidae (Hawkers & Emperors)	8					Gyrinidae* (Whirligig beetles)	5		A		A						
Corduliidae (Cruisers)	8					Halipidae* (Crawling water beetles)	5										
Gompidae (Clubtails)	6	1		A	A	Helodidae (Marsh beetles)	12										
Libellulidae (Darters/Skimmers)	4	B			B	Hydraenidae* (Minute moss beetles)	8										
LEPIDOPTERA (Aquatic Caterpillars/Moths)						Hydrophilidae* (Water scavenger beetles)	5		1		1						
Crambidae (Pyralidae)	12					Limnichidae (Marsh-Loving Beetles)	10										
						Psephenidae (Water Pennies)	10										



Nqabarha River

Date (dd-mm-yr):		09-Sep-22		Grid reference (dd mm ss.s) Lat: S		(dd.ddddd)		Biotopes Sampled (tick & rate)		Rating (1-5)		Time (min)					
Site Code:		Nqab01_R		Long: E		-32.091927		Stones Out Of Current (SOOC)		1							
Collector/Sampler:		Kylie Farrell		Datum (WGS84/Cape):		28.400234		Bedrock		5							
River:		Nqabara		Altitude (m):				Aquatic Veg		3							
Level 1 Ecoregion:		16: SOUTH EASTERN UPLANDS		Zonation:				MargVeg In Current		4							
Quaternary Catchment:		T90A		Routine or Project? (circle one)		Flow		MargVeg Out Of Current		4							
Site Description: 52		Temp (°C):		Project Name:		Clarity (cm):		Gravel		3							
Refer to Report Number:		pH:		WP11354		Turbidity:		Sand		3							
WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality		DO (mg/L):				Colour:		Mud		3							
		Conductivity:						Hand picking/Visual observation		x							
		Riparian Disturbance:						Biotope Score (%)		64							
		Instream Disturbance:															
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		B		B	Blepharoceridae (Mountain midges)	15				
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5				A	Ceratopogonidae (Biting midges)	5				1 1
Oligochaeta (Earthworms)	1			1	1	Hydrometridae* (Water measurers)	6					Chironomidae (Midges)	2	B	1	B	B
Hirudinea (Leeches)	3					Naucoridae* (Creeping water bugs)	7					Culicidae* (Mosquitoes)	1	1	A	A	A
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					Ephydriidae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Velidae/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	1			1	Corydalidae (Fishflies & Dobsonflies)	8					Simuliidae (Blackflies)	5	B		B	B
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					Hydropterygidae 1 sp	4					Ancylidae (Limpets)	6		1	1	A
Baetidae 2 sp	6					Hydropsychidae 2 sp	6		B		B	Bulininae*	3				
Baetidae > 2 sp	12		B	B	B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3				
Caenidae (Squaregills/Cainflies)	6	A	1		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 (Pronghills)	9	1	1	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					Glossosomatidae SWC	11					Corbiculidae (Clams)	5				
Teloganodidae SWC (Spiry 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					89
Calopterygidae ST,T (Demoselles)	10					Leptoceridae	6					No. of Taxa					18
Chlorocyphidae (Jewels)	10					Petrothrincidae SWC	11					ASPT					4.9
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisulidae	10					Other biota:					
Coenagrionidae (Sprites and blues)	4		B		B	Sericostomatidae SWC	13										
Lestidae (Emerald Damselflies/Spreadwings)	8					COLEOPTERA (Beetles)											
Platynemidae (Stream Damselflies)	10					Dytiscidae/Noteridae* (Diving beetles)	5										
Protonemidae (Threadwings)	8					Elmidae/Dryopidae* (Rifle beetles)	8										
Aeshnidae (Hawkers & Emperors)	8					Gyrinidae* (Whirligig beetles)	5	A			B	Comments/Observations:					
Cordulidae (Cruisers)	8					Halplidae* (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		1	A	A						
Crambidae (Pyralidae)	12					Limnichidae (Marsh-Loving Beetles)	10										
						Psephenidae (Water Pennies)	10										




Mtentu River


Date (dd-mm-yr):		06-Sep-22		Grid reference (dd mm ss.s) Lat: S		-31.130483°		Biotopes Sampled (tick & rate)		Rating (1-5)		Time (min)						
Site Code:		Mten01_R		Long: E		29.757179°		Stones Out Of Current (SOOC)		5								
Collector/Sampler:		Kylie Farrell		Datum (WGS84/Cape):				Bedrock		0								
River:		Mtentu		Altitude (m):				Aquatic Veg		0								
Level 1 Ecoregion:		17: NORTH EASTERN COASTAL BELT		Zonation:				MargVeg In Current		2								
Quaternary Catchment:		T60C		Routine or Project? (circle one)		Flow		MargVeg Out Of Current		2								
Site Description: 52		Temp (°C):		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		pH:		WP11354		Turbidity:		Sand		1								
		DO (mg/L):				Colour:		Mud		1								
		Conductivity:						Hand picking/Visual observation		5								
		Riparian Disturbance:						Biotope Score (%)		36								
		Instream Disturbance:																
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	A			1	A
TURBELLARIA (Flatworms)	3					Corixidae* (Water boatmen)	3			1	1	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	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		1	A	A	Pleidae* (Pygmy backswimmers)	4		1		1	Ephydridae (Shore flies)	3					
Atyidae (Freshwater Shrimps)	8					Veliidae/M...veliidae* (Ripple bugs)	5		A	A	B	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	
PLECOPTERA (Stoneflies)						Salidae (Alderflies)	6					Syrphidae* (Rat tailed maggots)	1					
Notonemouridae	14					TRICHOPTERA (Caddisflies)						Tabanidae (Horse flies)	5					
Perlidae	12	A		A	B	Dipseudopsidae	10					Tipulidae (Crane flies)	5					
EPHEMEROPTERA (Mayflies)						Ecnomidae	8					GASTROPODA (Snails)						
Baetidae 1sp	4					Hydropsychidae 1 sp	4					Ancylidae (Limpets)	6	1			1	
Baetidae 2 sp	6				B	Hydropsychidae 2 sp	6				B	Bulininae*	3					
Baetidae > 2 sp	12	A	B		B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3					
Caenidae (Squaregills/Cainflies)	6	B	1	A	B	Philopotamidae	10	1			1	Lymnaeidae* (Pond snails)	3					
Ephemeridae	15					Polycentropodidae	12					Physidae* (Pouch snails)	3					
Heptageniidae (Flatheaded mayflies)	13	B		A	B	Psychomyiidae/Xiphocentronidae	8					Planorbinae* (Orb snails)	3		A		A	
Leptophlebiidae (Pronghills)	9	B	A	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 (Bivalves)						
Prosoptomatidae (Water specs)	15					Glossosomatidae SWC	11					Corbiculidae (Clams)	5					
Teloganodidae SWC (Spiny Crawlers)	12					Hydroptilidae	6					Sphaeriidae (Pill clams)	3					
Tricorythidae (Stout Crawlers)	9		1	1		Hydrosalpingidae SWC	15					Unionidae (Perly mussels)	6					
ODONATA (Dragonflies & Damselflies)						Lepidostomatidae	10					SASS Score					176	
Calopterygidae ST,T (Demiselles)	10					Leptoceridae	6					No. of Taxa					27	
Chlorocyphidae (Jewels)	10		A		A	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		1	1	A							
Protoneuridae (Threadwings)	8					Erimidae/Dryopidae* (Riffle beetles)	8	1			B							
Aeshnidae (Hawkers & Emperors)	8					Gyrinidae* (Whirligig beetles)	5			B	B							
Corduliidae (Cruisers)	8					Halipidae* (Crawling water beetles)	5											
Gomphidae (Clubtails)	6			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	1	1		A							



Mbashe River (Upper)

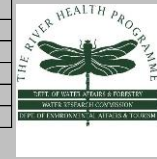
Date (dd-mm-yr): 09-Sep-22 Site Code: Mbas02_R Collector/Sampler: Kylie Farrell River: Upper Mbashe Level 1 Ecoregion: 16: SOUTH EASTERN UPLANDS Quaternary Catchment: T11H		Grid reference (dd mm ss.s) Lat: S -31.807857 Long: E 28.346994 Datum (WGS84/Cape): Altitude (m): Zonation:		Biotopes Sampled (tick & rate) 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		Rating (1-5) 2 2 5 0 2 1 1 2 3 x 40		Time (min) 	
Site Description: 52 Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality		Routine or Project? (circle one) Flow Project Name: WP11354 Clarity (cm): Turbidity: Colour:		Riparian Disturbance: Instream Disturbance:		Temp (°C): pH: DO (mg/L): Conductivity:		Taxon QV S Veg GSM TOT	
Taxon 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 Baetidae > 2 sp 12 Caenidae (Squagrigs/Cainflies) 6 Ephemeridae 15 Heptageniidae (Flatheaded mayflies) 13 Leptophlebiidae (Prongills) 9 Oligoneuridae (Brushlegged mayflies) 15 Polymitarcyidae (Pale Burrowers) 10 Prosoptomatidae (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 Cordulidae (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 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...velidae* (Ripple bugs) 5 MEGALOPTERA (Fishflies, Dobsonflies & Alderflies) Corydalidae (Fishflies & Dobsonflies) 8 Sialidae (Alderflies) 6 TRICHOPTERA (Caddisflies) Dipseudopsidae 10 Economidae 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 Petrotrichidae SWC 11 Pisuliidae 10 Sericostomatidae SWC 13 COLEOPTERA (Beetles) Dytiscidae/Notridae* (Diving beetles) 5 Elmidae/Dryopidae* (Riffle beetles) 8 Gyrinidae* (Whirligig beetles) 5 Halhididae* (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 Culicidae* (Mosquitoes) 1 Dixidae* (Dixid midge) 10 Empididae (Dance flies) 6 Ephydriidae (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 Bulininae* 3 Hydrobiidae* 3 Lymnaeidae* (Pond snails) 3 Physidae* (Pouch snails) 3 Planorbinae* (Orb snails) 3 Thiaridae* (=Melanidae) 3 Viviparidae* ST 5 PELECYPODA (Bivalvies) Corbiculidae (Clams) 5 Sphaeriidae (Pill clams) 3 Unionidae (Perly mussels) 6 SASS Score 145 No. of Taxa 23 ASPT 6.3					
Comments/Observations:		Other biota:							

Gcuwa River

Date (dd-mm-yr): 11-May-23 Site Code: GCUW01_R Collector/Sampler: Kylie Farrell River: Gcuwa Level 1 Ecoregion: 16. SOUTH EASTERN UPLANDS Quaternary Catchment: S70D		Grid reference (dd mm ss.s) Lat: S -32.319770° Long: E 28.136094° Datum (WGS84/Cape): Altitude (m): Zonation:		Biotopes Sampled (tick & rate) Rating (1-5) 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 BioScore (%) 44		Time (min) 											
Site Description: 52 Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality		Routine or Project? (circle one) Project Name: WP11354		Flow Clarity (cm): Turbidity: Colour:		Temp (°C): pH: DO (mg/L): Conductivity: Riparian Disturbance: Instream Disturbance:											
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					Ephydriidae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Velidae/M...veiididae* (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 (Squagrigills/Cainflies)	6					Philopotamidae	10					Lymnaeidae* (Pond snails)	3				
Ephemeridae	15					Psychocentropodidae	12					Physidae* (Pouch snails)	3				
Heptageniidae (Flatheaded mayflies)	13					Psychomyiidae/Xiphocentronidae	8					Planorbinae* (Orb snails)	3				
Leptophlebiidae (Pronghills)	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 (Pearly 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					
Cordulidae (Cruisers)	8					Halplidae* (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		Grid reference (dd mm ss.s) Lat: S (dd.ddddd) -31.897077		Biotopes Sampled (tick & rate)		Rating (1-5)		Time (min)									
Site Code: Indw01_R		Long: E 27.409825		Stones Out Of Current (SOOC)		3											
Collector/Sampler: Kylie Farrell		Datum (WGS84/Cape):		Bedrock		4											
River: Indwe		Altitude (m):		Aquatic Veg		5											
Level 1 Ecoregion: 18: DROUGHT CORRIDOR		Zonation:		MargVeg In Current		0											
Quaternary Catchment: S20D		Routine or Project? (circle one)		MargVeg Out Of Current		1											
Site Description: 52		Project Name: WP11354		Gravel		4											
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality		Flow		Sand		4											
Temp (°C):		Clarity (cm):		Mud		5											
pH:		Turbidity:		Hand picking/Visual observation		x											
DO (mg/L):		Colour:		Biotope Score (%)		60											
Conductivity:																	
Riparian Disturbance:																	
Instream Disturbance:																	
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					Ephyridae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Velidae/M...velidae* (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)						Ecmonidae	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/Cainflies)	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 (Pronghills)	9					Cased caddis:						Thiaridae* (=Melanidae)	3				
Oligoneuridae (Brushlegged mayflies)	15					Barbarochthonidae SWC	13					Viviparidae* ST	5				
Polymitarcyidae (Pale Burrowers)	10					Calamoceratidae ST	11					PELECYPODA (Bivalvies)					
Prosoptomatidae (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 (Damoiselles)	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:					
Cordulidae (Cruisers)	8					Halilidae* (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		Grid reference (dd mm ss.s) Lat: S (dd.ddddd)		-32.003057		Biotopes Sampled (tick & rate)		Rating (1-5)		Time (min)					
Site Code:		Wkei01_R		Long: E		27.351052		Stones Out Of Current (SOOC)		4							
Collector/Sampler:		Kylie Farrell		Datum (WGS84/Cape):				Bedrock		5							
River:		White Kei		Altitude (m):				Aquatic Veg		0							
Level 1 Ecoregion:		18: DROUGHT CORRIDOR		Zonation:				MargVeg In Current		0							
Quaternary Catchment:		S10J		Routine or Project? (circle one)		Flow		MargVeg Out Of Current		0							
Site Description: 52		Temp (°C):		Project Name:		Clarity (cm):		Gravel		5							
Refer to Report Number:		pH:		WP11354		Turbidity:		Sand		5							
WEM/WMA7/00/CON/DM/0722 and for all other site information, including in situ water quality		DO (mg/L):				Colour:		Mud		5							
Conductivity:		Riparian Disturbance:						Hand picking/Visual observation		x							
Instream Disturbance:								Biotope Score (%)		62							
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				A	Corixidae* (Water boatmen)	3					Blepharoceridae (Mountain midges)	15				
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5					Ceratopogonidae (Biting midges)	5	A		A	A
Oligochaeta (Earthworms)	1					Hydrometridae* (Water measurers)	6					Chironomidae (Midges)	2	B			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					Ephyridae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Velidae/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			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	B	Ancylidae (Limpets)	6				
Baetidae 2 sp	6			A		Hydropsychidae 2 sp	6	B				Bulininae*	3				
Baetidae > 2 sp	12	B			B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3				
Caenidae (Squeregills/Cairflies)	6			A	A	Philopotamidae	10					Lymnaeidae* (Pond snails)	3				
Ephemeridae	15					Polycentropodidae	12					Physidae* (Pouch snails)	3				
Heptageniidae (Flatheaded mayflies)	13	B		1	B	Psychomyiidae/Xiphocentronidae	8					Planorbinae* (Orb snails)	3				
Leptophlebiidae (Prongills)	9	B		A	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				
Teloganodidae SWC (Spiry Crawlers)	12					Hydroptilidae	6			A	A	Sphaeriidae (Pill clams)	3				
Tricorythidae (Stout Crawlers)	9	B			B	Hydrosalpingidae SWC	15					Unionidae (Perly mussels)	6				
ODONATA (Dragonflies & Damselflies)						Lepidostomatidae	10					SASS Score					114
Calopterygidae ST,T (Demoiselles)	10					Leptoceridae	6					No. of Taxa					18
Chlorocyphidae (Jewels)	10					Petrothrincidae SWC	11					ASPT					6.3
Synlestidae (Chlorolestidae)(SVlphs)	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	1			A						
Aeshnidae (Hawkers & Emperors)	8					Gyrinidae* (Whirligig beetles)	5				B						
Corduliidae (Cruisers)	8					Halplidae* (Crawling water beetles)	5					Comments/Observations:					
Gomphidae (Clubtails)	6			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										



Kubusi River


Date (dd-mm-yr): 10-May-23 Site Code: KUBU01_R Collector/Sampler: Kylie Farrell River: Kubusi Level 1 Ecoregion: 16. South Eastern Uplands Quaternary Catchment: S60B		Grid reference (dd mm ss.s) Lat: S (dd.ddddd) -32.50722 Long: E 27.731348 Datum (WGS84/Cape): Altitude (m): Zonation:		Biotopes Sampled (tick & rate) Rating (1-5) Time (min)									
Site Description: 52 Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality Temp (°C): pH: DO (mg/L): Conductivity: Riparian Disturbance: Instream Disturbance:		Routine or Project? (circle one) Flow Project Name: WP11354 Clarity (cm): Turbidity: Colour:		Stones Out Of Current (SOOC) 4 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
PORIFERA (Sponge)		5				A	HEMIPTERA (Bugs)						
COELENTERATA (Cnidaria)		1					DIPTERA (Flies)						
TURBELLARIA (Flatworms)		3	1		1	A	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...velliidae* (Ripple bugs) 5						
ANNELIDA							MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)						
Oligochaeta (Earthworms) 1 Hirudinea (Leeches) 3		1	1	A	A	B	TRICHOPTERA (Caddisflies)						
CRUSTACEA							Dipseudopsidae 10 Ecnomidae 8 Hydroptilidae 6 Hydroptilidae 6 Hydroptilidae > 2 sp 12 Philopotamidae 10 Polycentropodidae 12 Psychomyiidae/Xiphocentronidae 8						
Amphipoda (Scuds) 13 Potamonautidae* (Crabs) 3 Atyidae (Freshwater Shrimps) 8 Palaemonidae (Freshwater Prawns) 10							Caseid caddis:						
HYDRACARINA (Mites)		8					Barbarochthonidae SWC 13 Calamoceratidae ST 11 Glossosomatidae SWC 11 Hydroptilidae 6 Hydrosalpingidae SWC 15 Lepidostomatidae 10 Leptoceridae 6 Petrothricidae SWC 11 Pisuliidae 10 Sericostomatidae SWC 13						
PLECOPTERA (Stoneflies)							COLEOPTERA (Beetles)						
Notonemouridae 14 Perlidae 12			A		A	A	Dytiscidae/Noteridae* (Diving beetles) 5 Elmidae/Dryopidae* (Riffle beetles) 8 Gyrinidae* (Whirligig beetles) 5 Halipidae* (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						
EPHEMEROPTERA (Mayflies)							LEPIDOPTERA (Aquatic Caterpillars/Moths)						
Baetidae 1sp 4 Baetidae 2 sp 6 Baetidae > 2 sp 12 Caenidae (Squaregills/Cainflies) 6 Ephemeridae 15 Heptageniidae (Flatheaded mayflies) 13 Leptophlebiidae (Pronghills) 9 Oligoneuridae (Brushlegged mayflies) 15 Polymitarcyidae (Pale Burrowers) 10 Prosoptomatidae (Water specs) 15 Teloganodidae SWC (Spiny Crawlers) 12 Tricorythidae (Stout Crawlers) 9							Crambidae (Pyralidae) 12						
ODONATA (Dragonflies & Damselflies)							SASS Score 185 No. of Taxa 28 ASPT 6.6						
Calopterygidae ST,T (Demoselles) 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 Cordulidae (Cruisers) 8 Gomphidae (Clubtails) 6 Libellulidae (Darters/Skimmers) 4							Other biota: Comments/Observations:						



Buffalo River (Lower)

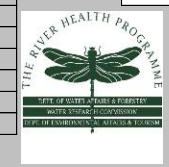
Not conducted due to health hazard

Keiskamma River (Lower)

Date (dd-mm-yr): 19-Sep-22 Site Code: KEIS02_R Collector/Sampler: Kylie Farrell River: Keiskamma (Lower) Level 1 Ecoregion: 31: EASTERN COASTAL BELT Quaternary Catchment: R10L Site Description: 52 Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 Riparian Disturbance: Instream Disturbance:		Grid reference (dd mm ss.s) Lat: S -33.075316 Long: E 27.218534 Datum (WGS84/Cape): Altitude (m): Zonation: Routine or Project? (circle one) Flow Project Name: WP11354 Clarity (cm): Turbidity: Colour:		Biotopes Sampled (tick & rate) Rating (1-5) Time (min)													
Stones Out Of Current (SOOC) 5 Bedrock 3 Aquatic Veg 0 MargVeg In Current 2 MargVeg Out Of Current 4 Gravel 3 Sand 2 Mud 2 Hand picking/Visual observation x 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					Ephyridae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Velidae/M...velidae* (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)						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				Bulininae*	3				
Baetidae > 2 sp	12	B			B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3				
Caenidae (Squaregills/Cainflies)	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 (Pronghills)	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 (Bivalvies)					
Prosoptomatidae (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:					
Cordulidae (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		Grid reference (dd mm ss.s) Lat: S -32.910291		Biotopes Sampled (tick & rate)		Rating (1-5)		Time (min)			
Site Code: Tyum01_R		Long: E 26.932242		Stones Out Of Current (SOOC)		5					
Collector/Sampler: Kylie Farrell		Datum (WGS84/Cape):		Bedrock		2					
River: Tyume		Altitude (m):		Aquatic Veg		4					
Level 1 Ecoregion: 18: DROUGHT CORRIDOR		Zonation:		MargVeg In Current		4					
Quaternary Catchment: R10H		Routine or Project? (circle one)		MargVeg Out Of Current		4					
Site Description: 52		Project Name: WP11354		Gravel		2					
Temp (°C):		Flow		Sand		2					
pH:		Clarity (cm):		Mud		2					
DO (mg/L):		Turbidity:		Hand picking/Visual observation		x					
Conductivity:		Colour:		Biotope Score (%)		62					
Riparian Disturbance:											
Instream Disturbance:											
Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5				B	HEMIPTERA (Bugs)					
COELENTERATA (Cnidaria)	1					Belostomatidae* (Giant water bugs)	3		1		1
TURBELLARIA (Flatworms)	3	A			A	Corixidae* (Water boatmen)	3			B	B
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5				
Oligochaeta (Earthworms)	1	A	1		A	Hydrometridae* (Water measurers)	6				
Hirudinea (Leeches)	3					Naucoridae* (Creeping water bugs)	7				
CRUSTACEA						Nepidae* (Water scorpions)	3				
Amphipoda (Scuds)	13					Notonectidae* (Backswimmers)	3	1		A	A
Potamonautidae* (Crabs)	3	A			A	Pleidae* (Pygmy backswimmers)	4				
Atyidae (Freshwater Shrimps)	8					Veliidae/M...veliidae* (Ripple bugs)	5		A		A
Palaemonidae (Freshwater Prawns)	10					MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
HYDRACARINA (Mites)	8					Corydalidae (Fishflies & Dobsonflies)	8				
PLECOPTERA (Stoneflies)						Salidae (Alderflies)	6				
Notonemouridae	14					TRICHOPTERA (Caddisflies)					
Perlidae	12					Dipseudopsidae	10				
EPHEMEROPTERA (Mayflies)						Ecnomidae	8				
Baetidae 1sp	4					Hydropsychidae 1 sp	4			1	
Baetidae 2 sp	6					Hydropsychidae 2 sp	6	A			A
Baetidae > 2 sp	12	B	B	B	B	Hydropsychidae > 2 sp	12				
Caenidae (Squaregills/Cainflies)	6	B		A	B	Philopotamidae	10				
Ephemeridae	15					Polycentropodidae	12				
Heptageniidae (Flatheaded mayflies)	13	B	A	A	B	Psychomyiidae/Xiphocentronidae	8				
Leptophlebiidae (Pronghills)	9	B		A	B	Cased caddis:					
Oligoneuridae (Brushlegged mayflies)	15					Barbarochthonidae SWC	13				
Polymitarcyidae (Pale Burrowers)	10					Calamoceratidae ST	11				
Prosoptomatidae (Water specs)	15					Glossosomatidae SWC	11				
Teloganodidae SWC (Spiny Crawlers)	12					Hydroptilidae	6				
Tricorythidae (Stout Crawlers)	9	B	A		B	Hydrosalpingidae SWC	15				
ODONATA (Dragonflies & Damselflies)						Lepidostomatidae	10				
Calopterygidae ST,T (Demoiselles)	10					Leptoceridae	6		B		B
Chlorocyphidae (Jewels)	10	1	A		A	Petrothrincidae SWC	11				
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisuliidae	10				
Coenagrionidae (Sprites and blues)	4		B	A	B	Sericostomatidae SWC	13				
Lestidae (Emerald Damselflies/Spreadwings)	8		1		1	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				B
Corduliidae (Cruisers)	8					Halipidae* (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	1			1



Koonap River

SASS Version 5 Score Sheet															Version date: Sep 2005				
Time :															Version date: Sep 2005				
Date (dd-mm-yr):		07-Sep-22		Grid reference (dd mm ss.s) Lat: S (dd.ddddd)					Biotopes Sampled (tick & rate)					Rating (1-5)		Time (min)			
Site Code:		Koon01_R		-33.042856					Stones Out Of Current (SOOC)					5					
Collector/Sampler:		Kylie Farrell		26.658506					Bedrock					3					
River:		Koonap		Datum (WGS84/Cape):					Aquatic Veg					4					
Level 1 Ecoregion:		18: DROUGHT CORRIDOR		Altitude (m):					MargVeg In Current					3					
Quaternary Catchment:		S32K		Zonation:					MargVeg Out Of Current					1					
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:									Hand picking/Visual observation					x					
Instream Disturbance:									Biotope Score (%)					62					
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						
TURBELLARIA (Flatworms)	3	1	A		A	Corixidae* (Water boatmen)	3			A	A	Blepharoceridae (Mountain midges)	15						
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5				A	Ceratopogonidae (Biting midges)	5	1	A		A		
Oligochaeta (Earthworms)	1			1	1	Hydrometridae* (Water measurers)	6					Chironomidae (Midges)	2	A		A	A		
Hirudinea (Leeches)	3	1	1	A	A	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		1	1		Ephydriidae (Shore flies)	3						
Atyidae (Freshwater Shrimps)	8					Veliidae/M...veliidae* (Ripple bugs)	5					Muscidae (House flies, Stable flies)	1	1			1		
Palaeomonidae (Freshwater Prawns)	10					MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)						Psychodidae (Moth flies)	1						
HYDRACARINA (Mites)	8					Corydalidae (Fishflies & Dobsonflies)	8					Simuliidae (Blackflies)	5	D	B		D		
PLECOPTERA (Stoneflies)						Stilidae (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	A		1	A	Ancylidae (Limpets)	6						
Baetidae 2 sp	6					Hydropsychidae 2 sp	6					Bulininae*	3						
Baetidae > 2 sp	12	B	B	A	B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3						
Caenidae (Squaregills/Cainflies)	6					Philopotamidae	10					Lymnaeidae* (Pond snails)	3						
Ephemeraeidae	15					Polycentropodidae	12					Physidae* (Pouch snails)	3	B	1		B		
Heptageniidae (Flatheaded mayflies)	13					Psychomyiidae/Xiphocentronidae	8					Planorbinae* (Orb snails)	3						
Leptophlebiidae (Pronghills)	9	1			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)							
Prosoptomatidae (Water specs)	15					Glossosomatidae SWC	11					Corbiculidae (Clams)	5						
Teloganodidae SWC (Spiny Crawlers)	12					Hydroptilidae	6					Sphaeriidae (Pill clams)	3						
Tricothyridae (Stout Crawlers)	9					Hydrosalpingidae SWC	15					Unionidae (Perly mussels)	6						
ODONATA (Dragonflies & Damselflies)						Lepidostomatidae	10					SASS Score					78		
Calopterygidae ST,T (Demoiselles)	10					Leptoceridae	6					No. of Taxa					20		
Chlorocyphidae (Jewels)	10					Petrothrincidae SWC	11					ASPT					3.9		
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisuliidae	10					Other biota:							
Coenagrionidae (Sprites and blues)	4		A	A	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* (Rifle beetles)	8												
Aeshnidae (Hawkers & Emperors)	8					Gyrinidae* (Whirligig beetles)	5	B			B	Comments/Observations:							
Corduliidae (Cruisers)	8					Halplidae* (Crawling water beetles)	5												
Gomphidae (Clubtails)	6					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												



Kat River (Lower)


Date (dd-mm-yr): 07-Sep-22		Grid reference (dd mm ss.s) Lat: S -32.890965		Grid reference (dd mm ss.s) Long: E 26.68407		Biotopes Sampled (tick & rate)		Rating (1-5)		Time (min)	
Site Code: kat01_R		Datum (WGS84/Cape):		Altitude (m):		Stones Out Of Current (SOOC)					
Collector/Sampler: Kylie Farrell		Flow:		Clarity (cm):		Bedrock					
River: Lower Kat		Project Name: WP11354		Turbidity:		Aquatic Veg					
Level 1 Ecoregion: 18: DROUGHT CORRIDOR		Routine or Project? (circle one)		Colour:		MargVeg In Current					
Quaternary Catchment: Q94F		Temp (°C):		Flow		MargVeg Out Of Current					
Site Description: 52		pH:		Flow		Gravel					
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality		DO (mg/L):		Flow		Sand					
		Conductivity:		Flow		Mud					
		Riparian Disturbance:		Flow		Hand picking/Visual observation					
		Instream Disturbance:		Flow		Biotope Score (%)		49			
Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5					HEMIPTERA (Bugs)					
COELENTERATA (Cnidaria)	1					Belostomatidae* (Giant water bugs)	3				
TURBELLARIA (Flatworms)	3					Corixidae* (Water boatmen)	3			A	A
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5		1		A
Oligochaeta (Earthworms)	1		B	B		Hydrometridae* (Water measurers)	6				
Hirudinea (Leeches)	3		1	1		Naucoridae* (Creeping water bugs)	7				
CRUSTACEA						Nepidae* (Water scorpions)	3				
Amphipoda (Scuds)	13					Notonectidae* (Backswimmers)	3		1		1
Potamonautidae* (Crabs)	3				1	Pleidae* (Pygmy backswimmers)	4				
Atyidae (Freshwater Shrimps)	8					Velidae/M. velidae* (Ripple bugs)	5		A		A
Palaemonidae (Freshwater Prawns)	10					MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
HYDRACARINA (Mites)	8			1	1	Corydalidae (Fishflies & Dobsonflies)	8				
PLECOPTERA (Stoneflies)						Sialidae (Alderflies)	6				
Notonemouridae	14					TRICHOPTERA (Caddisflies)					
Perlidae	12					Dipseudopsidae	10				
EPHEMEROPTERA (Mayflies)						Ecnomidae	8			1	1
Baetidae 1sp	4				1	Hydropsychidae 1 sp	4				
Baetidae 2 sp	6					Hydropsychidae 2 sp	6		B		B
Baetidae > 2 sp	12	B	B		B	Hydropsychidae > 2 sp	12				
Caenidae (Squaregills/Cainflies)	6				A	Philopotamidae	10				
Ephemeridae	15					Polycetropodidae	12				
Heptageniidae (Flatheaded mayflies)	13					Psychomyiidae/Xiphocentronidae	8				
Leptophlebiidae (Pronghills)	9	A			A	Cased caddis:					
Oligoneuridae (Brushlegged mayflies)	15					Barbarochthonidae SWC	13				
Polymitarcidae (Pale Burrowers)	10				1	Calamoceratidae ST	11				
Prosopistomatidae (Water specs)	15					Glossosomatidae SWC	11				
Teloganodidae SWC (Spiny Crawlers)	12					Hydroptilidae	6				
Tricorythidae (Stout Crawlers)	9					Hydrosalpingidae SWC	15				
ODONATA (Dragonflies & Damselflies)						Lepidostomatidae	10				
Calopterygidae ST,T (Demiselles)	10					Leptoceridae	6		B		B
Chlorocyphidae (Jewels)	10					Petrothrincidae SWC	11				
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisuliidae	10				
Coenagrionidae (Sprites and blues)	4		B		B	Sericostomatidae SWC	13				
Lestidae (Emerald Damselflies/Spreadwings)	8					COLEOPTERA (Beetles)					
Platycnemididae (Stream Damselflies)	10					Dytiscidae/Noteridae* (Diving beetles)	5				
Protoneuridae (Threadwings)	8					Elmidae/Dryopidae* (Riffle beetles)	8				
Aeshnidae (Hawkers & Emperors)	8					Gyrinidae* (Whirligig beetles)	5				B
Corduliidae (Cruisers)	8					Halipidae* (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				
							Comments/Observations:				
							SASS Score		120		
							No. of Taxa		22		
							ASPT		5.5		
							Other biota:				



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 Collector/Sampler: Kylie Farrell River: Upper Great Fish Level 1 Ecoregion: 18: DROUGHT CORRIDOR Quaternary Catchment: Q30B		Grid reference (dd mm ss.s) Lat: S -31.919527 Long: E 25.390974 Datum (WGS84/Cape): Altitude (m): Zonation:		Biotopes Sampled (tick & rate) Rating (1-5) Time (min)														
Site Description: 52 Refer to Report Number: WEM/WMA7/00/CON/RDM/0722		Routine or Project? (circle one) <input type="radio"/> Routine <input checked="" type="radio"/> Project Project Name: WP11354		Stones Out Of Current (SOOC) 1 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 BioScore (%) 47														
Temp (°C): pH: DO (mg/L): Conductivity:		Riparian Disturbance: Instream Disturbance:																
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		A	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	A	A		B	
Oligochaeta (Earthworms)	1					Hydrometridae* (Water measurers)	6					Chironomidae (Midges)	2	C	B		C	
Hirudinea (Leeches)	3	A	A		B	Naucoridae* (Creeping water bugs)	7					Culicidae* (Mosquitoes)	1	A	A		A	
CRUSTACEA						Nepidae* (Water scorpions)	3					Dixidae* (Didid midge)	10					
Amphipoda (Scuds)	13					Notonectidae* (Backswimmers)	3	1			A	Empididae (Dance flies)	6					
Potamonautidae* (Crabs)	3					Pleidae* (Pygmy backswimmers)	4					Ephydriidae (Shore flies)	3					
Atyidae (Freshwater Shrimps)	8					Velidae/M...velidae* (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	1			1	Corydalidae (Fishflies & Dobsonflies)	8					Simuliidae (Blackflies)	5	B			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		A		A	
EPHEMEROPTERA (Mayflies)						Ecmonidae	8					GASTROPODA (Snails)						
Baetidae 1sp	4					Hydropsychidae 1 sp	4					Ancylidae (Limpets)	6					
Baetidae 2 sp	6		B			Hydropsychidae 2 sp	6					Bulininae*	3					
Baetidae > 2 sp	12	B			B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3					
Caenidae (Squargills/Cainflies)	6	B			B	Philopotamidae	10					Lymnaeidae* (Pond snails)	3		A		A	
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)						
Prosoptomatidae (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					92	
Calopterygidae ST,T (Demoiselles)	10					Leptoceridae	6					No. of Taxa					19	
Chlorocyphidae (Jewels)	10					Petrothrincidae SWC	11					ASPT					4.8	
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisuliidae	10					Other biota:						
Coenagrionidae (Sprites and blues)	4	A	A		B	Sericostomatidae SWC	13											
Lestidae (Emerald Damselflies/Spreadwings)	8					COLEOPTERA (Beetles)												
Platycnemidae (Stream Damselflies)	10					Dytiscidae/Noteridae* (Diving beetles)	5	A	A		A							
Protoneuridae (Threadwings)	8					Elmidae/Dryopidae* (Rifle beetles)	8											
Aeshnidae (Hawkers & Emperors)	8					Gyrinidae* (Whirligig beetles)	5											
Corduliidae (Cruisers)	8					Halplidae* (Crawling water beetles)	5											
Gomphidae (Clubtails)	6					Helodidae (Marsh beetles)	12											
Libellulidae (Darters/Skimmers)	4		A		A	Hydraenidae* (Minute moss beetles)	8			A							A	
LEPIDOPTERA (Aquatic Caterpillars/Moths)						Hydrophilidae* (Water scavenger beetles)	5		1		1							
Crambidae (Pyralidae)	12					Limnichidae (Marsh-Loving Beetles)	10											
						Psephenidae (Water Pennies)	10											

Tarka River

SASS Version 5 Score Sheet										Version date: Sep 2005								
Time :										Time (min)								
Date (dd-mm-yr):	21-Sep-22	Grid reference (dd mm ss.s) Lat: S		(dd.ddddd)		Biotopes Sampled (tick & rate)		Rating (1-5)		Time (min)								
Site Code:	TARK01_R	Long: E		-32.283315		Stones Out Of Current (SOOC)		1										
Collector/Sampler:	Kylie Farrell	Datum (WGS84/Cape):		25.75928		Bedrock		0										
River:	TARKA	Altitude (m):				Aquatic Veg		1										
Level 1 Ecoregion:	18: DROUGHT CORRIDOR	Zonation:				MargVeg In Current		1										
Quaternary Catchment:	Q44C	Routine or Project? (circle one)		Flow		MargVeg Out Of Current		1										
Site Description: 52	Temp (°C):	Project Name:		Clarity (cm):		Gravel		2										
Refer to Report Number:	pH:	WP11354		Turbidity:		Sand		1										
WEM/WMA7/00/CON/RDM/0722	DO (mg/L):			Colour:		Mud		4										
	Conductivity:					Hand picking/Visual observation		x										
	Riparian Disturbance:					Biotope Score (%)		31										
	Instream Disturbance:																	
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	A	A		B	
Oligochaeta (Earthworms)	1					Hydrometridae* (Water measurers)	6					Chironomidae (Midges)	2	C	B		C	
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		A		A	Empididae (Dance flies)	6					
Potamonautidae* (Crabs)	3	A	1		A	Pleidae* (Pygmy backswimmers)	4					Ephydriidae (Shore flies)	3					
Atyidae (Freshwater Shrimps)	8					Velidae/M...velidae* (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	B	B		B	
PLECOPTERA (Stoneflies)						Sialidae (Alderflies)	6					Syrphidae* (Rat tailed maggots)	1					
Notonemouridae	14					TRICHOPTERA (Caddisflies)						Tabanidae (Horse flies)	5					
Perlidae	12	1			1	Dipseudopsidae	10					Tipulidae (Crane flies)	5					
EPHEMEROPTERA (Mayflies)						Ecnomidae	8					GASTROPODA (Snails)						
Baetidae 1sp	4	1				Hydropsychidae 1 sp	4	1			1	Ancyliidae (Limpets)	6					
Baetidae 2 sp	6					Hydropsychidae 2 sp	6					Bulininae*	3					
Baetidae > 2 sp	12		B		B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3					
Caenidae (Squaregills/Cainflies)	6		A		A	Philopotamidae	10					Lymnaeidae* (Pond snails)	3					
Ephemeridae	15					Polycentropodidae	12					Physidae* (Pouch snails)	3					
Heptageniidae (Flatheaded mayflies)	13	1			1	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					
Polymitarcidae (Pale Burrowers)	10					Calamoceratidae ST	11					PELECYPODA (Bivalves)						
Prosopistomatidae (Water specks)	15					Glossosomatidae SWC	11					Corbiculidae (Clams)	5					
Teloganodidae SWC (Spiry 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					16	
Chlorocyphidae (Jewels)	10					Petrothricidae SWC	11					ASPT					5.4	
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											
Cordulidae (Cruisers)	8					Halipidae* (Crawling water beetles)	5											
Gomphidae (Clubtails)	6					Helodidae (Marsh beetles)	12											
Libellulidae (Darters/Skimmers)	4					Hydraenidae* (Minute moss beetles)	8	A	1		A							
LEPIDOPTERA (Aquatic Caterpillars/Moths)						Hydrophilidae* (Water scavenger beetles)	5		A		A							
Crambidae (Pyralidae)	12					Limnichidae (Marsh-Loving Beetles)	10											
						Psephenidae (Water Pennies)	10											



Kouga River

Date (dd-mm-yr): 07-Sep-22		Grid reference (dd mm ss.s) Lat: S -33.788449		Biotopes Sampled (tick & rate)		Rating (1-5)		Time (min)			
Site Code: KOUG01_R		Long: E 24.025821		Stones Out Of Current (SOOC)		5					
Collector/Sampler: KYLIE FARRELL		Datum (WGS84/Cape):		Bedrock		1					
River: KOUGA		Altitude (m):		Aquatic Veg		5					
Level 1 Ecoregion: 19.Southern Folded Mountains		Zonation:		MargVeg In Current		5					
Quaternary Catchment: L82E		Routine or Project? (circle one)		MargVeg Out Of Current		3					
Site Description: 52		Project Name: WP11354		Gravel		4					
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722		Flow		Sand		1					
pH:		Clarity (cm):		Mud		1					
DO (mg/L):		Turbidity:		Hand picking/Visual observation		X					
Conductivity:		Colour:		Biotope Score (%)		67					
Riparian Disturbance:											
Instream Disturbance:											
Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)	5					HEMiptera (Bugs)					
COELENTERATA (Cnidaria)	1					Belostomatidae* (Giant water bugs)	3				
TURBELLARIA (Flatworms)	3					Corixidae* (Water boatmen)	3				
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5				
Oligochaeta (Earthworms)	1	A			A	Hydrometridae* (Water measurers)	6				
Hirudinea (Leeches)	3	1			1	Naucoridae* (Creeping water bugs)	7				
CRUSTACEA						Nepidae* (Water scorpions)	3				
Amphipoda (Scuds)	13					Notonectidae* (Backswimmers)	3				
Potamonautidae* (Crabs)	3					Pleidae* (Pygmy backswimmers)	4				
Atyidae (Freshwater Shrimps)	8					Velidae/M...veliidae* (Ripple bugs)	5				
Palaeoninae (Freshwater Prawns)	10					MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)					
HYDRACARINA (Mites)	8					Corydalidae (Fishflies & Dobsonflies)	8				
PLECOPTERA (Stoneflies)						Sialidae (Alderflies)	6				
Notonemouridae	14					TRICHOPTERA (Caddisflies)					
Perlidae	12					Dipseudopsidae	10				
EPHEMEROPTERA (Mayflies)						Ecnomidae	8				
Baetidae 1sp	4					Hydropsychidae 1 sp	4	B			B
Baetidae 2 sp	6		B			Hydropsychidae 2 sp	6				
Baetidae > 2 sp	12	B			B	Hydropsychidae > 2 sp	12				
Caenidae (Squaregills/Cairflies)	6	B			B	Philopotamidae	10				
Ephemeridae	15					Polycentropodidae	12				
Heptageniidae (Flatheaded mayflies)	13	A			A	Psychomyiidae/Xiphocentronidae	8				
Leptophlebiidae (Pronghills)	9	B			B	Cased caddis:					
Oligoneuridae (Brushlegged mayflies)	15					Barbarochthonidae SWC	13				
Polymitarcyidae (Pale Burrowers)	10					Calamoceratidae ST	11				
Prosoptomatidae (Water specs)	15					Glossosomatidae SWC	11				
Teloganodidae SWC (Spiry Crawlers)	12					Hydroptilidae	6				
Tricorythidae (Stout Crawlers)	9					Hydrosalpingidae SWC	15				
ODONATA (Dragonflies & Damselflies)						Lepidostomatidae	10				
Calopterygidae ST,T (Demoiselles)	10					Leptoceridae	6	B	B		B
Chlorocyphidae (Jewels)	10	1			1	Petrothrincidae SWC	11				
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisuliidae	10				
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				
Corduliidae (Cruisers)	8	A			A	Halipidae* (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		Grid reference (dd mm ss.s) Lat: S		-31.925698		Biotopes Sampled (tick & rate)		Rating (1-5)		Time (min)					
Site Code:		Mtat01_I		Long: E		29.136048		Stones Out Of Current (SOOC)									
Collector/Sampler:		Kylie Farrell		Datum (WGS84/Cape):				Bedrock									
River:		Lower Mthatha		Altitude (m):				Aquatic Veg									
Level 1 Ecoregion:		31: EASTERN COASTAL BELT		Zonation:				MargVeg In Current									
Quaternary Catchment:		T20G		Routine or Project? (circle one)		Flow		MargVeg Out Of Current									
Site Description: 52		Temp (°C):		Project Name: <td colspan="2">Clarity (cm):</td> <th colspan="2">Gravel</th> <td colspan="2"></td> <td colspan="2"></td>		Clarity (cm):		Gravel									
Refer to Report Number:		DO (mg/L):		WP11354		Turbidity:		Sand									
WEM/WM7/00/CON/RDM/0722 and for all other site information, including in situ water quality		Conductivity:				Colour:		Mud									
Riparian Disturbance:				Flow				Hand picking/Visual observation									
Instream Disturbance:				Clarity (cm):				Biotope Score (%)									
				Turbidity:													
				Colour:													
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				
Oligochaeta (Earthworms)	1					Hydrometridae* (Water measurers)	6					Chironomidae (Midges)	2			A	B
Hrudinea (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			A	A	Pleidae* (Pygmy backswimmers)	4					Ephydriidae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8			A	B	Velidae/M...velidae* (Ripple bugs)	5					Muscidae (House flies, Stable flies)	1				
Palaemonidae (Freshwater Prawns)	10				B	MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)						Psychodidae (Moth flies)	1				
HYDRACARINA (Mites)	8					Corydalidae (Fishflies & Dobsonflies)	8					Simuliidae (Blackflies)	5		C		B
PLECOPTERA (Stoneflies)						Sialidae (Alderflies)	6					Syrphidae* (Rat tailed maggots)	1				D
Notonemouridae	14					TRICHOPTERA (Caddisflies)						Tabanidae (Horse flies)	5				
Perlidae	12				B	Dipseudopsidae	10					Tipulidae (Crane flies)	5				
EPHEMEROPTERA (Mayflies)						Ecnomidae	8					GASTROPODA (Snails)					
Baetidae 1sp	4		A		1	A	Hydropsychidae 1 sp	4			A	Ancylidae (Limpets)	6				B
Baetidae 2 sp	6						Hydropsychidae 2 sp	6				Bulininae*	3				
Baetidae > 2 sp	12						Hydropsychidae > 2 sp	12				Hydrobiidae*	3				
Caenidae (Squaregills/Cairflies)	6						Philopotamidae	10		1		Lymnaeidae* (Pond snails)	3				
Ephemeraeidae	15						Polychaetopodidae	12				Physidae* (Pouch snails)	3				
Heptageniidae (Flatheaded mayflies)	13		A				Psychomyiidae/Xiphocentronidae	8				Planorbinae* (Orb snails)	3				
Leptophlebiidae (Pronghills)	9		A				Cased caddis:					Planorbinae* (Orb snails)	3				
Oligoneuridae (Brushlegged mayflies)	15						Barbarochthonidae SWC	13				Thianidae* (=Melanidae)	3				
Polymitarcyidae (Pale Burrowers)	10						Calamoceratidae ST	11				Viviparidae* ST	5				
Prosoptomatidae (Water specs)	15						Glossosomatidae SWC	11				PELECYPODA (Bivalves)					
Teloganodidae SWC (Spiny Crawlers)	12						Hydroptilidae	6				Corbiculidae (Clams)	5				
Tricorythidae (Stout Crawlers)	9						Hydrosalpingidae SWC	15				Sphaeriidae (Pill clams)	3				
ODONATA (Dragonflies & Damselflies)							Lepidostomatidae	10				Unionidae (Pearly mussels)	6				
Calopterygidae ST,T (Demoselles)	10						Leptostomatidae	10				SASS Score					83
Chlorocyphidae (Jewels)	10						Leptoceridae	6				No. of Taxa					14
Synlestidae (Chlorolestidae)(Sv/lphs)	8						Petrothricidae SWC	11				ASPT					5.9
Coenagrionidae (Sprites and blues)	4						Pisulidae	10				Other biota:					
Lestidae (Emerald Damselflies/Spreadwings)	8						Sericostomatidae SWC	13									
Platycnemidae (Stream Damselflies)	10						COLEOPTERA (Beetles)										
Protonemuridae (Threadwings)	8						Dytiscidae/Noteridae* (Diving beetles)	5									
Aeshnidae (Hawkers & Emperors)	8						Etmidae/Dryopidae* (Rifle beetles)	8									
Corduliidae (Cruisers)	8						Gyrinidae* (Whirligig beetles)	5		A							
Gomphidae (Clubtails)	6						Halplidae* (Crawling water beetles)	5									
Libellulidae (Darters/Skimmers)	4		A				Helodidae (Marsh beetles)	12									
LEPIDOPTERA (Aquatic Caterpillars/Moths)							Hydraenidae* (Minute moss beetles)	8									
Crambidae (Pyralidae)	12						Hydrophilidae* (Water scavenger beetles)	5									
							Limnichidae (Marsh-Loving Beetles)	10									
							Psephenidae (Water Pennies)	10									



Mthatha River (Lower): May 2023

Not conducted due to floods

Mbashe River (Middle): July 2022

Date (dd-mm-yr):		08-Sep-22		Grid reference (dd mm ss.s) Lat: S		-31.958131		Grid reference (dd mm ss.s) Long: E		28.472236		Biotopes Sampled (tick & rate)		Rating (1-5)		Time (min)							
Site Code:		Mbas01_I		Datum (WGS84/Cape):				Altitude (m):				Stones Out Of Current (SOOC)		5									
Collector/Sampler:		Kylie Farrell		Zonation:				Flow				Bedrock		0									
River:		Middle Mabashe		Routine or Project? (circle one)		Flow		Clarity (cm):				Aquatic Veg		0									
Level 1 Ecoregion:		31: EASTERN COASTAL BELT		Project Name:		WP11354		Turbidity:				MargVeg In Current		0									
Quaternary Catchment:		T13E		Riparian Disturbance:				Colour:				MargVeg Out Of Current		1									
Site Description: 52		Temp (°C):		Conductivity:				Hand picking/Visual observation		x		Biotope Score (%)		47									
Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality		pH:		Riparian Disturbance:				Instream Disturbance: <td colspan="2"></td> <th colspan="2">Taxon</th> <th colspan="2">QV</th> <th colspan="2">S</th> <th colspan="2">Veg</th> <th colspan="2">GSM</th> <th colspan="2">TOT</th>				Taxon		QV		S		Veg		GSM		TOT	
PORIFERA (Sponge)		5										HEMIPTERA (Bugs)											
COELENTERATA (Cnidaria)		1										DIPTERA (Flies)											
TURBELLARIA (Flatworms)		3										Athericidae (Snipe flies)		10									
ANNELIDA												Blepharoceridae (Mountain midges)		15									
Oligochaeta (Earthworms)		1										Ceratopogonidae (Biting midges)		5									
Hirudinea (Leeches)		3										Chironomidae (Midges)		2									
CRUSTACEA												Culicidae* (Mosquitoes)		1									
Amphipoda (Scuds)		13										Dixidae* (Dixid midge)		10									
Potamonautidae* (Crabs)		3		1		A						Empididae (Dance flies)		6									
Atyidae (Freshwater Shrimps)		8										Ephydriidae (Shore flies)		3									
Palaemonidae (Freshwater Prawns)		10										Muscidae (House flies, Stable flies)		1									
HYDRACARINA (Mites)		8										MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)											
PLECOPTERA (Stoneflies)												Corydalidae (Fishflies & Dobsonflies)		8									
Notonemouridae		14										Sialidae (Alderflies)		6									
Perlidae		12										TRICHOPTERA (Caddisflies)											
EPHEMEROPTERA (Mayflies)												Dipseudopsidae		10									
Baetidae 1 sp		4										Ecnomidae		8									
Baetidae 2 sp		6		B		A		A				Hydropsychidae 1 sp		4									
Baetidae > 2 sp		12		B		A		A		B		Hydropsychidae 2 sp		6		B							
Caenidae (Squaregills/Cainflies)		6										Hydropsychidae > 2 sp		12									
Ephemeridae		15										Philopotamidae		10									
Heptageniidae (Flatheaded mayflies)		13										Polycentropodidae		12									
Leptophlebiidae (Pronghills)		9		B		A		B				Psychomyiidae/Xiphocentronidae		8									
Oligoneuridae (Brushlegged mayflies)		15										Cased caddis:											
Polymitarcyidae (Pale Burrowers)		10										Barbarochthonidae SWC		13									
Prosopistomatidae (Water specs)		15										Calamoceratidae ST		11									
Teloganodidae SWC (Spiny Crawlers)		12										Glossosomatidae SWC		11									
Tricorythidae (Stout Crawlers)		9										Hydroptilidae		6									
ODONATA (Dragonflies & Damselflies)												Hydrosalpingidae SWC		15									
Calopterygidae ST,T (Demoiselles)		10										Lepidostomatidae		10									
Chlorocyphidae (Jewels)		10										Leptoceridae		6		A		A					
Syrletidae (Chlorolestidae)(Sylphs)		8										Petrothrincidae SWC		11									
Coenagrionidae (Sprites and blues)		4		A		A		A				Pisuliidae		10									
Lestidae (Emerald Damselflies/Spreadwings)		8										Sericosomatidae SWC		13									
Platycnemidae (Stream Damselflies)		10										COLEOPTERA (Beetles)											
Protoneuridae (Threadwings)		8										Dytiscidae/Noteridae* (Diving beetles)		5									
Aeshnidae (Hawkers & Emperors)		8										Eimidae/Dryopidae* (Riffle beetles)		8									
Corduliidae (Cruisers)		8										Gyrinidae* (Whirligig beetles)		5		1		A					
Gomphidae (Clubtails)		6										Halilidae* (Crawling water beetles)		5		A		A					
Libellulidae (Darters/Skimmers)		4		A		A		A				Helodidae (Marsh beetles)		12									
LEPIDOPTERA (Aquatic Caterpillars/Moths)												Hydraenidae* (Minute moss beetles)		8									
Crambidae (Pyralidae)		12										Hydrophilidae* (Water scavenger beetles)		5		A		A					
												Limnichidae (Marsh-Loving Beetles)		10									
												Psephenidae (Water Pennies)		10									




Mbashe River (Middle): May 2023

Date (dd-mm-yr):		08-Sep-22	Grid reference (dd mm ss.s) Lat: S		(dd.ddd)	-31.958131	Biotopes Sampled (tick & rate)		Rating (1-5)		Time (min)							
Site Code:		Mbas01_I	Long: E <td></td> <td>28.472236</td> <th colspan="2">Stones Out Of Current (SOOC)</th> <td colspan="2">2</td> <td colspan="2"></td>			28.472236	Stones Out Of Current (SOOC)		2									
Collector/Sampler:		Kylie Farrell	Datum (WGS84/Cape):				Bedrock		3									
River:		Middle Mabashe	Altitude (m):				Aquatic Veg		5									
Level 1 Ecoregion:		31: EASTERN COASTAL BELT	Zonation:				MargVeg In Current		0									
Quaternary Catchment:		T13E	Routine or Project? (circle one)		Flow		MargVeg Out Of Current		1									
Site Description: 52		Temp (°C):	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		pH:	WP11354		Turbidity:		Sand		4									
		DO (mg/L):			Colour:		Mud		4									
		Conductivity:					Hand picking/Visual observation		x									
		Riparian Disturbance:					Biotope Score (%)		49									
		Instream Disturbance:																
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
Hrudinea (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		Empididae (Dance flies)	6					
Potamonautidae* (Crabs)	3					Pleidae* (Pygmy backswimmers)	4			B		Ephydriidae (Shore flies)	3					
Atyidae (Freshwater Shrimps)	8					Velidae/M...velidae* (Ripple bugs)	5			A	A	Muscidae (House flies, Stable flies)	1					
Palaeomonidae (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 (Squagills/Cainflies)	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 (Bivalves)						
Prosoptomatidae (Water specs)	15					Glossosomatidae SWC	11					Corbiculidae (Clams)	5					
Teloganodidae SWC (Spiry 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					Petrohrincidae SWC	11					ASPT						6.5
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisulidae	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							
Protoneridae (Threadwings)	8					Elmidae/Dryopidae* (Riffle beetles)	8											
Aeshnidae (Hawkers & Emperors)	8					Gyrinidae* (Whirligig beetles)	5											
Corduliidae (Cruisers)	8					Halipidae* (Crawling water beetles)	5											
Gomphidae (Clubtails)	6		1		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: May 2023

Date (dd-mm-yr): 10-May-23 Site Code: BKEI01_J Collector/Sampler: Kylie Farrell River: Black Kei Level 1 Ecoregion: 18: DROUGHT CORRIDOR Quaternary Catchment: S32K		Grid reference (dd mm ss.s) Lat: S -32.118266 Long: E 27.068903 Datum (WGS84/Cape): Altitude (m): Zonation:		Biotopes Sampled (tick & rate) Stones Out Of Current (SOOC) 5 Bedrock 3 Aquatic Veg 5 MargVeg In Current 1 MargVeg Out Of Current 2 Gravel 3 Sand 2 Mud 2		Rating (1-5) 5 3 5 1 2 2 3 2 2		Time (min) _____ _____ _____						
Site Description: 52 Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality		Routine or Project? (circle one) Project Name: WP11354		Flow Clarity (cm): _____ Turbidity: _____ Colour: _____		Hand picking/Visual observation x Biotope Score (%) 56								
Riparian Disturbance: Instream Disturbance: _____		Taxon		Taxon		Taxon		Taxon						
QV	S	Veg	GSM	TOT	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					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				
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					Ephydriidae (Shore flies) 3				
Atyidae (Freshwater Shrimps) 8					Veliidae/M...velidae* (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 C B D				
PLECOPTERA (Stoneflies)					Stalidae (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 A					Ancylidae (Limpets) 6				
Baetidae 2 sp 6 B					Hydropsychidae 2 sp 6					Bulininae* 3				
Baetidae > 2 sp 12					Hydropsychidae > 2 sp 12					Hydrobiidae* 3				
Caenidae (Squaregills/Cainflies) 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 (Pronghills) 9 1 1					Cased caddis:					Thiaridae* (=Melanidae) 3				
Oligoneuridae (Brushlegged mayflies) 15					Barbarochthonidae SWC 13					Viviparidae* ST 5				
Polymitarcidae (Pale Burrowers) 10					Calamoceratidae ST 11					PELECYPODA (Bivalves)				
Prosoptomatidae (Water specs) 15					Glossosomatidae SWC 11					Corbiculidae (Clams) 5				
Teloganonidae SWC (Spiny Crawlers) 12					Hydroptilidae 6					Sphaeriidae (Pill clams) 3				
Tricorythidae (Stout Crawlers) 9 1 1					Hydrosalpingidae SWC 15					Unionidae (Perly mussels) 6				
ODONATA (Dragonflies & Damselflies)					Lepidostomatidae 10					SASS Score 58				
Calopterygidae ST,T (Demoselles) 10					Leptoceridae 6					No. of Taxa 11				
Chlorocyphidae (Jewels) 10					Petrothrincidae SWC 11					ASPT 5.3				
Synlestidae (Chlorolestidae)(Sylphs) 8					Pisulidae 10					Other biota:				
Coenagrionidae (Sprites and blues) 4					Sericoatomatidae 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 A					Comments/Observations:				
Corduliidae (Cruisers) 8					Halpliidae* (Crawling water beetles) 5					_____				
Gomphidae (Clubtails) 6					Helodidae (Marsh beetles) 12					_____				
Libellulidae (Darters/Skimmers) 4 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					_____				

Tsomo River: July 2022

Date (dd-mm-yr):		07-Sep-22	Grid reference (dd mm ss.s) Lat: S (dd.ddddd)					Biotope Score (%)					Rating (1-5)					Time (min)				
Site Code:		Tsom_01_1	Grid reference (dd mm ss.s) Long: E					Stones Out Of Current (SOOC)					3									
Collector/Sampler:		Kylie Farrell	Datum (WGS84/Cape):					Bedrock					4									
River:		Tsomo	Altitude (m):					Aquatic Veg					1									
Level 1 Ecoregion:		16: SOUTH EASTERN UPLANDS	Zonation:					MargVeg In Current					1									
Quaternary Catchment:		S50G	Routine or Project? (circle one)					MargVeg Out Of Current					0									
Site Description: 52		Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality	Project Name:					Gravel					4									
Temp (°C):			WP11354					Sand					5									
pH:			Clarity (cm):					Mud					5									
DO (mg/L):			Turbidity:					Hand picking/Visual observation					x									
Conductivity:			Colour:					Biotope Score (%)					62									
Riparian Disturbance:																						
Instream Disturbance:																						
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	Blepharoceridae (Mountain midges)	15									
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5					Ceratopogonidae (Biting midges)	5		1	1	A					
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						Neptidae* (Water scorpions)	3					Dixidae* (Dixid midge)	10									
Amphipoda (Scuds)	13					Notonectidae* (Backswimmers)	3					Empididae (Dance flies)	6									
Potamonautidae* (Crabs)	3	1		1		Pleidae* (Pygmy backswimmers)	4					Ephydriidae (Shore flies)	3									
Atyidae (Freshwater Shrimps)	8					Velidae/M...velidae* (Ripple bugs)	5					Muscidae (House flies, Stable flies)	1		1		1					
Palaeomonidae (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									
Baetidae 2 sp	6		B			Hydropsychidae 2 sp	6	B			B	Bulininae*	3									
Baetidae > 2 sp	12	B	B		B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3									
Caenidae (Squaregills/Cairnflies)	6		1		1	Phlebotomidae	10					Lymnaeidae* (Pond snails)	3									
Ephemeridae	15					Polycentropodidae	12					Physidae* (Pouch snails)	3		A		A					
Heptageniidae (Flatheaded mayflies)	13	A			A	Psychomyiidae/Xiphocentronidae	8					Planorbinae* (Orb snails)	3									
Leptophlebiidae (Pronghills)	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					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					87					
Catopterygidae ST.T (Demoiselles)	10					Leptoceridae	6					No. of Taxa					15					
Chlorocyphidae (Jewels)	10					Petrohrincidae SWC	11					ASPT					5.8					
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisulidae	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															
Protoneridae (Threadwings)	8					Elmidae/Dryopidae* (Riffle beetles)	8															
Aeshnidae (Hawkers & Emperors)	8					Gyrinidae* (Whirligig beetles)	5	A			A	Comments/Observations:										
Corduliidae (Cruisers)	8					Halipidae* (Crawling water beetles)	5															
Gomphidae (Clubtails)	6			1	1	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															



Tsomo River: May 2023

Date (dd-mm-yr):		11-May-23		Grid reference (dd mm ss.s) Lat: S		-32.04492		Grid reference (dd mm ss.s) Long: E		27.821557		Biotopes Sampled (tick & rate)		Rating (1-5)		Time (min)							
Site Code:		Tsom_01_1		Datum (WGS84/Cape):				Altitude (m):				Stones Out Of Current (SOOC)		3									
Collector/Sampler:		Kylie Farrell		Routine or Project? (circle one)		Project Name:		Flow <td colspan="2"></td> <th colspan="2">Bedrock</th> <td colspan="2">5</td> <th colspan="2"></th>				Bedrock		5									
River:		Tsomo		Project Name:		WP11354		Clarity (cm):				Aquatic Veg		0									
Level 1 Ecoregion:		16: SOUTH EASTERN UPLANDS		Riparian Disturbance:				Turbidity:				MargVeg In Current		0									
Quaternary Catchment:		S50G		Instream Disturbance:				Colour:				MargVeg Out Of Current		0									
Site Description: 52		Temp (°C):										Gravel		2									
Refer to Report Number:		WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality		pH:								Sand		5									
		DO (mg/L):										Mud		5									
		Conductivity:										Hand picking/Visual observation		x									
												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										
	1					Hydrometridae* (Water measurers)	6					Chironomidae (Midges)	2	A		A	A						
	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					Ephydriidae (Shore flies)	3										
Atyidae (Freshwater Shrimps)	8					Velidae/M...velidae* (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	Dipseuropsidae	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	Bulinidae*	3										
Baetidae > 2 sp	12	B			B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3										
Caenidae (Squaregills/Cainflies)	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 (Pronghills)	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)											
Prosoptomatidae (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	Hydropsalpingidae SWC	15					Unionidae (Perly mussels)	6										
ODONATA (Dragonflies & Damselflies)																							
						Lepidostomatidae	10					SASS Score											
Calopterygidae ST,T (Demoiselles)	10					Leptoceridae	6					106											
Chlorocyphidae (Jewels)	10					Petrothrincidae SWC	11					No. of Taxa											
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisuliidae	10					15											
Coenagrionidae (Sprites and blues)	4					Sericostomatidae SWC	13					ASPT											
Lestidae (Emerald Damselflies/Spreadwings)	8					COLEOPTERA (Beetles)						7.1											
Platycnemidae (Stream Damselflies)	10					Dytiscidae/Noteridae* (Diving beetles)	5					Other biota:											
Protoneuridae (Threadwings)	8					Elmidae/Dryopidae* (Rifle beetles)	8	A			A	Comments/Observations:											
Aeshnidae (Hawkers & Emperors)	8					Gyrinidae* (Whirligig beetles)	5	A		1													
Corduliidae (Cruisers)	8					Halipidae* (Crawling water beetles)	5																
Gomphidae (Clubtails)	6	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					Linnichidae (Marsh-Loving Beetles)	10																
						Psephenidae (Water Pennies)	10																



Buffalo River (Middle): July 2022

Date (dd-mm-yr):		16-Sep-22		Grid reference (dd mm ss.s) Lat: S		(dd.ddddd)		Biotopes Sampled (tick & rate)		Rating (1-5)		Time (min)					
Site Code:		BUFF01_I		Longitude: E		-32.991584		Stones Out Of Current (SOOC)		4							
Collector/Sampler:		Kylie Farrell		Datum (WGS84/Cape):		27.64055		Bedrock		0							
River:		Middle Buffalo		Altitude (m):				Aquatic Veg		1							
Level 1 Ecoregion:		31: EASTERN COASTAL BELT		Zonation:				MargVeg In Current		2							
Quaternary Catchment:		R20F		Routine or Project? (circle one)		Flow		MargVeg Out Of Current		2							
Site Description: 52		Temp (°C):		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	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				
TURBELLARIA (Flatworms)	3	B	1	A	B	Corixidae* (Water boatmen)	3					Blepharoceridae (Mountain midges)	15				
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5			1	1	Ceratopogonidae (Biting midges)	5			1	1
Oligochaeta (Earthworms)	1		1	1	A	Hydrometridae* (Water measurers)	6					Chironomidae (Midges)	2	B	A	1	B
Hirudinea (Leeches)	3	f	1		A	Naucoridae* (Creeping water bugs)	7					Culicidae* (Mosquitoes)	1				
CRUSTACEA						Nepidae* (Water scorpions)	3					Dixidae* (Dixid midge)	10				
Amphipoda (Scuds)	13					Notonectidae* (Backswimmers)	3			1	1	Epididae (Dance flies)	6				
Potamonautidae* (Crabs)	3					Pleidae* (Pygmy backswimmers)	4					Ephydriidae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Velidae/M...velidae* (Ripple bugs)	5	A	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	B		D
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	A			A
Baetidae 2 sp	6					Hydropsychidae 2 sp	6	B			B	Bulininae*	3				
Baetidae > 2 sp	12	B	B	B	B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3				
Caenidae (Squaregills/Cainflies)	6	A	1	A	B	Phlopotamidae	10					Lymnaeidae* (Pond snails)	3				
Ephemeroidea	15					Polycentropodidae	12					Physidae* (Pouch snails)	3		A		A
Heptageniidae (Flatheaded mayflies)	13	A	1		B	Psychomyiidae/Xiphocentronidae	8					Planorbinae* (Orb snails)	3				
Leptophlebiidae (Pronghills)	9	B		A	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				
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					142
Calopterygidae ST.T (Demoiselles)	10					Leptoceridae	6		1		1	No. of Taxa					24
Chlorocyphidae (Jewels)	10		A		A	Petrothrincidae SWC	11					ASPT					5.9
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)											
Platynemidae (Stream Damselflies)	10					Dytiscidae/Noteridae* (Diving beetles)	5										
Proteuneriidae (Threadwings)	8					Elmidae/Dryopidae* (Riffle beetles)	8	f			1						
Aeshnidae (Hawkers & Emperors)	8				1	Gyrinidae* (Whirligig beetles)	5										
Corduliidae (Cruisers)	8					Halipidae* (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					Limmichidae (Marsh-Loving Beetles)	10										
						Psephenidae (Water Pennies)	10										



Buffalo River (Middle): May 2023

Date (dd-mm-yr):		10-May-23	Grid reference (dd mm ss.s) Lat: S (dd.ddddd)					-32.991584					Biotopes Sampled (tick & rate)					Rating (1-5)					Time (min)				
Site Code:		BUFF01_1	Long: E					27.64055					Stones Out Of Current (SOOC)					4									
Collector/Sampler:		Kylie Farrell	Datum (WGS84/Cape):										Bedrock					0									
River:		Middle Buffalo	Altitude (m):										Aquatic Veg					1									
Level 1 Ecoregion:		31: EASTERN COASTAL BELT	Zonation:										MargVeg In Current					2									
Quaternary Catchment:		R20F	Routine or Project? (circle one)					Flow					MargVeg Out Of Current					2									
Site Description: 52			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	WP11354					Turbidity:					Sand					3									
pH:			Colour:										Mud					2									
DO (mg/L):			Riparian Disturbance:										Hand picking/Visual observation					x									
Conductivity:			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				A	HEMIPTERA (Bugs)						DIPTERA (Flies)															
COELENTERATA (Cnidaria)	1					Belostomatidae* (Giant water bugs)	3		A		A	Athericidae (Snipe flies)	10														
TURBELLARIA (Flatworms)	3					Corixidae* (Water boatmen)	3			A	A	Blepharoceridae (Mountain midges)	15														
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5					Ceratopogonidae (Biting midges)	5			A	A										
Oligochaeta (Earthworms)	1	1			1	Hydrometridae* (Water measurers)	6					Chironomidae (Midges)	2	B	B	B	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	1	A		A	Empididae (Dance flies)	6														
Potamonautidae* (Crabs)	3					Pleidae* (Pygmy backswimmers)	4	1			1	Ephydriidae (Shore flies)	3														
Atyidae (Freshwater Shrimps)	8					Velidae/M...veiliidae* (Ripple bugs)	5		A		A	Muscidae (House flies, Stable flies)	1	A			A										
Palaemonidae (Freshwater Prawns)	10					MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)						Psychodidae (Moth flies)	1														
HYDRACARINA (Mites)	8					Corydidae (Fishflies & Dobsonflies)	8					Simuliidae (Blackflies)	5	B	B		C										
PLECOPTERA (Stoneflies)						Sialidae (Alderflies)	6					Syrphidae* (Rat tailed maggots)	1														
Notonemouridae	14					TRICHOPTERA (Caddisflies)						Tabanidae (Horse flies)	5														
Perlidae	12					Dipseuopsidae	10					Tipulidae (Crane flies)	5														
EPHEMEROPTERA (Mayflies)						Economidae	8					GASTROPODA (Snails)															
Baetidae 1sp	4					Hydropsychidae 1 sp	4					Ancylidae (Limpets)	6														
Baetidae 2 sp	6	B	B	A	B	Hydropsychidae 2 sp	6	B			B	Bulininae*	3														
Baetidae > 2 sp	12					Hydropsychidae > 2 sp	12					Hydrobiidae*	3														
Caenidae (Squaregills/Cairnflies)	6	1			1	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	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					Glossosomatidae SWC	11					Corbiculidae (Clams)	5				1										
Teloganodidae SWC (Spiny Crawlers)	12					Hydroptilidae	6					Sphaeriidae (Pill clams)	3														
Tricorythidae (Stout Crawlers)	9					Hydroalpingidae SWC	15					Unionidae (Perly mussels)	6														
ODONATA (Dragonflies & Damselflies)						Lepidostomatidae	10					SASS Score					141										
Calopterygidae ST,T (Demoiselles)	10					Leptoceridae	6	1	B		B	No. of Taxa					28										
Chlorocyphidae (Jewels)	10	1			1	Petrothrincidae SWC	11					ASPT					5.0										
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisuliidae	10					Other biota:															
Coenagrionidae (Sprites and blues)	4	1	B		B	Sericostomatidae SWC	13																				
Lestidae (Emerald Damselflies/Spreadwings)	8					COLEOPTERA (Beetles)																					
Platynemidae (Stream Damselflies)	10					Dytiscidae/Noteridae* (Diving beetles)	5																				
Protonemidae (Threadwings)	8					Elmidae/Dryopidae* (Rifle beetles)	8		1		1																
Aeshnidae (Hawkers & Emperors)	8					Gyrinidae* (Whirligig beetles)	5		A		B	Comments/Observations:															
Cordulidae (Cruisers)	8		1	A	A	Halipidae* (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			1	1																
Crambidae (Pyralidae)	12					Limnichidae (Marsh-Loving Beetles)	10																				
						Psephenidae (Water Pennies)	10																				



Keiskamma (Upper): July 2022

Date (dd-mm-yr):		07-Sep-22		Grid reference (dd mm ss.s) Lat: S		-32.802217		(dd.ddd)		Biotopes Sampled (tick & rate)		Rating (1-5)		Time (min)			
Site Code:		Keis01_I		Long: E		27.024092				Stones Out Of Current (SOOC)		5					
Collector/Sampler:		Kylie Farrell		Datum (WGS84/Cape):						Bedrock		0					
River:		Keiskamma (upper)		Altitude (m):						Aquatic Veg		0					
Level 1 Ecoregion:		18: DROUGHT CORRIDOR		Zonation:						MargVeg In Current		2					
Quaternary Catchment:		R10E		Routine or Project? (circle one)		Flow				MargVeg Out Of Current		2					
Site Description: 52		Temp (°C):		Project Name: <td colspan="2">Clarity (cm):</td> <td colspan="2"></td> <td colspan="2">Gravel</td> <td colspan="2">4</td> <td colspan="2"></td>		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		pH:		WP11354		Turbidity:				Sand		4					
		DO (mg/L):				Colour:				Mud		5					
		Conductivity:								Hand picking/Visual observation		x					
		Riparian Disturbance:								Biotope Score (%)		60					
		Instream Disturbance:															
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		A		A	Athericidae (Snipe flies)	10				
TURBELLARIA (Flatworms)	3	A	A	A	B	Corixidae* (Water boatmen)	3	A	A		B	Blepharoceridae (Mountain midges)	15				
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5				A	Ceratopogonidae (Biting midges)	5	1	A	A	B
Oligochaeta (Earthworms)	1	A	1	B	B	Hydrometridae* (Water measurers)	6		1		1	Chironomidae (Midges)	2	A	B	B	B
Hirudinea (Leeches)	3					Naucoridae* (Creeping water bugs)	7					Culicidae* (Mosquitoes)	1		A	1	A
CRUSTACEA						Nepidae* (Water scorpions)	3					Dixidae* (Dixid midge)	10				
Amphipoda (Scuds)	13					Notonectidae* (Backswimmers)	3	1	A		A	Empididae (Dance flies)	6				
Potamonautidae* (Crabs)	3	A			A	Pleidae* (Pygmy backswimmers)	4					Ephydriidae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Velidae/M...velidae* (Ripple bugs)	5		A		A	Muscidae (House flies, Stable flies)	1	1			1
Palaeomonidae (Freshwater Prawns)	10					MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)						Psychodidae (Moth flies)	1				
HYDRACARINA (Mites)	8			1	1	Corydidae (Fishflies & Dobsonflies)	8					Simuliidae (Blackflies)	5	B	A	A	B
PLECOPTERA (Stoneflies)						Sialidae (Alderflies)	6					Syrphidae* (Rat tailed maggots)	1				
Notonemouridae	14					TRICHOPTERA (Caddisflies)						Tabanidae (Horse flies)	5	A	1	1	A
Perlidae	12					Dipseudopsidae	10					Tipulidae (Crane flies)	5				
EPHEMEROPTERA (Mayflies)						Ecnomidae	8					GASTROPODA (Snails)					
Baetidae 1sp	4					Hydropsychidae 1 sp	4	A			A	Ancylidae (Limpets)	6				B
Baetidae 2 sp	6					Hydropsychidae 2 sp	6					Bulininae*	3				
Baetidae > 2 sp	12	B	B	A	B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3				
Caenidae (Squaregills/Cairnflies)	6	A	A	B	B	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 (Pronghills)	9	B		A	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
Teloganodidae SWC (Spiny Crawlers)	12					Hydroptilidae	6					Sphaeriidae (Pill clams)	3				
Tricorythidae (Stout Crawlers)	9	B		A	B	Hydrosalpingidae SWC	15					Unionidae (Perly mussels)	6				
ODONATA (Dragonflies & Damselflies)						Lepidostomatidae	10					SASS Score					163
Calopterygidae ST.T (Demoiselles)	10					Leptoceridae	6		B		B	No. of Taxa					32
Chlorocyphidae (Jewels)	10		1		1	Petrohrinidae SWC	11					ASPT					5.1
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)											
Platycnemididae (Stream Damselflies)	10					Dytiscidae/Noteridae* (Diving beetles)	5		A		A						
Protoneuridae (Threadwings)	8					Elmidae/Dryopidae* (Riffle beetles)	8										
Aeshnidae (Hawkers & Emperors)	8				A	Gyrinidae* (Whirligig beetles)	5	B	A	A	B	Comments/Observations:					
Coruliidae (Cruisers)	8					Halilidae* (Crawling water beetles)	5										
Gomphidae (Clubtails)	6	A		1	A	Helodidae (Marsh beetles)	12										
Libellulidae (Darters/Skimmers)	4	1	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										




Keiskamma (Upper): May 2023

Date (dd-mm-yr):		08-May-23		Grid reference (dd mm ss.s) Lat: S		-32.802217		Biotopes Sampled (tick & rate)		Rating (1-5) <th colspan="2">Time (min)</th>		Time (min)											
Site Code:		Keis01_I		Long: E		27.024092		Stones Out Of Current (SOOC)		5													
Collector/Sampler:		Kylie Farrell		Datum (WGS84/Cape):				Bedrock		0													
River:		Keiskamma (upper)		Altitude (m):				Aquatic Veg		0													
Level 1 Ecoregion:		18: DROUGHT CORRIDOR		Zonation:				MargVeg In Current		2													
Quaternary Catchment:		R10E		Routine or Project? (circle one)		Flow		MargVeg Out Of Current		2													
Site Description: 52		Temp (°C):		Project Name:		Clarity (cm):		Gravel		4													
Refer to Report Number:		pH:		WP11354		Turbidity:		Sand		4													
WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality		DO (mg/L):				Colour:		Mud		5													
		Conductivity:						Hand picking/Visual observation		x													
		Riparian Disturbance:						Biotope Score (%)		60													
		Instream Disturbance:																					
Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT						
PORIFERA (Sponge)																							
COELENTERATA (Cnidaria)	1					HEMIPTERA (Bugs)												DIPTERA (Flies)					
TURBELLARIA (Flatworms)	3	1			1	Belostomatidae* (Giant water bugs)	3		A		A	Blepharoceridae (Mountain midges)	15				A	A					
ANNELIDA																							
Oligochaeta (Earthworms)	1	A			A	Corixidae* (Water boatmen)	3		1	A	A	Ceratopogonidae (Biting midges)	5	1		A	A						
Hirudinea (Leeches)	3					Gerridae* (Pond skaters/Water striders)	5			A	A	Chironomidae (Midges)	2	B		A	B						
CRUSTACEA																							
Amphipoda (Scuds)	13					Hydrometridae* (Water measurers)	6		B		B	Culicidae* (Mosquitoes)	1										
Potamonautidae* (Crabs)	3		A	1	A	Nepidae* (Water scorpions)	3		1		1	Dixidae* (Dixid midge)	10										
Atyidae (Freshwater Shrimps)	8					Notonectidae* (Backswimmers)	3		B		B	Empididae (Dance flies)	6										
Palaemonidae (Freshwater Prawns)	10					Pleidae* (Pygmy backswimmers)	4					Ephydriidae (Shore flies)	3										
HYDRACARINA (Mites)																							
HYDRACARINA (Mites)	8					Velidae/M...velidae* (Ripple bugs)	5		?		1	Muscidae (House flies, Stable flies)	1										
PLECOPTERA (Stoneflies)																							
Notonemouridae	14					MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)												GASTROPODA (Snails)					
Perlidae	12					Corydalidae (Fishflies & Dobsonflies)	8					Psychodidae (Moth flies)	1										
EPHEMEROPTERA (Mayflies)																							
Baetidae 1sp	4					Sialidae (Alderflies)	6					Simuliidae (Blackflies)	5	A		1	A						
Baetidae 2 sp	6		B	B		TRICHOPTERA (Caddisflies)												Syrphidae* (Rat tailed maggots)	1				
Baetidae > 2 sp	12	B			B	Dipseudopsidae	10					Tabanidae (Horse flies)	5	1			1						
Caenidae (Squaregills/Cainflies)	6			A	A	Ecnomidae	8			A	A	Tipulidae (Crane flies)	5										
Ephemeraeidae	15					Hydropsychidae 1 sp	4			A	A	GASTROPODA (Snails)											
Heptageniidae (Flatheaded mayflies)	13	A		A	B	Hydropsychidae 2 sp	6	B			B	Ancylidae (Limpets)	6			A	B						
Leptophlebiidae (Pronghills)	9	B		B	B	Hydropsychidae > 2 sp	12					Bulininae*	3										
Oligoneuridae (Brushlegged mayflies)	15					Philopotamidae	10					Hydrobiidae*	3										
Polymitarcyidae (Pale Burrowers)	10					Psychomyiidae/Xiphocentronidae	8					Lymnaeidae* (Pond snails)	3										
Prosimulidae (Water specs)	15					Cased caddis:												Physidae* (Pouch snails)	3				
Teloganodidae SWC (Spiny Crawlers)	12					Barbarochthonidae SWC	13					Planorbinae* (Orb snails)	3										
Tricorythidae (Stout Crawlers)	9	B		B	C	Calamoceratidae ST	11					Thiaridae* (=Melanidae)	3										
ODONATA (Dragonflies & Damselflies)																							
Catopterygidae ST,T (Demoiselles)	10					Glossosomatidae SWC	11					Viviparidae* ST	5										
Chlorocyphidae (Jewels)	10		1	A	A	Hydroptilidae	6					PELECYPODA (Bivalves)											
Synlestidae (Chlorolestidae)(Sylphs)	8					Hydropsalpingidae SWC	15					Corbiculidae (Clams)	5										
Coenagrionidae (Sprites and blues)	4		B		B	Lepidostomatidae	10					Sphaeriidae (Pill clams)	3										
Lestidae (Emerald Damselflies/Spreadwings)	8					Leptoceridae	6		B	A	B	Unionidae (Perly mussels)	6										
Platychenidae (Stream Damselflies)	10					Petrothrincidae SWC	11					SASS Score											
Protoneuridae (Threadwings)	8					Pisuliidae	10					No. of Taxa											
Aeshnidae (Hawkers & Emperors)	8	A			A	Sericostomatidae SWC	13					ASPT											
Corduliidae (Cruisers)	8					COLEOPTERA (Beetles)												Other biota:					
Gomphidae (Clubtails)	6			B	B	Dytiscidae/Noteridae* (Diving beetles)	5		1		1	Comments/Observations:											
Libellulidae (Darters/Skimmers)	4	A		A	B	Elmidae/Dryopidae* (Rifle beetles)	8																
LEPIDOPTERA (Aquatic Caterpillars/Moths)																							
Crambidae (Pyralidae)	12	1			1	Gyrinidae* (Whirligig beetles)	5	A	1		B												
						Halipidae* (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	A			A												



Kat River (Upper): July 2022

Date (dd-mm-yr): 07-Sep-22 Site Code: Ukat02_I Collector/Sampler: Kylie Farrell River: Upper Kat Level 1 Ecoregion: 18: DROUGHT CORRIDOR Quaternary Catchment: Q94B		Grid reference (dd mm ss.s) Lat: S -32.569705 Long: E 26.722041 Datum (WGS84/Cape): Altitude (m): Zonation:		Biotopes Sampled (tick & rate) Stones Out Of Current (SOOC) 5 Bedrock 4 Aquatic Veg 1 MargVeg In Current 4 MargVeg Out Of Current 3 Gravel 2 Sand 2 Mud 3 Hand picking/Visual observation x Biotope Score (%) 56		Rating (1-5) 5 4 1 4 3 2 2 3 x 56		Time (min) _____ _____ _____ _____ _____ _____ _____ _____ _____ _____									
Site Description: 52 Refer to Report Number: WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality		Routine or Project? (circle one) Project Name: WP11354 Flow Clarity (cm): Turbidity: Colour:		Temp (°C): pH: DO (mg/L): Conductivity: Riparian Disturbance: Instream Disturbance:													
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 (Shipe 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	Ephydriidae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Veliidae/M...velliidae* (Ripple bugs)	5		A		A	Muscidae (House flies, Stable flies)	1				
Palaeonidae (Freshwater Prawns)	10					MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)						Psychodidae (Moth flies)	1				
HYDRACARINA (Mites)	1	1	A		A	Corydidae (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					Dipseuopsidae	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/Cainflies)	6	A	B		A	Philopotamidae	10					Lymnaeidae* (Pond snails)	3				
Ephemerae	15					Polycentropodidae	12					Physidae* (Pouch snails)	3				
Heptageniidae (Flatheaded mayflies)	13	A	1		B	Psychomyiidae/Xiphocentronidae	8					Planorbinae* (Orb snails)	3		A		A
Leptophlebiidae (Pronghills)	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 (Bivalves)					
Prosoptomatidae (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
Catopterygidae 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					Pisulidae	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	Comments/Observations:					
Proteuridae (Threadwings)	8					Elmidae/Dryopidae* (Rifle beetles)	8										
Aeshnidae (Hawkers & Emperors)	8					Gyrinidae* (Whirligig beetles)	5		A		A						
Corduliidae (Cruisers)	8					Halplidae* (Crawling water beetles)	5										
Gompidae (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		Grid reference (dd mm ss.s) Lat: S		(dd.ddddd)		Biotopes Sampled (tick & rate)		Rating (1-5)		Time (min)					
Site Code:		Ukat02_1		Long: E		-32.569705 26.722041		Stones Out Of Current (SOOC)		5							
Collector/Sampler:		Kyle Farrell		Datum (WGS84/Cape):				Bedrock		4							
River:		Upper Kat		Altitude (m):				Aquatic Veg		2							
Level 1 Ecoregion:		18: DROUGHT CORRIDOR		Zonation:				MargVeg In Current		1							
Quaternary Catchment:		Q94B		Routine or Project? (circle one)		Flow		MargVeg Out Of Current		3							
Site Description: 52		Temp (°C):		Project Name:		Clarity (cm):		Gravel		3							
Refer to Report Number:		pH:		WP11354		Turbidity:		Sand		3							
WEM/WMA7/00/CON/RDM/0722 and for all other site information, including in situ water quality		Conductivity:		Colour:				Mud		3							
Riparian Disturbance:				Hand picking/Visual observation				x									
Instream Disturbance:				Biotope Score (%)				64									
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	A	A	Blepharoceridae (Mountain midges)	15				
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5					Ceratopogonidae (Biting midges)	5		1	A	A
Oligochaeta (Earthworms)	1					Hydrometridae* (Water measurers)	6					Chironomidae (Midges)	2	1	A	A	B
Hrudinea (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		A		A	Empididae (Dance flies)	6				
Potamonautidae* (Crabs)	3	1			A	Pleidae* (Pygmy backswimmers)	4		1	A	A	Ephydriidae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Velidae/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					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		1
Perlidae	12					Dipseudopsidae	10					Tipulidae (Crane flies)	5				
EPHEMEROPTERA (Mayflies)						Ecnomidae	8					GASTROPODA (Snails)					
Baetidae 1sp	4		1	1		Hydropsychidae 1 sp	4	1			1	Ancylidae (Limpets)	6	B		1	B
Baetidae 2 sp	6			A		Hydropsychidae 2 sp	6					Bulininae*	3				
Baetidae > 2 sp	12	A			B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3				
Caenidae (Squaregills/Cainflies)	6		1	1	A	Phlopotamidae	10					Lymnaeidae* (Pond snails)	3				
Ephemeridae	15					Polycentropodidae	12					Physidae* (Pouch snails)	3				
Heptageniidae (Flatheaded mayflies)	13	B	1	1	B	Psychomyiidae/Xiphocentronidae	8					Planorbinae* (Orb snails)	3		1		1
Leptophlebiidae (Pronghills)	9	A		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 (Bivalvies)					
Prosoptomatidae (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		1	C	Hydrosalpingidae SWC	15					Unionidae (Perly mussels)	6				
ODONATA (Dragonflies & Damselflies)						Lepidostomatidae	10					SASS Score					167
Calopterygidae ST.T (Demiselles)	10					Leptoceridae	6		B	B	B	No. of Taxa					30
Chlorocyphidae (Jewels)	10			A	A	Petrothrincidae SWC	11					ASPT					5.6
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisuliidae	10					Other biota:					
Coenagrionidae (Sprites and blues)	4			1	B	Sericostomatidae SWC	13					Sciomyzidae (Marsh Fly)					
Lestidae (Emerald Damselflies/Spreadwings)	8					COLEOPTERA (Beetles)											
Platycnemidae (Stream Damselflies)	10					Dytiscidae/Noteridae* (Diving beetles)	5		1		1						
Proteuridae (Threadwings)	8					Elmidae/Dryopidae* (Riffle beetles)	8										
Aeshnidae (Hawkers & Emperors)	8	1			1	Gyrinidae* (Whirligig beetles)	5										
Corduliidae (Cruisers)	8					Halipidae* (Crawling water beetles)	5										
Gomphidae (Clubtails)	6			A	A	Helodidae (Marsh beetles)	12										
Libellulidae (Darters/Skimmers)	4		1	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						



Great Fish River (Lower): July 2022

Date (dd-mm-yr):		20-Sep-22		Grid reference (dd mm ss.s) Lat: S		-33.083607		Rating (1-5)		Time (min)							
Site Code:		GFIS03_i		Long: E		26.225285		Stones Out Of Current (SOOC)		5							
Collector/Sampler:		Kylee Farrell		Datum (WGS84/Cape):				Bedrock		2							
River:		Great Fish (Lower)		Altitude (m):				Aquatic Veg		0							
Level 1 Ecoregion:		18: DROUGHT CORRIDOR		Zonation:				MargVeg In Current		4							
Quaternary Catchment:		Q91B		Routine or Project? (circle one)		Flow		MargVeg Out Of Current		2							
Site Description: 52		pH:		Project Name:		Clarity (cm):		Gravel		2							
Refer to Report Number:		Conductivity:		WP11354		Turbidity:		Sand		2							
WEM/WMA7/00/CON/RDM/0722		Riparian Disturbance:				Colour:		Mud		3							
		Instream Disturbance:						Hand picking/Visual observation		x							
								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	B	1		B
Oligochaeta (Earthworms)	1	A			B	Hydrometridae* (Water measurers)	6					Chironomidae (Midges)	2	B	B	A	B
Hirudinea (Leeches)	3				A	Naucoriidae* (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					Ephydriidae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Velidae/M...velidae* (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
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					Ancylidae (Limpets)	6	A	1		B
Baetidae 2 sp	6		B		A	Hydropsychidae 2 sp	6		B			Bulininae*	3				
Baetidae > 2 sp	12	B			B	Hydropsychidae > 2 sp	12					Hydrobiidae*	3				
Caenidae (Squaregills/Cainflies)	6					Philopotamidae	10					Lymnaeidae* (Pond snails)	3				
Ephemeridae	15					Polycentropodidae	12					Physidae* (Pouch snails)	3	A	B		B
Heptageniidae (Flatheaded mayflies)	13					Psychomyiidae/Xiphocentronidae	8					Planorbinae* (Orb snails)	3				
Leptophlebiidae (Pronghills)	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 (Bivalvles)					
Prosoptomatidae (Water specs)	15					Glossosomatidae SWC	11					Corbiculidae (Clams)	5			1	1
Teloganodidae SWC (Spiry 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					86
Calopterygidae ST,T (Demoselles)	10					Leptoceridae	6		1		1	No. of Taxa					17
Chlorocyphidae (Jewels)	10					Petrothricidae 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										
Protoneridae (Threadwings)	8					Elmidae/Dryopidae* (Riffle beetles)	8										
Aeshnidae (Hawkers & Emperors)	8					Gyrinidae* (Whirligig beetles)	5	B	A		B	Comments/Observations:					
Corduliidae (Cruisers)	8					Halipidae* (Crawling water beetles)	5										
Gomphidae (Clubtails)	6	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										



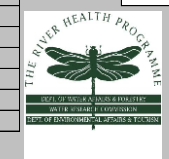
Great Fish River (Lower): May 2023

Date (dd-mm-yr):		04-May-23		Grid reference (dd mm ss.s) Lat: S		-33.083607		Grid reference (dd mm ss.s) Long: E		26.225285		Biotopes Sampled (tick & rate)		Rating (1-5)		Time (min)	
Site Code:		GFIS03 I		Datum (WGS84/Cape):				Altitude (m):				Stones Out Of Current (SOOC)		5			
Collector/Sampler:		Kylie Farrell		Zonation:				Flow				Bedrock		2			
River:		Great Fish (Lower)		Routine or Project? (circle one)		Project Name:		Clarity (cm):				Aquatic Veg		0			
Level 1 Ecoregion:		18: DROUGHT CORRIDOR		Project Name:		WP11354		Turbidity:				MargVeg In Current		4			
Quaternary Catchment:		Q91B		Temp (°C):				Colour:				MargVeg Out Of Current		1			
Site Description: 52		pH:				<th colspan="2"> <td colspan="2"></td> <th colspan="2">Gravel</th> <td colspan="2">2</td> <th colspan="2"> </th></th>		<td colspan="2"></td> <th colspan="2">Gravel</th> <td colspan="2">2</td> <th colspan="2"> </th>				Gravel		2			
Refer to Report Number:		WEM/WMA7/00/CON/RDM/0722		DO (mg/L):				<td colspan="2"></td> <th colspan="2">Sand</th> <td colspan="2">3</td> <th colspan="2"> </th>				Sand		3			
		Conductivity:				<th colspan="2"> <td colspan="2"></td> <th colspan="2">Mud</th> <td colspan="2">1</td> <th colspan="2"> </th></th>		<td colspan="2"></td> <th colspan="2">Mud</th> <td colspan="2">1</td> <th colspan="2"> </th>				Mud		1			
Riparian Disturbance:				Instream Disturbance:				<td colspan="2"></td> <th colspan="2">Hand picking/Visual observation</th> <td colspan="2">x</td> <th colspan="2"> </th>				Hand picking/Visual observation		x			
				<td colspan="2"></td> <th colspan="2"> <td colspan="2"></td> <th colspan="2">Biotope Score (%)</th> <td colspan="2">40</td> <th colspan="2"> </th></th>				<td colspan="2"></td> <th colspan="2">Biotope Score (%)</th> <td colspan="2">40</td> <th colspan="2"> </th>				Biotope Score (%)		40			
Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT	Taxon	QV	S	Veg	GSM	TOT
PORIFERA (Sponge)						HEMIPTERA (Bugs)						DIPTERA (Flies)					
COELENTERATA (Cnidaria)	1					Belostomatidae* (Giant water bugs)	3	A			A	Athericidae (Snipe flies)	10				
TURBELLARIA (Flatworms)	3					Corixidae* (Water boatmen)	3		A		A	Blepharoceridae (Mountain midges)	15				
ANNELIDA						MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)						GASTROPODA (Snails)					
Oligochaeta (Earthworms)	1					Gerridae* (Pond skaters/Water striders)	5					Ceratopogonidae (Biting midges)	5				
Hirudinea (Leeches)	3				1	Hydrometridae* (Water measurers)	6					Chironomidae (Midges)	2		A		A
CRUSTACEA						TRICHOPTERA (Caddisflies)						PELECYPODA (Bivalves)					
Amphipoda (Scuds)	13					Nepidae* (Water scorpions)	3					Dixidae* (Dixid midge)	10				
Potamonautidae* (Crabs)	3					Notonectidae* (Backswimmers)	3					Empididae (Dance flies)	6				
Atyidae (Freshwater Shrimps)	8					Pleidae* (Pygmy backswimmers)	4					Ephydriidae (Shore flies)	3				
Palaemonidae (Freshwater Prawns)	10					Velidae/M...veliidae* (Ripple bugs)	5		A		A	Muscidae (House flies, Stable flies)	1				
HYDRACARINA (Mites)						Caseid caddis:						SASS Score					
PLECOPTERA (Stoneflies)						Sialidae (Alderflies)	6					Psychodidae (Moth flies)	1				
Notonemouridae	14					Caseid caddis:						Simuliidae (Blackflies)	5	A		A	
Perliidae	12	A			A	Dipseudopsidae	10					Syrphidae* (Rat tailed maggots)	1				
EPHEMEROPTERA (Mayflies)						COLEOPTERA (Beetles)						Other biota:					
Baetidae 1sp	4	A				Ecnomidae	8					Tipulidae (Crane flies)	5	1			
Baetidae 2 sp	6		A		A	Barbarochthonidae SWC	13					ASPT					
Baetidae > 2 sp	12					Catamoceratidae ST	11					No. of Taxa					
Caenidae (Squaregills/Cainflies)	6		A	1	A	Glossosomatidae SWC	11					ASPT					
Ephemeridae	15					Hydroptilidae	6					5.3					
Heptageniidae (Flatheaded mayflies)	13					Hydrosalpingidae SWC	15					ASPT					
Leptophlebiidae (Pronghills)	9	A			A	Lepidostomatidae	10					ASPT					
Oligoneuridae (Brushlegged mayflies)	15					Leptoeridae	6		1			ASPT					
Polymitarcyidae (Pale Burrowers)	10					Petrothrincidae SWC	11					ASPT					
Prosoptomatidae (Water specs)	15					Pisuliidae	10					ASPT					
Teloganodidae SWC (Spiny Crawlers)	12					Sericostomatidae SWC	13					ASPT					
Tricorythidae (Stout Crawlers)	9					COLEOPTERA (Beetles)						ASPT					
ODONATA (Dragonflies & Damselflies)						COLEOPTERA (Beetles)						ASPT					
Catopterygidae ST, T (Demoiselles)	10					Dytiscidae/Noteridae* (Diving beetles)	5	A			A	ASPT					
Chlorocyphidae (Jewels)	10					Elmidae/Dryopidae* (Rifle beetles)	8	A			A	ASPT					
Synlestidae (Chlorolestidae)(Sylphs)	8					Gyrinidae* (Whirligig beetles)	5				B	ASPT					
Coenagrionidae (Sprites and blues)	4		B	1	B	Halplidae* (Crawling water beetles)	5					ASPT					
Lestidae (Emerald Damselflies/Spreadwings)	8					Helodidae (Marsh beetles)	12					ASPT					
Platycnemidae (Stream Damselflies)	10					Hydraenidae* (Minute moss beetles)	8					ASPT					
Protoneridae (Threadwings)	8					Hydrophilidae* (Water scavenger beetles)	5					ASPT					
Aeshnidae (Hawkers & Emperors)	8					Limnichidae (Marsh-Loving Beetles)	10					ASPT					
Corduliidae (Cruisers)	8					Psephenidae (Water Pennies)	10					ASPT					
Gomphidae (Clubtails)	6	B	A		A							ASPT					
Libellulidae (Darters/Skimmers)	4											ASPT					
LEPIDOPTERA (Aquatic Caterpillars/Moths)						LEPIDOPTERA (Aquatic Caterpillars/Moths)						ASPT					
Crambidae (Pyralidae)	12											ASPT					



KwaZungu/Swartkops River: July 2022

Date (dd-mm-yr):		24 September 2022		Grid reference (dd mm ss.s) Lat: S		-33.722183		Biotopes Sampled (tick & rate)		Rating (1-5)		Time (min)					
Site Code:		SWAR01_I		Long: E		25.300816		Stones Out Of Current (SOOC)		5							
Collector/Sampler:		Kylie Farrell		Datum (WGS84/Cape):				Bedrock		0							
River:		SWARTKOPS		Altitude (m):				Aquatic Veg		3							
Level 1 Ecoregion:		19.Southern Folded Mountains		Zonation:				MargVeg In Current		4							
Quaternary Catchment:		M10C		Routine or Project? (circle one)		Flow		MargVeg Out Of Current		4							
Site Description: 52		Temp (°C):		Project Name:		Clarity (cm):		Gravel		5							
Refer to Report Number:		pH:		WP11354		Turbidity:		Sand		5							
WEM/WMA7/00/CON/RDM/0722		DO (mg/L):				Colour:		Mud		1							
		Conductivity:						Hand picking/Visual observation		X							
		Riparian Disturbance:						Biotope Score (%)		71							
		Instream Disturbance:															
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		A			Ceratopogonidae (Biting midges)	5				
Oligochaeta (Earthworms)	1			1	1	Hydrometridae* (Water measurers)	6					Chironomidae (Midges)	2	A	B	A	B
Hirudinea (Leeches)	3					Naucoridae* (Creeping water bugs)	7		1		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	A			A	Pleidae* (Pygmy backswimmers)	4					Ephydriidae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Veliidae/M...velidae* (Ripple bugs)	5		A		A	Muscidae (House flies, Stable flies)	1				
Palaeomonidae (Freshwater Prawns)	10					MEGALOPTERA (Fishflies, Dobsonflies & Alderflies)						Psychodidae (Moth flies)	1				
HYDRACARINA (Mites)	8			1	1	Corydalidae (Fishflies & Dobsonflies)	8					Simuliidae (Blackflies)	5	A			A
PLECOPTERA (Stoneflies)						Salidae (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				
Baetidae 2 sp	6		B	B		Hydropsychidae 2 sp	6					Bulininae*	3				
Baetidae > 2 sp	12	A			B	Hydropsychidae > 2 sp	12	A			A	Hydrobiidae*	3				
Caenidae (Squaregills/Cainflies)	6					Philopotamidae	10	A		1	B	Lymnaeidae* (Pond snails)	3				
Ephemeridae	15					Polycentropodidae	12					Physidae* (Pouch snails)	3				
Heptageniidae (Flatheaded mayflies)	13					Psychomyiidae/Xiphocentronidae	8					Planorbinae* (Orb snails)	3				
Leptophlebiidae (Pronghills)	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					122
Calopterygidae ST.T (Demoiselles)	10					Leptoceridae	6		A	B	B	No. of Taxa					21
Chlorocyphidae (Jewels)	10	A		1	A	Petrohrinidae SWC	11					ASPT					5.8
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisuliidae	10					Other biota:					
Coenagrionidae (Sprites and blues)	4		B		B	Sericostomatidae SWC	13					Ptiiodactylidae (Toed-winged beetle) - not part of the SASS5 - 2 individuals recorded					
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	A			A	Gyrinidae* (Whirligig beetles)	5	A	B	1	B						
Corduliidae (Cruisers)	8					Halipidae* (Crawling water beetles)	5					Comments/Observations:					
Gomphidae (Clubtails)	6					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										
Crambidae (Pyralidae)	12					Limnichidae (Marsh-Loving Beetles)	10										
						Psephenidae (Water Pennies)	10										

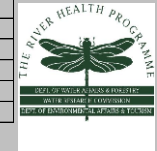


KwaZungu/Swartkops River: May 2023

Date (dd-mm-yr): 06-May-23 Site Code: SWAR01_I Collector/Sampler: Kylie Farrell River: SWARTKOPS Level 1 Ecoregion: 19.Southern Folded Mountains Quaternary Catchment: M10C		Grid reference (dd mm ss.s) Lat: S -33.722183 Long: E 25.300816 Datum (WGS84/Cape): Altitude (m): Zonation:		(dd.ddddd) Biotopes Sampled (tick & rate) Rating (1-5) Time (min)	
Site Description: 52 Refer to Report Number: WEM/WMA7/00/CON/RDM/0722		Routine or Project? (circle one) <input type="checkbox"/> Routine <input checked="" type="checkbox"/> Project Project Name: WP11354 Flow: Clarity (cm): Turbidity: Colour:		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	
Riparian Disturbance: Instream Disturbance:					
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	
Oligochaeta (Earthworms) 1		Hydrometridae* (Water measurers) 6		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		Empididae (Dance flies) 6	
Potamonautidae* (Crabs) 3		Pleidae* (Pygmy backswimmers) 4		Ephydriidae (Shore flies) 3	
Atyidae (Freshwater Shrimps) 8		Velidae/M...velidae* (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	
Perlidae 12		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		Hydropsychidae 2 sp 6		Buliminae* 3	
Baetidae > 2 sp 12		Hydropsychidae > 2 sp 12		Hydrobiidae* 3	
Caenidae (Squaregills/Cainflies) 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	
Telandriidae 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 103	
Calopterygidae ST,T (Demiselles) 10		Leptoceridae 6		No. of Taxa 18	
Chlorocyphidae (Jewels) 10		Petroltrincidae SWC 11		ASPT 5.7	
Syrletidae (Chlorolestidae)(Sylphs) 8		Pisuliidae 10		Other biota:	
Coenagrionidae (Sprites and blues) 4		Sencostomatidae SWC 13		Ptilodactylidae (Toed-winged beetle) - not part of the SASS5 - A abundance	
Lestidae (Emerald Damselflies/Spreadwings) 8		COLEOPTERA (Beetles)		SIC and GSM	
Platychemidae (Stream Damselflies) 10		Dytiscidae/Noteridae* (Diving beetles) 5		Comments/Observations:	
Protoneuridae (Threadwings) 8		Elmidae/Dryopidae* (Rifle beetles) 8			
Aeshnidae (Hawkers & Emperors) 8		Gyrinidae* (Whirligig beetles) 5			
Coruliidae (Cruisers) 8		Halplidae* (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			

Gamtoos River: July 2022

Date (dd-mm-yr):		07-Sep-22		Grid reference (dd mm ss.s) Lat: S		-33.760983		(dd.ddd)		Biotopes Sampled (tick & rate)		Rating (1-5)		Time (min)			
Site Code:		GAMT01_I		Long: E		24.693677		Datum (WGS84/Cape):		Stones Out Of Current (SOOC)		3					
Collector/Sampler:		Kylie Farrell		Altitude (m):				Zonation:		Bedrock		0					
River:		GAMTOOS		Flow						Aquatic Veg		4					
Level 1 Ecoregion:		19.Southern Folded Mountains		Clarity (cm):						MargVeg In Current		4					
Quaternary Catchment:		L90A		Turbidity:						MargVeg Out Of Current		4					
Temp (°C):				Colour:						Gravel		4					
pH:				Riparian Disturbance:						Sand		3					
Site Description: 52				Instream Disturbance:						Mud		2					
Refer to Report Number:		WEM/WMA7/00/CON/RDM/0722		Routine or Project? (circle one)		Project Name:		WP11354		Hand picking/Visual observation		X					
DO (mg/L):				Flow						Biotope Score (%)		64					
Conductivity:				Clarity (cm):													
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	1	A	Corixidae* (Water boatmen)	3	A		B	B	Blepharoceridae (Mountain midges)	15				
ANNELIDA						Gerridae* (Pond skaters/Water striders)	5				A	Ceratopogonidae (Biting midges)	5		1		1
Oligochaeta (Earthworms)	1			A	A	Hydrometridae* (Water measurers)	6					Chironomidae (Midges)	2	A	A	B	B
Hrudinea (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					Pleidae* (Pygmy backswimmers)	4					Ephydriidae (Shore flies)	3				
Atyidae (Freshwater Shrimps)	8					Veliidae/M...velidae* (Ripple bugs)	5					Muscidae (House flies, Stable flies)	1	1	A	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	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)						Economidae	8					GASTROPODA (Snails)					
Baetidae 1sp	4	A				Hydropsychidae 1 sp	4					Ancylidae (Limpets)	6			A	A
Baetidae 2 sp	6		B	A	B	Hydropsychidae 2 sp	6					Bulininae*	3				
Baetidae > 2 sp	12					Hydropsychidae > 2 sp	12					Hydrobiidae*	3				
Caenidae (Squaregills/Cainflies)	6					Philopotamidae	10					Lymnaeidae* (Pond snails)	3	A	1	A	A
Ephemeridae	15					Polycentropodidae	12					Physidae* (Pouch snails)	3	B	B	B	B
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)					
Prosoptomatidae (Water specs)	15					Glossosomatidae SWC	11					Corbiculidae (Clams)	5				
Teloganodidae SWC (Spiry 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					65
Calopterygidae ST,T (Demoiselles)	10					Leptoceridae	6					No. of Taxa					17
Chlorocyphidae (Jewels)	10					Petrothrincidae SWC	11					ASPT					3.8
Synlestidae (Chlorolestidae)(Sylphs)	8					Pisulidae	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										
Aeshnidae (Hawkers & Emperors)	8					Gyrinidae* (Whirligig beetles)	5		A	A	B	Comments/Observations:					
Corduliidae (Cruisers)	8					Halipidae* (Crawling water beetles)	5										
Gomphidae (Clubtails)	6					Helodidae (Marsh beetles)	12										
Libellulidae (Darters/Skimmers)	4		A	A	A	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										



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

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

Species	Family	Common Name/s	Alien	Threat status	Protection Level	SA Endemic	Presence on sites										
							GKEI01_1 (Great Kei)	TSOMO001_1 (Tsono)	BKEI01_1 (Black Kei)	BUFF01_1 (Mid Buffalo)	KEIS01_1 (Upper Keiskamma)	GAMT01_1 (Gamtoos)	FISH03_1 (Middle Great Fish)	SWART01_1 (Swartkops)	KAT01_1 (Upper Kat)	MTHA01_1 (Mthatha)	MBSA01_1 (Middle Mbashe)
<i>Argemone ochroleuca</i>	PAPAVERACEAE	White Mexican Poppy	*	Not Evaluated			y	y	y		y						y
<i>Arundinella nepalensis</i>	POACEAE	River Grass		LC				y								y	y
<i>Arundo donax</i>	POACEAE	Spanish Reed	*	Not Evaluated					y		y						
<i>Asparagus suaveolens</i>	ASPARAGACEAE	Wild Asparagus		LC			y		y		y						
<i>Berula thunbergii</i>	APIACEAE	Toothache Root		LC							y				y		
<i>Bidens pilosa</i>	ASTERACEAE	Black Jack	*	Not Evaluated			y	y	y	y	y	y		y			y
<i>Celtis africana</i>	CELTIDACEAE	White Stinkwood		LC				y	y		y				y		
<i>Centella asiatica</i>	APIACEAE	Pennywort		LC					y						y		
<i>Cestrum laevigatum</i>	SOLANACEAE	Inkberry	*	Not Evaluated												y	
<i>Cliffortia strobilifera</i>	ROSACEAE	Cone Rice Bush		LC					y	y				y	y		
<i>Combretum caffrum</i>	COMBRETACEAE	Cape bushwillow		LC		Yes	y	y		y	y		y		y	y	y
<i>Commelina diffusa subsp. diffusa</i>	COMMELINACEAE			LC						y							
<i>Conyza bonariensis</i>	ASTERACEAE	Horseweed	*	Not Evaluated			y	y	y	y	y	y		y	y	y	y

Species	Family	Common Name/s	Alien	Threat status	Protection Level	SA Endemic	Presence on sites										
							GKEI01_1 (Great Kei)	TSOMO001_1 (Tsono)	BKEI01_1 (Black Kei)	BUFF01_1 (Mid Buffalo)	KEIS01_1 (Upper Keiskamma)	GAMT01_1 (Gamtoos)	FISH03_1 (Middle Great Fish)	SWART01_1 (Swartkops)	KAT01_1 (Upper Kat)	MTHA01_1 (Mthatha)	MBSA01_1 (Middle Mbashe)
<i>Cotula nigellifolia</i> var. <i>nigellifolia</i>	ASTERACEAE			LC		Yes				y	y	y			y		
<i>Cyclosorus interruptus</i>	THELYPTERIDACEAE	Water fern		LC									y	y			
<i>Cynodon dactylon</i>	POACEAE	Coach grass		LC			y	y	y	y	y					y	y
<i>Cyperus dives</i>	CYPERACEAE	Giant sedge		LC					y	y							
<i>Cyperus laevigatus</i>	CYPERACEAE			LC													y
<i>Cyperus longus</i>	CYPERACEAE	Sweet Cyperus		LC			y	y	y		y						
<i>Cyperus sexangularis</i>	CYPERACEAE			LC					y			y					
<i>Cyperus textilis</i>	CYPERACEAE	Tall star sedge		LC		Yes	y			y	y	y	y	y	y		
<i>Dais cotinifolia</i>	THYMELAEACEAE	Pompom Tree		LC						y							y
<i>Dietes butcheriana</i>	IRIDACEAE	Forest Iris		LC						y				y			
<i>Eichhornia crassipes</i>	PONTEDERIACEAE	Water Hyacinth	*	Not Evaluated						y							
<i>Equisetum ramosissimum</i>	EQUISETACEAE			LC					y								y
<i>Erica caffra</i> var. <i>caffra</i>	ERICACEAE	Water Tree Erica		LC						y				y			

Species	Family	Common Name/s	Alien	Threat status	Protection Level	SA Endemic	Presence on sites									
							GKEI01_1 (Great Kei)	TSOMO001_1 (Tsono)	BKEI01_1 (Black Kei)	BUFF01_1 (Mid Buffalo)	KEIS01_1 (Upper Keiskamma)	GAMT01_1 (Gamtoos)	FISH03_1 (Middle Great Fish)	SWART01_1 (Swartkops)	KAT01_1 (Upper Kat)	MTHA01_1 (Mthatha)
<i>Euclea divinorum</i>	EBENACEAE			LC									y			
<i>Ficus ingens</i>	MORACEAE	Red-leaved fig		LC						y						
<i>Ficus sur</i>	MORACEAE	Broomcluster Fig		LC			y								y	
<i>Fraxinus americana</i>	OLEACEAE	American Ash	*	Not Evaluated				y								
<i>Fuirena hirsuta</i>	CYPERACEAE			LC						y						
<i>Gleditsia tracanthos</i>	FABACEAE	Honey Locust	*	Not Evaluated					y							
<i>Gomphocarpus fruticosus</i>	APOCYNACEAE	Milkweed		LC								y				
<i>Gomphostigma virgatum</i>	BUDDLEJACEAE	River stars		LC			y	y			y			y		y
<i>Grevillea robusta</i>	PROTEACEAE	Australian silky oak	*	Not Evaluated									y			
<i>Gymnosporia buxifolia</i>	CELASTRACEAE	Common Spike-thorn		LC			y		y	y	y			y		y
<i>Hemarthria altissima</i>	POACEAE	Swamp Couch		LC					y						y	
<i>Ischaemum fasciculatum</i>	POACEAE	Hippo Grass		LC					y	y	y					
<i>Juncus effusus</i>	JUNCACEAE	Soft rush		LC												y

Species	Family	Common Name/s	Alien	Threat status	Protection Level	SA Endemic	Presence on sites									
							GKEI01_1 (Great Kei)	TSOMO001_1 (Tsono)	BKEI01_1 (Black Kei)	BUFF01_1 (Mid Buffalo)	KEIS01_1 (Upper Keiskamma)	GAMT01_1 (Gamtoos)	FISH03_1 (Middle Great Fish)	SWART01_1 (Swartkops)	KAT01_1 (Upper Kat)	MTHA01_1 (Mthatha)
<i>Kyllinga elatior</i>	CYPERACEAE			LC										y		
<i>Lantana camara</i>	VERBENACEAE	Bird's Brandy	*	Not Evaluated			y		y							y
<i>Leersia hexandra</i>	POACEAE	Rice Grass		LC									y			
<i>Lemna gibba</i>	LEMNACEAE	Duckweed		LC					y							
<i>Leonotis intermedia</i>	LAMIACEAE			LC				y	y						y	
<i>Leucaena leucocephala</i>	FABACEAE	Leucaena	*	Not Evaluated					y							
<i>Lippia javanica</i>	VERBENACEAE	Fever Tea								y						
<i>Melia azedarach</i>	MELIACEAE	Syringa	*	Not Evaluated			y		y	y	y			y		
<i>Mentha aquatica</i>	LAMIACEAE	Water Mint		LC						y				y		
<i>Miscanthus ecklonii</i>	POACEAE	Daba grass		LC			y		y	y	y		y	y	y	y
<i>Nicotiana glauca</i>	SOLANACEAE	Wild tobacco	*	Not Evaluated												y
<i>Nymphaea nouchali</i>	NYMPHAEACEAE	Blue Water Lily		LC									y			
<i>Olea europaea subsp. africana</i>	OLEACEAE	Wild Olive		LC									y	y		y

Species	Family	Common Name/s	Alien	Threat status	Protection Level	SA Endemic	Presence on sites										
							GKEI01_1 (Great Kei)	TSOMO001_1 (Tsono)	BKEI01_1 (Black Kei)	BUFF01_1 (Mid Buffalo)	KEIS01_1 (Upper Keiskamma)	GAMT01_1 (Gamtoos)	FISH03_1 (Middle Great Fish)	SWART01_1 (Swartkops)	KAT01_1 (Upper Kat)	MTHA01_1 (Mthatha)	MBSA01_1 (Middle Mbashe)
<i>Opuntia ficus-indica</i>	CACTACEAE	Prickly pear	*	Not Evaluated			y			y	y		y		y		
<i>Panicum maximum</i>	POACEAE	Guinea Grass		LC							y		y				
<i>Paspalum distichum</i>	POACEAE	Water Couch		LC								y					
<i>Pennisetum clandestinum</i>	POCEAE	Kikuyu Grass	*	Not Evaluated							y						
<i>Pennisetum macrourum</i>	POCEAE	Riverbed grass		LC								y					
<i>Persicaria decipiens</i>	POLYGONACEAE			LC			y		y								
<i>Persicaria lapathifolia</i>	POLYGONACEAE	Spotted Knotweed	*	Not Evaluated					y						y		
<i>Persicaria madagascariensis</i>	POLYGONACEAE			LC			y			y			y				
<i>Phoenix reclinata</i>	ARECACEAE	Wild date palm		LC					y							y	
<i>Phragmites australis</i>	POACEAE	Common Reed		LC							y	y					
<i>Phragmites mauritianus</i>	POACEAE			LC													y
<i>Plectranthus ecklonii</i>	LAMIACEAE	Large Spur-flower bush		LC			y			y							
<i>Pluchea dioscoridis</i>	ASTERACEAE			LC						y	y		y	y			

Species	Family	Common Name/s	Alien	Threat status	Protection Level	SA Endemic	Presence on sites									
							GKEI01_I (Great Kei)	TSOMO001_I (Tsono)	BKEI01_I (Black Kei)	BUFF01_I (Mid Buffalo)	KEIS01_I (Upper Keiskamma)	GAMT01_I (Gamtoos)	FISH03_I (Middle Great Fish)	SWART01_I (Swartkops)	KAT01_I (Upper Kat)	MTHA01_I (Mthatha)
<i>Plumbago auriculata</i>	PLUMBAGINACEAE										y	y				
<i>Populus X canescens</i>	SALICACEAE	Grey Poplar	*	Not Evaluated					y							
<i>Potamogeton schweinfurthii</i>	POTAMOGETONACEAE	Broad-leaved Pondweed		LC							y					
<i>Prionium serratum</i>	PRIONIACEAE			Declining		Yes						y				
<i>Pycreus intactus</i>	CYPERACEAE			LC			y									
<i>Pycreus polystachyos var. polystachyos</i>	CYPERACEAE			LC				y	y	y			y			
<i>Ranunculus baurii</i>	RANUNCULACEAE			LC							y					
<i>Ricinus communis</i>	EUPHORBIACEAE	Cateroil Bush	*	Not Evaluated							y	y	y			
<i>Rubus fruticosus</i>	ROSACEAE	European Blackberry	*	Not Evaluated									y			
<i>Salix babylonica var. babylonica</i>	SALICACEAE	Weeping Willow	*	Not Evaluated				y	y							
<i>Salix fragilis var. fragilis</i>	SALICACEAE	Crack Willow	*	Not Evaluated					y							
<i>Salix mucronata subsp. mucronata</i>	SALICACEAE	Cape willow		LC			y	y	y		y			y		
<i>Sansevieria hyacinthoides</i>	DRACAENACEAE	Mother-in-law's-tongue		LC			y									

Species	Family	Common Name/s	Alien	Threat status	Protection Level	SA Endemic	Presence on sites										
							GKEI01_1 (Great Kei)	TSOMO001_1 (Tsono)	BKEI01_1 (Black Kei)	BUFF01_1 (Mid Buffalo)	KEIS01_1 (Upper Keiskamma)	GAMT01_1 (Gamtoos)	FISH03_1 (Middle Great Fish)	SWART01_1 (Swartkops)	KAT01_1 (Upper Kat)	MTHA01_1 (Mthatha)	MBSA01_1 (Middle Mbashe)
<i>Schkuhria pinnata</i>	ASTERACEAE	Dwarf Marigold	*	Not Evaluated					y								
<i>Schoenoplectus corymbosus</i>	CYPERACEAE			LC				y	y								
<i>Schoenoplectus decipiens</i>	CYPERACEAE			LC								y					y
<i>Schoenoplectus paludicola</i>	CYPERACEAE			LC		Yes	y										
<i>Searsia dentata</i>	ANACARDIACEAE			LC						y							
<i>Searsia lancea</i>	ANACARDIACEAE	Karee tree		LC								y					
<i>Searsia lepidictya</i>	ANACARDIACEAE							y									
<i>Searsia lucida</i>	ANACARDIACEAE	Glossy Currant		LC		Yes						y					
<i>Searsia pyroides var. pyroides</i>	ANACARDIACEAE			LC				y	y							y	
<i>Senegalia ataxacantha</i>	FABACEAE	Flame thorn		LC			y										
<i>Senegalia caffra</i>	FABACEAE	Common hook thorn		LC		Yes		y		y	y				y		y
<i>Senegalia schweinfurthii var. schweinfurthii</i>	FABACEAE	River climbing thorn		LC											y		
<i>Senna didymobotrya</i>	FABACEAE	Peanut butter cassia	*	Not Evaluated						y	y					y	

Species	Family	Common Name/s	Alien	Threat status	Protection Level	SA Endemic	Presence on sites									
							GKEI01_1 (Great Kei)	TSOMO001_1 (Tsono)	BKEI01_1 (Black Kei)	BUFF01_1 (Mid Buffalo)	KEIS01_1 (Upper Keiskamma)	GAMT01_1 (Gamtoos)	FISH03_1 (Middle Great Fish)	SWART01_1 (Swartkops)	KAT01_1 (Upper Kat)	MTHA01_1 (Mthatha)
<i>Sesbania punicea</i>	FABACEAE	Red Sesbania	*	Not Evaluated			y		y	y	y				y	y
<i>Setaria megaphylla</i>	POACEAE	Broad-leaved bristle grass		LC										y		
<i>Setaria sphacelata var. sericea</i>	POACEAE	Golden Bristle Grass		LC							y					
<i>Sida dregei</i>	MALVACEAE	Fanpetals		LC			y		y	y				y		y
<i>Solanum mauritianum</i>	SOLANACEAE	Bugweed	*	Not Evaluated				y	y							y
<i>Solanum torvum</i>	SOLANACEAE	Turkey berry	*	Not Evaluated					y						y	y
<i>Sporobolus fimbriatus</i>	POACEAE	Dropseed Grass		LC				y	y						y	
<i>Sporobolus ioclados</i>	POACEAE	Pan Dropseed		LC						y	y					y
<i>Stuckenia pectinatus</i>	POTAMOGETONACEAE	Fennel-leaved Pondweed		LC							y					
<i>Tagetes minuta</i>	ASTERACEAE	Khaki Weed	*	Not Evaluated				y	y	y		y				y
<i>Tithonia diversifolia</i>	ASTERACEAE	Mexican sunflower	*	Not Evaluated								y				
<i>Tithonia rotundifolia</i>	ASTERACEAE	Red sunflower	*	Not Evaluated					y							y
<i>Typha capensis</i>	TYPHACEAE	Bulrush		LC							y					

Species	Family	Common Name/s	Alien	Threat status	Protection Level	SA Endemic	Presence on sites										
							GKEI01_I (Great Kei)	TSOMO01_I (Tsono)	BKEI01_I (Black Kei)	BUFF01_I (Mid Buffalo)	KEIS01_I (Upper Keiskamma)	GAMT01_I (Gamtoos)	FISH03_I (Middle Great Fish)	SWART01_I (Swartkops)	KAT01_I (Upper Kat)	MTHA01_I (Mthatha)	MBSA01_I (Middle Mbashe)
<i>Vachellia karroo</i>	FABACEAE	Sweet Thorn		LC			y	y	y	y	y	y	y	y	y	y	
<i>Vachellia robusta</i>	FABACEAE			LC			y										
<i>Verbena bonariensis</i>	VERBENACEAE	Wild Verbena	*	*				y	y	y	y	y				y	
<i>Vinca minor</i>	APOCYNACEAE	Periwinkle	*	Not Evaluated							y					y	
<i>Xanthium strumarium</i>	ASTERACEAE	Large Cocklebur	*	Not Evaluated			y		y	y	y			y			
<i>Zinnia peruviana</i>	ASTERACEAE	Peruvian zinnia	*				y										
<i>Ziziphus mucronata</i>	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, gullyng
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	Xilinxha 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	<i>Caesalpinia pulcherrima</i> (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: MTA01_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 conditions (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	76.41		
INTEGRATED ECOSTATUS CATEGORY		C		

Nqabarha 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	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	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	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	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	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 CATEGORY		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	65.97		
INTEGRATED ECOSTATUS CATEGORY		C		

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 CATEGORY		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 CATEGORY		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 CATEGORY		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 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 CATEGORY		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 CATEGORY		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 CATEGORY		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 CATEGORY		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 CATEGORY		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 CATEGORY		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 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 CATEGORY		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 ECOLOGICAL CATEGORY	82.40		RIPARIAN VEGETATION (VEGRAI/VEGCON) EC %	RIPARIAN VEGETATION (VEGRAI/VEGCON) EC
				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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Exotic vegetation encroachment Cattle trampling and grazing (erosion)
INSTREAM HABITAT INTEGRITY CLASS	Very high	Moderate	<ul style="list-style-type: none"> Mhlangu Dam in upper reaches (flow modification) Localised gravel mining Cattle trampling and grazing (erosion)
FINAL ECOLOGICAL IMPORTANCE FOR SITE	High	High	<ul style="list-style-type: none"> Remains high
ES METRIC	DESKTOP	RAPID	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	High	Moderate	<ul style="list-style-type: none"> All fish species expected and occurring regarded as moderately tolerant to modified water quality
FISH NO-FLOW SENSITIVITY	High	Moderate	<ul style="list-style-type: none"> Most fish species expected and occurring 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Stream size sensitivity 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 low 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 occurring 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 occurring 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 sensitivity 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	<ul style="list-style-type: none"> Limited cover features present Bedrock, large boulders dominated
HABITAT SIZE (LENGTH) CLASS	Low	Low	
INSTREAM MIGRATION LINK CLASS	Very high	High	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Although one species with a requirement 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 1 out of 4 expected taxa (mostly with high FROCs) recorded for unmodified physico-chemical conditions changed
INVERTS VELOCITY SENSITIVITY	Very high	Moderate	<ul style="list-style-type: none"> 3 out of 5 and 0 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	<ul style="list-style-type: none"> Small to moderate sized river Modified flows will have an impact on the current existing riffle habitats
FINAL ECOLOGICAL SENSITIVITY FOR SITE	Moderate	Moderate	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Although one species with a requirement for catchment-scale migration is expected (AMOS), this is expected at a moderate FROC under reference 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	<ul style="list-style-type: none"> Indwe and Xonxa Dams upstream Sand mining Cattle trampling and grazing (bank erosion)
FINAL ECOLOGICAL IMPORTANCE FOR SITE	Moderate	Moderate	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Moderate sized river Modified flows will have an impact on the current existing riffle habitats
FINAL ECOLOGICAL SENSITIVITY FOR SITE	Moderate	Moderate	<ul style="list-style-type: none"> 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, with 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 dominated by species considered to be moderately tolerant to modified water quality, with one species (SBAI) considered to be intolerant to modified water quality and occurring 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Cattle trampling and grazing (causing bank collapse) Vegetation removal Several weirs
INSTREAM HABITAT INTEGRITY CLASS	Very high	Moderate	<ul style="list-style-type: none"> Water quality (extensive algae) Irrigation
FINAL ECOLOGICAL IMPORTANCE FOR SITE	Moderate	Moderate	<ul style="list-style-type: none"> Remains Moderate
ES METRIC	DESKTOP	RAPID	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	Very high	Moderate	<ul style="list-style-type: none"> Fish assemblage under reference and present conditions is expected to be dominated by species considered to be moderately tolerant to modified water quality, with no species considered to be intolerant to modified water quality occurring under present conditions
FISH NO-FLOW SENSITIVITY	Moderate	High	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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 classes, 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	<ul style="list-style-type: none"> Flow modification (loss of floods)
INSTREAM HABITAT INTEGRITY CLASS	High	Low	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Remains Moderate
ES METRIC	DESKTOP	RAPID	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	Very high	Moderate	<ul style="list-style-type: none"> 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 occurring under present conditions
FISH NO-FLOW SENSITIVITY	Moderate	Moderate	
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Moderate	Moderate	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Increased flows due to IBT Scoring and bed armouring due to increased flows
FINAL ECOLOGICAL IMPORTANCE FOR SITE	Moderate	Moderate	<ul style="list-style-type: none"> Remains Moderate
ES METRIC	DESKTOP	RAPID	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	Moderate	Low	<ul style="list-style-type: none"> Limited species expected under natural conditions, with lack of sufficient flow limiting occurrence of species with a moderate tolerance to unmodified water quality
FISH NO-FLOW SENSITIVITY	Moderate	Moderate	
INVERTS			
INVERT PHYS-CHEMICAL SENSITIVITY	Very high	Low	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Remains Moderate
ES METRIC	DESKTOP	RAPID	
FISH			
FISH PHYS-CHEMICAL SENSITIVITY	Moderate	Low	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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 vegetation 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, functionality 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 lose 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 include Alluvial 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 rheophyte habitats
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	Low	• Large size river. Although will lose 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 grass banks, bedrock and cobbles thus will not be active or inactive 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 <i>Salix mucronata</i>
HABITAT DIVERSITY CLASS	Low	Low	
HABITAT SIZE (LENGTH) CLASS	Moderate	Moderate	
INSTREAM MIGRATION LINK CLASS	Very high	Moderate	• Only AMOS likely 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Two SA endemic species (<i>Combretum caffrum</i>, <i>Senegalia caffra</i>) and 17 indigenous species observed at site. Riparian habitats include mid-channel bar (protection against floods), alluvial flood bench, alluvial woody banks, lateral bars sedges, grasses.
HABITAT DIVERSITY CLASS	Low	Low	
HABITAT SIZE (LENGTH) CLASS	Low	Low	
INSTREAM MIGRATION LINK CLASS	High	Low	<ul style="list-style-type: none"> Only a single species of eel (<i>AMOS</i>) 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	<ul style="list-style-type: none"> Corridor mostly intact and maintains functionality upstream and downstream of the site but deteriorates in the vicinity of the bridge and site.
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	Moderate	Moderate	<ul style="list-style-type: none"> Moderate levels of AIP (mainly <i>Wattle</i>), with high grazing pressure and selective wood removal.
INSTREAM HABITAT INTEGRITY CLASS	High	Moderate	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 4 out of 8 (<i>Hydropsychidae</i> >2spp (froc4) absent, rest low frocs. <i>Prosopistomatidae</i> 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	<ul style="list-style-type: none"> 5 out of 8 (<i>Hydropsychidae</i> >2spp (froc 4) absent. Rest are froc 1 absent. <i>Prosopistomatidae</i> 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 <i>Gomphostigma virgatum</i> , as well as <i>Salix mucronata</i> riffle habitats
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	Moderate	<ul style="list-style-type: none"> 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 (<i>Afrocarpus falcatus</i>) protected in SA; 4 SA endemic species (<i>Combretum caffrum</i> , <i>Cotula nigellifolia</i> var. <i>nigellifolia</i> , <i>Cyperus textilis</i> , <i>Senegalia caffra</i>) 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 (<i>Eichhornia crassipes</i> - 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 prevalence 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 prevalence 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 <i>Hydrophysidae</i> >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. <i>Simuliidae</i> 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	<ul style="list-style-type: none"> Mostly intact but generally less than 500m.
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Moderate	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Corridor mostly intact and maintains functionality.
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	Moderate	Moderate	<ul style="list-style-type: none"> Mainly affected by vegetation removal, clearing, AIP and changes to water quantity.
INSTREAM HABITAT INTEGRITY CLASS	High	Moderate	<ul style="list-style-type: none"> Low water bridge (bed modification), some nutrients (algae), cattle 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	<ul style="list-style-type: none"> 3 out of 9 (Perlidae absent (froc5), rest low frocs) and 9 out of 12 expected taxa (taxa with low frocs absent) recorded for unmodified and moderately unmodified physico-chemical conditions changed respectively.
INVERTS VELOCITY SENSITIVITY	Very high	Moderate	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Large number of weirs located upstream and downstream of the site. Only a single species requiring 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	<ul style="list-style-type: none"> Corridor mostly intact and maintains functionality below the Kat River Dam.
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	High	High	<ul style="list-style-type: none"> AIP present but low, vegetation removal also low, main impacts are related to potential altered flow regime.
INSTREAM HABITAT INTEGRITY CLASS	High	High	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Some agricultural encroachment has occurred.
RIPARIAN-WETLAND NATURAL VEG IMPORTANCE BASED ON EXPERT RATING	Low	Moderate	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Corridor mostly intact and maintains functionality.
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	High	Moderate	<ul style="list-style-type: none"> Marginal zone has shifted due to transfer with elevated flows, which has also scoured the site.
INSTREAM HABITAT INTEGRITY CLASS	High	Low	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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 aquatic 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 <ul style="list-style-type: none"> Remainder of fish species have requirement for within-reach movement
RIPARIAN-WETLAND ZONE MIGRATION LINK	Moderate	Low	<ul style="list-style-type: none"> 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 severely downstream from where the sand mining starts.
INSTREAM HABITAT INTEGRITY CLASS	Moderate	High	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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 aquatic 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	<ul style="list-style-type: none"> Species with a requirement for catchment-scale and between reach scale migration requirements occurring at a lower FROC than expected Site often dry
RIPARIAN-WETLAND ZONE MIGRATION LINK	Very high	Moderate	<ul style="list-style-type: none"> Corridor fragmentation is high but the upland is mainly agriculture, so functionality persists.
RIPARIAN-WETLAND ZONE HABITAT INTEGRITY CLASS	Very high	Moderate	<ul style="list-style-type: none"> AIP high
INSTREAM HABITAT INTEGRITY CLASS	High	Low	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Marginal zone grasses, sedges, and the aquatic species Stuckenia pectinatus.
STREAM SIZE			
STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES	Low	Moderate	<ul style="list-style-type: none"> 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	