

Supplementary Materials

Table S1. A summary of bio-physical characteristics of the ten sampling sites at the Swartkops River system, Eastern Cape, South Africa.

Study sites	Riparian vegetation	Stream vegetation	Site structure and characteristics
1	Grasses and a few shrubs	<i>Cyperus</i> spp., <i>Phragmites</i> spp., and <i>Typha</i> spp.	Open canopy, shallow, narrow channel composed of cobbles and a few pebble stones, with a medium flow and high water clarity
2	<i>Typha</i> spp., and dense <i>Phragmites</i> spp.	<i>Nasturtium officinale</i> , and <i>Stuckenia pectinata</i>	Open canopy, composed of pebbles and boulders with medium turbidity.
3	<i>Typha</i> spp., and dense <i>Phragmites</i> spp.	Permanent <i>P. crassipess</i> dense mat and <i>S. pectinata</i>	Open canopy, composed of pebbles and boulders with medium turbidity
4	<i>Typha</i> spp., and dense <i>Phragmites</i> spp.,	<i>N. officinale</i> and <i>S. pectinata</i>	Open canopy, composed of pebbles, boulders and deep waters
5	Dense <i>Phragmites</i> spp., <i>Cyperus</i> spp., <i>Typha</i> spp., and <i>Eucalyptus</i> spp.	<i>N. officinale</i> and <i>S. pectinata</i>	Wider river channel, shallow water depth, open canopy. Composed of cobbles and boulders. Turbid and occasionally higher water velocity caused by sewage effluent
6	<i>Phragmites</i> spp., <i>Cyperus</i> spp., <i>Typha</i> spp., and <i>Eucalyptus</i> spp.	Permanent <i>P. crassipess</i> dense mat	Open canopy, fully dense <i>P. crassipes</i> cover on the water column
7	<i>Phragmites</i> spp., <i>Cyperus</i> spp., <i>Typha</i> spp., and <i>Eucalyptus</i> spp.	<i>N. officinale</i> and <i>S. pectinata</i>	Wider river channel, shallow water depth, open canopy. Composed of cobbles and boulders
8	<i>Eucalyptus</i> spp., and <i>Typha</i> spp.	<i>N. officinale</i> and <i>S. pectinata</i>	Open canopy, composed of cobbles and pebbles, shallow to deep waters

Table S3. Sediment chemistry mean and (\pm standard deviation) recorded from 10 sites, including native macrophytes stands along the Swartkops River system South Africa (April 2018–September 2018). Bolded *H*-values indicate significant differences (Kruskal–Wallis ANOVA, $p < 0.05$).

Heavy metals (mg/kg)	Sites										<i>H</i> - Value
	1	2	3	4	5	6	7	8	9	10	
Fe	1321.25 \pm 838.89	967.37 \pm 641.5	950.78 \pm 283.05	520.02 \pm 261.10	220.43 \pm 136.60	554.19 \pm 230.32	268.95 \pm 206.10	769.73 \pm 421.7	511.56 \pm 210.11	628.36 \pm 514.10	24.32
Zn	7.59 \pm 4.27	62.55 \pm 31.04	41.92 \pm 4.05	26.92 \pm 15.30	87.16 \pm 45.38	19.89 \pm 12.44	9.65 \pm 5.63	22.4 \pm 15.97	11.17 \pm 2.24	7.19 \pm 1.92	35.79
Cd	0.21 \pm 0.21	0.12 \pm 0.15	0.14 \pm 0.16	0.17 \pm 0.32	0.10 \pm 0.11	0.02 \pm 0.05	0.02 \pm 0.03	0.02 \pm 0.04	0.06 \pm 0.10	0.06 \pm 0.09	8.260
As	4 \pm 2.67	0.61 \pm 0.68	0.32 \pm 0.42	1.20 \pm 1.44	1.49 \pm 0.83	1.46 \pm 0.10	0.28 \pm 0.42	1.55 \pm 1.90	0.42 \pm 0.42	0.27 \pm 0.43	17.08
Cr	11.54 \pm 3.37	16.23 \pm 6.98	18.03 \pm 7.53	16.02 \pm 10.28	41.12 \pm 25.25	16.14 \pm 7.34	9.50 \pm 3.59	11.73 \pm 5.21	9.08 \pm 4.32	8.15 \pm 2.86	20.39
Pb	14.07 \pm 6.73	16.36 \pm 7.50	21.10 \pm 7.39	10.23 \pm 7.24	19.90 \pm 8.54	6.43 \pm 4.51	6.45 \pm 5.57	8.42 \pm 6.79	4.32 \pm 5	3.67 \pm 4.41	26.19
Hg	2.07 \pm 3.25	1.77 \pm 2.50	1.26 \pm 1.48	0.72 \pm 0.88	1.36 \pm 1.52	0.87 \pm 1.45	0.64 \pm 0.60	0.98 \pm 1.19	0.99 \pm 1.41	0.83 \pm 1.11	1.756
Cu	1.58 \pm 0.75	4.29 \pm 0.67	2.73 \pm 1.01	1.83 \pm 1.49	5.56 \pm 3.96	3.43 \pm 2.47	0.67 \pm 0.24	2.34 \pm 0.86	1.32 \pm 0.45	0.92 \pm 0.14	26.46
P	296.24 \pm 128.88	978.45 \pm 410.0	489.94 \pm 275.31	391.60 \pm 543.64	2240.83 \pm 1899.70	454.77 \pm 333.68	281.07 \pm 215.38	1077.85 \pm 274.5	863.70 \pm 542.90	468.8 \pm 344.05	21.63

Table S4. Percentage reduction of heavy metals concentration in sediments semi and permanent stands of *Pontederia crassipes* and *Salvinia molesta* along the Swartkops River system, Eastern Cape, South Africa.

Percentage reduction between immediate upstream and downstream sites per non-native macrophyte patch			
Heavy metals in sediments	Non-native macrophyte 1 (<i>P. crassipes</i>)	Non-native macrophyte 2 (<i>P. crassipes</i>)	Non-native macrophyte 3 (<i>S. molesta</i>)
Fe	46	No reduction	18
Zn	57	89	65
As	No reduction	81	83
Cr	1	77	31
Pb	37	68	56
Hg	59	53	15
Cu	57	88	60
P	60	87	57