Supplementary Information for:

Hydromorphological rehabilitation improves channel morphology, in-stream biotopes and macroinvertebrate communities, and thus enhances the conservation of an urban river

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Table S1. Summary of results from Principal Components Analysis (PCA) of predictor variables (channel morphology metrics and biotope composition) between the study reaches.

Eigenvalues			
PC	Eigenvalues	%Variation	Cumulative % Variation
1	8.52	60.9	60.9
2	3.64	26.0	86.9

Eigenvectors (Coefficients in the linear combinations of variables making up PCs)		
Variable	PC1	PC2
CV-depth	0.294	-0.241
CV-width	0.335	0.024
SWI-biotope	0.299	0.549
Wet surface area	0.291	-0.242
Number of biotopes	0.322	0.572
Cobbles%	0.329	-0.127
Gravel%	0.530	-0.130
Sand%	-0.181	0.001
Silt%	-0.540	-0.005
Tree root%	0.095	0.471
Marginal plant%	0.178	0.542
Leaf litter%	0.135	0.580
Macroalgae%	0.238	0.040
Macrophytes, Submerged, fine-leaved%	-0.206	0.040

Table S2. Main permutational MANOVA results for the predictor variables (channel morphology metrics and biotope composition). Bold font indicates significant (P<0.05) differences.

Source	df	SS	S	Pseudo-F	P(perm)	Unique perms
Period	1	5.6966	5.6966	125.3	**0.001**	997
Reach	2	67.838	33.919	746.5	**0.001**	996
Period x Reach	2	11.411	5.7053	125.2	**0.001**	997
Residual	12	0.0545	0.05416			
Total	17	85				

Table S3. Summary of the permutational MANOVA pair-wise analysis for between reach differences in predictor variables (channel morphology metrics and biotope composition). Reaches compared before and after the rehabilitation process. Bold font indicates significant (P<0.05) differences.

Period	PERMANOVA results		
Before	Reaches	t	P(perm)
	Control, Reference	77.626	**0.001**
	Control, Rehabilitated	1.0036	0.3508
	Reference, Rehabilitated	71.49	**0.001**
After	Reaches	t	P(perm)
	Control, Reference	63.65	**0.001**
	Control, Rehabilitated	14.24	**0.001**
	Reference, Rehabilitated	37.88	**0.001**

Table S4. Summary of Permutational MANOVA pair-wise analysis of temporal differences channel morphology metrics and biotope composition for each reach separately. Bold font indicates significant (P<0.05) differences.

Study reaches	Period	t	P(perm)
Control reach	Before, After	1.462	0.102
Reference reach	Before, After	2.46	0.105
Rehabilitated reach	Before, After	9.23	**0.002**

Table S5. Presence/Absence list of macroinvertebrate taxa recorded according to the study reaches.

Order	Family	Genus	Before rehabilitation			After rehabilitation		
			Control	Reference	Rehabilitated	Control	Reference	Rehabilitated
Amphipoda	Gammaridae	*Gammarus pulex*	X	X	X	X	X	X
Isopoda	Asellidae	*Asellus aquaticus*	X	X	X	X	X	X
Lymnaeoidea	Lymnaeidae	*Lymnaea (Radix) peregra*		X	X		X	X
		Lymnaea truncatula	X	X	X	X	X	X
Heterostropha	Valvatidae	*Valvata macrostoma*	X			X		
Rissooidea	Hydrobiidae	*Potamopyrgus antipodarum*	X	X	X	X	X	X
	Bithyniidae	*Bithynia tentaculata*	X	X	X	X	X	X
		Bithynia leachii	X	X	X	X	X	X
Planorboidea	Planorbidae	*Planorbis contortus*	X	X		X	X	X
		Ancylus fluviatilis	X	X		X	X	X
		Ancylus lacustris		X			X	X
Veneroida	Pisidiidae	*Pisidium sp.*		X	X		X	X
	Sphaeriidae	*Sphaerium sp.*	X	X	X	X	X	X
Unionoida	Unionidae	*Anadonta sp.*	X			X		
Rhynchobdellida	Glossiphoniidae	*Glossiphonia complanata*	X	X	X	X	X	X
		Helobdella stagnalis		X	X			X
	Erpobdellidae	*Erpobdella octoculata*	X	X	X	X	X	X
		Erpobdella testacea	X	X	X	X		

Lumbriculida	Lumbriculidae	Lumbriculidae		X	X		X	X	
Lumbricina	Lumbricidae	Lumbricidae		X	X				
Haplotaxida	Tubificidae	Tubificidae	X	X	X	X	X	X	
	Naididae	*Nais sp.*	X	X	X	X	X	X	
Tricladida	Planariidae	*Polycelis felina*	X			X		X	
Coleoptera	Elmidae	Elmidae		X			X	X	
	Scirtidae	Scirtidae		X			X	X	
	Haliplidae	Dytiscidae		X			X	X	
Diptera	Muscidae	Muscidae		X					
	Psychodidae	Psychodidae	X	X	X	X	X		
	Ptychopteridae	Ptychopteridae		X			X		
	Tabanidae	Tabanidae		X			X		
	Stratiomyidae	Stratiomyidae					X		
	Empididae	Empididae					X		
	Tipulidae	Tipulidae		X			X	X	
	Pediciidae	Pediciidae		X			X	X	
	Simuliidae	Simuliidae	X	X	X	X	X	X	
	Ceratopogonidae	Ceratopogonidae	X	X	X	X	X	X	
	Chironomidae	Chironominae	X	X	X	X	X	X	
		Prodiamesinae	X	X	X	X	X	X	
		Orthocladiinae	X	X	X	X	X	X	
		Diamesinae	X	X	X	X			
		Tanypodinae	X	X	X	X	X	X	
Trichoptera	Hydropsychidae	*Hydropsyche siltatay*		X			X	X	
		Hydropsyche instabilus		X			X		
		Halesus radiatus.	X	X	X	X	X		
	Limnephilidae	*Halesus digitatus*					X		

		Limnephilus lunatus.	X	X	X		X	X
		Limnephilus nigriceps	X	X		X	X	X
		Anabolia nervosa	X		X	X		
		Chaetopteryx villosa	X	X	X		X	X
		Glyphotaelius pellucidus		X			X	X
		Phacopteryx brevipennis					X	
		Micropterna sp.		X			X	X
	Leptoceridae	*Mystacides longicornis(azurea)*		X			X	X
		Ceraclea sp.		X			X	X
	Lepidostomatidae	*Crunoecia irrorata*		X			X	
		Lepidostoma hirtum		X			X	
		Lasiocephala basalis		X			X	X
	Sericostomatidae	*Sericostoma personatum*	X	X	X	X	X	X
	Glossosomatidae	*Agapetus fuscipes*		X			X	X
	Hydroptilidae	Hydroptilidae					X	
	Polycentropodidae	*Plectrocnemia conspersa*		X			X	
		Polycentropus flavomaculatus		X			X	X
	Beraeidae	*Beraea pullata*		X			X	X
	Goeridae	*Silo pallipes*		X			X	X
		Goera pilosa		X			X	
Ephemeroptera	Baetidae	*Baetis rhodani*	X	X	X	X	X	X
		Centroptilum luteolum		X			X	X
	Caenidae	*Caenis luctuosa*	X	X	X	X	X	X
	Ephemeridae	*Ephemera danica*		X			X	
	Ephemerellidae	*Serratella ignita*		X			X	

	Leptophlebiidae	*Habrophlebia fusca*	X	X	X	X	X	X
		Paraleptophlebia werneri		X			X	
Megaloptera	Sialidae	*Sialis lutaria*	X	X	X	X	X	X
Odonata	Calopterygidae	*Calopteryx virgo*			X			X
	Coenagrionidae	*Coenagrion sp.*	X		X	X		
Hemiptera	Veliidae	*Velia caprai*			X			
Acari	Libertiidae	*Lebirtia porosa*	X	X	X	X	X	X
	Hygrobatidae	*Hygrobates sp (longu)*	X	X	X	X	X	X
	Sperchontidae	*Sperchon sp.*	X	X	X	X	X	X
	Hydryphantidae	*Diplodontus despiciens*		X			X	
	Limnesiidae	*Limnesia sp*	X	X		X	X	X
	Arrenuridae	*Arrenurus truncatellus*		X			X	X
	Mideopsidae	*Mideopsis orbicularis*		X			X	
Total number of taxa			40	71	40	38	71	55

Table S6. Main permutational ANOVA results for all measured macroinvertebrate metrics. Bold font indicates significant (P<0.05) differences.

Total density (individuals m^{-2})						
Source	df	SS	S	Pseudo-F	P(perm)	Unique perms
Period	1	218.26	218.26	30.048	**0.0001**	9822
Reach	2	1748.8	874.42	120.38	**0.0001**	9952
Period x Reach	2	347.51	173.76	23.921	**0.0001**	9949
Residual	30	217.92	7.2639			
Total	35	2532.5				
Total biomass (mgDM m^{-2})						
Source	df	SS	S	Pseudo-F	P(perm)	Unique perms
Period	1	7.4376	7.4376	36.486	**0.0001**	9813
Reach	2	72.924	36.462	178.87	**0.0001**	9942
Period x Reach	2	12.815	6.4077	31.434	**0.0001**	9953
Residual	30	6.1155	0.20385			
Total	35	99.293				
Taxon richness						
Source	df	SS	S	Pseudo-F	P(perm)	Unique perms
Period	1	0.073575	0.073575	0.41544	0.528	9845
Reach	2	90.93	45.465	256.72	**0.0001**	9954
Period x Reach	2	2.711	1.3555	7.6536	**0.002**	9961
Residual	30	5.3131	0.1771			
Total	35	99.028				
Taxon diversity						
Source	df	SS	S	Pseudo-F	P(perm)	Unique perms
Period	1	4.3544	4.3544	50.058	**0.0001**	9830
Reach	2	23.3	11.65	133.93	**0.0001**	9959
Period x Reach	2	9.7765	4.8882	56.195	**0.0001**	9953
Residual	30	2.6096	0.086987			
Total	35	40.04				
Evenness						
Source	df	SS	S	Pseudo-F	P(perm)	Unique perms
Period	1	0.1421	0.1421	31.745	**0.0001**	9838
Reach	2	0.28799	0.14399	32.169	**0.0001**	9960
Period x Reach	2	0.28533	0.14267	31.872	**0.0001**	9943
Residual	30	0.13429	0.0044762			
Total	35	0.84971				
EPT richness						
Source	df	SS	S	Pseudo-F	P(perm)	Unique perms
Period	1	0.40303	0.40303	5.9458	**0.0164**	9847
Reach	2	5.3714	2.6857	39.621	**0.0001**	9951
Period x Reach	2	0.02468	0.01234	0.18204	0.8514	9948
Residual	30	2.0335	0.067785			
Total	35	7.8326				

EPT diversity

Source	df	SS	S	Pseudo-F	P(perm)	Unique perms
Period	1	0.34554	0.34554	3.8102	0.0646	9832
Reach	2	15.679	7.8397	86.447	**0.0001**	9932
Period x Reach	2	1.947	0.97348	10.734	**0.0003**	9940
Res	30	2.7206	0.090688			
Total	35	20.693				

EPT count%

Source	df	SS	S	Pseudo-F	P(perm)	Unique perms
Period	1	0.2107	0.2107	4.7995	**0.0351**	9804
Reach	2	11.974	5.9871	136.38	**0.0001**	9952
Period x Reach	2	1.1844	0.59219	13.49	**0.0001**	9949
Residual	30	1.317	0.043899			
Total	35	14.686				

EPT biomass%

Source	df	SS	S	Pseudo-F	P(perm)	Unique perms
Period	1	0.00016	0.00016	0.000844	0.9784	9829
Reach	2	4.5943	2.2972	11.947	**0.0003**	9952
Period x Reach	2	0.12826	0.06413	0.33352	0.7292	9963
Residual	30	5.7685	0.19228			
Total	35	10.491				

Chironomidae count%

Source	df	SS	S	Pseudo-F	P(perm)	Unique perms
Period	1	4.7217	4.7217	11.33	**0.0024**	9838
Reach	2	125.25	62.625	150.27	**0.0001**	9945
Period x Reach	2	32.198	16.099	38.63	**0.0001**	9951
Residual	30	12.502	0.41674			
Total	35	174.67				

Chironomidae biomass%

Source	df	SS	S	Pseudo-F	P(perm)	Unique perms
Period	1	1.0236	1.0236	2.4806	0.1298	9844
Reach	2	94.917	47.458	115.02	**0.0001**	9952
Period x Reach	2	15.024	7.512	18.205	**0.0001**	9959
Residual	30	12.379	0.41262			
Total	35	123.34				

Table S7. Summary of the permutational ANOVA pair-wise analysis for between reach differences in macroinvertebrate community structural univariate metrics. Reaches compared before and after the rehabilitation process. Bold font indicates significant (P<0.05) differences.

Community metrics	Period	PERMANOVA results			
Total density	Before	Reaches	t	P(perm)	Unique perms
		Control, Reference	10.369	**0.0026**	462
		Control, Rehabilitated	1.0036	0.3508	461
		Reference, Rehabilitated	20.103	**0.0028**	462
	After	Reaches	t	P(perm)	Unique perms
		Control, Reference	8.39	**0.0021**	461
		Control, Rehabilitated	12.503	**0.0030**	460
		Reference, Rehabilitated	5.8018	**0.0012**	462
Total biomass	Before	Reaches	t	P(perm)	Unique perms
		Control, Reference	17.01	**0.0019**	461
		Control, Rehabilitated	0.04212	0.9732	462
		Reference, Rehabilitated	8.906	**0.0026**	462
	After	Reaches	t	P(perm)	Unique perms
		Control, Reference	17.177	**0.0033**	458
		Control, Rehabilitated	13.416	**0.002**	462
		Reference, Rehabilitated	4.6582	**0.0043**	461
Taxon richness	Before	Reaches	t	P(perm)	Unique perms
		Control, Reference	14.259	0.0016	462
		Control, Rehabilitated	1.3148	0.2224	462
		Reference, Rehabilitated	17.174	0.0017	462
	After	Reaches	t	P(perm)	Unique perms
		Control, Reference	11.64	0.0022	461
		Control, Rehabilitated	16.324	0.0025	461
		Reference, Rehabilitated	0.06559	0.9477	459
Taxon diversity	Before	Reaches	t	P(perm)	Unique perms
		Control, Reference	11.106	0.0015	462
		Control, Rehabilitated	0.10498	0.9458	461
		Reference, Rehabilitated	19.376	0.0024	460
	After	Reaches	t	P(perm)	Unique perms
		Control, Reference	9.0647	0.0021	461
		Control, Rehabilitated	13.423	0.0021	462
		Reference, Rehabilitated	1.6262	0.1289	461
Evenness	Before	Reaches	t	P(perm)	Unique perms
		Control, Reference	4.4796	0.0021	462
		Control, Rehabilitated	1.8349	0.0904	461
		Reference, Rehabilitated	14.731	0.0021	459
	After	Reaches	t	P(perm)	Unique perms
		Control, Reference	5.1426	0.0021	462
		Control, Rehabilitated	7.0026	0.0022	462
		Reference, Rehabilitated	4.0097	0.0016	462
EPT richness	Before	Reaches	t	P(perm)	Unique perms
		Control, Reference	5.8381	0.0033	462
		Control, Rehabilitated	0.77586	0.4434	462
		Reference, Rehabilitated	8.9786	0.0025	462
	After	Reaches	t	P(perm)	Unique perms
		Control, Reference	7.1795	0.0013	462
		Control, Rehabilitated	7.959	0.0021	462
		Reference, Rehabilitated	0.20935	0.8384	462
EPT diversity	Before	Reaches	t	P(perm)	Unique perms

		Control, Reference	11.917	0.0027	462
		Control, Rehabilitated	0.52607	0.6056	462
		Reference, Rehabilitated	10.23	0.0024	462
	After	Reaches	t	P(perm)	Unique perms
		Control, Reference	5.4277	0.0022	462
		Control, Rehabilitated	14.522	0.0023	459
		Reference, Rehabilitated	2.9514	0.0207	462
EPT count%	Before	Reaches	t	P(perm)	Unique perms
		Control, Reference	11.629	0.0028	462
		Control, Rehabilitated	2.3385	0.0634	460
		Reference, Rehabilitated	17.183	0.0019	461
	After	Reaches	t	P(perm)	Unique perms
		Control, Reference	8.5594	0.0023	462
		Control, Rehabilitated	6.7174	0.0028	460
		Reference, Rehabilitated	6.5368	0.0018	462
Chironomidae count%	Before	Reaches	t	P(perm)	Unique perms
		Control, Reference	11.998	0.0024	459
		Control, Rehabilitated	0.4688	0.6815	462
		Reference, Rehabilitated	15.025	0.0029	462
	After	Reaches	t	P(perm)	Unique perms
		Control, Reference	11.566	0.0028	460
		Control, Rehabilitated	14.662	0.0021	459
		Reference, Rehabilitated	2.0982	0.0722	462
EPT biomass%	Before	Reaches	t	P(perm)	Unique perms
		Control, Reference	3.533	0.0027	461
		Control, Rehabilitated	0.06119	0.9278	462
		Reference, Rehabilitated	6.8344	0.0012	462
	After	Reaches	t	P(perm)	Unique perms
		Control, Reference	2.8012	0.0139	462
		Control, Rehabilitated	5.0864	0.0025	462
		Reference, Rehabilitated	1.7723	0.1263	462
Chironomidae biomass%	Before	Reaches	t	P(perm)	Unique perms
		Control, Reference	8.4562	0.0026	460
		Control, Rehabilitated	1.1464	0.2877	462
		Reference, Rehabilitated	5.7692	0.0025	462
	After	Reaches	t	P(perm)	Unique perms
		Control, Reference	10.76	0.0013	462
		Control, Rehabilitated	11.921	0.0023	462
		Reference, Rehabilitated	2.1455	0.0561	462

Table S8. Summary of permutational ANOVA pair-wise analysis of temporal differences in macroinvertebrate univariate metrics for each reach separately. Bold font indicates significant (P<0.05) differences.

Control reach temporal differences				Reference reach temporal differences				Rehabilitated reach temporal differences			
Total Density (individuals m^{-2})				**Total Density (individuals m^{-2})**				**Total Density (individuals m^{-2})**			
Period	t	*P*(perm)	Unique perms	Period	t	*P*(perm)	Unique perms	Period	t	*P*(perm)	Unique perms
Before, After	0.096512	0.9426	462	Before, After	0.89428	0.386	462	Before, After	5.5409	**0.002**	462
Total Biomass (mgDM m^{-2})				**Total Biomass (mgDM m^{-2})**				**Total Biomass (mgDM m^{-2})**			
Period	t	*P*(perm)	Unique perms	Period	t	*P*(perm)	Unique perms	Period	t	P(perm)	Unique perms
Before, After	1.1844	0.289	461	Before, After	1.7901	0.0995	461	Before, After	7.3531	**0.0016**	462
Taxon Richness				**Taxon Richness**				**Taxon Richness**			
Period	t	*P*(perm)	Unique perms	Period	t	*P*(perm)	Unique perms	Period	t	*P*(perm)	Unique perms
Before, After	1.0126	0.3367	461	Before, After	1.7213	0.1141	462	Before, After	16.108	**0.0019**	460
Taxon Diversity				**Taxon Diversity**				**Taxon Diversity**			
Period	t	*P*(perm)	Unique perms	Period	t	*P*(perm)	Unique perms	Period	t	P(perm)	Unique perms
Before, After	0.27596	0.7119	462	Before, After	0.12355	0.9085	462	Before, After	23.478	**0.0031**	461
Evenness				**Evenness**				**Evenness**			
Period	t	*P*(perm)	Unique perms	Period	t	*P*(perm)	Unique perms	Period	t	*P*(perm)	Unique perms
Before, After	0.2274	0.6661	462	Before, After	0.71059	0.4974	462	Before, After	20.882	**0.0024**	461
EPT Richness				**EPT Richness**				**EPT Richness**			
Period	t	*P*(perm)	Unique perms	Period	t	*P*(perm)	Unique perms	Period	t	*P*(perm)	Unique perms
Before, After	0.49866	0.6213	461	Before, After	1.5081	0.1595	462	Before, After	8.2456	**0.002**	462
EPT Diversity				**EPT Diversity**				**EPT Diversity**			
Period	t	*P*(perm)	Unique perms	Period	t	*P*(perm)	Unique perms	Period	t	P(perm)	Unique perms
Before, After	0.83783	0.4321	462	Before, After	0.67687	0.5132	462	Before, After	15.327	**0.003**	462
EPT Count%				**EPT Count%**				**EPT Count%**			
Period	t	*P*(perm)	Unique perms	Period	t	*P*(perm)	Unique perms	Period	t	*P*(perm)	Unique perms
Before, After	0.45726	0.6424	462	Before, After	1.6572	0.1251	462	Before, After	14.084	**0.0027**	460
Chironomidae Count%				**Chironomidae Count%**				**Chironomidae Count%**			
Period	t	*P*(perm)	Unique perms	Period	t	*P*(perm)	Unique perms	Period	t	*P*(perm)	Unique perms
Before, After	1.0015	0.3361	462	Before, After	0.39261	0.7189	462	Before, After	14.035	**0.003**	461
EPT Biomass%				**EPT Biomass%**				**EPT Biomass%**			
Period	t	P(perm)	Unique perms	Period	t	P(perm)	Unique perms	Period	t	P(perm)	Unique perms
Before, After	0.069035	0.846	461	Before, After	1.5437	0.1424	460	Before, After	4.7802	**0.0043**	461

Chironomidae Biomass%				**Chironomidae Biomass%**				**Chironomidae Biomass%**			
Period	t	P(perm)	Unique perms	Period	t	P(perm)	Unique perms	Period	t	P(perm)	Unique perms
Before, After	0.84159	0.4182	462	Before, After	0.41499	0.6859	462	Before, After	4.798	**0.0024**	462

Table S9. Main permutational ANOVA results for all measured macroinvertebrate FFG density (individual.m^{-2}).

Absorber						
Source	df	SS	S	Pseudo-F	P(perm)	Unique perms
Period	1	4.3821	4.3821	1.7957	0.1905	9837
Reach	2	2.7271	1.3635	0.55874	0.5748	9957
Period x Reach	2	2.75	1.375	0.56344	0.5773	9957
Residual	30	73.21	2.4403			
Total	35	83.069				
Deposit-feeder						
Source	df	SS	S	Pseudo-F	P(perm)	Unique perms
Period	1	0.24766	0.24766	0.11041	0.747	9840
Reach	2	95.644	7.822	1.327	0.0701	9957
Period x Reach	2	4.7019	2.3509	1.0481	0.3635	9952
Residual	30	67.292	2.2431			
Total	35	167.89				
Shredders						
Source	df	SS	S	Pseudo-F	P(perm)	Unique perms
Period	1	155.27	155.27	50.977	**0.0001**	9816
Reach	2	1185.6	592.82	194.63	**0.0001**	9956
Period x Reach	2	276.65	138.33	45.415	**0.0001**	9953
Residual	30	91.374	3.0458			
Total	35	1708.9				
Scraper						
Source	df	SS	S	Pseudo-F	P(perm)	Unique perms
Period	1	107	107	39.071	**0.001**	999
Reach	2	1510	755.02	275.71	**0.001**	999
Period x Reach	2	165.06	82.529	30.137	**0.001**	999
Residual	30	82.155	2.7385			
Total	35	1864.2				
Filter-feeder						
Source	df	SS	S	Pseudo-F	P(perm)	Unique perms
Period	1	66.806	66.806	30.842	**0.001**	997
Reach	2	206.47	103.24	47.662	**0.001**	999
Period x Reach	2	29.552	14.776	6.8216	**0.003**	999
Residual	30	64.981	2.166			
Total	35	367.81				
Piercer						
Source	df	SS	S	Pseudo-F	P(perm)	Unique perms
Period	1	10.676	10.676	13.124	0.0912	9845
Reach	2	27.133	13.566	16.676	0.0702	9944
Period x Reach	2	6.508	3.254	4	0.0822	9953
Residual	30	24.405	0.8135			
Total	35	68.722				

Predator

Source	df	SS	S	Pseudo-F	P(perm)	Unique perms
Period	1	16.964	16.964	7.2263	0.0646	9824
Reach	2	45.252	22.626	6.3106	0.0801	9954
Period x Reach	2	80.672	40.336	11.938	0.0601	9949
Residual	30	55.159	1.8386			
Total	35	198.05				

Parasite

Source	df	SS	S	Pseudo-F	P(perm)	Unique perms
Period	1	1.3371	1.3371	1.1869	0.2798	9840
Reach	2	46.713	23.357	20.734	0.0911	9952
Period x Reach	2	3.3996	1.6998	1.5089	0.244	9957
Residual	30	33.795	1.1265			
Total	35	85.245				

Table S10. Summary of the permutational ANOVA pair-wise analysis for between reach differences in macroinvertebrate FFG, based on groups' average density. Reaches compared before and after the rehabilitation process. Bold font indicates significant (P<0.05) differences.

Community metrics	Period	PERMANOVA results			
Shredders	Before	Reaches	t	P(perm)	Unique perms
		Control, Reference	12.495	0.0021	462
		Control, Rehabilitated	2.1481	0.0604	461
		Reference, Rehabilitated	23.355	0.0017	461
	After	Reaches	t	P(perm)	Unique perms
		Control, Reference	10.799	0.0022	462
		Control, Rehabilitated	8.7535	0.0029	461
		Reference, Rehabilitated	3.3384	0.0044	460
Scraper	Before	Reaches	t	P(perm)	Unique perms
		Control, Reference	11.23	0.0017	462
		Control, Rehabilitated	0.34562	0.7306	462
		Reference, Rehabilitated	28.252	0.0019	458
	After	Reaches	t	P(perm)	Unique perms
		Control, Reference	11.883	0.0013	462
		Control, Rehabilitated	3.2085	0.0087	462
		Reference, Rehabilitated	10.426	0.0028	462
Filter-feeder	Before	Reaches	t	P(perm)	Unique perms
		Control, Reference	4.5162	0.0059	462
		Control, Rehabilitated	0.86409	0.4117	462
		Reference, Rehabilitated	9.3217	0.0021	461
	After	Reaches	t	P(perm)	Unique perms
		Control, Reference	6.5052	0.0023	461
		Control, Rehabilitated	5.1165	0.007	458
		Reference, Rehabilitated	5.1072	0.0013	461

Table S11. Summary of permutational ANOVA pair-wise analysis of seasonal differences in macroinvertebrate FFG, based on groups' average density, for each reach separately. Bold font indicates significant (P<0.05) differences.

Control reach temporal differences				Reference reach temporal differences				Rehabilitated reach temporal differences			
Shredders				**Shredders**				**Shredders**			
Period	t	P(perm)	Unique perms	Period	t	P(perm)	Unique perms	Period	t	P(perm)	Unique perms
Before, After	0.18347	0.7654	457	Before, After	0.21901	0.8356	462	Before, After	15.68	**0.0025**	462
Scraper				**Scraper**				**Scraper**			
Period	t	P(perm)	Unique perms	Period	t	P(perm)	Unique perms	Period	t	P(perm)	Unique perms
Before, After	0.011795	0.9944	461	Before, After	1.1027	0.2932	462	Before, After	13.06	**0.0028**	462
Filter-feeder				**Filter-feeder**				**Filter-feeder**			
Period	t	P(perm)	Unique perms	Period	t	P(perm)	Unique perms	Period	t	P(perm)	Unique perms
Before, After	0.43666	0.6563	462	Before, After	0.32395	0.7367	462	Before, After	6.2004	**0.0026**	462