

Online Appendix 1. Nested ANOVAs to test the effect of small dams on macroinvertebrate community attributes. Significant p values are in bold. Factor in parenthesis is nested within the factor out of the parenthesis.

Source of variation	DF	F	p	Source of variation	DF	F	p
Total abundance				Shannon diversity			
Dam	1	10.42	0.001	Dam	1	3.98	0.047
Reach	1	0.04	0.949	Reach	1	5.60	0.019
Period	1	25.02	0.038	Period	1	189.55	0.005
Date (Period)	2	1.99	0.138	Date (Period)	2	0.03	0.966
Habitat	2	3.18	0.048	Habitat	2	32.11	<0.001
Replicate (Habitat)	6	0.48	0.825	Replicate (Habitat)	6	0.24	0.964
Dam × Reach	1	1.01	0.316	Dam × Reach	1	6.85	0.009
Dam × Reach × Period	1	1.24	0.266	Dam × Reach × Period	1	2.85	0.092
Dam × Reach × Habitat × Period	2	0.54	0.581	Dam × Reach × Habitat × Period	2	1.56	0.212
Taxonomic richness				Evenness			
Dam	1	0.28	0.599	Dam	1	9.58	0.002
Reach	1	1.66	0.198	Reach	1	5.98	0.015
Period	1	108.59	0.009	Period	1	7.43	0.112
Date (Period)	2	10.53	0.592	Date (Period)	2	0.04	0.963
Habitat	2	896.11	<0.001	Habitat	2	14.64	<0.001
Replicate (Habitat)	6	8.48	0.863	Replicate (Habitat)	6	0.22	0.971
Dam × Reach	1	284.01	0.001	Dam × Reach	1	2.00	0.159
Dam × Reach × Period	1	34.72	0.189	Dam × Reach × Period	1	3.48	0.063
Dam × Reach × Habitat × Period	2	4.94	0.782	Dam × Reach × Habitat × Period	2	2.37	0.095

Online Appendix 2. Nested ANOVAs to test the effect of small dams on the abundance of functional feeding groups. Significant p values are in bold. Factor in parenthesis is nested within the factor out of the parenthesis.

Source of variation	DF	F	p	Source of variation	DF	F	p
Predators				Shredders			
Dam	1	3.01	0.084	Replicate (Habitat)	6	0.85	0.535
Reach	1	0.28	0.600	Dam × Reach	1	7.81	0.006
Period	1	20.86	0.045	Dam × Reach × Period	1	3.36	0.068
Date (Period)	2	2.63	0.074	Dam × Reach × Habitat × Period	2	0.23	0.795
Habitat	2	4.41	0.013	Gathering collectors			
Replicate (Habitat)	6	0.70	0.652	Dam	1	6.65	0.010
Dam × Reach	1	0.09	0.764	Reach	1	1.32	0.252
Dam × Reach × Period	1	0.24	0.624	Period	1	80.11	0.012
Dam × Reach × Habitat × Period	2	0.30	0.741	Date (Period)	2	0.52	0.597
Scrapers				Habitat	2	10.48	<0.001
Dam	1	10.42	0.001	Replicate (Habitat)	6	0.45	0.842
Reach	1	0.04	0.838	Dam × Reach	1	0.07	0.797
Period	1	15.32	0.059	Dam × Reach × Period	1	1.03	0.312
Date (Period)	2	0.04	0.962	Dam × Reach × Habitat × Period	2	1.84	0.161
Habitat	2	0.30	0.740	Filtering collectors			
Replicate (Habitat)	6	0.44	0.854	Dam	1	14.62	0.002
Dam × Reach	1	0.16	0.688	Reach	1	1.45	0.230
Dam × Reach × Period	1	0.13	0.719	Period	1	8.32	0.102
Dam × Reach × Habitat × Period	2	1.06	0.348	Date (Period)	2	3.05	0.049
Shredders				Habitat	2	68.40	<0.001
Dam	1	1.20	0.274	Replicate (Habitat)	6	0.86	0.544
Reach	1	0.19	0.660	Dam × Reach	1	2.36	0.125
Period	1	1.94	0.298	Dam × Reach × Period	1	0.01	0.915
Date (Period)	2	2.39	0.094	Dam × Reach × Habitat × Period	2	3.07	0.048
Habitat	2	67.85	<0.001				

Online Appendix 3. Nested ANOVAs to test the effect of small dams on the abundance of 22 macroinvertebrate benthic taxa. Significant *p* values are in bold. Factor in parenthesis is nested within the factor out of the parenthesis.

Source of variation	DF	<i>F</i>	<i>p</i>	Source of variation	DF	<i>F</i>	<i>p</i>	Source of variation	DF	<i>F</i>	<i>p</i>
DugesIIDae				<i>Americabaetis</i> sp.				<i>Varipes</i> sp.			
Dam	1	13.34	0.001	Dam	1	18.45	<0.001	Dam	1	315.67	<0.001
Reach	1	2.61	0.108	Reach	1	3.14	0.077	Reach	1	11.83	0.001
Period	1	2.85	0.234	Period	1	3.80	0.190	Period	1	63.82	0.015
Date (Period)	2	3.89	0.021	Date (Period)	2	0.98	0.375	Date (Period)	2	0.96	0.383
Habitat	2	13.34	<0.001	Habitat	2	22.47	<0.001	Habitat	2	12.15	<0.001
Replicate (Habitat)	6	0.92	0.479	Replicate (Habitat)	6	0.36	0.902	Replicate (Habitat)	6	0.22	0.971
Dam × Reach	1	5.32	0.022	Dam × Reach	1	0.04	0.849	Dam × Reach	1	2.95	0.080
Dam × Reach × Period	1	0.52	0.472	Dam × Reach × Period	1	0.30	0.584	Dam × Reach × Period	1	0.02	0.888
Dam × Reach × Habitat × Period	2	0.26	0.775	Dam × Reach × Habitat × Period	2	1.27	0.281	Dam × Reach × Habitat × Period	2	0.19	0.828
Naidinae				<i>Camelobaetidius penai</i>				<i>Caenis</i> sp.			
Dam	1	14.55	0.001	Dam	1	10.67	0.001	Dam	1	82.96	<0.001
Reach	1	2.93	0.088	Reach	1	4.42	0.036	Reach	1	6.86	0.009
Period	1	42.24	0.023	Period	1	145.22	0.007	Period	1	2.53	0.253
Date (Period)	2	4.68	0.010	Date (Period)	2	0.49	0.616	Date (Period)	2	1.36	0.259
Habitat	2	2.20	0.112	Habitat	2	122.33	<0.001	Habitat	2	19.60	<0.001
Replicate (Habitat)	6	0.88	0.509	Replicate (Habitat)	6	0.32	0.927	Replicate (Habitat)	6	0.18	0.981
Dam × Reach	1	0.10	0.756	Dam × Reach	1	0.08	0.779	Dam × Reach	1	0.06	0.806
Dam × Reach × Period	1	0.86	0.354	Dam × Reach × Period	1	0.10	0.755	Dam × Reach × Period	1	0.51	0.477
Dam × Reach × Habitat × Period	2	0.69	0.505	Dam × Reach × Habitat × Period	2	0.05	0.947	Dam × Reach × Habitat × Period	2	1.42	0.243
Hydrachnidia				<i>Paracloeodes</i> sp.				<i>Leptohyphes eximius</i>			
Dam	1	148.64	<0.001	Dam	1	48.59	<0.001	Dam	1	1.58	0.210
Reach	1	2.51	0.115	Reach	1	1.61	0.206	Reach	1	0.60	0.439
Period	1	19.13	0.048	Period	1	4.84	0.159	Period	1	37.60	0.026
Date (Period)	2	2.14	0.119	Date (Period)	2	0.81	0.445	Date (Period)	2	0.80	0.451
Habitat	2	1.98	0.140	Habitat	2	56.43	<0.001	Habitat	2	36.36	<0.001
Replicate (Habitat)	6	0.42	0.865	Replicate (Habitat)	6	1.82	0.096	Replicate (Habitat)	6	1.27	0.272
Dam × Reach	1	0.66	0.418	Dam × Reach	1	3.27	0.071	Dam × Reach	1	0.17	0.682
Dam × Reach × Period	1	0.15	0.698	Dam × Reach × Period	1	3.61	0.058	Dam × Reach × Period	1	0.02	0.878
Dam × Reach × Habitat × Period	2	0.05	0.950	Dam × Reach × Habitat × Period	2	0.04	0.957	Dam × Reach × Habitat × Period	2	1.72	0.181

Online Appendix 3. (Continued.)

Source of variation	DF	F	p
<i>Tricorythodes popayanicus</i>			
Dam	1	0.10	0.754
Reach	1	9.31	0.002
Period	1	82.08	0.012
Date (Period)	2	0.57	0.567
Habitat	2	58.56	<0.001
Replicate (Habitat)	6	0.36	0.905
Dam × Reach	1	3.19	0.075
Dam × Reach × Period	1	0.01	0.908
Dam × Reach × Habitat × Period	2	0.63	0.534
Coenagrionidae			
Dam	1	16.30	0.001
Reach	1	0.01	0.973
Period	1	16.12	0.057
Date (Period)	2	0.36	0.701
Habitat	2	39.07	<0.001
Replicate (Habitat)	6	0.32	0.929
Dam × Reach	1	0.44	0.505
Dam × Reach × Period	1	1.07	0.303
Dam × Reach × Habitat × Period	2	0.42	0.660
<i>Chimarra</i> sp.			
Dam	1	0.05	0.824
Reach	1	13.01	0.001
Period	1	2.68	0.243
Date (Period)	2	0.44	0.645
Habitat	2	71.44	<0.001
Replicate (Habitat)	6	1.40	0.216
Dam × Reach	1	0.01	0.965
Dam × Reach × Period	1	0.15	0.702
Dam × Reach × Habitat × Period	2	0.12	0.884

Source of variation	DF	F	p
<i>Marilia</i> sp.			
Dam	1	54.57	<0.001
Reach	1	1.70	0.193
Period	1	22.44	0.042
Date (Period)	2	0.16	0.854
Habitat	2	1.19	0.304
Replicate (Habitat)	6	0.58	0.742
Dam × Reach	1	9.15	0.003
Dam × Reach × Period	1	1.07	0.302
Dam × Reach × Habitat × Period	2	0.35	0.705
Elmidae			
Dam	1	75.53	<0.001
Reach	1	3.94	0.048
Period	1	12.82	0.070
Date (Period)	2	0.26	0.768
Habitat	2	29.96	<0.001
Replicate (Habitat)	6	0.31	0.932
Dam × Reach	1	1.55	0.215
Dam × Reach × Period	1	0.33	0.565
Dam × Reach × Habitat × Period	2	0.21	0.809
<i>Simulium wolffhuegeli</i>			
Dam	1	0.05	0.818
Reach	1	1.94	0.165
Period	1	6.62	0.123
Date (Period)	2	6.23	0.002
Habitat	2	168.26	<0.001
Replicate (Habitat)	6	0.85	0.529
Dam × Reach	1	0.59	0.442
Dam × Reach × Period	1	0.87	0.350
Dam × Reach × Habitat × Period	2	1.03	0.359

Source of variation	DF	F	p
<i>Polypedilum</i> sp.			
Dam	1	3.46	0.064
Reach	1	0.07	0.796
Period	1	1.49	0.347
Date (Period)	2	2.74	0.066
Habitat	2	62.03	<0.001
Replicate (Habitat)	6	1.14	0.337
Dam × Reach	1	7.61	0.006
Dam × Reach × Period	1	3.77	0.053
Dam × Reach × Habitat × Period	2	0.59	0.553
<i>Tanytarsus</i> sp.			
Dam	1	58.72	<0.001
Reach	1	0.50	0.480
Period	1	7.93	0.106
Date (Period)	2	1.04	0.355
Habitat	2	20.36	<0.001
Replicate (Habitat)	6	0.30	0.937
Dam × Reach	1	19.81	<0.001
Dam × Reach × Period	1	1.51	0.220
Dam × Reach × Habitat × Period	2	0.17	0.844
<i>Djalmabatista</i> sp.			
Dam	1	61.73	<0.001
Reach	1	4.28	0.039
Period	1	21.04	0.044
Date (Period)	2	1.12	0.327
Habitat	2	37.97	<0.001
Replicate (Habitat)	6	0.46	0.837
Dam × Reach	1	1.22	0.270
Dam × Reach × Period	1	0.03	0.871
Dam × Reach × Habitat × Period	2	0.65	0.521

Online Appendix 3. (Continued.)

Source of variation	DF	F	p
<i>Thienemannimyia</i> sp.			
Dam	1	95.65	< 0.001
Reach	1	0.35	0.557
Period	1	1.05	0.412
Date (Period)	2	0.82	0.442
Habitat	2	29.43	<0.001
Replicate (Habitat)	6	0.51	0.802
Dam × Reach	1	6.43	0.011
Dam × Reach × Period	1	0.04	0.948
Dam × Reach × Habitat × Period	2	0.98	0.376
<i>Corynoneura</i> sp.			
Dam	1	3.79	0.052
Reach	1	0.15	0.702
Period	1	18.99	0.048
Date (Period)	2	1.42	0.244
Habitat	2	17.11	<0.001
Replicate (Habitat)	6	0.43	0.857
Dam × Reach	1	2.42	0.121
Dam × Reach × Period	1	3.48	0.063
Dam × Reach × Habitat × Period	2	0.36	0.699

Source of variation	DF	F	p
<i>Lopescladius</i> sp.			
Dam	1	53.47	<0.001
Reach	1	19.48	<0.001
Period	1	1.82	0.310
Date (Period)	2	7.15	0.001
Habitat	2	4.57	0.011
Replicate (Habitat)	6	1.05	0.392
Dam × Reach	1	2.65	0.104
Dam × Reach × Period	1	0.48	0.489
Dam × Reach × Habitat × Period	2	0.02	0.978
<i>Cricotopus</i> sp. 3			
Dam	1	68.57	< 0.001
Reach	1	7.20	0.007
Period	1	24.64	0.038
Date (Period)	2	8.57	0.001
Habitat	2	39.07	<0.001
Replicate (Habitat)	6	0.80	0.567
Dam × Reach	1	10.61	0.001
Dam × Reach × Period	1	3.32	0.069
Dam × Reach × Habitat × Period	2	2.50	0.0839