Table S1. Fish length-mass equations from the National Fish Populations Database (Environment Agency, UK). Individual wet body mass (g), y, is estimated from body length (mm) measuremnts, x, using the forumala: $y = a*(x^b)$.

Common name	Species	Lw Factor Name	a	b
Barbel	*Barbus barbus*	Anglian FDPS / AN Default	0.00004862	2.7810
Chub	*Leuciscus cephalus*	Anglian FDPS / AN Default	0.00002606	2.8842
Dace	*Leuciscus leuciscus*	Anglian FDPS / AN Default	0.00000984	3.0457
Common carp varieties	*Cyprinus carpio*	Anglian FDPS (Common (wild) carp) / AN Default	0.00006245	2.8462
Gudgeon	*Gobio gobio*	Anglian FDPS / AN Default	0.00003327	2.8038
Roach	*Rutilus rutilus*	Anglian FDPS / AN Default	0.00000288	3.3495
Perch	*Perca fluviatilis*	Anglian FDPS / AN Default	0.00000352	3.3072
European eel	*Anguilla anguilla*	ANEAKE Dec 2002 Standard	0.00000078	3.1419
3-spined stickleback	*Gasterosteus aculeatus*	Anglian FDPS / AN Default	0.00091759	1.9527
Minnow	*Phoxinus phoxinus*	Anglian FDPS / AN Default	0.00000027	3.7585
Stone loach	*Barbatula barbatula*	Anglian FDPS / AN Default	0.00000027	3.7585
Flounder	*Platichthys flesus*	ANEAKE Oct 1994 Standard / AN Default	0.00003168	2.7888

Table S2. Comparison of maciroinvertbrate density between treatment reaches (Restored and Control) prior to restoration.

Response	Estimated difference from 'Control'	Std. Error	df	t value	P value
Log_{10} (total density)	0.03	0.08	37.00	0.35	0.726
Log_{10} (ARMI)	−0.13	0.10	38.00	−1.29	0.204
Log_{10} (EPT)	−0.07	0.09	38.00	−0.73	0.469

Table S3 Contrasts from linear-mixed effects models testing differences in macroinvertebrate density with restoration over the 5 year post-restoration monitoring period.

Group	Contrast	Difference	Std. Error	t value	P value
Total density	Year 1:Restored - Control	0.02	0.10	0.21	0.9999
Total density	Year 2:Restored - Control	0.29	0.10	3.04	0.0116
Total density	Year 3:Restored - Control	0.38	0.10	3.92	0.0004
Total density	Year 4:Restored - Control	0.39	0.10	4.10	0.0002
Total density	Year 5:Restored - Control	0.20	0.10	2.05	0.1851
ARMI	Year 1:Restored - Control	0.38	0.14	2.71	0.0334
ARMI	Year 2:Restored - Control	0.48	0.14	3.38	0.0037
ARMI	Year 3:Restored - Control	0.32	0.14	2.24	0.1184
ARMI	Year 4:Restored - Control	0.54	0.14	3.87	0.0005
ARMI	Year 5:Restored - Control	0.50	0.14	3.54	0.0020
EPT	Year 1:Restored - Control	0.45	0.14	3.30	0.0048
EPT	Year 2:Restored - Control	0.45	0.14	3.27	0.0054
EPT	Year 3:Restored - Control	0.33	0.14	2.43	0.0742
EPT	Year 4:Restored - Control	0.59	0.14	4.27	0.0001
EPT	Year 5:Restored - Control	0.49	0.14	3.59	0.0017
Amphipoda	Year 1:Restored - Control	0.15	0.12	1.22	0.7143
Amphipoda	Year 2:Restored - Control	0.31	0.12	2.59	0.0467
Amphipoda	Year 3:Restored - Control	0.15	0.12	1.22	0.7157
Amphipoda	Year 4:Restored - Control	0.27	0.12	2.21	0.1275
Amphipoda	Year 5:Restored - Control	0.38	0.12	3.15	0.0082
Asellidae	Year 1:Restored - Control	0.14	0.13	1.06	0.8187
Asellidae	Year 2:Restored - Control	0.40	0.13	3.04	0.0119
Asellidae	Year 3:Restored - Control	0.43	0.13	3.30	0.0048

Asellidae	Year 4:Restored - Control	0.32	0.13	2.43	0.0740
Asellidae	Year 5:Restored - Control	0.34	0.13	2.59	0.0473
Bivalvia	Year 1:Restored - Control	0.00	0.05	0.00	1.0000
Bivalvia	Year 2:Restored - Control	0.05	0.05	0.99	0.8582
Bivalvia	Year 3:Restored - Control	0.00	0.05	0.00	1.0000
Bivalvia	Year 4:Restored - Control	−0.05	0.05	−1.03	0.8379
Bivalvia	Year 5:Restored - Control	0.03	0.05	0.66	0.9718
Cased.Trichoptera	Year 1:Restored - Control	0.24	0.07	3.44	0.0029
Cased.Trichoptera	Year 2:Restored - Control	−0.05	0.07	−0.78	0.9422
Cased.Trichoptera	Year 3:Restored - Control	−0.04	0.07	−0.60	0.9812
Cased.Trichoptera	Year 4:Restored - Control	0.00	0.07	0.00	1.0000
Cased.Trichoptera	Year 5:Restored - Control	−0.05	0.07	−0.71	0.9609
Caseless.Trichoptera	Year 1:Restored - Control	0.00	0.13	0.00	1.0000
Caseless.Trichoptera	Year 2:Restored - Control	0.34	0.13	2.61	0.0448
Caseless.Trichoptera	Year 3:Restored - Control	0.21	0.13	1.59	0.4487
Caseless.Trichoptera	Year 4:Restored - Control	0.62	0.13	4.73	0.0000
Caseless.Trichoptera	Year 5:Restored - Control	0.65	0.13	4.97	0.0000
Chironomidae	Year 1:Restored - Control	−0.21	0.10	−2.06	0.1821
Chironomidae	Year 2:Restored - Control	−0.01	0.10	−0.09	1.0000
Chironomidae	Year 3:Restored - Control	−0.04	0.10	−0.42	0.9962
Chironomidae	Year 4:Restored - Control	0.04	0.10	0.37	0.9979
Chironomidae	Year 5:Restored - Control	0.08	0.10	0.81	0.9328
Ephemeroptera	Year 1:Restored - Control	0.36	0.11	3.33	0.0044
Ephemeroptera	Year 2:Restored - Control	0.30	0.11	2.70	0.0344
Ephemeroptera	Year 3:Restored - Control	0.29	0.11	2.61	0.0446
Ephemeroptera	Year 4:Restored - Control	0.01	0.11	0.06	1.0000
Ephemeroptera	Year 5:Restored - Control	−0.03	0.11	−0.32	0.9990

Gastropoda	Year 1:Restored - Control	0.00	0.09	0.00	1.0000
Gastropoda	Year 2:Restored - Control	0.02	0.09	0.25	0.9997
Gastropoda	Year 3:Restored - Control	0.00	0.09	0.00	1.0000
Gastropoda	Year 4:Restored - Control	0.07	0.09	0.72	0.9579
Gastropoda	Year 5:Restored - Control	−0.30	0.09	−3.15	0.0082
Hirudinea	Year 1:Restored - Control	0.09	0.09	0.99	0.8574
Hirudinea	Year 2:Restored - Control	0.25	0.09	2.69	0.0353
Hirudinea	Year 3:Restored - Control	0.23	0.09	2.45	0.0696
Hirudinea	Year 4:Restored - Control	0.06	0.09	0.67	0.9690
Hirudinea	Year 5:Restored - Control	0.09	0.09	0.93	0.8854
Oligochaeta	Year 1:Restored - Control	−0.17	0.14	−1.18	0.7423
Oligochaeta	Year 2:Restored - Control	0.14	0.14	0.94	0.8811
Oligochaeta	Year 3:Restored - Control	0.07	0.14	0.51	0.9908
Oligochaeta	Year 4:Restored - Control	0.21	0.14	1.45	0.5489
Oligochaeta	Year 5:Restored - Control	0.47	0.14	3.30	0.0047
Plecoptera	Year 1:Restored - Control	0.03	0.06	0.48	0.9935
Plecoptera	Year 2:Restored - Control	0.00	0.06	0.00	1.0000
Plecoptera	Year 3:Restored - Control	0.12	0.06	1.96	0.2279
Plecoptera	Year 4:Restored - Control	0.07	0.06	1.15	0.7661
Plecoptera	Year 5:Restored - Control	0.02	0.06	0.34	0.9987
Simuliidae	Year 1:Restored - Control	0.17	0.11	1.65	0.4030
Simuliidae	Year 2:Restored - Control	0.34	0.11	3.23	0.0062
Simuliidae	Year 3:Restored - Control	0.53	0.11	5.02	0.0000
Simuliidae	Year 4:Restored - Control	0.00	0.11	0.00	1.0000
Simuliidae	Year 5:Restored - Control	0.06	0.11	0.56	0.9859
Zygoptera	Year 1:Restored - Control	0.00	0.02	0.00	1.0000
Zygoptera	Year 2:Restored - Control	0.00	0.02	0.00	1.0000

Zygoptera	Year 3:Restored - Control	0.02	0.02	0.75	0.9515
Zygoptera	Year 4:Restored - Control	0.00	0.02	0.00	1.0000
Zygoptera	Year 5:Restored - Control	0.01	0.02	0.31	0.9991
Miscellaneous	Year 1:Restored - Control	0.01	0.08	0.13	1.0000
Miscellaneous	Year 2:Restored - Control	−0.01	0.08	−0.10	1.0000
Miscellaneous	Year 3:Restored - Control	−0.03	0.08	−0.38	0.9979
Miscellaneous	Year 4:Restored - Control	0.13	0.08	1.51	0.5022
Miscellaneous	Year 5:Restored - Control	−0.05	0.08	−0.55	0.9877

Table S4. Condition assessment of invertebrate assemblages based on the BMWP (Biological Monitoring Working Party) scores. The score for each family present is totalled to give a site score. Because these site BMWP scores are influenced by sample size (a high score can be achieved through a large number of low scoring families as well as a small number of high scoring families) an Average Score Per Taxa (ASPT) is also calculated from the resulting BMWP scores and allows further interpretation of the results. The higher the ASPT, the greater the proportion of more sensitive families in the sample and therefore the better the site condition.

Period	Reach	BMWP	ASPT	Contributing taxa	Status
Before	Upper-Control	99	4.5	22	Moderate
	Upper-Restored	74	4.11	18	Moderate
	Lower-Restored	92	4.18	22	Moderate
	Lower-Control	90	4.09	22	Moderate
After	Upper-Control	87	4.35	26	Moderate
	Upper-Restored	104	4.52	23	Good/mod
	Lower-Restored	105	4.57	26	Good/mod
	Lower-Control	121	4.65	24	Good/mod

Table S5. Summary output from linear-mixed effects modeling testing for differences in species body mass with restoration.

Common name	Species	Estimated difference from 'Control'	Std. Error	chisq	df	P value
Eel	Anguilla anguilla	0.19	0.08	143.80	2.353	0.0200
Stone loach	Barbatula barbatula	0.02	0.02	412.82	0.815	0.4160
Gudgeon	Gobio gobio	0.00	0.10	68.77	0.04	0.9681
Chub	Leuciscus cephalus	0.54	0.06	719.13	9.435	$<2\times10^{-16}$
Minnow	Phoxinus phoxinus	0.05	0.02	1940.00	2.112	0.0348

Table S6. Summary output from LME models testing for the effects of restoration on macroinvertebrate density across the 6 year monotring period.

log10(total density)	Estimate	Std. Error	df	t value	P value
(Intercept)	3.09	0.07	114.00	46.55	< 0.0001
periodYear1	0.02	0.09	114.00	0.26	0.7972
periodYear2	−0.06	0.09	114.00	−0.62	0.5347
periodYear3	−0.33	0.09	114.00	−3.56	0.0005
periodYear4	−0.72	0.09	114.00	−7.67	< 0.0001
periodYear5	−0.36	0.09	114.00	−3.86	0.0002
log10(ARMI+ 1)	**Estimate**	**Std. Error**	**df**	**t value**	**P value**
(Intercept)	1.68	0.09	23.95	17.81	< 0.0001
periodYear1	0.22	0.13	113.00	1.69	0.0933
periodYear2	0.44	0.13	113.00	3.33	0.0012
periodYear3	0.22	0.13	113.00	1.68	0.0949
periodYear4	0.12	0.13	113.00	0.92	0.3597
periodYear5	0.23	0.13	113.00	1.75	0.0832
log10(EPT + 1)	**Estimate**	**Std. Error**	**df**	**t value**	**P value**

(Intercept)	1.52	0.09	113.97	16.73	< 0.0001
periodYear1	0.20	0.13	114.00	1.56	0.1225
periodYear2	0.51	0.13	114.00	3.95	0.0001
periodYear3	0.16	0.13	114.00	1.25	0.2154
periodYear4	0.12	0.13	114.00	0.94	0.3469
periodYear5	0.29	0.13	114.00	2.28	0.0247
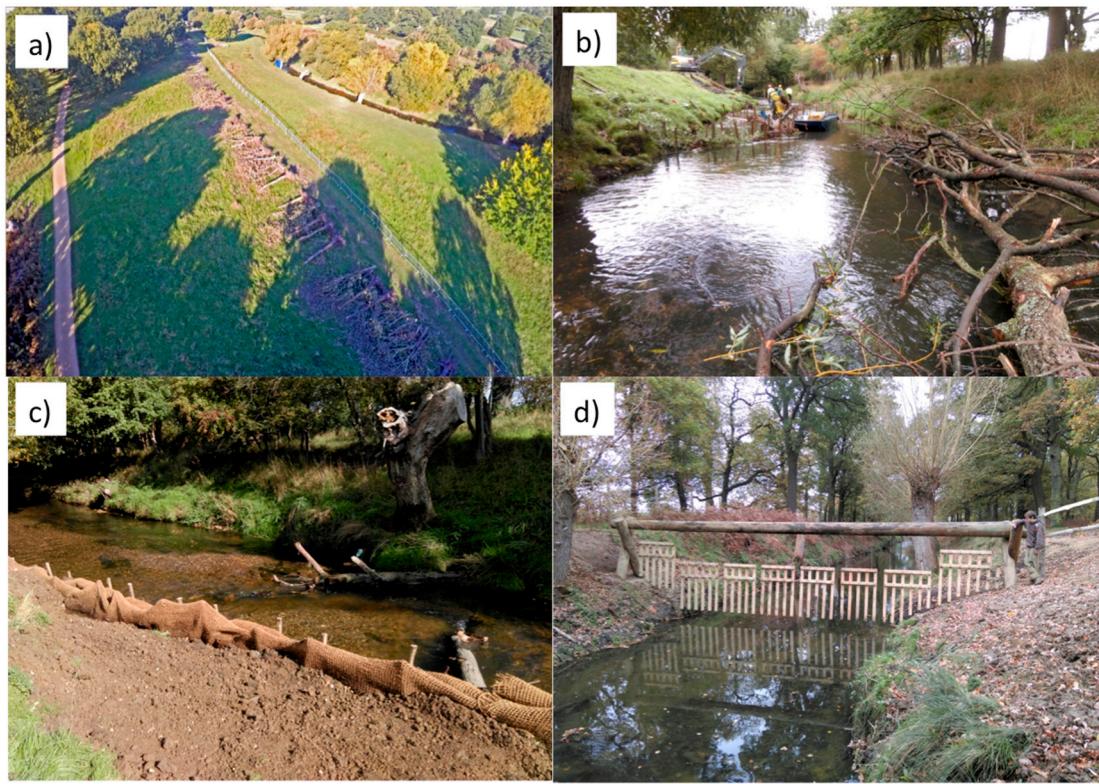
Figure S1. Beverley Brook restoration work. a) Some of the Large woody material (LWM) stockpile seen from the air; b) Tree tops and brash in the foreground before being compressed and secured; c) LWM immediately forming holes, shoals and riffles and d) river gates stopping deer access and marking the end of the restored section of the river.
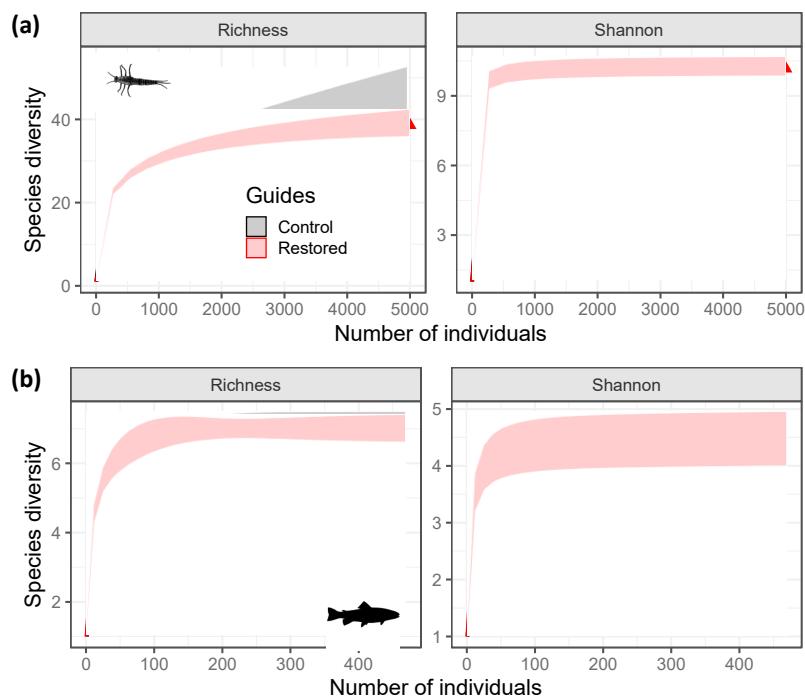
Figure S2. Species richness and Shannon diversity rarefaction (solid line segment) and extrapolation (dotted line segments) sampling curves between treatments for macroinvertebrate (a) and fish (b) assemblages pre-restoration (2015). Shaded areas indicate 95% confidence intervals and solid dots/triangles represent the reference samples.
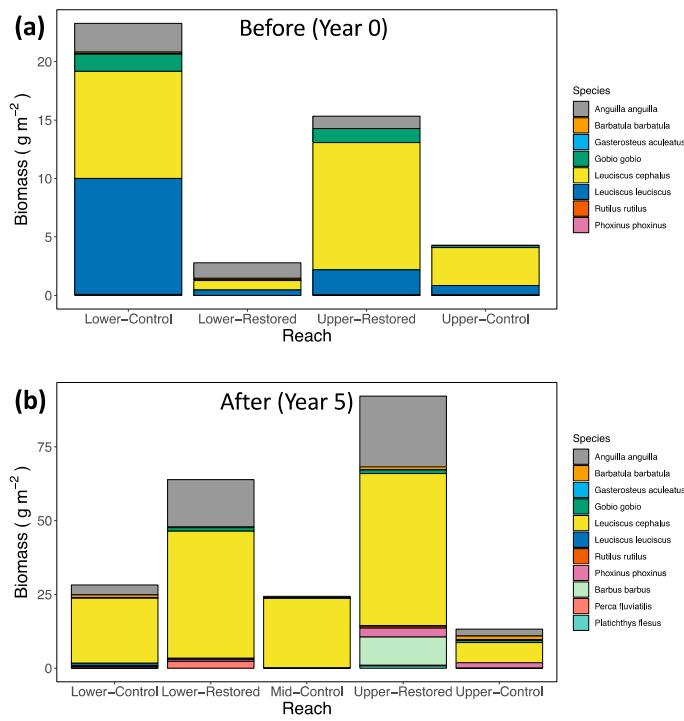
**Figure S3.** Fish biomass estimates for each monitoring reach before (a) and 5-years after (b) restoration.
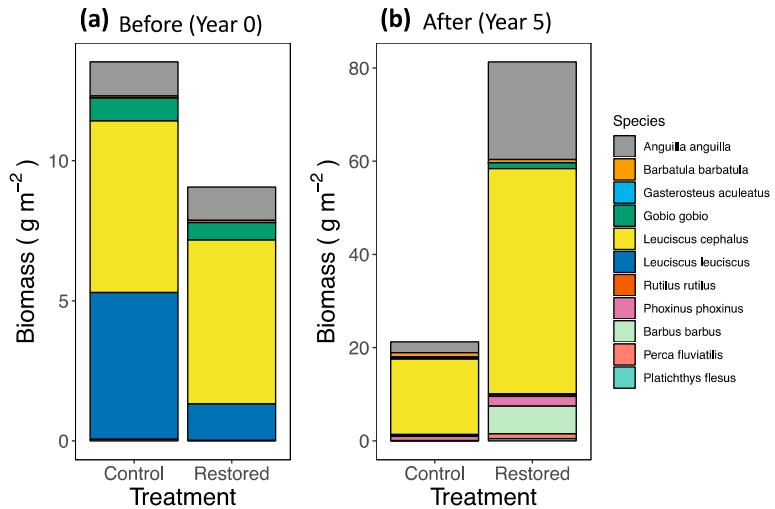
Figure S4. Fish biomass estimates (per unit stream area) between treatments before (a) and 5-years after (b) restoration.
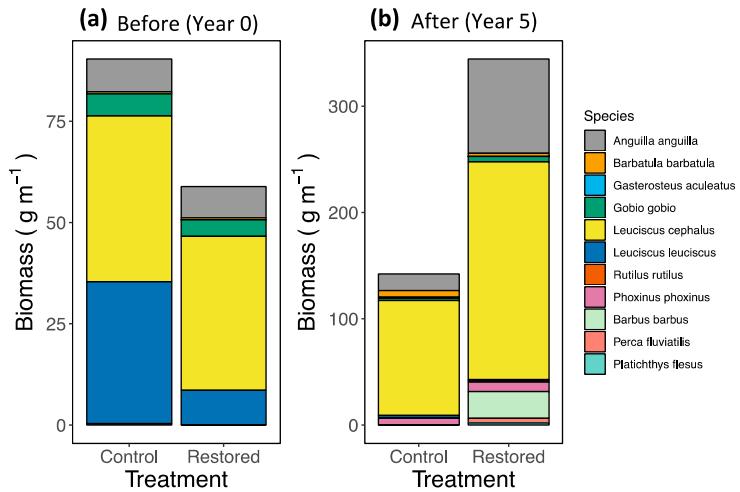
Figure S5. Fish biomass estimates (per unit stream length) between treatments before (a) and 5-years after (b) restoration.
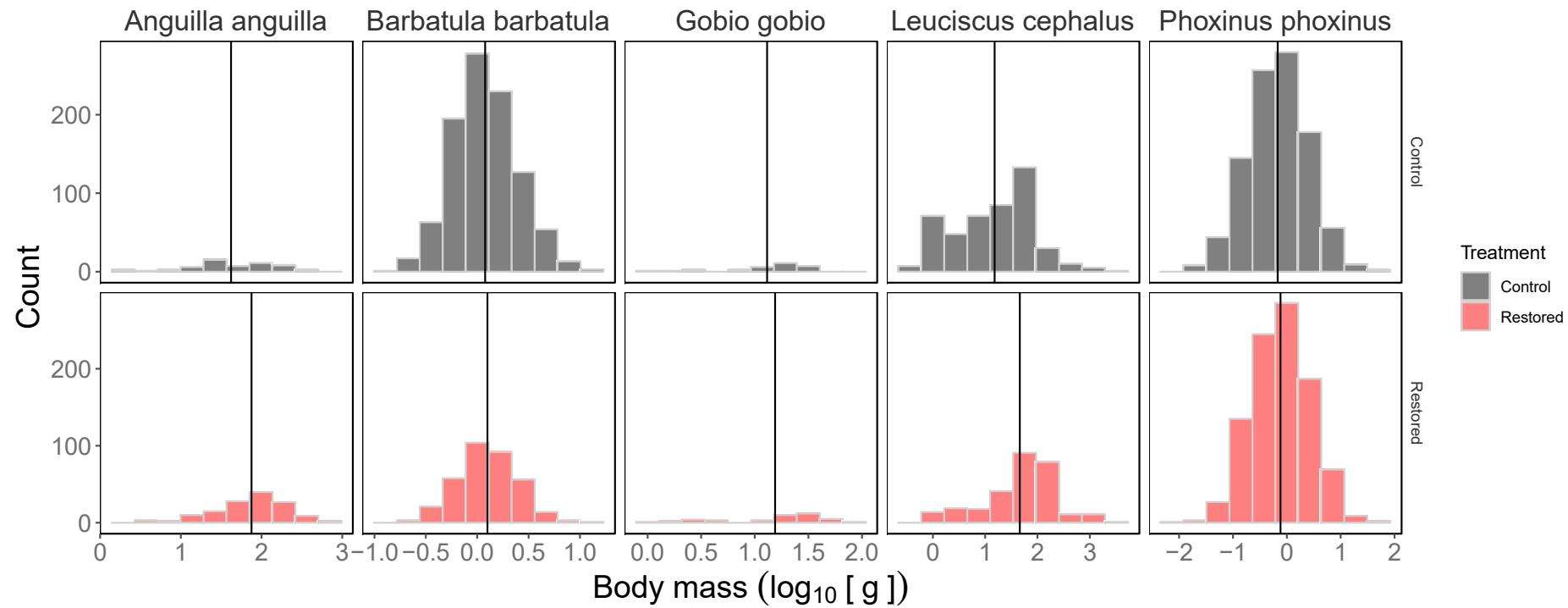
Figure S6. Fish body mass distributions between treatments 5-years after restoration. The solid lines denotes the mean body mass.
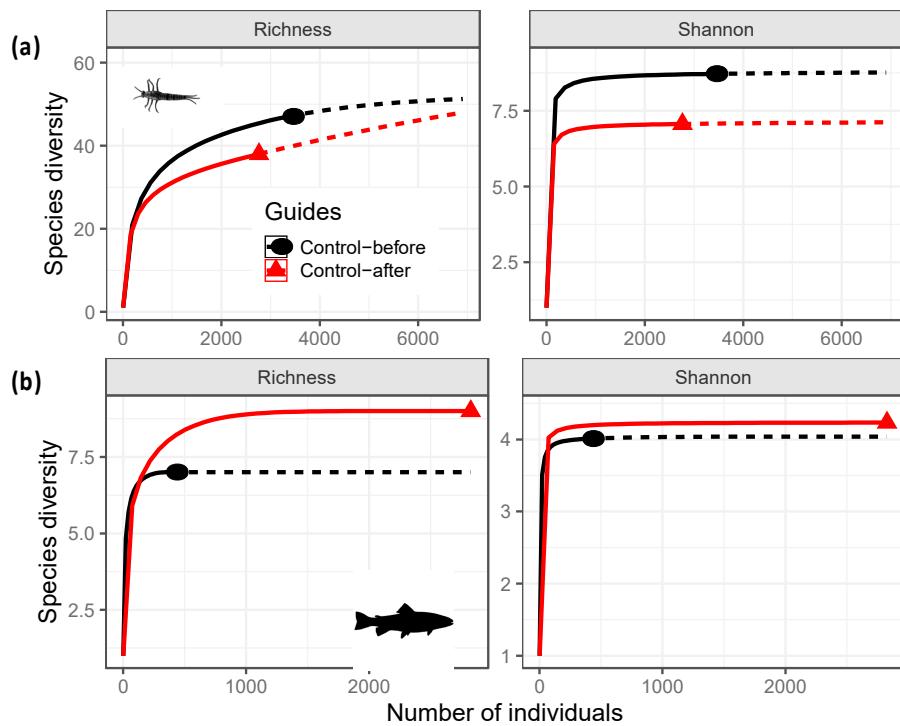
Figure S7. Species richness and Shannon diversity rarefaction (solid line segment) and extrapolation (dotted line segments) sampling curves for macroinvertebrate (a) and fish (b) assemblages for control reaches pre- and post-restoration. Shaded areas indicate 95% confidence intervals and solid dots/triangles represent the reference samples.