

Supplementary materials

A permeable hyporheic zone may contribute to buffer the effects of a drying event on prey availability for salmonid juveniles

Short title: Mitigation of a drying event on salmonid prey

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Figure S1 Water temperature (°C) recorded after the drying during trout growth (from the 16/07/2015 to the 06/08/2015) in the 3 control (black lines) and the 3 dry channels (grey dotted lines).

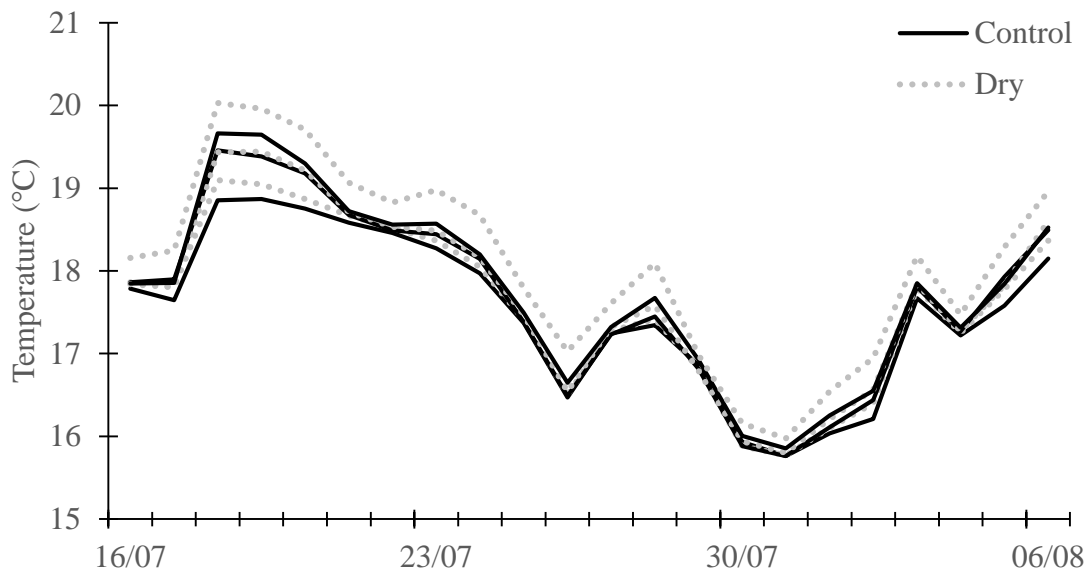


Table S1 Prior distributions assigned to parameters in the models used. E, VAR and CV correspond to mean, variance and coefficient of variation, respectively.

Parameter	Factor	Prior
MACROINVERTEBRATES		
<i>Abundance</i>		
μ	Mean invertebrate abundance	\sim Normal($E = 0$, $VAR = 100$)
α	Dry impact	\sim Normal($E = 0$, $VAR = 100$)
β	Other sources of variations corresponding to each channel	\sim Normal($E = 0$, $VAR = \sigma_{\beta}^2$)
σ_{β}	Standard deviation of β	\sim half-Cauchy(0, 1, 1)
γ	Sampling period	\sim Normal($E = 0$, $VAR = \sigma_{\gamma}^2$)
σ_{γ}	Standard deviation of γ	\sim half-Cauchy(0, 1, 1)
δ	Trout predation pressure	\sim Normal($E = 0$, $VAR = 100$)
FISH		
<i>Survival probability</i>		
μ	Logit of the mean survival probability	\sim Normal($E = 0$, $VAR = 100$)
α	Dry impact	\sim Normal($E = 0$, $VAR = 100$)
β	Other sources of variations corresponding to each channel	\sim Normal($E = 0$, $VAR = \sigma_{\beta}^2$)
σ_{β}	Standard deviation of β	\sim half-Cauchy(0, 1, 1)
<i>Growth</i>		
B. σ .G	Hyperparameter of the standard deviation of fish growth	\sim Gamma($E = 1$, $CV = 100\%$)
E. σ .G	Hyperparameter of the standard deviation of fish growth	\sim Gamma($E = 1$, $CV = 100\%$)
μ	Mean growth	\sim Normal($E = 0$, $VAR = 100$)
α	Dry impact	\sim Normal($E = 0$, $VAR = 100$)
β	Other sources of variations corresponding to each channel	\sim Normal($E = 0$, $VAR = \sigma_{\beta}^2$)
σ_{β}	Standard deviation of β	\sim half-Cauchy(0, 1, 1)
<i>Condition factor</i>		
μ	Mean condition factor	\sim Normal($E = 0$, $VAR = 100$)
α	Dry impact	\sim Normal($E = 0$, $VAR = 100$)
β	Other sources of variations corresponding to each channel	\sim Normal($E = 0$, $VAR = \sigma_{\beta}^2$)
σ_{β}	Standard deviation of β	\sim half-Cauchy(0, 1, 1)

Table S2 Main statistics of the posterior probability distribution functions of the α (differences between control and dry channels), β (all the other sources of variations, corresponding to each channel), γ (period) and δ (fish predation) parameters affecting the abundance of macroinvertebrates.

Parameter	Mean	2.5%	Median	97.5%	P(X > 0)
<i>Total Abundance</i>					
α_1	-0.1393	-0.9078	-0.1401	0.6385	0.3478
α_2	0.1665	-0.5952	0.1656	0.9407	0.6781
α_3	0.3749	-0.375	0.3732	1.125	0.8541
β_1	0.1211	-0.2673	0.08121	0.6556	0.725
β_2	-0.0336	-0.5149	-0.01561	0.3983	0.437
β_3	0.07939	-0.329	0.04809	0.5799	0.6552
β_4	0.01882	-0.4306	0.007198	0.4879	0.5348
β_5	-0.2019	-0.7882	-0.1528	0.1535	0.167
β_6	0.0139	-0.4365	0.005971	0.4686	0.529
γ_1	0.3898	-0.5451	0.3445	1.535	0.8489
γ_2	-0.2819	-1.33	-0.2581	0.7233	0.2089
γ_3	-0.05455	-1.069	-0.04858	0.9899	0.4267
δ	-0.7173	-1.318	-0.7172	-0.1138	0.0109
<i>Abundance of Diptera</i>					
α_1	-0.1539	-0.9101	-0.1578	0.6064	0.329
α_2	0.1523	-0.5998	0.15	0.8906	0.6716
α_3	0.2396	-0.5123	0.2394	0.9921	0.7555
β_1	0.1106	-0.2578	0.06746	0.6278	0.7139
β_2	-0.01939	-0.4641	-0.007506	0.4039	0.4593
β_3	0.05957	-0.3325	0.03005	0.5403	0.6206
β_4	-0.01296	-0.4517	-0.004073	0.4103	0.474
β_5	-0.167	-0.7348	-0.1173	0.1676	0.2024
β_6	0.03212	-0.3803	0.0148	0.4903	0.57
γ_1	0.5306	-0.5845	0.5108	1.759	0.8934
γ_2	-0.2486	-1.477	-0.2198	0.9086	0.2787
γ_3	-0.3034	-1.531	-0.2675	0.8284	0.2428
δ	-0.6979	-1.307	-0.6968	-0.1001	0.0129
<i>Abundance of Coleoptera</i>					
α_1	-0.194	-1.318	-0.1947	0.9452	0.3539
α_2	-0.2225	-1.355	-0.2209	0.9068	0.3361
α_3	0.3357	-0.8019	0.3322	1.492	0.7356
β_1	0.1998	-0.3388	0.1379	0.9823	0.7484
β_2	0.1575	-0.4081	0.1	0.9102	0.7048
β_3	-0.02597	-0.6883	-0.0109	0.6061	0.465
β_4	0.03487	-0.6012	0.0154	0.7195	0.5482
β_5	-0.1661	-0.9201	-0.1059	0.3837	0.2847
β_6	-0.1937	-0.9784	-0.1318	0.3542	0.2547
γ_1	-0.5449	-2.443	-0.561	1.45	0.2219
γ_2	-0.4898	-2.433	-0.5037	1.517	0.2397
γ_3	1.278	-0.5295	1.2	3.418	0.9376
δ	-1.475	-2.406	-1.474	-0.5452	0.0015
<i>Abundance of Oligochaeta</i>					
α_1	-0.2893	-1.775	-0.2888	1.208	0.345
α_2	0.8455	-0.6229	0.8444	2.307	0.8797
α_3	1.504	-0.03793	1.505	3.03	0.9724
β_1	0.1497	-0.4682	0.06963	1.044	0.6591
β_2	-0.1464	-1.038	-0.06795	0.4857	0.342

β_3	0.02009	-0.712	0.004423	0.7998	0.5199
β_4	0.1229	-0.5189	0.05416	1.004	0.6337
β_5	-0.1652	-1.089	-0.08206	0.4503	0.3217
β_6	0.03006	-0.6858	0.00753	0.8024	0.5311
γ_1	-0.3758	-2.057	-0.2876	1.032	0.2684
γ_2	-0.2386	-1.862	-0.1678	1.225	0.3449
γ_3	0.6674	-0.6347	0.5491	2.591	0.8448
δ	-0.2187	-1.626	-0.221	1.225	0.379
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<i>Abundance of "Others"</i>					
α_1	-0.1321	-1.033	-0.03729	0.6466	0.4527
α_2	-0.06386	-0.9425	0.03244	0.711	0.5437
α_3	0.145	-0.7455	0.2432	0.9152	0.7789
β_1	-0.3	-8.198	0.03595	0.4997	0.6671
β_2	-0.3007	-1.293	-0.01059	0.3056	0.4287
β_3	-0.3522	-8.508	0.006997	0.4002	0.5523
β_4	-0.2398	-1.154	0.01169	0.4247	0.5742
β_5	-0.4868	-8.888	-0.06236	0.1744	0.2582
β_6	-0.2897	-1.261	-0.005912	0.3363	0.456
γ_1	0.3783	-0.6001	0.3585	1.383	0.8612
γ_2	-0.2669	-1.372	-0.2314	0.6403	0.223
γ_3	-0.1633	-1.249	-0.1336	0.751	0.328
δ	-0.8263	-1.372	-0.8264	-0.2868	0.001667
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Table S3 Main statistics of the posterior probability distribution functions of the α (dry effect) and β (all the other sources of variations, corresponding to each channel) parameters affecting the survival, the growth and the condition factor of juveniles.

Parameter	Mean	2.5%	Median	97.5%	P(X > 0)
<i>Survival</i>					
α	0.418	-1.681	0.392	2.674	0.655
β_1	0.082	-1.151	0.025	1.559	0.554
β_2	-0.033	-1.504	-0.008	1.297	0.482
β_3	0.080	-1.125	0.023	1.559	0.550
β_4	-0.282	-2.133	-0.101	0.784	0.355
β_5	-0.161	-1.653	-0.053	0.981	0.404
β_6	0.309	-0.777	0.101	2.366	0.653
<i>Growth</i>					
α	-0.009	-0.156	-0.010	0.142	0.425
β_1	-0.036	-0.145	-0.033	0.064	0.188
β_2	-0.038	-0.157	-0.034	0.063	0.188
β_3	0.004	-0.101	0.005	0.108	0.554
β_4	-0.023	-0.142	-0.020	0.080	0.303
β_5	0.030	-0.072	0.027	0.143	0.762
β_6	0.059	-0.043	0.055	0.178	0.902
<i>Condition factor</i>					
α	-0.012	-0.073	-0.011	0.046	0.319
β_1	-0.005	-0.054	-0.002	0.033	0.403
β_2	-0.005	-0.053	-0.002	0.035	0.403
β_3	-0.003	-0.048	-0.001	0.035	0.437
β_4	-0.008	-0.059	-0.004	0.030	0.347
β_5	0.0070	-0.032	0.004	0.056	0.647
β_6	0.0120	-0.023	0.007	0.066	0.730

Table S4 Punctual measurements of dissolved oxygen concentration (in mg L⁻¹) and water temperature (°C) during a dry event in control and dry channels.

Date	Channel treatment	Dissolved Oxygen mg L ⁻¹	Water temperature °C
01/07/2015 (04:00PM)	Control	11.49	19.2
	Control	11.62	19.3
	Control	11.8	19.3
	Dry	12.03	20.4
	Dry	12.07	20.4
	Dry	12.36	20.4
06/07/2015 (09:30AM)	Control	11.68	16.82
	Control	11.44	16.8
	Control	11.78	16.83
	Dry	12.04	17.01
	Dry	11.87	17
	Dry	12.48	17.01
06/07/2015 (05:30PM)	Control	10.99	19.21
	Control	11.13	19.34
	Control	11.21	19.34
	Dry	11.25	20.32
	Dry	11.52	20.63
	Dry	11.83	20.63