



**Figure. S1.** Plot showing the relationship between total annual runoff and the runoff caused by sudden flow rises (hm<sup>3</sup>) each year

**Table S1. (a)** Coefficients of determination ( $R^2$ ) of the General Linear Models (GLMs) for the different river transects (T) developed using IBICAT2010 as the dependent variable and (i) the mean discharge (qmean) computed with different months, (ii) the proportion of alien individuals (CPUE\_I\_T) and (iii) the proportion of alien species (R\_I\_T), as independent variables (Indep. var.) **(b)** Modelled mean discharges (m<sup>3</sup>/s) to achieve the moderate and good ecological status for each transect at each period

<b>(a)</b>		T 1	T 2	T 3	T 4	T 5	T 6	T 2_4
Indep. var.								
qmean_1		0.00	0.00	0.03	0.05	0.18	0.00	-0.12
qmean_3		0.09	0.02	0.06	0.00	0.04	0.01	-0.06
qmean_6		0.07	0.00	0.01	0.19	0.09	0.03	-0.11
qmean_9		0.06	0.29	0.17	***0.65	0.38	0.38	*0.48
qmean_12		0.05	0.38	0.25	***0.78	*0.48	0.49	***0.70
qmean_24		0.04	0.27	0.24	***0.69	*0.46	**0.75	**0.58
qmean_36		0.04	0.18	0.27	*0.41	0.24	**0.75	*0.38
qmean_48		0.12	0.17	0.24	0.18	0.22	*0.59	0.18
CPUE_I_T		0.32	0.05	0.02	0.12	**0.64	*0.58	-0.11
R_I_T		0.01	0.07	0.11	*0.47	0.10	0.25	0.00

  

<b>(b)</b>		T 1	T 2	T 3	T 4	T 5	T 6	T 2_4
Status	Indep. var.							
Moderate	qmean_1	ns	ns	ns	ns	ns	ns	ns
	qmean_3	ns	ns	ns	ns	ns	ns	ns
	qmean_6	ns	ns	ns	ns	ns	ns	ns
	qmean_9	ns	ns	ns	765.98	ns	ns	1204.38
	qmean_12	ns	ns	ns	569.26	707.15	ns	845.69
	qmean_24	ns	ns	ns	458.86	541.69	273.58	691.02
	qmean_36	ns	ns	ns	435.04	ns	232.81	593.93
	qmean_48	ns	ns	ns	ns	ns	177.29	ns
	CPUE_I_T	ns	ns	ns	ns	0.03	0.57	ns
	R_I_T	ns	ns	ns	0.40	ns	ns	ns
Good	qmean_1	ns	ns	ns	ns	ns	ns	ns
	qmean_3	ns	ns	ns	ns	ns	ns	ns
	qmean_6	ns	ns	ns	ns	ns	ns	ns
	qmean_9	ns	ns	ns	865.44	ns	ns	1360.76
	qmean_12	ns	ns	ns	643.18	798.97	ns	955.49
	qmean_24	ns	ns	ns	518.44	612.02	309.11	780.74
	qmean_36	ns	ns	ns	491.53	ns	263.04	671.05
	qmean_48	ns	ns	ns	ns	ns	200.31	ns
	CPUE_I_T	ns	ns	ns	ns	ns	0.49	ns
	R_I_T	ns	ns	ns	0.34	ns	ns	ns

\* p<0.05; \*\* p<0.01; \*\*\* p<0.001; ns: not significant

**Table S2. (a)** Coefficients of determination ( $R^2$ ) of the General Linear Models (GLMs) for the different river transects (T) developed using IBICAT2b and EFI+ as dependent variables (Dep. var.) and (i) the mean discharge (qmean) computed with different months, (ii) the proportion of alien individuals (CPUEI\_I\_T) and (iii) the proportion of alien species (R\_I\_T) as independent variables (Indep. var.). **(b)** Modelled mean discharges ( $m^3/s$ ) to achieve moderate and good ecological status for each transect at each period.

**(a)**

Dep. var.	Indep. var.	T 1	T 2	T 3	T 4	T 5	T 6	T 2_4
IBICAT2 b	qmean_1	0.11	0.07	0.24	0.05	0.02	0.06	0.19
	qmean_3	0.36	0.36	*0.41	0.03	0.17	0.00	*0.54
	qmean_6	0.07	0.00	0.01	0.06	0.00	0.55	0.03
	qmean_9	0.09	0.26	0.05	*0.44	0.36	**0.73	0.06
	qmean_12	0.11	0.30	0.06	**0.58	*0.42	*0.68	0.09
	qmean_24	0.18	0.17	0.00	**0.62	0.24	0.21	0.14
	qmean_36	0.25	0.13	0.00	0.26	0.26	0.11	0.16
	qmean_48	0.35	0.06	0.00	0.10	0.17	0.07	0.17
	CPUE_I_T	0.08	0.09	0.00	0.06	0.01	0.06	0.01
	R_I_T	***0.74	***0.66	***0.89	***0.79	***0.65	***0.88	***0.83
EFI+	qmean_1	n/a	0.12	0.04	0.11	0.13	0.47	0.4
	qmean_3	n/a	0.07	0.01	0.18	0.21	**0.73	0.25
	qmean_6	n/a	0.00	0.01	0.01	0.09	0.01	0.12
	qmean_9	n/a	0.01	0.00	0.31	0.12	0.23	0.00
	qmean_12	n/a	0.05	0.01	0.36	0.12	0.28	0.01
	qmean_24	n/a	0.33	0.06	0.20	0.03	0.38	0.06
	qmean_36	n/a	0.19	0.03	*0.44	0.18	0.08	0.10
	qmean_48	n/a	0.27	0.09	0.23	0.16	0.15	0.29
	CPUE_I_T	n/a	0.07	n/a	0.09	0.00	0.13	0.00
	R_I_T	n/a	0.04	0.04	0.02	0.00	0.02	0.07

(b)

Dep. var.	Status	Indep. var.	T 1	T 2	T 3	T 4	T 5	T 6	T 2_4
IBICAT2b	Moderate	qmean_1	ns	ns	ns	ns	ns	ns	ns
		qmean_3	ns	ns	n/a	ns	ns	ns	n/a
		qmean_6	ns	ns	ns	ns	ns	ns	ns
		qmean_9	ns	ns	ns	979.86	ns	660.52	ns
		qmean_12	ns	ns	ns	770.22	1016.97	524.28	ns
		qmean_24	ns	ns	ns	644.16	ns	ns	ns
		qmean_36	ns	ns	ns	ns	ns	ns	ns
		qmean_48	ns	ns	ns	ns	ns	ns	ns
		CPUE_I_T	ns	ns	ns	ns	ns	ns	ns
	R_I_T	0.42	0.42	0.41	0.43	0.33	0.39	0.5	
	Good	qmean_1	ns	ns	ns	ns	ns	ns	ns
		qmean_3	ns	ns	n/a	ns	ns	ns	n/a
		qmean_6	ns	ns	ns	ns	ns	ns	ns
		qmean_9	ns	ns	ns	1707.77	ns	1166.65	ns
		qmean_12	ns	ns	ns	1289.67	1636.14	922.67	ns
		qmean_24	ns	ns	ns	1022.90	ns	ns	ns
		qmean_36	ns	ns	ns	ns	ns	ns	ns
		qmean_48	ns	ns	ns	ns	ns	ns	ns
CPUE_I_T		ns	ns	ns	ns	ns	ns	ns	
R_I_T	0.15	0.11	0.12	0.15	0	0.08	0.26		
EFI+	Moderate	qmean_1	ns	ns	ns	ns	ns	ns	ns
		qmean_3	ns	ns	ns	ns	ns	559.92	ns
		qmean_6	ns	ns	ns	ns	ns	ns	ns
		qmean_9	ns	ns	ns	ns	ns	ns	ns
		qmean_12	ns	ns	ns	ns	ns	ns	ns
		qmean_24	ns	ns	ns	ns	ns	ns	ns
		qmean_36	ns	ns	ns	n/a	ns	ns	ns
		qmean_48	ns	ns	ns	ns	ns	ns	ns
		CPUE_I_T	ns	ns	ns	ns	ns	ns	ns
	R_I_T	ns	ns	ns	ns	ns	ns	ns	
	Good	qmean_1	ns	ns	ns	ns	ns	ns	ns
		qmean_3	ns	ns	ns	ns	ns	906.11	ns
		qmean_6	ns	ns	ns	ns	ns	ns	ns
		qmean_9	ns	ns	ns	ns	ns	ns	ns
		qmean_12	ns	ns	ns	ns	ns	ns	ns
		qmean_24	ns	ns	ns	ns	ns	ns	ns
		qmean_36	ns	ns	ns	n/a	ns	ns	ns
		qmean_48	ns	ns	ns	ns	ns	ns	ns
CPUE_I_T		ns	ns	ns	ns	ns	ns	ns	
R_I_T	ns	ns	ns	ns	ns	ns	ns		

\* p&lt;0.05; \*\* p&lt;0.01; \*\*\* p&lt;0.001; ns: not significant; n/a: not applicable

**Table S3.** Coefficients of determination ( $R^2$ ) using only mean annual flow (12-month period) as the independent variable to explain ecological quality using the IBICAT2010 index.

Transect	$R^2$	Sign
T 1	0.05	+
T 2	0.38	+
T 3	0.25	+
T 4	***0.79	+
T 5	*0.48	+
T 6	0.38	+

\*  $p < 0.05$ ; \*\*\*  $p < 0.001$