

**Supplementary Tab. 1.** List of sampling sites, their main watershed, elevation latitude and longitude, and crayfish species present at each site.

Site	Typology	Watershed	Elevation (m asl)	Latitude	Longitude	Species	Hystorical data
<b>Lakes and ponds</b>							
Lamar l. <sup>o</sup>	Permament	Adige	725	46.130751°N	11.063755°E	nn	2007
Santo Lamar l.	Permament	Adige	717	46.124395°N	11.059288°E	<i>A.p.</i>	
Terlago p. <sup>#</sup>	Permament	Adige	521	46.098517°N	11.033762°E	<i>A.p.</i>	2011
Santo Cembra l.	Permament	Avisio	1199	46.195149°N	11.208935°E	<i>A.p.</i>	
Bellasio 1 <sup>st</sup> p.	Seasonal	Brenta	241	46.012907°N	11.633750°E	nn	
Bellasio 2 <sup>nd</sup> p.	Seasonal	Brenta	241	46.012907°N	11.633750°E	nn	
Caldonazzo l. <sup>o</sup>	Permament	Brenta	449	46.026103°N	11.244560°E	<i>O.l.</i>	2004
Grigno p.	Permament	Brenta	280	46.015922°N	11.626330°E	<i>A.p.</i>	
Levico l. <sup>o</sup>	Permament	Brenta	447	46.008318°N	11.281423°E	<i>O.l.</i>	2004
Roncone l. <sup>o</sup>	Permament	Chiese	810	45.985218°N	10.690852°E	nn	1980
Canzolino l. <sup>o</sup>	Permament	Fersina	537	46.085058°N	11.218897°E	<i>O.l.</i>	1900
Costa l. <sup>o</sup>	Permament	Fersina	500	46.075683°N	11.237531°E	<i>A.p.</i>	2010
Lases l. <sup>o</sup>	Permament	Fersina	640	46.141681°N	11.219590°E	nn	2007
Madrano l. <sup>o</sup>	Permament	Fersina	550	46.085453°N	11.218397°E	<i>O.l.</i>	1900
Piazzè l. <sup>o</sup>	Permament	Fersina	1021	46.155985°N	11.283508°E	nn	2004
Restel l. <sup>o</sup>	Permament	Fersina	878	46.088756°N	11.244453°E	<i>A.p.</i>	
S. Colomba l. <sup>o</sup>	Permament	Fersina	924	46.123566°N	11.180566°E	nn	2004
Serraia l. <sup>o</sup>	Permament	Fersina	970	46.136997°N	11.258140°E	nn	2004
Mezzocorona p. <sup>#</sup>	Permament	Noce	249	46.227737°N	11.094852°E	<i>A.p.</i>	
Vezzano p. <sup>#</sup>	Permament	Sarca	473	46.077567°N	11.019738°E	<i>A.p.</i>	
<b>Running water sites</b>							
Bondone c.	Permament	Adige	311	46.008339°N	11.105587°E	nn	
Carpine c.	Permament	Adige	378	46.113635°N	11.120527°E	<i>A.p.</i>	
Cortesano c.	Seasonal	Adige	615	46.123115°N	11.136502°E	nn	
Faedo c.	Permament	Adige	489	46.194468°N	11.154924°E	nn	
Gardolo c.	Permament	Adige	411	46.112737°N	11.121480°E	<i>A.p.</i>	

Site	Typology	Watershed	Elevation (m asl)	Latitude	Longitude	Species	Hystorical data
Maestro c.	Permament	Adige	541	46.091289°N	11.053458°E	nn	
Monreale c.	Seasonal	Adige	365	46.203001°N	11.152261°E	nn	
Netta c.	Permament	Adige	221	46.139534°N	11.071978°E	nn	
Salè c.	Permament	Adige	578	46.068015°N	11.172722°E	nn	
Terlago c.°	Permament	Adige	521	46.098517°N	11.033762°E	<i>A.p.</i>	2011
Valsorda c.	Permament	Adige	330	46.006700°N	11.143000°E	<i>A.p.</i>	
Zambana c.	Permament	Adige	218	46.156428°N	11.071810°E	nn	
Avisio s.°	Permament	Avisio	614	46.226676°N	11.308939°E	nn	2000
Brusago c.	Permament	Avisio	635	46.219469°N	11.310374°E	nn	
Favorine c.	Permament	Avisio	774	46.197328°N	11.242631°E	nn	
Fornei c.	Permament	Avisio	675	46.172222°N	11.179077°E	<i>A.p.</i>	
Gamberi c.°	Permament	Avisio	656	46.136560°N	11.146815°E	nn	1950
Lisignago c.	Permament	Avisio	518	46.164893°N	11.180831°E	nn	
Mercar c.	Permament	Avisio	958	46.187630°N	11.222179°E	nn	
Molino c.	Permament	Avisio	809	46.228528°N	11.292790°E	nn	
Pramalga c.	Permament	Avisio	641	46.134218°N	11.151881°E	nn	
Regnana c.	Permament	Avisio	627	46.180313°N	11.263873°E	nn	
Scorzai c.°	Permament	Avisio	739	46.178186°N	11.209719°E	nn	2000
Vallalta c.	Permament	Avisio	542	46.146634°N	11.158744°E	nn	
Brenta r. st. 1	Permament, artificial	Brenta	435	46.002860°N	11.315665°E	nn	
Brenta r. st. 2	Permament	Brenta	242	46.003640°N	11.645323°E	nn	
Centa s.	Permament	Brenta	550	45.974840°N	11.245896°E	nn	
Grigno c.	Permament	Brenta	280	46.015922°N	11.626330°E	<i>A.p.</i>	
Grigno s.	Permament	Brenta	301	46.019052°N	11.638064°E	nn	
Larganza s.	Permament	Brenta	153	46.049273°N	11.403584°E	nn	
Mandola c.	Permament	Brenta	648	45.999455°N	11.213185°E	nn	
Merdar c.	Seasonal	Brenta	452	46.038132°N	11.231289°E	nn	
Resenzola s.	Permament	Brenta	232	45.999193°N	11.661843°E	nn	
S. Giuliana c.	Seasonal	Brenta	443	45.999674°N	11.315100°E	nn	

Site	Typology	Watershed	Elevation (m asl)	Latitude	Longitude	Species	Hystorical data
Trambario s.	Permament, artificial	Brenta	692	45.990581°N	11.220633°E	nn	
Vignola c.	Seasonal	Brenta	561	46.043305°N	11.258491°E	nn	
Roncone c.°	Permament	Chiese	800	45.988255°N	10.680755°E	nn	1980
Roncone Lake emissary°	Seasonal	Chiese	804	45.984029°N	10.675257°E	nn	1980
Canzolino-Costa c.	Permament	Fersina	512	46.079331°N	11.234433°E	nn	
Farinella c.	Permament	Fersina	551	46.096304°N	11.170943°E	<i>A.p.</i>	
Mala c.	Permament	Fersina	856	46.094572°N	11.282529°E	nn	
Nero c.	Permament	Fersina	532	46.073994°N	11.247322°E	<i>A.p.</i>	
S. Colomba c.	Permament	Fersina	484	46.093917°N	11.182014°E	<i>A.p.</i>	
Valgrande c.	Seasonal	Fersina	463	46.069634°N	11.205887°E	nn	
Vergini c.	Permament	Fersina	977	46.109753°N	11.296573°E	nn	
Viarago c.	Permament	Fersina	777	46.074624°N	11.265497°E	nn	
Ambiez s.	Permament	Sarca	614	46.076983°N	10.890176°E	nn	
Andogno c.	Permament	Sarca	488	46.062707°N	10.897461°E	<i>A.p.</i>	
Banale c.°	Permament	Sarca	448	46.043956°N	10.881982°E	nn	1950
Boldeno c.	Permament	Sarca	549	46.034260°N	10.737320°E	nn	
Cavaione c.	Permament	Sarca	779	46.020957°N	10.815115°E	nn	
Comano c.	Permament	Sarca	408	46.040023°N	10.87470°E	nn	
Dalo s.	Permament	Sarca	476	46.012324°N	10.870119°E	nn	
Diga c.	Seasonal	Sarca	958	46.187630°N	11.222179°E	nn	
Folon c.	Permament	Sarca	550	46.037009°N	10.751487°E	<i>A.p.</i>	
Madice c.	Permament	Sarca	690	46.025217°N	10.828608°E	nn	
Pill c.	Permament	Sarca	835	46.024723°N	10.813784°E	nn	
Poia c.°	Permament	Sarca	552	46.032295°N	10.883229°E	nn	2008
Ponte Pià c.	Permament	Sarca	483	46.052560°N	10.814860°E	nn	
Pravert c.°	Permament	Sarca	507	46.045055°N	10.879431°E	nn	1950
Premione c. st.1	Permament	Sarca	644	46.049811°N	10.873403°E	nn	
Premione c. st.2	Permament	Sarca	675	46.043855°N	10.876261°E	nn	
Rango c.	Permament	Sarca	805	46.022642°N	10.813146°E	<i>A.p.</i>	

Site	Typology	Watershed	Elevation (m asl)	Latitude	Longitude	Species	Hystorical data
Sarca r.	Permament	Sarca	525	46.037339°N	10.736908°E	nn	
Squero c. <sup>o</sup>	Permament	Sarca	642	46.033795°N	10.757218°E	nn	1980
Tanfurin c. st.1	Permament	Sarca	532	46.037080°N	10.845959°E	nn	
Tanfurin c. st.2	Permament	Sarca	411	46.040300°N	10.852520°E	nn	
Tavodo c.	Permament	Sarca	494	46.061562°N	10.896158°E	nn	
Tignerone c.	Seasonal	Sarca	421	46.041432°N	10.850990°E	nn	
Vezzano c. <sup>#</sup>	Permament	Sarca	473	46.077567°N	11.019738°E	<i>A.p.</i>	
Sites with <i>A.p.</i> including sites where <i>A.p.</i> went extinct, as recorded in 2010-2012						21	
Sites where <i>A.p.</i> went extinct in 2010-2012						3	
Sites where <i>A.p.</i> went extinct in historical time						22	
Sites where <i>A.p.</i> went extinct in historical time, now with with <i>O.l.</i>						4	
Total sites without crayfish						66	
Total sites						89	

l., lake; p., pond; c., creek; s., stream; r., river; st., station; nn, no crayfish present; *A.p.*, *Austropotamobius pallipes*; *O.l.*, *Orconectes limosus*. <sup>o</sup>Extinct populations of *A. pallipes*. The year of the last record (from historical data of our surveys) is listed; thus, the extinction occurred between that date and 2010-2012 (details on dates are provided in Tab. 1). In Terlago pond and the emissary creek, *A. pallipes* was extinct after 2011. In Costa lake, *A. pallipes* was extinct after 2010; <sup>#</sup>crayfish were observed but not collected.

**Supplementary Tab. 2.** Physico-chemical and environmental characteristics of sampling sites.

Site	Date	Crayfish	T (°C)	pH	O <sub>2</sub> % sat	O <sub>2</sub> (mg/L)	Conductivity (mS)	Turbidity (NTU)	Depth (m)	Flow	Quality class right° bank	Quality class left° bank	Habitat types	Boulder	Cobble	Woody debris	Tree roots	Submerg. vegetation	Emerg. vegetation	Shading
Lakes and ponds																				
Caldonazzo l. <sup>#</sup>	6/28/2011	nn														x	x	x	x	x
Canzolino l. <sup>#</sup>	6/22/2011	<i>O.l.</i>	21.0	8.80	111.0	9.60	339.0	21.00	0.5					x				x	x	
Canzolino l. <sup>#</sup>	8/04/2011	<i>O.l.</i>	24.4	8.31	88.0	7.86	263.0	2.88	1.0					x				x	x	
Costa l. <sup>#</sup>	6/28/2011	<i>O.l.</i>	26.7				175.5	2.84	1.0					x				x	x	
Lamar l. <sup>#</sup>	8/30/2011	nn	22.0	8.22	76.0	6.42	349.0	3.02	1.0							x	x	x	x	x
Lases l. <sup>#</sup>	6/25/2010	<i>A.p.</i>							0.5						x	x	x	x	x	
Levico l. <sup>#</sup>	8/02/2011	nn	21.3	8.39	122.0	9.72	274.0	3.90	1.0					x	x	x	x		x	x
Madrano l. <sup>#</sup>	6/22/2011	nn							1.0					x	x	x	x	x	x	x
Madrano l. <sup>#</sup>	8/04/2011	<i>O.l.</i>	25.0				279.0		1.0					x	x	x	x	x	x	x
Piazzè l. <sup>#</sup>	6/25/2010	<i>O.l.</i>	23.1	8.62	76.0	6.12	346.0	3.62	1.0					x		x	x	x	x	x
Restel l.	6/23/2011	<i>O.l.</i>	24.8				322.0		1.0					x		x	x	x	x	x
Roncone l.	7/04/2012	<i>A.p.</i>							1.0						x	x		x		
S. Colomba l.	6/26/2010	nn							1.0					x				x		
Santo Cembra l.	7/11/2012	<i>A.p.</i>	16.1	8.48	66.30	5.80	246.0		1.0					x	x	x	x	x	x	x
Santo Lamar l.	8/30/2011	nn							1.0					x	x	x	x	x	x	x
Santo Lamar l.	9/20/2011	nn							1.0					x	x	x	x	x	x	x
Serraia l. <sup>#</sup>	6/25/2010	<i>A.p.</i>	21.9	8.38	104.0	8.22	277.0	11.50	0.5					x	x	x		x	x	
Bellasio p. <sup>§</sup>	8/25/2011	<i>A.p.</i>	16.0	8.40	90.0			2.50	0.5					x	x	x		x	x	
Grigno p. <sup>#</sup>	8/25/2011	<i>A.p.</i>	17.0	8.00	95.0			2.60	1.0					x	x	x		x	x	
Mezzocorona p. <sup>#</sup>	8/11/2012	nn							1.0					x		x		x	x	
Terlago p. <sup>#</sup>	8/30/2011	<i>A.p.</i>							1.0						x			x		
Vezzano p. <sup>#</sup>	6/21/2012	<i>A.p.</i>							1.0						x	x		x		x
Running water sites																				
Ambiez s.	7/20/2012	nn																		
Andogno c.	9/13/2012	<i>A.p.</i>	11.8	7.94	94.3	9.44	514.0	7.71	0.3	Low	I	II	Glide, pool	x	x	x	x			x
Avisio s.	8/13/2012	nn							1.0	High	III	III	Run, glide, riffle, pool	x	x	x	x		x	x
Banale c.	7/06/2012	nn																		
Boldeno c.	7/04/2012	nn																		

Site	Date	Crayfish	T (°C)	pH	O <sub>2</sub> % sat	O <sub>2</sub> (mg/L)	Conductivity (mS)	Turbidity (NTU)	Depth (m)	Flow	Quality class right° bank	Quality class left° bank	Habitat types	Boulder	Cobble	Woody debris	Tree roots	Submerg. vegetation	Emerg. vegetation	Shading
Bondone c.	7/09/2012	nn							0.4	Medium	I	I	Free fall, chute, glide, pool	x	x	x		x	x	
Brenta R. st. 1	7/02/2010	nn							0.6	Medium	IV	IV	Glide, run	x				x	x	
Brenta R. st. 2	8/25/2011	nn							1.0	High	III - IV	III - IV	Glide, run	x	x	x	x	x	x	
Brusago c.	8/13/2012	nn							1.0	High	III - IV	III - IV	Glide, run	x	x	x	x	x	x	
Canzolino-Costa c.	10/15/2010	nn							0.2	Low	III	III - IV	Glide						x	x
Carpine c.	7/06/2011	<i>A.p.</i>	18.2		78.6	7.05	599.0	7.14	0.5	Low	I	I	Free fall, chute, glide, pool	x	x	x	x		x	x
Cavaione c.	8/01/2012	nn							0.5	Low	II	I	Glide	x		x		x	x	x
Centa s.	7/01/2010	nn							0.6	High			Glide, run, riffle	x	x	x				
Comano c.	8/01/2012	nn																		
Cortesano c. §	7/26/2011	nn													x	x			x	x
Dalo c.	7/23/2012	nn																		
Diga c. §	7/30/2012	nn																		
Faedo c.	7/29/2011	nn							0.2	Very low	I	I	Glide, pool	x	x	x	x		x	x
Farinella c.	8/19/2011	<i>A.p.</i>	16.0	8.37	84.3	7.99	470.0	1.42	0.5	Low	I	I	Free fall, chute, glide, pool	x	x	x	x		x	x
Favorine c.	8/13/2012	nn																		
Folon c.	7/04/2012	<i>A.p.</i>	13.6	7.63	60.4	5.84	360.0	1.48	0.5	Low	II	I	Glide	x		x		x	x	x
Fornei c.	10/04/2011	<i>A.p.</i>	12.6	8.11	91.8	9.03	362.0	3.11	0.4	Low	II	II	Chute, glide, pool	x	x	x	x			x
Fornei c.	8/07/2012	<i>A.p.</i>	15.1		92.8	8.61	323.0	4.26	0.4	Low	II	II	Chute, glide, pool	x	x	x	x			x
Gamberi c.	7/26/2011	nn	12.4		38.2	3.87	478.0	0.27	0.3	Low	I	I	Chute, glide, pool	x	x	x	x		x	x
Gardolo c.	7/12/2011	<i>A.p.</i>	19.2		65.2	5.79	616.0	7.37	0.4	Low	I	I	Free fall, chute, glide, pool	x	x	x	x		x	x
Grigno c.	8/25/2011	nn							1.0	High	III	III	Run, glide, riffle	x	x	x			x	
Grigno s.	8/25/2011	<i>A.p.</i>							0.6	Low	III - IV	III - IV	Glide, pool	x	x	x		x	x	
Larganza s.	8/25/2011	nn							0.4	High	IV	IV	Run		x					
Lisignago c.	8/02/2012	nn																		
Madice c.	8/01/2012	nn																		
Maestro c.	7/09/2012	nn							0.6	Low	II	II	Glide, pool		x	x	x	x	x	x
Mala c.	7/21/2011	nn	11.9		56.9	6.33	316.0	4.29	0.5	Low	II	II	Run, glide	x	x	x			x	x
Mandola c.	7/01/2010	nn							0.5	Medium	II	II	Run, glide, pool	x	x	x	x			x
Mercar c.	7/28/2012	nn																		

Site	Date	Crayfish	T (°C)	pH	O <sub>2</sub> % sat	O <sub>2</sub> (mg/L)	Conductivity (mS)	Turbidity (NTU)	Depth (m)	Flow	Quality class right° bank	Quality class left° bank	Habitat types	Boulder	Cobble	Woody debris	Tree roots	Submerg. vegetation	Emerg. vegetation	Shading
Merdar c. §	7/01/2010	nn												x	x				x	
Molino c.	8/03/2012	nn																		
Monreale c. §	7/29/2011	nn												x	x	x	x		x	x
Nero c.	7/06/2011	nn	15.2		80.70	7.53	303.0	2.03	0.3	Low	I	I	Free fall, chute, glide, pool	x	x	x	x		x	x
Netta c.	7/29/2011	nn							0.6	Low	IV	IV	Glide	x	x			x	x	
Pill c.	7/11/2012	nn							0.3	Low	II	I	Glide		x	x	x		x	x
Poia c.	7/13/2012	nn							0.3	Low	II	II	Glide, pool		x	x	x			
Ponte Pià c.	7/30/2012	nn																		
Pramalga c.	7/26/2011	nn	10.2		37.30	3.83	775.0	0.42	0.2	Low	I	I	Chute, glide, pool	x	x	x	x		x	x
Pravert c.	7/09/2012	nn							0.2	Low	II	I	Glide		x	x	x	x	x	x
Premione c. st. 1	7/06/2012	nn																		
Premione c. st. 2	9/06/2012	nn																		
Rango c.	9/13/2012	A.p.	13.0	8.38	71.50	7.81	478.0		0.3	Low	I	I	Glide, pool	x	x		x		x	x
Regnana c.	7/15/2012	nn																		
Resenzola s.	8/25/2011	nn							0.6	Low	I - II	I - II	glide			x	x	x	x	x
Roncone c.	7/04/2012	nn							0.2	Low	II	II	Glide, pool		x			x	x	
Roncone l. emissary§	7/04/2012	nn													x	x			x	
Salè c.	7/09/2012	nn							0.3	Medium	II	II	Glide, pool	x	x	x			x	x
Sarca s.	7/04/2012	nn							0.5	High	III	III	Run, glide, pool	x	x		x			
Squero c.	7/04/2012	nn							0.4	High	I	I	Free fall, chute, glide, pool							
S. Colomba c.	7/21/2011	A.p.	16.0		65.90	6.18	527.0	1.78	0.3	Low	I	I	Free fall, chute, glide, pool	x	x	x	x		x	x
S. Colomba c.	8/19/2011	A.p.	16.7	8.38	90.50	8.28	538.0	3.97	0.3	Low	I	I	Free fall, chute, glide, pool	x	x	x	x		x	x
S. Giuliana c. §	7/02/2010	nn													x	x	x		x	x
Scorzai c.	7/07/2012	nn							0.4	Low	II	II	Chute, glide, pool	x	x	x	x			x
Tanfurin c. st.1	7/23/2012	nn																		
Tanfurin c. st.2	7/23/2012	nn																		
Tavodo c.	7/20/2012	nn							0.3	Low	I	II	Glide, pool	x	x	x	x			x
Terlago c.	8/30/2011	A.p.	19.6	8.01	79.00	6.88	344.0	10.00	0.2	Very low	III - I	IV - III	Glide, pool	x	x	x	x		x	x
Tignerone c. §	7/25/2012	nn																		

Site	Date	Crayfish	T (°C)	pH	O <sub>2</sub> % sat	O <sub>2</sub> (mg/L)	Conductivity (mS)	Turbidity (NTU)	Depth (m)	Flow	Quality class right° bank	Quality class left° bank	Habitat types	Boulder	Cobble	Woody debris	Tree roots	Submerg. vegetation	Emerg. vegetation	Shading
Trambario s.	7/01/2010	nn							0.5	Medium	IV	IV	Glide, run		x	x				
Valgrande c. §	7/01/2010	nn													x	x			x	
Vallalta c.	7/26/2011	nn						0.2	Low		II	II	Free fall, chute, glide, pool	x	x					x
Valsorda c.	7/26/2011	<i>A.p.</i>	13.1		35.70	3.51	460.0	1.38	0.4	Medium	I	I	Free fall, chute, glide, pool	x	x	x	x	x	x	x
Valsorda c.	9/28/2011	<i>A.p.</i>	11.2	8.32	87.50	9.11	507.0	1.11	0.5	Medium	I	I	Free fall, chute, glide, pool	x	x	x	x	x	x	x
Vergini c.	7/21/2011	nn	11.3		61.50	5.62	610.0	0.70	0.3	Low	I	I	Chute, glide, pool	x	x	x	x			x
Vezzano c.	6/21/2012	<i>A.p.</i>	14.1	7.92	117.9	11.36	470.0	6.06	0.3	Low	III	III	Glide, pool	x	x			x	x	x
Viarago c.	7/21/2011	nn	10.6		50.10	4.96	295.0	1.55	0.5	Low	I	I	Free fall, chute, glide, pool	x	x	x	x			x
Vignola c. §	7/01/2010	nn												x	x	x	x		x	x
Zambana c.	7/29/2011	nn							0.2	Low	IV	IV	Glide	x	x			x		

Submerg., submergent; emerg., emergent; l., lake; p., pond; s., stream; c., creek; r., river; st., station; nn, no crayfish present; *O.l.*, *Orconectes limosus*; *A.p.*, *Austropotamobius pallipes*; °I, very good; II, good; III, sufficient; IV, poor; #extinct populations of *A. pallipes*; §temporary waterbody (dry at survey date).