

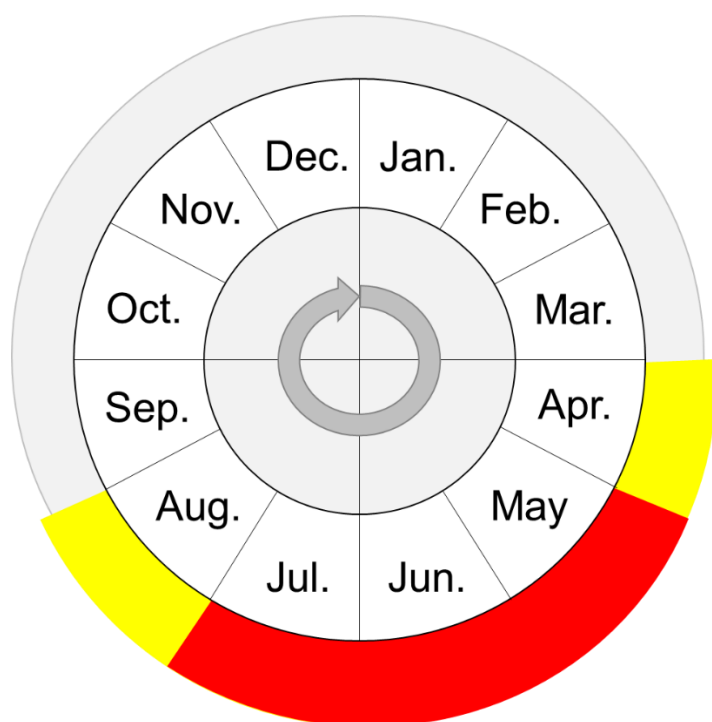
This document is useful for information on the data used in the study.

Table S1. Study sites.

Rivers	Stations (Down → Up)	ID _{SIEAG}	X (L93)	Y (L93)	SG _{Ac.stu}	SG _{Alo.alo}
Garonne	Cadillac	05076000	436352	6398405	YES	NO
	Couthures	05081000	468052	6383237	YES	NO
	Aiguillon	05104000	486239	6357982	YES	YES
	Port Ste-Marie	05111500	491837	6353375	YES	YES
	Lamagistère	05117000	525494	6338433	NO	YES
	St-Nicolas de la Grave	05118950	542162	6334557	NO	YES
	St-Aignan	05152000	545946	6326736	NO	NO
	Bourret	05154250	553241	6318792	NO	NO
	Verdun-sur-Garonne	05154500	558715	6307780	NO	NO
	Toulouse2	05161000	568458	6290383	NO	NO
	Toulouse1	05163290	572088	6272052	NO	NO
	Marquefave	05175800	557518	6248030	NO	NO
Dordogne	Port St-Pardon	05026000	438339	6428849	YES	NO
	Pessac	05046000	469019	6417866	YES	NO
	Bergerac	05047000	489261	6419166	YES	YES
	Cours de Pile	05047600	504681	6419145	NO	YES
	Trémolat	05048210	528019	6421626	NO	YES
	Cenac	05059000	558051	6413474	NO	NO
	Carennac	05061500	600859	6424893	NO	NO
	Brivezac	05067000	608950	6436734	NO	NO
	Argentat	05068300	616593	6444162	NO	NO

SIEAG = “Système d’Informations sur l’Eau Adour-Garonne”; L93 = Lambert 93; SG_{Ac.stu} = Spawning grounds of *Acipenser sturio*; SG_{Alo.alo} = Spawning grounds of *Alosa alosa*

Table S2. Life cycle of the European sturgeon and allis shad.



**Reproduction + development phase
of early life stages**

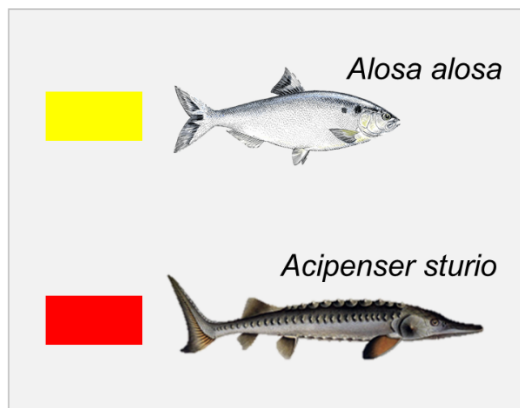


Table S3. HC50 values obtained for each substance quantified in water on the scale of main rivers and on the scale of allis shad and European sturgeon spawning grounds.

Chemicals	CAS	MAIN RIVER SCALE			SPAWNING GROUND SCALE		
		HC50	N _{sp}	N _d	HC50	N _{sp}	N _d
Estrone (Hygiene and Care Products)	53167	7.42e-05	5	65	1.56e-04	3	33
PCDD 48 (Other Industrial Pollutants)	1746016	2.25e-04	4	37	2.25e-04	3	36
Tributylstannane (Other Industrial Pollutants)	688733	8.90e-04	3	11	NA	NA	NA
Cypermethrin (Agrochemicals)	52315078	1.12e-03	17	332	NA	NA	NA
λ-Cyhalothrin (Agrochemicals)	91465086	1.24e-03	8	103	NA	NA	NA
Hydroxyatrazine (Agrochemicals)	2163680	2.25e-03	1	23	2.25e-03	1	23
Hydroxyterbuthylazine (Agrochemicals)	66753079	2.49e-03	1	23	2.49e-03	1	23
Oxadiazon (Agrochemicals)	19666309	3.70e-03	4	10	NA	NA	NA
Desethylterbuthylazine (Agrochemicals)	30125634	6.14e-03	1	21	6.14e-03	1	21
Monomethyldiuron (Agrochemicals)	3567622	6.32e-03	3	16	6.42e+00	1	2
Diuron (Agrochemicals)	330541	6.41e-03	13	72	8.31e-01	9	24
Permethrin (Agrochemicals)	52645531	7.02e-03	17	105	8.81e-03	9	69
Endosulfan (Agrochemicals)	115297	1.01e-02	29	174	NA	NA	NA
Metformin (Hygiene and Care Products)	657249	1.27e-02	1	3	1.27e-02	1	3
p,p'-DDT (Agrochemicals)	50293	1.31e-02	23	91	NA	NA	NA
Hexachlorobenzene (Agrochemicals)	118741	1.63e-02	3	12	NA	NA	NA
Anthracene (Other Industrial Pollutants)	120127	2.11e-02	2	25	NA	NA	NA
4-n-Octylphenol (Other Industrial Pollutants)	1806264	2.24e-02	1	1	NA	NA	NA
Benzo[a]pyrene (Other Industrial Pollutants)	50328	2.49e-02	3	27	1.12e-02	1	13
Decabromodiphenyl ether (Other Industrial Pollutants)	1163195	2.84e-02	2	80	4.11e-02	2	32
Acetochlor (Agrochemicals)	34256821	3.49e-02	3	73	1.80e-02	2	45
Azoxystrobin (Agrochemicals)	131860338	3.95e-02	4	37	5.43e-03	2	5
Propylparaben (Hygiene and Care Products)	94133	4.11e-02	2	3	NA	NA	NA
Fluoranthene (Other Industrial Pollutants)	206440	5.07e-02	5	22	5.46e-02	3	13
Branched 4-nonylphenol (Other Industrial Pollutants)	84852153	6.90e-02	7	146	4.99e-02	3	54
Diclofenac (Hygiene and Care Products)	15307865	6.99e-02	4	46	3.22e-01	1	1
Copper (Metals)	7440508	7.23e-02	19	154	4.44e-02	6	27
Ziram (Agrochemicals)	137304	7.33e-02	2	18	7.33e-02	1	10
Dinocap (Agrochemicals)	39300453	8.35e-02	1	2	NA	NA	NA
Triclosan (Agrochemicals)	3380345	8.36e-02	5	70	6.80e-02	4	34
Carbofuran (Agrochemicals)	1563662	8.74e-02	22	86	1.64e-01	9	27
Mesotrione (Agrochemicals)	104206828	8.81e-02	2	73	2.56e-02	1	1
Pentachlorophenol (Agrochemicals)	87865	9.07e-02	23	231	9.31e-02	15	107
Lindane (Agrochemicals)	58899	9.19e-02	22	96	5.80e-02	10	46
4-tert-Octylphenol (Other Industrial Pollutants)	140669	9.96e-02	5	100	3.05e-02	2	73
Carbendazim (Agrochemicals)	10605217	1.07e-01	10	93	1.78e-02	5	37
Lead (Metals)	7439921	1.09e-01	5	11	1.36e-02	2	3
Deisopropylatrazine (Agrochemicals)	1007289	1.14e-01	1	25	NA	NA	NA
4-Nonylphenol (Other Industrial Pollutants)	104405	1.21e-01	17	268	6.71e-02	8	72
Ketoprofen (Hygiene and Care Products)	22071154	1.28e-01	2	23	1.86e+01	1	3
Butylparaben (Hygiene and Care Products)	94268	1.32e-01	3	7	NA	NA	NA
Deethylatrazine (Agrochemicals)	6190654	1.35e-01	1	27	1.37e-01	1	25
Piperonyl butoxide (Agrochemicals)	51036	1.42e-01	3	51	NA	NA	NA
3,4-Dichloroaniline (Agrochemicals)	95761	1.59e-01	11	184	NA	NA	NA
Cadmium (Metals)	7440439	1.63e-01	11	62	2.46e-02	7	41
Nicosulfuron (Agrochemicals)	111991094	1.66e-01	2	34	NA	NA	NA
Linuron (Agrochemicals)	330552	1.87e-01	9	84	7.75e+00	3	17

Selenium (Metals)	7782492	2.08e-01	5	13	1.36e-01	4	11
Bisphenol S (Other Industrial Pollutants)	80091	2.10e-01	1	104	2.18e-01	1	98
Uranium (Metals)	7440611	2.10e-01	1	14	2.67e-01	1	5
Didealkylatrazine (Agrochemicals)	3397624	2.16e-01	1	19	NA	NA	NA
Atrazine (Agrochemicals)	1912249	2.25e-01	26	532	2.13e+00	9	221
Silver (Metals)	7440224	2.26e-01	4	85	1.73e+00	2	55
Trifluralin (Agrochemicals)	1582098	2.34e-01	5	26	NA	NA	NA
Propiconazole (Agrochemicals)	60207901	2.71e-01	6	103	NA	NA	NA
PCB 28 (Other Industrial Pollutants)	7012375	2.77e-01	3	19	NA	NA	NA
Dimethoate (Agrochemicals)	60515	2.78e-01	15	122	2.12e-01	6	14
Diocetyl phthalate (Other Industrial Pollutants)	117817	2.87e-01	17	490	1.90e-01	10	242
Pentachlorobenzene (Agrochemicals)	608935	2.88e-01	5	22	NA	NA	NA
Myclobutanil (Agrochemicals)	88671890	3.06e-01	2	20	3.06e-01	2	20
Dibutyl phthalate (Other Industrial Pollutants)	84742	3.16e-01	14	318	5.65e-01	5	108
Ibuprofen (Hygiene and Care Products)	15687271	3.31e-01	7	89	1.44e+00	4	39
Phenanthrene (Other Industrial Pollutants)	85018	3.33e-01	4	22	3.33e-01	3	18
Epoxiconazole (Agrochemicals)	133855988	4.13e-01	2	13	4.13e-01	2	13
Acenaphthene (Other Industrial Pollutants)	83329	4.14e-01	2	19	NA	NA	NA
Pyrimethanil (Agrochemicals)	53112280	4.14e-01	2	20	NA	NA	NA
Sulfamethoxazole (Hygiene and Care Products)	723466	4.19e-01	2	28	2.75e+01	1	2
Bisphenol A (Other Industrial Pollutants)	80057	4.85e-01	16	695	2.25e+00	5	371
Butyl benzyl phthalate (Other Industrial Pollutants)	85687	6.72e-01	6	75	1.66e+00	3	39
Mancozeb (Agrochemicals)	8018017	7.03e-01	10	34	1.10e+00	5	7
Simazine (Agrochemicals)	122349	7.80e-01	8	44	2.15e+00	3	26
Alachlor (Agrochemicals)	15972608	8.31e-01	6	29	1.55e+00	3	17
Methomyl (Agrochemicals)	16752775	8.50e-01	9	73	2.36e+00	6	31
4-Chlorophenol (Other Industrial Pollutants)	106489	8.50e-01	5	20	NA	NA	NA
Tributyl phosphate (Other Industrial Pollutants)	126738	9.38e-01	3	41	9.38e-01	3	39
Pendimethalin (Agrochemicals)	40487421	1.01e+00	3	77	NA	NA	NA
Zinc (Metals)	7440666	1.10e+00	13	109	5.28e-01	5	63
Carbaryl (Agrochemicals)	63252	1.18e+00	36	374	1.53e+00	16	143
Fluorene (Other Industrial Pollutants)	86737	1.21e+00	1	8	NA	NA	NA
Flusilazole (Agrochemicals)	85509199	1.24e+00	2	29	1.24e+00	2	29
1,2,4-Trichlorobenzene (Other Industrial Pollutants)	120821	1.34e+00	4	31	1.34e+00	2	10
2,4-Dichlorophenol (Agrochemicals)	120832	1.35e+00	13	165	2.21e+00	7	90
Triclopyr (Agrochemicals)	55335063	1.79e+00	3	10	1.09e+01	2	4
Carbamazepine (Hygiene and Care Products)	298464	1.95e+00	5	132	1.06e+00	3	21
4-Chloroaniline (Other Industrial Pollutants)	106478	2.05e+00	5	13	NA	NA	NA
Chlortoluron (Agrochemicals)	15545489	2.17e+00	1	7	2.17e+00	1	7
Imidacloprid (Agrochemicals)	138261413	2.21e+00	14	556	3.93e+00	5	80
Perfluorohexanesulfonic acid (Other Industrial Pollutants)	355464	2.37e+00	1	17	2.37e+00	1	17
Fenofibric acid (Hygiene and Care Products)	42017890	2.40e+00	1	28	NA	NA	NA
Tebuconazole (Agrochemicals)	107534963	2.57e+00	5	161	1.04e+00	2	64
Perfluorooctanoic acid (Other Industrial Pollutants)	335671	2.59e+00	8	618	NA	NA	NA
BDE 47 (Other Industrial Pollutants)	5436431	2.89e+00	1	35	NA	NA	NA
Tetraconazole (Agrochemicals)	112281773	2.95e+00	2	26	2.95e+00	2	22
Nickel (Metals)	7440020	3.21e+00	3	17	NA	NA	NA
Chromium (Metals)	7440473	3.36e+00	3	10	2.05e+01	1	2
Cyanazine (Agrochemicals)	21725462	3.38e+00	5	21	NA	NA	NA
Diethyl phthalate (Other Industrial Pollutants)	84662	3.54e+00	6	88	9.87e-01	2	32
1-Chloro-2-nitrobenzene (Other Industrial Pollutants)	88733	3.55e+00	1	4	NA	NA	NA
Diisobutyl phthalate (Other Industrial Pollutants)	84695	4.17e+00	1	19	NA	NA	NA

Roundup (Agrochemicals)	38641940	5.39e+00	35	912	1.15e+01	13	87
Terbutylazine (Agrochemicals)	5915413	5.43e+00	2	5	5.43e+00	2	5
Perfluorohexanoic acid (Other Industrial Pollutants)	307244	6.99e+00	1	75	NA	NA	NA
4-tert-Butylphenol (Other Industrial Pollutants)	98544	7.84e+00	1	2	NA	NA	NA
Bromoxynil (Agrochemicals)	1689845	8.91e+00	1	5	NA	NA	NA
AMPA (Agrochemicals)	1066519	9.51e+00	4	42	6.67e+01	2	11
Bentazon (Agrochemicals)	25057890	1.09e+01	1	4	NA	NA	NA
Tetrachloroethylene (Other Industrial Pollutants)	127184	1.13e+01	5	35	1.13e+01	3	9
2-Chlorophenol (Other Industrial Pollutants)	95578	1.36e+01	2	8	NA	NA	NA
Cymoxanil (Agrochemicals)	57966957	1.69e+01	1	5	NA	NA	NA
Toluene (Other Industrial Pollutants)	108883	1.86e+01	6	63	1.86e+01	4	29
Propargite (Agrochemicals)	2312358	1.90e+01	1	3	NA	NA	NA
2,4-D (Agrochemicals)	94757	2.47e+01	19	109	3.35e+01	8	42
Arsenic (Metals)	7440382	2.50e+01	1	5	2.50e+01	1	5
3-Chloroaniline (Other Industrial Pollutants)	108429	2.55e+01	1	5	NA	NA	NA
Perfluoroheptanoic acid (Other Industrial Pollutants)	375859	2.69e+01	1	26	NA	NA	NA
Acetaminophen (Hygiene and Care Products)	103902	3.15e+01	4	47	2.85e+01	3	45
Ofloxacin (Hygiene and Care Products)	82419361	3.41e+01	1	2	3.41e+01	1	2
Benzene (Other Industrial Pollutants)	71432	3.48e+01	4	13	NA	NA	NA
Chloroform (Other Industrial Pollutants)	67663	4.35e+01	5	46	4.16e+02	4	15
Aminotriazole (Agrochemicals)	61825	4.57e+01	4	8	4.57e+01	1	2
Nitrobenzene (Other Industrial Pollutants)	98953	6.74e+01	3	9	NA	NA	NA
Metalaxyl (Agrochemicals)	57837191	7.60e+01	3	7	NA	NA	NA
Iron (Metals)	7439896	2.41e+02	3	17	2.41e+02	1	5
tert-Butyl methyl ether (Other Industrial Pollutants)	1634044	8.93e+02	1	68	NA	NA	NA
Triphenyltin chloride (Agrochemicals)	639587	1.71e+03	1	1	NA	NA	NA
Dicamba (Agrochemicals)	1918009	NA	NA	NA	1.54e+01	1	18

Table S4. Categorization of fish life stages.

Categorization of stage lifes of fish	Available stage lifes of fish
Embryo*	"Blastula", "Egg", "Embryo", "Gastrula", "Eyed egg or stage, eyed embryo", "Morula"
Larva**	"Larva", "New, newly or recent hatch", "Newborn", "Protolarvae", "Post-hatch", "Yolk sac larvae, sac larvae", "Post-larva", "Alevin", "Sac fry, yolk sac fry", "Fry", "Swim-up"
Juvenile***	"Young", "Juvenile", "Parr", "Immature", "Sexually immature", "Fingerling", "Yearling", "Underyearling", "Smolt", "Young of year", "Pre-smolt", "Pre-, sub-, semi-, near adult, or peripubertal", "Subadult"
Adult****	"Adult", "Mature", "Pre-spawning", "Sexually mature", "Young adult", "Mature reproductive"

*Embryos are considered to be developing in the egg.

**Larvae are considered to be developing outside the egg.

***Juveniles are considered to have almost finished growing but not yet sexually mature.

****Adults are considered to have finished growing and to have the capacity to reproduce.