

Supplementary material

Table S1. Surveys collated to assess lamprey presence. Note, not all surveys took place every year. Gear acronyms within Table S2. MIK = Midwater Ringnet, FKN = Fyke net. NA = No information given.

Survey category	Full name (where available)	Survey acronym	Gear acronym	Geographical region	Years	Month	Haul No.	Source
ICES DATRAS ¹	Bottom Trawl Survey	BTS	TBB	Greater North Sea and Celtic Sea	1987 - 2018	7-10	12 054	DOI:10.7489/1967-1
	Bottom Trawl Survey	BTS-VIII	TBB	Bay of Biscay	2011-2017	11-12	455	http://datras.ices.dk
	Demersal Young Fish Survey	DYFS	TBB	Greater North Sea	2002-2017	8-11	3932	http://datras.ices.dk
	Evaluation Halieutique Ouest de l'Europe	EVHOE	OTB	Celtic sea and Bay of Biscay	1997-2017	10-12	2575	10.7489/1958-1 Not
	French Channel Ground Fish Survey	FR-CGFS	OTB	Eastern English Channel	1988-2018	9-11	2678	DOI: 10.18142/11
	North Sea International Bottom Trawl Survey	NS-IBTS	OTB	Greater North Sea	1965-2018	All	30 290	DOI: 10.7489/1922-1
	Portuguese International Bottom Trawl Survey	PT-IBTS	OTB	Bay of Biscay and the Iberian coast	2002-2017	9-11	574	10.7489/1963-1
	Scottish West Coast Bottom Trawl Survey	SWC-IBTS	OTB	Celtic sea	1985-2010	1-4 & 10-12	2307	10.7489/1957-1 10.7489/1924-1

French scientific surveys	Arca	TBB	Bay of Biscay	1995, 1996	10, 6	31	Ifremer
	Arca	GN	Bay of Biscay	1996	6	2	
	Arca	FKN	Bay of Biscay	1995	10	5	
Nourriceries démersaux	Nourdem Bargip/	OTB	Channel and Bay of Biscay (Loire and Seine)	2015-2018	± All	195	Le Goff et al, 2017
Etude de l'impact des marées noires de l'Erika	Black	OTB	Bay of Biscay	2000	2,6,7	27	DOI: 10.17600/50150
	Black	TBB	Bay of Biscay	2000	2,6,7	103	
Nurse (nourriceries) sur la Baie du mont Saint-Michel	BMSM2003	TBB	Bay of Biscay	2003	11	12	Ifremer
Nurse (nourriceries) sur la baie de Bourgneuf	Bour	TBB	Bay of Biscay	1980-1984	7,10,11	136	Ifremer
CAMpagne MANche Occidentale pluridisciplinaire	CAMANOC	OTB	English Channel	2014	9-10	86	DOI: 10.17600/14001900
Campagne de comparaison de racasseurs lourds et légers sur la sélectivité des soles	Captusol01	TBB	Bay of Biscay	1984	10	76	Ifremer
CLASS 2008	CLA08_	OTM	Bay of Biscay	2008	5-6	14	DOI: 10.17600/8040050
		MIK	Bay of Biscay	2008	5-6	11	

Analyse des peuplements de crépidules en baie de bourgneuf	CREBOUR	TBB	Bay of Biscay	2006	2	41	DOI: 10.17600/6050020
EPIfaune BENThique du Golfe du Lion	EPIBENGOL	OTB	Mediterranean	2018	9	10	DOI: 10.17600/18000589
	Giro	TBB	Western English Channel	1997	10	1	Ifremer
Campagne sur les gradients de production côte-large incluant la baie de Vilaine et la rade de Brest	Isobaie09	OTB	Bay of Biscay	2009	4	10	Ifremer
	Isobaie09	FKN	Bay of Biscay	2009	4	11	
	Isobaie09	NA	Bay of Biscay	2009	4	2	
Nurse (nourriceries) en estuaire externe de la Loire	Loir	TBB	Bay of Biscay	1980-1986	7-11	136	Ifremer
	Marika	TBB	Bay of Biscay	2005	5 & 7	31	Ifremer http://www.ifremer.fr/SIH-indices-campagnes/
Mediterranean trawl survey - Corse	MEDITS-CORSE	OTB	Mediterranean	1994-2017	5-7	504	http://www.ifremer.fr/SIH-indices-campagnes/
Mediterranean trawl survey - Golfe du Lion	MEDITS-LION	OTB	Mediterranean	1994-2018	5-7	1628	http://www.ifremer.fr/SIH-indices-campagnes/

Nurse (nourriceries) en 2003	MISOLRE	OTB	Bay of Biscay	2003	9	38	DOI:10.17600/3050120
	MISOLRE	TBB	Bay of Biscay	2003	9	95	
Nurse (nourriceries) dans le golfe du Morbihan	Morb	TBB	Bay of Biscay	1995-1996	6 & 10	78	Ifremer
Nurse (nourriceries) dans le pertuis breton	Nonamebreton	TBB	Bay of Biscay	1987	10	40	Ifremer
Nurse (nourriceries) dans la Vilaine	Nonamvillaine	TBB	Bay of Biscay	1996	9	36	Ifremer
Nourriceries en Méditerranée	NOURMED	TBB	Mediterranean	2018	9	91	DOI: 10.17600/18000588 https://sextant.ifremer.fr/record/98ac17c5-8d70-455e-9496-aafb0dd4ae17/
Nourriceries Baie de Somme	NOURSOM	TBB	Channel	1987-2018	8-10	1609	
Nourriceries golfe de Gascogne	Nurse	TBB	Bay of Biscay	1981-2016	5-11	2361	Ifremer
	Nurse	OTB	Bay of Biscay	2000-2002, 2008-2009	8-9	65	
	Nurse	NA	Bay of Biscay	2009	8	1	
	Nurse	GN	Bay of Biscay	2013	9	1	

Nurse (nourriceries) dans la Vilaine	Nurvil	TBB	Bay of Biscay	2004-2005	9	124	Ifremer
	Nurvil	OTB	Bay of Biscay	2005	9	4	
	Peco/PECOS	OTB	Bay of Biscay and Western English Channel	1976-1980 2004-2006	± All	734	Ifremer
	Peco/PECOS	TBB	Bay of Biscay and Western English Channel	1980, 2004	6-7	58	
Pélagiques Gascogne	PELGAS	OTM	Bay of Biscay	2000-2018	4-6	1158	DOI: 10.17882/59 809
	PELGAS	PS	Bay of Biscay	2007-2011	4-5	54	
	PELGAS	PTM	Bay of Biscay	2007-2018	4-5	627	
Nurse (nourriceries) dans les pertuis (breton et antioche) Campagnes pour la compréhension des communautés sur les habitats à Haploops	Pertuis	TBB	Bay of Biscay	1986-1987	10	168	Ifremer
	Ploops	TBB	Bay of Biscay	2009-2010	5,7,8,9	48	Ifremer
	RESSGASC	OTB	Bay of Biscay	1984-2002	1-12	2344	Ifremer
Nurse (nourriceries) en baie de Vilaine mais en hiver (winter) Suivi des Effets bioLogiques de la contamination chimique	RetroB	TBB	Bay of Biscay	2008	3	48	Ifremer
	SELIMED-1	OTB	Mediterranean	2016	9	19	DOI: 10.17600/16 011900

en Méditerranée								
	Répartition de la distribution des soles sur la radiale cote-large de la baie de Vilaine	Sold	OTB	Bay of Biscay	1988-1989	± All	354	DOI:10.17600/88011211
		Typo	OTB	Bay of Biscay	1996	9	8	Ifremer
		Typo	TBB	Bay of Biscay	1997-1997	9	172	
Fisheries-dependent data	French fisheries observer data	ObsMer	Refer to Table S3	Greater North Sea, Celtic Sea, Bay of Biscay	2003-2019	All	10 0617	https://doi.org/10.13155/39722

Table S2. French fisheries-dependent data (ObsMer) catch by gear type.

Gear mobility	Gear category	Gear acronym	Gear type	Water layer	Seabed depth range	Haul No.	Target species
Mobile	Benthic mobile	DRB	Boat dredges	Benthic	4-47	420	Mussels, scallops
Static	Pots	FPO	Pots	Benthic	4-2181	2191	Crab, lobster, Common prawn, whelk
Static	Static net	GEN	Gillnet and entangling net	Benthopelagic	5-64	2	Monkfish
Static	Static net	GN	Gillnet	Benthopelagic	7-19	1	Fish
Mobile	Pelagic mobile	GNC	Encircling gillnet	Pelagic	4-12	55	Seabass, seabream, mullets
Static	Static net	GND	Driftnet	Pelagic	2-40	122	Seabass, seabream, herring, meagre, mullet
Static	Static net	GNE	Set gillnet	Pelagic	2-17	55	Seabass, seabream, mullet
Static	Static net	GNS	Set gillnet (anchored)	Demersal	0-1493	9337	Wide variety (e.g. ² soles, redcoat, gadoids, seabream, bonito, seabass)
Static	Static net	GTN	Combined gillnets-trammel nets	Demersal	9-184	54	Seabream, turbot
Static	Static net	GTR	Trammel net	Demersal	0-2181	20 822	Wide variety (e.g. Soles, turbot, meagre, nephrops, seabream, monkfish, crabs, lobsters)
	Line	LH	Hand line	Demersal	1-4933	37	seabass, seabream, gadoids, tuna
	Line	LHM	Han and pole lines (mechanised)	Demersal	1-105	53	Pollack
	Line	LHP	Hand lines and pole-lines (hand operated)	Demersal	5-4781	170	Seabass, seabream, sand eels, mackerel, cuttlefish, tuna

² Examples of the most commonly caught species provided.

Static	Line	LL	Longlines	Demersal	1-83	88	Seabass, mackerel
Static	Line	LLD	Drift longline	Demersal	6-3588	130	Tuna, sword fish
Static	Line	LLF	Fixed floating longline	Demersal	5-362	126	Seabass, seabream, sword fish
Static	Line	LLS	Set longline	Demersal	1-2435	2979	Hake, seabass, gadoids, meagre, mackerel, skates, conge
Static	Line	LTL	Trolling lines	Demersal	4-4820	170	Pollack, tuna
Static	Line	LTS	Surface longline	Pelagic	1-4815	8	Pelagic fish
Static	Line	LVS	Vertical longline	Pelagic	8-56-85	9	Seabass
Mobile	Demersal mobile	OTB	Otter beam trawl	Demersal	0-4846	32 292	Wide variety (e.g. whiting, monkfish, squid, saithe, sole)
Mobile	Pelagic mobile	OTM	Otter midwater trawl	Pelagic	0-4471	2782	Wide variety (Anchovy, sardine, monkfish)
Mobile	Demersal mobile	OTT	Otter twin trawl	Demersal	2-4906	19 400	Wide variety (e.g. monkfish, nephrops, cuttlefish, soles)
Mobile	Pelagic mobile	PS	Purse seine	Pelagic	0-2335	298	Sardine, horse mackerel, seabream, anchovy
Mobile	Demersal mobile	PTB	Bottom pair trawl	Demersal	2-1473	1473	Wide variety (e.g. flat fish, gadoids, monkfish)
Mobile	Pelagic mobile	PTM	Midwater pair trawl	Pelagic	1-4912	4144	Wide variety (e.g. seabass, sardine, tuna, hake)
Mobile	Demersal mobile	PTT	Demersal pair trawl	Demersal	8-556	48	Saithe
Mobile	Demersal mobile	SDN	Danish seine net	Demersal	7-384	2746	Squid, gadoids, redcoat, seabass, mackerel
Mobile	Pelagic mobile	SPR	Vessel pair seine	Pelagic	3-39	3	Fish
Mobile	Demersal mobile	SSC	Scottish seine net	Demersal	2-44	28	Redcoat
Mobile	Benthic mobile	TBB	Bottom beam trawl	Benthic	2-280	574	Queen scallop, flat fish

Table S3. Lampreys at sea records between 1966 and 2018 using fisheries-dependent and independent data. SE = Standard Error, BM = Benthic mobile, DM= Demersal mobile, PM= Pelagic mobile, SN= Seine net, NA (grey) = no data available. See Table S2 for precise gear types corresponding to the different surveys, the dates and haul numbers.

Species	Data type	Haul No.	Presence	Total No.	Year	Mean length \pm SE (cm)	Length range (cm)	Distance from the coast (km)	Mean distance from coast \pm SD (km)	Gear type	Haul No.	Presence
<i>P. marinus</i>	ObsMer	100 617	23	24	2008-2019	26.63 \pm 3.57	13-92	0.3 - 67.6	19.90 \pm 20.33	DM	55 987	4
										Line	3770	8
										PM	7282	4
	ICES SBTSSs	54 865	84	369	1980-2017	26.55 \pm 0.8	13-80	1.4 -276.1	41.68 \pm 57.45	SN	30 393	7
										BM	16 441	9
										DM	38 424	75
										DM	6026	14
French surveys	13 422	27	28	1977-2018	26.56 \pm 1.21	19-39	1.9 -139.5	33.08 \pm 38.92	PM	1879	13	
<i>L. fluviatilis</i>	ObsMer	100 617	2	6	2012 & 2015	24.5 \pm 2.35	14-29	9.8 - 11.2	10.50 \pm 0.99	Line	3770	1
										PM	7282	1
	ICES SBTSSs	54 865	114	292	1973-2018	30.05 \pm 0.34	19-42	0.2 - 209.8	25.15 \pm 36.22	BM	16 441	55
										DM	38 424	59
	French surveys	13 422	4	4	1981-2018	25.00 \pm 4.00	21-29	1.6 - 11.3	6.72 \pm 3.98	BM	5495	1
										DM	6026	3

Table S4. Summary table of lampreys observed from the different surveys. FD = fisheries-dependent data (ObsMer), FI_ICES = scientific bottom trawl surveys submitted to ICES DATRAS, FI_Fr = French scientific bottom trawl surveys from IFREMER. See Table S1 for survey types.

Species	Survey category	Survey	Presence	Haul No.	Percent presence (%)
<i>P. marinus</i>	FD	ObsMer	23	100 617	0.02
	FI_Fr	Peco/PECOS	9	792	1.14
	FI_Fr	PELGAS	13	1854	0.7
	FI_Fr	Sold	5	354	1.41
	FI_ICES	DYFS	9	3932	0.23
	FI_ICES	EVHOE	1	2575	0.04
	FI_ICES	FR-CGFS	1	2678	0.04
	FI_ICES	NS-IBTS	70	30 290	0.23
	FI_ICES	SWC-IBTS	3	2307	0.13
<i>L. fluviatilis</i>	FD	ObsMer	2	100 617	0.00
	FI_Fr	Bargip/Nourdem	2	195	1.03
	FI_Fr	Nurse	1	2428	0.04
	FI_Fr	Sold	1	354	0.28
	FI_ICES	BTS	6	12 054	0.05
	FI_ICES	DYFS	49	3932	1.25
	FI_ICES	NS-IBTS	59	30 290	0.19

Table S5. Summary table of lampreys observed from the different gear types from fisheries-dependent and independent data. BM = Benthic mobile, DM= Demersal mobile, PM= Pelagic mobile, SN= Seine net. Refer to Table S2 for gear type acronyms.

Species	Gear category	Gear type	Presence	Haul No.	Percent presence (%)
<i>P. marinus</i>	BM	TBB	9	22 510	0.04
	DM	OTB	91	76 742	0.12
	DM	OTT	1	19 400	0.01
	DM	PTB	1	1473	0.07
	Line	LLS	8	2979	0.27
	PM	OTM	9	3954	0.23
	PM	PTM	8	4771	0.17
	SN	GNS	4	9337	0.04
	SN	GTR	3	20 822	0.01
<i>L. fluviatilis</i>	BM	TBB	56	22 510	0.25
	DM	OTB	62	76 742	0.08
	Line	LLS	1	2979	0.03
	PM	PTM	1	4771	0.02

Table S6. Summary table fisheries-dependent data (ObsMer) target species and gear types for which lamprey were observed. Refer to Table S2 for gear type acronyms.

Species	Target species	Gear category	Gear	Presence	Hauls	Percent presence (%)		
<i>P. marinus</i>	Common anchovy	Pelagic mobile	OTM	1	945	0.11		
				1	888	0.11		
	Common sardine Hake	Static net Line	GNS	2	1011	0.20		
				6	766	0.78		
				Demersal mobile	PTB	1	41	2.44
						2	364	0.55
	Meagre	Static net	GNS	1	411	0.24		
	Prawns	Demersal mobile	OTB	2	303	0.66		
				1	213	0.47		
	Redcoat Sea bream, Sparidae	Static net Line	GNS	1	1252	0.08		
				1	188	0.53		
	Seabass			1	724	0.14		
	Soles	Static net	GTR	3	14 179	0.02		
<i>L. fluviatilis</i>	Whiting	Line	LLS	1	166	0.60		
	Meagre	Pelagic mobile	PTM	1	14	7.14		

Table S7. Summary table of hauls undertaken and lampreys observed within ICES biogeographic regions and ICES divisions from fisheries-dependent and independent data.

Biogeographic region		ICES division		Presence	
ICES ecoregion	Haul No.	Area_27	Haul No.	<i>P. marinus</i>	<i>L. fluviatilis</i>
Baltic Sea	60	3.c.22	60	0	0
Greater North Sea	83 544	3.a.20	2119	7	7
		3.a.21	1394	18	7
		3.b.23	18	2	0
		4.a	12 553	4	0
		4.b	20 577	27	51
		4.c	9495	19	49
		7.d	25 087	6	2
		7.e	12 301	2	0
Norwegian Sea	347	2.a.2	347	0	0
Faroes	26	5.b.1.b	19	0	0
		5.b.2	7	0	0
Oceanic Northeast Atlantic	194	6.b.1	36	0	0
		7.j.1	7	0	0
		7.k.1	75	0	0
		8.d.1	31	0	0
		8.e.1	45	0	0
Celtic Sea	30 846	6.a	7720	0	0
		6.b.2	48	0	0
		7.a	2033	2	0
		7.b	255	1	0
		7.c.2	501	0	0
		7.f	1366	0	0
		7.g	6012	1	0
		7.h	9453	0	0
		7.j.2	2928	0	0
		7.k.2	530	0	0
Bay of Biscay and the Iberian Coast	45 346	8.a	27 885	28	3
		8.b	15 482	15	1
		8.c	433	0	0
		8.d.2	970	0	0
		8.e.2	2	0	0
		9.a	574	0	0
Mediterranean	8541		8541	2	0

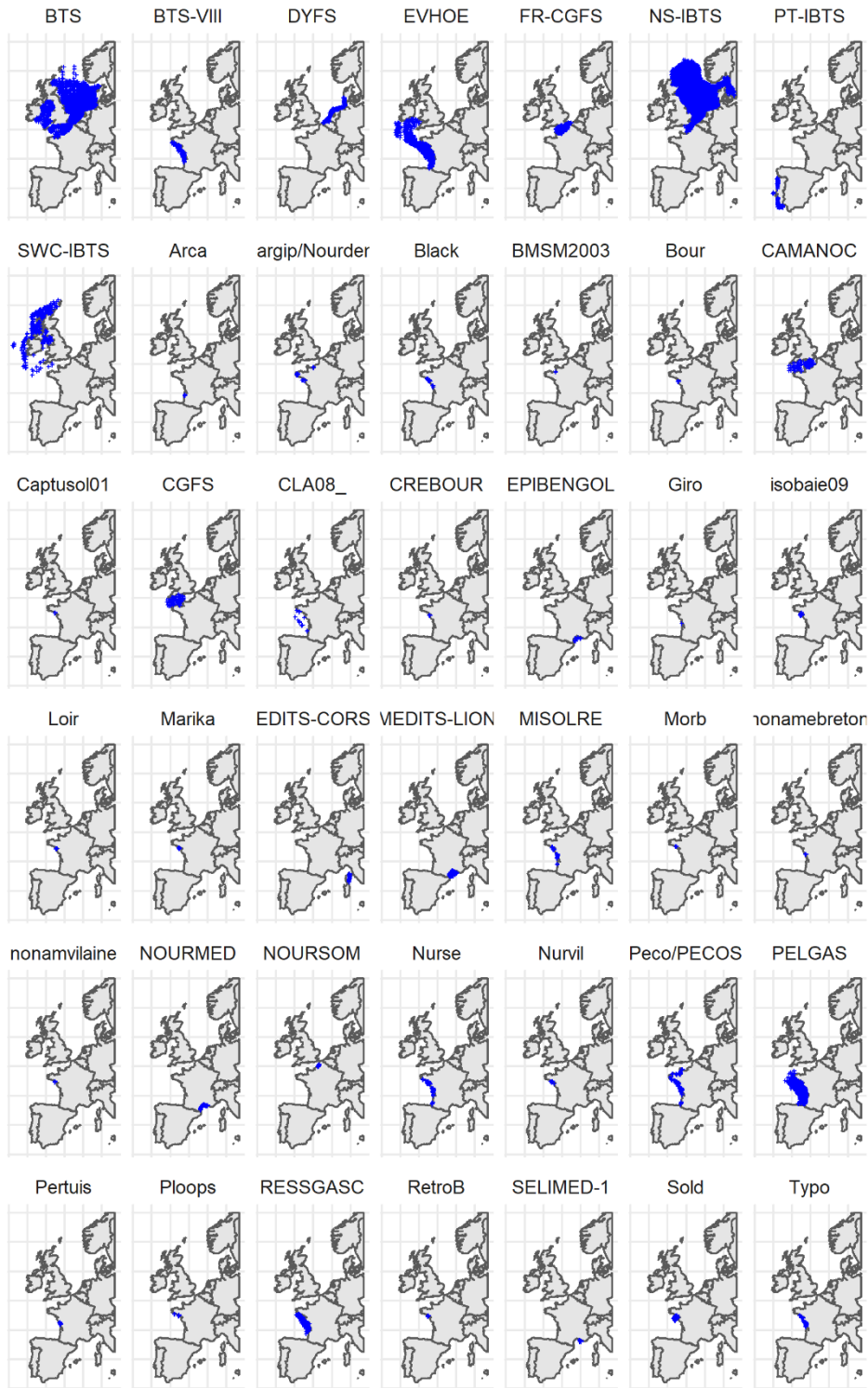


Figure S1. Location of the hauls (blue points) from the fisheries-independent surveys used to assess lamprey presence. Refer to Table S1 for more detail.