

European eel (*Anguilla anguilla*) throughout its natural range

ICES advice on fishing opportunities

ICES advises that when the precautionary approach is applied for European eel, all anthropogenic impacts (e.g. caused by recreational and commercial fishing on all stages, hydropower, pumping stations, and pollution) that decrease production and escapement of silver eels should be reduced to – or kept as close to – zero as possible in 2019.

Stock development over time

The status of eel remains critical.

Indices of both glass and yellow eel recruitment strongly declined from 1980 to about 2010, and have remained at a low level since. The annual recruitment of glass eel to European waters in 2018 is 2.1% of the 1960–1979 level in the “North Sea” series and 10.1% in the “Elsewhere Europe” series. The annual recruitment of young yellow eel to European waters in 2018 was 29% of the 1960–1979 level.

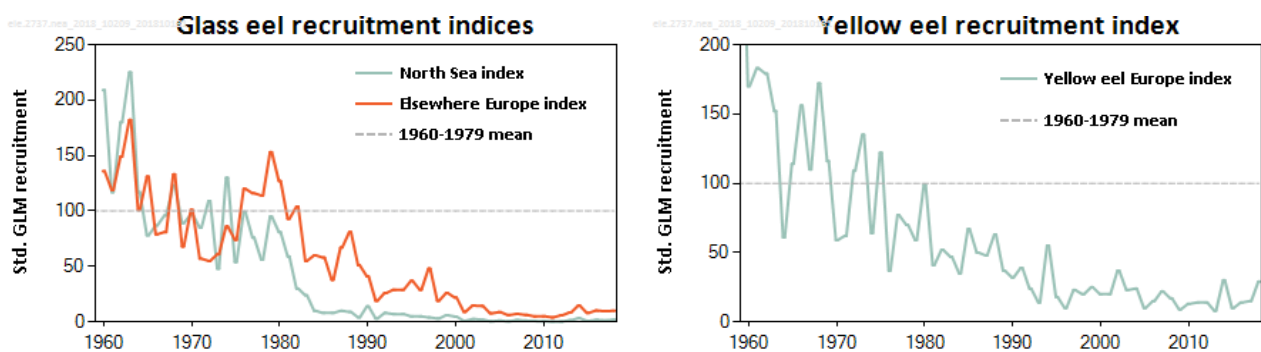


Figure 1 European eel. Left panel: indices, geometric mean of estimated (Generalised Linear Model – GLM) glass eel recruitment for the continental “North Sea” and “Elsewhere Europe” series. The GLM was fitted to 46 time-series comprising either pure glass eel or a mixture of glass + yellow eels. The predictions were then scaled to the 1960–1979 average $\bar{p}_{1960-1979}$. In the Baltic area, recruitment occurs at the yellow eel stage only. The “North Sea” series are from Norway, Sweden, Germany, Denmark, the Netherlands, and Belgium. The “Elsewhere” series are from UK, Ireland, France, Spain, Portugal, and Italy. Right panel: Geometric mean of estimated (GLM) yellow eel recruitment trends for Europe. The GLM was fitted to 14 yellow eel time-series and scaled to the 1960–1979 average $\bar{p}_{1960-1979}$.

Stock and exploitation status

ICES cannot assess the exploitation status relative to the maximum sustainable yield (MSY) and precautionary approach (PA) reference points, because the reference points are undefined. While stock size reference points are also undefined, it is considered that stock size is likely well below potential biological reference points.

Table 1 European eel. State of the stock and fishery relative to reference points.

		Fishing pressure			Stock size		
		2015	2016	2017	2016	2017	2018
Maximum sustainable yield	F_{MSY}	?	?	?	Undefined	MSY	?
Precautionary approach	F_{pa}, F_{lim}	?	?	?	Undefined	B_{pa}, B_{lim}	Below potential reference points
Management plan	F_{MGT}	–	–	–	Not applicable	B_{MGT}	– Not applicable
Qualitative evaluation	–	?	?	?	Unknown	–	Highly impaired recruitment

Catch scenarios

Total landings and effort data are incomplete. In addition, there is great heterogeneity among the time-series of landings due to inconsistencies in reporting by, and between, countries. Changes in management practices have also affected the reporting of commercial and non-commercial/recreational fisheries. Therefore ICES does not have the information needed to provide a reliable estimate of total catches of eel. Furthermore, the understanding of the stock dynamic relationship is not sufficient to determine/estimate the level of impact that fisheries (at the glass, yellow, or silver eel stage) have on the reproductive capacity of the stock.

Basis of the advice

Table 2 European eel. The basis of the advice.

Advice basis	Precautionary approach.
Management plan	<p>A management framework for eel within the EU was established in 2007 through an EU regulation (EC Regulation No. 1100/2007; EU, 2007), but there is no internationally coordinated management plan for the whole stock area, which extends beyond the EU. The objective of the EU regulation is the protection, recovery, and sustainable use of the stock. To achieve the objective, EU Member States have developed Eel Management Plans (EMPs) for their river basin districts, designed to reduce mortality to a level that allows at least 40% of the silver eel biomass to escape to the sea with high probability, relative to the best estimate of escapement that would have existed if no anthropogenic influences had impacted the stock. ICES has evaluated the conformity of the national management plans with EC Regulation No. 1100/2007 (ICES, 2009, 2010) and progress in implementing EMP actions (ICES, 2013a, 2013b, 2018a in progress). The EU Member States produced progress reports in 2012, 2015, and 2018. The 2015 and 2018 reports have not been post-evaluated at the time of writing this advice.</p> <p>Work is ongoing towards the development of an adaptive regional management plan for eel in the Mediterranean Region under the auspices of the General Fisheries Commission for the Mediterranean (GFCM).</p> <p>The EC Regulation of 2007 (EU, 2007), establishing measures for the recovery of the stock of European eel, has not been evaluated by ICES for its conformity with the precautionary approach and has for this reason not been used as the basis for the advice.</p>

Quality of the assessment

An eel data call was issued for the first time in 2017, which has substantially improved the coverage and completeness of the data being reported to ICES. A new call was issued in 2018, building on the previous call (ICES, 2018b), which included the stock indicators and associated data as reported to the EU in the 2018 progress reports. However, data on fisheries and other anthropogenic impacts remain incomplete.

The advice is based on two glass eel recruitment indices and a yellow eel recruitment index. The indices are based on data from fisheries and scientific surveys, and form the longest and most reliable time-series that constitute an index of abundance. The quality of the underlying recruitment data is variable and needs further investigation. The current advice is based on the fact that the indices used by ICES are still well below the 1960–1979 levels.

Issues relevant for the advice

In September 2008, and again in 2014, eel was listed in the IUCN Red List as a critically endangered species.

The European eel (*Anguilla anguilla*) is listed in CITES Appendix II (species that are not necessarily now threatened with extinction, but that may become so unless trade is closely controlled) and in the EU implementation of CITES rules (Annex B to Council Regulation (EC) No 338/97; EU, 1996) since 13 March 2009. Since 2010, import and export of eel from the EU has been prohibited.

The assessment and management of the fisheries and non-fisheries mortality factors are carried out by national and regional authorities. Fisheries take place on all available continental life stages throughout the distribution area, although fishing pressure varies from area to area, from almost nil to heavy overexploitation. Illegal, unreported, and unregulated

(IUU) fishing is known to occur. The non-fishing anthropogenic mortality factors can be grouped as those due to (a) hydropower, pumping stations, and other water intakes; (b) habitat loss or degradation; (c) pollution, diseases, and parasites; and (d) other management actions that may affect levels of predation, e.g. conservation vs. control of predators. Climate change may have impacts, but these have not been quantified.

Environmental impacts in marine, transitional, and fresh waters, which include habitat alteration, barriers to eel passage, deterioration in water quality, and presence of non-native diseases and parasites, all contribute to the anthropogenic stresses and mortality on eels, and also affect their reproductive success. It is anticipated that the implementation of the Water Framework (WFD) and the Marine Strategy Framework (MSFD) directives may result in improvements to the continental environment, and that this may have a positive effect on the reproductive potential of silver eel.

ICES notes that stocking of eels is considered a management action in the EU regulation and many eel management plans, and that this stocking is reliant on a glass eel fishery catch. There is evidence that translocated and stocked eel can contribute to yellow and silver eel production in recipient waters, but information on contribution to actual spawning is missing due to the general lack of knowledge of the spawning of eel. Internationally coordinated research is required to determine any net benefit of restocking on the overall population, including carrying capacity estimates of glass eel source estuaries, detailed mortality estimates at each step of the stocking process, and performance estimates of stocked vs. non-stocked eels.

When stocking to increase silver eel escapement and thus aid stock recovery, an estimation of the prospective net benefit should be made prior to any stocking activity. Stocking should take place only where survival to silver eel escapement is high, and should not be used as an alternative to reducing anthropogenic mortality. Where eel are translocated and stocked, measures should be taken to evaluate their fate and their contribution to silver eel escapement. Such measures should include regionally coordinated mass marking of eels to distinguish stocked eels from natural recruits in future scientific surveys.

A management framework for eel within the EU was established in 2007 through an EU Regulation (EC Regulation No. 1100/2007; EU, 2007), but there is no internationally coordinated management plan for the whole stock area.

The framework required EU Member States to report on progress in 2012, 2015, and 2018. In 2012, many EU Member States did not completely report stock indicators (22 of 81 eel management plans did not report all biomass indicators, and 38 did not report all mortality indicators), and there are differences in the approaches used to calculate reported stock indicators. A complete reporting of verified indicators covering the distribution area of the European eel is required for a full assessment of the stock. The 2015 reports were not requested to be evaluated by ICES and the reports for 2018 are currently being evaluated and should be reported soon.

Reference points

The EC Regulation (EU, 2007) specifies that mortality should be reduced to allow an escapement limit of at least 40% of the silver eel biomass relative to the best estimate of escapement that would have existed if no anthropogenic influences had impacted the stock.

Recruitment at the 1960–1979 level is currently regarded as an unimpaired recruitment level.

ICES has advised the EU CITES Scientific Review Group on reference points for the eel stock that could be used in developing, and reviewing, an application for a non-detriment finding (NDF), under circumstances of any future improvement of the stock (ICES, 2015). These reference points were developed specifically using CITES guiding principles for NDF.

Basis of the assessment

Table 3 European eel. Basis of the assessment.

ICES stock data category	3 (ICES, 2018c).
Assessment type	Trend analysis, GLM of glass and yellow eel recruitment indices.
Input data	Glass eel and yellow eel recruitment indices.
Discards and bycatch	Not included.
Indicators	None.
Other information	Landing statistics, while improved by the Data calls in 2017 and 2018, remain incomplete and reporting inconsistent. Stock indicators are incomplete from eel management units/countries in the EU and from non-EU countries. There is no international legislative requirement to collect and provide data for the entire stock area.
Working group	Joint EIFAAC/ICES/GFCM Working Group on Eels (WGEEL).

Information from stakeholders

Data on recruitment collected by stakeholders are included in the assessment where appropriate. No additional information is available.

History of the advice, catch, and management

Table 4 European eel. History of ICES advice.

Year	ICES advice	Predicted catch corresponding to the advice	TAC *	ICES catch **
1999	A recovery plan	-		
2000	No fishery and a recovery plan	0	-	-
2001	A recovery plan should be implemented for the eel stock and fishing mortality should be reduced to the lowest possible level until such a plan is agreed upon and implemented	-	-	-
2002	Exploitation should be reduced to the lowest possible level until a recovery plan is agreed upon and implemented	0	-	-
2003	All anthropogenic mortality as close to zero as possible, until a recovery plan is agreed upon and implemented	-	-	-
2004	-	-	-	-
2005	-	-	-	-
2006	All anthropogenic mortality as close to zero as possible, until a recovery plan is agreed upon and implemented	-	-	-
2007	All exploitation and other anthropogenic impacts should be reduced to a level as close to zero as possible and a recovery plan for the whole stock should be implemented urgently	-	-	-
2008	All exploitation and other anthropogenic impacts should be reduced to as low as possible, until there are clear signs of recovery	-	-	-
2009	All exploitation and other anthropogenic impacts should be reduced to as close to zero as possible	-	-	-
2010	All anthropogenic impacts should be reduced to as close to zero as possible until stock recovery is achieved	-	-	-
2011	All anthropogenic mortality as close to zero as possible until there is clear evidence that the stock is increasing	-	-	-
2012	All anthropogenic mortality as close to zero as possible until there is clear evidence that both recruitment and the adult stock are increasing	-	-	-
2013	All anthropogenic mortality as close to zero as possible until there is clear evidence that both recruitment and the adult stock are increasing	-	-	-
2014	All anthropogenic mortality as close to zero as possible, until there is clear evidence of sustained increase in both recruitment and the adult stock	-	-	-
2015	All anthropogenic mortality as close to zero as possible	-	-	-
2016	All anthropogenic mortality as close to zero as possible	-	-	-
2017	All anthropogenic impacts as close to zero as possible	-	-	-
2018	All anthropogenic impacts as close to zero as possible	-	-	-
2019	All anthropogenic impacts as close to zero as possible	-	-	-

* There has never been a TAC for this stock.

** Catch estimates considered too incomplete to be presented.

History of catch and landings

Landings data are not complete for the entire natural range of the European eel. However, Tables 5, 6, 8, and 9 present the landings reported to ICES, the European Inland Fisheries and Aquaculture Advisory Commission (EIFAAC), and GCFM, either through responses to the 2018 Data call (ICES, 2018b), in Country Reports, or integrated by ICES in 2017 (ICES, 2017) using data from its previous reports. Table 7 contains landings data reported to FAO for countries where data were not available to the working group (FAO, 2017). Not all countries have reported all their landings, so the values given here should be considered as a minimum. Care should also be taken with the interpretation of the landings as indicators of the stock, since the catch statistics now reflect the status of reduced fisheries activity as well as of stock levels.

Data deficiencies in reports for recreational fisheries (Tables 8–9) were described by ICES (ICES, 2016). Though improvements have been evidenced since then, overall, the impact of recreational fisheries on the eel stock remains largely unquantified, being likely at the same order of magnitude as the commercial fisheries.

Information on fishing effort and the capacity of the fisheries is lacking, but is necessary to fully interpret the changes to the landings data over the years. The wide variety of fisheries and gear types makes this challenging.

Few countries reported the level of misreporting and illegal fisheries to ICES, EIFAAC, and GCFM, i.e. seizure of illegal nets as well as illegal trade of glass eels, from countries both inside and outside the EU. There are indications from customs seizures, however, that the illegal export of glass eel could be very substantial, potentially exceeding the legal market.

Table 5 European eel. Commercial landings (tonnes) of glass eel (1960–2018) in countries where fisheries exist, combining information from the 2018 Data call and the WGEEL database. 0 = No catch. Empty cell = No information or Not collected or Not pertinent.

Year	United Kingdom	France	Spain	Portugal	Italy
1960			9		
1961			17		
1962			11		
1963			8		
1964			11		
1965			4		
1966			6		
1967			5		
1968			4		
1969			4		
1970			5		
1971			1		
1972	17		1		
1973	28		1		
1974	58		2		
1975	10		3		
1976	13		12		
1977	39		18		
1978	61	1393	22		
1979	67	1850	17	9	
1980	40	1491	15	10	
1981	37	890	13	18	
1982	48	866	19	22	
1983	17	791	10	7	
1984	25	528	16	16	
1985	20	444	18	15	
1986	19	423	6	7	
1987	21	461	9	10	
1988	21	504	10	3	
1989	21	410	10	3	
1990	21	325	5	4	
1991	1	179	7	3	
1992	5	183	4	4	
1993	6	329	5	4	
1994	10	329	2	3	
1995	12	413	5	5	
1996	19	262	15	9	
1997	9	287	12	4	
1998	11	195	14	4	
1999		242	14	4	
2000		206	11	3	
2001	0.8	101	12	1	

Year	United Kingdom	France	Spain	Portugal	Italy
2002	0.5	202	9	0.8	
2003	2	151	10	1	
2004	1	89	5	0.8	
2005	2	89	6	1	
2006	1	67	4	3	
2007	2	77	5	0.9	
2008	0.8	79	5	0.8	
2009	0.3		4	1	
2010	1	41	6	2	
2011	2	31	5	1	
2012	3	34	5	0.8	
2013	6	34	7	1	
2014	12	35	11	1	0.4
2015	3	36	9	1	0.2
2016	4	46	7	0.4	0.1
2017	3	46	16	2	0.1
2018	4	54	0.6		

Table 6 European eel. Commercial landings (tonnes) of yellow and silver eel (1960–2017) in Norway (NO), Sweden (SE), Finland (FI), Estonia (EE), Latvia (LV), Lithuania (LT), Poland (PL), Germany (DE), Denmark (DK), Netherlands (NL), Ireland (IE), United Kingdom (UK), France (FR), Spain (ES), Portugal (PT), Italy (IT), Slovenia (SI), Greece (GR), Turkey (TR), and Tunisia (TN), combining information from the 2018 Data call and the WGEEL database. 0 = No catch. Empty cell = No data or Not Collected or Not Pertinent.

Year	NO	SE	FI	EE	LV	LT	PL	DE	DK	NL	IE	UK	FR	ES	PT	IT	SI	GR	TR	TN
1960	430	1905			37	165	733		4937	2999		772		98						
1961	449	2387			43	139	640		4110	2452		768		154						
1962	356	2171			41	155	663		4122	1443		696		115						
1963	503	2334			56	260	762		4166	1618		788		137						
1964	440	2612		3	37	225	884		3505	2068		549		92						
1965	523	2051		0.3	35	125	682		3402	2268		784		130						
1966	510	2219		2	33	238	804		3901	2339		881		192				15		
1967	491	1835		3	39	153	906		3679	2524		569		164				19		
1968	569	2052		3	28	165	943		4476	2209		586		176				5		
1969	522	1922		49	36	134	935		3878	2389		606		136		2469		3	342	
1970	422	1209		62	29	118	847		3558	1111	200	752		119		2300		0	441	
1971	415	1391		60	29	124	722		3378	853	200	842		107		2113		0	460	
1972	422	1204		73	25	126	696		3429	857	200	633		119		1997		4	220	
1973	409	1212		69	27	120	645		3656	823	91	723		100		588		15	315	
1974	368	1034		51	20	86	691		2977	840	67	765		93	2	2122		130	588	
1975	407	1391		82	19	114	810		3485	1000	79	762		78	6	2886		134	448	
1976	386	935		72	24	88	761		3054	1172	150	622		83	13	2596		159	499	
1977	352	989		66	16	68	868		2502	783	108	691		80	23	2390		89	282	
1978	347	1076		63	18	70	910		2492	719	76	824		67	7	2172		225	283	
1979	374	954		28	21	57	979		1904	530	110	1045		97		2354		185	396	
1980	387	1112		26	9	45	1214		2288	664	75	912		90		2198		227	224	
1981	369	887		22	10	27	944		2227	722	94	907		98		2270		251	374	
1982	385	1161		14	12	28	911		2541	842	144	943		20		2025	0.795	255	424	
1983	324	1212		29	9	23	868		2119	937	117	866		18		2013	0.67	201	588	
1984	310	963		72	12	27	819		1871	691	88	973		11		2050	1	285	616	
1985	352	1029		75	18	29	1022	1097	1630	679	87	750		17		2135	2	190	583	
1986	272	829		61	19	32	921	1119	1672	721	87	651	1944	13		2134	3	152	517	
1987	282	700		67	25	20	887	1031	1279	538	230	684	2062	21		2265	2	266	543	
1988	513	933		110	15	23	943	1018	1878	425	215	934	2265	14		2027	2	268	756	
1989	313	903		55	13	21	813	964	1696	526	400	875	1746	5	14	1243	1	156	472	
1990	336	918		61	13	19	768	830	1675	472	256	784	1778	9	13	1088	2	194	230	
1991	323	1060		52	14	16	670	725	1465	573	245	737	1645	50	23	1097	1	209	262	
1992	372	1154		39	17	12	638	762	1451	548	234	715	1321	54	30	1084	0.061	185	245	
1993	340	1121		59	19	10	568	790	1080	293	260	671	1280	66	34	782	0.066	182	261	

Year	NO	SE	FI	EE	LV	LT	PL	DE	DK	NL	IE	UK	FR	ES	PT	IT	SI	GR	TR	TN
1994	472	1265		47	19	12	635	833	1200	330	300	778	1280	51	27	771	0.718	201	329	
1995	454	950		45	38	9	642	778	892	354		900	1280	69	24	1047	0.01	201	390	
1996	353	1053		55	24	9	629	603	752	300		805	1280	62	26	953	0.012	151	342	
1997	467	1065		59	25	11	526	616	797	285		731	1223	61	25	727	0.002	137	400	
1998	331	646		44	30	17	544	567	597	323		693	1150	44	23	666	0.003	88	300	
1999	447	702		65	26	18	599	645	717	332	250	668	1005	48	23	634		81	200	
2000	281	531		67	15	11	444	591	628	382	250	588	986	55	22	588	0.004	88	176	53
2001	304	643		67	19	12	435	569	707	440	98	584	1002	130	15	520	0.019	93	122	93
2002	311	591		50	11	13	373	544	614	371	123	551		106	27	415	0.009	136	147	251
2003	240	565		49	11	12	366	498	648	311	111	552		96	11	446		77	158	137
2004	237	583		39	11	16	337	475	546	311	136	472		85	9	379		58	165	95
2005	249	676		31	12	22	220	455	534	256	101	476		88	7	75	0.002	116	176	107
2006	293	732		33	8	16	184	472	596	241	133	382		116	10	56	0.014	77	162	288
2007	194	702		31	10	15	181	424	537	197	114	451		82	11	277	0.009	90	179	257
2008	211	671	1	31	13	14	160	408	466	148	108	393		66	7	56	0.031	71	171	194
2009	69	514	2	22	5	9	161	374	467	109	0	460		89	8	330	0.002	78	158	141
2010	32	525	2	19	9	19	173	366	422	447	0	455		76	11	265	0.003	59	182	114
2011	0	450	2	16	6	11	119	279	370	127	0	456	368	61	6	190	0	83	28	122
2012	0	340	2	18	6	8	119	245	317	354	0	414	473	84	4	182	0	55	38	141
2013	0	374	1	17	5	14	137	265	356	321	0	427	504	86	3	172	0.001	38	48	180
2014	0	324	1	17	4	8	117	232	346	321	0	406	434	124	3	192	0	58	56	137
2015	0	246	0.609	14	5	6	102	224	282	293	0	341	357	60	3	170	0	60	71	95
2016	3	279	1	15	4	14	138	205	265	313	0	347	443	83	2	205	0	84	75	299
2017		244	1	16	9	14	173		257	422	0	321	280	75	1	200		62		149

Table 7 European eel. Commercial landings (tonnes) of yellow and silver eel (1960–2016) obtained from the FAO database (FAO, 2017) for countries not listed in Table 6: Albania (AL), Algeria (DZ), Croatia (HR), Cyprus (CY), Czechia (CZ), Slovakia (SK), Hungary (HU), Lebanon (LB), Montenegro (ME), Macedonia (MK), Morocco (MA), Romania (RO), Russian Federation (RU), Ukraine (UA), Belarus (BY), Switzerland (CH), and Egypt (EG). 0 = No catch. Empty cell = No data or Not Collected or Not Pertinent.

Year	AL	DZ	HR	CY	CZ*	SK*	HU	LB	ME†	MK	MA	RO	RU**	UA**	BY**	CH	EG
1960				0											300		
1961				0							300				300		
1962				0							300				400		
1963				0							300				400		
1964				0							300				300		
1965				0							300				300		
1966				0							300				400		
1967				0							300				400		
1968				0							300				400		
1969				0							300				500		
1970	0	0		0			0				0				600		
1971	0	0		0			0				0				600		
1972	0	0		0			0				0				600		
1973	0	0		0			0				0				1051		
1974	0	50		0			0				1				1229		
1975	0	0		0			0				7				768		
1976	0	0		0			0				4				394		
1977	0	0		0			0				23				986		
1978	0	0		0			0				22				1518		
1979	0	0		0			0				41				632		
1980		0		0							25				1240		
1981		0		0							56				315		
1982		0		0							149				215		
1983		0		0							226				211		
1984		0		0		50					135	0			478		
1985		0		0		55	0				108	0			418	12	
1986		0		0		60	0				114	0			430	10	
1987	177	0		0		61	0				117	0			407	14	
1988	194	0		0		54	0				44	0	169	100	40	13	
1989	143	0		0		48	0				35	0	301	4	56	11	
1990	165	0		0		42	151				54	0	221	2	46	11	
1991	81	0		0		40	126				32	0	133	0	15	7	
1992	188	0	7	0		40	421				51	0	53	0	22	7	
1993	150	0	5	0	31	7	263				104	0	35	0	19	4	

Year	AL	DZ	HR	CY	CZ*	SK*	HU	LB	ME†	MK	MA	RO	RU**	UA**	BY**	CH	EG
1994	100	0	5	0	32	20	501				150	0	33	0	26	5	
1995	39	0	7	0	31	13	411		5		100	0	41	0	15	5	798
1996	50	0	6	0	28	7	579		3		100	0	46	0	20	3	537
1997	21	0	7	0	27	8	124		3		401	1	47	0	15	2	585
1998	58	10	0	0	28	8	182		3		303	1	49	0	18	3	501
1999	63		0	0	28	8	179				250	0	23	0	16	3	709
2000	70		0	0	24	4	76				100	26	46	0	14	2	2064
2001	98		0	0	29	6	27				150	0	56	0	25	2	1979
2002	25		0	0	28	7	18		4		200	0	55	5	12	2	1802
2003	0		0	6	26	5	9		4		101	0	56	0	8	2	781
2004	52		0	2	25	7	13		2		53	0	60	0	16	2	916
2005	105		0	0	26	5	74		2	0	71	0	56	0	13	2	924
2006	193		0	0	21	4	90		8	3	50	0	55	0	9	3	3983
2007	119		0	0	21	3	34		3	3	41	0	36	0	9	2	2055
2008	98		0	0	21	3	52		2	3	40	0	17	0	10	5	944
2009	70		0	0	21	3	92		7	12	41	0	9	0	8	4	1238
2010	59	0	0	0	19	3	235		1	16	35	0	16	0	31	4	345
2011	48	15	0	0	17	3	26		11	11	26	0	9	0	8	3	208
2012	50	64	0	0	16	3	17		11	10	23	0	5	0	12	3	5043
2013	47	60	1	0	15	2	67		11	13	23	0	6	0	9	3	662
2014	43	71	1	1	15	3	155		4	13	4	0	4	0	6	2	489
2015	50	98	0	0	13	3	10		1	12	7	0	4	0	3	3	659
2016	41	98	1	0	12	3	3	0	1	0	2	0	6	0	5	2	569

* Data for Czechia and Slovakia were submitted as "Czechoslovakia" prior to 1993.

** Data submitted as "USSR" prior to 1988.

‡ Data submitted as "Serbia and Montenegro" prior to 2006.

Table 8 European eel. Recreational landings (tonnes) of glass eel (1978–2018) in countries where fisheries exist, Spain (ES) and France (FR), combining information from the 2018 Data call and the WGEEL database. 0 = No catch. Empty cell = No data or Not Collected or Not Pertinent.

Year	France	Spain
1978	647	
1979	697	
1980	1303	
1981	904	
1982	219	
1983	161	
1984	156	
1985	71	
1986	87	
1987	172	
1988	40	
1989	110	
1990	54	
1991	87	
1992	77	
1993	130	
1994	74	
1995	113	
1996	25	
1997	39	
1998	6	
1999	6	
2000	2	
2001	1	
2002	37	
2004		0.858
2005	0	1
2006	1	2
2007	0	1
2008	0	2
2009	0	0.439
2010	0	0.821
2011	0	0.389
2012	0	1
2013	0	2
2014	0	2
2015	0	2
2016	0	2
2017	0	2
2018	0	2

Table 9 European eel. Recreational landings of yellow and silver eel (1980–2017) (tonnes) in Finland (FI), Estonia (EE), Latvia (LV), Lithuania (LT), Poland (PL), Germany (DE), Denmark (DK), Netherlands (NL), France (FR), Italy (IT), and Slovenia (SI), combining information from the Data call and WGEEEL database. 0 = No fishing or No information. Countries omitted include those where recreational landings are prohibited, as well as those that have not reported.

Year	FI	EE	LV	LT	PL	DE	DK	NL	FR	IT	SI
1980											0
1981											0
1982											0
1983											0
1984											0
1985						523					0
1986						496					0.07
1987						495					0.14
1988						490					0.134
1989						467					0.11
1990						444					0.06
1991						438					0.058
1992						432					0.092
1993						421					0.078
1994						439					0.036
1995						400					0.029
1996						387					0.143
1997						378					0.207
1998						403					0.088
1999						386					0.023
2000						391					0.004
2001						386					0.02
2002						389					0.033
2003						385					0.004
2004						380					0.006
2005		2				357					0
2006		1				359			684		0.004
2007		0.958				346					0
2008	17	1				293					0
2009		1				286	100				0
2010	10	1				253	118	111		150	0
2011		0.98				251	80			61	0
2012	5	0.612		1	32	246	52	41	5	74	0
2013		0.589	0.037	3	27	251	50		5	70	0
2014	20	0.536	0.038	2	30	254	57	70	4	70	0
2015		0.744	0.007	5	26	256	118		4	60	0
2016		0.634	0.009	2		258	164		3	57	0
2017		0.579	0.01	0.8			117		1	41	

Summary of the assessment

Table 10 European eel. Recruitment indices – geometric means of estimated (GLM) recruitment for glass eel in the continental “North Sea” and “Elsewhere Europe”, and recruitment of yellow eel in Europe. The glass eel GLM (predicting recruitment as a function of area, year, and site) was fitted to 43 time-series, comprising either pure glass eel or a mixture of glass eels and yellow eels and scaled to the 1960–1979 geometric mean. The yellow eel GLM (predicting recruitment as a function of year and site) was fitted to 14 yellow eel time-series and scaled to the 1960–1979 arithmetic mean. These indices are updated on an annual basis and, as they are presented in relative terms, these updates may change the historical values.

Year	Glass eel recruitment		Yellow eel recruitment
	Elsewhere Europe	North Sea	Europe
1960	136	209	170
1961	119	117	183
1962	149	180	179
1963	182	225	152
1964	101	117	61
1965	131	78	114
1966	79	87	156
1967	81	96	110
1968	133	123	172
1969	68	89	116
1970	101	97	59
1971	57	85	62
1972	55	109	109
1973	61	48	135
1974	86	130	64
1975	74	54	122
1976	120	99	37
1977	116	76	77
1978	114	56	70
1979	153	95	59
1980	127	81	99
1981	93	59	41
1982	104	30	52
1983	55	24	47
1984	60	10	35
1985	58	8	67
1986	38	8	50
1987	67	10	48
1988	81	9	63
1989	51	4	37
1990	41	14	32
1991	19	3	39
1992	26	8	24
1993	29	7	14
1994	29	7	55
1995	37	5	18
1996	29	5	10
1997	48	4	23
1998	19	3	20
1999	26	6	25
2000	21.9	4.8	20
2001	9.1	1	20
2002	14.7	2.6	37
2003	14.3	2	23
2004	7.7	0.6	24
2005	8.8	1.2	10
2006	6.2	0.5	15
2007	7.2	1.7	22

Year	Glass eel recruitment		Yellow eel recruitment
	Elsewhere Europe	North Sea	Europe
2008	6.3	1.1	17
2009	5	0.8	9
2010	5.1	0.6	13
2011	4.1	0.4	14
2012	5.9	0.4	14
2013	8.4	1.5	8
2014	14.6	3.3	30
2015	8	0.9	10
2016	10.2	1.8	14
2017	9.6	1.4	15
2018	10.1	2.1	29

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