

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

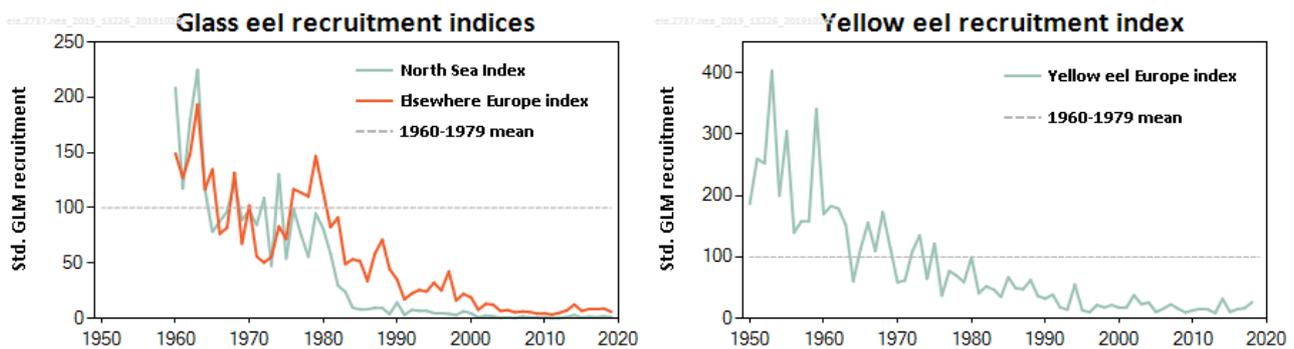
### ICES advice on fishing opportunities

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 as possible to, zero in 2020.

### Stock development over time

The status of European eel remains critical.

Indices of both glass and yellow eel recruitment strongly declined from 1980 to 2011. The glass eel recruitment compared to that in 1960–1979 in the “North Sea” index area was 1.4% in 2019 (provisional), 1.9% in 2018 (finalized), and the previous 5-year mean was 1.7% (2012–2016). In the “Elsewhere Europe” index series it was 6.0% in 2019 (provisional), 8.9% in 2018 (final), and the previous 5-year mean was 8.7%, based on available dataserries. For the yellow eel dataserries, recruitment for 2018 was 26.4% of the 1960–1979 level and the previous 5-year mean was 16.6% (2013–2017); the 2019 data collection is ongoing so the data are not available for this advice. The annual recruitment of yellow eel to European waters in 2018 was 29% of the 1960–1979 level. Statistical analyses of the time-series from 1980 to 2019 show a change in 2011 in the trend of glass eel recruitment indices; the recruitment stopped decreasing and has been increasing in the period 2011–2019 at a rate that statistically differs significantly from zero. The highest value observed during the period from 2011 to 2019 occurred in 2014.



**Figure 1** European eel. **Left panel:** indices, geometric mean of estimated (Generalized 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:** Estimated (GLM) yellow eel recruitment trends for Europe. The GLM was fitted to 13 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 the 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					
		2016	2017	2018	2017	2018	2019			
Maximum sustainable yield	$F_{MSY}$	?	?	?	Unknown	MSY $B_{trigger}$	⊗	⊗	⊗	Below potential reference points
Precautionary approach	$F_{pa}, F_{lim}$	?	?	?	Unknown	$B_{pa}, B_{lim}$	⊗	⊗	⊗	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. There is also 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. ICES does not, therefore, 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 or 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 by an EU regulation (<a href="#">EC Regulation No. 1100/2007</a>; EU, 2007), but there is no internationally coordinated management plan for the entire stock area; this 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. These are designed to reduce anthropogenic mortalities, permitting with high probability the escapement to the sea of at least 40% of the silver eel biomass. This is 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). The EU Member States produced progress reports in 2012, 2015, and 2018. The 2015 reports were not post-evaluated. Elements of the 2018 reports have been post-evaluated by ICES (WKEMP; ICES, 2019a) and the EU is evaluating the Eel Regulation.</p> <p>From 2018, the European Council and the EU Commission have jointly enforced a three-month closure for all eel stages in all Union waters of the ICES area, in Union and international waters of the Mediterranean Sea, and in brackish waters.</p> <p>At its 42nd annual meeting in 2018, the General Fisheries Commission for the Mediterranean (GFCM) adopted Recommendation GFCM/42/2018/1 establishing management measures for European eel (<i>Anguilla anguilla</i>) in the Mediterranean Sea. These measures comprise a consecutive 3-month closure period to be defined by each EU Member State in accordance with its national management plan, the conservation objectives of Regulation (EC) No 1100/2007, and the temporal migration patterns of eel in the Member State. In consideration of the critical state of the stock, the recommendation shall apply to all activities catching European eel and include freshwaters as well as transitional brackish waters such as lagoons and estuaries.</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 GFCM. The Commission approved Recommendation GFCM/42/2018/1 on a multiannual management plan for European eel in the Mediterranean Sea. This details scope, general and operational objectives, and transitional management measures, while also addressing the need for improved scientific advice.</p> <p>The <a href="#">EC Regulation No. 1100/2007</a> (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. Work is progressing in this area.</p>

## Quality of the assessment

Data for the most recent year are typically considered as “provisional”, to allow for a small proportion of late reporting of data. These data are finalized the following year. ICES does not expect the finalization of data to materially affect the present advice.

An eel data call was issued for the first time in 2017, which substantially improved the coverage and completeness of the data being reported to ICES. A new call was issued in 2018 that built upon the previous one (ICES, 2018b); it included the national stock indicators and associated data as reported to the EU in the 2018 progress reports. Another call was issued in 2019 (ICES, 2019b). Data on fisheries, however, and other anthropogenic impacts across the whole stock, remain incomplete. There is no international legislative requirement to collect and provide data for the entire stock area.

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

Many fishery-based time-series are used to assess temporal trends in recruitment and escapement for this advice. Changes to these time-series, e.g. through new fishery regulations or changes to habitat, might introduce biases in those time-series and compromise their use in the analyses. Recent analyses, for example, indicate that losing fishery-based indices would increase the noise in the stock assessment. This means that the implementation of new fishery-independent time-series should be encouraged.

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. Some non-EU range states allow export of European eel, mostly to the Far East.

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 into those resulting from the following: (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 effects, but these have not been quantified.

ICES has updated the quantification of the impacts of non-fishery factors and estimated that a total potential current loss of eel to all non-fishery anthropogenic factors (largely hydropower and pumps), from approximately half of the countries reporting to ICES, amounted to 1625 tonnes annually. The estimate would require further improvement through better and more consistent data delivery from EU Member States.

Eel picornavirus (EPV-1) was detected in organs from a diseased yellow eel in Lake Constance in Germany from 2005 with a potentially high mortality rate, and very recently in yellow eels in North Rhine (Germany). Information about EPV-1 infections and the impact of this virus on health and escapement is currently missing. This means that the potential risk for disease transfer cannot currently be evaluated.

Environmental impacts in marine, transitional, and freshwaters all contribute to the anthropogenic stresses on eels, their mortality, and their reproductive success; these include habitat alteration, barriers to eel passage, deterioration in water quality, and the presence of non-native diseases and parasites. 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 the 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 by 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). There are also 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. It was not requested that ICES evaluate the 2015 reports. Elements of the 2018 reports have been post-evaluated by ICES (WKEMP; ICES, 2019a) and the EU is evaluating the Eel Regulation. In 2018, nine of 95 eel management plans did not report all biomass indicators, and 17 did not report all mortality indicators (ICES, 2019a).

### Reference points

The EC Regulation No. 1100/2007 (EU, 2007) specifies that anthropogenic mortalities should be reduced, permitting with high probability the escapement to the sea of at least 40% of the silver eel biomass. This is 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); this would be under the circumstances of any future improvement of the stock (ICES, 2015). These reference points were developed using the specific 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	None.
Working group	Joint EIFAAC/ICES/GFCM Working Group on Eels (WGEEL).

### Information from stakeholders

Data collected by stakeholders are included in the assessment where appropriate.

## 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	-	-	-
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	-	-	-
2020	All anthropogenic impacts as close to zero as possible	-	-	-

\* There has never been a TAC for this stock.

\*\* There are no ICES catch estimates for the complete stock to be presented.

## History of catch and landings

Landings data are not complete for the entire natural range of the European eel. Tables 5, 6, 8, and 9, however, present the landings reported to ICES, the European Inland Fisheries and Aquaculture Advisory Commission (EIFAAC), and GCFM. Landings are reported either through responses to the 2018 and 2019 Data calls (ICES, 2018b, 2019b), in Country Reports (ICES, 2019c), or integrated by ICES in 2017 (ICES, 2017) using data from 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 (2016). Though improvements have been evidenced since then, the overall impact of recreational fisheries on the eel stock remains largely unquantified; it is likely to be 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 GFCM, i.e. the seizure of illegal nets as well as the 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 2019 Data call and the WGEEL database.

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	2	
1975	10		3	6	
1976	13		12	13	
1977	39		18	23	
1978	61	1393	22	7	
1979	67	1850	17	18	
1980	40	1491	15	20	
1981	37	890	13	36	
1982	48	866	19	44	
1983	17	791	10	13	
1984	25	528	16	32	
1985	20	444	18	30	
1986	19	423	6	14	
1987	21	461	9	19	
1988	21	504	10	5	
1989	21	410	10	6	
1990	21	325	5	9	
1991	1	179	7	6	
1992	5	183	4	9	
1993	6	329	5	7	
1994	10	329	2	6	
1995	12	413	5	11	
1996	19	262	15	17	
1997	9	287	12	9	
1998	11	195	14	9	
1999		242	14	7	
2000		206	11	6	
2001	0.8	101	12	2	

Year	United Kingdom	France	Spain	Portugal	Italy
2002	0.5	202	9	2	
2003	2	151	10	3	
2004	0.97	89	5	2	
2005	2	89	6	2	
2006	1	67	4	5	
2007	2	77	5	2	
2008	0.8	79	5	2	
2009	0.3		4	3	
2010	1	41	6	5	
2011	2	31	5	2	
2012	3	34	5	2	
2013	6	34	7	2	
2014	12	35	11	2	0.4
2015	3	36	9	3	0.2
2016	4	46	7	0.9	0.1
2017	3	46	11	4	0.1
2018	4	54	3	1	0.2
2019	4	50	4	0.6	

0 = No catch.

Empty cell = No information or Not collected or Not pertinent.

**Table 6** European eel. Official commercial landings (tonnes) of yellow and silver eel (1960–2019) 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), Croatia (HR), Greece (GR), Turkey (TR), and Tunisia (TN), combining information from the 2019 Data call and the WGEEL database.

Year	NO	SE	FI	EE	LV	LT	PL	DE	DK	NL	IE	UK	FR	ES	PT	IT	HR	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	27	1243		1	156	472	
1990	336	918		61	13	19	768	830	1675	472	256	784	1778	9	26	1088		2	194	230	
1991	323	1060		52	14	16	670	725	1465	573	245	737	1645	50	47	1097		1	209	262	
1992	372	1154		39	17	12	638	762	1451	548	234	715	1321	54	59	1084		0.061	185	245	
1993	340	1121		59	19	10	568	790	1080	293	260	671	1280	66	68	782		0.066	182	261	

Year	NO	SE	FI	EE	LV	LT	PL	DE	DK	NL	IE	UK	FR	ES	PT	IT	HR	SI	GR	TR	TN
1994	472	1265		47	19	12	635	833	1200	330	300	778	1280	51	53	771		0.718	201	329	
1995	454	950		45	38	9	642	778	892	354		900	1280	69	47	1047		0.01	201	390	
1996	353	1053		55	24	9	629	603	752	300		805	1280	62	51	953		0.012	151	342	
1997	467	1065		59	25	11	526	616	797	285		731	1223	61	49	727		0.002	137	400	
1998	331	646		44	30	17	544	567	597	323		693	1150	44	47	666		0.003	88	300	
1999	447	702		65	26	18	599	645	717	332	250	668	1005	48	46	634			81	200	
2000	281	531		67	15	11	444	591	628	382	250	588	986	55	44	588		0.004	88	176	53
2001	304	643		67	19	12	435	569	707	440	98	584	1002	130	30	520		0.019	93	122	93
2002	311	591		50	11	13	373	544	614	371	123	551		106	54	415		0.009	136	147	251
2003	240	565		49	11	12	366	498	648	311	111	552		96	21	446			77	158	137
2004	237	583		39	11	16	337	475	546	311	136	472		85	18	379			58	165	95
2005	249	676		31	12	22	220	455	534	256	101	476		88	14	75		0.002	116	176	107
2006	293	732		33	8	16	184	472	596	241	133	382		116	20	56		0.014	77	162	288
2007	194	702		31	10	15	181	424	537	197	114	451		82	21	277		0.009	90	179	257
2008	211	671	1	31	13	14	160	408	466	148	108	393		66	14	56		0.031	71	171	194
2009	69	514	2	22	5	9	161	374	467	109	0	460		89	16	330		0.002	78	158	141
2010	32	525	2	19	9	19	173	366	422	447	0	455		76	22	265		0.003	59	182	114
2011	0	450	2	16	6	11	119	279	370	127	0	456	368	61	12	190		0	83	28	122
2012	0	340	2	18	6	8	119	245	317	354	0	414	473	84	8	182		0	55	38	141
2013	0	374	1	17	5	14	137	265	356	321	0	427	504	86	5	172		0.001	38	48	180
2014	0	324	1	17	4	8	117	232	346	321	0	406	434	125	7	192	0.516	0	58	56	137
2015	0	246	0.609	14	5	6	102	224	282	293	0	341	357	60	6	170	0.149	0	60	71	95
2016	3	279	1	15	4	14	138	205	265	313	0	347	443	83	5	205	0.595	0	84	75	299
2017		244	1	16	9	10	173		257	422	0	321	294	75	2	214	0.56		62		149
2018		250	1	18	6		146		182	461	0	365	544	45	4	159			41		153
2019*														26							

\* Data for 2019 are incomplete.

0 = No catch.

Empty cell = No data or Not Collected or Not Pertinent.

**Table 7** European eel. Commercial landings (tonnes) of yellow and silver eel (1960–2017) 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).

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
2017	47	98	1	0	15	3	6		0	0		0	11	0	6	2	350

\* 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.

0 = No catch.

Empty cell = No data or Not Collected or Not Pertinent.

**Table 8** European eel. Recreational landings (tonnes) of glass eel (1978–2019) in countries where fisheries exist, Spain (ES) and France (FR), combining information from the 2019 Data call and the WGEEL database.

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
2019	0	0.865

0 = No catch.

Empty cell = No data or Not Collected or Not Pertinent.

**Table 9** European eel. Recreational landings of yellow and silver eel (1980–2019) (tonnes) in Belgium (BE), Germany (DE), Denmark (DK), Estonia (EE), Spain (ES), Finland (FI), France (FR), Greece (GR), Italy (IT), Latvia (LV), Lithuania (LT), Netherlands (NL), Poland (PL), and Slovenia (SI), combining information from the 2019 Data call and WGEEEL database. Countries omitted include those where recreational landings are prohibited, as well as those that have not reported.

Year	BE	DE	DK	EE	ES	FI	FR	GR	IT	LV	LT	NL	PL	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		357		2										0
2006		359		1			684							0.004
2007		346		0.958										0
2008		293		1		17								0
2009		286	100	1										0
2010		253	118	1		10			150			111		0
2011		251	80	0.98					61					0
2012		246	52	0.612		5	5		74		1	59	32	0
2013		251	50	0.589			5		70	0.037	3		27	0
2014		254	57	0.536		20	4		70	0.038	2	70	30	0
2015		256	118	0.744			4		60	0.007	5		26	0
2016		258	164	0.634			3		57	0.009	2	24	34	0
2017	30		117	0.579			3		41	0.447	3			
2018			105	1			3	1	38	0.162				
2019*					0.265									

\* Data for 2019 incomplete.

0 = No fishing or No information.

**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
1950			186.7
1951			259.7
1952			252.3
1953			402.8
1954			199.8
1955			304.8
1956			139.9
1957			158.5
1958			158.3
1959			340.6
1960	149.1	208.5	170.1
1961	127.2	117.5	182.9
1962	148.8	179.5	178.9
1963	193.5	224.7	151.7
1964	116.7	116.6	60.6
1965	134.7	78.4	113.5
1966	76.6	87.6	155.8
1967	82.2	96.7	109.9
1968	131.7	123.3	173.0
1969	67.8	89.0	115.9
1970	102.0	97.4	58.9
1971	56.0	84.6	62.0
1972	50.5	108.9	109.0
1973	55.8	47.6	135.2
1974	83.2	130.3	64.6
1975	71.8	54.2	121.8
1976	117.0	98.8	37.4
1977	113.7	75.6	77.3
1978	110.3	55.7	69.4
1979	146.8	95.0	59.2
1980	114.4	81.3	99.6
1981	82.5	58.6	41.3
1982	91.3	29.8	52.1
1983	49.1	24.0	47.2
1984	53.5	9.7	35.3
1985	51.8	8.1	67.0
1986	33.8	8.3	49.2
1987	58.6	9.5	47.7
1988	71.2	9.4	62.4
1989	44.5	4.0	36.5
1990	35.2	14.4	32.2
1991	17.3	3.3	38.8
1992	22.6	7.8	18.0
1993	25.7	6.9	14.3
1994	24.3	6.8	55.0
1995	32.3	4.9	13.6
1996	25.4	4.8	10.1
1997	42.4	4.2	21.8

Year	Glass eel recruitment		Yellow eel recruitment
	Elsewhere Europe	North Sea	Europe
1998	16.4	3.1	17.8
1999	22.2	6.5	21.8
2000	19.1	4.7	17.6
2001	7.9	1.0	17.9
2002	13.1	2.6	37.9
2003	12.5	2.0	23.2
2004	6.8	0.6	25.9
2005	7.6	1.1	10.3
2006	5.5	0.4	16.1
2007	6.3	1.8	23.0
2008	5.7	1.1	15.7
2009	4.4	0.8	9.6
2010	4.5	0.7	13.4
2011	3.6	0.4	15.5
2012	5.1	0.4	14.9
2013	7.4	1.4	8.7
2014	12.6	3.1	31.8
2015	6.8	0.9	10.6
2016	8.6	1.7	15.1
2017	8.4	1.3	16.8
2018	8.9	1.9	26.4
2019	6.0	1.4	

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