

Stock Annex for Grey Gurnard in SD VI and VIIa-c,e-k

Stock specific documentation of standard assessment procedures used by ICES.

Stock	Grey gurnard in Subarea VI and Divisions VIIa-c and e-k (Celtic Sea and West of Scotland)
Working Group	WGNEW
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A.1 General biology

Grey gurnards *Eutrigla gurnardus* occur in the Eastern Atlantic from Iceland, Norway and the southern Baltic Sea in the North, to Morocco and Madeira in the South. It is also found in the Mediterranean and Black Seas.

In the North Sea and in Skagerrak/Kattegat, grey gurnard is an abundant demersal species. In the North Sea, the species may form dense semi-pelagic aggregations in winter to the northwest of the Dogger Bank, in summer it is more widespread. The species is less abundant in the Channel, the Celtic Sea and in the Bay of Biscay.

Grey gurnard is most common on sandy bottoms, but also on mud, shell and rocky bottoms (Wheeler, 1978). It can be found from the coastline up to depths of 140 m. Juveniles feed on a variety of small crustaceans. The diet of older specimens consists mainly of larger crustaceans (mostly shrimps and shore crabs) and small fish (mostly gobies, sandeels, young herring and flatfish) (Wheeler, 1978; Gordon, 1981; De Gee and Kikkert, 1993). Due to its piscivorous behaviour, grey gurnard appears to play an important role in the ecosystem.

Spawning takes place in spring and summer and, perhaps, in autumn (Russel, 1976), and may also explain the observed seasonal movements (Van der Land, 1990).

There do not seem to be clear nursery areas. Grey gurnard can reach a maximum published length of 60 cm.

A.2 Stock ID and possible assessment areas

No studies on the stock ID of grey gurnard are known, but it is assumed that Grey gurnard from the North Sea may well be separated from grey gurnard in the English Channel. In the Eastern Channel, the abundance of grey gurnard seems to be low compared to the North Sea (Figure 1.). The distribution in the western Channel is not known. A higher abundance is observed in the Celtic Sea, whereas the species is almost absent from the Bay of Biscay (Figure 1.).

In a pragmatic approach (in the absence of specific information on stock structure), the ICES Ecoregions are currently used as a minimum level of disaggregation for the definition of stock units. This way, three grey gurnard stocks are currently recognized: 1) the North Sea (including IIIa and VIId), 2) the Celtic Seas and West of Scotland (excluding VIId), and 3) the South European Atlantic (Bay of Biscay and Atlantic Iberian waters). This is an interim solution until more information becomes available on the stock structure of this species. ICES does not necessarily advocate that the Areas VI and VII constitute a management unit for grey gurnard, and further work is required.

A.3 Management regulations

There is no minimum landing size for this species, and no TACs have been set.

B. Data

B.3 Fisheries data

Fisheries: Historically, grey gurnard is mainly taken as a bycatch in mixed demersal fisheries for flatfish and roundfish. However, the market is limited due to the low commercial value of this species, and the larger part of the catch appears to be discarded. Therefore, landings data do not reflect the actual catches very well. More information on the UK (England and Wales) and Russian fisheries in 2012 can be found in working documents 8 and 25 of the report of WGCSE 2013 (ICES, 2013).

Landings: Gurnards were often not sorted by species when landed. This is reflected in the catch statistics where different species of gurnards were often reported into one generic category of “gurnards”. In the EU, this approach was legal until 2010. After that the legislation changed, now requiring all gurnards to be landed under their exact species names. As a consequence, the official statistics seem to improve gradually over the years, but it remains problematic to disentangle the past gurnard landings into the different species parts. Another problem is that the catch statistics are incomplete for several years: some countries reporting no landings at all, other countries reporting exceptionally high landings in certain years (see Table 1). A third aspect relates to the spatial entities in which landings are reported. Sometimes landings from certain ICES Divisions are reported separately, sometimes they are pooled in larger geographical units (e.g. VIId and VIIe vs. VIIde).

The landings of grey gurnard in the Celtic Seas and West of Scotland are presented in Table 1 and Figure 3 for ICES Subareas VI and VII combined (source: ICES FishStat). These show large intra-annual fluctuations, probably mainly due to the above mentioned problems. In the period 2007–2011 the international landings appear to be among the lowest in the time-series, but in 2012 and 2013 values of 275 tonnes and 723 tonnes were reached respectively, mainly due to an increase of the UK landings in those years. In the most recent decade, Subarea VI was only responsible for less than 5% of the total landings.

Discards: Due to the low commercial value, catches of grey gurnard are largely discarded. Therefore, landing data will not reflect the actual catches and are thus only considered to be marginally informative. Only DCF observer programmes and/or self-sampling programmes could provide more accurate estimates of the true catches. Some data on discards of grey gurnard have been analysed in previous WGNEW-meetings, but no comprehensive international overview of discard practices could be compiled for this stock area. In general, the observed discard rates were highly variable. Data from the French discard sampling in 2005 and 2006 in different ICES areas are shown in Figure 1.44-5.

B.4 Survey data/ recruit series

Several surveys that catch grey gurnard could be identified in the Celtic Seas and West of Scotland. Four of these have data available through DATRAS (EVHOE-WIBTS-Q4, FR-CGFS-Q4, IE-CGFS-Q4 and BTS-VIIa-Q3), but also some Scottish, Spanish, Russian and Northern Irish surveys could prove to be informative with respect to the trends of grey gurnard in the northern and central parts of the stock area (VI, VIIa, VIIbc).

So far, only the data from EVHOE-WIBTS-Q4 (VII fghj) have been analysed by WGENW (updated in WGENW 2014), but obviously this survey can only be used as an indicator of abundance of grey gurnard in this area. Figures 6–8 illustrate that grey gurnard is caught in sufficient numbers by this survey to deliver a meaningful abundance index. The highest abundances are observed in the northern part of the Celtic Sea and south of Ireland (Figure 6). The abundance index (numbers per hour) shows a much higher mean abundance over the last six years compared to the years before, but the signal is very noisy (Figure 7). From Figure 8 it becomes clear that EVHOE catches mainly immature grey gurnards (FishBase: $L_m = 19.3$ cm).

B.5 Biological sampling

Biological data for this species are scarce. In the early 1990s some countries collected otoliths and information on maturity stages during the quarterly IBTS surveys. Table 22-3 provide sex-separated age-length keys based on sampling by Cefas in the 4th quarter of 1992. For the same fish, Tables 4–5 provide information on maturity-at-length.

B.6 Population biological parameters and other research

The maximum size reported by different authors ranges from 45 (Wheeler, 1978) to 60 cm (FishBase). In the North Sea, specimens >45 cm are rarely caught.

The average length of 1-year-olds was 13–14 cm and of 2-year-olds 19–20 cm in samples collected during the first quarter of 1977–1978. The highest age reported was nine years. The average length of 8-year-old fish has been estimated at 35 cm (Damm, 1987) and 32 cm (MacDonald *et al.*, 1994). Females grow faster and live longer than males (Damm, 1987). This is supported by a survey in May 1992, where all specimens larger than 32 cm were females (Knijn *et al.*, 1993).

Available von Bertalanffy growth parameters are given in the text table below:

Area	L_∞ (cm)	K (yr ⁻¹)	t_0 (yr)	Reference
Brittany males	34.4	0.85	0.14	Baron, 1985
Brittany females	38.0	0.77	0.16	Baron, 1985

Sexual maturity is said to be attained at between two and three years of age (Wheeler, 1978; Baron, 1985a,b), but data from the North Sea from the first half of May 1992 show that specimens from about 15 cm onwards can be mature, males at a somewhat smaller length than females (Knijn *et al.*, 1993). The same can be seen in the data for the 4th quarter of 1992 presented in Table 3-5. This indicates that maturity may even be reached in 1-year old fish.

Studies in the Baie de Douarnenez (Brittany) have shown that the length at which 50% of males and females were mature were 29.4 and 31.2 cm, respectively (Baron, 1985a,b). These values seem very high compared to the North Sea.

The spawning period is from April to August (Wheeler, 1978). Off the English north-east coast eggs are found from May to August (Harding and Nichols, 1987). The pelagic eggs are 1.3–1.5 mm in diameter, and the larvae hatch at a length of 3–4 mm (Russell, 1976).

Seasonal distribution maps indicate a marked seasonal northwest–southeast migration pattern that is rather unusual. The population is concentrated in the central western North Sea during winter and spreads into the southeastern part during spring to spawn. In the Kattegat and the northern North Sea, such shifts appear to be absent. The

withdrawal from the colder coastal waters may reflect the southerly origin of the species (ICES-FishMap).

B.7 Analysis of stock trends/ assessment

Information from landings is very poor, due to poor reporting (gurnard landings are not always identified at the species level or delivered in sufficient spatial detail, and there are additional concerns regarding misreporting) and also because the low value of the species leads to massive discarding. The EVHOE trend cannot be assumed to be relevant to the entire stock area. Therefore, the status of grey gurnard in the Celtic Seas and West of Scotland is not exactly known, and no certain statements can be made with regards to the trends in this stock.

B.8 Data requirements

Further progress can be made with respect to:

- the stock identity of grey gurnard in the Northeast Atlantic;
- the reported landings (species-specific and by ICES Division);
- discards;
- analysis of other surveys;
- biological data from commercial sampling programmes.

Progress on processing all this information can only be achieved if experts are formally designated as stock coordinator and stock assessor in order to take the leadership on the needed analysis.

C. References

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- Wheeler, A. 1978. Key to the fishes of northern Europe. Frederick Warne, London. 380 pp.

Table 1. Grey Gurnard in Subarea VI and Divisions VIIa-c,e-j. Official landings by country (source: ICES FishStat).

	BEL	FRA	IRL	NLD	RUS	UK	TOTAL
1978	0	206	0	0	0	0	206
1979	0	165	0	0	0	0	165
1980	0	155	0	0	0	0	155
1981	0	0	0	0	0	0	0
1982	0	407	0	0	0	0	407
1983	0	271	0	0	0	0	271
1984	0	157	0	0	0	2	159
1985	35	130	0	0	0	2	167
1986	0	280	0	0	0	0	280
1987	37	216	0	0	0	0	253
1988	30	211	0	0	0	21	262
1989	34	646	0	0	0	0	680
1990	18	538	16	0	0	0	572
1991	17	298	15	0	0	4	334
1992	13	123	17	0	0	0	153
1993	11	113	10	0	0	1	135
1994	11	107	0	0	0	2	120
1995	7	101	0	0	0	0	108
1996	6	117	0	0	0	2	125
1997	8	61	0	0	0	2	71
1998	13	59	38	0	0	0	110
1999	11	0	0	0	0	0	11
2000	13	109	0	7	26081	0	26 210
2001	3	116	0	0	3155	13	3287
2002	7	81	0	0	60	11	159
2003	3	66	0	1	263	0	333
2004	5	61	0	7	1401	0	1474
2005	9	59	0	8	2456	0	2532
2006	4	28	0	10	138	6	186
2007	4	24	0	1	0	4	33
2008	7	1	0	3	0	1	12
2009	11	33	0	1	0	8	53
2010	14	45	0	5	0	12	76
2011	18	49	0	3	1	19	82
2012	24	57	0	2	92	101 ⁽¹⁾	275
2013*	14	⁽²⁾	0	⁽²⁾	⁽²⁾	709	723

* preliminary.

(1) value from WGCSE 2013 (lacking in ICES FishStat).

(2) not yet provided at WGNEW 2014.

Table 1. Age-length key for female grey gurnard from the North Sea (1992, quarter 4). Data provided by Cefas.

FEMALES	AGE											Grand Total
Length (mm)	0	1	2	3	4	5	6	7	8	9	10+	
110	1											1
120	1											1
130	1											1
150		5										5
160		6	2									8
170		4	4									8
180		2	4		1							7
190		3	3	1	1							8
200		1	5									6
210			1	4								5
220			3	4	1							8
230			1	2	2	1						6
240				1	3							4
250				3	2	1	1					7
260				2	2	2		1				7
270				1	3	3	1					8
280					3	1	1	1			1	7
290					4	1	1	1				7
300					2	1			1			4
310					1		2	1				4
320					1			1	2		1	5
330					1			3	2			6
340					1	1		2		1		5
350						1				2		3
360					1				1		1	3
370							1		1			2
380						2		1		1		4
390							2	1		1	1	5
400												0
410												0
420											2	2
430											1	1
440												0
450												0
460											1	1
Grand Total	3	21	23	18	29	14	9	12	7	5	8	149

Table 2. Age-length key for male grey gurnard from the North Sea (1992, quarter 4). Data provided by Cefas.

Males

Length (mm)	AGE											Grand Total
	0	1	2	3	4	5	6	7	8	9	10+	
140	1											1
150		3										3
160		1	1									2
170		4										4
180		2	5	1								8
190		1	3	1	1							6
200		1	5									6
210			4	3	1							8
220			1	4								5
230			1	3	3							7
240			1	2		1						4
250			1		1	1	1		1	1		6
260					2	2	1					5
270					1					1	1	3
280					2	2					2	6
290						1	1	1			2	5
300				1	1	1	1		1			5
310					1		1					2
320					1	1				1		3
330					1				2			3
340						1			1			2
350							1	1				2
360							1					1
370										1	1	2
380							1			1		2
390											1	1
400											2	2
410											1	1
Grand Total	1	12	22	15	15	10	8	2	5	5	10	105

Table 3. Maturity data for female grey gurnard from the North Sea (1992, quarter 4). Data provided by Cefas.

Females

LENGTH	IMMATURE	MATURING	MATURE	SPENT	GRAND TOTAL
110	1				1
120	1				1
130	1				1
150	5				5
160	5	2		1	8
170	8				8
180	5	1		1	7
190	6	1		1	8
200	4	1		1	6
210	2	3			5
220	3	4		1	8
230	2	1		3	6
240	1	1		2	4
250	2	3		2	7
260	1	3		3	7
270	2	3		3	8
280		3		4	7
290	1	4		2	7
300		2		2	4
310		2		2	4
320		3		2	5
330		5		1	6
340		2		3	5
350		3			3
360		1		2	3
370		2			2
380		3		1	4
390		2	1	2	5
420		1		1	2
430		1			1
460				1	1
Grand Total	50	57	1	41	149

Table 4. Maturity data for male grey gurnard from the North Sea (1992, quarter 4). Data provided by Cefas.

Males

LENGTH	IMMATURE	MATURING	MATURE	SPENT	GRAND TOTAL
140	1				1
150	3				3
160	2				2
170		4			4
180	6	1		1	8
190	4	1		1	6
200	3	3			6
210	6	2			8
220	3	1		1	5
230	1	2		4	7
240	1	1		2	4
250	1	2		3	6
260	1	1	1	2	5
270		3			3
280	1	3		2	6
290		1		4	5
300	1	2		2	5
310		1		1	2
320	1	2			3
330				3	3
340		2			2
350		2			2
360		1			1
370				2	2
380				2	2
390		1			1
400		2			2
410		1			1
Grand Total	35	39	1	30	105

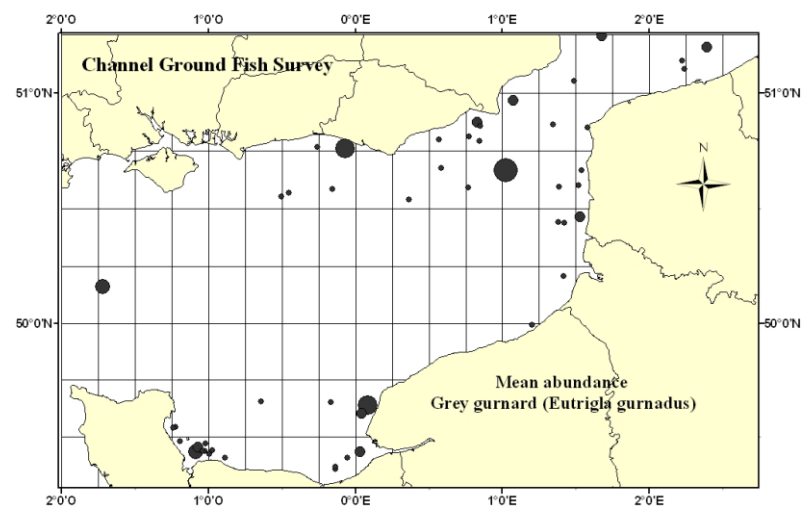


Figure 1.1. Distribution of grey gurnard in the eastern Channel. CGFS survey 1988–2004.

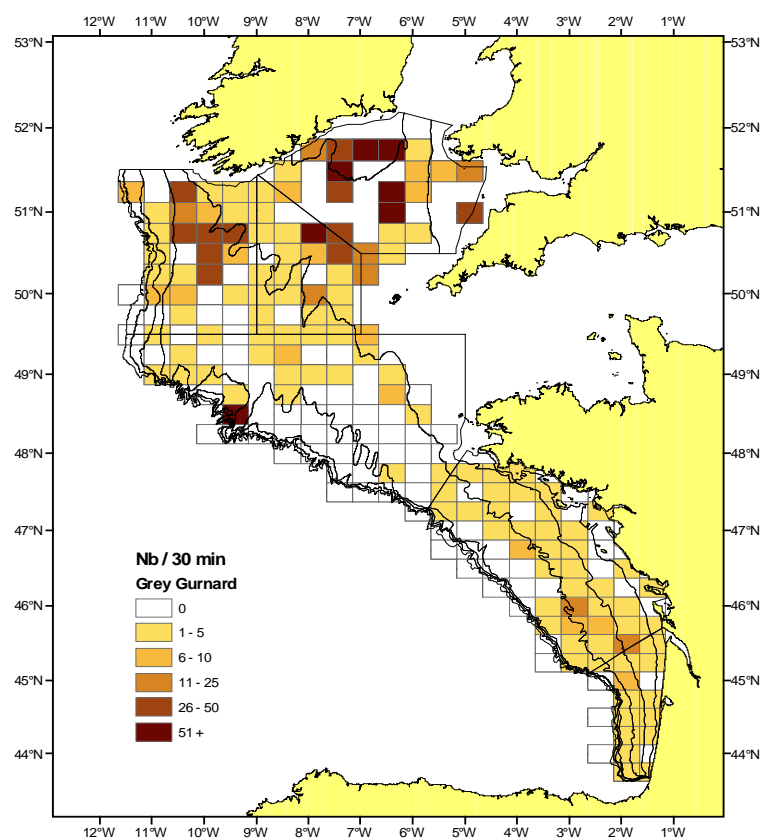


Figure 1.2. Distribution of grey gurnard in the Celtic Sea and the Bay of Biscay. EVHOE survey, 1997–2004.

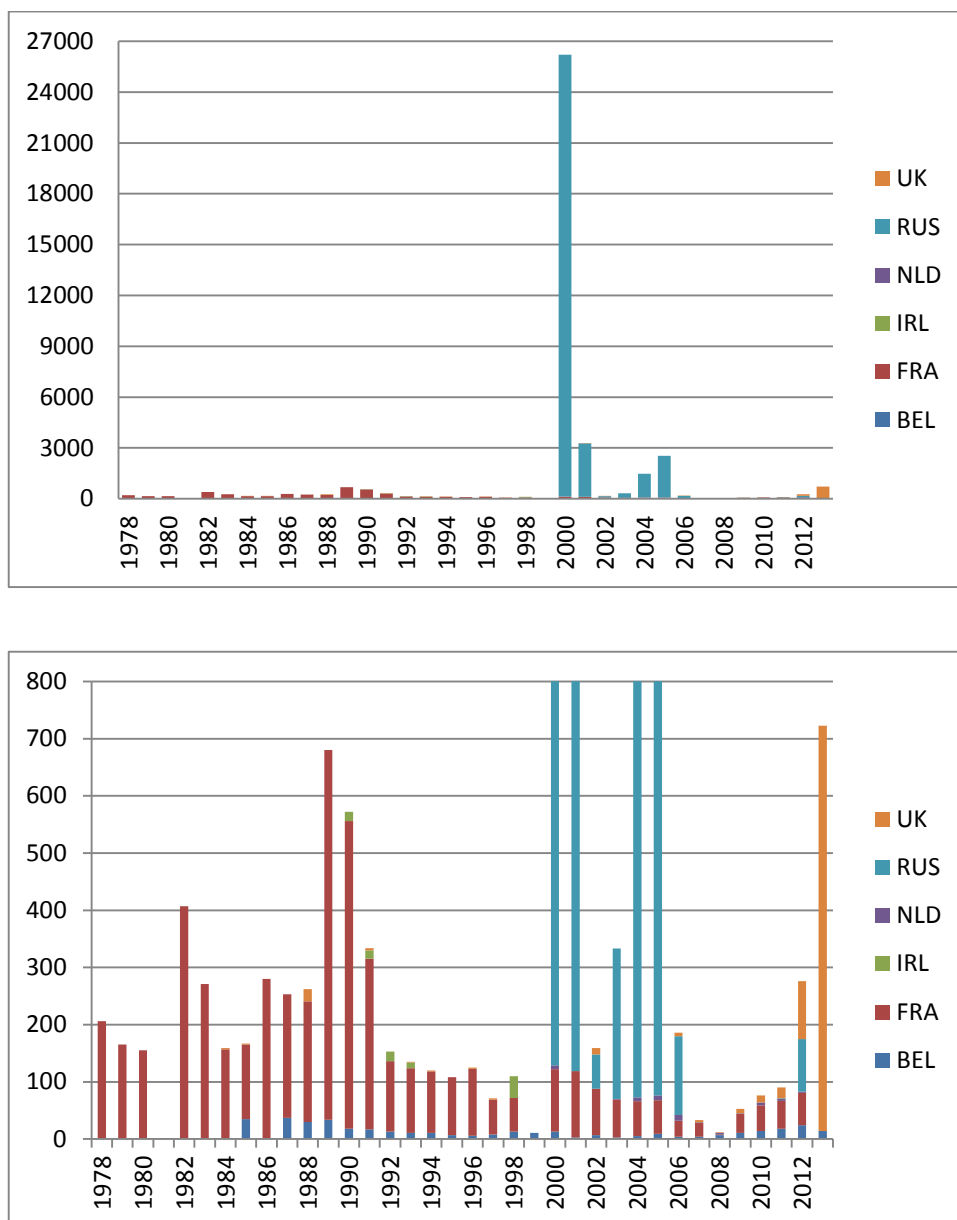


Figure 1.3. Grey Gurnard in Subarea VI and Divisions VIIa–c,e–j. Official landings by country (source: ICES FishStat). The lower panel presents a detailed view of the lower range of values from the top panel.

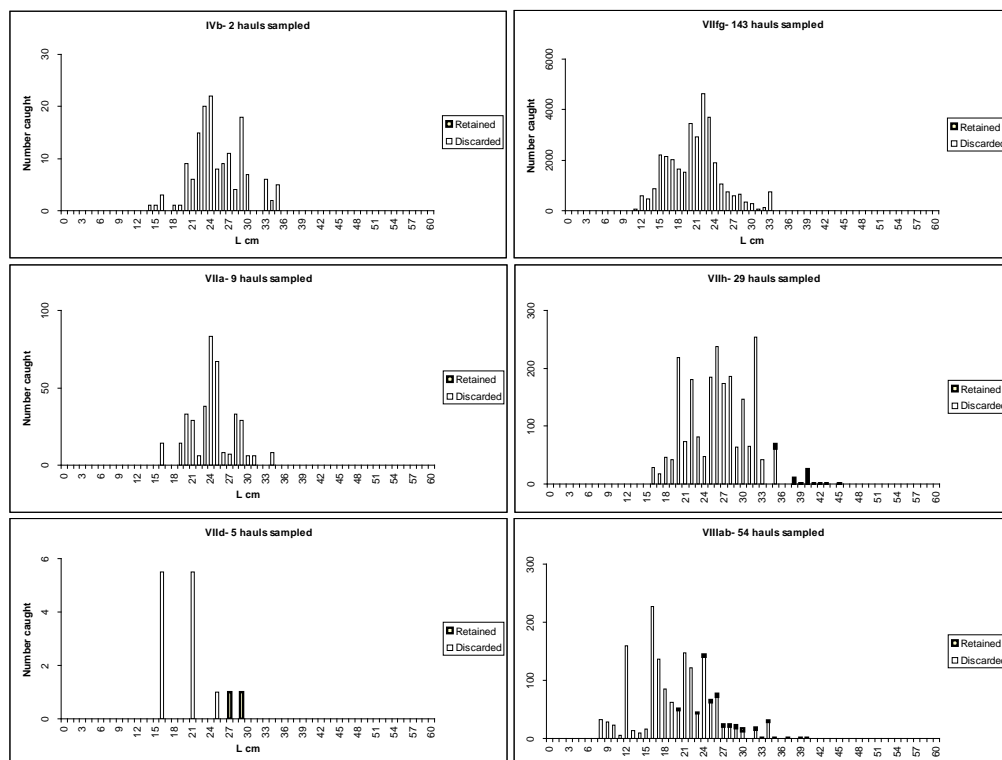


Figure 1.4. Length composition of French catches of grey gurnard in 2005.

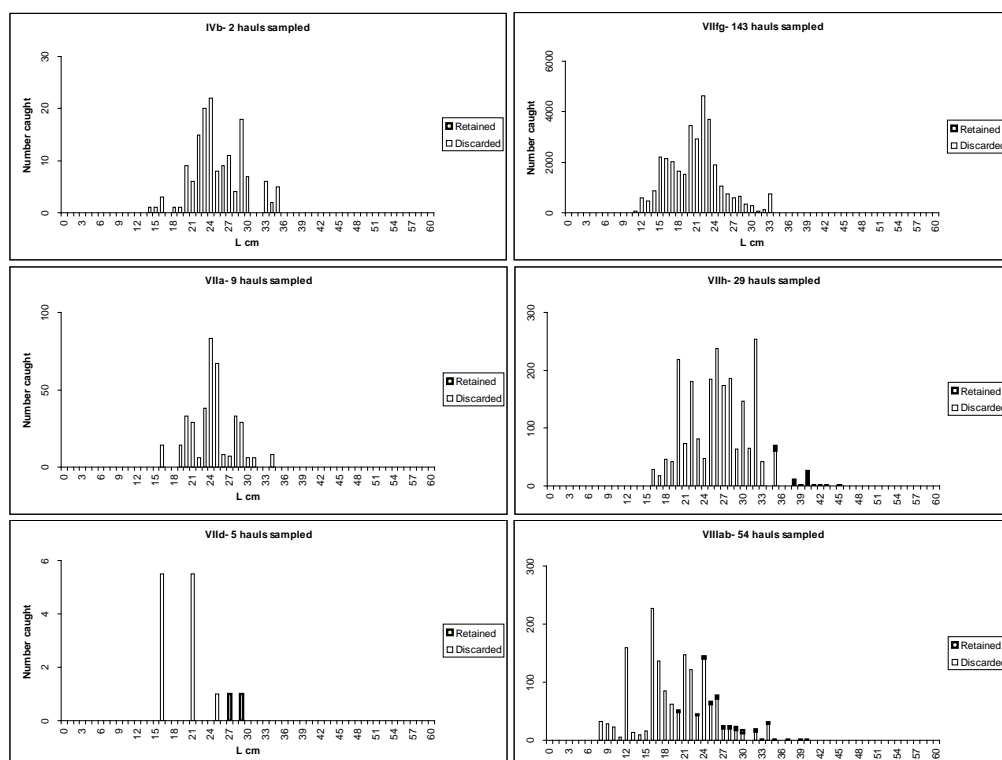


Figure 1.5. Length composition of French catches of grey gurnard in 2006.

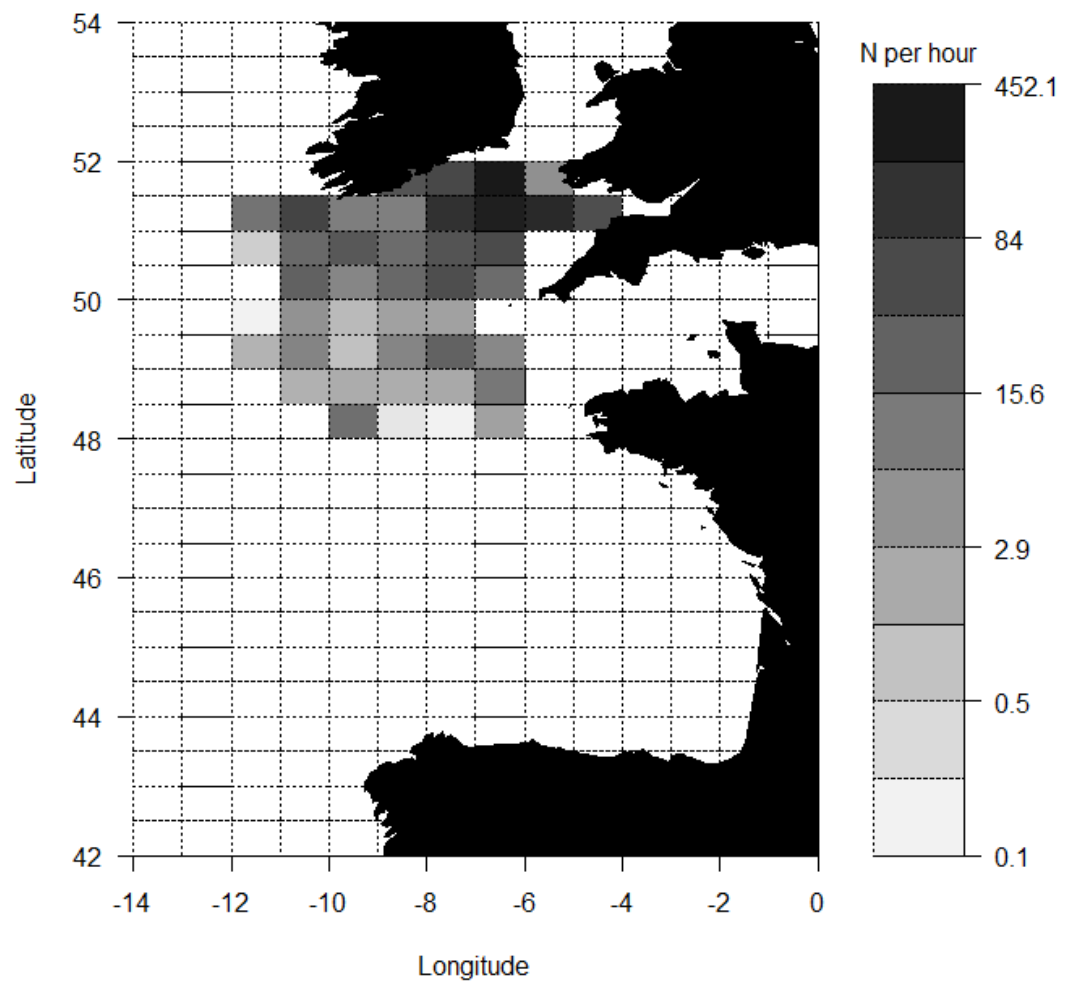


Figure 6. Grey Gurnard in Subarea VI and Divisions VIIa–c,e–j. Distribution of catches of grey gurnard in the EVHOE-WIBTS-Q4. Abundance is shown as N per hour caught, based on all data available in Datras.

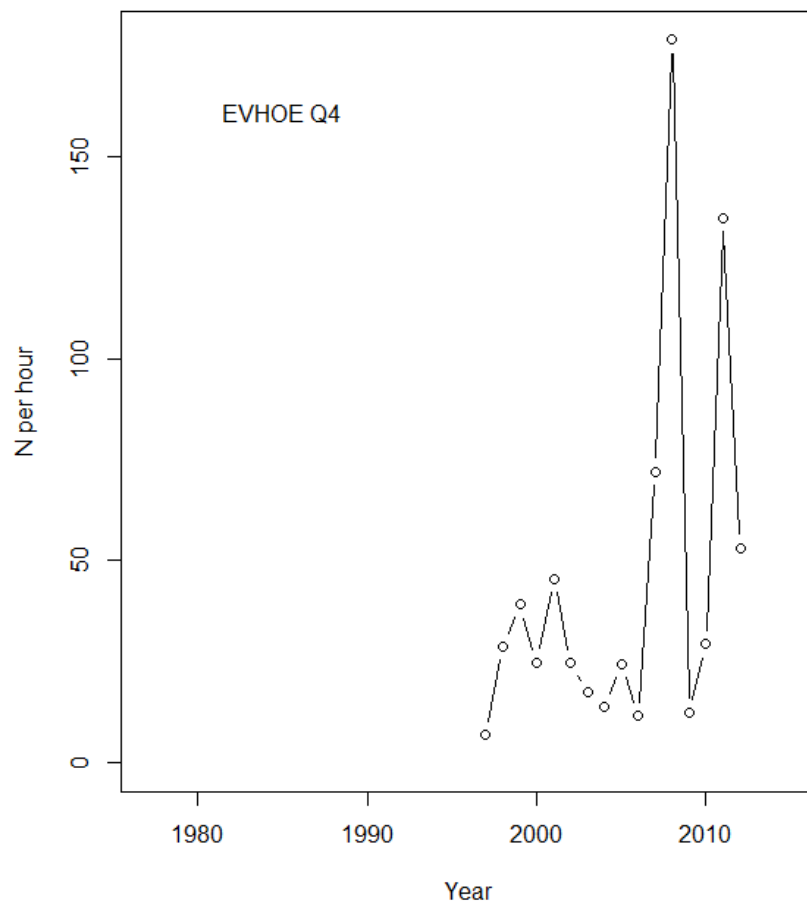


Figure 7. Grey Gurnard in Subarea VI and Divisions VIIa-c, e-j. Time-series of catches of grey gurnard in the EVHOE-WIBTS-Q4, shown as numbers caught per hour. Data from Datas.

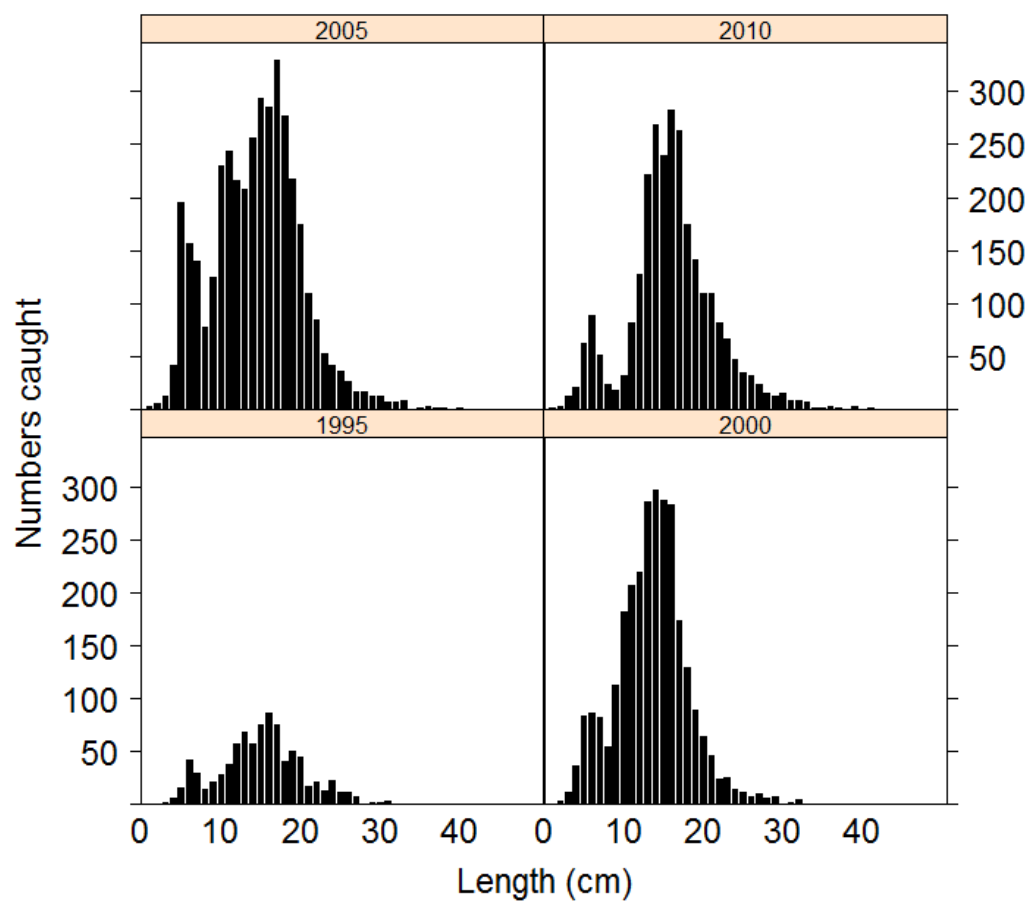


Figure 8. Grey Gurnard in Subarea VI and Divisions VIIa–c,e–j. Length distribution of grey gurnard catches in the EVHOE-WIBTS-Q4 by 5-year periods.