7 Grey gurnard (*Eutrigla gurnardus*) in Subarea 4, Divisions 7.d and 3.a (North Sea, Eastern English Channel, Skagerrak and Kattegat)

7.1 General

Grey gurnard (*Eutrigla gurnardus*) was assessed in the Working Group on the Assessment of New MoU Species (ICES, 2014) until 2014. Since 2015 the stock was assessed by the WGNSSK and defined as a category DLS 3.2 stock (ICES, 2015). For this stock, only survey data and limited catch data (InterCatch data 2012–2019) are available. Official landings data are incomplete or were not reported specifically for grey gurnard in the past. Grey gurnard in Subarea 4, Divisions 7.d and 3.a is a non-target stock with no TAC. ICES has not been requested to provide advice on fishing opportunities for this stock in recent years. New advice was not due for 2022. During the WGNSSK 2021, new available discard and landings data and the current assessment was updated.

7.1.1 Biology and ecosystem aspects

Grey gurnard (*Eutrigla gurnardus*) occurs in the Eastern Atlantic from Iceland, Norway, southern Baltic, and North Sea to southern Morocco and Madeira. It is also found in the Mediterranean and Black Seas. In the North Sea and in the 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, whereas in summer it is more widely distributed. The species is less abundant in the Channel, the Celtic Sea and in the Bay of Biscay. Spawning takes place in spring and summer. There do not seem to be clear nursery areas.

Grey gurnard is considered a predator on young age groups of a number of commercially important demersal stocks (cod, whiting, haddock, sandeel, and Norway pout) in the North Sea (de Gee and Kikkert, 1993). A steep increase in abundance of grey gurnard has led to an increase in mortality especially of North Sea cod (age-0) and whiting (age-0 and age-1) in recent years (ICES, 2017). The multispecies model SMS estimated that grey gurnard can cause up to 50% of the predation mortality on 0-group cod and whiting. Therefore, the abundance and distribution pattern of grey gurnard and its prey size preferences are highly relevant from an ecological point of view (Floeter and Temming, 2005; Kempf *et al*., 2013).

7.1.2 Stock ID and possible assessment areas

No studies are known of the stock ID of grey gurnard. In a pragmatic approach for advisory purposes and in order to facilitate addressing ecosystem considerations, the population is currently split among three ecoregions: North Sea including Division 7.d, Celtic Seas and South European Atlantic. This proposal should be discussed considering the low levels of catches reported in recent years in Celtic Seas and South European Atlantic (ICES, 2011; ICES, 2012).

7.1.3 Management regulations

There is no minimum landing size for this species and there is no TAC.

7.2 Fisheries data

7.2.1 Historical landings

Historically, grey gurnard is taken as a by-catch species in mixed demersal fisheries for flatfish and roundfish. Grey gurnard from the North Sea is mainly landed for human consumption purposes. However, the market is limited and the largest part of the catch is discarded (see also Stock Annex). Owing to the low commercial value of this species, landings data do not reflect the actual catches.

In the past, gurnards were often not sorted by species when landed and were reported as one generic category of "gurnards". Further, catch statistics are incomplete for some years, e.g. the Netherlands did not report gurnards during the years 1984–1999. In recent years, the official statistics seem to improve gradually. However, some countries continue to report "gurnards" landings and do not provide information on grey gurnard separately (e.g. Germany) or the data imported into InterCatch are based on a gurnard mix raised by survey information on the proportion of the specific gurnard species.

Since the early 1980s specific landings data for grey gurnard are available from the official catch statistics. Before that, these data occurred only sporadically in the statistics. Most of grey gurnard catches are taken in Subarea 4 and to a much lesser extent in divisions 7.d and 3.a (Figure 7.1–7.3; Table 7.4–7.6). Exceptionally high annual landings were reported during the late 1980s to early 1990s with a maximum of 46 598 tonnes in 1987 (Figure 7.2; Table 7.5) because of Danish landings for reduction purposes. After this peak, the Danish landings dropped again to low levels. Compared to 2019 the official landings in 2020 with 1756 tonnes were on a rather constant level (1621 tonnes in 2019; Table 7.8). The average official landings for the last ten years (2011–2020) was 1417 tonnes. Official landings data from 1950 to 2005 were taken from the "ICES catch statistics 1950 to 2010" (https://www.ices.dk/data/Documents/CatchStats/HistoricalLandings1950-2010.zip). Data from 2006 to 2018 were taken from the "ICES catch statistics 2006 to 2018" (https://www.ices.dk/data/Documents/CatchStats/OfficialNominalCatches.zip). Data for 2019 and 2020 were taken from the preliminary catch statistics provided by ICES (http://data.ices.dk/rec12/login.aspx).

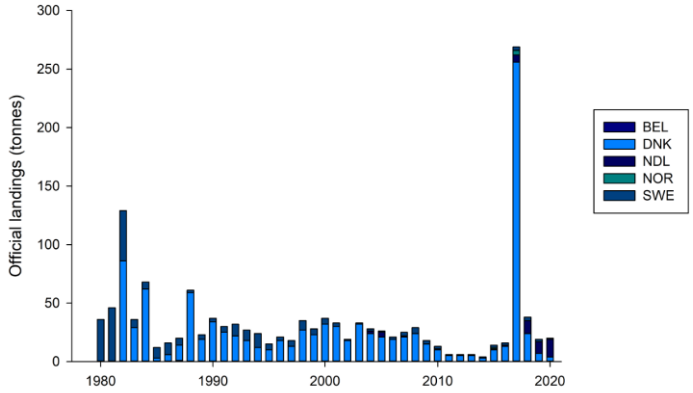

Figure 7.1. Grey gurnard in Subarea 4, Division 3.a and Division 7.d: Official landings of grey gurnard in Division 3.a 1980–2020.

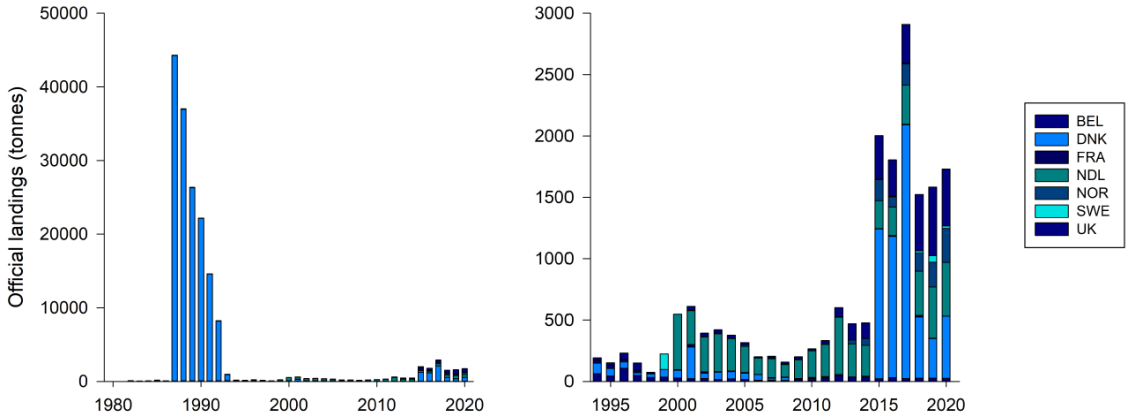

Figure 7.2. Grey gurnard in Subarea 4, Division 3.a. and Division 7.d: Official landings of grey gurnard in Subarea 4 by country for the years 1980 - 2020 (a), and official landings of grey gurnard by country in Subarea 4 for the years 1994 - 2020 (b).

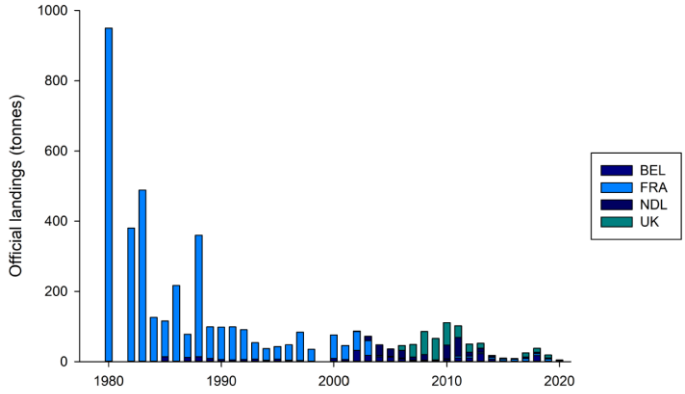

Figure 7.3. Grey gurnard in Subarea 4, Division 3.a. and Division 7.d: Official landings by country of grey gurnard in Division 7.d for the years 1980–2020.

7.2.2 InterCatch data

InterCatch contains now data for the years 2012–2020. The largest amount of landings in 2020 was reported by Denmark as industrial bycatch (502 tonnes, MIS_MIS_0_0_0_IBC). Considerable amounts of landings were also reported by Scotland for the OTB_DEF_>=120_0_0_all métier (366 tonnes), and by Norway for the same métier (235 tonnes). For all countries, except for Norway, the amount of discards exceeded the amount of landings (Figure 7.5). The largest amounts of discards were reported for the Scottish OTB_DEF_>=120_0_0_all métier (630 tonnes), the Dutch TBB_DEF_70-99_0_0_all métier (620 tonnes), and the Dutch OTB_CRU_70-99_0_0_all métier (420 tonnes).

The largest amount of discards was estimated for the Dutch SSC_DEF_70-99_0_0_all métier (2282 tonnes), the UK (England) OTB_DEF_70-99_0_0_all metier (444 tonnes), and the Dutch TBB_DEF_>=120_0_0_all métier (407 tonnes). The total catch estimated with InterCatch for the year 2020 was 10 226 tonnes from which 1 971 tonnes were landings (24%) and 8 249 tonnes

estimated discards (76% of total catch). The Netherlands took the largest proportion of the total catch in 2020 with a high amount of discards, followed by UK England, and UK Scotland.

In general, it was attempted to use the same groupings for discard raising as for the previous data years. However, this was not possible for all cases and compared to the previous year slight changes had to be made. The grouping is based on gear type and mesh size over areas and season. For the sample allocation scheme only one landing and one discard group was set up, because data availability did not allow for a higher resolution. The following groupings were used for the 2020 data discard raising:

Group 1: all passive gears -> raised with all other passive métiers.

Group 2: MIS_MIS_0_0_0_HC -> no discard data available for this métier. Raised with all other métiers.

Group 3: TBB_DEF_70-99_0_0_all -> raised with TBB_DEF_70-99_0_0_all

Group 4: TBB_DEF_>=120_0_0_all -> raised with TBB_DEF_>=120_0_0_all

Group 5: OTB_CRU_70-99_0_0_all -> raised with OTB_CRU_70-99_0_0_all

Group 6: OTB_DEF_120_0_0_all -> raised with OTB_DEF_120_0_0_all

Group 7: 7 OTB_DEF_100-119_0_0_all, SSC_DEF_100-119_0_0_all -> raised with

Group 8: OTB_DEF_70-99_0_0, SSC_DEF_70-99_0_0_all, SDN_DEF_70-99_0_0_all, OTM_SPF and OTB_SPF_70-99_0_0_all -> raised with OTB_DEF_70-99_0_0_all

Group 9: 9 SSC and SDN_DEF_>=120_0_0_all -> raised with SSC and SDN_DEF_>=120_0_0_all

Group 10: OTB_CRU_100-119_0_0_all -> raised with OTB_CRU_100-119_0_0_all (one ENG métier) and OTB_CRU_90-119_0_0_all (exclude two DEN métiers because of exceptional high discard ratios)

Group 11: OTB_CRU_32-69_0_0_all -> raised with OTB_CRU_32-69_0_0_all (no discards)

Some métiers were not raised because no suitable data were available or they were negligible:

- MIS_MIS_0_0_0_IBC (8 métiers)
- DRB_all_0_0_all (1 métier)
- OTB_SPF_32-69_0_0_all (9 métiers)
- OTB_CRU_16-31_0_0_all (3 métiers)
- PS_SPF_0_0_0 (2 métiers)
- TBB_CRU_16-31_0_0_all (3 métiers)

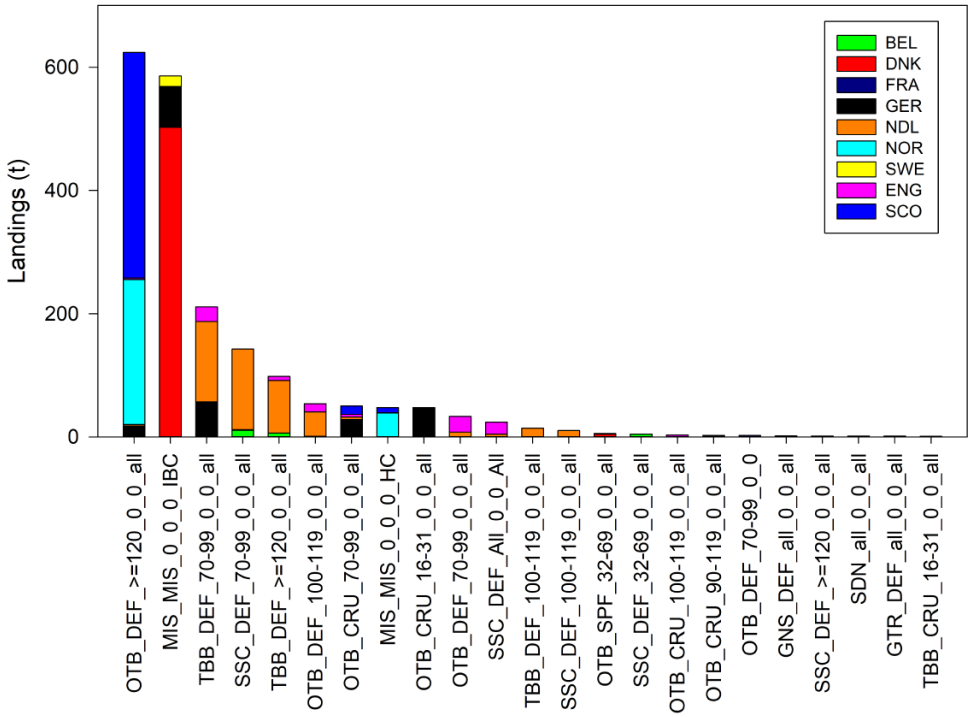

Figure 7.4. Grey gurnard in Subarea 4, Division 3.a. and Division 7.d. Grey gurnard landings in 2020 by métier and country as uploaded into InterCatch.

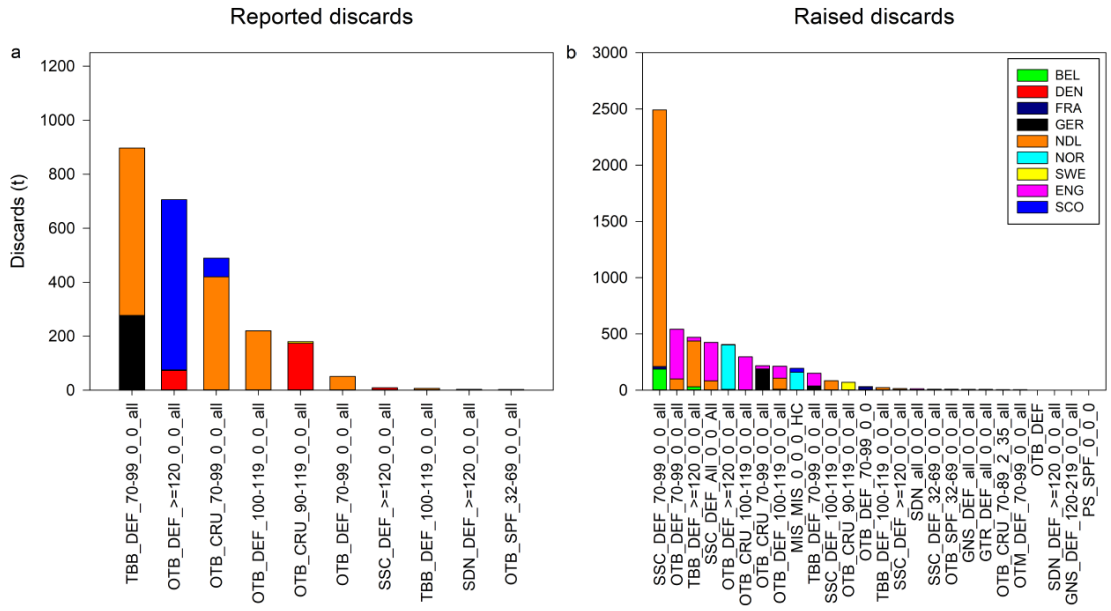

Figure 7.5. Grey gurnard in Subarea 4, Division 3.a. and Division 7.d. Grey gurnard discards in 2020 by métier and country. Reported discards panel (a), raised discards panel (b). Legend valid for both panels.

7.2.3 Other information on Discards

In Table 7.1 the numbers per hour of discarded grey gurnard in Dutch bottom-trawl fisheries in North Sea and Eastern Channel are shown for 2006–2012 (Uhlmann *et al.*, 2013). The rates are highly variable depending on the specific métiers, with highest values observed for the SSC_DEF métiers. German discard data from an observer programme indicate that the proportion of discarded gurnard in German demersal trawl fisheries ranges between 76.6% and 93.0% (Ulleweit *et al.*, 2010).

Table 7.1 Grey gurnard in Subarea 4, Division 3.a. and Division 7.d: Discards per hour of grey gurnard by different métiers in the Netherlands 2006–2012.

Métier	TBB_DEF	TBB_DEF*	TBB_DEF	SSC_DEF	SSC_DEF	OTB_MCD	OTB_DEF	OTB_DEF
Mesh	70-99	70-99	100-119	100-119	>120	70-99	70-99	100-119
2006	68.3							
2007	60.2							
2008	34.3							
2009	55	17	37			111	77	15
2010	81	10	109			47	52	110
2011	61	27	10	NA	119	27	55	70
2012	41	24	30	317	307	110	75	12

*≤300 hp segment

7.3 Survey data/recruit series

For the North Sea and Skagerrak/Kattegat, data are available from the International Bottom Trawl survey. The IBTS–Q1 and IBTS–Q3 can provide information on distribution and the length composition of the stock. Grey gurnard occurs throughout the North Sea and Skagerrak/Kattegat. During winter, grey gurnards are concentrated to the northwest of the Dogger Bank at depths of 50–100 m, while densities are lower off the Danish coast, in the German Bight and eastern part of the Southern Bight (Figure 7.6). The distribution pattern changes substantially in spring, when the whole area south of 56°N becomes densely populated and the high concentrations in the central North Sea disappear until the next winter (Daan *et al.*, 1990; Figure 7.7).

The nearly absence of grey gurnard in the southern North Sea during winter and the marked shift in the centre of distribution between winter and summer suggests a preference for higher water temperatures (Hertling, 1924; Daan *et al.*, 1990).

During winter, grey gurnard occasionally form dense aggregations just above the sea bed (or even in midwater, especially during night time) which may result in extremely large catches. Within one survey, these large hauls may account for 70% or more of the total catch of all species. Bottom temperatures in high density areas usually range from 8 to 13°C (Sahrhage, 1964).

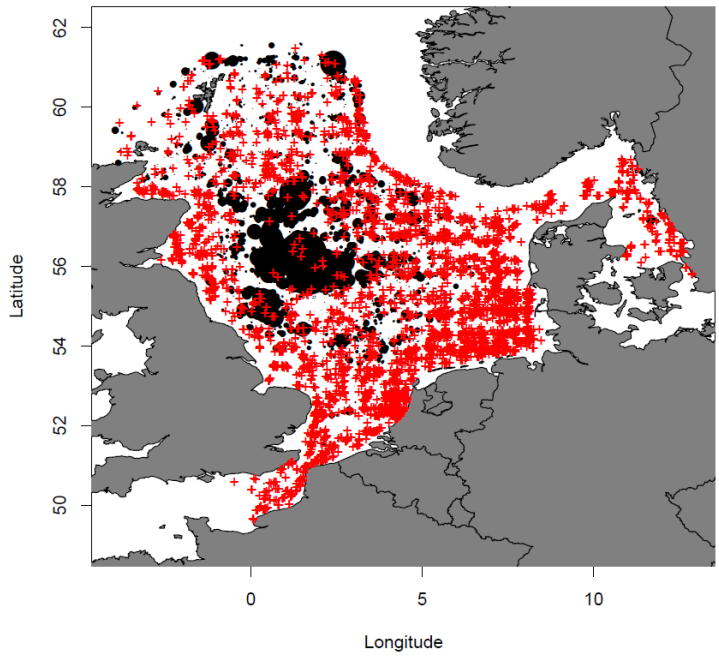

Figure 7.6. Grey gurnard in Subarea 4, Division 3.a. and Division 7.d. Spatial distribution of grey gurnard from IBTS–Q1 survey (all years) in Subarea 4 and Division 3.a. Red crosses display zero hauls.

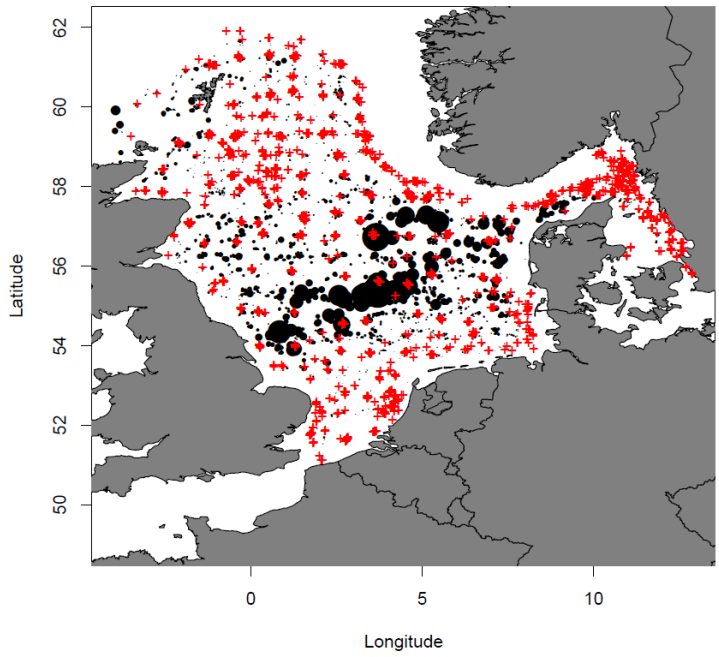

Figure 7.7. Grey gurnard in Subarea 4, Division 3.a. and Division 7.d: Spatial distribution of grey gurnard from IBTS–Q3 survey (all years) in Subarea 4 and Division 3.a. Red crosses display zero hauls.

7.4 Biological sampling

Individual biological data for this species are scarce (see also the stock annex). In the North Sea, individual data have been collected sporadically during some years of the IBTS–Q1 and IBTS–Q3 survey. The age readings done on collected otoliths from IBTS–Q1 resulted in an age range from 2 to 14, but not many individuals were aged (n = 469, years 2010 and 2014).

Available data on grey gurnard individual weights and maturity were analysed in order to estimate a mature biomass index. The obtained weight–length relation was Weight = 0.006 * LngtClass ^ 3.082 (IBTS Q1 and Q3 2010-2018 data; Figure 7.8a). A maturity ogive based on all available grey gurnard maturity data from IBTS–Q1 was used to calculate this mature biomass index. The obtained maturity ogive shows that above 21.1 cm more than 95% of all the individuals can be considered mature (Figure 7.8b). The corresponding Lmat50% value was 16.3 cm. Proportion mature at length was calculated by the obtained model
Prop-Mat = 0.991 / (1 + exp (-1 * (LngtClass - 16.273) / 2.105)).

The available age and maturity data suggest that grey gurnard is early maturing in the North Sea and a certain proportion of fish at age 1 are mature.

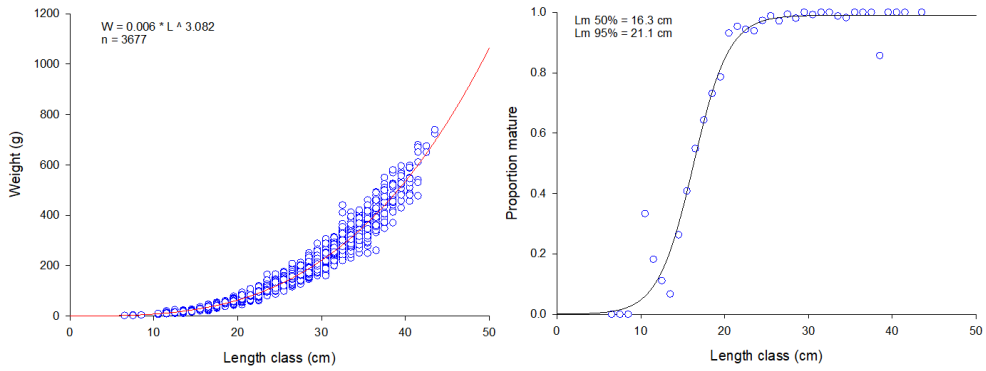

Figure 7.8 Grey gurnard in Subarea 4, Division 3.a. and Division 7.d: Length-weight relationship from IBTS Q1 and IBTS Q3 CA data (left panel); maturity ogive obtained from IBTS Q1 CA data (right panel).

7.5 Analysis of stock trends/assessment

Information from landings is very poor, due to poor reporting (gurnard species are not always identified in the data, and probably also misreporting has occurred) and also because the low value of the species leads to massive discarding.

To analyse stock trends a mature biomass index was calculated applying a length weight relationship and a maturity ogive which were obtained from all available IBTS CA records (see Section 7.4).

According to van Heesen and Daan (1996), outliers were excluded from the IBTS–Q1 time series since grey gurnards tend to form dense concentrations during winter. Outliers were defined as hauls which accounted for more than 90% of the total gurnard weight caught in the respective year. However, such extreme outliers were only identified in the time period before 1983 which is not displayed here. The time series of mature biomass index of grey gurnard of the IBTS–Q1 survey has shown a strong increase pattern from the beginning of 1990s (Figure 7.9; Table 7.7). Since then it was fluctuating on a high level until 2017. A strong decline of the index was observed for the year 2018. In 2019 the index value was only slightly higher compared to the 2018

value, and it dropped slightly again in 2020 and also 2021. The mature biomass index for the IBTS–Q3 does not show the same pronounced increasing trend compared to the quarter 1 index but the 2014 value was the highest observed in the time series ever. Since then the IBTS–Q3 index decreased again, but increased in 2019 and 2020. In general, lower biomass and abundance values were observed for the IBTS–Q3 survey time series. Compared to the North Sea/Skagerrak (Subarea 4/Division 3.a) the mature biomass values recorded by the Channel Ground Fish Survey (CGFS) in the Eastern Channel (Division 7.d) were extremely low (not shown in this report). No trend could be detected in the CGFS index. Therefore, the advice for grey gurnard in area 4, 3.a and 7.d should be based on the IBTS survey, which covers by far the largest part of the stock distribution area.

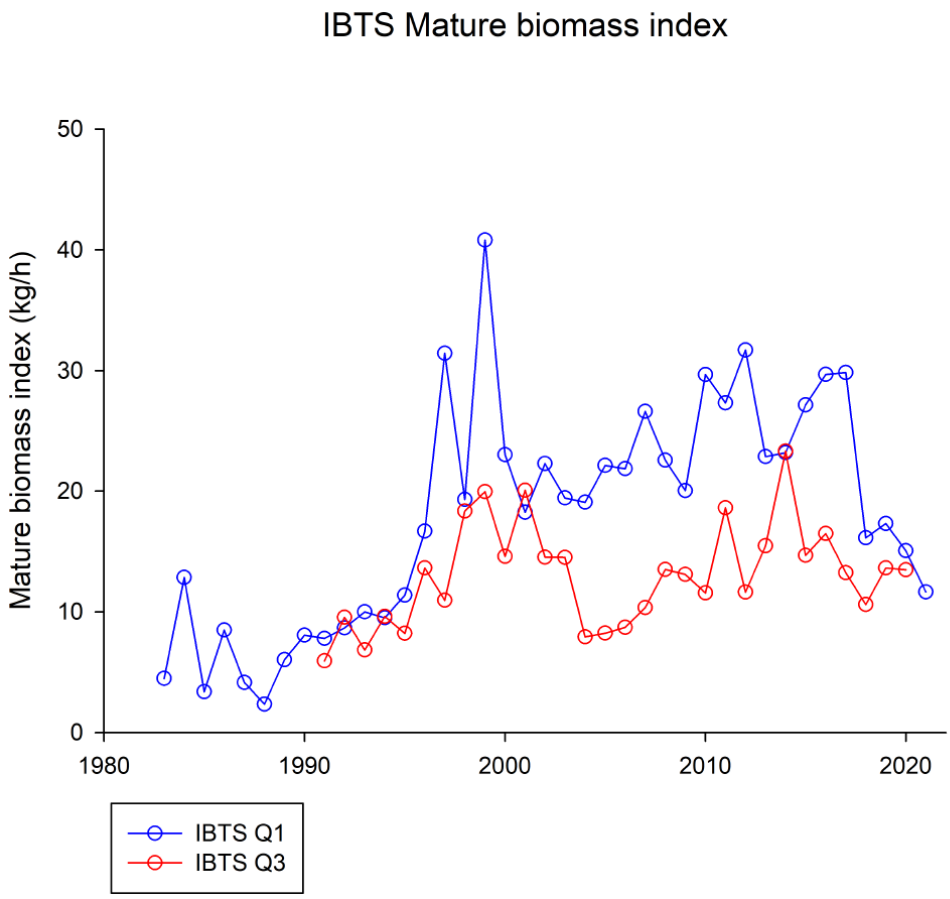

Figure 7.9. Grey gurnard in Subarea 4, Division 3.a. and Division 7.d: IBTS–Q1 and IBTS–Q3 grey gurnard mature biomass index.

7.6 MSY Proxies

7.6.1 Length Based Indicators (LBI) - update

Results of the length based indicator method are sensitive to the assumed values of L_{inf} and L_{mat} (16.3 cm). During the WGNSSK2021 L_{inf} was updated (38.2 cm compared to 37.2cm in previous year). How these values were estimated is described in detail in the WGNSSK 2018 report (ICES, 2018) and in the stock annex. The available length frequency distributions from InterCatch were binned into 20 mm size classes and all show a unimodal distribution (Figure 7.10). The change in L_{inf} resulted in different results for the LBI indicators compared to the previous years. However, the results show that with respect to conservation the indicators are still above the reference points for LC / L_{mat} and $L_{25\%}$ / L_{mat} for all the data years (Figure 7.11 and Table 7.2 and Table 7.3). For the $L_{max5\%}$ / L_{inf} reference point the indicator is above the reference point for the last four years. The P_{mega} was for all years below the reference of 30%. With respect to MSY the indicator is above the reference points for the last four data years (Figure 7.13). It was concluded, that the exploitation for this stock was still below F_{MSY} in the year 2020.

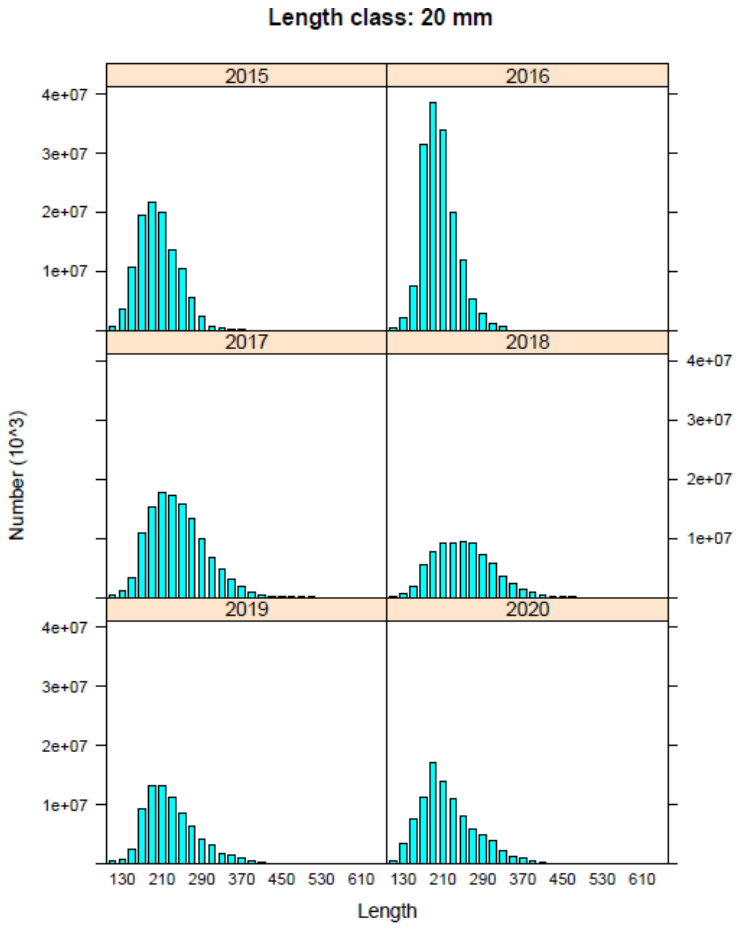

Figure 7.10 Grey gurnard in Subarea 4, Division 3.a. and Division 7.d: Obtained length frequency distributions binned into 20 mm size classes.

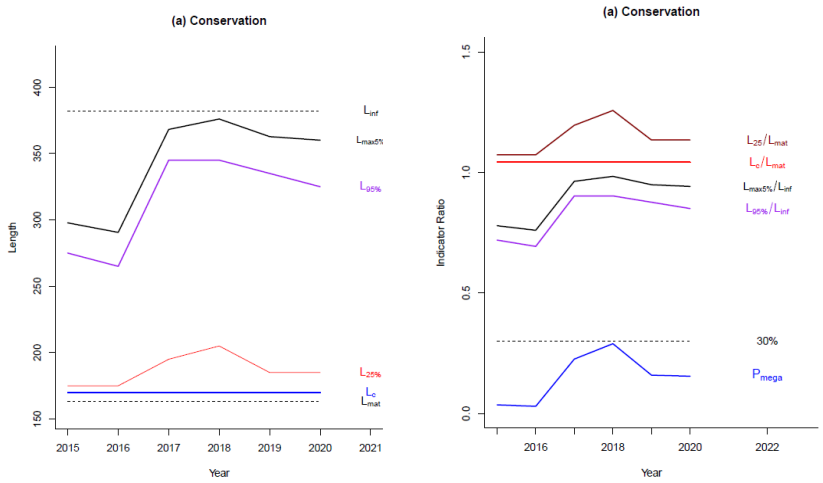

Figure 7.11 Grey gurnard in Subarea 4, Division 3.a. and Division 7.d: Conservation indicators (left panel) and indicator ratios (right panel).

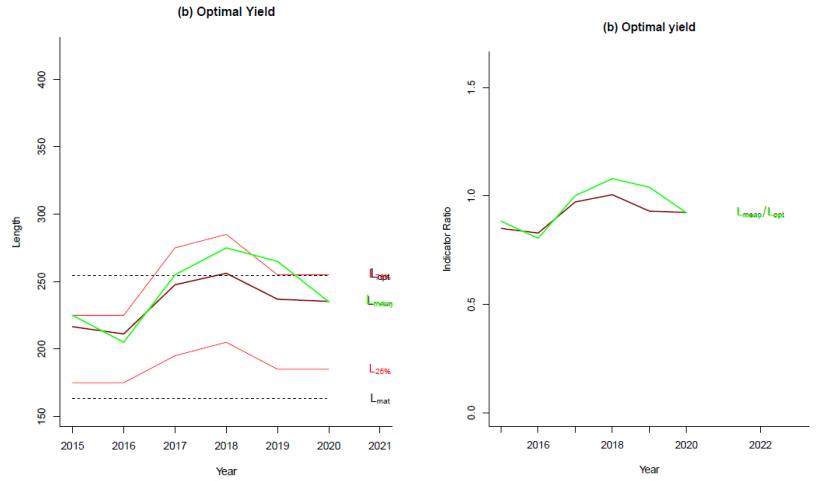

Figure 7.12 Grey gurnard in Subarea 4, Division 3.a. and Division 7.d: Optimum yield indicators (left panel) and indicator ratios (right panel).

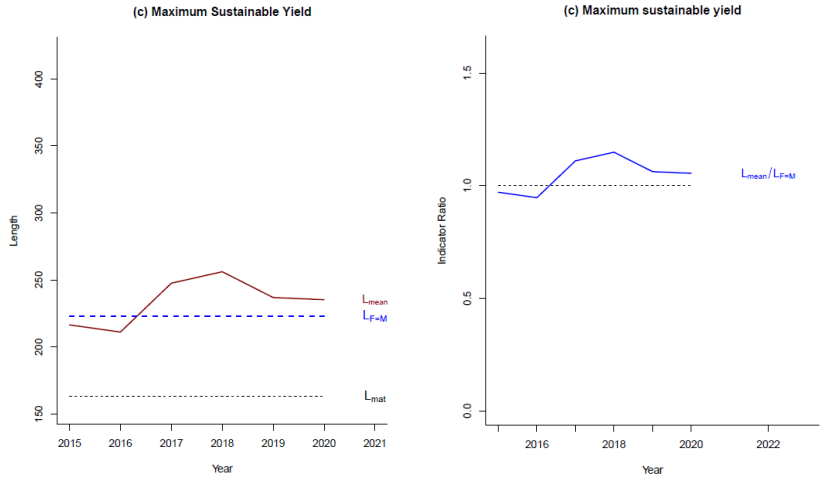

Figure 7.13 Grey gurnard in Subarea 4, Division 3.a. and Division 7.d: Maximum sustainable yield indicator (left panel) and indicator ratio (right panel).

Table 7.2 Grey gurnard in Subarea 4, Division 3.a. and Division 7.d: Length-based reference points.

Year	L75	L25	Lmed	L90	L95	Lmean	Lc	LFeM	Lmaxy	Lmat	Lopt	Linf	Lmax5
2015	225	175	195	255	275	216.53	170	223	225	163	254.67	382	297.77
2016	225	175	195	245	265	211.17	170	223	205	163	254.67	382	290.57
2017	275	195	235	315	345	247.62	170	223	255	163	254.67	382	368.15
2018	285	205	245	325	345	256.17	170	223	275	163	254.67	382	376.01
2019	255	185	215	305	335	236.91	170	223	265	163	254.67	382	362.73
2020	255	185	205	305	325	235.31	170	223	235	163	254.67	382	360.06

Table 7.3 Grey gurnard in Subarea 4, Division 3.a. and Division 7.d: Length-based indicators. Green colour indicate that the observed value is above the respective reference point, red colour indicates that it is below.

	Conservation				Optimizing Yield	MSY
	LC/L_{mat}	$L_{25\%}/L_{mat}$	$L_{max5\%}/L_{inf}$	P_{mega}	L_{mean}/L_{opt}	$L_{mean}/L_{F=M}$
Ref	**>1**	**>1**	**>0.8**	**>30%**	**~1(>0.9)**	**≥1**
2015	**1.04**	**1.07**	0.78	0.04	0.85	0.97
2016	**1.04**	**1.07**	0.76	0.03	0.83	0.95
2017	**1.04**	**1.20**	**0.96**	0.23	**0.97**	**1.11**
2018	**1.04**	**1.26**	**0.98**	0.29	**1.01**	**1.15**
2019	**1.04**	**1.13**	**0.95**	0.16	**0.93**	**1.06**
2020	**1.04**	**1.13**	**0.94**	0.16	**0.92**	**1.06**

7.7 Data requirements

For management purposes, information should be available on catches and landings. Traditionally the quality of landings data has been poor for this species because in the past often only landings of "gurnards" were reported which is still the case for some countries today (e.g. Germany, UK England). Further, this species is highly discarded and discard data are only available for the recent years (2012–2019).

Given the high level of discarding, observation at sea under DCF is the main source of information to better estimate the total catches.

For a better understanding of this species an increase in our knowledge of biological parameters is required. In the context of ecosystem considerations, it would be useful to obtain more information on age composition of the stock and its diet composition.

From the information presented here, it can be concluded that grey gurnard is currently of very limited commercial interest.

7.8 Issues list

The available data (landings, discards, length samples) are uploaded into InterCatch for the years 2012-2019 and are used for the assessment. It should be investigated if this data series could possibly be extended to cover more years in the past.

The used survey indices are well suitable for this stock as the IBTS covers most of the stock distribution area and shows a good catchability for this species.

There are some issues with the reporting of grey gurnard for some nations, e.g. Germany does not officially report grey gurnard but only a generic gurnard group in which also other gurnard species are included. This is usually not corrected for when uploading data to InterCatch. This is similar to the UK data for which a ratio from survey data was used to correct for the proportion of other gurnard species. However, also this method will introduce a bias in the final estimates because the survey abundance does not necessarily reflect what is landed or discarded in the fishery.

For some fleets zero landings are reported, but at the same time no discards are reported. For these cases it is not possible to raise any discards in InterCatch, although high discards may occur in these fleets. It is not known how this affects the estimation of the total catch within InterCatch.

Biological data are not collected on a routine basis for grey gurnard on the IBTS. However, from time to time new data are available via DATRAS and the availability of these data should be compiled during a benchmark assessment.

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7.10 Catch and index tables

Table 7.4. Grey gurnard in Subarea 4, Division 3.a. and Division 7.d: Official grey gurnard landings in Division 3.a (tonnes).

Year	BE	DK	NL	NO	SE	Total
1980	0	0	0	0	36	36
1981	0	0	0	0	46	46
1982	0	86	0	0	43	129
1983	0	29	0	0	7	36
1984	0	62	0	0	6	68
1985	0	3	0	0	9	12
1986	0	6	0	0	10	16
1987	1	13	0	0	6	20
1988	0	59	0	0	2	61
1989	0	19	0	0	4	23
1990	0	34	0	0	3	37
1991	0	25	0	0	5	30
1992	0	22	0	0	10	32
1993	0	18	0	0	9	27
1994	0	12	0	0	12	24
1995	0	10	0	0	5	15
1996	0	18	0	0	3	21
1997	0	13	0	0	5	18
1998	0	27	0	0	8	35
1999	0	23	0	0	5	28
2000	0	32	0	0	5	37
2001	0	30	0	0	3	33
2002	0	18	0	0	1	19
2003	0	32	0	0	1	33
2004	0	24	2	0	2	28
2005	0	21	4	0	1	26
2006	0	19	0	0	2	21
2007	0	21	1	0	3	25
2008	0	24	0	0	5	29
2009	0	15	0	0	3	18
2010	0	10	1	0	2	13
2011	0	5	0	0	1	6
2012	0	5	0	0	1	6
2013	0	5	0	0	1	6
2014	0	3	0	0	1	4
2015	0	10	0	1	2	14
2016	0	13	1	0	2	16
2017	0	256	6	4	3	269

Year	BE	DK	NL	NO	SE	Total
2018	0	24	11	0	3	38
2019	0	7	10	0	2	19
2020	0	4	15	0	1	20

Table 7.5. Grey gurnard in Subarea 4, Division 3.a. and Division 7.d: Official grey gurnard landings in Subarea 4 (tonnes).

Year	BE	DK	FR	NL	NO	SE	UK	Total
1980	0	0	43	0	0	0	0	43
1981	0	0	0	0	0	0	0	0
1982	0	0	100	0	0	0	0	100
1983	0	0	64	0	0	0	0	64
1984	0	0	71	0	0	0	0	71
1985	88	0	85	0	0	0	0	173
1986	0	27	66	0	0	0	0	93
1987	63	44205	56	0	0	0	0	44324
1988	72	36887	43	0	0	0	22	37024
1989	73	26230	45	0	0	0	0	26348
1990	85	22041	42	0	0	0	0	22168
1991	70	14514	28	0	0	0	0	14612
1992	98	8113	21	0	0	0	10	8242
1993	106	822	27	0	0	0	24	979
1994	63	87	21	0	0	0	22	193
1995	43	63	26	0	0	0	21	153
1996	108	52	18	0	0	0	54	232
1997	49	23	22	0	0	0	57	151
1998	33	29	13	0	0	0	0	75
1999	35	63	0	0	0	127	0	225
2000	28	63	5	452	0	0	0	548
2001	22	258	20	277	0	1	33	611
2002	23	45	10	285	0	1	29	393
2003	16	60	5	307	0	6	26	420
2004	21	59	6	264	0	3	23	376
2005	16	52	5	213	0	8	22	316
2006	10	46	2	133	2	0	7	200
2007	11	16	3	155	5	0	14	204
2008	8	24	2	104	5	3	12	158
2009	15	6	2	154	1	1	22	201
2010	14	8	10	218	1	0	14	266
2011	26	6	7	263	1	0	31	334
2012	49	3	4	467	2	0	77	602
2013	30	4	2	268	33	1	131	470

Year	BE	DK	FR	NL	NO	SE	UK	Total
2014	35	4	3	252	56	0	128	478
2015	20	1220	2	229	172	5	354	2004
2016	31	1151	6	232	83	6	297	1806
2017	24	2067	4	320	172	8	314	2909
2018	27	497	14	360	149	16	461	1524
2019	26	324	3	416	203	51	560	1583
2020	25	506	1	438	276	20	465	1731

Table 7.6. Grey gurnard in Subarea 4, Division 3.a. and Division 7.d: Official grey gurnard landings in Division 7.d (tonnes).

Year	BE	FR	NL	UK	Total
1980	0	950	0	0	950
1981	0	0	0	0	0
1982	0	380	0	0	380
1983	0	489	0	0	489
1984	0	126	0	0	126
1985	14	102	0	0	116
1986	0	217	0	0	217
1987	12	66	0	0	78
1988	14	346	0	0	360
1989	9	90	0	0	99
1990	6	92	0	0	98
1991	5	94	0	0	99
1992	6	85	0	0	91
1993	7	47	0	0	54
1994	4	33	0	0	37
1995	7	36	0	0	43
1996	4	44	0	0	48
1997	3	81	0	0	84
1998	1	34	0	0	35
1999	1	0	0	0	1
2000	9	67	0	0	76
2001	6	40	0	0	46
2002	32	54	1	0	87
2003	18	42	12	0	72
2004	14	3	31	0	48
2005	13	2	21	0	36
2006	8	2	22	14	46
2007	3	1	9	36	49
2008	1	3	16	66	86
2009	1	1	3	61	66

Year	BE	FR	NL	UK	Total
2010	6	2	39	64	111
2011	11	5	53	33	102
2012	11	5	11	23	50
2013	23	4	11	14	52
2014	7	5	4	2	18
2015	2	6	2	0	10
2016	1	6	2	0	9
2017	1	8	4	12	25
2018	17	6	4	11	38
2019	1	7	3	8	19
2020	1	2	1	1	5

Table 7.7. Grey gurnard in Subarea 4, Division 3.a. and Division 7.d: Mature biomass indices (kg/hour) from IBTS–Q1 and IBTS–Q3.

Year	IBTS–Q1	IBTS–Q3
1983	4.48	
1984	12.85	
1985	3.38	
1986	8.49	
1987	4.15	
1988	2.35	
1989	6.03	
1990	8.07	
1991	7.80	5.93
1992	8.67	9.55
1993	10.01	6.84
1994	9.51	9.62
1995	11.38	8.22
1996	16.68	13.63
1997	31.44	10.96
1998	19.31	18.35
1999	40.80	19.96
2000	23.04	14.59
2001	18.26	20.08
2002	22.29	14.53
2003	19.44	14.52
2004	19.08	7.93
2005	22.13	8.23
2006	21.87	8.71
2007	26.62	10.35

Year	IBTS–Q1	IBTS–Q3
2008	22.58	13.52
2009	20.04	13.10
2010	29.67	11.56
2011	27.33	18.63
2012	31.70	11.64
2013	22.88	15.47
2014	23.20	23.33
2015	26.68	14.68
2016	29.69	16.49
2017	29.84	13.24
2018	16.14	10.61
2019	17.32	13.64
2020	15.07	13.49
2021	11.64	

Table 7.8. Grey gurnard in Subarea 4, Division 3.a. and Division 7.d: Summary of the assessment done during the WGNSSK 2021 with updated values (Official BMS landings, ICES landings (incl. IBC), discards (incl. BMS), and catches in tonnes).

Year	Official landings	Official BMS landings	ICES Landings	ICES catches	ICES discards	Discard rate
1983	589					
1984	265					
1985	301					
1986	326					
1987	44422					
1988	37445					
1989	26470					
1990	22303					
1991	14741					
1992	8365					
1993	1060					
1994	254					
1995	211					
1996	301					
1997	253					
1998	145					
1999	254					
2000	661					
2001	690					
2002	499					
2003	525					
2004	452					

Year	Official landings	Official BMS landings	ICES Landings	ICES catches	ICES discards	Discard rate
2005	378					
2006	267					
2007	279					
2008	273					
2009	285					
2010	390					
2011	442					
2012	658		689	8345	7656	0.92
2013	528		1180	10230	9050	0.88
2014	500		1892	8596	6704	0.78
2015	2028		2141	8451	6310	0.75
2016	1831		2156	12129	9973	0.82
2017	3203		3451	17121	13670	0.80
2018	1600		1137	11418	10281	0.90
2019	1621	13	1709	9295	7586	0.82
2020	1756	6	1971	10226	8255	0.81